Connecticut Department of
ENERGY &
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NOV 3 0 2015

Mr. Andrew Bazinet
Director of Development
CPV Towantic, LLC
50 Braintree Hill Office Park Suite 300
Braintree, MA 02184

Dear Mr. Bazinet:

Enclosed are copies of your new permits to construct and operate a 805 MW Combined Cycle Power Plant consisting of two GE 7HA.01 combustion turbines with duct firing, one auxiliary boiler and two emergency diesel fired engines at 16 Woodruff Hill Road, Oxford, CT.

This letter does not relieve you of the responsibility to comply with the requirements of other appropriate Federal, State, and municipal agencies. These permits are not transferable from one permittee to another (without prior written approval), from one location to another, or from one piece of equipment to another. The permits must be made available at the site of operation throughout the period that such permit is in effect.

Permit renewal applications must be filed at least one hundred twenty (120) days prior to the permit expiration date, if applicable. Pursuant to Section 22a-174-3a of the Regulations of Connecticut State Agencies, CPV Towantic, LLC must apply for a permit modification/revision in writing if it plans any physical change, change in method of operation, or addition to this source which constitutes a modification or revision pursuant to Section 22a-174-1 and 22a-174-2a, respectively. Any such changes should first be discussed with Mr. James Grillo of the Bureau of Air Management, by calling (860) 424-4152. Such changes shall not commence prior to the issuance of a permit modification.

Sincerely,

Gary S. Rose

Gary S. Rose
Director
Engineering & Enforcement Division
Bureau of Air Management

GSR:JAG:jad
Enclosure

Connecticut Department of

ENERGY &
ENVIRONMENTAL
PROTECTION

BUREAU OF AIR MANAGEMENT
NEW SOURCE REVIEW PERMIT
TO CONSTRUCT AND OPERATE A STATIONARY SOURCE

Issued pursuant to Title 22a of the Connecticut General Statutes (CGS) and Section 22a-174-3a of the Regulations of Connecticut State Agencies (RCSA).

Owner/Operator	CPV Towantic, LLC
Address	50 Braintree Hill Office Park, Suite 300 Braintree, MA 02184
Equipment Location	16 Woodruff Hill Road, Oxford, CT
Equipment Description	General Electric 7HA.01Gas Turbine with DLN combustors, Duct Burners and Heat Recovery Steam Generator (Unit 1)
Collateral Conditions	Part VII of this permit contains collateral conditions with other NSR permits affecting the Greenhouse Gas requirements and the certified NOx emissions reduction offsets for the entire facility.
Town-Permit Numbers	144-0023
Premises Number	14
Stack Number	7
Permit Issue Date	NOV 30 2015
Expiration Date	None

Michael Sullivan
Deputy Commissioner

November 30, 2015
Date

This permit specifies necessary terms and conditions for the operation of this equipment to comply with state and federal air quality standards. The Permittee shall at all times comply with the terms and conditions stated herein.

PART I. DESIGN SPECIFICATIONS

A. General Description

CPV Towantic, LLC operates a power generation facility consisting of two (2) General Electric 7HA.01 combustion turbines with DLN combustors and a combined nominal gross electrical output of 805 MW in Oxford, CT. The turbines are dual fuel fired combined cycle units, each with a separate heat recovery steam generator (HRSG) that includes natural gas supplementary firing (duct burners) to power a single steam turbine generator. Oil firing for the turbines is limited to ultra-low sulfur distillate (ULSD) No. 2 fuel oil during periods of natural gas curtailment or as allowed in Part VII of this permit. Pollution control equipment will include selective catalytic reduction (SCR), oxidation catalyst, and water injection (ULSD firing only) to control NOx, CO and VOC emissions. The turbine, duct burner and HRSG are designated as Unit 1 for this permit.

B. Equipment Design Specifications

1. Turbine
   The design gross heat input to the turbine is 2,544 MMBtu/hr while firing natural gas and 2,511 MMBtu/hr while firing ULSD oil. These heat inputs are based on an ambient temperature of 59^0F and result in firing rates of 2,435,742 scf of natural gas (HHV 996 Btu/scf) and 17,326 gallons of ULSD (HHV 138,000 Btu/gal) per hour. Heat input will vary by approximately $\pm$5% over the typical range of temperatures expected, with higher heat input occurring at lower ambient temperatures.

2. Duct Burner
   The design gross heat input to the duct burner is 962 MMBtu/hr while firing natural gas. The heat input is based on an assumed HHV of 996 Btu/scf and results in a firing rate of 965,863 scfh.

C. Stack Parameters

1. Minimum Stack Height (ft): 150 (above base elevation)

2. Minimum Exhaust Gas Flow Rate at minimum operating load, turbine only (acfm): 663,327 (gas); 860,408 (ULSD)

3. Minimum Stack Exit Temperature at 100% load (°F): 170

4. Minimum Distance from Stack to Property Line (ft): 188

D. Definitions

1. "Steady-state" operation shall be defined as all periods other than transient operation.

2. "Transient" operation shall be all modes of operation at loads less than 30%, including periods of startup, shutdown, fuel switching and equipment cleaning. "Load" shall be defined as the net electrical output of the turbine. No period of transient operation shall exceed 60 consecutive minutes.

3. "Shakedown" shall be defined as turbine operations including, but not limited to, the first firing of the turbine, proof of interlocks, steam blowing, chemical cleaning and initial turbine roll. The shakedown period shall not extend to or beyond the required date for the initial performance tests specified in Part V.B of this permit.

PART II. OPERATIONAL CONDITIONS and REQUIREMENTS

A. Equipment

1. Turbine
   a. Allowable Fuel Types: Natural Gas; Ultra-Low Sulfur Distillate (ULSD)
   b. Maximum Heat Input over any Consecutive 12 Month Period: 2.12×10^7 MMBtu (gas); 1.72×10^6 MMBtu (ULSD)
   c. Maximum Distillate Fuel Oil Sulfur Content (% by weight, dry basis): 0.0015
   d. Natural gas shall be the primary fuel combusted in this unit. Firing of ULSD is allowed only in the following scenarios:
      i. ISO-NE declares an Energy Emergency as defined in ISO New England's Operating Procedure No. 21 and requests the firing of ULSD.
      ii. The natural gas supply is curtailed by an entity through which gas supply and/or transportation is contracted,
      iii. There exists a physical blockage or breakage in the natural gas pipeline,
      iv. During all periods of commissioning of the plant including performance testing,
      v. During routine maintenance and readiness testing.
      vi. In order to maintain an appropriate turnover of the on-site fuel inventory, to prevent wastage of oil, the owner/operator can fire ULSD when the last delivery of oil was more than six months ago.
   e. The Permittee shall not operate the duct burner while firing ULSD in the turbine.

2. Duct Burner
   a. Allowable Fuel: Natural Gas
   b. Maximum Heat Input over any Consecutive 12 Month Period: 4.09×10^6 MMBtu

B. The Permittee shall operate this equipment, including the SCR, oxidation catalyst, and water injection in a manner to comply with the emissions limits in Part III of this permit.

C. The Permittee shall operate and maintain this equipment, air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup and shutdown.

D. The Permittee shall operate and maintain this equipment in accordance with the manufacturer's specifications and written recommendations.

E. The Permittee shall minimize emissions during periods of startup and shutdown and shall start the ammonia injection as soon as the SCR vendor's recommended minimum catalyst temperature is reached.

F. The Permittee shall not operate the auxiliary boiler, Permit No. 144-0025, simultaneously with the combustion turbines for more than 500 hours in any calendar year.

G. The Permittee shall not exceed a maximum allowable heat rate at full operating load while firing natural gas, without duct firing, of 7,220 Btu/kW-hr (HHV, net plant), on a12-month rolling average for Units 1 and 2 combined.

H. The Permittee shall immediately institute shutdown of the turbine in the event where emissions are in excess of a limit in Part III of this permit that cannot be corrected within three hours of when the emissions exceedance was identified.

I. The Permittee shall not exceed 250 startup events per calendar year for this unit.

PART III. ALLOWABLE EMISSION LIMITS

A. Steady State

Except during the initial shakedown period, the Permittee shall not cause or allow this equipment to exceed the emission limits stated herein at any time during steady state operation.

1. Turbine Operating on Natural Gas without Duct Firing

Pollutant	lb/hr	ppmvd @ 15% O_2	lb/MMBtu
PM	9.73		6.5E-3
$PM_{10/2.5}$	9.73		6.5E-3
SO_2	4.49		1.5E-3
NOx	19.4	2.0	
VOC	3.37	1.0	
CO	5.31	0.9	
Lead	1.3E-03		
H_2SO_4	2.11		
Ammonia		2.0	

2. Turbine Operating on Natural Gas with Duct Firing

Pollutant	lb/hr	ppmvd @ 15% O_2	lb/MMBtu
PM	20.4		8.1E-3
$PM_{10/2.5}$	20.4		8.1E-3
SO_2	6.2		1.5E-3
NOx	26.8	2.0	
VOC	8.82	2.0	
CO	13.8	1.7	
Lead	1.7E-03		
H_2SO_4	2.7		
Ammonia		2.0	

3. Turbine Operating on ULSD

Pollutant	lb/hr	ppmvd @ 15% O_2	lb/MMBtu
PM	42.6		3.19E-2
$PM_{10/2.5}$	42.6		3.19E-2
SO_2	4.92		1.53E-3
NOx	52.0	5.0	
VOC	6.2	2.0	
CO	12.7	2.0	
Lead	3.7E-02		
H_2SO_4	2.31		
Ammonia		5.0	

B. Transient Emissions

1. Except during the initial shakedown period, the Permittee shall not cause or allow this equipment to exceed these limits during startup and shutdown events. No startup or shutdown event shall last longer than 1 hour in duration.

	Type of Event			
	Startup		Shutdown	
	Natural Gas	ULSD	Natural Gas	ULSD
NO_x (lb/hr)	93	104	19	34
VOC (lb/hr)	37	90	60	23
CO (lb/hr)	242	231	121	18

2. Ammonia (NH_3) emissions shall not exceed 5 ppmvd @ 15% O_2 (both fuels) during transient operation.

C. Total Allowable Annual Emission Limits (per unit)

The Permittee shall not cause or allow this equipment to exceed the emission limits stated herein at any time.

1. Pollutants

Pollutant	tons per 12 consecutive months
PM	76.7
$PM_{10/2.5}$	76.7
SO_2	19.7
NOx	94.7
VOC	24.5
CO	64.5
Pb	1.9E-02
H_2SO_4	9.1
NH_3	35

D. Greenhouse Gas Emissions

1. The Permittee shall not exceed a combined annual CO_2e emissions limit of 2,675,185 tons/yr for this unit in combination with the units operating under permit numbers 144-0024, 144-0025, 144-0026, and 144-0027. Compliance with this limitation shall be determined on a consecutive 12-month rolling basis. The Permittee shall make and keep monthly records of CO_2e emissions with the following methodologies:
   a. CO_2 emissions from the combustion turbines, operating under permit numbers 144-0023 and 144-0024, shall be determined by the methodology found in 40 CFR Part 75, Appendix G, Equation G-4.
   b. CO_2 emissions from the boiler and two diesel engines, operating under permit numbers 144-0025, 144-0026, and 144-0027, shall be determined using the default emissions factors found in 40 CFR Part 98, Subpart C, Table C-1.
   c. Methane (CH_4) and nitrous oxide (N_2O) for all combustion sources shall be determined using the default emissions factors found in 40 CFR Part 98, Subpart C, Table C-2.
   d. Estimated fugitive emissions of sulfur hexafluoride (SF_6) from the electrical circuit breakers shall be determined using mass balance.
   e. Estimated fugitive emissions of CH_4 from the natural gas pipeline and associated components shall be determined using default emissions factors found in 40 CFR Part 98, Subpart W, Table W-7.

E. Hazardous Air Pollutants (HAP)

This equipment shall not cause an exceedance of the Maximum Allowable Stack Concentration (MASC) for any hazardous air pollutant (HAP) emitted and listed in RCSA Section 22a-174-29. [STATE ONLY REQUIREMENT]

F. Opacity

This equipment shall not exceed 10% opacity during any six minute block average as measured by 40 CFR 60, Appendix A, Reference Method 9.

G. Demonstration of compliance with the above emission limits may be met by calculating emissions based on emission factors from the following sources:

- *PM/PM10/PM2.5, VOC, H_2SO_4: Stack test data*
- *SO_2: Sulfur content in fuel*
- *NOx & CO (steady state): CEM data*
- NOx, VOC, & CO (transient): Manufacturer's recommended uncontrolled emission factors
- HAP: AP-42, Fifth Edition, Volume I Chapter 3.1, April 2000 except for those HAP with required stack test found in Part V of this permit.

H. The Permittee is not required to demonstrate compliance with the short-term emission limits stated herein prior to the completion of the Shakedown period. Emissions prior to the completion of the Shakedown period shall be counted towards the annual emission limits stated herein.

I. The commissioner may require other means (e.g. stack testing) to demonstrate compliance with the above emission limits, as allowed by state or federal statute, law or regulation.

PART IV. MONITORING, RECORD KEEPING AND REPORTING REQUIREMENTS

A. Monitoring

1. The Permittee shall comply with the CEM requirements as set forth in RCSA Section 22a-174-4, RCSA §22a-174-22, 40 CFR 60 Subpart *KKKK and* 40 CFR Parts 72-78, as applicable. Continuous Emissions Monitoring (CEM) is required for the following pollutants and enforced on the following basis:

Pollutant	Averaging Times	Emission Limit (ppmvd @15% O_2)
Opacity (ULSD only)	six minute block	10%
NOx	1 hour block	See Part III.A
CO	1 hour block	See Part III.A
NH_3	1 hour block	See Part III.A

2. The Permittee shall continuously monitor the following parameters:

Operational Parameter	Averaging Times
O_2	1 hour block
Fuel Flow	1 hour block
Net Electrical Output	Continuous

3. At least sixty (60) days prior to the initial stack test, the Permittee shall submit a CEM monitoring plan to the Commissioner in accordance with RCSA 22a-174-4(c)(3).

4. The Permittee shall use fuel flow meters, certified in accordance with 40 CFR Part 75 Appendix D to measure and record the flow rate of fuels to the turbine and duct burner.

5. The Permittee shall perform inspections and maintenance of the SCR and oxidation catalysts as recommended by the manufacturer.

6. Prior to operation, the Permittee shall develop a written plan for the operation, inspection, maintenance, preventive and corrective measures for minimizing GHG emissions (CH_4 emissions from the natural gas pipeline components and SF_6 emissions from the insulated electrical equipment). At a minimum the plan shall provide for:

   i. Implementation daily auditory/visual/olfactory inspections of the natural gas piping components supplying natural gas to the combustion turbine/duct burner;

   ii. An installed leak detection system to include audible alarms to identify SF_6 leakage from the circuit breakers;

   iii. Inspection for SF_6 emissions from the insulated electrical equipment on at least a monthly basis.

B. Record Keeping

1. For the turbine, the Permittee shall keep records of monthly and consecutive 12 month fuel consumption (for each fuel). The consecutive 12 month fuel consumption shall be determined by adding (for each fuel) the current month's fuel consumption to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of the previous month.

2. For the duct burner, the Permittee shall keep records of monthly and consecutive 12 month natural gas consumption. The consecutive 12 month fuel consumption shall be determined by adding the current month's fuel consumption to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of the previous month.

3. The Permittee shall keep records of the monthly and consecutive 12 month heat input to the turbine for both natural gas and ULSD firing. The records shall include sample calculations.

4. The Permittee shall keep records of the monthly and consecutive 12 month heat input to the duct burner. The records shall include sample calculations.

5. The Permittee shall keep records of the fuel certification for each delivery of fuel oil from a bulk petroleum provider or a copy of the current contract with the fuel supplier supplying the fuel used by the equipment that includes the applicable sulfur content of the fuel as a condition of each shipment. The shipping receipt or contract shall include the date of delivery, the name of the fuel supplier, type of fuel delivered, the percentage of sulfur in such fuel, by weight, dry basis, and the method used to determine the sulfur content of such fuel.

6. The Permittee shall calculate and record the monthly and consecutive 12 month PM, PM_{10}, $PM_{2.5}$, SO_2, NOx, VOC, CO, H_2SO_4, NH_3, and CO_2e emissions in units of tons for all fuels combusted.

   The consecutive 12 month emissions shall be determined by adding (for each pollutant) the current month's emissions to that of the previous 11 months. Such records shall include a sample calculation for each pollutant. The Permittee shall make these calculations within 30 days of the end of the previous month.

   Emissions during startup and shutdown shall be included in the monthly and consecutive 12 month calculations.

7. The Permittee shall keep records of the number of startup events for each calendar year.

8. The Permittee shall keep records of the emissions of this turbine and duct burner during the initial shakedown period. Emissions during shakedown shall be calculated using good engineering judgment and the best data and methodology available for estimating such emissions. Emissions during shakedown shall be counted towards the annual emission limitation in Part III.C of this permit.

9. The Permittee shall keep records of the occurrence and duration of all transient operation of the unit; any malfunction of the air pollution control equipment that causes an exceedance of any emission limitation found in Part III of this permit; or any periods during which a continuous monitoring system or monitoring device is inoperative.

   Such records shall contain the following information:
   a. type of event and percent load;
   b. equipment affected;
   c. date of event;
   d. duration of event (minutes);
   e. fuel being used during event; and
   f. total NO_x, CO and VOC emissions emitted (lb) during the event.

10. The Permittee shall keep records of each delivery of aqueous ammonia/urea. The records shall include:
    a. the date of delivery;
    b. the name of the supplier;
    c. the quantity of aqueous ammonia delivered; and
    d. the percentage of ammonia in solution, by weight.

11. The Permittee shall keep records of the inspection and maintenance of the SCR and oxidation catalysts. The records shall include:
    a. the name of the person conducting the inspection/maintenance;
    b. the date of the inspection/maintenance;
    c. the results or actions taken; and
    d. the date the catalyst is replaced.

12. The Permittee shall keep records of all repairs/replacement of parts and other maintenance activities for the equipment.

13. The Permittee shall keep records of the electrical output of the plant (net) and the heat rate for the turbines while firing natural gas (HHV, net plant) without duct firing, on a 12-month rolling average for the plant.

14. The Permittee shall keep records of the inspection, maintenance, preventive and corrective measures for minimizing GHG emissions from the natural gas pipeline components and the insulated electrical equipment. The records shall include:
    a. the name of the person conducting the inspection/maintenance;
    b. the date the inspection/maintenance;
    c. the results or actions taken;
    d. the leak detection methods used; and
    e. the amount of SF_6 added (if any) to the electrical equipment

15. The Permittee shall keep monthly records of the audible alarms from the SF_6 leak detection system and inspections for the insulated electrical equipment. The records shall include:
    a. the name of the person conducting the inspection/maintenance;
    b. the date the inspection/maintenance;
    c. the results or actions taken.

16. The Permittee shall make and keep records of each hour of co-firing of this unit with the auxiliary boiler for each month and consecutive 12 months.

17. The Permittee shall make and keep records of all occurrences of firing ULSD in the turbine. At a minimum these records shall contain the following information:
    a. the duration of ULSD firing,
    b. the reason for ULSD firing, and
    c. the heat input to the turbine.

18. The Permittee shall keep a certified copy of this permit on the premises at all times, and shall make this copy available upon request of the Commissioner for the duration of this permit. This copy shall also be available for public inspection during regular business hours.

19. The Permittee shall keep records of the manufacturer written recommendations for operation and maintenance of the equipment found in this permit.

20. The Permittee shall keep all records required by this permit for a period of no less than five years and shall submit such records to the commissioner upon request.

C. Reporting

1. The Permittee shall notify the commissioner in writing of all exceedances of an emissions limitation, and shall identify the cause or likely cause of such exceedance, all corrective actions and preventive measures taken with respect thereto, and the dates of such actions and measures as follows:
   a. For any hazardous air pollutant, no later than 24 hours after such exceedance was identified; and
   b. For any other regulated air pollutant, no later than ten days after such exceedance commenced.

2. The Permittee shall notify the commissioner, in writing, of the dates of commencement of construction, completion of construction, and initial startup of this equipment. Such written notifications shall be submitted no later than 30 days after the subject event.

PART V. STACK EMISSION TEST REQUIREMENTS

A. Stack emission testing shall be performed in accordance with the RCSA 22a-174-5 and the Emission Test Guidelines available on the DEEP website.

B. Initial stack emission testing is required for the following pollutant(s):

☒ $PM/PM_{10/2.5}$ ☒ SO_2 ☒ NOx ☒ CO ☒ CO_2
☒ VOC ☒ Opacity
☒ Other (HAPs): Sulfuric Acid, Formaldehyde, arsenic

1. Stack emissions testing firing natural gas, without duct firing, for CO_2 shall only be required during the initial performance test to show compliance with an emissions limit of 809 lbs/MW-hr (net plant), corrected to ISO conditions, as defined in the approved stack test protocol.

2. For the purposes of determining maximum heat input of the turbine during performance testing, the following equations may be used:

$$\mathbf{MHI_T = Q_1 - [(T - T_1)/(T_2 - T_1)] \times (Q_1 - Q_2)}$$

Where,

MHI_T = Turbine maximum heat input at ambient temperature (^0F)
T = Ambient Temperature
T_1 = Temperature Value from Table 1 that is below the ambient temperature
T_2 = Temperature Value from Table 1 that is above the ambient temperature
Q_1 = Heat Input at corresponding T_1
Q_2 = Heat Input at corresponding T_2

Table 1

Natural Gas Firing			ULSD Firing	
Temperature (T) ^0F	Heat Input (Q)		Temperature (T) ^0F	Heat Input (Q)
-14.2	2649		-14.2	2652
20	2672		20	2613
50	2590		50	2559
59	2544		59	2511
90	2416		90	2390
100	2409		100	2331

3. The Duct Burner shall be required to meet a minimum heat input value of 770 MMBtu/hr for all ambient temperatures during initial and recurring performance testing.

4. The Permittee shall perform one set of tests on this turbine when burning natural gas with the duct burner and one set without duct firing. The Permittee shall perform one set of tests with the turbine burning ULSD.

C. The Permittee shall conduct initial stack emission testing within 60 days of achieving the maximum production rate, but not later than 180 days after initial startup. The Permittee shall submit test results within 60 days after completion of testing.

D. Recurrent stack testing of all pollutants listed in Part V.B of this permit, except for VOC and CO_2, shall be performed within five years from the date of the previous stack test. Testing shall be as described in Part V.B of this permit with the following exceptions:

1. After the initial performance test, stack testing may not be required for pollutants requiring CEM. The commissioner retains the right to require stack testing of any pollutant at any time to demonstrate compliance.

2. More frequent testing of VOC is required to verify the correlation between VOC and the CO CEM data. Performance testing for VOC shall be performed within 18-months from the date of the previous stack test.

E. Fuel oil analysis of the arsenic in the distillate oil may be substituted for stack testing while firing distillate oil. Arsenic testing is not required for natural gas firing.

F. Stack Emission test results shall be reported as follows: all pollutants in units of lb/hr; NOx, CO, VOC, formaldehyde, and ammonia in units of ppmvd at 15% O_2;

PART VI. SPECIAL REQUIREMENTS

A. The Permittee shall possess, at least, 235 tons of external emissions reductions to offset the quantity of NO_x emitted from the sources covered under following Permit Numbers. to comply with RCSA 22a-174-3a(l):

- 144-0023 [General Electric 7HA.01 combustion turbine/duct Burner]
- 144-0024 [General Electric 7HA.01 combustion turbine/duct burner]
- 144-0025 [92.4 MMBtu/hr natural gas fired auxiliary boiler]
- 144-0026 [1,500 kW ULSD fired emergency generator]
- 144-0027 [350 bhp ULSD fired emergency fire pump]

Such a quantity is sufficient to offset the emissions from the sources listed above at a ratio of 1.2 to

1 tons of reduction for every ton of NOx emissions allowed under the permits listed. Specifically, the reductions are real, quantifiable, surplus, permanent, and enforceable as defined in RCSA 22a-174-3a(l)(5). The Permittee shall maintain sole ownership and possession of these emissions reductions for the duration of this permit and any subsequent changes to the permit.

Such offsets have been obtained from the following sources:

- 106 tons from Consolidated Edison Company of New York: NY-NY-DEC-2-6301-00006-106
- 110 tons from Akeida Capital Management LLC: CT4NOX00-015-0045-7888-110
- 19 tons from Sikorsky Aircraft Corporation: CTNOX1011-178-0039-19

The Permittee may be required to obtain additional NOx offsets and complete additional ambient air quality analysis to show that the NAAQS and PSD increments have not been violated, if observed steady state or transient emissions exceed a limit specified in Parts III.A, III.B or III.C of this permit.

B. Total annual VOC emissions from all VOC emitting sources located at the premises shall not exceed 49.9 tons/year.

Demonstration of compliance with the annual VOC premises wide limit shall be based on each consecutive 12 month time period and shall be determined by adding the current month's VOC premises wide emissions to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of the previous month.

Monthly premises wide VOC emissions shall be calculated using the following equations:

$$VOC_{premises} = \Sigma VOC_{turbines} + \Sigma VOC_{engines} + VOC_{aux\ boiler} + \Sigma VOC_{storage\ tanks} + \Sigma VOC_{add}$$

where,

$\Sigma VOC_{turbines}$ = The sum of VOC emissions from the two turbine trains covered by permits 144-0023 and 144-0024 determined by correlating the VOC emissions to the CO emissions using the results of a diagnostic stack test and tracked using the CO CEMS. VOC emissions from the turbine train shall be recorded on the CEMS data acquisition system.

$\Sigma VOC_{engines}$ = The sum of emissions from the emergency engines covered by permit numbers 144-0026 and 144-0027. VOC emissions shall be calculated using the following equation:

VOC (ton/month)= [X (VOC lbs/hr) * Y (hrs/month)] * 1 ton/2000 lbs

$VOC_{aux\ boiler}$ = The emissions from the auxiliary boiler covered by permit 144-0025. VOC emissions shall be calculated using the following equation:

VOC (ton/month)= [X (VOC lbs/hr) * Y (hrs/month)] * 1 ton/2000 lbs

$\Sigma VOC_{storage\ tanks}$ = The emissions from any storage tanks located on the premises shall be determined using the latest version of the EPA TANKS model or other equivalent method.

ΣVOC_{add} = The VOC emissions from any additional VOC emitting equipment that is added to the premises after the issuance of this permit. The VOC emissions from such equipment shall be calculated using good engineering practices.

The Commissioner may require other methods for determining VOC emissions from these sources as allowed by state or federal statute, law or regulation.

C. Upon completion of construction of the turbines and control equipment regulated under Permit No. 144-0023 and 144-0024, the Permittee shall prepare and submit a written standby plan in accordance with the RCSA 22a-174-6(d)(2) through (d)(5).

D. The Permittee shall comply with all applicable sections of the following New Source Performance Standard(s) at all times.

Title 40 CFR Part 60, Subpart: KKKK and A

Copies of the Code of Federal Regulations (CFR) are available online at the U.S. Government Printing Office website.

E. The Permittee shall operate this facility at all times in a manner so as not to violate or contribute significantly to the violation of any applicable state noise control regulations, as set forth in RCSA Sections 22a-69-1 through 22a-69-7.4. [STATE ONLY REQUIREMENT]

F. Unless directed otherwise by the Commissioner, if construction does not commence within eighteen (18) months from the date of issuance of this permit, the Permittee shall submit a written updated review of all prior BACT determinations for this unit. The Permittee shall submit this review to the Commissioner within 30 days of the end of such 18 month period.

PART VII. ADDITIONAL TERMS AND CONDITIONS

A. This permit does not relieve the Permittee of the responsibility to conduct, maintain and operate the regulated activity in compliance with all applicable requirements of any federal, municipal or other state agency. Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.

B. Any representative of the DEEP may enter the Permittee's site in accordance with constitutional limitations at all reasonable times without prior notice, for the purposes of inspecting, monitoring and enforcing the terms and conditions of this permit and applicable state law.

C. This permit may be revoked, suspended, modified or transferred in accordance with applicable law.

D. This permit is subject to and in no way derogates from any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material, nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the facility or regulated activity affected thereby. This permit shall neither create nor affect any rights of persons or municipalities who are not parties to this permit.

E. Any document, including any notice, which is required to be submitted to the commissioner under this permit shall be signed by a duly authorized representative of the Permittee and by the person who is responsible for actually preparing such document, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense under section 22a-175 of the Connecticut General Statutes, under section 53a-157b of the Connecticut General Statutes, and in accordance with any applicable statute."

F. Nothing in this permit shall affect the commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of this or any other permit issued to the Permittee by the commissioner.

G. Within 15 days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.

H. The date of submission to the commissioner of any document required by this permit shall be the date such document is received by the commissioner. The date of any notice by the commissioner under this permit, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" means calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.

I. Any document required to be submitted to the commissioner under this permit shall, unless otherwise specified in writing by the commissioner, be directed to: Office of Director; Engineering & Enforcement Division; Bureau of Air Management; Department of Energy and Environmental Protection; 79 Elm Street, 5th Floor; Hartford, Connecticut 06106-5127.

Connecticut Department of

ENERGY &
ENVIRONMENTAL
PROTECTION

BUREAU OF AIR MANAGEMENT
NEW SOURCE REVIEW PERMIT
TO CONSTRUCT AND OPERATE A STATIONARY SOURCE

Issued pursuant to Title 22a of the Connecticut General Statutes (CGS) and Section 22a-174-3a of the Regulations of Connecticut State Agencies (RCSA).

Owner/Operator	CPV Towantic, LLC
Address	50 Braintree Hill Office Park, Suite 300 Braintree, MA 02184
Equipment Location	16 Woodruff Hill Road, Oxford, CT
Equipment Description	General Electric 7HA.01Gas Turbine with DLN combustors, Duct Burners and Heat Recovery Steam Generator (Unit 2)
Collateral Conditions	Part VII of this permit contains collateral conditions with other NSR permits affecting the Greenhouse Gas requirements and the certified NOx emissions reduction offsets for the entire facility.
Town-Permit Numbers	144-0024
Premises Number	14
Stack Number	8
Permit Issue Date	NOV 30 2015
Expiration Date	None

Michael Sullivan
Deputy Commissioner

November 30, 2015
Date

This permit specifies necessary terms and conditions for the operation of this equipment to comply with state and federal air quality standards. The Permittee shall at all times comply with the terms and conditions stated herein.

PART I. DESIGN SPECIFICATIONS

A. General Description

CPV Towantic, LLC operates a power generation facility consisting of two (2) General Electric 7HA.01 combustion turbines with DLN combustors and a combined nominal gross electrical output of 805 MW in Oxford, CT. The turbines are dual fuel fired combined cycle units, each with a separate heat recovery steam generator (HRSG) that includes natural gas supplementary firing (duct burners) to power a single steam turbine generator. Oil firing for the turbines is limited to ultra-low sulfur distillate (ULSD) No. 2 fuel oil during periods of natural gas curtailment or as allowed in Part VII of this permit. Pollution control equipment will include selective catalytic reduction (SCR), oxidation catalyst, and water injection (ULSD firing only) to control NOx, CO and VOC emissions. The turbine, duct burner and HRSG are designated as Unit 1 for this permit.

B. Equipment Design Specifications

1. Turbine
   The design gross heat input to the turbine is 2,544 MMBtu/hr while firing natural gas and 2,511 MMBtu/hr while firing ULSD oil. These heat inputs are based on an ambient temperature of 59^{0}F and result in firing rates of 2,435,742 scf of natural gas (HHV 996 Btu/scf) and 17,326 gallons of ULSD (HHV 138,000 Btu/gal) per hour. Heat input will vary by approximately $\pm$5% over the typical range of temperatures expected, with higher heat input occurring at lower ambient temperatures.

2. Duct Burner
   The design gross heat input to the duct burner is 962 MMBtu/hr while firing natural gas. The heat input is based on an assumed HHV of 996 Btu/scf and results in a firing rate of 965,863 scfh.

C. Stack Parameters

1. Minimum Stack Height (ft): 150 (above base elevation)

2. Minimum Exhaust Gas Flow Rate at minimum operating load, turbine only (acfm): 663,327 (gas); 860,408 (ULSD)

3. Minimum Stack Exit Temperature at 100% load (°F): 170

4. Minimum Distance from Stack to Property Line (ft): 188

D. Definitions

1. "Steady-state" operation shall be defined as all periods other than transient operation.

2. "Transient" operation shall be all modes of operation at loads less than 30%, including periods of startup, shutdown, fuel switching and equipment cleaning. "Load" shall be defined as the net electrical output of the turbine. No period of transient operation shall exceed 60 consecutive minutes.

3. "Shakedown" shall be defined as turbine operations including, but not limited to, the first firing of the turbine, proof of interlocks, steam blowing, chemical cleaning and initial turbine roll. The shakedown period shall not extend to or beyond the required date for the initial performance tests specified in Part V.B of this permit.

PART II. OPERATIONAL CONDITIONS and REQUIREMENTS

A. Equipment

1. Turbine
   a. Allowable Fuel Types: Natural Gas; Ultra-Low Sulfur Distillate (ULSD)
   b. Maximum Heat Input over any Consecutive 12 Month Period: 2.12×10^7 MMBtu (gas); 1.72×10^6 MMBtu (ULSD)
   c. Maximum Distillate Fuel Oil Sulfur Content (% by weight, dry basis): 0.0015
   d. Natural gas shall be the primary fuel combusted in this unit. Firing of ULSD is allowed only in the following scenarios:
      i. ISO-NE declares an Energy Emergency as defined in ISO New England's Operating Procedure No. 21 and requests the firing of ULSD.
      ii. The natural gas supply is curtailed by an entity through which gas supply and/or transportation is contracted,
      iii. There exists a physical blockage or breakage in the natural gas pipeline,
      iv. During all periods of commissioning of the plant including performance testing,
      v. During routine maintenance and readiness testing.
      vi. In order to maintain an appropriate turnover of the on-site fuel inventory, to prevent wastage of oil, the owner/operator can fire ULSD when the last delivery of oil was more than six months ago.
   e. The Permittee shall not operate the duct burner while firing ULSD in the turbine.

2. Duct Burner
   a. Allowable Fuel: Natural Gas
   b. Maximum Heat Input over any Consecutive 12 Month Period: 4.09×10^6 MMBtu

B. The Permittee shall operate this equipment, including the SCR, oxidation catalyst, and water injection in a manner to comply with the emissions limits in Part III of this permit.

C. The Permittee shall operate and maintain this equipment, air pollution control equipment, and monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup and shutdown.

D. The Permittee shall operate and maintain this equipment in accordance with the manufacturer's specifications and written recommendations.

E. The Permittee shall minimize emissions during periods of startup and shutdown and shall start the ammonia injection as soon as the SCR vendor's recommended minimum catalyst temperature is reached.

F. The Permittee shall not operate the auxiliary boiler, Permit No. 144-0025, simultaneously with the combustion turbines for more than 500 hours in any calendar year.

G. The Permittee shall not exceed a maximum allowable heat rate at full operating load while firing natural gas, without duct firing, of 7,220 Btu/kW-hr (HHV, net plant), on a12-month rolling average for the Units 1 and 2 combined.

H. The Permittee shall immediately institute shutdown of the turbine in the event where emissions are in excess of a limit in Part III of this permit that cannot be corrected within three hours of when the emissions exceedance was identified.

I. The Permittee shall not exceed 250 startup events per calendar year for this unit.

PART III. ALLOWABLE EMISSION LIMITS

A. Steady State

Except during the initial shakedown period, the Permittee shall not cause or allow this equipment to exceed the emission limits stated herein at any time during steady state operation.

1. Turbine Operating on Natural Gas without Duct Firing

Pollutant	lb/hr	ppmvd @ 15% O_2	lb/MMBtu
PM	9.73		6.5E-3
$PM_{10/2.5}$	9.73		6.5E-3
SO_2	4.49		1.5E-3
NOx	19.4	2.0	
VOC	3.37	1.0	
CO	5.31	0.9	
Lead	1.3E-03		
H_2SO_4	2.11		
Ammonia		2.0	

2. Turbine Operating on Natural Gas with Duct Firing

Pollutant	lb/hr	ppmvd @ 15% O_2	lb/MMBtu
PM	20.4		8.1E-3
$PM_{10/2.5}$	20.4		8.1E-3
SO_2	6.2		1.5E-3
NOx	26.8	2.0	
VOC	8.82	2.0	
CO	13.8	1.7	
Lead	1.7E-03		
H_2SO_4	2.7		
Ammonia		2.0	

3. Turbine Operating on ULSD

Pollutant	lb/hr	ppmvd @ 15% O_2	lb/MMBtu
PM	42.6		3.19E-2
$PM_{10/2.5}$	42.6		3.19E-2
SO_2	4.92		1.53E-3
NOx	52.0	5.0	
VOC	6.2	2.0	
CO	12.7	2.0	
Lead	3.7E-02		
H_2SO_4	2.31		
Ammonia		5.0	

B. Transient Emissions

1. Except during the initial shakedown period, the Permittee shall not cause or allow this equipment to exceed these limits during startup and shutdown events. . No startup or shutdown event shall last longer than 1 hour in duration.

	Type of Event			
	Startup		Shutdown	
	Natural Gas	ULSD	Natural Gas	ULSD
NO_x (lb/hr)	93	104	19	34
VOC (lb/hr)	37	90	60	23
CO (lb/hr)	242	231	121	18

2. Ammonia (NH_3) emissions shall not exceed 5 ppmvd @ 15% O_2 (both fuels) during transient operation.

C. Total Allowable Annual Emission Limits (per unit)

The Permittee shall not cause or allow this equipment to exceed the emission limits stated herein at any time.

1. Pollutants

Pollutant	tons per 12 consecutive months
PM	76.7
$PM_{10/2.5}$	76.7
SO_2	19.7
NOx	94.7
VOC	24.5
CO	64.5
Pb	1.9E-02
H_2SO_4	9.1
NH_3	35

D. Greenhouse Gas Emissions

1. The Permittee shall not exceed a combined annual CO_2e emissions limit of 2,675,185 tons/yr for this unit in combination with the units operating under permit numbers 144-0023, 144-0025, 144-0026, and 144-0027. Compliance with this limitation shall be determined on a consecutive 12-month rolling basis. The Permittee shall make and keep monthly records of CO_2e emissions with the following methodologies:
   a. CO_2 emissions from the combustion turbines, operating under permit numbers 144-0023 and 144-0024, shall be determined by the methodology found in 40 CFR Part 75, Appendix G, Equation G-4.
   b. CO_2 emissions from the boiler and two diesel engines, operating under permit numbers 144-0025, 144-0026, and 144-0027, shall be determined using the default emissions factors found in 40 CFR Part 98, Subpart C, Table C-1.
   c. Methane (CH_4) and nitrous oxide (N_2O) for all combustion sources shall be determined using the default emissions factors found in 40 CFR Part 98, Subpart C, Table C-2.
   d. Estimated fugitive emissions of sulfur hexafluoride (SF_6) from the electrical circuit breakers shall be determined using mass balance.
   e. Estimated fugitive emissions of CH_4 from the natural gas pipeline and associated components shall be determined using default emissions factors found in 40 CFR Part 98, Subpart W, Table W-7.

E. Hazardous Air Pollutants (HAP)

This equipment shall not cause an exceedance of the Maximum Allowable Stack Concentration (MASC) for any hazardous air pollutant (HAP) emitted and listed in RCSA Section 22a-174-29. [STATE ONLY REQUIREMENT]

F. Opacity

This equipment shall not exceed 10% opacity during any six minute block average as measured by 40 CFR 60, Appendix A, Reference Method 9.

G. Demonstration of compliance with the above emission limits may be met by calculating emissions based on emission factors from the following sources:

- *PM/PM10/PM2.5, VOC, H_2SO_4: Stack test data*
- *SO_2: Sulfur content in fuel*
- *NOx & CO (steady state): CEM data*
- NOx, VOC, & CO (transient): Manufacturer's recommended uncontrolled emission factors
- HAP: AP-42, Fifth Edition, Volume I Chapter 3.1, April 2000 except for those HAP with required stack test found in Part V of this permit.

H. The Permittee is not required to demonstrate compliance with the short-term emission limits stated herein prior to the completion of the Shakedown period. Emissions prior to the completion of the Shakedown period shall be counted towards the annual emission limits stated herein.

I. The commissioner may require other means (e.g. stack testing) to demonstrate compliance with the above emission limits, as allowed by state or federal statute, law or regulation.

PART IV. MONITORING, RECORD KEEPING AND REPORTING REQUIREMENTS

A. Monitoring

1. The Permittee shall comply with the CEM requirements as set forth in RCSA Section 22a-174-4, RCSA §22a-174-22, 40 CFR 60 Subpart *KKKK* and 40 CFR Parts 72-78, as applicable. Continuous Emissions Monitoring (CEM) is required for the following pollutants and enforced on the following basis:

Pollutant	Averaging Times	Emission Limit (ppmvd @15% O_2)
Opacity (ULSD only)	six minute block	10%
NOx	1 hour block	See Part III.A
CO	1 hour block	See Part III.A
NH_3	1 hour block	See Part III.A

2. The Permittee shall continuously monitor the following parameters:

Operational Parameter	Averaging Times
O_2	1 hour block
Fuel Flow	1 hour block
Net Electrical Output	Continuous

3. At least sixty (60) days prior to the initial stack test, the Permittee shall submit a CEM monitoring plan to the Commissioner in accordance with RCSA 22a-174-4(c)(3).

4. The Permittee shall use fuel flow meters, certified in accordance with 40 CFR Part 75 Appendix D to measure and record the flow rate of fuels to the turbine and duct burner.

5. The Permittee shall perform inspections and maintenance of the SCR and oxidation catalysts as recommended by the manufacturer.

6. Prior to operation, the Permittee shall develop a written plan for the operation, inspection, maintenance, preventive and corrective measures for minimizing GHG emissions (CH_4 emissions from the natural gas pipeline components and SF_6 emissions from the insulated electrical equipment). At a minimum the plan shall provide for:

   i. Implementation daily auditory/visual/olfactory inspections of the natural gas piping components supplying natural gas to the combustion turbine/duct burner;

   ii. An installed leak detection system to include audible alarms to identify SF_6 leakage from the circuit breakers;

   iii. Inspection for SF_6 emissions from the insulated electrical equipment on at least a monthly basis.

B. Record Keeping

1. For the turbine, the Permittee shall keep records of monthly and consecutive 12 month fuel consumption (for each fuel). The consecutive 12 month fuel consumption shall be determined by adding (for each fuel) the current month's fuel consumption to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of the previous month.

2. For the duct burner, the Permittee shall keep records of monthly and consecutive 12 month natural gas consumption. The consecutive 12 month fuel consumption shall be determined by adding the current month's fuel consumption to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of the previous month.

3. The Permittee shall keep records of the monthly and consecutive 12 month heat input to the turbine for both natural gas and ULSD firing. The records shall include sample calculations.

4. The Permittee shall keep records of the monthly and consecutive 12 month heat input to the duct burner. The records shall include sample calculations.

5. The Permittee shall keep records of the fuel certification for each delivery of fuel oil from a bulk petroleum provider or a copy of the current contract with the fuel supplier supplying the fuel used by the equipment that includes the applicable sulfur content of the fuel as a condition of each shipment. The shipping receipt or contract shall include the date of delivery, the name of the fuel supplier, type of fuel delivered, the percentage of sulfur in such fuel, by weight, dry basis, and the method used to determine the sulfur content of such fuel.

6. The Permittee shall calculate and record the monthly and consecutive 12 month PM, PM_{10}, $PM_{2.5}$, SO_2, NOx, VOC, CO, H_2SO_4, NH_3, and CO_2e emissions in units of tons for all fuels combusted.

   The consecutive 12 month emissions shall be determined by adding (for each pollutant) the current month's emissions to that of the previous 11 months. Such records shall include a sample calculation for each pollutant. The Permittee shall make these calculations within 30 days of the end of the previous month.

   Emissions during startup and shutdown shall be included in the monthly and consecutive 12 month calculations.

7. The Permittee shall keep records of the number of startup events for each calendar year.

8. The Permittee shall keep records of the emissions of this turbine and duct burner during the initial shakedown period. Emissions during shakedown shall be calculated using good engineering judgment and the best data and methodology available for estimating such emissions. Emissions during shakedown shall be counted towards the annual emission limitation in Part III.C of this permit.

9. The Permittee shall keep records of the occurrence and duration of all transient operations of the unit; any malfunction of the air pollution control equipment that causes an exceedance of any emission limitation found in Part III of this permit; or any periods during which a continuous monitoring system or monitoring device is inoperative.

   Such records shall contain the following information:
   a. type of event and percent load;
   b. equipment affected;
   c. date of event;
   d. duration of event (minutes);
   e. fuel being used during event; and
   f. total NO_x, CO and VOC emissions emitted (lb) during the event.

10. The Permittee shall keep records of each delivery of aqueous ammonia/urea. The records shall include:
    a. the date of delivery;
    b. the name of the supplier;
    c. the quantity of aqueous ammonia delivered; and
    d. the percentage of ammonia in solution, by weight.

11. The Permittee shall keep records of the inspection and maintenance of the SCR and oxidation catalysts. The records shall include:
    a. the name of the person conducting the inspection/maintenance;
    b. the date of the inspection/maintenance;
    c. the results or actions taken; and
    d. the date the catalyst is replaced.

12. The Permittee shall keep records of all repairs/replacement of parts and other maintenance activities for the equipment.

13. The Permittee shall keep records of the electrical output of the plant (net) and the heat rate for the turbines while firing natural gas (HHV, net plant) without duct firing, on a 12-month rolling average for the plant.

14. The Permittee shall keep records of the inspection, maintenance, preventive and corrective measures for minimizing GHG emissions from the natural gas pipeline components and the insulated electrical equipment. The records shall include:
    a. the name of the person conducting the inspection/maintenance;
    b. the date the inspection/maintenance;
    c. the results or actions taken;
    d. the leak detection methods used; and
    e. the amount of SF_6 added (if any) to the electrical equipment

15. The Permittee shall keep monthly records of the audible alarms from the SF_6 leak detection system and inspections for the insulated electrical equipment. The records shall include:
    a. the name of the person conducting the inspection/maintenance;
    b. the date the inspection/maintenance;
    c. the results or actions taken.

16. The Permittee shall make and keep records of each hour of co-firing of this unit with the auxiliary boiler for each month and consecutive 12 months.

17. The Permittee shall make and keep records of all occurrences of firing ULSD in the turbine. At a minimum these records shall contain the following information:
    a. the duration of ULSD firing,
    b. the reason for ULSD firing, and
    c. the heat input to the turbine.

18. The Permittee shall keep a certified copy of this permit on the premises at all times, and shall make this copy available upon request of the Commissioner for the duration of this permit. This copy shall also be available for public inspection during regular business hours.

19. The Permittee shall keep records of the manufacturer written recommendations for operation and maintenance of the equipment found in this permit.

20. The Permittee shall keep all records required by this permit for a period of no less than five years and shall submit such records to the commissioner upon request.

C. Reporting

1. The Permittee shall notify the commissioner in writing of all exceedances of an emissions limitation, and shall identify the cause or likely cause of such exceedance, all corrective actions and preventive measures taken with respect thereto, and the dates of such actions and measures as follows:
   a. For any hazardous air pollutant, no later than 24 hours after such exceedance was identified; and
   b. For any other regulated air pollutant, no later than ten days after such exceedance commenced.

2. The Permittee shall notify the commissioner, in writing, of the dates of commencement of construction, completion of construction, and initial startup of this equipment. Such written notifications shall be submitted no later than 30 days after the subject event.

PART V. STACK EMISSION TEST REQUIREMENTS

A. Stack emission testing shall be performed in accordance with the RCSA 22a-174-5 and the Emission Test Guidelines available on the DEEP website.

B. Initial stack emission testing is required for the following pollutant(s):

☒ $PM/PM_{10/2.5}$ ☒ SO_2 ☒ NOx ☒ CO ☒ CO_2
☒ VOC ☒ Opacity
☒ Other (HAPs): Sulfuric Acid, Formaldehyde, arsenic

1. Stack emissions testing firing natural gas, without duct firing, for CO_2 shall only be required during the initial performance test to show compliance with an emissions limit of 809 lbs/MW-hr net plant), corrected to ISO conditions, as defined in the approved stack test protocol.

2. For the purposes of determining maximum heat input of the turbine during performance testing, the following equations may be used:

$$\mathbf{MHI_T = Q_1 - [(T - T_1)/(T_2 - T_1)] \times (Q_1 - Q_2)}$$

Where,

MHI_T = Turbine maximum heat input at ambient temperature (^0F)
T = Ambient Temperature
T_1 = Temperature Value from Table 1 that is below the ambient temperature
T_2 = Temperature Value from Table 1 that is above the ambient temperature
Q_1 = Heat Input at corresponding T_1
Q_2 = Heat Input at corresponding T_2

Table 1

Natural Gas Firing			ULSD Firing	
Temperature (T) ^0F	Heat Input (Q)		Temperature (T) ^0F	Heat Input (Q)
-14.2	2649		-14.2	2652
20	2672		20	2613
50	2590		50	2559
59	2544		59	2511
90	2416		90	2390
100	2409		100	2331

3. The Duct Burner shall be required to meet a minimum heat input value of 770 MMBtu/hr for all ambient temperatures during initial and recurring performance testing.

4. The Permittee shall perform one set of tests on this turbine when burning natural gas with the duct burner and one set without duct firing. The Permittee shall perform one set of tests with the turbine burning ULSD.

C. The Permittee shall conduct initial stack emission testing within 60 days of achieving the maximum production rate, but not later than 180 days after initial startup. The Permittee shall submit test results within 60 days after completion of testing.

D. Recurrent stack testing of all pollutants listed in Part V.B of this permit, except for VOC and CO_2, shall be performed within five years from the date of the previous stack test. Testing shall be as described in Part V.B of this permit with the following exceptions:

1. After the initial performance test, stack testing may not be required for pollutants requiring CEM. The commissioner retains the right to require stack testing of any pollutant at any time to demonstrate compliance.

2. More frequent testing of VOC is required to verify the correlation between VOC and the CO CEM data. Performance testing for VOC shall be performed within 18-months from the date of the previous stack test.

E. Fuel oil analysis of the arsenic in the distillate oil may be substituted for stack testing while firing distillate oil. Arsenic testing is not required for natural gas firing.

F. Stack Emission test results shall be reported as follows: all pollutants in units of lb/hr; NOx, CO, VOC, formaldehyde, and ammonia in units of ppmvd at 15% O_2;

PART VI. SPECIAL REQUIREMENTS

A. The Permittee shall possess, at least, 235 tons of external emissions reductions to offset the quantity of NO_x emitted from the sources covered under following Permit Numbers. to comply with RCSA 22a-174-3a(l):

- 144-0023 [General Electric 7HA.01 combustion turbine/duct Burner]
- 144-0024 [General Electric 7HA.01 combustion turbine/duct burner]
- 144-0025 [92.4 MMBtu/hr natural gas fired auxiliary boiler]
- 144-0026 [1,500 kW ULSD fired emergency generator]
- 144-0027 [350 bhp ULSD fired emergency fire pump]

Such a quantity is sufficient to offset the emissions from the sources listed above at a ratio of 1.2 to

1 tons of reduction for every ton of NOx emissions allowed under the permits listed. Specifically, the reductions are real, quantifiable, surplus, permanent, and enforceable as defined in RCSA 22a-174-3a(l)(5). The Permittee shall maintain sole ownership and possession of these emissions reductions for the duration of this permit and any subsequent changes to the permit.

Such offsets have been obtained from the following sources:

- 106 tons from Consolidated Edison Company of New York: NY-NY-DEC-2-6301-00006-106
- 110 tons from Akeida Capital Management LLC: CT4NOX00-015-0045-7888-110
- 19 tons from Sikorsky Aircraft Corporation: CTNOX1011-178-0039-19

The Permittee may be required to obtain additional NOx offsets and complete additional ambient air quality analysis to show that the NAAQS and PSD increments have not been violated, if observed steady state or transient emissions exceed a limit specified in Parts III.A, III.B or III.C of this permit.

B. Total annual VOC emissions from all VOC emitting sources located at the premises shall not exceed 49.9 tons/year.

Demonstration of compliance with the annual VOC premises wide limit shall be based on each consecutive 12 month time period and shall be determined by adding the current month's VOC premises wide emissions to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of the previous month.

Monthly premises wide VOC emissions shall be calculated using the following equations:

$$VOC_{premises} = \Sigma VOC_{turbines} + \Sigma VOC_{engines} + VOC_{aux\ boiler} + \Sigma VOC_{storage\ tanks} + \Sigma VOC_{add}$$

where,

$\Sigma VOC_{turbines}$ = The sum of VOC emissions from the two turbine trains covered by permits 144-0023 and 144-0024 determined by correlating the VOC emissions to the CO emissions using the results of a diagnostic stack test and tracked using the CO CEMS. VOC emissions from the turbine train shall be recorded on the CEMS data acquisition system.

$\Sigma VOC_{engines}$ = The sum of emissions from the emergency engines covered by permit numbers 144-0026 and 144-0027. VOC emissions shall be calculated using the following equation:

VOC (ton/month)= [X (VOC lbs/hr) * Y (hrs/month)] * 1 ton/2000 lbs

$VOC_{aux\ boiler}$ = The emissions from the auxiliary boiler covered by permit 144-0025. VOC emissions shall be calculated using the following equation:

VOC (ton/month)= [X (VOC lbs/hr) * Y (hrs/month)] * 1 ton/2000 lbs

$\Sigma VOC_{storage\ tanks}$ = The emissions from any storage tanks located on the premises shall be determined using the latest version of the EPA TANKS model or other equivalent method.

ΣVOC_{add} = The VOC emissions from any additional VOC emitting equipment that is added to the premises after the issuance of this permit. The VOC emissions from such equipment shall be calculated using good engineering practices.

The Commissioner may require other methods for determining VOC emissions from these sources as allowed by state or federal statute, law or regulation.

C. Upon completion of construction of the turbines and control equipment regulated under Permit No. 144-0023 and 144-0024, the Permittee shall prepare and submit a written standby plan in accordance with the RCSA 22a-174-6(d)(2) through (d)(5).

D. The Permittee shall comply with all applicable sections of the following New Source Performance Standard(s) at all times.

Title 40 CFR Part 60, Subpart: KKKK and A

Copies of the Code of Federal Regulations (CFR) are available online at the U.S. Government Printing Office website.

E. The Permittee shall operate this facility at all times in a manner so as not to violate or contribute significantly to the violation of any applicable state noise control regulations, as set forth in RCSA Sections 22a-69-1 through 22a-69-7.4. [STATE ONLY REQUIREMENT]

F. Unless directed otherwise by the Commissioner, if construction does not commence within eighteen (18) months from the date of issuance of this permit, the Permittee shall submit a written updated review of all prior BACT determinations for this unit. The Permittee shall submit this review to the Commissioner within 30 days of the end of such 18 month period.

PART VII. ADDITIONAL TERMS AND CONDITIONS

A. This permit does not relieve the Permittee of the responsibility to conduct, maintain and operate the regulated activity in compliance with all applicable requirements of any federal, municipal or other state agency. Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.

B. Any representative of the DEEP may enter the Permittee's site in accordance with constitutional limitations at all reasonable times without prior notice, for the purposes of inspecting, monitoring and enforcing the terms and conditions of this permit and applicable state law.

C. This permit may be revoked, suspended, modified or transferred in accordance with applicable law.

D. This permit is subject to and in no way derogates from any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material, nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the facility or regulated activity affected thereby. This permit shall neither create nor affect any rights of persons or municipalities who are not parties to this permit.

E. Any document, including any notice, which is required to be submitted to the commissioner under this permit shall be signed by a duly authorized representative of the Permittee and by the person who is responsible for actually preparing such document, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense under section 22a-175 of the Connecticut General Statutes, under section 53a-157b of the Connecticut General Statutes, and in accordance with any applicable statute."

F. Nothing in this permit shall affect the commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of this or any other permit issued to the Permittee by the commissioner.

G. Within 15 days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.

H. The date of submission to the commissioner of any document required by this permit shall be the date such document is received by the commissioner. The date of any notice by the commissioner under this permit, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" means calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.

I. Any document required to be submitted to the commissioner under this permit shall, unless otherwise specified in writing by the commissioner, be directed to: Office of Director; Engineering & Enforcement Division; Bureau of Air Management; Department of Energy and Environmental Protection; 79 Elm Street, 5th Floor; Hartford, Connecticut 06106-5127.

Connecticut Department of

ENERGY &
ENVIRONMENTAL
PROTECTION

BUREAU OF AIR MANAGEMENT
NEW SOURCE REVIEW PERMIT
TO CONSTRUCT AND OPERATE A STATIONARY SOURCE

Issued pursuant to Title 22a of the Connecticut General Statutes (CGS) and Section 22a-174-3a of the Regulations of Connecticut State Agencies (RCSA).

Owner/Operator	CPV Towantic, LLC
Address	50 Braintree Hill Office Park, Suite 300 Braintree, MA 02184
Equipment Location	16 Woodruff Hill Road Oxford, CT
Equipment Description	92.4 MMBtu/hr Natural Gas Fired CB Nebraska Boiler Model Number NB-300D-70
Town-Permit Numbers	144-0025
Premises Number	14
Stack Number	9
Permit Issue Date	NOV 30 2015
Expiration Date	None

Michael Sullivan
Deputy Commissioner

November 30, 2015
Date

This permit specifies necessary terms and conditions for the operation of this equipment to comply with state and federal air quality standards. The Permittee shall at all times comply with the terms and conditions stated herein.

PART I. DESIGN SPECIFICATIONS

A. General Description

CB-Nebraska NB-300D-70, 92.4 MMBtu/hr is a natural gas fired auxiliary boiler. The boiler will provide steam to warm up the steam turbine to minimize the duration of plant start-ups.

B. Equipment Design Specifications

1. Fuel Type(s): Natural Gas
2. Maximum Fuel Firing Rate(s) (CF/hr): 89,900
3. Maximum Gross Heat Input (MMBTU/hr): 92.4
4. Maximum Steam Flow (lbs/hr) @ 387^{0}F and 200 psig: 77,000

C. Control Equipment Design Specifications

1. Ultra-Low NOx Burner/Flue Gas Recirculation
   a. Make: CB-Nebraska

D. Stack Parameters

1. Minimum Stack Height (ft): 62
2. Minimum Exhaust Gas Flow Rate at maximum firing rate (acfm): 4,910
3. Minimum Stack Exit Temperature at maximum firing rate (°F): 241 (at economizer exit)
4. Minimum Distance from Stack to Property Line (ft): 136

PART II. OPERATIONAL CONDITIONS

A. Equipment

1. This unit shall only fire natural gas.
2. Maximum Fuel Consumption over any Consecutive 12 Month Period: 359.6 MMft^3
3. The Permittee shall not operate this unit with either of the combustion turbines, permit numbers 144-0023 and 144-0024, for 500 hrs or more in any calendar year.
4. The Permittee shall operate and maintain this equipment in accordance with the manufacturer's specifications and written recommendations.

5. The Permittee shall properly operate the flue gas recirculation (FGR) system at all times that this equipment is in operation and emitting air pollutants.

PART III. ALLOWABLE EMISSION LIMITS

The Permittee shall not cause or allow this equipment to exceed the emission limits stated herein at any time.

A. Pollutants

Pollutant	lb/hr		tpy
PM_{10}	0.65		1.29
$PM_{2.5}$	0.65		1.29
SO_2	0.14		0.28
NOx	0.79	7 ppmvd @3% O_2	1.6
VOC	0.38		0.75
CO	3.42	50 ppmvd @3% O_2	6.83
Pb	4.5E-05		9.1E-05
H_2SO_4	0.011		0.02
CO_2e		117 lbs/MMBtu	21,627

B. Hazardous Air Pollutants

This equipment shall not cause an exceedance of the Maximum Allowable Stack Concentration (MASC) for any hazardous air pollutant (HAP) emitted and listed in RCSA Section 22a-174-29. [STATE ONLY REQUIREMENT]

C. Opacity

This equipment shall not exceed 10% opacity during any six minute block average as measured by 40 CFR 60, Appendix A, Reference Method 9.

D. Demonstration of compliance with the above emission limits may be met by calculating emissions based on emission factors from the following sources:

- *NOx, CO, VOC: Stack test data*
- *PM_{10}: Guaranteed Vendor Emissions Factor*
- *Opacity: Stack Test Data*
- *SO_2, H_2SO_4: Calculated from fuel sulfur content not exceeding 0.5 grains of Sulfur/100 dscf*
- *Pb: AP-42, Table 1.4-2*
- *CO_2e: 40 CFR part 98, Tables A-1, C-1, and C-2*

The commissioner may require other means (e.g. stack testing) to demonstrate compliance with the above emission limits, as allowed by state or federal statute, law or regulation.

PART IV. MONITORING, RECORD KEEPING AND REPORTING REQUIREMENTS

A. Monitoring

1. The Permittee shall continuously monitor this unit's fuel consumption using a non-resettable totalizing fuel meter.

2. The Permittee shall perform inspections of the burners and flue gas recirculation (FGR) system as recommended by the manufacturer.

3. The Permittee shall monitor all hours of simultaneous operations of this unit with either of the combustion turbines.

B. Record Keeping

1. The Permittee shall keep records of monthly and consecutive 12 month fuel consumption. The consecutive 12 month fuel consumption shall be determined by adding the current month's fuel consumption to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of the previous month.

2. The Permittee shall calculate and record the monthly and consecutive 12 month PM, PM_{10}, $PM_{2.5}$, SO_2, NOx, VOC, CO, and CO_2e emissions in units of tons. The consecutive 12 month emissions shall be determined by adding (for each pollutant) the current month's emissions to that of the previous 11 months. Such records shall include a sample calculation for each pollutant. The Permittee shall make these calculations within 30 days of the end of the previous month.

3. The Permittee shall make and keep records of all maintenance and tune-up activities for this unit.

4. The Permittee shall make and keep records of all inspections of the burners and FGR system.

5. The Permittee shall make and keep records of all hours of simultaneous operation of this unit with either of the combustion turbines. The Permittee shall total these hours for each month and for the calendar year. The Permittee shall make these calculations within 30 days of the end of the previous month.

6. The Permittee shall make and keep records of manufacturer written specifications and recommendations for operation and maintenance.

7. The Permittee shall keep all records required by this permit for a period of no less than five years and shall submit such records to the commissioner upon request.

C. Reporting

1. The Permittee shall comply with the applicable reporting requirements of Section 22a-174-22(l).

2. The Permittee shall comply with the record keeping and reporting requirements in 40 CFR 60.49b

3. The Permittee shall notify the commissioner, in writing, of the date of commencement of construction and the date of initial startup of this equipment. Such written notifications shall be submitted no later than 30 days after the subject event.

PART V. STACK EMISSION TEST REQUIREMENTS

Stack emission testing shall be performed in accordance with the Emission Test Guidelines available on the DEEP website.

Initial stack testing shall be required for the following pollutant(s):

☐ PM ☐ PM_{10} ☐ $PM_{2.5}$ ☐ SO_2 ☒ NOx ☒ CO
☒ VOC ☒ Opacity ☐ Other (HAPs):

The Permittee shall conduct initial stack testing within 60 days of achieving the maximum production rate, but not later than 180 days after initial startup. The Permittee shall submit test results within 30 days after completion of testing.

Recurrent stack testing for the above pollutants shall be conducted within 5 years from the date of the previous stack test.

Stack test results shall be reported as follows: all pollutants in units of lb/hr and ppmvd at 3% O_2.

PART VII. SPECIAL REQUIREMENTS

A. The Permittee shall comply with all applicable sections of the following New Source Performance Standard(s) at all times.

Title 40 CFR Part 60, Subparts Dc and A

Copies of the Code of Federal Regulations (CFR) are available online at the U.S. Government Printing Office website.

B. The Permittee shall not cause or permit the emission of any substance or combination of substances which creates or contributes to an odor beyond the property boundary of the premises that constitutes a nuisance as set forth in RCSA Section 22a-174-23. [STATE ONLY REQUIREMENT]

PART VIII. ADDITIONAL TERMS AND CONDITIONS

A. This permit does not relieve the Permittee of the responsibility to conduct, maintain and operate the regulated activity in compliance with all applicable requirements of any federal, municipal or other state agency. Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.

B. Any representative of DEEP may enter the Permittee's site in accordance with constitutional limitations at all reasonable times without prior notice, for the purposes of inspecting, monitoring and enforcing the terms and conditions of this permit and applicable state law.

C. This permit may be revoked, suspended, modified or transferred in accordance with applicable law.

D. This permit is subject to and in no way derogates from any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material, nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the facility or regulated activity affected thereby. This permit shall neither create nor affect any rights of persons or municipalities who are not parties to this permit.

E. Any document, including any notice, which is required to be submitted to the commissioner under this permit shall be signed by a duly authorized representative of the Permittee and by the person who is responsible for actually preparing such document, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense under section 22a-175 of the Connecticut General Statutes, under section 53a-157b of the Connecticut General Statutes, and in accordance with any applicable statute."

F. Nothing in this permit shall affect the commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of this or any other permit issued to the Permittee by the commissioner.

G. Within 15 days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.

H. The date of submission to the commissioner of any document required by this permit shall be the date such document is received by the commissioner. The date of any notice by the commissioner under this permit, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" means calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.

I. Any document required to be submitted to the commissioner under this permit shall, unless otherwise specified in writing by the commissioner, be directed to: Office of Director; Engineering & Enforcement Division; Bureau of Air Management; Department of Energy and Environmental Protection; 79 Elm Street, 5th Floor; Hartford, Connecticut 06106-5127.

Connecticut Department of

ENERGY &
ENVIRONMENTAL
PROTECTION

BUREAU OF AIR MANAGEMENT
NEW SOURCE REVIEW PERMIT
TO CONSTRUCT AND OPERATE A STATIONARY SOURCE

Issued pursuant to Title 22a of the Connecticut General Statutes (CGS) and Section 22a-174-3a of the Regulations of Connecticut State Agencies (RCSA).

Owner/Operator	CPV Towantic, LLC
Address	50 Braintree Hill Office Park, Suite 300 Braintree, MA 02184
Equipment Location	16 Woodruff Hill Road Oxford, CT
Equipment Description	1500 kW Diesel Fired Emergency Engine
Town-Permit Numbers	144-0026
Premises Number	14
Stack Number	10
Permit Issue Date	NOV 30 2015
Expiration Date	None

Michael Sullivan
Deputy Commissioner

November 30, 2015
Date

This permit specifies necessary terms and conditions for the operation of this equipment to comply with state and federal air quality standards. The Permittee shall at all times comply with the terms and conditions stated herein.

PART I. DESIGN SPECIFICATIONS

A. General Description

CPV Towantic LLC operates a Caterpillar 3512C 4-Stroke Lean Burn 1500 kW diesel fired emergency engine to provide emergency back-up power to the facility. The generator is not connected to the electrical grid and is only utilized as an emergency engine pursuant to RCSA 22a-174-22. The unit is also subject to 40 CFR Part 60 Subpart IIII.

B. Equipment Design Specifications

1. Allowable Fuel Type: Ultra Low Sulfur Distillate (ULSD)
2. Maximum Fuel Firing Rate (gal/hr): 104.6
3. Maximum Gross Heat Input (MMBTU/hr): 14.4

C. Stack Parameters

1. Minimum Stack Height (ft): 14.5
2. Minimum Exhaust Gas Flow Rate at maximum firing rate (acfm): 10,909
3. Minimum Stack Exit Temperature at maximum firing rate (°F): 1,145
4. Minimum Distance from Stack to Property Line (ft): 295

PART II. OPERATIONAL CONDITIONS

A. Equipment

1. This equipment shall fire only Ultra Low Sulfur Diesel (ULSD)
2. Maximum Fuel Consumption over any Consecutive 12 Month Period: 31,380 gallons
3. Maximum Fuel Sulfur Content: 0.0015% by weight
4. The Permittee may operate this source for up to 300 hours per calendar year. Total engine hours of operation from this unit and the fire pump, permit number 144-0027, shall not exceed 500 hours per calendar year.
5. The Permittee shall operate and maintain this equipment in accordance with the manufacturer's specifications and written recommendations.
6. The Permittee shall operate and maintain this equipment and any monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown and malfunction.

B. For Emergency Use

1. This emission unit shall only operate in accordance with the definition of emergency engine as defined in RCSA Section 22a-174-22.

2. The Permittee shall not operate the subject engine for routine scheduled testing or maintenance during days when ambient ozone is forecasted by the commissioner to be "moderate unhealthy for sensitive groups" to "very unhealthy" anywhere in Connecticut.
   a. Forecast Information

   Official ambient ozone information can be obtained by calling:
   i. (860) 424-4167 Department's Bureau of Air Management Monitoring Section (Recorded Message Updated daily at 3:00 p.m.)
   ii. (860) 424-3027 Department's Bureau of Air Management Monitoring Section (For additional air quality information)

PART III. ALLOWABLE EMISSION LIMITS

The Permittee shall not cause or allow this equipment to exceed the emission limits stated herein at any time.

A. Short Term Emission Limits

1. Criteria Pollutants

Pollutant	lb/hr	(lbs/MMBtu)
PM	0.15	
$PM_{10/2.5}$	0.15	
SO_2	0.02	
NOx	19.84	
VOC	0.53	
CO	2.14	
Pb	1.1E-05	
H_2SO_4	1.66E-03	
CO_2		163.6

C. Annual Emission Limits

Pollutant	tons per 12 consecutive months
PM	0.02
$PM_{10/2.5}$	0.02
SO_2	0.003
NOx	2.98
VOC	0.08
CO	0.32
Pb	1.7E-06
H_2SO_4	2E-04
CO_2e	354

D. Hazardous Air Pollutants

This equipment shall not cause an exceedance of the Maximum Allowable Stack Concentration (MASC) for any hazardous air pollutant (HAP) emitted and listed in RCSA Section 22a-174-29. [STATE ONLY REQUIREMENT]

E. Opacity

Opacity resulting from operation of this engine shall not exceed 10% during any six-minute block average or 40% reduced to a one-minute block average; as measured by 40 CFR 60, Appendix A, Reference Method 9.

F. Demonstration of compliance with the above emission limits may be met by calculating emissions based on emission factors from the following sources:

- *SO_2, H_2SO_4: Calculated from fuel sulfur content*
- *NOx, $PM_{10/2.5}$, VOC, CO: EPA Certified Vendor Emissions Factor*
- *Pb: AP-42 Sec. 3.1*
- *CO_2: 40 CFR 98 Subpart C, Table C-1*
- *CO_2e: 40 CFR 98, Subpart C, Table C-2*

The commissioner may require other means (e.g. stack testing) to demonstrate compliance with the above emission limits, as allowed by state or federal statute, law or regulation.

PART IV. MONITORING, RECORD KEEPING AND REPORTING REQUIREMENTS

A. Monitoring

1. The Permittee shall continuously monitor fuel consumption by this unit using a non-resettable totalizing fuel meter.

2. The Permittee shall monitor all hours that this unit is in operation.

B. Record Keeping

1. The Permittee shall keep records of monthly and consecutive 12 month fuel consumption. The consecutive 12 month fuel consumption shall be determined by adding the current month's fuel consumption to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of the previous month.

2. The Permittee shall keep records of the fuel certification for each delivery of fuel oil from a bulk petroleum provider or a copy of the current contract with the fuel supplier supplying the fuel used by the equipment that includes the applicable sulfur content of the fuel as a condition of each shipment. The shipping receipt or contract shall include the date of delivery, the name of the fuel supplier, type of fuel delivered, the percentage of sulfur in such fuel, by weight, dry basis, and the method used to determine the sulfur content of such fuel.

3. The Permittee shall calculate and record the monthly and consecutive 12 month PM_{10}, $PM_{2.5}$, SO_2, NOx, VOC, CO H_2SO_4, and CO_2e emissions in units of tons. The consecutive 12 month emissions shall be determined by adding (for each pollutant) the current month's emissions to that of the previous 11 months. Such records shall include a sample calculation for each pollutant. The Permittee shall make these calculations within 30 days of the end of the previous month.

4. The Permittee shall keep monthly and calendar year records of all hours of operation and fuel use for this unit.

   Such records shall contain the following information:
   a. reason for operating;
   b. date of event;
   c. duration of event (minutes);
   d. gallons of fuel combusted;
   e. ozone level as forecasted for the day;
   f. total engine hours of operation and total combined engine hours of operation with the fire pump, permit number 144-0027.

5. The Permittee shall keep records of the inspection and maintenance for this engine. The records shall include:
   a. the name of the person conducting the inspection or maintenance;
   b. the date of the inspection or maintenance;
   c. the results or actions taken.

6. The Permittee shall comply with the applicable record keeping requirements of Section 22a-174-22(l).

7. The Permittee shall keep records of the manufacturer's specifications and written recommendations.

8. The Permittee shall keep all records required by this permit for a period of no less than five years and shall submit such records to the commissioner upon request.

C. Reporting

1. The Permittee shall comply with the applicable reporting requirements of Section 22a-174-22(l).

2. The Permittee shall comply with the reporting requirements in 40 CFR 60.4214

3. The Permittee shall notify the commissioner, in writing, of the date of commencement of construction and the date of initial startup of this equipment. Such written notifications shall be submitted no later than 30 days after the subject event.

PART V. SPECIAL REQUIREMENTS

A. The Permittee shall comply with all applicable sections of the following New Source Performance Standard(s) at all times.

Title 40 CFR Part 60, Subparts: IIII and A

Copies of the Code of Federal Regulations (CFR) are available online at the U.S. Government Printing Office website.

B. The Permittee shall not cause or permit the emission of any substance or combination of substances which creates or contributes to an odor beyond the property boundary of the premises that constitutes a nuisance as set forth in RCSA Section 22a-174-23. [STATE ONLY REQUIREMENT]

PART VI. ADDITIONAL TERMS AND CONDITIONS

A. This permit does not relieve the Permittee of the responsibility to conduct, maintain and operate the regulated activity in compliance with all applicable requirements of any federal, municipal or other state agency. Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.

B. Any representative of the DEEP may enter the Permittee's site in accordance with constitutional limitations at all reasonable times without prior notice, for the purposes of inspecting, monitoring and enforcing the terms and conditions of this permit and applicable state law.

C. This permit may be revoked, suspended, modified or transferred in accordance with applicable law.

D. This permit is subject to and in no way derogates from any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material, nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the facility or regulated activity affected thereby. This permit shall neither create nor affect any rights of persons or municipalities who are not parties to this permit.

E. Any document, including any notice, which is required to be submitted to the commissioner under this permit shall be signed by a duly authorized representative of the Permittee and by the person who is responsible for actually preparing such document, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense under section 22a-175 of the Connecticut General Statutes, under section 53a-157b of the Connecticut General Statutes, and in accordance with any applicable statute."

F. Nothing in this permit shall affect the commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of this or any other permit issued to the Permittee by the commissioner.

G. Within 15 days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.

H. The date of submission to the commissioner of any document required by this permit shall be the date such document is received by the commissioner. The date of any notice by the commissioner under this permit, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" means calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.

I. Any document required to be submitted to the commissioner under this permit shall, unless otherwise specified in writing by the commissioner, be directed to: Office of Director; Engineering & Enforcement Division; Bureau of Air Management; Department of Energy and Environmental Protection; 79 Elm Street, 5th Floor; Hartford, Connecticut 06106-5127.

Connecticut Department of

ENERGY &
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PROTECTION

BUREAU OF AIR MANAGEMENT
NEW SOURCE REVIEW PERMIT
TO CONSTRUCT AND OPERATE A STATIONARY SOURCE

Issued pursuant to Title 22a of the Connecticut General Statutes (CGS) and Section 22a-174-3a of the Regulations of Connecticut State Agencies (RCSA).

Owner/Operator	CPV Towantic, LLC
Address	50 Braintree Hill Office Park, Suite 300 Braintree, MA 02184
Equipment Location	16 Woodruff Hill Road Oxford, CT
Equipment Description	350 bhp Diesel Fire Pump
Town-Permit Numbers	144-0027
Premises Number	14
Stack Number	11
Permit Issue Date	NOV 30 2015
Expiration Date	None

Michael Sullivan
Deputy Commissioner

November 30, 2015
Date

This permit specifies necessary terms and conditions for the operation of this equipment to comply with state and federal air quality standards. The Permittee shall at all times comply with the terms and conditions stated herein.

PART I. DESIGN SPECIFICATIONS

A. General Description

CPV Towantic LLC operates a 350 bhp 4-stroke lean-burn John Deere fire pump to provide emergency fire protection to the facility. The generator is not connected to the electrical grid and is only utilized as a fire pump pursuant to RCSA 22a-174-22. The unit is also subject to 40 CFR Part 60 Subpart IIII.

B. Equipment Design Specifications

1. Allowable Fuel Type: Ultra Low Sulfur Distillate (ULSD)
2. Maximum Fuel Firing Rate (gal/hr): 17.8
3. Maximum Gross Heat Input (MMBTU/hr): 2.45

C. Stack Parameters

1. Minimum Stack Height (ft): 17.5
2. Minimum Exhaust Gas Flow Rate at maximum firing rate (acfm): 1,877
3. Minimum Stack Exit Temperature at maximum firing rate (°F): 961
4. Minimum Distance from Stack to Property Line (ft): 275

PART II. OPERATIONAL CONDITIONS

A. Equipment

1. This equipment shall only fire Ultra Low Sulfur Diesel (ULSD)
2. Maximum Fuel Consumption over any Consecutive 12 Month Period: 5,330 gallons
3. Maximum Fuel Sulfur Content: 0.0015% by weight
4. The Permittee may operate this source for up to 300 hours per calendar year. Total engine hours of operation from this unit and the emergency engine, permit number 144-0026, shall not exceed 500 hours per calendar year.
5. The Permittee shall operate and maintain this equipment in accordance with the manufacturer's specifications and written recommendations.
6. The Permittee shall operate and maintain this equipment and any monitoring equipment in a manner consistent with good air pollution control practices for minimizing emissions at all times including during startup, shutdown and malfunction.

B. For Emergency Use

1. This emission unit shall only operate in accordance with the definition of emergency engine as defined in RCSA Section 22a-174-22.

2. The Permittee shall not operate the subject engine for routine scheduled testing or maintenance during days when ambient ozone is forecasted by the commissioner to be "moderate unhealthy for sensitive groups" to "very unhealthy" anywhere in Connecticut.
   a. Forecast Information

   Official ambient ozone information can be obtained by calling:
   i. (860) 424-4167 Department's Bureau of Air Management Monitoring Section (Recorded Message Updated daily at 3:00 p.m.)
   ii. (860) 424-3027 Department's Bureau of Air Management Monitoring Section (For additional air quality information)

PART III. ALLOWABLE EMISSION LIMITS

The Permittee shall not cause or allow this equipment to exceed the emission limits stated herein at any time.

A. Short Term Emission Limits

1. Criteria Pollutants

Pollutant	lbs/hr	lb/MMBtu
PM	0.1	
$PM_{10/2.5}$	0.1	
SO_2	0.0037	
NOx	2.65	
VOC	0.07	
CO	0.64	
Pb	1.9E-06	
H_2SO_4	2.8E-04	
CO_2		163.6

C. Annual Emission Limits

Pollutant	tons per 12 consecutive months
PM	0.014
$PM_{10/2.5}$	0.014
SO_2	6E-04
NOx	0.4
VOC	0.01
CO	0.09
Pb	2.8E-07
H_2SO_4	4E-05
CO_2e	60

D. Hazardous Air Pollutants

This equipment shall not cause an exceedance of the Maximum Allowable Stack Concentration (MASC) for any hazardous air pollutant (HAP) emitted and listed in RCSA Section 22a-174-29. [STATE ONLY REQUIREMENT]

E. Opacity

Opacity resulting from operation of this engine shall not exceed 10% during any six-minute block average or 40% reduced to a one-minute block average; as measured by 40 CFR 60, Appendix A, Reference Method 9.

F. Demonstration of compliance with the above emission limits may be met by calculating emissions based on emission factors from the following sources:

- *SO_2, H_2SO_4: Calculated from fuel sulfur content*
- *NOx: EPA Certified Vendor emission factor.*
- *NOx, $PM_{10/2.5}$, VOC, CO: EPA Certified Vendor Emissions Factor*
- *Pb: AP-42 Sec. 3.1*
- *CO_2: 40 CFR 98 Subpart C, Table C-1*
- *CO_2e: 40 CFR 98, Subpart C, Table C-2*

The commissioner may require other means (e.g. stack testing) to demonstrate compliance with the above emission limits, as allowed by state or federal statute, law or regulation.

PART IV. MONITORING, RECORD KEEPING AND REPORTING REQUIREMENTS

A. Monitoring

1. The Permittee shall continuously monitor fuel consumption by this unit using a non-resettable totalizing fuel meter.

2. The Permittee shall monitor all hours that this unit is in operation.

B. Record Keeping

1. The Permittee shall keep records of monthly and consecutive 12 month fuel consumption. The consecutive 12 month fuel consumption shall be determined by adding the current month's fuel consumption to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of the previous month.

2. The Permittee shall keep records of the fuel certification for each delivery of fuel oil from a bulk petroleum provider or a copy of the current contract with the fuel supplier supplying the fuel used by the equipment that includes the applicable sulfur content of the fuel as a condition of each shipment. The shipping receipt or contract shall include the date of delivery, the name of the fuel supplier, type of fuel delivered, the percentage of sulfur in such fuel, by weight, dry basis, and the method used to determine the sulfur content of such fuel.

3. The Permittee shall calculate and record the monthly and consecutive 12 month PM_{10}, $PM_{2.5}$, SO_2, NOx, VOC, CO, and CO_2e emissions in units of tons. The consecutive 12 month emissions shall be determined by adding (for each pollutant) the current month's emissions to that of the previous 11 months. Such records shall include a sample calculation for each pollutant. The Permittee shall make these calculations within 30 days of the end of the previous month.

4. The Permittee shall keep monthly and calendar year records of all hours of operation and fuel use for this unit.

   Such records shall contain the following information:
   a. reason for operating;
   b. date of event;
   c. duration of event (minutes);
   d. gallons of fuel combusted;
   e. ozone level as forecasted for the day;
   f. total engine hours of operation and total combined engine hours of operation with the emergency generator, permit number 144-0026.

5. The Permittee shall keep records of the inspection and maintenance for this engine. The records shall include:
   a. the name of the person conducting the inspection or maintenance;
   b. the date of the inspection or maintenance;
   c. the results or actions taken.

6. The Permittee shall comply with the applicable record keeping requirements of Section 22a-174-22(l).

7. The Permittee shall keep records of the manufacturer's specifications and written recommendations.

8. The Permittee shall keep all records required by this permit for a period of no less than five years and shall submit such records to the commissioner upon request.

C. Reporting

1. The Permittee shall comply with the applicable reporting requirements of Section 22a-174-22(l).

2. The Permittee shall comply with the reporting requirements in 40 CFR 60.4214

3. The Permittee shall notify the commissioner, in writing, of the date of commencement of construction and the date of initial startup of this equipment. Such written notifications shall be submitted no later than 30 days after the subject event.

PART V. SPECIAL REQUIREMENTS

A. The Permittee shall comply with all applicable sections of the following New Source Performance Standard(s) at all times.

Title 40 CFR Part 60, Subparts: IIII and A

Copies of the Code of Federal Regulations (CFR) are available online at the U.S. Government Printing Office website.

B. The Permittee shall not cause or permit the emission of any substance or combination of substances which creates or contributes to an odor beyond the property boundary of the premises that constitutes a nuisance as set forth in RCSA Section 22a-174-23. [STATE ONLY REQUIREMENT]

PART VI. ADDITIONAL TERMS AND CONDITIONS

A. This permit does not relieve the Permittee of the responsibility to conduct, maintain and operate the regulated activity in compliance with all applicable requirements of any federal, municipal or other state agency. Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.

B. Any representative of the DEEP may enter the Permittee's site in accordance with constitutional limitations at all reasonable times without prior notice, for the purposes of inspecting, monitoring and enforcing the terms and conditions of this permit and applicable state law.

C. This permit may be revoked, suspended, modified or transferred in accordance with applicable law.

D. This permit is subject to and in no way derogates from any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material, nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the facility or regulated activity affected thereby. This permit shall neither create nor affect any rights of persons or municipalities who are not parties to this permit.

E. Any document, including any notice, which is required to be submitted to the commissioner under this permit shall be signed by a duly authorized representative of the Permittee and by the person who is responsible for actually preparing such document, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense under section 22a-175 of the Connecticut General Statutes, under section 53a-157b of the Connecticut General Statutes, and in accordance with any applicable statute."

F. Nothing in this permit shall affect the commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of this or any other permit issued to the Permittee by the commissioner.

G. Within 15 days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.

H. The date of submission to the commissioner of any document required by this permit shall be the date such document is received by the commissioner. The date of any notice by the commissioner under this permit, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" means calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.

I. Any document required to be submitted to the commissioner under this permit shall, unless otherwise specified in writing by the commissioner, be directed to: Office of Director; Engineering & Enforcement Division; Bureau of Air Management; Department of Energy and Environmental Protection; 79 Elm Street, 5th Floor; Hartford, Connecticut 06106-5127.