Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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October 12, 2016

Mr. Todd D. Cutler, Assistant Secretary
Exelon West Medway, LLC and Exelon
West Medway II, LLC
300 Exelon Way
Kennett Square, PA 19348

RE: **Medway**
Transmittal No.: X265409
Application No.: CE-15-016
Class: **OP**
FMF No.: 309313
PROPOSED AIR QUALITY PLAN APPROVAL

Dear Mr. Cutler:

The Massachusetts Department of Environmental Protection ("MassDEP"), Bureau of Air and Waste, has reviewed your Major Comprehensive Plan Application and your Emission Offset and Nonattainment Review application ("Application") listed above. This Application concerns the proposed installation and operation of two simple-cycle combustion turbine driven electric generators and ancillary equipment at the West Medway Generating Station located at 9 Summer Street in Medway, Massachusetts ("Project"). Hereinafter the new installation, the subject of this Plan Approval, will be termed the 'Project,' and the existing and new installations together will be termed the 'Facility.' The Application bears the seal and signature of A.J. Jablonowski, Massachusetts Registered Professional Engineer Number 39123.

This Application was submitted in accordance with 310 CMR 7.02 Plan Approval and Emission Limitations as contained in 310 CMR 7.00 "Air Pollution Control" regulations adopted by MassDEP pursuant to the authority granted by Massachusetts General Laws, Chapter 111, Section 142 A-O, Chapter 21C, Section 4 and 6, Chapter 21E, Section 6. MassDEP's review of your Application has been limited to air pollution control regulation compliance and does not relieve you of the obligation to comply with any other regulatory requirements.

MassDEP determined that the Application is administratively and technically complete and that the Application is in conformance with the Air Pollution Control regulations and current air pollution control engineering practice, and hereby grants this **Plan Approval** for said Application, as submitted, subject to the conditions listed below.

This Plan Approval combines and includes the 310 CMR 7.02 Comprehensive Plan Approval and the 310 CMR 7.00: Appendix A: Emission Offsets and Nonattainment Review (also called "nonattainment new source review" or "NNSR") approval. This Plan Approval allows for construction and operation of the proposed Project. This Plan Approval describes the proposed Project, the Application and other requirements. This Plan Approval sets out conditions for emission control systems, emission limits, Continuous Emissions Monitoring Systems (CEMS), Continuous Opacity Monitoring Systems (COMS), monitoring and testing, record keeping, reporting and other requirements.

Additionally, Exelon West Medway, LLC and Exelon West Medway II, LLC (collectively, "Exelon" or "the Permittee") is required to obtain a Prevention of Significant Deterioration (PSD) Permit pursuant to 40 CFR 52.21. MassDEP administers the PSD program under a Delegation Agreement with the U.S. Environmental Protection Agency. MassDEP is concurrently issuing a separate PSD Permit for the Project.

Based on MassDEP's review and subsequent analysis of the Best Available Control Technology (BACT) analyses submitted by Exelon for all air contaminants emitted by this proposed Project including: nitrogen oxides (NOx), volatile organic compounds (VOC), carbon monoxide (CO), particulate matter ($PM/PM_{10}/PM_{2.5}$), sulfur dioxide (SO_2), sulfuric acid mist (H_2SO_4), greenhouse gases (GHG), ammonia (NH_3) and Hazardous Air Pollutants (HAP), MassDEP determined that the emission limits contained in this Plan Approval represent BACT for this Project.

Based on MassDEP's review and subsequent analysis of the Lowest Achievable Emission Rate (LAER) analysis for NOx, included in the Application, MassDEP determined that the NOx emission limits contained in the Plan Approval represent LAER for all emission units for this Project.

Finally, MassDEP has included in this Plan Approval requirements that create annual declining CO_{2e} caps on all sources of greenhouse gas included in the Project. Exelon shall comply with the declining annual CO_{2e} caps by either controlling the Project's operations to limit actual CO_{2e} emissions below the applicable year's CO_{2e} cap, or use over compliance credits created when the Project's actual annual project-wide emissions of CO_{2e} are less than the Project's applicable year's CO_{2e} cap. This will ensure that this Project will not emit GHG emissions that may cause or contribute to a condition of air pollution, or cause damage or threat of damage to the environment, as required by the state Clean Air Act, M.G.L. c. 111, §§ 142A-142E, MassDEP air regulations, 310 CMR 7.00, and M.G.L. c. 21A, § 8. This will also ensure that the Project's GHG emissions will not jeopardize achievement of the mandated limits to reduce GHG emissions by 25% from 1990 emission levels by the year 2020 and by 80% from 1990 emission levels by the year 2050 as required by the Global Warming Solutions Act ("GWSA"), M.G.L. c. 21N, and the decision by the Supreme Judicial Court in Kain v DEP, 474 Mass. 278 (2016) ("Kain"). To demonstrate compliance with the declining annual CO_{2e} caps, MassDEP has incorporated into the Plan Approval monitoring, recordkeeping and reporting requirements.

Furthermore, MassDEP has been directed by Governor Baker to finalize regulations to impose annual declining GHG emissions limits on multiple sectors in the Commonwealth effective on or before August 11, 2017 (see Executive Order 569).[1] MassDEP will develop regulations to meet Section 3(d) requirements and the Kain decision. In working on regulations, MassDEP will take into account all GHG emissions from existing and new facilities in the electric generation sector. After input from stakeholders during the notice and public comment process required under M.G.L. c. 30A, MassDEP intends to finalize Section 3(d) regulations that, along with other measures, will ensure that statewide GHG emissions will meet the 2020 goals of the GWSA and the Kain decision. Therefore, MassDEP has included a provision in this Plan Approval that requires Exelon to comply with any applicable Section 3(d) regulations when adopted.

Please review the entire Plan Approval, as it stipulates the conditions with which Exelon must comply in order to operate the Project in compliance with this Plan Approval.

[1] http://www.mass.gov/governor/legislationexecorder/execorders/executive-order-no-569.html

TABLE of CONTENTS

1. Description of Project and Application

Exelon has proposed to modify the existing West Medway Generating Station by constructing two new quick-starting simple-cycle combustion turbine generators and ancillary equipment at 9 Summer Street in Medway, Massachusetts. The Facility will operate based on dispatch orders from ISO-NE consistent with ISO-NE's efforts to provide low-cost electric energy to consumers, maintain operating reserve, and coordinate transmission and generation outages. A facility with the Project's characteristics such as quick-starting and its particular energy price relative to other generators is likely to operate during such circumstances as peak electrical energy demand. The combustion turbines will run primarily on natural gas, with Ultra Low Sulfur Diesel fuel (ULSD) as a backup fuel.

The Project will be located on approximately 13 acres within the existing West Medway Generating Station property. The new construction will include two simple-cycle combustion turbines with a nominal maximum electrical output of 100 megawatts each. Exelon has chosen the General Electric LMS 100 combustion turbines. Other equipment includes a ULSD fired emergency standby engine-driven generator, a ULSD fired emergency standby engine-driven fire pump, and an aqueous ammonia storage tank.

The existing West Medway Generating Station consists of six emission units (EUs J1T1-J3T2). Each emission unit consists of two oil-fired simple-cycle combustion turbines. This Plan Approval does not regulate emissions from these emission units.

The combustion turbines will be equipped with a selective catalytic reduction (SCR) emissions control system with Low-NOx burners and aqueous ammonia injection to reduce emissions of nitrogen oxides (NOx) and an oxidation catalyst to reduce emissions of carbon monoxide (CO) and volatile organic compounds (VOC) including some Hazardous Air Pollutant (HAP) emissions, such as formaldehyde. Other air pollutant emissions include sulfur dioxide, sulfuric acid mist, particulate matter, greenhouse gases, non-VOC HAP and unreacted ammonia. Dedicated 160-foot tall exhaust stacks, one for each turbine, will disperse exhaust gases from each combustion turbine to the atmosphere.

The combustion turbines will operate no more than 60% of the time each year. To maintain applicability of provisions of 40 CFR 60 Subpart TTTT for non-base load units, the Project will be limited to 471,000 MW hours per year net electric sales for each combustion turbine (3-year average). In order to prevent sound emissions that might cause noise in violation of 310 CMR 7.10, the existing combustion turbines at the West Medway Generating Station will not operate concurrently with the new combustion turbines during certain overnight hours except in specific electrical grid conditions, as described in Section 3 below. The emergency generator will only operate during power outages, for maintenance and for readiness testing. The emergency fire pump will operate during emergencies when electric power is not available, for maintenance and for readiness testing. However, in accordance with 40 CFR 60.4211(f), emergency generators can be operated for a maximum of 100 hours per calendar year for “non-emergency situations” which includes maintenance checks and readiness testing.

The Project includes various features to reduce the level of sound emissions that may cause noise. These include single-entry, louvered combustion air inlets, and acoustical enclosures for the turbine-generator, and other equipment. The Project includes close-fitting sound barrier walls around the turbine and generator enclosures and lube oil sump pumps and roof skid barriers. Silencers will be included on the turbine ventilation fans and the exhaust stacks. Additionally, the Project includes a 55-foot noise barrier wall around the entire power block housing the combustion turbines, generators, and other sound-emitting equipment, a 25-foot wall around the gas compressor yard containing a dedicated gas compressor enclosure, and potentially a 20-foot wall near the property line adjacent to 5 Summer Street. The Project also includes ultra-low-noise air-cooled heat exchangers and low noise transformers. The Project also includes adding noise reduction equipment to parts of the existing West Medway Generation Station unless sound measurements after the Project is constructed show these are not necessary.

Table 1 below shows potential air contaminant emissions from the Project, along with the PSD Significant Emission Rates and the NNSR Applicability thresholds. The final two columns show whether pollutants are subject to PSD and/or NNSR review.

Table 1

Potential Emissions (tons per year)

Pollutant	Combustion Turbines[1]	Emergency Generator Engine[2]	Fire Pump Engine[2]	Project-wide PTE	PSD Significant Emission Rates	NNSR Applicability Thresholds	Does PSD Apply?	Does NNSR Apply?
NOx	65.1	0.6	0.235	65.9	40	25	yes	yes
VOC	20.5	0.006	0.0078	20.7[3]	40	50	no	no
CO	67.3	0.52	0.204	68.0	100		no	
SO_2	13.4	0.0011	0.0004	13.4	40		no	
$PM/PM_{10}/PM_{2.5}$	58.2	0.030	0.012	58.2	15 PM_{10} 10 $PM_{2.5}$		yes	
NH_3	35.1	NA	NA	35.1				
Pb	0.01	NA	NA	0.01	0.6		no	
H_2SO_4	12.3	0.0009	0.0003	12.3	7		yes	
CO_2	695,875			695,875				
GHG (as CO_2e)	696,867	116	37	697,049[4]	75,000		yes	
HAP	4.2	0.0012	0.0005	4.2				

Table 1 Key:

CO = Carbon monoxide
CO_2 = Carbon dioxide
CO_2e = Carbon dioxide equivalents
GHG = Greenhouse gases
H_2SO_4 = Sulfuric acid mist
NA = Not applicable
HAP = Hazardous Air Pollutants
NH_3 = Ammonia
NOx = Nitrogen oxides
Pb = Lead
PM = Particulate matter
$PM_{2.5}$ = Particulate matter less than or equal to 2.5 microns in diameter
PM_{10} = Particulate matter less than or equal to 10 microns in diameter
PSD = Prevention of Significant Deterioration
PTE = Potential to emit
SO_2 = Sulfur dioxide
VOC = Volatile organic compounds

Table 1 Notes:

1. Includes emissions from both combustion turbines firing at 100% load for 5,256 hours per year, of which 720 hours are firing ULSD, and assumes 450 starts and stops firing natural gas and 50 starts and stops firing ULSD per turbine.
2. Assumes engines operate 300 hours per year.
3. Includes 0.2 tons per year VOC from working and breathing losses from the ULSD storage tank.
4. Includes 23 tons per year of equivalent GHG fugitive emissions from methane leaks and 6.27 tons per year of equivalent GHG fugitive emissions from sulfur hexafluoride leaks.

2. Emission Offset and Nonattainment Review

Massachusetts has only come into attainment of the air quality standard for ozone in the last few years. When Massachusetts did not attain the ozone air quality standard, MassDEP promulgated the emission offset and nonattainment new source review requirements in 310 CMR 7.00: Appendix A. Those requirements protect the ozone air quality in the Commonwealth and protect other states from the effects of Massachusetts's NOx and VOC emissions. NOx and VOC emissions are precursors to the formation of ground level ozone.

Massachusetts now attains the ozone standard. However, Massachusetts is in the Ozone Transport Region and states in the Ozone Transport Region are required to maintain programs applicable to nonattainment areas, such as NNSR, even though the state is in attainment of the ozone standard.

The Project's potential NOx emissions exceed the threshold for nonattainment new source review as noted in Table 1 above. Therefore, the Project is subject to NNSR, which requires, among other things, offsets, Lowest Achievable Emission Rate (LAER) for new emissions, and a demonstration that the benefits of the Project outweigh its environmental and social costs.

Also, note that MassDEP has demonstrated to EPA that Massachusetts facilities, area sources and mobile sources do not contribute to ozone nonattainment in other states.

Offsets

Exelon must offset the total annual NOx emissions from the Project by a greater reduction in the actual emissions of NOx from other emission sources. MassDEP requires an offset ratio of at least 1.26 tons of offset emissions for each ton of the Project's annual potential emissions (1.26 is derived from the federally required 1.2:1 offset ratio coupled with a 5% public benefit set aside). All offsets used must be federally enforceable.

Since annual potential NOx emissions from the Project are 65.9 tons per year, Exelon is required to obtain 83 tons per year of offsets.

Exelon has obtained 83 tons per year of offsets. This includes 31.2 tons per year of Emission Reduction Credits (ERCs) in the MassDEP Rate ERC Bank[2] acquired from the Osram Sylvania, Inc. facility in Central Falls, RI. The ERCs in the Rate ERC bank will be used in their entirety upon commencement of operation, with no further obligation.

The remainder of the obligation will be satisfied using "discreet" ERCs, that is, ERCs in the MassDEP Mass ERC Bank[3]. Exelon must hold a minimum of five years of ERCs in the Mass ERC Bank or 259 tons, upon commencement of operation and for the remaining operating life of the Project. Exelon must use 51 tons of ERCs in the Mass ERC bank for each year of operation. Exelon must add additional ERCs to the Mass ERC Bank if annual use causes Exelon's holdings to fall below 259 tons. Exelon may use ozone-season ERCs in the Mass ERC Bank for allowable year-round operation. Non-ozone season ERCs may be used only for non-ozone-season allowable operation.

Lowest Achievable Emission Rate Analysis

The Application includes an analysis of LAER for the Project's NOx emission sources. MassDEP regulations define LAER as the more stringent rate of emissions based on the following:

> (a) The most stringent emissions limitation which is contained in any state [State Implementation Plan] for such class or category of stationary source, unless the owner or operator of the proposed stationary source demonstrates that such limitations are not achievable; or
> (b) The most stringent emissions limitation which is achieved in practice by such class or category of stationary source. This limitation, when applied to a modification, means the lowest achievable emissions rate for the new or modified emissions units within a stationary source.

[2] The Massachusetts Rate ERC Bank is a registry for ERCs quantified by an emissions rate, that is, tons per year.
[3] The Massachusetts Mass ERC Bank is a registry for ERCs quantified by an emissions mass, that is, tons.

The LAER analysis concluded there is no NOx emission limitation in a State Implementation Plan that is more stringent than the most stringent emission limitations achieved in practice, so the analysis concentrated on identifying the most stringent emission limitation achieved in practice for simple-cycle combustion turbines with rated capacity greater than 25 MW firing natural gas and fuel oil. Exelon investigated LAER emission limits in pre-construction or operating permits and the RACT/BACT/LAER Clearinghouse (RBLC)[4]. Where Exelon identified applicable permitted emission limits they were further verified at the air permitting agencies that issued the limits. The Applicant investigated other information sources, including recent permits issued by MassDEP and BACT and LAER determinations issued by Texas, California's South Coast Air Quality Management District, other California districts, and determinations compiled by the California Air Resources Board.

The LAER analysis investigated three techniques for limiting NOx emissions: alternative fuels, process modifications, and add-on controls. The Applicant considered four add-on control technologies, three of which were not technically feasible for the proposed combustion turbines[5]. The Applicant found selective catalytic reduction (SCR) to be essential for reaching LAER for NOx emissions from combustion turbines.

The LAER analysis concluded that LAER corresponds to NOx emission limits for simple-cycle combustion turbines of 2.5 parts per million, volumetric dry (ppmvd) corrected to 15% oxygen (O_2) while firing natural gas and 5.0 ppmvd at 15% O_2 while firing fuel oil. To meet LAER, the combustion turbines will use good combustion practices, low NOx burners with water injection, and SCR.

The LAER analysis also considered NOx emissions from the emergency generator engine and the emergency fire pump engine. Exelon conducted similar analyses for each engine. 40 CFR 60 Subpart IIII Standards of Performance for Stationary Compression Ignition Internal Combustion Engines regulates emissions from these engines. Similar to the LAER analysis for the combustion turbines, Exelon searched for emission limitations in practice and investigated the same three techniques for limiting NOx emissions: changing raw materials, process modifications, and add-on controls.

The LAER analysis found the most stringent NOx emission limits in practice for emergency generator engines and fire pump engines to be 3.0 grams per brake horsepower-hour (g/BHP-hr) and 4.0 grams NOx per kilowatt-hour (g/kW-hr), respectively. Exelon proposed these emission levels as LAER for the emergency generator engine and the emergency fire pump engine.

Based on MassDEP's independent review and analysis of the LAER analysis for NOx included in the Application, MassDEP determined that the NOx emission limits proposed by Exelon

[4] See: http://cfpub.epa.gov/rblc/
[5] The technologies not technically feasible were: Kawasaki's catalytic combustion-based technology, catalytic combustion systems such as K-Lean™ (formally XONON), and Emerachem's EMx™ (formally SCONOx) multi-pollutant control systems.

represent LAER for the combustion turbines, the emergency generator engine and the emergency fire pump engine.

Alternatives Analysis

The Application includes an alternatives analysis corresponding to 310 CMR 7.00: Appendix A(8)(b), which states:

> "By means of an analysis of alternative sites, sizes, production processes, and environmental control techniques for such proposed new or modified stationary source, the owner or operator of the proposed stationary source or modification shall demonstrate to the satisfaction of the Department that the benefits of the proposed source significantly outweigh the environmental and social costs imposed as a result of its location, construction, or modification."

Analysis of Alternative Sites

The Applicant evaluated five candidate sites for the development of a simple-cycle combustion turbine generator power plant. The five sites were located at the then existing Exelon Generation Company, LLC properties in Everett, Framingham, Boston, Medway and Weymouth, Massachusetts. The sites were evaluated based on: the use of nearby properties, space available, current use of the property, availability of electric, natural gas and water connections, site preparation needed, community acceptance and to which ISO-New England load zone electricity could be supplied.

Exelon eliminated three candidate sites in the initial evaluation based on, among other things, little space available for expansion, Exelon's plans to sell two of the properties and site-specific issues regarding cost and approvability. The remaining candidate sites were those in Everett and Medway.

Exelon then evaluated the remaining two sites based on a number of locational, environmental and community criteria. Exelon preferred the Medway site on locational criteria because it was considered superior for natural gas supply and reliability, ease of electrical transmission connection, the ability to sell electricity to two load zones, and lower demolition and remediation requirements and costs. The sites were comparable for most environmental criteria, but Medway was preferable with respect to waterway impacts and traffic. Medway was slightly preferable for community criteria because of the Town of Medway's interest in expanding its industrial tax base.

Overall, while both sites met most of Exelon's locational, environmental and community criteria, Exelon determined the Medway site was preferable to the Everett site.

Analysis of Alternative Sizes and Production Processes

The Application includes a copy of written testimony to the Energy Facilities Siting Board (EFSB) with a subsection entitled "Results of Assessment Comparing the Medway Project to Other Fossil-Fuel Generating Technologies." This analysis examined electric generating technologies in comparison to the proposed configuration of two General Electric LMS 100 aero-derivative, simple-cycle combustion turbines fired with natural gas and ULSD as a backup fuel. The criteria examined were: reliability, cost, diversity in energy supply and environmental impact. Table 2 shows the specific technologies, units and sizes analyzed.

Table 2

Technology Comparison

Technology	Combustion Turbine Make/Model	Typical Unit Size (megawatts)
Natural Gas Simple-cycle (Exelon Proposal)	2 GE LMS 100 (aeroderivative)	100
Natural Gas Simple-cycle	1 Siemens SGT6-5000F (Frame)	205-417
Natural Gas Simple-cycle	2 GE 7FA.05 (Frame)	383-396
Natural Gas Combined-cycle	1 Siemens SGT6-5000F (Frame)	302-305
Natural Gas Combined-cycle	2 GE 7FA.05 (Frame)	576-595
Reciprocating Engine	1 Wartsila 18V50DF	18-20
Reciprocating Engine	1 Wartsila 18V50SG	18-20

Regarding reliability, the assessment found the proposed aero-derivative technology has a relatively attractive combination of reliability attributes. Those attributes are: a shorter development and construction lead time, flexible and quick start operations, fuel assurance and low outage rates. Other technologies examined have some, but not all, of these attributes.

Regarding cost, the assessment found a relatively attractive combination of economic attributes for the proposed technology. Those attributes are:

- relatively low installed cost (though higher than simple-cycle frame technology on a dollar per kilowatt basis),
- lower heat rate[6] than simple-cycle frame technologies (though not as good as combined-cycle or reciprocating engines),
- better variable operating and maintenance costs than reciprocating engines and similar to other natural gas technologies,
- lower fixed operating and maintenance costs than other fossil fuel technologies on a dollar per kilowatt basis, and
- lower forced and unforced outage rates.

[6] Heat rate is a measure of the efficiency of an electric generating unit to convert the chemical energy content of the fuel into electrical energy. Heat rate is often measured in British thermal units fuel energy per kilowatt hour electric output.

While there are tradeoffs between the proposed technology and other technologies assessed, the assessment concluded the economic attributes of the proposed technology are favorable compared to other technologies assessed.

Regarding diversity in energy supply, the assessment found that the proposed ability to burn ULSD in addition to natural gas, and the ability to support integration of wind, solar and distributed energy resources through fast-ramping and load-following capability, contributes to energy diversity in the region. These attributes are comparable to other technologies assessed, except natural gas only plants.

Regarding environmental impact, the assessment found that, because of its low heat rate for a fossil fueled simple-cycle unit, ISO-NE would likely dispatch the Project before other fossil fueled units with a higher heat rate. That means less fuel would be combusted for a given level of electrical output, resulting in lower air emissions, all else being equal. These attributes lead the assessment to conclude the proposed Project has relatively attractive environmental characteristics compared to other fossil fuel generating technologies.

The assessment concluded that the proposed technology "provides a combination of features that makes it relatively attractive from a reliability, cost, diversity and environmental point of view."

Analysis of Alternative Environmental Control Techniques

Although the Application doesn't mention it in the section that deals with compliance with the Nonattainment Review requirements, the BACT analyses included in the Application are essentially a comparison of alternative environmental control techniques. The BACT analyses examine applicable air pollution control methods for each pollutant emitted and determine which method is the best technology available. See the details of MassDEP's review of the BACT analysis below.

Environmental and Social Costs

The Application includes an analysis of the proposed Project's benefits and environmental and social costs.

Regarding electric energy generation, the Application states the Project will add reliability to the regional electrical system and provide resources to support intermittent and variable resources, including renewable resources. The Project will dispatch before other less efficient power plants, thereby reducing CO_2 emissions in the region.

Regarding air quality, the Project will not cause or contribute to an exceedance of any National or Massachusetts Ambient Air Quality Standard, will be subject to stringent enforceable emission limits and minimize emissions by using efficient combustion turbines, air pollution control equipment, good combustion practices and burning natural gas primarily. The Project will offset

its NOx emissions by using offsets. It will also surrender CO_2 and SO_2 allowances under the Regional Greenhouse Gas Initiative and the federal Acid Rain Program, respectively.

Regarding noise, the Project must meet the MassDEP noise regulation and the noise requirements of the Town of Medway Zoning Bylaw. To attenuate sound emission levels, the Project includes noise walls and various equipment and design features to prevent noise. The existing combustion turbines will be restricted from operating while the new combustion turbines are operating except during identified circumstances.

Regarding water usage, the Project will use water for NOx air emission controls and washing the combustion turbines. Exelon will develop an on-site well to reduce water use from municipal sources. Exelon provided funding assistance to the Town of Medway for a leak detection study of the Town's water supply lines, which identified a sizable leak.

Regarding waste water management, the Project will connect to the existing town sewer system for sanitary and process wastewater.

Regarding stormwater management, Exelon will collect drainage from around the combustion turbines, process the drainage through an oil-water separator, and direct the drainage to an infiltration pond.

Regarding wetlands, electric transmission line interconnection work adjacent to the existing Eversource 115 kV switchyard will result in approximately 206 square feet of permanent filling of a bordering vegetative wetland. The Applicant will restore approximately 323 square feet of a temporary alteration. To mitigate impacts Exelon is proposing to create approximately 500 square feet of new Bordering Vegetated/Freshwater Wetland. Minor portions of the new infrastructure are located within the 100 foot Buffer Zone to Bordering Vegetated/Freshwater Wetland and Riverfront Area. No permanent impacts to wetland resource areas are anticipated from installation of the new natural gas pipeline connection.

Regarding traffic, a traffic study concluded there is adequate capacity along Summer Street and at study intersections to accommodate the Project.

Regarding chemical storage, both the ULSD tank and the aqueous ammonia storage tanks will be equipped with full secondary containment. Accidental release modeling found that the impacts of a complete failure of the aqueous ammonia tank are below applicable health impact thresholds at the fence line and beyond the Facility site.

Regarding social impacts, the Project was subject to enhanced public participation and enhanced analysis of impacts and mitigation requirements under the Massachusetts Environmental Justice Policy in the Massachusetts Environmental Policy Act (MEPA) process. This included enhanced public participation during the MEPA and EFSB processes, publishing the Environmental Notification Form in multiple languages, and providing translated notices of all public hearing processes. The enhanced impact analysis included air quality modeling and a human health risk

assessment, which demonstrated that the maximum modeled air quality impact for specific substances associated with the Project emissions would not be expected to contribute to significant health risks among potentially affected populations. Section 7 of this Plan Approval discusses public participation and enhanced analysis in more depth. Further, under PSD review, the application must address, and MassDEP must determine that there are no disproportionately high and adverse human health or environmental effects due to the Project in areas with minority or low-income populations.

Regarding miscellaneous local impacts, the Project will be located in the Town of Medway's Industrial II zoning district. The Project will have minimal visual impacts on the existing viewshed and Exelon will consult with neighbors on the characteristics of selected structures visible to abutters. The Project is consistent with local and regional land use plans and is consistent with Medway's goal to encourage commercial/industrial development. The Project will expand the Town's tax base.

Conclusion of the Alternatives Analysis

MassDEP has determined that there will be benefits from the Project including increased electric grid reliability, support for intermittent renewable sources, and reduction of GHG emissions. MassDEP has also determined that there are environmental and social costs resulting from the modification of the West Medway Generating Station. Among other things, emissions to the ambient air and neighborhood noise will increase and the viewshed will change. Exelon will minimize these costs by using: the cleanest fossil fuels available, the most modern combustion technology, advanced emission control technology, noise mitigation systems, the GHG mitigation measures identified in the Section 61 Findings and the use of NOx emission offsets and surrender of Regional Greenhouse Gas Initiative (RGGI) and Acid Rain allowances. Impacts to ambient air and to neighborhood noise are, with adequate mitigation, within the standards and guidelines designed to protect public health and welfare. Accordingly, Exelon has demonstrated to the satisfaction of MassDEP that the benefits of the Project significantly outweigh any environmental and social costs.

NNSR Applicant Demonstrations

In accordance with the requirements of 310 CMR 7.00: Appendix A: (7) (a) through (c), Exelon must make the following demonstrations to the satisfaction of MassDEP:

- (7)(a) "the emissions offsets required under 310 CMR 7.00: *Appendix A*(6), when considered in conjunction with the proposed emissions increase will have a net air quality benefit in the affected area;"

  As a preconstruction condition, Exelon is required to identify enforceable emissions offsets for the Project's nitrogen oxide emissions at a rate of 1.26 tons of offsets for each ton of nitrogen oxide emitted. Nitrogen oxide emissions are precursors to photochemical reactions that lead to ozone formation. It is reasonable to conclude that the net reduction

of nitrogen oxide emissions will result in a net air quality benefit in terms of reduced potential for ozone formation in the Ozone Transport Region.

- (7)(b) "the emissions from the proposed new major stationary source or major modification will not contribute to nonattainment in, or interfere with maintenance by any other state of any national primary or secondary ambient air quality standard;"

  As discussed above, emissions from Massachusetts do not now contribute to nonattainment or interfere with maintenance in any other state. Restricting NOx emissions to LAER, offsetting NOx emissions 1.26:1, and restricting other pollutant emissions to BACT ensures that emissions from the Project do not contribute to nonattainment or interfere with maintenance in any other state, as confirmed by the results of the air quality impact analysis that follows herein.

- (7)(c) "the emissions from the proposed new major stationary source or major modification will not interfere with measures required to be included in the applicable implementation plan for any other State under a program for the prevention of significant deterioration or for the protection of visibility."

  As stated above, since Exelon has demonstrated the Project will not contribute to nonattainment in the area around the Project, it will not interfere with measures in the implementation plan of any other State for the prevention of significant deterioration. The Applicant has demonstrated the Project will not interfere with measures in the implementation plan of any other State for the protection of visibility.

NNSR Additional Conditions for Approval

In accordance with the requirements of 310 CMR 7.00: Appendix A (8)(a), all major stationary sources in Massachusetts (Everett, Framingham, Boston and Medway) controlled by Exelon are in compliance with all applicable emission standards under the federal Clean Air Act.

In accordance with the requirement of 310 CMR 7.00: Appendix A (8)(c), the Administrator of EPA has not determined that the Massachusetts State Implementation Plan is not being adequately implemented in the nonattainment area in which the Project is proposed.

3. BACT Analysis

Pursuant to 310 CMR 7.02(3)(j)6., the emission limits in MassDEP's approval of the Project must represent the most stringent emission limit as specified in 310 CMR 7.02(8). Under 310 CMR 7.02(8)(a)2., such limits must represent BACT. Under 310 CMR 7.00 Definitions,

BEST AVAILABLE CONTROL TECHNOLOGY means an emission limitation based on the maximum degree of reduction of any regulated air contaminant emitted from or

> which results from any regulated facility which the Department, on a case-by-case basis taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems and techniques for control of each such contaminant. The best available control technology determination shall not allow emissions in excess of any emission standard established under the New Source Performance Standards, National Emission Standards for Hazardous Air Pollutants or under any other applicable section of 310 CMR 7.00, and may include a design feature, equipment specification, work practice, operating standard, or combination thereof.

The Application includes analyses that propose BACT for each of the Project's emission sources, that is, the combustion turbines, the emergency generator engine and the emergency fire pump engine. The analyses use a 'top-down' approach, where the analyst ranks all feasible control technologies in order of stringency and emission limits associated with the most stringent technology is BACT unless the analyses eliminates it because of its economic, energy or environmental impacts.

The basis for the top-down BACT analysis procedure are EPA's October 1990 Draft New Source Review Workshop Manual[7], EPA's March 2011 PSD and Title V Permitting Guidance for Greenhouse Gases[8], and MassDEP's June 2011 Best available Control Technology (BACT) Guidance[9].

The Application includes Top-Down BACT analyses for emissions of nitrogen oxides, particulate matter, carbon monoxide, volatile organic compounds, greenhouse gases, sulfur dioxide and sulfuric acid mist. As part of the BACT analyses, the Application includes fuel selection as a control option for the Project's emission sources.

Combustion Turbines

Fuel Selection

Exelon proposed to burn primarily natural gas with ULSD as a back-up fuel. Exelon proposed a 60% capacity factor; that is, operating up to 5,256 hours per year, 720 hours (30 days) of which could be burning ULSD. Further, Exelon is proposing a 43% capacity factor based on net electric sales over a 3-year rolling average.

Exelon's analysis for fuel selection examined the use of only natural gas and the use of natural gas with a back-up fuel, either: liquefied natural gas ("LNG"), biodiesel, or ULSD. Exelon determined that the use of LNG was not technically feasible because the West Medway site is not large enough to accommodate the size of the LNG facility needed. Exelon also determined the use of biodiesel was not technically feasible due to some adverse biodiesel characteristics,

[7] https://www.epa.gov/sites/production/files/2015-07/documents/1990wman.pdf
[8] https://www.epa.gov/sites/production/files/2015-12/documents/ghgpermittingguidance.pdf
[9] http://www.mass.gov/eea/docs/dep/air/approvals/bactguid.pdf

limited experience using biodiesel in combustion turbines and shared storage with the fuel used in the existing combustion turbines, which do not have the capability to use biodiesel.

Since natural gas is lower emitting than ULSD for most pollutants, using only natural gas ranks higher as BACT than using natural gas with ULSD back-up.

MassDEP reviewed and considered the energy, economic and environmental impacts of Exelon's fuel selection proposal. The Project having the ability to use ULSD helps maintain electric grid reliability when the supply of natural gas is sometimes constrained in the winter. Using only natural gas, assuming a firm contract for the supply of natural gas is necessary, is much more expensive than an interruptible supply contract with ULSD back-up. With regard to environmental impacts, burning any ULSD will increase emissions over burning natural gas, but not result in an unacceptable air quality impact. Burning any ULSD increases water use, because the Low-NOx burners used on the dual-fueled GE LMS 100 combustion turbines require water injection to reduce NOx emissions while firing both natural gas and ULSD. Finally, Exelon demonstrated that this Project using ULSD on days when the natural gas supply is constrained would likely reduce regional GHG emissions because this Project would likely displace older, less efficient oil-fired electric generators.

Upon review, MassDEP determined that the emission limits associated with the use of natural gas with ULSD backup represents BACT for the Exelon West Medway II proposal. The Project will be restricted to the equivalent of a 60% full-load operating capacity factor and no more than the equivalent of 30 full-load days of the 60% operating capacity factor per year operating on ULSD. Use of ULSD will be limited, in general, to periods when natural gas is more expensive than ULSD, to emergencies, to periods when natural gas is not available, and for testing and maintenance.

Nitrogen Oxides

For nitrogen oxides emissions from the combustion turbines, the analysis proposed that of the available options, only Selective Catalytic Reduction (SCR), Low-NOx burners, and the use of clean fuels and good combustion control were technically feasible. All these control technologies are economically feasible and as such, Exelon concluded that using all three would be necessary to achieve BACT.

Exelon proposed Low-NOx burners with water injection to control NOx emissions while firing both natural gas and ULSD. Dry Low-NOx burners are not an option with the dual-fueled GE LMS100 combustion turbines, which require water injection to reduce NOx emissions. An on-site well and the Town of Millis municipal water system will supply the Project's water needs.

The Applicant proposed an emission limit of 2.5 ppmvd at 15% O_2 firing natural gas and 5.0 ppmvd at 15% O_2 when firing ULSD. Upon review, MassDEP determined that proposed emission limits represent BACT for simple-cycle combustion turbines fired with the fuels proposed.

Particulate Matter

The BACT analysis reviewed emission rates and control technologies for particulate matter using the conservative assumption that all particulate matter emissions are 2.5 microns aerodynamic particle diameter or smaller. The analysis found that potential control options included fabric filtration, electrostatic precipitation, wet scrubbing, cyclone collection, and side-stream separation. As with all of the pollutants considered for the BACT analysis, the use of clean fuels and good combustion control is another option for emissions control. All of the post-combustion control options were found to be technically infeasible, since the minimum outlet concentration achievable using post-combustion control is generally higher than the inlet concentration achievable using clean fuels. Therefore, the installation of post-combustion controls will not reduce particulate emissions. As such, Exelon proposed the emission limits associated with the use of clean fuels and good combustion control as BACT for the combustion turbines. Upon review, MassDEP determined that emission limits of 0.018 lb PM/PM_{10}/$PM_{2.5}$/MMBtu for natural gas and 0.032 lb PM/PM_{10}/$PM_{2.5}$/MMBtu for ULSD represent BACT.

Carbon Monoxide

For carbon monoxide emissions, the available control options are the use of an oxidation catalyst for post-combustion control and the use of clean fuels and good combustion control. Both of these options are technically feasible. Exelon proposed the emission limits associated with the use of clean fuels and good combustion control and with the use of an oxidation catalyst as BACT for CO emissions from the combustion turbines. Uncontrolled CO emissions concentrations from the GE LMS100 Low-NOx burner with water injection vary over a range of load conditions, with maximum CO emissions concentration at 25% load. The Project will meet the BACT emission rates by using an oxidation catalyst with 95% removal efficiency. The Applicant proposed, and upon review, MassDEP determined that an emissions limit of 5.0 ppmvd at 15% O_2 for both fuels represent BACT.

Volatile Organic Compounds

Exelon proposed the emission limits associated with the use of an oxidation catalyst and clean fuels and good combustion control as BACT for VOC emissions, including VOC HAP. The Applicant found both of these technologies to be technically feasible for the Project's combustion turbines, and that an oxidation catalyst is capable of 37.5% VOC reduction during natural gas firing, and 55% VOC reduction during ULSD firing. Accordingly, Exelon proposed VOC emission limits of 2.5 ppmvd at 15% O_2 during natural gas firing and 4.5 ppmvd at 15% O_2 during ULSD firing. Upon review, MassDEP determined that these emission limits represent BACT.

Greenhouse Gases

Massachusetts regulations define GHG as including, but not limited to, carbon dioxide, methane, nitrous oxide, perfluorocarbons, sulfur hexafluoride and hydrofluorocarbons. Nitrous oxide emissions from uncontrolled and SCR controlled combustion turbines are inherently low. Hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride are not products of combustion and will not be emitted by the Facility. Exelon will comply with 310 CMR 7.72 Reducing Sulfur Hexafluoride Emissions from Gas-insulated Switchgear to reduce sulfur hexafluoride emissions. The SCR will control nitrous oxide as NOx, and good combustion practices will control methane emissions. The GHG BACT analysis focused on CO_2 emissions as the primary GHG component. Emissions calculations are as CO_2-equivalent, or CO_2e[10]. Potential available control options were carbon capture sequestration, alternative electric generation technologies, and the use of clean fuels, good combustion control, and efficient operation. Of these technologies, Exelon found only the use of clean fuels, good combustion control, and efficient operation to be technically feasible. Based on this conclusion, Exelon proposed GHG emission limits of 1,151 pounds of CO_2e per megawatt-hour and 1,551 pounds of CO_2e per megawatt-hour adjusted to ISO conditions when firing natural gas and ULSD, respectively. These values include an added 9.5% margin to account for design uncertainty, turbine degradation, and variations in fuel quality. Further, Exelon proposed an annual average GHG emission limit of 1,352 (lb CO_2e/MWh) (gross), including periods of part-load operation and ULSD firing. Based on review, MassDEP determined that these emission limits represent BACT. All Project GHG emissions are also subject to an annual declining cap. See Condition 23 in Table 17.

Sulfur Dioxide and Sulfuric Acid Mist

The oxidation of sulfur in the fuels generates sulfur dioxide emissions. SO_2 may convert to sulfuric acid when oxidation of the fuel sulfur also generates small amounts of sulfite (SO_3) in the turbine as well as in the oxidation catalyst and the SCR catalyst. The sulfite can react with the moisture in the exhaust to form sulfuric acid. Limiting the sulfur content of the fuel or scrubbing the SO_2 from the exhaust gas are control options for reducing sulfur dioxide and sulfuric acid mist emissions. Exelon determined that control of sulfur dioxide and sulfuric acid mist emissions by using flue gas desulfurization was not technically feasible, in practice, for the Project. Consistent with the BACT analysis, Exelon proposed emission limits associated with the use of clean fuels and good combustion practices as BACT. The applicable BACT emission limits that result from this determination are 0.0026 lb SO_2/MMBtu firing natural gas and 0.0016 lb SO_2/MMBtu firing ULSD. For sulfuric acid mist, the BACT limits are 0.0024 lb H_2SO_4/MMBtu firing natural gas and 0.0015 lb H_2SO_4/MMBtu firing ULSD.

MassDEP has determined that *de minimis* emissions of non-VOC HAP from the combustion turbines, including metals from ULSD combustion and acid gases other than sulfuric acid mist, may be omitted from BACT analysis.

[10] That is, Exelon converts emissions of individual GHG chemicals to an equivalent amount of CO_2 emissions based on the chemical's particular global warming potential relative to CO_2.

Ammonia

Ammonia injection into the combustion turbine exhaust stream is necessary for the SCR to control NOx emissions. Anhydrous ammonia, along with the SCR catalyst, reduces NOx emissions to nitrogen and water. Operators inject some excess ammonia to the exhaust stream to assure the complete reduction of NOx. The only control options for ammonia emissions are to eliminate SCR and to minimize excess ammonia. Exelon determined that eliminating the SCR is technically infeasible, as SCR controls NOx emissions. Exelon proposed a using a system to monitor exhaust stream temperature, SCR inlet and outlet NOx concentration, and ammonia emissions and to adjust automatically the ammonia injection rate to minimize excess ammonia. Exelon proposed an ammonia emission limit of 5.0 ppmvd at 15% O_2 while firing both natural gas and ULSD based on MassDEP's top-case BACT. Based on review, MassDEP determined that this emission limit represents BACT.

Emergency Generator and Emergency Fire Pump Engines

The Project includes an emergency generator engine and an emergency fire pump engine. Both engines will operate on ULSD fuel. The proposed emergency generator engine will be a 603 brake horsepower Caterpillar C-15 (or equivalent) ULSD-fired combustion ignition engine with a standby generating capacity of 450 kW. The emergency fire pump engine will be a 197 brake horsepower Clarke JU6H-UFAD (or equivalent) ULSD-fired combustion ignition engine. Both engines will be used in emergencies only (with the exception of periodic maintenance and testing and use in non-emergency situations allowed under 40 CFR 60.4211(f)) and will be limited to a maximum of 300 hours per rolling 12-month period of operation unless MassDEP amends 310 CMR 7.26(42)(d)1, which is the basis of that requirement. The engines must meet the operation time limits of an amended regulation, if any. Each engine is also subject to the operating limitations specified in 40 CFR 60, Subpart IIII for emergency engines (including a 100-hour limit for non-emergency operation per calendar year.)

The BACT analysis for both engines included a fuel selection BACT and BACT analyses for NOx, CO, VOC, HAP, PM, SO_2/Sulfuric Acid Mist, and GHG emissions.

Fuel Selection

The BACT analysis for the engines demonstrated that ULSD is the best fuel choice for the emergency engines due to the requirement for the engines to have a fuel supply that is directly available without interruption. While propane can be stored locally, the operator needs to evaporate the propane before firing in the emergency generator engine. Engines of the size proposed for the Project could need an external heat source to vaporize the propane fast enough to be used, especially in cold weather. Propane may therefore be unreliable in an emergency. Also, low pressure natural gas is not available at the Project site. National Fire Protection Association regulations restrict or prohibit the use of natural gas or propane instead of ULSD in the emergency fire pump engine.

ULSD is the fuel of choice due to its ability to be stored in a small tank adjacent to the engines. As such, Exelon proposed ULSD as the BACT fuel for the Project's emergency generator engine and emergency fire pump engine.

Upon review, MassDEP determined that ULSD is the best fuel choice for the Project's emergency engines. This has the effect of limiting emergency engine selection to compression ignition reciprocating internal combustion engines (CI RICE).

Nitrogen Oxides

With respect to NOx emissions from the emergency engines, Exelon identified two candidate technologies. These two technologies are selective catalytic reduction (SCR) and the use of a low-NOx engine design. The BACT analysis concluded that both of these technologies are technically feasible, however the use of an SCR on an emergency engine is highly unusual. An economic analysis for an SCR unit on the emergency engines found that the pollutant removal cost is not economically feasible. Exelon proposed the emission limits associated with the use of low-NOx engines was as BACT. A low-NOx engine refers to an engine that complies with 40 CFR 89 Tier 3 engine standards (referenced by 40 CFR 60 Subpart IIII for emergency engines).

Based on MassDEP review, new CI RICE selection is constrained by the applicable federal emissions standards that apply to manufacturers under 40 CFR 89, or, for fire pump engines, an engine that complies with the applicable emission standards in Table 4 of 40 CFR 60 Subpart IIII. There is limited opportunity for owners to deviate from the standard offerings for either emergency or non-emergency stationary CI RICE, without jeopardizing the required manufacturer emissions certifications.

Therefore, MassDEP determined that the NOx emission limits imposed for the latest available model-year New Source Performance Standard (NSPS)-compliant emergency stationary CI RICE represent BACT.

Carbon Monoxide, Volatile Organic Compounds and VOC Hazardous Air Pollutants

For products of incomplete combustion (CO, VOC, and VOC HAP) Exelon proposed the emission limits associated with the use of clean fuels and good combustion control as BACT, consistent with 40 CFR 89 Tier 3 engine standards (referenced by 40 CFR 60 Subpart IIII for emergency engines), MassDEP BACT guidance, and with past MassDEP BACT determinations for similar emission units.

After review, MassDEP determined that the emission limits imposed for the latest available model-year NSPS-compliant emergency stationary CI RICE represent BACT for these emissions.

Particulate Matter and Non-VOC Hazardous Air Pollutants

Exelon identified two control technologies as available to control particulate and non-VOC HAP emissions from the emergency engines. These two control technologies are an active diesel particulate filter (DPF) and low-PM engine design. DPF was technically feasible, but ruled out as BACT due to the excessive pollutant removal cost. As such, the review of other RBLC precedents (none of which indicate use of DPF for engines of this type) supports the proposal of low-PM engine design as BACT. A low-PM engine design refers to an engine that complies with 40 CFR 89 Tier 3 engine standards (referenced by 40 CFR 60 Subpart IIII for emergency engines).

MassDEP determined that PM emission limits imposed for the latest available model-year NSPS-compliant emergency stationary CI RICE represent BACT for PM including non-VOC HAP.

Sulfur Dioxide and Sulfuric Acid Mist

The only control technology identified for sulfur emissions (sulfur dioxide and sulfuric acid mist) from the emergency engines is the use of clean fuels. The use of clean fuels is technically feasible for emergency engines. An economic analysis of the cost effectiveness for emission control was not conducted for use of clean fuels. This is because the use of a clean fuel such as ULSD is already inherent to the project design and is unlikely to be economically infeasible. Exelon proposed the emission limits associated with the use of clean fuels as BACT for control of sulfur dioxide and sulfuric acid mist emissions. Upon review, MassDEP determined that emission limits reflecting the use of ULSD represent BACT for SO_2 and sulfuric acid mist.

Greenhouse Gases

Exelon identified two potential control technologies for control of GHG emission from the emergency engines: post-combustion controls and the use of clean fuels and good combustion control. Post-combustion controls were found to be technically infeasible for engines of this size.

As stated above, MassDEP determined there is no readily available alternative fuel for an emergency stationary CI RICE with lower GHG emissions than ULSD. MassDEP determined that emission limits based on manufacturer specifications for the latest available model-year NSPS certified CI RICE, below in Table 3, and operation only during emergencies, non-emergency situations allowed under the NSPS and for maintenance and testing represents BACT for GHG. All GHG emissions from the Project are also subject to a declining cap. See Condition 23 in Table 17.

Emergency Engine BACT Emission Limits

Upon review, MassDEP determined the specific emergency generator engine and emergency fire pump engine emission limits from 40 CFR 89 and 40 CFR 60 Subpart IIII Table 4 and listed in Table 3 below represent BACT.

Table 3				
Emergency Generator Engine BACT Emission Limits				
Pollutant	**EPA Tier 3 Standard (g/kWh)**	**Emissions (lb/hr)**	**Emissions (lb/MMBtu)**	**Emissions (tpy)**
NOx and NMHC	4.0	3.98	0.85	0.60
$PM/PM_{10}/PM_{2.5}$	0.20	0.23	0.48	0.034
H_2SO_4 [3]	N/A	0.006	0.0012	0.0009
GHG, CO_2e	N/A	771	163.64	116
Emergency Fire Pump Engine BACT Emission Limits				
NOx and NMHC	4.0	1.6	1.04	0.24
$PM/PM_{10}/PM_{2.5}$	0.20	0.09	0.06	0.0133
H_2SO_4 [3]	N/A	0.002	0.0012	0.0003
GHG, CO_2e	N/A	247	163.64	37

Table 3 Key:

CO_2e = Carbon dioxide equivalents
g/kWh = grams per Kilowatt-hour
GHG = Greenhouse gases
lb/hr = pounds per hour
lb/MMBtu = pounds per million British thermal units
NOx = Nitrogen oxides
NMHC = Non-methane hydrocarbons
PM =Particulate matter
$PM_{2.5}$ = Particulate matter less than or equal to 2.5 microns in diameter
PM_{10} = Particulate matter less than or equal to 10 microns in diameter
H_2SO_4 = Sulfuric acid mist
tpy = tons per 12-month rolling period

4. Air Quality Impact Analysis

The EPA has promulgated National Ambient Air Quality Standards (NAAQS) for six air contaminants known as criteria pollutants for the protection of public health and welfare. MassDEP has promulgated Massachusetts Ambient Air Quality Standards (MAAQS), for the same six pollutants, but has not updated the MAAQS recently. The criteria pollutants are: nitrogen dioxide, sulfur dioxide, particulate matter, carbon monoxide, ozone and lead. The NAAQS and MAAQS include both primary and secondary standards of different averaging

periods. The primary standards protect public health and the secondary standards protect public welfare, such as damage to property or vegetation.

MassDEP holds that a demonstration of compliance with the NAAQS is sufficient to assure compliance with the MAAQS, except for the annual and 24-hour SO_2 MAAQS, which averaging periods are no longer regulated by the NAAQS.

Pursuant to 310 CMR 7.02(3)(j)1., the emission limits in MassDEP's approval of the Project must ensure that the emissions from the Project and the Facility do not result in air quality exceeding either the Massachusetts or National Ambient Air Quality Standards.

Under PSD review, new major sources and major modifications of existing sources are required to use air quality dispersion modeling to predict the air quality impact of their new emissions with respect to pollutants subject to PSD review. MassDEP's June 2011 Modeling Guidance for Significant Stationary Sources of Air Pollution establishes thresholds for prescriptive modeling requirements that apply to the Project, regardless of PSD review. Furthermore, for PSD review and for non-PSD pollutants, modeling related to 310 CMR 7.02 Plan Approvals, as the Massachusetts EPA-approved new source review regulation, must conform to 40 CFR 51 Appendix W, Guideline on Air Quality Models, and associated EPA guidance. Emissions from new major sources and major modification must not cause or contribute to an exceedance of the NAAQS or MAAQS.

The Application includes the analyses required to demonstrate compliance with NAAQS and the MassDEP Ambient Air Toxics Guidelines, as well as an analysis of the offsite consequences of a failure of aqueous ammonia storage. The sections below describe those analyses.

Modeling Approach and Significant Impact Analysis

Exelon used dispersion modeling analyses to assess the Project's air impacts of criteria air pollutants and air toxics against applicable significant impact levels (SILs), NAAQS and MAAQS, and MassDEP's Allowable Ambient Levels (AALs) and Threshold Effects Exposure Limits (TELs) Guidelines for air toxics. These analyses were conducted in accordance with EPA's "Guideline on Air Quality Models" (November 2005) and MassDEP's "Modeling Guidance for Significant Stationary Sources of Air Pollution" (June 2011) and as described in the Air Quality Modeling Protocol submitted to MassDEP on November 5, 2013 and revised March 2015. MassDEP approved the Modeling Protocol in March 2015.

Exelon used the EPA-recommended AERMOD model (AERMOD version 14134, AERMAP version 11103 and AERMET version 14134) to perform the dispersion modeling. Exelon conducted dispersion modeling in a manner that evaluated emissions from a range of operating conditions in an effort to identify the worst case operating conditions, that is, those that result in the highest ambient impact for each pollutant and averaging period.

Exelon used five years (2009 through 2013) of surface weather data collected by the National Weather Service (NWS) from the Worcester Airport weather station in Worcester, Massachusetts and the corresponding upper air data from Albany, New York in the dispersion modeling. These stations are the closest first order NWS Stations and most representative of the Medway area. AERMET (version 14134), AERMINUTE (version 14237), and AERSURFACE (version 13016) were employed to prepare the meteorological files. The Applicant used default processing options in the AERMET processing for this analysis.

Exelon characterized land use within a 3 kilometer radius of the Facility as rural and therefore used rural dispersion coefficients in the dispersion modeling.

The modeling analyses included emissions from all proposed combustion equipment, that is; the two combustion turbines, the emergency generator engine, and the emergency fire pump engine, plus the existing combustion turbines, all operating simultaneously. Exelon determined emission rates at four combustion turbine operating loads (25, 50, 75, and 100 percent loads) at four ambient operating temperatures (0°F, 30°F, 50°F and 100°F) at steady state conditions while firing natural gas and ULSD. Exelon also evaluated emissions from a combustion turbine startup/shut down condition. The analysis used the particular operating scenario the resulted in the maximum impact for each particular pollutant and averaging period for subsequent analysis and comparison to SILs and NAAQS and MAAQS.

The first part of the analysis was to predict which pollutants at which averaging times have more than a 'significant' impact on air quality. To identify new pollution sources with the potential to alter significantly ambient air quality, the EPA and MassDEP have adopted "significant impact levels" for the criteria pollutants except ozone and lead. If the predicted impact of the new or modified emission source is less than the SIL for a particular pollutant and averaging period, and the difference between background ambient air quality and the NAAQS is greater than the SIL, then no further evaluation is needed for that pollutant and averaging period. However, if the predicted impact of the new or modified emission source is equal to or greater than the SIL for a particular pollutant and averaging period, then further impact evaluation is required. This additional evaluation must include measured background levels of pollutants, as well as emissions from both the proposed new or modified source and any existing emission sources that may interact with emissions from the proposed new emissions source (referred to as cumulative modeling).

Table 4 presents the maximum predicted ambient air quality impact concentrations for the new sources at the Project. The analysis predicted that maximum ambient air quality impact concentrations from new sources at the Project are below SILs for all pollutants and averaging periods, except for the 1-hour NO_2, the 24-hour PM_{10}, and the 24-hour $PM_{2.5}$ NAAQS.

Table 4				
Results of Significant Impact Level Analysis				
Criteria Pollutant	**Averaging Period**	**Significant Impact Level ($\mu g/m^3$)**	**Maximum Predicted Project Impact (new sources only) ($\mu g/m^3$)**	**Less than the SIL?**
NO_2	Annual[1] 1-hour[2]	1 7.5	0.3 **9.0**	Yes **No**
SO_2	Annual[1, 3] 24-hour[3, 4] 3-hour[4] 1-hour[5, 6]	1 5 25 7.8	0.04 0.7 1.5 1.4	Yes Yes Yes Yes
$PM_{2.5}$	Annual[7] 24-hour[8]	0.3 1.2	0.13 **6.4**	Yes **No**
PM_{10}	Annual 24-hour[9]	1 5	0.18 **9.2**	Yes **No**
CO	8-hour[4] 1-hour[4]	500 2,000	73.1 132.3	Yes Yes

Table 4 Key:

$\mu g/m^3$ = micrograms per cubic meter
CO = Carbon monoxide
NO_2 = Nitrogen dioxide
$PM_{2.5}$ = Particulate matter less than or equal to 2.5 microns in diameter
PM_{10} = Particulate matter less than or equal to 10 microns in diameter
SIL = Significant Impact Level
SO_2 = Sulfur dioxide

Table 4 Notes:

1. Not to be exceeded.
2. Compliance based on 3 year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area. The 1-hour NO_2 standard was effective April 12, 2010.
3. The Environmental Protection Agency has revoked the 24-hour and annual average primary standards for SO_2.
4. Not to be exceeded more than once per year.
5. Compliance based on 3-year average of 99th percentile of the daily maximum 1-hour average at each monitor within an area.
6. The 1-hour SO_2 standard was effective as of August 23, 2010.
7. Compliance based on 3-year average of weighted annual mean $PM_{2.5}$ concentrations at community oriented monitors.
8. Compliance based on 3-year average of 98th percentile of 24-hour concentrations at each population oriented monitor within an area.
9. Not to be exceeded more than once per year on average over 3 years.

Cumulative Dispersion Modeling

Existing Facility Sources

Notwithstanding the SIL analysis above, Exelon used dispersion modeling to assess the air quality impacts from the entire Facility, all pollutants over all averaging times, including both the six existing emission sources and all proposed new sources. Exelon added these impacts to background air quality. Exelon used the MassDEP air quality monitoring station closest to the Facility, on Summer Street in Worcester, which is approximately 20 miles west-northwest of the Facility for representative background air quality. Table 5 shows the cumulative impact of both the new and existing sources at the West Medway Facility when added to background air quality. The results of the cumulative Facility impact analysis show that the Facility's worst case emissions from the proposed new sources in combination with emissions from the existing Facility sources plus measured background levels did not result in concentrations that exceeded the applicable NAAQS.

Table 5

Results of Cumulative Impact Analysis of the Facility

Criteria Pollutant	Averaging Period	Predicted Facility Impact ($\mu g/m^3$)	Background ($\mu g/m^3$)	Predicted Facility Impact plus Background ($\mu g/m^3$)	Primary/ Secondary NAAQS ($\mu g/m^3$)	Less than Primary/ Secondary NAAQS?
NO_2	Annual[1] 1-hour[2]	11.7 98.3	32.6 80.1	44.3 178.4	100/100 188/None	Yes/Yes Yes/NA
SO_2	Annual[1, 3] 24-hour[3, 4] 3-hour[4] 1-hour[5, 6]	1.3 22.2 54.6 45.1	8.4 21 33.5 25.2	9.7 43.3 88.1 70.3	80/None 365/None None/1,300 196/None	NA/NA NA/NA NA/Yes Yes/NA
$PM_{2.5}$	Annual[7] 24-hour[8]	0.3 6.4	8.3 20.7	8.6 27.2	12/15 35/35	Yes/Yes Yes/Yes
PM_{10}	Annual 24-hour[9]	0.38 6.0	17.4 40	17.8 46.1	50/50 150/150	Yes/Yes Yes/Yes
CO	8-hour[4] 1-hour[4]	255.8 476.4	1,948.2 2,635.8	2,204.0 3,112.5	10,000/None 40,000/None	Yes/NA Yes/NA
Pb	3-month[1]	0.004[10]	0.021	0.025	0.15/0.15	Yes/Yes

Table 5 Key:

CO = Carbon monoxide
$\mu g/m^3$ = micrograms per cubic meter
NAAQS = National Ambient Air Quality Standards
NO_2 = Nitrogen dioxide
NA = Not applicable
Pb = Lead
$PM_{2.5}$ = Particulate matter less than or equal to 2.5 microns in diameter

PM_{10} = Particulate matter less than or equal to 10 microns in diameter
SO_2 = Sulfur dioxide

Table 5 Notes:

1. Not to be exceeded.
2. Compliance based on 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area. The 1-hour NO_2 standard was effective April 12, 2010.
3. The Environmental Protection Agency has revoked that the 24-hour and annual average primary standards for SO_2.
4. Not to be exceeded more than once per year.
5. Compliance based on 3-year average of 99th percentile of the daily maximum 1-hour average at each monitor within an area.
6. The 1-hour SO_2 standard was effective as of August 23, 2010.
7. Compliance based on 3-year average of weighted annual mean $PM_{2.5}$ concentrations at community oriented monitors.
8. Compliance based on 3-year average of 98th percentile of 24-hour concentrations at each population oriented monitor within an area.
9. Not to be exceeded more than once per year on average over 3 years.
10. Compliance based on assuming 24-hour average is a conservative estimate of the 3-month average concentration.

Existing Offsite Sources

Since dispersion modeling predicted maximum impact concentrations above SILs for the 1-hour NO_2, the 24-hour $PM_{2.5}$, and the 24-hour PM_{10}standards, Exelon conducted cumulative impact modeling for these pollutants and averaging periods with emissions from the new and existing sources at the facility and interactive sources. Those impacts were added to measured background levels and compared to the corresponding NAAQS. The existing interactive sources nearby the Facility considered in the cumulative modeling were:

- ANP Bellingham (3.2 km south of West Medway Station)
- Ardagh Glass, Inc., Milford (5.6 km west-southwest of West Medway Station)
- Bellingham Cogen (6.1 km west-southwest of West Medway Station)
- ANP Blackstone (10.4 km southwest of West Medway Station)
- Milford Power (5.4 km west-southwest of West Medway Station)

Table 6 shows the cumulative impacts with interactive sources at locations where the new source impact is above the SIL. The results of the cumulative impact analysis show that the Project's worst case emissions in combination with emissions from the existing onsite or interactive sources plus measured background levels did not result in concentrations that exceeded the applicable NAAQS.

Table 6

Cumulative Impacts of the Facility and Interactive Sources

Criteria Pollutant	Averaging Period	Cumulative Impact Facility Plus Interactive Sources[1] ($\mu g/m^3$)	Background ($\mu g/m^3$)[2]	Total Impact Plus Background ($\mu g/m^3$)	Primary/ Secondary NAAQS ($\mu g/m^3$)	Less than Primary/ Secondary NAAQS?
NO_2	1-hour	80.8[3]	47.8	128.5	188/None	Yes/NA
$PM_{2.5}$	24-hour	2.5	20.7	23.2	35/35	Yes/Yes
PM_{10}	24-hour	6.5	40.0	46.5	150/150	Yes/Yes

Table 6 Key:

EPA = Environmental Protection Agency
$\mu g/m^3$ = micrograms per cubic meter
NA = Not applicable
NAAQS = National Ambient Air Quality Standards
NO_2 = Nitrogen dioxide
$PM_{2.5}$ = Particulate matter less than or equal to 2.5 microns in diameter
PM_{10} = Particulate matter less than or equal to 10 microns in diameter

Table 6 Notes:

1. Consistent with EPA modeling guidance for NAAQS compliance assessments, impact concentrations are based on the 5-year average of the 8th highest 24-hour average values occurring in each year for the 24-hour $PM_{2.5}$ concentration, and the 5-year average of the 8th highest daily maximum concentrations occurring in each year for the 1-hour NO_2 concentration. PM_{10} impact concentrations are the highest 6th high 24-hour average value over 5 years.
2. Background concentrations are based on the measured air quality from 2011 through 2013. Short term background concentrations for 24-hour $PM_{2.5}$ and 1-hour NO_2, are the average of the 98th percentile values over the 3 years (2011-2013). These assumptions are consistent with the definition of the NAAQS for the pollutant.
3. The modeled cumulative NO_2 impacts represent an EPA-approved 'Tier 3' approach reflecting the use of the Plume Volume Molar Ratio Method for the conversion of NOx emissions to NO_2 in the ambient air. This modeling guidance is contained in EPA's Clarification Memo, dated March 1, 2011, "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard". The use of a 'Tier 3' method requires justification and approval from the appropriate regulatory agencies. The Applicant justified its use in a modeling protocol submitted to and approved by MassDEP in March 2015.

Air Toxics Analysis

MassDEP has established health based ambient air guidelines for a variety of toxic air contaminants. These air guidelines establish two limits for each air toxic listed: an Ambient Air Level (AAL), which is based on an annual average concentration; and a Threshold Effect Exposure Limit (TEL), which is based on a 24-hour time period. In general, AALs represent the concentration associated with a one in one million excess lifetime cancer risk, assuming a lifetime of continuous exposure to that concentration. The TELs protect the general population

from non-cancer health effects. For air toxics that do not pose cancer risks, the AAL is equal to the TEL.

Table 7 presents the projected maximum impacts for each air toxic that will potentially be emitted by the Project's new emission sources for which an AAL or TEL has been established. Exelon used the worst case emission scenarios to predict these maximum impacts. As shown in Table 6, the Project's maximum predicted ambient air quality impact concentrations were significantly below applicable AALs and TELs for all of the air toxics modeled.

Table 7

Predicted Air Toxics Impacts

Pollutant	Averaging Period	TEL AAL ($\mu g/m^3$)	Maximum Predicted Project Impact (new sources only) ($\mu g/m^3$)	Less than TEL/AAL?
Acetaldehyde	24-hour (TEL)	30	0.029806	Yes
	Annual (AAL)	0.4	0.002093	Yes
Acrolein	24-hour (TEL)	0.07	0.00431	Yes
	Annual (AAL)	0.07	0.000288	Yes
Ammonia	24-hour (TEL)	100	2.535833	Yes
	Annual (AAL)	100	0.026039	Yes
Benzene	24-hour (TEL)	0.6	0.052925	Yes
	Annual (AAL)	0.1	0.007168	Yes
1,3-Butadiene	24-hour (TEL)	1.20	0.004658	Yes
	Annual (AAL)	0.003	0.000009	Yes
Ethylbenzene	24-hour (TEL)	300	0.012071	Yes
	Annual (AAL)	300	0.000108	Yes
Formaldehyde	24-hour (TEL)	2.0	0.159468	Yes
	Annual (AAL)	0.08	0.004612	Yes
Naphthalene	24-hour (TEL)	14.25	0.015061	Yes
	Annual (AAL)	14.25	0.001043	Yes
Propylene Oxide	24-hour (TEL)	6	0.010940	Yes
	Annual (AAL)	0.3	0.000098	Yes
Sulfuric Acid	24-hour (TEL)	2.72	0.969441	Yes
	Annual (AAL)	2.72	0.022755	Yes
Toluene	24-hour (TEL)	80	0.063712	Yes
	Annual (AAL)	20	0.003177	Yes
Xylenes	24-hour (TEL)	11.80	0.034295	Yes
	Annual (AAL)	11.80	0.002106	Yes
Arsenic	24-hour (TEL)	0.003	0.000548	Yes
	Annual (AAL)	0.0003	0.000001	Yes
Beryllium	24-hour (TEL)	0.001	0.000090	Yes
	Annual (AAL)	0.0004	0.000000	Yes
Cadmium	24-hour (TEL)	0.002	0.000717	Yes
	Annual (AAL)	0.0002	0.000001	Yes
Chromium (total)	24-hour (TEL)	1.36	0.003202	Yes
	Annual (AAL)	0.68	0.000005	Yes
Lead[1]	24-hour (TEL)	0.14	0.004076	Yes
	Annual (AAL)	0.07	0.000007	Yes

Table 7				
Predicted Air Toxics Impacts				
Pollutant	**Averaging Period**	**TEL AAL ($\mu g/m^3$)**	**Maximum Predicted Project Impact (new sources only) ($\mu g/m^3$)**	**Less than TEL/AAL?**
Mercury (elemental)	24-hour (TEL) Annual (AAL)	0.14 0.07	0.000349 0.000001	Yes Yes
Nickel	24-hour (TEL) Annual (AAL)	0.27 0.18	0.001339 0.000002	Yes Yes
Selenium	24-hour (TEL) Annual (AAL)	0.54 0.54	0.007278 0.000012	Yes Yes

Table 7 Key:

$\mu g/m^3$ = micrograms per cubic meter
AAL = Ambient Air Limits
TEL = Threshold Effects Exposure Limits

Table 7 Notes:

1. Most air toxics do not have a NAAQS, with the exception of lead. Modeled lead impacts are well below the NAAQS of 0.15 $\mu g/m^3$.

Preconstruction Monitoring Analysis

As described in the "Cumulative Dispersion Modeling" section above, Exelon used ambient background monitoring data from MassDEP's Worcester Summer Street monitoring site to determine the Project's predicted compliance with the NAAQS. For non-PSD pollutants, MassDEP Guidance merely states "a technical justification for the background air quality concentrations should be provided." The PSD Federal regulations require one year of preconstruction monitoring, but allow applicants to use existing representative monitoring data in lieu of preconstruction monitoring if the facility can demonstrate that its ambient air impact is less than a Significant Monitoring Concentration (SMC) as specified in those regulations. As shown in Table 8 below, dispersion modeling predicted maximum new source impact concentrations below corresponding SMC levels for all pollutants for which SMCs exist.

Table 8				
Significant Monitoring Concentration Analysis				
Pollutant	**Averaging Period**	**SMC ($\mu g/m^3$)**	**Maximum Predicted Project Impact ($\mu g/m^3$)**	**Less than SMC?**
NO_2	Annual	14	0.3	Yes
SO_2	24-hour	13	0.7	Yes
PM_{10}	24-hour	10	9.3	Yes
CO	8-hour	575	73.1	Yes
Pb	3-month	0.1	0.004	Yes

Table 8 Key:

$\mu g/m^3$ = micrograms per cubic meter
CO = Carbon monoxide
NO_2 = Nitrogen dioxide
Pb = Lead
PM_{10} = Particulate matter less than or equal to 10 microns in diameter
SMC = Significant Monitoring Concentration
SO_2 = Sulfur dioxide

Accidental Release Modeling of Aqueous Ammonia (NH_3)

The Project's SCR system will use aqueous ammonia as the reducing agent to control NOx emissions from the combustion turbines. A 19% solution of aqueous ammonia will be stored onsite in an above-ground 12,000-gallon single-walled steel tank located west of the new combustion turbine structures. The tank, as well as ammonia transfer pumps, valves, and piping will be contained within a concrete dike designed to contain 110 percent of the volume of the tank.

The containment area will use passive evaporative controls (polyethylene balls or equivalent) to reduce the exposed surface area of any spilled aqueous ammonia by 90 percent. The aqueous ammonia storage tank will meet the Massachusetts Department of Public Safety requirements for storage tanks greater than 10,000 gallons containing material other than water. The dike wall and enclosure surrounding the tank will decrease the risk of damage to the tank caused by accidental vehicle contact.

Transfer from ammonia delivery trucks to the storage tank will take place within a contained concrete storage unloading pad with drainage design such that any spills during ammonia delivery will drain into the containment area. Delivery trucks will be required to have fast-acting shutoff valves in the unlikely event that a leak or other problem should arise. Exelon will control transfer losses by connecting a hose from the top of the tank back to the truck to return displaced vapor to the truck, or use an equivalent method.

The storage tank will be equipped with level monitoring instrumentation that personnel in the Project's control room will continuously monitor. In the event that the tank level approaches an overfill condition during filling, a high level alarm will sound, initiating an immediate response to the situation. In addition, ammonia sensors in the enclosure will alert plant staff and prevent the accumulation of significant amounts of ammonia in the containment area.

Ammonia in aqueous solution is volatile, and the accidental release of this material would result in release of ammonia to the ambient air. Therefore, Exelon modeled a worst case accidental release scenario to evaluate the potential health impacts of such a release. This scenario assumed a release of the entire contents of the tank into the containment area, and conservatively evaluated the air quality impacts of such a release at or beyond the fence line.

In order to evaluate conservatively the offsite consequences of an ammonia release, Exelon used the same AERMOD dispersion model used for evaluation of air quality impacts from the combustion turbine exhaust stacks to determine maximum ammonia concentration at the fence line. The predicted ammonia concentration at the fence line was compared to the American Industrial Hygiene Association Emergency Response Planning Guideline Level 1 (ERPG-1) of 25 parts per million (ppm) by volume, and the ERPG-2 of 150 ppm by volume. ERPG-1 is the maximum airborne concentration below which nearly all individuals could be exposed to for up to one hour without experiencing either mild transient health effects and/or a clearly defined objectionable odor. ERPG-2 is the maximum airborne concentration below which it is believed that nearly all individuals could be exposed to for up to one hour without experiencing or developing irreversible or other serious health effects or symptoms that could impair the ability to take self-directed protective action.

The results of the AERMOD model indicate that in the event of a hypothetical worst case release, the maximum hourly ammonia concentration at or beyond the fence line would be 4.38 ppm, less than the ERPG-1 level of 25 ppm by volume and obviously well below the ERPG-2 level of 150 ppm by volume. The point along the Facility fence line at the maximum hourly ammonia concentration is approximately 935 feet from the ammonia storage area.

5. Noise

Exelon conducted a background sound level survey in May of 2014 in accordance with a protocol approved in advance by MassDEP. The survey consisted of a full week (168 hours) of continuous ambient sound data collected at seven locations (R1 through R7) representing the nearest receptor locations in all relevant directions from the Project, as well as the 94 acre property boundary. Calibrated sound level meters at the receptor locations collected A-weighted broadband and unweighted one-third octave band sound level data (L_1, L_{10}, L_{50}, L_{90}, L_{max}, and L_{eq}) over one-hour intervals with a one-minute time history. A portable on-site meteorological station recorded wind speed, direction, temperature, and precipitation events. The combustion turbines at the existing West Medway Generating Station did not operate during the week-long ambient measurement program.

Exelon analyzed and reported data in accordance with the approved MassDEP protocol for daytime (6 AM – 11 PM) and nighttime (11 PM – 6 AM) hours. The lowest average nighttime ambient L_{90} values across the seven monitoring locations range from 32 to 35 dBA. The corresponding daytime (6 AM - 11 PM) values range from 36 to 43 dBA. At all seven monitoring locations, Exelon recorded the lowest nighttime readings between 1 AM and 4 AM.

The impact of Facility sound emissions on ambient sound levels was modeled using the Cadna/A noise calculation software (DataKustik Corporation, 2015). This software, which uses the ISO 9613-2 international standard for sound propagation (Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation), produces a refined set of computations. In addition to the geometry and sound power levels of a complete inventory of sound

producing equipment and components, the Cadna software accounts for local topography, ground attenuation, drop-off with distance, barrier shielding, diffraction around building edges, reflection off building facades, and atmospheric absorption of sound from multiple sound emission sources.

Table 9 below provides a summary of the predicted nighttime sound level impacts predicted from 100% load operation of the Project modeled by Exelon:

Table 9

Predicted Nighttime (11 PM-6 AM) Sound Level Impacts of the Project (dBA)

Receptor ID	Background Sound Level[1]	Project Contribution to Sound Level	Combined Project and Background Sound Level	Increase Above Background[2]
R1	34	41	42	7.3
R2	33	42	43	9.9
R3	34	40	41	6.7
R4	34	40	41	7.4
R5	35	42	43	7.7
R6	32	33	35	3.3
R7	32	36	37	4.9

Table 9 Key:

dBA = Decibel A weighted

Table 9 Notes:

1. The background levels observed during nighttime equipment operating hours (11 PM to 6 AM) where the sound level is exceeded 90 percent of the time (L_{90}).
2. MassDEP Noise regulation prohibits unnecessary sound emissions that cause noise. MassDEP Policy 90-001 establishes a sound level increase of 10 dBA over the ambient L_{90} level or pure tone conditions or tonal sounds, defined as any octave band level that exceeds the levels in adjacent octave bands by 3 dBA or more, as indicators of a condition of noise.

The "Combined Project and Existing Facility and Background Sound Level" and "Increase Above Background" columns in Table 10 show the predicted ambient sound levels both with retrofit noise controls on the existing West Medway Generating Station and without. Table 10 reflects the 6 AM to 11 PM daytime analysis with the limiting (lowest) ambient being the 10-11 PM hour.

Table 10

Predicted Daytime (6 AM-11 PM) Sound Level Impacts of the Facility (dBA)

Receptor ID	Background Sound Level[1]	Contribution of the Existing Units to Future Sound Level		Project Contribution to Future Sound Level	Combined Project and Existing Facility and Background Sound Level		Increase Above Background[2]	
		With Retrofit Controls on Existing Units	Without Retrofit Controls on Existing Units		With Retrofit Controls	Without Retrofit Controls	With Retrofit Controls on Existing Units	Without Retrofit Controls on Existing Units
R1	38	46	49	41	48	50	10.0	12.2
R2	40	46	48	42	48	49	8.8	9.7
R3	41	37	38	40	44	44	3.4	3.5
R4	43	35	35	40	45	45	2.3	2.3
R5	38	42	42	42	45	46	7.4	7.5
R6	41	35	36	33	42	42	1.5	1.7
R7	36	36	37	36	41	41	4.4	4.5

Table 10 Key:

dBA = Decibel A weighted

Table 10 Notes:

1. The background levels observed during daytime equipment operating hours (6 AM to 11 PM) where the sound level is exceeded 90 percent of the time (L_{90}).
2. MassDEP Noise regulation prohibits unnecessary sound emissions that cause noise. MassDEP Policy 90-001 establishes a sound level increase of 10 dBA over the ambient L_{90} level or pure tone conditions or tonal sounds, defined as any octave band level that exceeds the levels in adjacent octave bands by 3 dBA or more, as indicators of a condition of noise.

Exelon proposed not to operate simultaneously the existing facility and the Project during the hours from 11 PM to 6 AM unless required solely by ISO-NE because of a local or regional system contingency (that is, Volt Ampere Reactive Control or transmission reliability) or Security Constrained Unit Commitment.

Additionally, at this time, Exelon is not proposing to install the retro-fit controls on the existing combustion turbines. Instead, Exelon proposed, subject to Table 17 Conditions 13 below, not to operate simultaneously the existing units and the Project during the hours that are predicted to result in an offsite sound level increase above background greater than 10 dBA, that is, between 6 PM and 11 PM. During this period, Exelon will only operate simultaneously the existing units and the Project if required by ISO-NE because of a local or regional system contingency (that is, Volt

Ampere Reactive Control or transmission reliability) or Security Constrained Unit Commitment. However, if Exelon successfully demonstrates to MassDEP that simultaneous operation of the existing units and the Project (with or without the installation of the retro-fit controls) results in an offsite sound level increase above background of less than 10 dBA during the hours of 6 PM and 11 PM, the restriction on simultaneous operation from 6 PM to 11 PM will no longer be in effect. Exelon's proposal not to install retro-fit controls on the existing combustion turbines and the associated operating hour restriction may be subject to EFSB approval.

6. Applicable Regulations

New Source Performance Standards

The NSPS, 40 CFR 60 Subpart KKKK – Standards of Performance for Stationary Combustion Turbines, apply to stationary combustion turbines with a heat input rating greater than or equal to 10 MMBtu/hr, and which commenced construction, reconstruction, or modification after February 18, 2005. Therefore, the NSPS, 40 CFR 60 Subpart KKKK, apply to both proposed combustion turbines at the Project.

This NSPS allows the turbine owner or operator the choice of either a concentration based or output based NOx emission standard. The concentration based limit is in units of ppmvd at 15% O_2. The output based emission limit is in units of mass emissions per unit of useful recovered energy, lb/MW-hr. The applicable NOx emission standard for the turbines is 15 ppmvd at 15% O_2 or 0.43 lb/MW-hr. The Permittee has ensured that the Project will comply with these limits by using water injected Low-NOx combustion technology in conjunction with SCR add-on NOx control technology to control NOx emissions from the Project. Exelon will comply with all applicable emission standards, monitoring, record keeping and reporting requirements of Subpart KKKK.

The 40 CFR 60 Subpart KKKK SO_2 emissions are the same for all turbines regardless of size or fuel type. The NSPS for turbines located in the continental area prohibits the discharge into the atmosphere of any gases that contain SO_2 in excess of 0.90 lb/MW-hr gross energy output. The owner or operator of the turbine can choose to comply with either the SO_2 limit or the limit on the sulfur content of the fuel burned. For a turbine located in a continental area, the fuel sulfur content limit is 0.060 lb SO2/MMBtu heat input. The Project will meet the applicable SO_2 NSPS by utilizing pipeline natural gas (no greater than 0.0026 lb SO_2/MMBtu) and ULSD (no greater than 0.0016 lb SO_2/MMBtu).

The Project is subject to the NSPS at 40 CFR 60 Subpart TTTT – Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units because the stationary combustion turbines have a base load heat rating greater than 250 MMBtu/hr and because the Project is capable of generating greater than 25 MW of electricity. Consistent with the NSPS, the Project is subject to a CO_2 emission standard in 40 CFR 60 Subpart TTTT Table 2 if its three year

average net electric sales for each turbine is no greater than 471,000 MW hours per year on a three year rolling average.

The emergency generator engine and emergency fire pump engine serving the Project are both subject to the NSPS under 40 CFR 60 Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. The NSPS requires emergency generator engines to meet the non-road engine emission standards identified in 40 CFR 89.112 and 89.113. The emergency fire pump engine will be subject to the emission standards identified in Subpart IIII, Table 4. The NSPS requires engine manufacturers to produce engines that comply with these standards. The Permittee will install and operate an emergency generator engine and an emergency fire pump engine that comply with the Subpart IIII requirements.

Exelon will comply with all applicable emission standards, operating restrictions, monitoring, record keeping, and reporting requirements of Subpart IIII for the emergency generator engine and emergency fire pump engine.

National Emission Standards for Hazardous Air Pollutants

Stationary Combustion Turbines

The National Emission Standards for Hazardous Air Pollutants (NESHAP) at 40 CFR 63 Subpart YYYY – National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines, apply to combustion turbines at major sources of hazardous air pollutant (HAP) emissions. A major source of HAP emissions is a source that has the potential to emit 10 or more tons per year of any single HAP, or 25 or more tons per year of all HAPs combined. The Project is not a major source of HAP emissions. Therefore, the Project's combustion turbines are not subject to the Subpart YYYY requirements.

Emergency Generator and Fire Pump Engine

The NESHAP at 40 CFR 63 Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines, for stationary reciprocating internal combustion engines (RICE) apply to both major and area sources of HAP emissions, and covers both emergency and non-emergency engines. Both the emergency generator engine and the emergency fire pump engine are RICE units that must comply with Subpart ZZZZ. However, for new stationary emergency engines at area sources of HAP emissions that began construction or reconstruction after June 12, 2006, the NESHAP requirements are satisfied if the engines comply with the NSPS requirements under 40 CFR 60 Subpart IIII. The Permittee will install emergency generator and fire pump engines that comply with Subpart IIII. Compliance with Subpart ZZZZ is met by meeting the requirements of 40 CFR 60 Subpart IIII, per 40 CFR 63.6590(c).

Allowances

The Project is subject to various emission allowance programs. Emission allowance programs are market based air quality regulatory programs for which various classes of emission sources are required to obtain, secure, and/or hold a sufficient number of 'allowances' to cover the Project's actual reported emissions. One allowance equals one ton of emissions. At specified intervals, 'true-up' occurs, at which time allowances in the Permittee's account are withdrawn to cover actual emissions over a specified period. The true-ups are required on a Facility-wide basis, for emissions from all subject emission units at the Facility. True-ups for annual SO_2 emissions are required annually. True-up for CO_2 emissions is required every three years. A partial true-up for CO_2 emissions is required annually.

MassDEP no longer enforces the requirement in 310 CMR 7.32 – the Massachusetts Clean Air Interstate Rule (Mass CAIR) that emission sources hold NOx allowances for each ozone season. In January 2015, the federal Clean Air Interstate Rule program ended and thus the Mass CAIR program ended as well. However, MassDEP is requiring affected facilities to continue to monitor and report NOx mass emissions and heat input date to the EPA and report ozone season net output data to MassDEP.

These allowance programs require that actual facility emissions of SO_2, NOx, and CO_2 be monitored, recorded, and reported pursuant to documented monitoring plans and the regulatory provisions of 40 CFR Part 75.

Table 11 below contains the Permittee's applicable allowance programs for each pollutant and the applicable regulation covered in this Plan Approval.

Table 11

Applicable Allowance Programs

Pollutant	Program	Applicable Regulation	Required Submittals
SO_2	Acid Rain Program (ARP)	40 CFR Parts 72, 73, and 75	Phase II Acid Rain Permit Application 24 months to EPA before commencement of operation
NOx	NOx Ozone Season Clean Air Interstate Rule (CAIR)[1]	310 CMR 7.32 (for monitoring and reporting)	Monitor and report NOx mass emissions and applicable supporting parameters to the EPA and report ozone season net output data to MassDEP.
CO_2	Regional Greenhouse Gas Initiative CO_2 Budget Trading Program	310 CMR 7.70	CO_2 Budget Emission Control Plan 12 months before commencement of operation

Table 11 Key:

CFR = Code of Federal Regulations
CMR = Code of Massachusetts Regulations
CO_2 = Carbon dioxide
EPA = Environmental Protection Agency
NOx = Nitrogen oxides
SO_2 = Sulfur dioxide

Table 11 Notes:

1. 310 CMR 7.32 is presently enforced as the state-level "SIPNOX" program, per MassDEP's correspondence dated December 31, 2014 and May 29, 2015. Ozone season NOx emission trading requirements for new units may terminate upon MassDEP's pending issuance of 310 CMR 7.34: Massachusetts NOx Ozone Season Program (MassNOx).

7. Public Participation

On October 12, 2016, MassDEP issued a Proposed Air Quality Plan Approval, a Draft PSD Permit and a PSD Fact Sheet for this Application. Issuance of the Proposed Air Quality Plan Approval and Draft PSD Permit begins a public comment period that will continue until November 16, 2016. MassDEP will hold a public hearing on the proposed actions on November 15, 2016 at 7:00 PM at Medway Middle School Auditorium in Medway, Massachusetts. MassDEP published the Notice of Public Hearing and Public Comment Period, in The Milford Daily, Worcester Telegram and Gazette, and the Boston Globe, in The Environmental Monitor and sent the Notice to the First United Methodist Church of Milford, 39 Exchange Street, Milford, MA and the Saint Mary of the Assumption Roman Catholic Church, 17 Winter Street, Milford, MA. MassDEP published the Notice of Public Hearing and Public Comment Period in English, Spanish and Portuguese. Copies of Exelon's applications for an Air Quality Plan Approval and a PSD Permit, as well as the Proposed Air Quality Plan Approval, Draft PSD Permit and PSD Fact Sheet are available for review:

- by contacting the MassDEP Central Region Records Coordinator at 508-767-2716 between 9:00 AM and 4:00 PM,
- at the MassDEP website at: http://www.mass.gov/eea/agencies/massdep/news/comment/,
- at the Medway Town Clerk's Office located at 155 Village Street, Medway, MA, and
- at public libraries in Medway, Millis, Bellingham, Milford and Franklin.

Oral and written testimony received at the public hearing and written comments received during the public comment period will be considered before the issuance of any final Plan Approval or PSD Permit.

8. Environmental Justice

Title VI of the federal Civil Rights Act of 1964 applies to all recipients of federal financial assistance. The Executive Office of Energy and Environmental Affairs (EOEEA) is a recipient

of federal financial assistance for the administration of MassDEP's air pollution control program. Section 601 of Title VI provides that:

> No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subject to discrimination under any program or activity receiving federal financial assistance.

To comply with Title VI of the Civil Rights Act, on October 2, 2002, EOEEA adopted an Environmental Justice Policy (EJ Policy) that requires the Department to make environmental justice an integral consideration in the implementation and enforcement of laws, regulations, and policies. The Policy bases environmental justice on the principle that all people have a right to be protected from environmental pollution and to live in and enjoy a clean and healthful environment. Environmental justice is the equal protection and meaningful involvement of all people with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies, and the equitable distribution of environmental benefits.

The Project is subject to Nonattainment review and is located within five miles of Environmental Justice (EJ) communities. Because the Project exceeds an Environmental Notification Form threshold for air and is located within five miles of an EJ population, EOEEA concluded that the project is subject to EJ Policy requirements for enhanced public participation and for enhanced analysis of impacts and mitigation pursuant to the EJ Policy.

Identification of Environmental Justice Areas

The Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA) Geographic Information System includes environmental justice areas divided by block groups based on the 2010 US Census data. Based on environmental justice mapping completed by EOEEA and EPA, Exelon determined the Project is within approximately five miles of a number of environmental justice communities in the Towns of Milford and Franklin.

Public Participation

MassDEP published the Notice of Public Hearing and Public Comment Period on the Proposed Air Quality Plan Approval in English, Spanish, and Portuguese. MassDEP will provide a translator at the Public Hearing and will provide copies of documents in the public record in Spanish and Portuguese, when requested.

The following is a summary of recently conducted public outreach throughout the regulatory process for the Project, including outreach to environmental justice communities.

Massachusetts Environmental Policy Act

Exelon provided the Environmental Notification Form in alternative information repositories and the public notice was published in Spanish and Portuguese in the Milford Daily News. The Draft Environmental Impact Report (DEIR) and Final Environmental Impact Report (FEIR) were

provided to Town offices and public libraries in Medway, Millis, Bellingham, Milford and Franklin and are available to the public upon request through the Environmental Monitor or the Project website. In addition to the Monitor, the Milford Daily News published a notice on the filing of the DEIR (including Spanish and Portuguese translations) and the FEIR. Exelon also provided DEIR Notices for posting at two Milford churches with Portuguese and Spanish speaking congregants. The Town of Medway's website included information on the Project. In addition to the initial distribution list, Exelon provided copies of the DEIR and FEIR (paper or electronic) upon request during the comment period.

Energy Facility Siting Board

At the direction of the Energy Facilities Siting Board (EFSB), Exelon published the Notice of Public Hearing/Notice of Adjudication ("Notice") for this proceeding in English in the Boston Globe and the Milford Daily News, and in Spanish in El Mundo on May 21, 2015, May 28, 2015, and June 4, 2015. In compliance with the directives of the EFSB, Exelon provided copies of the Petition to the Medway Town Clerk and the Medway Public Library. For the EFSB public hearing process, community newspapers published translated Notices and interpreter services were provided at the hearing. Moreover, as required by the EFSB, Exelon produced versions of the Notice in three languages – English, Spanish and Portuguese – and mailed the Notice to all property owners within 300 feet of the 94-acre Summer Street property. Exelon posted the Notice in all three languages at the Medway Town Clerk office, and sent the Notice to the Medway Planning Board and to the Planning Board of each abutting municipality. On June 11, 2015, the Siting Board conducted a public comment hearing regarding Exelon's Petition to construct and Amended Zoning Exemption Petition. The hearing was held at the Medway Middle School, 45 Holliston Street, Medway.

Stakeholder Outreach

Project representatives have attended a number of open Selectmen and other Town Board meetings in Medway and Millis during the fall and early winter of 2015. The Project has continued to update its website[11] and has provided updates on social media, including Facebook[12] and Twitter.[13] The Town of Medway complemented Exelon's communications efforts with its own outreach and communications programs. The Town of Medway retained a team of attorneys, engineers and environmental consultants to conduct an independent review of the Project. The team completed its review and reported their findings at a well-attended public forum on October 21, 2015. The Town's review team responded to residents' questions during the forum. Lastly, the Town of Medway website also contains a section devoted to the Exelon Project.[14]

[11] See: http://www.medwayenergy.com/
[12] See: https://www.facebook.com/Medway-Clean-Energy-Expansion-1627579820839604/?fref=nf
[13] See: https://twitter.com/ExelonGen?lang=en
[14] See: http://www.townofmedway.org/Pages/MedwayMA_Bcomm/BOS/exelonbulletin

Impact/Health Analysis

As part of its air quality modeling analysis, Exelon computed a population weighted average concentration for pollutants and at averaging times above the Significant Impact Levels (NO_2, $PM_{2.5}$, and PM_{10}) using the worst case modeled impacts from the new emission sources for each averaging period. Exelon calculated the population weighted concentrations for areas classified as environmental justice areas and compared that to the population weighted concentrations in areas not classified as environmental justice areas within five miles of the Facility. The results demonstrate that the air quality impacts from the Project are not disproportionately higher in the environmental justice areas than in other to areas not classified as environmental justice areas.

The Project impacts for all pollutants and operational scenarios are below the NAAQS, which are protective of the health of sensitive populations such as asthmatics, children and the elderly. In addition, the total air quality impacts (including modeled impacts from all of the West Medway emission sources – existing and new sources – plus modeled impacts from other significant emitters within 10 km of the Facility, plus ambient monitored values) demonstrate that there is no adverse impact expected within any environmental justice areas within five miles of the Facility. Exelon also submitted a Human Health Risk Assessment demonstrating that the Project will not contribute to any significant health risks among potentially affected populations, both within and outside environmental justice areas.

Conclusion

The proposed Facility is located within five miles of environmental justice areas, and MassDEP hereby finds that there will be no disproportional adverse health or environmental impact to any such community. Exelon has demonstrated that emissions from the Project itself will be well within the NAAQS, which are designed to be health-protective of sensitive populations.

9. Section 61 Findings

MassDEP carefully considered the Exelon's Final Environmental Impact Report (FEIR) prior to taking action on its Comprehensive Plan Application. MassDEP, in issuing this Proposed Plan Approval, requires the Permittee to use all feasible means and measures to avoid or minimize adverse environmental impacts. Measures MassDEP deems necessary to mitigate or prevent harm to the environment that are related to air quality or GHG emissions are included as enforceable conditions in this Plan Approval and are listed in Section 14 below. MassDEP made its decision under applicable law based on a balancing, where appropriate, of environmental and socioeconomic objectives, as mandated by 301 CMR 11.01(4).

In the issuance of this Plan Approval, MassDEP considered the reasonably foreseeable climate change impacts, including GHG emissions and effects as addressed in the FEIR through the MEPA Greenhouse Gas Emissions Policy and Protocol and the GHG emission

mitigation/adaptation measures adopted by Exelon in the FEIR as referenced in the Secretary's Certificate of finding on the FEIR, dated March 18, 2016 (EEA #15363).

Pursuant to M.G.L. Chapter 30 Section 61 of the Massachusetts Environmental Policy Act, (MEPA), 301 CMR 11.12 of the MEPA regulations, and the Secretary's Certificate of finding on the FEIR, MassDEP's Section 61 Findings on the Project determining that all feasible measures have been taken to avoid or minimize impacts to the environment are presented in Section 14 below.

Summary of Section 61 Findings

Based upon its review of the MEPA documents, the Comprehensive Plan Application and amendments thereof submitted to date and MassDEP's regulations, MassDEP finds that the terms and conditions of this Plan Approval constitute all feasible measures to avoid damage to the environment and will minimize and mitigate such damage to the maximum extent practicable. Implementation of the mitigation measures will occur in accordance with the terms and conditions set forth in this Plan Approval.

10. Energy Facility Siting Board

The Energy Facilities Siting Board (EFSB) has not, as of the issuance of this Proposed Air Quality Plan Approval, issued a Final Decision under M.G.L. Chapter 164, § 69J¼ of Exelon's Petition for approval to construct the Project. MassDEP is issuing this Proposed Air Quality Plan Approval (and, concurrently, the Draft PSD Permit), but will not issue any final Plan Approval until and unless EFSB issues a Final Decision.

11. Emission Unit Identification

Each Emission Unit ("EU") identified in Table 12 is subject to and regulated by this Plan Approval, except as noted:

Table 12			
Emission Unit Identification			
EU	**Description**	**Design Capacity**	**Pollution Control Device (PCD)**
J4	Combustion Turbine: GE LMS100	992 MMBtu/hr Heat Input firing natural gas 946 MMBtu/hr Heat Input firing ULSD	Water Injected Low-NOx Combustor, Selective Catalytic Reduction, Oxidation Catalyst
J5	Combustion Turbine: GE LMS 100	992 MMBtu/hr Heat Input firing natural gas 946 MMBtu/hr Heat Input firing ULSD	Water Injected Low-NOx Combustor, Selective Catalytic Reduction, Oxidation Catalyst
EDG	Emergency Generator Engine	4.7 MMBtu/hr Heat Input 603 Horsepower	None
FP	Emergency Fire Pump Engine	1.5 MMBtu/hr Heat Input 197 Horsepower	None

Table 12 Key:

EU = Emission Unit
MMBtu/hr = Million British thermal units per hour

12. Applicable Requirements

Operational, Production and Emission Limits

The Permittee is subject to, and shall not exceed the Operational, Production, and Emission Limits as contained in Tables 13 and 13a:

Table 13			
Operational/Production and Emission Limits			
EU	**Operational / Production Limit**	**Air Contaminant**	**Emission Limit[1, 2]**
J4 and J5	1. Emission limits apply from first combustion of fuel until flame out except that NOx, CO and VOC limits don't apply during startups and shutdowns. 2. Maximum Fuel Heat Input of each EU: 5,150,880 MMBtu, HHV per 12-month rolling period total[3] and 681,120 MMBtu, HHV per 12-month rolling period firing ULSD.[3] 3. Up to the equivalent of 5,256 hours per 12-month period operating firing natural gas at 100% load which includes up to the equivalent of 720 hours per 12-month period operating firing ULSD at 100% load.	NOx (natural gas)	9.14 lb/hr 0.0092 lb/MMBtu 2.5 ppmvd @ 15% O_2
		NOx (ULSD)	18.38 lb/hr 0.0194 lb/MMBtu 5.0 ppmvd @ 15% O_2
		CO (natural gas)	11.12 lb/hr 0.0112 lb/MMBtu 5.0 ppmvd @ 15% O_2
		CO (ULSD)	11.19 lb/hr 0.0118 lb/MMBtu 5.0 ppmvd @ 15% O_2
		VOC (natural gas),as methane	3.18 lb/hr 0.0032 lb/MMBtu 2.5 ppmvd @ 15% O_2
		VOC (ULSD),as methane	5.75 lb/hr 0.0061 lb/MMBtu 4.5 ppmvd @ 15% O_2
		Sulfur in fuel	1 grains/100 scf natural gas 0.0015% sulfur by weight in ULSD
		SO_2 (natural gas)	2.58 lb/hr 0.0026 lb/MMBtu
		SO_2 (ULSD)	1.51 lb/hr 0.0016 lb/MMBtu
		H_2SO_4 (natural gas)	2.34 lb/hr 0.0024 lb/MMBtu
		H_2SO_4 (ULSD)	1.39 lb/hr 0.0015 lb/MMBtu

Table 13			
Operational/Production and Emission Limits			
EU	**Operational / Production Limit**	**Air Contaminant**	**Emission Limit[1, 2]**
J4 and J5		$PM/PM_{10}/PM_{2.5}$[4] (natural gas)	8.15 lb/hr 0.018 lb/MMBtu
		$PM/PM_{10}/PM_{2.5}$[4] (ULSD)	30.69 lb/hr 0.032 lb/MMBtu
		NH_3 (natural gas)	6.75 lb/hr 0.0068 lb/MMBtu 5.0 ppmvd @ 15% O_2
		NH_3 (ULSD)	6.79 lb/hr 0.0072 lb/MMBtu 5.0 ppmvd @ 15% O_2
		Single HAP (formaldehyde)	0.27 TPM[5]
		Total HAP	1.10 TPM[6]
		Opacity	Less than 5%, less than 10% for up to 2 minutes during any one hour[7]
	4. Less than 471,000 MW-hr per year net electric sales three year rolling average for each EU.	CO_2	The applicable CO_2 emission standard in 40 CFR 60 Subpart TTTT Table 2
	5. Operation at 100% load, steady state, initial compliance test only within 180 days of startup.[8]	NOx	0.084 lb/MW-hr natural gas 0.175 lb/MW-hr ULSD
		CO	0.103 lb/MW-hr natural gas 0.107 lb/MW-hr ULSD
		VOC	0.029 lb/MW-hr natural gas 0.055 lb/MW-hr ULSD
		SO_2	0.024 lb/MW-hr natural gas 0.014 lb/MW-hr ULSD
		H_2SO_4	0.022 lb/MW-hr natural gas 0.013 lb/MW-hr ULSD
		$PM/PM_{10}/PM_{2.5}$[5]	0.084 lb/MW-hr natural gas 0.293 lb/MW-hr ULSD

Table 13			
Operational/Production and Emission Limits			
EU	**Operational / Production Limit**	**Air Contaminant**	**Emission Limit[1, 2]**
J4 and J5		NH_3	0.062 lb/MW-hr natural gas 0.065 lb/MW-hr ULSD
		Greenhouse Gases, CO_2e (at ISO Conditions)[9]	1,151 lb/MW-hr natural gas 1,551 lb/MW-hr ULSD 1,352 lb/MW-hr annual average
EDG	6. Limited to the operating hours restriction of 310 CMR 7.26(42)(d)1, if any. 7. Ultra Low Sulfur Diesel shall be the only fuel of use.	NOx and NMHC, Combined Total	3.98 lb/hr 3.0 g/bhp-hr 4.0 g/KW-hr
		CO	3.45 lb/hr 2.6 g/bhp-hr 3.5 g/KW-hr
		Sulfur in fuel	0.0015% by weight
		SO_2	0.0075 lb/hr
		H_2SO_4	0.006 lb/hr
		$PM/PM_{10}/PM_{2.5}$	0.20 lb/hr 0.15 g/bhp-hr 0.20 g/KW-hr
		Greenhouse Gases, CO_2e	163.64 lb/MMBtu
		Opacity	less than 5%, except less than10% for up to 2 minutes during any one hour[7]
FP	8. Limited to the operating hours restriction of 310 CMR 7.26(42)(d)1, if any. 9. Ultra Low Sulfur Diesel shall be the only fuel of use.	NOx and NMHC, combined total	1.6 lb/hr 3.0 g/bhp-hr 4.0 g/KW-hr
		CO	1.36 lb/hr 2.6 g/bhp-hr 3.5 g/KW-hr
		Sulfur in fuel	0.0015% by weight
		SO_2	0.002 lb/hr
		H_2SO_4	0.002 lb/hr

Table 13			
Operational/Production and Emission Limits			
EU	**Operational / Production Limit**	**Air Contaminant**	**Emission Limit[1, 2]**
FP		$PM/PM_{10}/PM_{2.5}$	0.078 lb/hr 0.15 g/bhp-hr 0.20 g/KW-hr
		Greenhouse Gases, CO_2e	163.64 lb/MMBtu
		Opacity	less than 5%, except less than 10% for up to 2 minutes during any one hour[7]
Project-wide[10]	NA	NOx	66.0 TPY
		CO	68.0 TPY
		VOC	20.7 TPY
		SO_2	13.4 TPY
		$PM/PM_{10}/PM_{2.5}$[4]	58.2 TPY
		NH_3	35.1 TPY
		H_2SO_4	12.4 TPY
		Single HAP (formaldehyde)	1.88 TPY
		Total HAPs	4.2 TPY
		CO_2	695,875 TPY
		Greenhouse Gases, CO_2e	697,049 TPY

Table 13 Key:

CO = Carbon monoxide
CO_2 = Carbon dioxide
CO_2e = Carbon dioxide equivalents
CMR = Code of Massachusetts Regulations
EU = Emission Unit
g/bhp-hr = grams per brake horsepower-hour
g/KW-hr = grams per kilowatt-hour
H_2SO_4 = Sulfuric acid mist
HAP = Hazardous Air Pollutant
HHV = Higher heating value
ISO = International Organization for Standardization
lb/hr = pounds per hour
lb/MMBtu = pounds per million British thermal unit
lb/MW-hr = pounds per megawatt-hour
$\mu g/m^3$ = micrograms per cubic meter

MMBtu = Million British thermal unit
MMBtu/hr = Million British thermal units per hour
NH_3 = Ammonia
NOx = Nitrogen oxides
NMHC = Non-methane hydrocarbons
NA = Not applicable
O_2 = Oxygen
Pb = Lead
PM =Particulate matter
$PM_{2.5}$ = Particulate matter less than or equal to 2.5 microns in diameter
PM_{10} = Particulate matter less than or equal to 10 microns in diameter
ppmvd @ 15% O_2 = parts per million by volume, dry basis corrected to 15 percent oxygen
% = percent
psia = pounds per square inch absolute
scf = Standard cubic feet
SO_2 = Sulfur dioxide
TPM = Tons per month
TPY = Tons per 12-month rolling period
ULSD = Ultra Low Sulfur Diesel
VOC = Volatile organic compounds

Table 13 Notes:

1. Emission limits are the maximum allowed emission and are one hour block averages unless otherwise noted and apply to any block hour with more than 30 minutes of normal operation.
2. Emission limits for EUs EGD and FP are consistent with manufacturers' certifications using gaseous testing procedures in accordance with 40 CFR Part 89.
3. Maximum fuel heat input (total) for each combustion turbine calculated using 5,256 hours of operation per 12 month rolling period at 100% load and 50ºF ambient temperature (980 MMBtu/hr, HHV). Maximum total fuel heat input (ULSD) for each combustion turbine calculated using 720 hours of operation per 12 month rolling period at 100% load and 50ºF ambient temperature (946 MMBtu/hr, HHV).
4. Particulate matter emission limits include both filterable and condensable particulate matter.
5. The single HAP (formaldehyde) monthly emission limit calculated by multiplying the formaldehyde pounds per hour emission factor in AP-42[15] for natural gas by 744 hours per month and dividing by 2000 pounds per ton.
6. The total HAP monthly emission limit calculated by adding:
   - the formaldehyde tons per month emission limit, and
   - the toluene potential emissions per month, estimated by multiplying the toluene pounds per hour emissions factor in AP-42[16] for natural gas by 744 hours per month and dividing by 2000 pounds per ton, and
   - the tons VOC HAP potential emissions per month, estimated by adding the VOC HAP pounds per hour emission factors for each VOC HAP listed in AP-42[16] for natural gas (except formaldehyde and toluene), multiplying the sum by 744 hours per month and dividing by 2000 pounds per ton, and
   - the tons non-VOC HAP (metals) emissions per month, estimated by summing the non-VOC HAP (metals) pounds per hour emissions factors for each metal listed in AP-42[17] for ULSD, multiplying the sum by 744 hours per month and dividing by 2000 pounds per ton.
7. Opacity emission limits are one minute block averages.

[15] EPA AP-42 Compilation of Air Pollutant Emission Factors, Fifth Edition, Section 3.1 Background Document.
[16] ibid. Table 3.1-3
[17] ibid. Table 1.3-10 for arsenic and Table 3.1-5 for other metals.

8. The pound per megawatt-hour emission limits calculated using 100% load using lb/hr emissions and MW-hr gross electrical output.
9. Emission limit calculated using 100% load emissions and gross electrical output, corrected to ISO conditions (59°F, 14.7 psia, 60% humidity). Emissions calculations use a natural gas CO_2e emission factor of 119.0 lb/MMBtu. This emission factor is based on a CO_2 emission factor of 118.9 lb/MMBtu calculated from Equation G-4 of 40 CFR Part 75 Appendix G plus an emission factor of 0.1 lb/MMBtu for other greenhouse gases (methane and nitrous oxide) calculated utilizing the emission factors for these two pollutants from Table C-2 of 40 CFR 98 Subpart C and the global warming potentials for these two pollutants from Table A-1 of 40 CFR 98 Subpart A. Compliance shall be determined during the initial compliance test performed within 180 days after initial firing of the EU. Similarly, ULSD emissions calculated using a ULSD CO_2e emission factor of 163.64 lb/MMBtu.
10. The TPY emission limits apply to the emissions from EUs J4, J5, EDG and FP combined.

Table 13a

Operational/Production and Emission Limits

EU	Operational / Production Limit	Air Contaminant	Emission Limit
J4 and J5	1. Operation during **startups** (from first combustion of fuel to compliance with the NOx and CO emission limits, but no more than 30 minutes).	NOx	22.0 lb/startup event on natural gas 39.0 lb/startup event on ULSD
		CO	19.0 lb/startup event on natural gas 11.0 lb/startup event on ULSD
		VOC, as methane	2.2 lb/startup event on natural gas 5.0 lb/startup event on ULSD
	2. Operation during **shutdowns** (from 25% load firing natural gas or 50% load firing ULSD to flame out, but no more than 13 minutes).	NOx	6.0 lb/shutdown event on natural gas 7.0 lb/shutdown event on ULSD
		CO	9.0 lb/shutdown event on natural gas 9.0 lb/shutdown event on ULSD
		VOC, as methane	4.3 lb/shutdown event on natural gas 6.0 lb/shutdown event on ULSD

Table 13a Key:

EU = Emission Unit
lb = pounds
NOx = Nitrogen oxides
% = percent
ULSD = Ultra Low Sulfur Diesel
VOC = Volatile Organic Compounds

Compliance Demonstration

The Permittee is subject to, and shall comply with, the monitoring, testing, record keeping, and reporting requirements as contained in Tables 14, 15 and 16:

Table 14	
EU	**Monitoring and Testing Requirements**
J4 and J5	1. The Permittee shall install, calibrate, certify, maintain and continuously operate a DAHS, and a Continuous Emission Monitoring System (CEMS) in an accurate operating condition to measure and record emissions of NOx, CO, NH_3, and O_2 in the stacks and to measure and record fuel flow.
	2. The Permittee shall install, calibrate, certify, maintain, and operate the CEMS in accordance with 40 CFR 60 Appendix B (Performance Specifications) and 40 CFR 60 Appendix F (Quality Control Procedures).
	3. The Permittee shall program a calibration error check sequence for each CEMS unit into the DAHS and perform the error check sequence at least daily.
	4. The Permittee shall install, calibrate, certify, maintain, and continuously operate a Continuous Opacity Monitoring System (COMS) to monitor opacity of the emissions from EUs J4 and J5. The Permittee shall maintain the COMS in an accurate operating condition and shall install, calibrate, certify, and operate the COMS in accordance with 40 CFR 60 Appendix B (Performance Specifications) and apply the quality assurance and quality control procedures in 40 CFR 60 Appendix F, Procedure 3.
	5. The Data Acquisition and Handling System (DAHS) shall collect and record opacity values from the COMS monitor. The DAHS shall continuously record opacity once every 10 seconds and compile 1 minute block opacity averages.
	6. The Permittee shall obtain and record emissions data from each CEMS unit serving EUs J4 and J5 at all times EUs J4 and J5 are firing except for periods of CEMS and COMS calibration error checks, zero and span adjustments, maintenance, and periods of malfunction.
	7. The Permittee shall obtain and record emissions data from each CEMS and COMS serving EUs J4 and J5 for at least ninety five (95) percent of EUs J4's and J5's operating hours every calendar quarter, except for periods of CEMS and COMS calibration error checks, zero and span adjustments, and preventive maintenance.
	8. The Permittee shall install the COMS with visible and audible alarms that activates whenever the opacity is within 2% of the emission limit in Table 13 of this Plan Approval.

Table 14	
EU	**Monitoring and Testing Requirements**
J4 and J5	9. The Permittee shall continuously monitor NOx, CO and NH_3 and compile one-hour block average emission concentrations. The DAHS shall calculate the emissions in lbs/hr, lbs/MMBtu and ppmvd at 15% O_2 to determine compliance with the applicable emission limits in Table 13 of this Plan Approval.
	10. The Permittee shall equip the CEMS with properly operated and properly maintained audible and visible alarms. The alarms shall be set to activate whenever emissions from the Project are within 5% of the lb/hr emission limits in Table 13 of this Plan Approval.
	11. The Permittee shall conform with the EPA monitoring specifications at 40 CFR 60.13 and 40 CFR 60 Appendices B and F, and all applicable portions of 40 CFR 72 and 75, 310 CMR 7.32, and 310 CMR 7.70 for all emission monitors and recorders serving EUs J4 and J5.
	12. The Permittee shall monitor emissions during all periods that emissions are above the emission limits in Table 13 and 13a of this Plan Approval, even if the exceedance is attributable to startup, shutdown, malfunction, emergency, equipment cleaning, and upsets or failures associated with the emission control system or the CEMS or COMS. An exceedance of emission limits in Table 13 or 13a of this Plan Approval due to an emergency or malfunction shall not be deemed a federally permitted release as that term is used in 42 U.S.C. 9601(10).
	13. The Permittee shall use and maintain the CEMS and COMS serving EUs J4 and J5 as "direct-compliance" monitors to measure opacity and emissions of NOx, CO and NH_3. "Direct-compliance" monitors generate data that legally documents the compliance status of a source.
	14. The Permittee shall not certify the COMS or CEMS during SCR or oxidation catalyst startup, during malfunction or maintenance.
	15. The Permittee shall conduct Relative Accuracy Test Audits (RATA) on the NOx and CO CEMS units at a frequency determined in accordance with 40 CFR 75.
	16. The Permittee shall develop and implement a quality assurance/quality control program for the long-term operation of the CEMS and COMS serving EUs J4 and J5 before the commencement of commercial operations so as to conform with 40 CFR 60 Appendices B and F, all applicable portions of 40 CFR 72 and 75, 310 CMR 7.32, and 310 CMR 7.70.
	17. Whenever the NH_3 CEMS unit is not available for more than two hours, the Permittee shall monitor the following parameters to assure that the NH_3 emissions, operating loads, and NH_3 injection rates are consistent with prior NH_3 compliant operation: (a) NOx CEMS unit, (b) temperature of SCR and oxidation catalyst inlet, (c) temperature of ammonia injection system, (d) ammonia injection rate, and (e) pressure drop across the SCR and oxidation catalyst.

Table 14	
EU	**Monitoring and Testing Requirements**
J4 and J5	18. Whenever the NOx CEMS unit is not available for more than two hours, the Permittee shall monitor the following parameters to assure that the NOx emissions are consistent with prior NOx compliant operation: (a) ammonia CEMS unit, (b) temperature of SCR and oxidation catalyst inlet, (c) temperature of ammonia injection system, (d) ammonia injection rate, and (e) pressure drop across the SCR and oxidation catalyst.
	19. Whenever the CO CEMS unit is not available for more than two hours, the Permittee shall monitor the following parameters to assure that the CO emissions are consistent with prior CO compliant operation: (a) ambient temperature, and (b) combustion turbine load.
	20. Whenever the COMS unit is not available for more than two hours, the Permittee shall monitor the following parameters to assure that opacity is consistent with prior opacity compliant operation: (a) ambient temperature, and (b) combustion turbine load.
	21. The Permittee shall monitor the date and hours that EUs J4 and J5 operate.
	22. The Permittee shall install and continuously operate monitors fitted with alarms to monitor the temperatures at the inlets to the SCR and oxidation catalysts serving EUs J4 and J5. The alarms shall be set to activate when temperatures at the inlets to the SCR and oxidation catalysts deviate from normal operating temperatures. In addition, the Permittee shall monitor the ambient temperature.
	23. The Permittee shall install, calibrate, certify, maintain and continuously operate fuel flow monitors that monitor the amount of natural gas and ULSD used to fire EUs J4 and J5.
	24. The Permittee shall monitor fuel heat input rate (MMBtu/hr, HHV), natural gas heat input (MMBtu), ULSD heat input (MMBtu), natural gas consumption (scf) and ULSD consumption (gallons) for EUs J4 and J5.
	25. The Permittee shall monitor the load, startup and shutdown duration, and mass emissions (lb/event) of NOx, CO, and VOC during startup and shutdown of EUs J4 and J5.
	26. The Permittee shall continuously monitor the gross electrical output of the Project.
	27. The Permittee shall monitor the sulfur content of the fuel combusted by EUs J4 and J5 in accordance with 40 CFR 60 Subpart KKKK, or pursuant to any alternative fuel monitoring schedule in accordance with 40 CFR 60 Subpart KKKK unless the Permittee elects not to monitor the sulfur content of the fuel and makes a demonstration required in 40 CFR 60.4365.
	28. The Permittee shall monitor SO_2 and CO_2 emissions in accordance with 40 CFR 75.

Table 14	
EU	**Monitoring and Testing Requirements**
J4 and J5	29. The Permittee shall install and operate high and low level audible alarm monitors on the ammonia storage tank and shall maintain the monitors according to the manufacturer's recommendations.
	30. The Permittee shall monitor the Greenhouse Gas emission rate using the calculation procedures in 40 CFR 98.
	31. The Permittee shall conduct initial compliance testing of EUs J4 and J5 within 180 days of the initial firing of EUs J4 and J5 to determine the compliance status with the emission limits in Table 13 and 13a of this Plan Approval. Initial compliance testing shall be conducted in accordance with MassDEP's "Guidelines for Source Emissions Testing," in accordance with EPA reference test methods in 40 CFR 60, Appendix A, 40 CFR 60 Subpart KKKK, 40 CFR 72 and 75, or by another method that has been approved in writing by MassDEP, and in accordance with the emission testing protocol required by Table 16 Condition 2 below.
	32. The Permittee shall construct the Project to accommodate the emissions testing requirements in 40 CFR 60 Appendix A. The two outlet sampling ports (90 degrees apart from each other) for each emission unit must be located at a minimum of one duct diameter upstream and two duct diameters downstream of any flow disturbance. In addition, the Permittee shall facilitate access to the sampling ports and testing equipment by constructing platforms, ladders, or other necessary equipment.
	33. The Permittee shall conduct initial compliance testing of EUs J4 and J5 within 180 days of the initial firing of EUs J4 and J5 to determine their compliance status with the emission limits (in lb/hr, lb/MMBtu, and ppmvd, as applicable) in Table 13 and 13a of this Plan Approval while firing natural gas and ULSD for the following pollutants: NOx, CO, VOC, total PM[1], NH_3, H_2SO_4, total HAP, single HAP (formaldehyde), and opacity.
	34. The Permittee shall conduct initial compliance testing of EUs J4 and J5: (a) at representative operating conditions, (b) at no less than the following load conditions while testing for NOx, CO, VOC, NH_3 and opacity: while firing natural gas; 25%, 50%, 75% and 100%, and while firing ULSD; 50%, 75% and 100%, (c) at no less than the following load conditions while testing for total PM: while firing natural gas; 25% and 100%, and while firing ULSD; 50% and 100%, (d) at no less than the following load conditions while testing for CO_2, H_2SO_4, and single HAP (formaldehyde): while firing natural gas; 100%, and while firing ULSD; 100%, (e) at no less than the following load conditions while testing for toluene: while firing natural gas; 100%, and (f) during periods of steady state operation of EU J4 and J5 of the SCR and the oxidation catalyst.
	35. The Permittee shall comply with the parametric monitoring methodology approved by MassDEP for PM, PM_{10}, and $PM_{2.5}$ emissions from EUs J4 and J5.

Table 14	
EU	**Monitoring and Testing Requirements**
J4 and J5	36. The Permittee shall sample and analyze the natural gas and ULSD used during the initial compliance testing to determine their compliance status with the sulfur in fuel, SO_2 emission limit in Table 13 of this Plan Approval. The Permittee shall sample and analyze the ULSD used during the initial compliance testing to determine emissions of non-VOC HAP (metals).
	37. The Permittee shall conduct initial compliance tests of EUs J4 and J5 to determine their compliance status with the startup and shutdown emission limits for NOx, CO and VOC. Startup is the period from first combustion of fuel to compliance with the NOx and CO emission limits in Table 13a of this Plan Approval, but no more than 30 minutes. Shutdown is the period from 25% load while firing natural gas or 50% load while firing ULSD to flame out, but no more than 13 minutes.
	38. The Permittee shall conduct initial compliance testing to determine compliance with all lb/MW-hr emission limits in Table 13 of this Plan Approval within 180 days of initial firing of each EU. The Permittee shall conduct this initial compliance test at 100% load and calculate lb/MW-hr emissions using gross electrical output.
	39. The Permittee shall develop a correlation between CO and VOC emissions for EUs J4 and J5 during initial compliance testing.
	40. The Permittee shall consider the VOC emission rate during startup or shutdown, as occurring at the rate of VOC emissions determined in the most recent emissions test during startup and shutdown.
	41. For periods other than startup and shutdown, when CO emissions are below the CO pound per hour emission limit, the Permittee shall consider the VOC emissions pound per hour emission rate as meeting the VOC emission limits in Table 13 of this Plan Approval, subject to correlation in Table 13 Condition 42 below.
	42. For periods other than startup and shutdown, when CO emissions are above the CO pound per hour emission limit the Permittee shall consider VOC emissions occurring at a rate determined by the equation: $VOC_{actual} = VOC_{limit} \times (CO_{actual}/CO_{limit})$, until a VOC/CO correlation curve for each combustion turbine is developed and approved by MassDEP. After approval, the approved VOC/CO correlation curved shall be used for determining compliance with the VOC pound per hour emission limit in Table 13 of this Plan Approval.
	43. The Permittee shall conduct emission tests for PM and H_2SO_4 that meet the requirements for initial compliance tests in Table 14 Conditions 33, 34 and 39 above, every five years.
	44. The Permittee shall conduct a sound measurement program no later than 180 days after the commencement of commercial operations to determine the compliance status with the requirements of Table 17Condition 9 below. The sound measurement program shall measure the sound impact of the Facility while operating EUs J1T1 through J5 at 100% load and while operating only EUs J4 and J5 at 100% load. The Permittee shall conduct the sound measurement program in accordance with the noise testing protocol required by Table 16 Condition 2 below. The Permittee shall schedule the sound measurement program such that MassDEP personnel can witness it.

Table 14	
EU	**Monitoring and Testing Requirements**
EDG and FP	45. The Permittee shall equip, operate, and maintain non-resettable hour meters on the emergency generator engine and the emergency fire pump engine.
Project-wide	46. The Permittee shall monitor all operations to ensure sufficient information is available to comply with 310 CMR 7.12 Source Registration.
	47. If and when MassDEP requires it, the Permittee shall conduct emission testing in accordance with EPA Reference Test Methods and 310 CMR 7.13.
	48. The Permittee shall monitor the sulfur content of each shipment of ULSD received. The Permittee may determine the sulfur content of ULSD by analyzing the sulfur content of the ULSD or by relying on ULSD suppliers to provide the sulfur content of ULSD received. The analysis of sulfur content of ULSD shall be in accordance with the applicable ASTM International test methods or any other method approved by MassDEP and EPA.
	49. The Permittee shall meter any well at the Project used to withdraw process water and read the meters and record the data monthly. The Permittee shall operate, maintain, calibrate and replace the meters according to the manufacturer's specifications.
	50. The Permittee shall monitor emissions of CO_{2e} from all emission units associated with the Project.

Table 14 Key:

CO = Carbon monoxide
CO_2 = Carbon dioxide
CO_{2e} = Carbon dioxide equivalent
CFR = Code of Federal Regulations
CMR = Code of Massachusetts Regulations
CEMS = Continuous Emission Monitors
COMS = Continuous Opacity Monitors
DAHs= Data Acquisition and Handling System
EU = Emission Unit
EPA = Environmental Protection Agency
H_2SO_4 = Sulfuric acid mist
HHV = Higher heating value
lb/event = Pounds per event
lb/hr = Pounds per hour
lb/MW-hr = Pounds per megawatt-hour
lb/MMBtu = Pounds per million British thermal units
MMBtu = Million British thermal units
MMBtu/hr = Million British thermal units per hour
NH_3 = Ammonia
NOx = Nitrogen oxides
O_2 = Oxygen
PM =Particulate matter
$PM_{2.5}$ = Particulate matter less than or equal to 2.5 microns in diameter
PM_{10} = Particulate matter less than or equal to 10 microns in diameter

% = percent
ppmvd = parts per million by volume, dry basis
RATA = Relative Accuracy Test Audits
scf = standard cubic feet
SCR = Selective Catalytic Reduction
SO_2 = Sulfur dioxide
ULSD = Ultra Low Sulfur Diesel
U.S.C. = United States Code
VOC = Volatile organic compounds

Table 14 Notes:

1. The Permittee has the option of testing PM and comparing PM emissions to the $PM/PM_{10}/PM_{2.5}$ emission limit in Table 13 of this Plan Approval or testing PM, PM_{10} and $PM_{2.5}$, adding those emissions, and comparing that sum to the $PM/PM_{10}/PM_{2.5}$ emission limit.

Table 15	
EU	**Record Keeping Requirements**
J4 and J5	1. The Permittee shall maintain on-site permanent records of output from all continuous monitors (including CEMS and COMS) for flue gas emissions, natural gas consumption (scf) and ULSD consumption (gallons).
	2. The Permittee shall maintain records of the load, startup and shutdown duration, and mass emissions (lb/event) of NOx, CO, and VOC during startup and shutdown of EUs J4 and J5.
	3. The Permittee shall maintain records of the hourly fuel heat input rate (MMBtu/hr, HHV), NOx, CO and NH_3 hourly emissions, opacity, natural gas heat input (MMBtu), ULSD heat input (MMBtu), natural gas consumption (scf), ULSD consumption (gallons) and purchase records for natural gas and ULSD per month and on a twelve month rolling period basis for EUs J4 and J5.
	4. The Permittee shall maintain records of SO_2 and CO_2 emissions from EUs J4 and J5 in accordance with 40 CFR 75.
	5. The Permittee shall maintain records of the Greenhouse Gas emission rate of EUs J4 and J5 in accordance with the schedule and calculation procedures in 40 CFR 98.
	6. The Permittee shall maintain continuous records of the SCR and oxidation catalyst: • inlet temperature, • the ambient temperature, and • the pressure drop across the SCR and the oxidation catalyst.
	7. The Permittee shall continuously estimate VOC emissions on the DAHS using CO emissions and the VOC/CO correlation curve developed during the most recent emissions test and maintain a record of estimated VOC emissions.

Table 15	
EU	**Record Keeping Requirements**
J4 and J5	8. The Permittee shall maintain records of the sulfur content of the fuel fired by EUs J4 and J5 at the frequency required by 40 CFR 60 Subpart KKKK, or pursuant to any alternative fuel monitoring schedule in accordance with 40 CFR 60 Subpart KKKK.
	9. The Permittee shall maintain records of gross electrical output from the Project on a daily basis.
	10. The Permittee shall maintain records of the date and hours that EUs J4 and J5 operate per month and per twelve month rolling period.
	11. The Permittee shall maintain a log to record problems, upsets or failures associated with the emission control systems, DAHS, CEMS, and/or COMS serving EUs J4 and J5, and the ammonia handling system serving EUs J4 and J5.
	12. The Permittee shall keep records of the CEMS unit's calibration error check sequences.
	13. The Permittee shall continuously record the following: • ammonia injection rate, and • temperature of the injected ammonia.
	14. The Permittee shall record the date, time of observation and name of the observer (if applicable) of the following: • the condition of the ammonia system, daily, and • alarm event when triggered on the ammonia leak detection system.
	15. The Permittee shall maintain records all of manufacturer's required monitoring protocols and inspections included in the SOMP for each CEMS, COMS, the SCR, the oxidation catalyst and the ammonia handling system. The records shall include: the date, time of monitoring and/or inspection, the results of inspection, and the name of the staff member performing the monitoring and/or inspection.
	16. The Permittee shall maintain adequate records on-site to demonstrate the compliance status with all operational/production limits and emission limits in Table 13 and 13a above: (a) the records shall include all associated calculations and supporting data, (b) the records shall include the actual emissions of air contaminants emitted for each calendar month and for each consecutive twelve-month period, (c) the records shall include the actual emissions of air contaminants for each calendar month, and for each consecutive twelve month period, and (d) the Permittee shall compile these records no later than the 15th day following each month. The Permittee may download an electronic version of the MassDEP approved record keeping form, in Microsoft Excel format, at: http://www.mass.gov/eea/agencies/massdep/air/approvals/limited-emissions-record-keeping-and-reporting.html#WorkbookforReportingOn-SiteRecordKeeping.

Table 15	
EU	**Record Keeping Requirements**
J4 and J5	17. The Permittee shall maintain compliance records sufficient to document actual HAP emissions from the Project as follows: (a) determine single HAP (formaldehyde) monthly emissions by multiplying the pounds formaldehyde emitted per hour for natural gas and for ULSD determined during the initial compliance testing by the hours operated during the month firing natural gas and ULSD, respectively, dividing each by 2000 pounds per ton and adding the two results. (b) estimate total HAP monthly emissions by adding: i. the tons formaldehyde emitted per month, determined in Table 15 Condition 17(a) above, and ii. the tons toluene emitted per month, calculated by multiplying the pounds toluene emitted per hour for natural gas determined during the initial compliance testing by the hours operated during the month firing natural gas and dividing by 2000 pounds per ton, and iii. the tons VOC HAP emitted per month, calculated by adding the pounds VOC HAP per hour emission factors for each VOC HAP listed in AP-42[18] for natural gas (except formaldehyde and toluene), multiplying the sum by the hours operated during the month firing natural gas and dividing by 2000 pounds per ton, and iv. the tons non-VOC HAP (metals) emitted per month, calculated by multiplying the pounds non-VOC HAP (metals) per hour emitted for ULSD determined during the initial compliance testing by the hours operated during the month firing ULSD and dividing by 2000 pounds per ton.
	18. The Permittee shall maintain a record of the sulfur content of each ULSD delivery made to the Project.
	19. The Permittee shall maintain all records required by 310 CMR 7.32, 310 CMR 7.70, 310 CMR 7.71 (Reporting of Greenhouse Gas Emissions), and 40 CFR 98 (Mandatory Greenhouse Gas Emissions Reporting) at the Project.
	20. The Permittee shall maintain the following records: (a) the dates ULSD was fired, (b) the specific condition of Table 17 Condition 7 under which ULSD was allowed to be fired for each period of ULSD firing, (c) for any ULSD firing under Table 17 Condition 7(a), the price comparison required by Table 17 Condition7(a), (d) the heat input when firing ULSD under Table 17 Condition 7(a), and (e) the heat input when firing ULSD under Table 17 Condition 7(b).
	21. The Permittee shall maintain a complaint log concerning emissions, odor, and noise from the Project. The Permittee shall make available to the general public a telephone number that receives and records complaints concerning the Project and is available to receive complaints 24 hours per day. The Permittee shall maintain the complaint log for the most recent five (5) year period. The Permittee shall make the complaint log available to members of the public and to MassDEP upon request. The Permittee shall take all reasonable actions to respond to any complaints in a timely manner.

[18] ibid. Table 3.1-3

Table 15	
EU	**Record Keeping Requirements**
J4 and J5	22. The Permittee shall maintain records of monitoring and testing as required by Table 14 of this Plan Approval.
	23. The Permittee shall maintain records to ensure sufficient information is available to comply with 310 CMR 7.12 Source Registration.
	24. The Permittee shall maintain a copy of this Plan Approval, its underlying Application, and the most up-to-date SOMP at the Facility.
	25. The Permittee shall maintain records required by this Plan Approval on-site for a minimum of five (5) years.
	26. The Permittee shall make records required by this Plan Approval available to MassDEP and EPA personnel upon request.
	27. The Permittee shall maintain withdrawal records and any other information in sufficient detail to demonstrate compliance with the water metering requirements of this Plan Approval.
EDG and FP	28. The Permittee shall maintain a record of the hours of operation of EUs EDG and FP per month and per twelve month rolling period and the reason EUs EDG and FP operated.
Project-wide	29. The Permittee shall establish and maintain a record keeping system for the Project so that year-to-date information is readily available. Record keeping shall, at a minimum, include: (a) Compliance records sufficient to document actual emissions from the Project in order to determine compliance with the operational/production limits and emission limits in Table 13 and 13a of this Plan Approval. Such records shall include, but are not limited to, fuel usage rates, emissions test results, and monitoring equipment data and reports, (b) Maintenance: A record of maintenance, repair and inspection activities performed on all emission units and their associated equipment, control equipment and their associated equipment and monitoring equipment. The records shall include, at a minimum, the type or a description of the maintenance, repair or inspection performed and the date and time the work was commenced and completed, and (c) Malfunctions: A record of all malfunctions of the control and monitoring equipment serving EUs J4 and J5 including, at a minimum: the date and time the malfunction occurred; a description of the malfunction and the corrective action taken; the date and time corrective actions began; and the date and time corrective actions were completed.
	30. The Permittee shall record the total emissions of CO_{2e} from all emission units associated with the Project in each calendar year

Table 15 Key:

CO = Carbon monoxide
CO_2 = Carbon dioxide
CO_{2e} = Carbon dioxide equivalents
CFR = Code of Federal Regulations

CMR = Code of Massachusetts Regulations
CEMS = Continuous Emission Monitors
COMS = Continuous Opacity Monitors
DAHS = Data Acquisition and Handling System
EU = Emission Unit
HHV = Higher heating value
lb/event = pounds per event
MMBtu = Million British thermal units
MMBtu/hr = Million British thermal units per hour
NOx = Nitrogen oxides
scf = standard cubic feet
SCR = Selective Catalytic Reduction
SOMP = Standard Operating and Maintenance Procedures
SO_2 = Sulfur dioxide
ULSD = Ultra Low Sulfur Diesel
VOC = Volatile organic compounds

Table 16

EU	Reporting Requirements
J4 and J5	1. The Permittee shall submit a QA/QC program plan for the CEMS and COMS serving EUs J4 and J5 to MassDEP, in writing, at least 30 days before commencement of commercial operation of EUs J4 and J5. The Permittee shall implement the QA/QC program approved by MassDEP. The Permittee shall submit subsequent changes to the QA/QC program plan to MassDEP for MassDEP approval prior to their implementation.
	2. The Permittee shall submit a written test protocol to MassDEP at least 45 days before initial compliance testing and obtain written MassDEP approval of an emissions test protocol before conducting initial compliance testing of EUs J4 and J5. The protocol shall include, but not be limited to: (a) A detailed description of sampling port locations, sampling equipment, sampling and analytical procedures, and operating conditions for the initial compliance testing, (b) Procedures for initial compliance testing of startup and shutdown emissions, (c) Procedures for the required CO and VOC correlation, and (d) Procedures to confirm the parametric monitoring methodology for particulate emissions approved by MassDEP.
	3. The Permittee shall notify MassDEP of the proposed schedule for initial compliance testing at least 30 days prior to conducting the initial compliance testing.
	4. The Permittee shall submit a final emissions test results report to MassDEP within 45 days of completion of the initial compliance testing.
	5. The Permittee shall include in the final emissions test results report an estimate of the single HAP (formaldehyde) and the total HAP potential emissions per month as follows: (a) estimate single HAP (formaldehyde) monthly potential emissions by multiplying the pounds formaldehyde per hour emissions for natural gas or for ULSD (whichever is greater) determined

Table 16	
EU	**Reporting Requirements**
	during the initial compliance testing by 744 hours per month and dividing by 2000 pounds per ton. (b) estimate total HAP monthly potential emissions by adding: i. the tons formaldehyde emitted per month estimated in Table 16 Condition 5 (a) above, and ii. the tons toluene emitted per month, calculated by multiplying the pounds toluene per hour emissions for natural gas determined during the initial compliance testing by 744 hours per month and dividing by 2000 pounds per ton, and iii. the tons VOC HAP emitted per month, calculated by adding the pounds VOC HAP per hour emission factors for each VOC HAP listed in AP-42[18] for natural gas (except formaldehyde and toluene), multiplying the sum by 744 hours per month and dividing by 2000 pounds per ton, and iv. the tons non-VOC HAP (metals) emitted per month, calculated by multiplying the pounds non-VOC HAP (metals) per hour emissions for ULSD determined during the initial compliance testing by 744 hours per month and dividing by 2000 pounds per ton.
J4 and J5	6. The Permittee shall submit to MassDEP for approval a proposed parametric monitoring methodology to assure emissions of particulate matter and sulfuric acid mist comply with the emission limits in Table 13 of this Plan Approval. The Permittee shall submit the proposed parametric monitoring methodology within 60 days after commencement of commercial operations. The Permittee shall implement the parametric monitoring methodology approved by MassDEP.
	7. The Permittee shall submit a quarterly Excess Emissions Report to MassDEP by the thirtieth (30th) day of April, July, October, and January each year. The Excess Emissions Report shall include at least the information listed below for the previous calendar periods of January through March, April through June, July through September, and October through December, respectively. (a) CEMS and COMS excess emissions data, in a format acceptable to MassDEP, (b) exceedances of operational/production limits, (c) for each period of excess emissions or exceedances of operational/production limits for EUs J4 and J5, the Permittee shall list the duration, cause, the response taken, and the amount of excess emissions. Periods of excess emissions shall include excess emissions during startup and shutdown, malfunction, emergency, equipment cleaning, and upsets or failures associated with the emission control system or CEMS or COMS. ("**Malfunction**" means any sudden and unavoidable failure of air pollution control equipment or process equipment or of a process to operate in a normal or usual manner. Failures caused entirely or in part by poor maintenance, careless operation, or any other preventable upset condition or preventable equipment breakdown are not malfunctions. "**Emergency**" means any situation arising from sudden and reasonably unforeseeable events beyond the control of the Permittee, including acts of God, which would require immediate corrective action to restore normal operation, and that causes the Project to exceed a technology based limitation in this Plan Approval, due to unavoidable increases in emissions attributable to the emergency. An emergency does not include noncompliance caused by improperly designed equipment, lack of maintenance, careless or improper operations, operator error or decision to keep operating despite knowledge of these things.), (d) A tabulation of periods of operation of each emission unit and total hours of operation of each emission unit during the calendar quarter, and (e) The number of hours each of the CEMS and the COM collected data and the percent data capture for each CEMs and the COM when EUs J4 and J5 were operating.

Table 16	
EU	**Reporting Requirements**
J4 and J5	8. The Permittee shall comply with all applicable reporting requirements of 310 CMR 7.32, 310 CMR 7.70, 310 CMR 7.71 (Reporting of Greenhouse Gas Emissions), and 40 CFR 98 (Mandatory Greenhouse Gas Emissions Reporting).
EDG and FP	9. The Permittee shall submit to MassDEP a certification for EUs EDG and FP not later than 30 days before their construction or installation begins.
	10. The Permittee shall submit to MassDEP, in accordance with the provisions of 310 CMR 7.02(5)(c), the plans and specifications for the emergency generator engine and generator set, the emergency fire pump engine, and associated exhaust stacks once the specific information has been determined, but in any case not later than 30 days before the construction or installation of each component.
Project-wide	11. The Permittee shall submit a semi-annual report to MassDEP by January 30 and July 30 of each year to demonstrate the Project's compliance status regarding the Project-wide emission limits (TPY) and annual operational/production limits in Table 13 and 13a. (The Permittee may download the optional MassDEP format at: http://www.mass.gov/eea/docs/dep/air/approvals/aq/aqsarpt.doc). The Permittee shall include in its calculation of actual emissions, emissions during steady state operation, startup, shutdown, malfunction, emergency, equipment cleaning, and upsets or failures associated with the emission control system or CEMS or COMS. The semi-annual report shall include, but not be limited to: (a) actual emissions for each month of the previous 12-month period, (b) the maximum hourly fuel heat input rate (MMBtu/hr, HHV), natural gas heat input (MMBtu), ULSD heat input (MMBtu), natural gas consumption (scf), and ULSD consumption (gallons) per month and on a twelve month rolling period basis, (c) a list of deviations from the conditions of the Plan Approval, (d) the hours when any of EUs J1T1 through J3T2 operated simultaneously with EUs J4 and J5 under the provisions in Table 17 Conditions 12 and 13 below, (e) in the semi-annual report required by July 30 each year for the period of the previous July through June, the following information regarding ULSD firing pursuant to Table 17 Condition 7 below: i. the dates ULSD was fired, ii. the specific condition of Table 17 Condition 7 under which ULSD was allowed to be fired for each day of ULSD firing, iii. for any ULSD firing under Table 17 Condition 7(a), the price comparison required by Table 17 Condition 7(a), iv. the heat input when firing ULSD under Table 17 Condition 7(a), and v. the heat input when firing ULSD under Table 17 Condition 7(b).
	12. The Permittee shall submit, in writing, the following notifications to MassDEP within five (5) business days of: (a) the date of commencement of construction of each Emission Unit, (b) the date each Emission Unit construction has been completed, (c) the date of initial firing of each Emission Unit, (d) the date CEMS and the COM are certified, and

Table 16	
EU	**Reporting Requirements**
	(e) the date of commencement of commercial operation.
Project-wide	13. The Permittee shall submit to MassDEP a plan for monitoring and abating air and noise impacts during the period of construction of the Project, no later than 60 days before the commencement of construction.
	14. The Permittee shall submit to MassDEP, in accordance with the provisions of 310 CMR 7.02(5)(c), plans and specifications for the main exhaust stacks, EUs J4 and J5, the SCR (including the ammonia handling and storage system), the oxidation catalyst, and the CEMS, COMS, and DAHS once the specific information has been determined, but in any case not later than 30 days before the construction or installation of each component.
	15. The Permittee shall submit to MassDEP for approval, a SOMP for: (a) all emission units, (b) all emissions control equipment, (c) the ammonia handling system, (d) the CEMS, (e) the COM, and (f) the DAHS, no later than 45days before commencement of commercial operation. The Permittee shall include in the SOMP, but not be limited to, all manufacturer's required monitoring protocols, schedules and inspections. The Permittee shall implement the SOMP approved by MassDEP. Thereafter, the Permittee shall submit updated versions of the SOMP to MassDEP no later than thirty (30) days before a significant change. The updated SOMP shall supersede prior versions of the SOMP.
	16. The Permittee shall submit a sound testing protocol to MassDEP at least 60 days before sound measurement testing and obtain written MassDEP approval of the sound testing protocol before conducting a sound measurement program at the Facility. The protocol shall include, at least, a detailed description of monitoring locations, monitoring equipment, sampling and analytical procedures, data handling and Facility operating conditions for the sound measurement program.
	17. The Permittee shall notify MassDEP of the proposed schedule for any sound measurement program at least 30 days prior to conducting the sound measurement testing.
	18. The Permittee shall submit a final sound measurement testing results report to MassDEP within 45 days of completion of sound measurement testing.
	19. The Permittee shall submit to MassDEP, in accordance with the provisions of 310 CMR 7.02(5)(c), plans and specifications for all sound walls required by the Plan Approval no later than 14 days after the specific information has been determined.
	20. The Permittee shall submit an Operating Permit Application to MassDEP in accordance with 310 CMR 7.00: Appendix C(4)(b) at lease nine months before the planned commencement of commercial operation.

Table 16	
EU	**Reporting Requirements**
Project-wide	21. The Permittee shall notify the Central Regional Office of MassDEP, BAW Permit Chief by telephone: 508-767-2845, email: CERO.Air@state.ma.us and roseanna.stanley@state.ma.us, or fax: 508-792-7621, as soon as possible, but no later than three (3) business days after discovery of an exceedance(s) of Table 13 or 13a requirements. A written report shall be submitted to the Permit Chief at MassDEP within ten (10) business days thereafter and shall include: identification of exceedance(s), duration of exceedance(s), reason for the exceedance(s), corrective actions taken, and action plan to prevent future exceedance(s).
	22. The Permittee shall notify MassDEP immediately by telephone or fax or e-mail [CERO.Air@state.ma.us and roseanna.stanley@state.ma.us] and within three (3) business days, in writing, of any upset or malfunction to the ammonia handling or delivery systems that resulted in a release or threat of release of ammonia to the ambient air. In addition, the Permittee shall comply with all notification procedures required under M.G.L. c. 21 E for any release or threat of release of ammonia.
	23. All notifications and reporting to MassDEP required by this Plan Approval shall be made, unless otherwise noted, to the attention of: Department of Environmental Protection Bureau of Air and Waste 8 New Bond Street Worcester, Massachusetts 01606 Attn: Permit Chief Phone: (508) 792-7650 Fax: (508) 792-7621 E-Mail: cero.air@state.ma.us
	24. The Permittee shall report annually to MassDEP, in accordance with 310 CMR 7.12, all information required by the Source Registration/Emission Statement Form. The Permittee shall include HAP emissions in the reporting. The Permittee shall note therein any minor changes (under 310 CMR 7.02(2)(e), 7.03, 7.26, etc.), which did not require plan approval.
	25. The Permittee shall submit to MassDEP all information required by this Plan Approval over the signature of a "Responsible Official" as defined in 310 CMR 7.00 and shall include the Certification statement as provided in 310 CMR 7.01(2)(c).
	26. The Permittee shall provide to MassDEP a copy of any record required by this Plan Approval within thirty (30) days of MassDEP's request.
	27. If and when MassDEP requires emission testing, the Permittee shall submit to MassDEP for approval an emission pretest protocol, at least forty-five (45) days before emission testing.
	28. If and when MassDEP requires emission testing, the Permittee shall submit to MassDEP a final emission test results report, within forty five (45) days of completion of the emission testing.

Table 16	
EU	**Reporting Requirements**
Project-wide	29. The Permittee shall report the monthly withdrawal volume from each well in the semi-annual report required by January 30 of each year for the period of the previous January through December. The monthly withdrawal volume data shall be included with the semi-annual report and submitted to the following address: Massachusetts Department of Environmental Protection Water Management Program 8 New Bond St Worcester, MA 01606
	30. The Permittee shall submit an Annual Project Wide CO_{2e} Limit Compliance Report to MassDEP. This report shall be submitted on or before April 1st of the following year. The report shall contain the following information: (a) The reporting year, (b) The Annual CO_{2e} Emission Limit for that reporting year, (c) The Project wide total emissions of CO_{2e} emitted during that reporting year, (d) Emissions of CO_{2e} emitted from each Emission Unit associated with the Project during that reporting year, (e) The difference between the Annual CO_{2e} Emission Limit for that reporting year and the Project wide total emissions of CO_{2e} during that reporting year. (f) The balance of "Over Compliance Credits."

Table 16 Key:

BAW = Bureau of Air and Waste
CO = Carbon monoxide
CO_{2e} = Carbon dioxide equivalent
CFR = Code of Federal Regulations
CEMS = Continuous Emission Monitors
COMS = Continuous Opacity Monitors
DAHS = Data Acquisition and Handling System
EU = Emission Unit
EPA = Environmental Protection Agency
HAP = Hazardous Air Pollutants
HHV = Higher heating value
M.G.L. = Massachusetts General Laws
MMBtu = Million British thermal units
MMBtu/hr = Million British thermal units per hour
QA/QC = Quality assurance/quality control
scf = standard cubic feet
SCR = Selective Catalytic Reduction
SOMP = Standard Operation and Maintenance Procedures
TPY = Tons per 12-month rolling period
ULSD = Ultra Low Sulfur Diesel
VOC = Volatile Organic Compounds

13. Special Terms and Conditions

A. The Permittee is subject to, and shall comply with, the Special Terms and Conditions as contained in Table 17 below:

Table 17

EU	Special Terms and Conditions
J4 and J5	1. The Permittee shall certify the CEMS and COMS serving EUs J4 and J5 according to the procedures and schedule in 40 CFR 75.
	2. The Permittee shall maintain an adequate supply of spare parts on-site to maximize the on-line availability and data capture of the CEMS and COMS equipment and to maximize the availability of the SCR and the oxidation catalyst.
	3. The Permittee shall operate the SCR serving EUs J4 and J5 whenever the flue gas temperature at the inlet to the SCR is above the minimum flue gas temperature specified by the SCR manufacturer and other system parameters are satisfied for SCR operation.
	4. The Permittee shall not operate EUs J4 and J5 at less than 25% load while firing natural gas or less than 50% load while firing ULSD, except during startups and shutdowns.
	5. The Permittee shall develop as part of the SOMP for EUs J4 and J5 an optimization protocol to establish conditions that maintain compliance with all emission limits at all ambient temperatures and conditions.
	6. The Permittee shall comply with all applicable requirements of 40 CFR 60 Subpart KKKK.

Table 17	
EU	**Special Terms and Conditions**
J4 and J5	7. The Permittee shall not operate EUs J4 and J5 firing ULSD except under the following conditions: (a) Up to a maximum heat input of 681,120, MMBtu during each period from July 1 through June 30, on any day the price of ULSD is less than the price of natural gas for the Project on a dollars per MMBtu basis. To compare the price of ULSD and the price of natural gas, the Permittee shall compare: for ULSD, the final "Settle" price for the prompt month NY Harbor ULSD Futures (or a successor product) as published by CME Group multiplied by 7.21 gallons per MMBtu, and for natural gas, the Midpoint price for Algonquin, city-gates (or a successor product) as published in Platt's Gas Daily multiplied by 1.1. The Permittee and MassDEP will designate a replacement price index if either price index is no longer provided by the above noted source or if a successor to either index above is not available, or, (b) Up to a maximum heat input of 1,362,240 MMBtu during each period from July 1 through June 30, except that this maximum heat input is reduced by the amount of any heat input used under Table 17 Condition 7(a) above during the same period: i. When ISO-NE declares an Emergency, an Energy Emergency, or a Capacity Scarcity Condition as defined in ISO New England's Tariff or as referenced in Operating Procedure No. 4, No. 7 or No. 21, or; ii. When the natural gas supply (1) is curtailed by the pipeline operator; (2) cannot be procured or delivered at any price; or (3) is not available for purchase or delivery within the timeframe required to support operation of the Project. In this situation, the Permittee shall use all commercially reasonable efforts to switch to firing natural gas as soon as possible as allowed under ISO-NE market rules and without jeopardizing the safety of equipment or operating personnel, or; iii. In the event the Project is operating on natural gas and the pipeline operator curtails the supply or delivery of natural gas. In this situation, the Permittee shall use all

Table 17	
EU	**Special Terms and Conditions**
J4 and J5	commercially reasonable efforts to switch back to firing natural gas as soon as possible as allowed under ISO-NE market rules and without jeopardizing the safety of equipment or operating personnel, or; iv. In the Real-Time market when ISO-NE dispatches the Project at or above the Reserve Constraint Penalty Factor price applicable to either the System reserve requirements or local reserve requirements associated with the load zone in which the Project is located, or; v. In the event there is (1) a failure of any equipment (whether on-site or off-site) required to fire EUs J4 and J5 with natural gas; (2) a physical blockage of the supply pipeline; (3) or other pipeline or natural gas supply condition preventing the delivery of natural gas of appropriate quality and pressure. In this situation, the Permittee shall use all commercially reasonable efforts to switch back to firing natural gas as soon as possible as allowed under ISO-NE market rules and without jeopardizing the safety of equipment or operating personnel, or; vi. During commissioning and start-up testing when EUs J4 and J5 are fired with ULSD, or; vii. For emission testing purposes required by this Plan Approval or required by MassDEP or for testing required by ISO-NE or any other regulatory authority, or; viii. During testing, modification, repair and maintenance if any equipment requires firing with ULSD. The Permittee shall not operate EU J4 and J5 firing ULSD pursuant to Table 17 Conditions 7(a) and 7(b)viii during the Ozone Season[19]**.**
EGD and FP	8. The Permittee shall comply with the applicable requirements in 40 CFR 60 Subpart IIII.

[19] "Ozone season" means the ozone monitoring season for Massachusetts as stated in 40 CFR 58 Appendix D Table D-3.

Table 17

EU	Special Terms and Conditions
Project-wide	9. The Permittee shall design, construct, operate and maintain the Project such that at all times: (a) No condition of air pollution will be caused by emission of sounds as provided in 310 CMR 7.01, (b) No sound emission resulting in noise will occur as provided in 310 CMR 7.10 and MassDEP's Policy DAQC 90-001, and (c) Daytime and nighttime sound emissions from the Project will not exceed the levels in the table below, at the receptors described in the Comprehensive Plan Application for this Plan Approval.

Receptor	Maximum Sound Level (dBA)
1	41
2	42
3	40
3A	43
4	40
5	42
6	33
7	36

	10. The Permittee shall construct and maintain, for the life of the Project, the acoustical controls and noise barrier walls that are included in the Comprehensive Plan Application for this Plan Approval, except as provided in Table 17 Condition 13 below.
	11. The Permittee may forgo the construction of the "L" shaped noise barrier wall in the area of Receptor 3 (5 Summer St.) that is included in the Comprehensive Plan Application for this Plan Approval after demonstrating to MassDEP and receiving MassDEP written approval, that the Permittee has taken ownership of the property in the area of Receptor 3, the property is not used for residential or other noise-sensitive uses and the Facility will comply with 310 CMR 7.10 Noise and the MassDEP Policy DAQC 90-001without constructing the "L" shaped noise barrier wall.
	12. The Permittee shall not operate EUs J4 and J5 between 11:00 PM and 6:00 AM whenever EUs J1T1 through J3T2 are operating unless required solely by ISO-NE to dispatch EUs J1T1 through J3T2 because of a local or regional system contingency (that is, Volt Ampere Reactive Control or transmission reliability) or Security Constrained Unit Commitment.

Table 17	
EU	**Special Terms and Conditions**
Project-wide	13. The Permittee shall not operate EUs J4 and J5 between 6:00 PM and 11:00 PM whenever EUs J1T1 through J3T2 are operating, except: (a) when required solely by ISO-NE to dispatch EUs J1T1 through J3T2 because of a local or regional system contingency (that is, Volt Ampere Reactive Control or transmission reliability) or Security Constrained Unit Commitment, or (b) after demonstrating to MassDEP and receiving MassDEP written approval, that a sound measurement program demonstrated compliance with 310 CMR 7.10 Noise and MassDEP DAQC Policy 90-001 with none or any of the acoustical controls proposed in the Comprehensive Plan Application for this Plan Approval installed on EUs J1T1 through J3T2 and/or their appurtenances.
	14. The Permittee shall properly train all personnel to operate the Project and the control and monitoring equipment in accordance with manufacturer specifications. All persons responsible for the operation of the Project shall sign a statement affirming that they have read and understand the approved SOMP. The Permittee shall give refresher training to Project personnel at least annually.
	15. The Permittee shall minimize fugitive dust emissions during construction of the Project so as not to cause a condition of air pollution, using at least, but not limited to, the following mitigation measures: • water construction areas, access roads, and staging areas as needed, • cover trucks hauling soils and other loose materials, • cover inactive stockpiles of soils and other excavated materials, • pave access roads when possible, and • limit vehicles to 15 miles per hour on unpaved areas.
	16. The Permittee shall determine compliance with the annual CO_2e emission limit in Table 13 of the Plan Approval using the calculation procedures in 40 CFR 98.
	17. The Permittee shall maintain in the control room, at least two (2) portable ammonia detectors for use during an ammonia spill, or other emergency involving ammonia. The Permittee shall maintain the portable ammonia detectors according to manufacturer's recommendations.
	18. The Permittee shall continue to operate the emission control system during periods of CEMS data unavailability.
	19. The Permittee shall only accept delivery of ULSD with a sulfur content no greater than 0.0015 percent by weight.
	20. The Permittee shall comply with all provisions of 40 CFR 72 and 75, 40 CFR 60, 40 CFR 63, 40 CFR 64, 40 CFR 68, 40 CFR Part 98, and 310 CMR 6.00 through 8.00 that are applicable to this Project.
	21. The Permittee shall comply with the requirements of 310 CMR 7.72 Reducing Sulfur Hexafluoride Emissions from Gas-insulated Switchgear.

Table 17

EU	Special Terms and Conditions
Project-wide	22. All requirements of this Plan Approval that apply to the Permittee shall apply to all subsequent owners and/or operators of the Project.
	23. GHG Reductions: To ensure that the Project will not cause or contribute to a condition of air pollution, and will help the Commonwealth achieve the mandated limits to reduce GHG emissions by 25% from the 1990 emission levels by the year 2020 and by 80% from the 1990 emission level by the year 2050, as required under the GWSA and the Supreme Judicial Court decision in Kain v. DEP, MassDEP is including the following declining annual CO2e emission limits on the Project. MassDEP is also including conditions that will ensure that Exelon demonstrates compliance with the actual CO2e cap for each calendar year. The Permittee shall ensure that the annual emissions of CO_{2e} from the Project at the date of commencement of commercial operation of the Project shall not exceed 505,000 tons per year[20] ("tpy"), and, thereafter, the CO_{2e} Cap shall be reduced by 2.5% from the preceding year. Starting in 2025, the Cap shall not exceed 377,000 tpy[21] and thereafter shall be reduced 2.5% from the preceding year.

Year	CO_{2e} Cap (tpy)	Year	CO_{2e} Cap (tpy)	Year	CO_{2e} Cap (tpy)
		2028	349,426	2040	257,876
		2029	340,690	2041	251,429
2018	505,000	2030	332,173	2042	245,143
2019	492,375	2031	323,869	2043	239,015
2020	480,066	2032	315,772	2044	233,039
2021	468,064	2033	307,878	2045	227,213
2022	456,362	2034	300,181	2046	221,533
2023	444,953	2035	292,676	2047	215,995
2024	433,829	2036	285,389	2048	210,595
2025	377,000	2037	278,225	2049	205,330
2026	367,575	2038	271,270	2050	200,197

[20] 505,000 tpy is equivalent to approximately a 43 percent capacity factor.
[21] 377,000 tpy is equivalent to approximately a 33 percent capacity factor.

Table 17	
EU	**Special Terms and Conditions**
Project-wide	24. Compliance: The Permittee shall demonstrate compliance in achieving the CO_{2e} Cap in each calendar year by: (a) Controlling operations at the Project to limit Actual CO_{2e} Emissions to a level at or below the applicable year's CO_{2e} Cap, or (b) In the event that the emissions units are required to operate in order to meet the Project's obligation to ISO-New England and to ensure a reliable supply of electricity in the Commonwealth, and the resulting Actual CO_{2e} Emissions exceed the applicable CO_{2e} Cap, the owner or operator of the Project may demonstrate compliance by retiring credits, as set forth in item 25 below, to offset the amount by which the Actual CO_{2e} Emissions exceed the CO_{2e} Cap. Provided however that the Project shall not operate at greater than a 43% capacity factor over a rolling 36-month average
	25. Over Compliance Credits: For purposes of demonstrating compliance with the CO_{2e} Cap, the owner or operator may use over compliance credits which may be created as follows. In any calendar year in which the Project's actual annual project-wide emissions of CO_{2e} are less than the Project's CO_{2e} Cap, the difference (in tpy) between Actual CO_{2e} Emissions and the CO_{2e} Cap for such calendar year shall be deemed over compliance credits generated at the following rates: (a) For CO_{2e} Over Compliance Credits created from 2018-2021: Offset = 90% (b) For CO_{2e} Over Compliance Credits created from 2022-2026: Offset = 80% (c) For CO_{2e} Over Compliance Credits created from 2027-2031: Offset = 70% (d) For CO_{2e} Over Compliance Credits created from 2032-2036: Offset = 60% (e) For CO_{2e} Over Compliance Credits created from 2037-2046: Offset = 50% (f) CO_{2e} Over Compliance Credits may not be created after 2046
	26. The schedule of annual emissions of CO_{2e} established by this Plan Approval, and related compliance requirements, shall be modified after the promulgation of any final MassDEP regulation establishing declining annual greenhouse gas emissions caps applicable to the Project under the authority of section 3(d) of Chapter 21N of the Massachusetts Global Warming Solutions Act and Executive Order 569 to ensure that the goals of that statute are met to reduce greenhouse gas emissions in the Commonwealth by 25% from 1990 level emissions by the year 2020. The process for such modification shall be specified in the final rule or any amendments thereto as may be promulgated from time to time.

Table 17 Key:

CO_{2e} = Carbon dioxide equivalents
CFR = Code of Federal Regulations
CMR = Code of Massachusetts Regulations
CEMS = Continuous Emission Monitors
COMS = Continuous Opacity Monitors
dBA = Decibel A weighted

EU = Emission Unit
ISO-NE = ISO New England
MMBtu = Million British thermal units
% = Percent
SOMP = Standard Operating and Maintenance Procedures
SCR = Selective Catalytic Reduction
tpy = tons per year
ULSD = Ultra Low Sulfur Diesel

B. The Permittee shall install and use an exhaust stack, as required in Table 18 below, on each of the Emission Units that is consistent with good air pollution control engineering practice and that discharges so as to not cause or contribute to a condition of air pollution. The Permittee shall configure each exhaust stack to discharge the gases vertically and shall not equip exhaust stacks with any part or device that restricts the vertical exhaust flow of the emitted gases, including, but not limited to, rain protection devices known as "shanty caps" and "egg beaters."

C. The Permittee shall install and utilize exhaust stacks with the following parameters, as contained in Table 18 below, for the Emission Units regulated by this Plan Approval:

Table 18

Stacks

EU	Stack Height Above Ground (feet)	Stack Inside Exit Dimensions (feet)	Stack Gas Exit Velocity Range (feet per second)	Stack Gas Exit Temperature Range (°F)
J4	160	13.0	57-123	757-932
J5	160	13.0	57-123	757-932
EDG	65	0.667	approximately 189	approximately 917
FP	17	0.5	approximately 84.5	approximately 966

Table 18 Key:

°F = degrees Fahrenheit
EU = Emission Unit

14. MEPA Section 61 Conditions

The Permittee shall comply with the following findings made under Chapter 30 Section 61 of the Massachusetts Environmental Policy Act:

Air Quality:

1. Use state-of-the-art emission control techniques to minimize and mitigate air emissions;

2. Minimize emissions through good combustion control, and use of an oxidation catalyst;
3. Use GE LMS100 CTG (most efficient simple-cycle technology available, burning less fuel per MWH than any peaking turbine in its size range currently on the market;
4. Use Low-NOx burners with water injection (process modification);
5. Install SCR as an add-on control for NOx (pollution control technology that injects anhydrous or aqueous ammonia into the flue gas over a catalyst at a relatively low temperature to form water and nitrogen);
6. Minimize emissions by using the cleanest available fuels (natural gas and ULSD);
7. Control NOx emissions to a stack concentration of 2.5 ppmvd (corrected to 15 percent oxygen) with natural gas firing and 5.0 ppm with ULSD firing;
8. Control CO emissions to 5.0 ppm with natural gas firing and 5.0 ppm with ULSD firing;
9. Control NH_3 emissions to 5.0 ppm with natural gas firing and 5.0 ppm with ULSD firing;
10. Control VOC emissions to 2.5 ppm (natural gas firing) and 4.5 ppm with ULSD firing;
11. Control PM emissions to 0.018 pounds per million BTU (lb/MMBtu) with natural gas firing and 0.032 lb/MMBtu with ULSD firing; and
12. Control SO_2 emissions to 0.026 lb/MMBtu with natural gas firing and 0.0016 lb/MMBtu with ULSD firing.

GHG Emissions:

13. Purchase CO_2 offsets – one RGGI allowance for each ton of CO_2 emitted (between $2 million and $4 million per year);
14. Use highly efficient GE LMS100 CTG, natural gas compressor and GSU transformer;
15. Review options with GE to use hot gas recirculation for aqueous ammonia vaporization in the SCR systems, and implementation if technically and economically feasible;
16. At a minimum, construct the administration building roof as solar-ready, enabling retrofit of PV in the future, and review feasibility on a periodic schedule;
17. Review of solar PV array on administration building roof to offset 24.5 tpy GHG emissions, and implementation if technically and economically feasible;
18. Design administrative building envelope to meet or exceed the Building Code, obtaining an approximate nine percent improvement in energy efficiency in the heating season;
19. Use propane or LP gas, combined with an efficient condensing furnace, for building heat, or Cold-Climate Air-Source Heat Pumps and condensers for heating and air conditioning;
20. Use switchable LED-based lighting fixtures for interior and exterior lighting (approximately 30 percent improvement above Code);
21. Use Energy Star-rated appliances;

22. Consult with the Town of Medway regarding options and feasibility of municipal-scale renewable energy projects;
23. Contribute at least $20,000 per year over the life of the project to the Town of Medway dedicated to the development of an energy conservation awareness program;
24. Prohibit use of natural gas or any other non-inert GHG in any blow-out cleaning of the Project piping (comply with NFPA 56 standards); and
25. Regular verification of the absence of leaks in natural gas piping and SF_6-insulated circuit breakers (procured with maximum leakage guarantees and means for on-line monitoring).
26. Declining Annual CO_{2e} Emissions Caps on the Project and conditions to demonstrate compliance with the actual CO_{2e} cap for each calendar year.

Noise:

27. Purchase every noise control enhancement available from GE at a cost of approximately $6 million including:

(a) GE Low Noise Configuration – Single-entry, louvered combustion air inlets with filters and lagging; Turbine and generator acoustical enclosures; Close-fitting noise barrier walls around turbine & generator enclosures; Turbine roof skid barriers; Turbine vent fan silencers; Acoustic enclosures for VBV stack, water skid, and intercooler pipes; and Lube oil sump pump barriers.

(b) Combustion Exhaust Noise Control – Stack silencers; CO/SCR catalyst insertion losses; Breech base duct bend insertion losses; and Perforated exhaust stacks; and

28. Spend $10 million for additional noise mitigations which includes: Ultra Low Noise Air Cooled Heat Exchanger Fans; Low Noise Transformers Gas Compressor Enclosure; Gas Compressor Yard Noise Barrier Wall (25-ft tall); Power Block Noise Barrier Wall (55-ft tall) ($8 million); and, L-shaped Property-Line Noise Barrier Wall near 5 Summer Street (20-ft tall).

Construction:

29. Heavy construction equipment will be fitted with the best available after-engine emission control technology, such as diesel particulate filters (DPFs) or diesel oxidation catalysts (DOCs), in accordance with the MassDEP Clean Air Construction Initiative (CACI);
30. Encourage contractors to use construction equipment that meets EPA Tier 4 emission standards;
31. Minimize fugitive dust emissions;
32. Implement construction noise mitigation measures including appropriate mufflers on all equipment, maintenance of mufflers, muffling enclosures on continuously running equipment, replacing specific construction operations and techniques with less noisy

ones, where feasible, selecting the quietest equipment alternatives, where feasible; and scheduling the noisiest construction activities during daylight hours; and

33. Comply with MassDEP Idling Regulations and use ULSD.

15. General Conditions

The Permittee is subject to, and shall comply with, the following general conditions:

A. Pursuant to 310 CMR 7.01, 7.02, 7.09 and 7.10, should any nuisance condition(s), including but not limited to smoke, dust, odor or noise, occur as the result of the operation of the Project, then the Permittee shall immediately take appropriate steps including shutdown, if necessary, to abate said nuisance condition(s).

B. If asbestos remediation/removal will occur as a result of the approved construction, reconstruction, or alteration of this Project, the Permittee shall ensure that all removal/remediation of asbestos shall be done in accordance with 310 CMR 7.15 in its entirety and 310 CMR 4.00.

C. If construction or demolition of an industrial, commercial or institutional building will occur as a result of the approved construction, reconstruction, or alteration of this Project, the Permittee shall ensure that said construction or demolition shall be done in accordance with 310 CMR 7.09(2) and 310 CMR 4.00.

D. Pursuant to 310 CMR 7.01(2)(b) and 7.02(7)(b), the Permittee shall allow MassDEP and / or EPA personnel access to the Project, buildings, and all pertinent records for the purpose of making inspections and surveys, collecting samples, obtaining data, and reviewing records.

E. This Plan Approval does not negate the responsibility of the Permittee to comply with any other applicable Federal, State, or local laws or regulations now or in the future.

F. The Application is incorporated into this Plan Approval by reference. Should there be any differences between the Application and this Plan Approval, the Plan Approval shall govern.

G. Pursuant to 310 CMR 7.02(3)(k), MassDEP may revoke this Plan Approval if the construction work is not commenced within two years from the date of issuance of this Plan Approval, or if the construction work is suspended for one year or more.

H. This Plan Approval may be suspended, modified, or revoked by MassDEP if MassDEP determines that any condition or part of this Plan Approval is being violated.

I. This Plan Approval may be modified or amended when in the opinion of MassDEP such is necessary or appropriate to clarify the Plan Approval conditions or after consideration of a written request by the Permittee to amend the Plan Approval conditions.

J. Pursuant to 310 CMR 7.01(3) and 7.02(3)(f), the Permittee shall comply with all conditions contained in this Plan Approval. Should there be any differences between provisions contained in the General Conditions and provisions contained elsewhere in the Plan Approval, the latter shall govern.

16. Appeal Process

This Plan Approval is an action of MassDEP. If you are aggrieved by this action, you may request an adjudicatory hearing. A request for a hearing must be made in writing and postmarked within twenty-one (21) days of the date of issuance of this Plan Approval.

Under 310 CMR 1.01(6)(b), the request must state clearly and concisely the facts, which are the grounds for the request, and the relief sought. Additionally, the request must state why the Plan Approval is not consistent with applicable laws and regulations.

The hearing request along with a valid check payable to the Commonwealth of Massachusetts in the amount of one hundred dollars ($100.00) and a completed Adjudicatory Hearing Fee Transmittal Form, a copy of which is attached hereto, must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211

This request will be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below. The filing fee is not required if the appellant is a city or town (or municipal agency), county, or district of the Commonwealth of Massachusetts, or a municipal housing authority.

MassDEP may waive the adjudicatory hearing filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request as provided above, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Enclosed is a stamped approved copy of the application submittal.

Should you have any questions concerning this Plan Approval, please contact MassDEP, Central Regional Office, Bureau of Air and Waste by telephone at 508-767-2845, or in writing at the letterhead address.

This final document copy is being provided to you electronically by the Department of Environmental Protection. A signed copy of this document is on file at the DEP office listed on the letterhead.

Roseanna E. Stanley
Permit Chief
Bureau of Air and Waste

Enclosures:

- Adjudicatory Hearing Fee Transmittal Form
- Stamped Comprehensive Plan Application

ecc: Medway Board of Health
Medway Fire Department
MassDEP/Boston - Yi Tian
MassDEP/CERO – Kim McCoy
AJ Jablonowski, Epsilon Associates, Inc.