ESS Group, Inc.

Engineers
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March 10, 2010

Mr. Donald Dahl
Air Permits, Toxic and Indoor Air Program Unit
US Environmental Protection Agency
One Congress Street – Suit 1100
Boston, MA 02203

Re: Pioneer Valley Energy Center, Westfield, Massachusetts
Prevention of Significant Deterioration Air Permit Application
Supplemental Information
ESS Project Number E402-007.01

Dear Mr. Dahl:

On behalf of Pioneer Valley Energy Center, LLC., ESS Group Inc (ESS) is providing the following supplemental information to the above referenced application in response to your recent questions and comments.

ENVIRONMENTAL JUSTICE

ESS performed an environmental justice assessment using the policy guidance and framework of the "Toolkit for Assessing Potential Allegations of Environmental Injustice" published by the US EPA. Consistent with EPA methods and procedures, several communities in the vicinity of the proposed Project were identified for the environmental justice assessment. These Affected Areas or Areas-of-Concern communities met the following criteria:

- The community's minority population percentage is above the statewide minority population percentage. As a percent of the total population, the statewide minority population is 15.5%; or
- The community's percentage of population below the poverty level exceeds the statewide average population percentage below the poverty level. As a percent of the total population, approximately 6.7% of the total population lives below the poverty level in the Commonwealth of Massachusetts.

Figures 1 and 2 (attached) show the predicted 24-hour and annual ambient air quality impacts of fine particulate emissions from the proposed project as isopleths around the site boundary. As shown in the figures, there are several Affected Areas or Areas-of-Concern located within 3 km of the Project site. The modeled 24-hour average air quality concentration of particulates is predicted to approach 0.9 $\mu g/m^3$ to the southeast of the Site along the northern boundary of one affected community. In comparison, the highest 24-hour concentration at the closest Affected Area or Area of Concern to the northeast of the Site is not expected to exceed 0.78 $\mu g/m^3$. Although these specific impacts are for particulate emissions, air quality impacts of other emissions will follow the same trends.

These figures graphically demonstrate that the maximum predicted air quality impacts (both 24-hr and Annual) from the proposed facility will not create disproportionate adverse impacts in any Affected Areas or Areas-of-Concern within the 3 km buffer zone.

BACT for Limited Use of Fuel Oil

In order to support the proposed use of ultra low sulfur distillate (ULSD) fuel oil for the equivalent of 1,440 hours per year as part of the Best Available Control Technology (BACT) analysis for the facility, an incremental cost and emissions analysis was performed. The objective of this analysis was to determine the cost-effectiveness of securing a firm natural gas supply versus the proposed intermittent natural gas supply (with 60 day ULSD firing as back-up) for the Project. The natural gas cost data used in the analysis was from the currently-effective Tennessee gas pipeline rates.

The cost differential to secure a firm natural gas contract is significant based on several factors. The most critical factors are the reservation charges required to guarantee firm transportation of the gas to the site. These charges are added to accommodate the "long-haul" transportation from areas of the country where the natural gas is most available (primarily the gulf region of the southern United States). The second major issue is the physical availability of firm gas and the need to establish "liquidated damages" in the event that the gas supply is curtailed for any reason. For example, if the gas supplier did not deliver, the Project's only recourse in the contract is being reimbursed for its replacement cost of gas. This can present quite a problem in the case of an electrical power generator. If the Project is unable to replace the gas and is required to shut down, there would be no ability to re-coup the penalties or other financial losses associated with the failure to meet the requirements in energy and capacity sale obligations to counterparties, including the NE-ISO.

Based on this information, the added cost to secure a firm natural gas contract is approximately $13,900,000 annually. Table 1 (attached) presents the cost effectivenss of firm gas versus the proposed intermittent gas supply contract with regard to the potential reductions in emissions of each criteria pollutant. The cost effectiveness ratio is in the range of $850,000 to $1,300,000 per ton for the selected criteria pollutants and is well in excess of levels deemed for prior projects. Therefore, securing a firm natural gas contract is not cost effective, and can be eliminated as a BACT option for the Project.

Carbon Dioxide (CO_2) Emissions Controls

The proposed project will utilize clean burning natural gas as the primary fuel with ULSD as back-up (equivalent fuel use of up to 1,440 hours annually). The gas turbine proposed for this project (Mitsubishi M501G) is one the most efficient turbines in its class with a gross heat rate as low as 5,846 Btu/kWH at 100% load. A comparison of the Project's average annual CO_2 emission rate while firing natural gas to the latest ISO-New England Marginal Emission Rate is presented in the table below.

CO_2 Emission Rate	New England Marginal Emission Rate (ISO-NE 2007)	Pioneer Valley Energy Center
Lb/MWh	1004	759

A comparison was also made (below) of the CO_2 emission rate for PVEC versus other turbine models proposed for a similar combined cycle plant. The data shows that the MHI501G based turbine project has the lowest lb/MWh CO_2 emission rate of comparable turbines.

	MHI 501G (PVEC)	GE 7FA	Siemens 5000F	MHI 510F
CO2 (lb/hr)	293,700	212,818	237,598	225,606
Gross Output (MW)	387	274	309	292
CO2 Emissions (lb/MWh)	759	777	769	773

Another factor in the reduction of CO_2 emissions is the use of wet cooling over other cooling methods to increase the efficiency of the project. The use of a mechanical draft wet cooling tower is a far more effective means of reducing the steam pressure in the condenser than an air cooled condenser. This increase in efficiency results in a reduction of nearly 51 MMBtu/hr of additional heat input or an additional 51,000 ft^3/hr of natural gas from a water-cooled facility compared to air cooled to produce the same amount of power.

This reduction in fuel use represents approximately 2% of the total fuel use required for the turbine at full load. Because the emissions of pollutants are proportional to the fuel use and heat input rates, the use of a mechanical draft wet cooling tower will result in proportionally less CO_2 emissions from the steam turbine generator, for the same power output. This gain in efficiency and reduction in fuel usage and emissions is expected over the full operating range of the turbine, and under all meteorological conditions as it is driven largely by the parasitic loads of the larger fans and pumps associated with dry cooling technology. Significant reductions in regional air emissions (including CO_2) will be facilitated by the Project's use of wet cooling technology.

The use of the efficient MHI 501G combustion turbine and wet cooling technology for the Project will result in the highest level of CO_2 emissions control available for a project of this type.

1-Hour NO_2

EPA finalized the previously proposed 1-hour NO_2 NAAQS on January 22, 2010. The standard is 100 ppb, based on the 3-year average of the 98th percentile impacts (the highest 7th high). ESS has reviewed the available 1-hour NO_2 monitoring data available on the AIRS website for 2005-2008 for the area surrounding the Project. Using the data from the monitoring station at the Anderson Air Force Base in Chicopee, it was determined that a conservative value for

the Project 1-hour background concentration would be 48 ppb (90.6 µg/m^3). The maximum predicted Project 1-hour NO_2 impacts during normal operation, when combined with a conservative estimate of the existing background concentration, will not cause an exceedance of the recently promulgated NAAQS for 1-hour NO_2 (100 ppb or 188.7 µg/m^3).

We trust that the above information is a complete response to your questions and comments. Please feel free to contact me by phone at (781) 489-1146 or via e-mail at dfrecker@essgroup.com if there are any other questions.

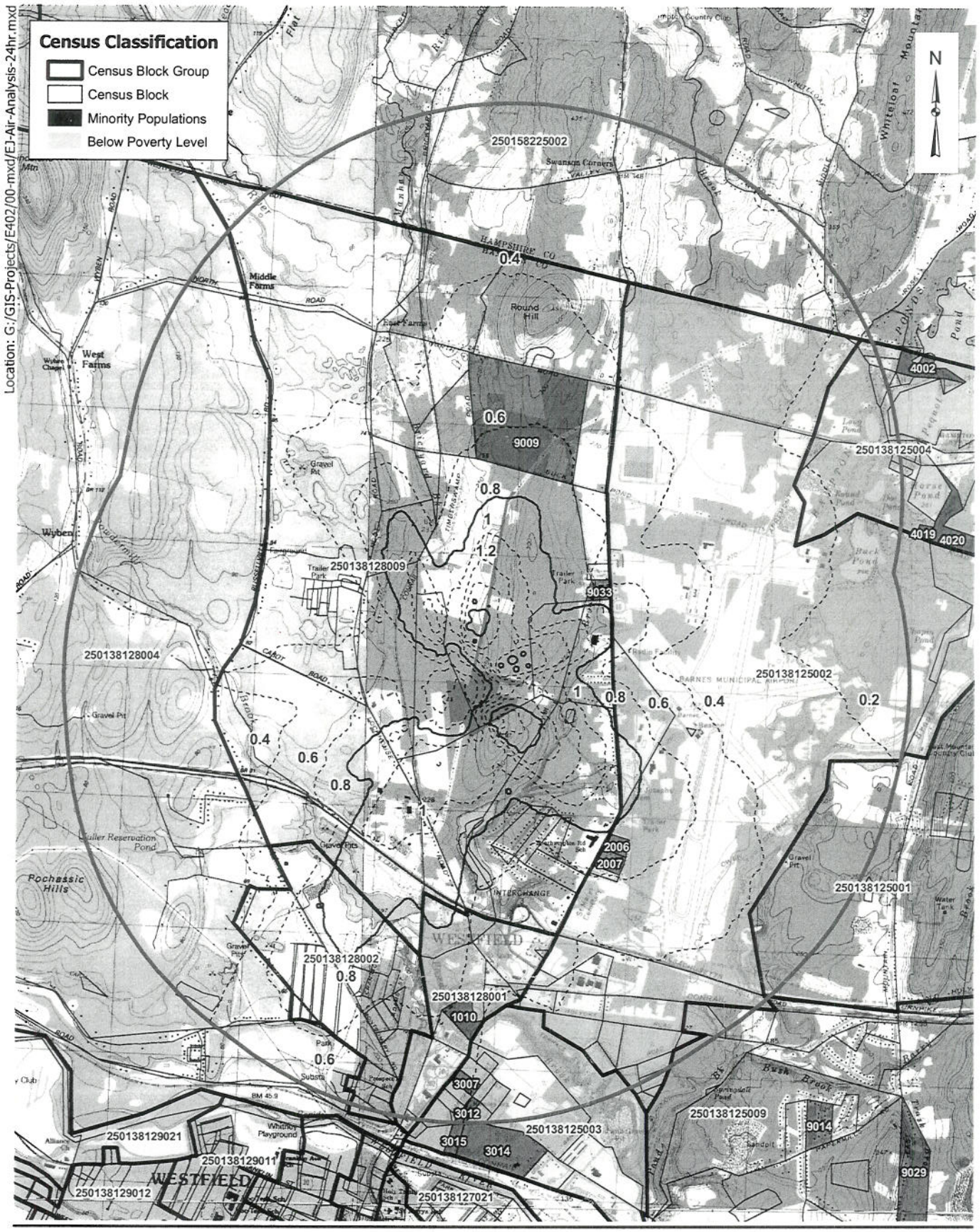
Sincerely,

ESS GROUP, INC.

Dammon Frecker
Vice President, Energy & Industrial Services

Attachments: Table 1
Figures 1 & 2

C: Matthew Palmer, PVEC
Jack Arruda, PVEC



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EMI WESTFIELD
Westfield, Massachusetts

Scale: 1" = 3,500'

Source: 1) MassGIS, USGS DRG, 1987
2) ESS, Contours 24hr, 2008

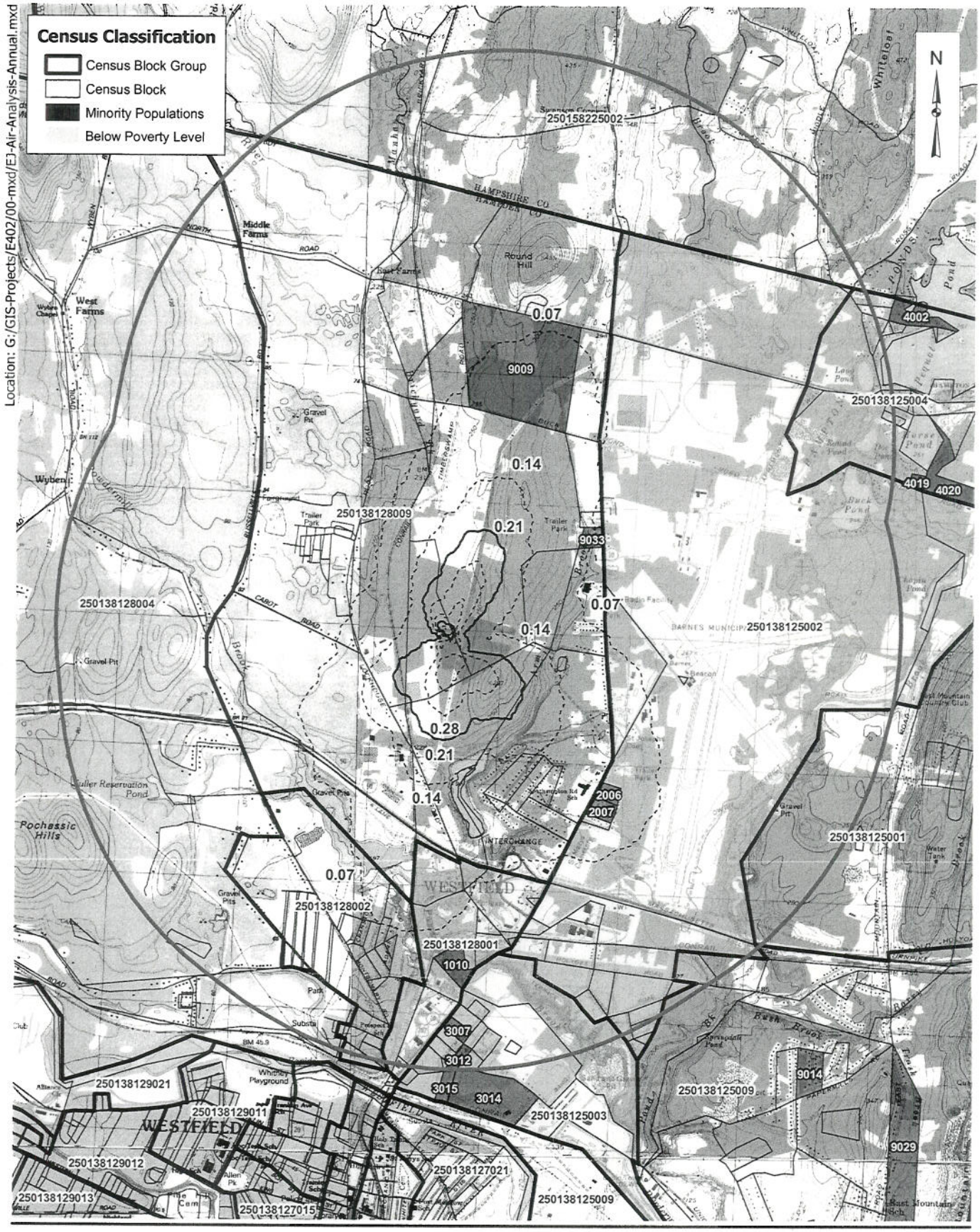
Legend

- 3km Buffer from Site
- 0.2 µg/m³ Contour Interval
- 0.8 µg/m³ Contour Interval
- Site Boundary

Values shown are the modeled $PM_{2.5}/PM_{10}$ ambient air impacts in µg/m³ from the PVEC Facility during normal operation.

EFSB-A-13
Isopleth Contours of 24 Hour Concentrations

Figure 1



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EMI WESTFIELD
Westfield, Massachusetts

Scale: 1" = 3,500'

Source: 1) MassGIS, USGS DRG, 1987
2) ESS, Contours 24hr, 2008

Legend

- 3km Buffer from Site
- 0.07 µg/m³ Contour Interval
- 0.21 µg/m³ Contour Interval
- Site Boundary

Values shown are the modeled $PM_{2.5}/PM_{10}$ ambient air impacts in µg/m³ from the PVEC Facility during normal operation.

EFSB-A-13
Isopleth Contours of Annual Concentrations

Figure 2

Table 1
Pioneer Valley Energy Center
Cost Effectiveness - Firm Natural Gas versus 60-day Interruptible

	Pollutant (lb/hr)					
PSD Pollutants	Natural Gas	Oil Firing	Differential (Increase due to Oil Firing) (lb/hr)	Differential Based on 1440 Hours (tons)	Annual Premium for Firm Gas ($)	Cost Effectiveness ($/ton)
NO_x	20.2	43	22.8	16.4	13,933,560	848,779
CO	12.3	31.5	19.2	13.8	13,933,560	1,007,925
SO_2	4.7	3.4	-1.3	-0.9	13,933,560	N/A
$PM_{10/2.5}$	9.8	26.8	17	12.2	13,933,560	1,138,363
VOC	3.6	18	14.4	10.4	13,933,560	1,343,900