



FUSS & O'NEILL

June 17, 2016

Mr. Michael Wood
Town Manager
Town of Burrillville
100 Main Street
Harrisville, RI 02930

RE: Clear River Energy Center Air Quality Application Review

Dear Mr. Wood:

At your request, Fuss & O'Neill, Inc. has provided a review of the documents submitted to the Rhode Island Department of Environmental Management (RIDEM) and additional information provided to the Rhode Island Energy Facilities Siting Board (EFSB) related to air quality.

Air Quality Permitting Summary

Invenergy submitted an air quality Major Source Permit Application for a Combined-Cycle Electric Generating Facility to RIDEM Office of Air Resources on June 26, 2015. The submittal did not include the Air Dispersion Modeling Report or Health Risk Assessment Report, both of which are needed for RIDEM to start their preliminary review to determine whether the application is administratively complete and start their technical review. Invenergy submitted the Air Dispersion Modeling Report for the project to RIDEM on October 30, 2015, and the Health Risk Assessment Report on January 27, 2016. We received notice on April 28, 2016 that RIDEM had sent a letter to Invenergy stating the application had been deemed administratively complete. The application was deemed administratively complete by RIDEM on or about April 26, 2016.

In addition, Invenergy has provided additional information to the RI EFSB related to air quality in response to Data Requests submitted by Interested Parties. The Town of Burrillville's Data Request #7 addressed air quality issues with forty-two questions related to the permit application in general, as well as specific questions regarding the Air Dispersion Modeling Report, Health Risk Protocol, and Health Risk Assessment Report. Additional air quality questions were included in other data requests by the Town, include Data Request Nos. 4 and 6.

Ambient Air Quality - Existing Conditions

The Clean Air Act, which was last amended in 1990, requires EPA to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The Clean Air Act identifies two types of national ambient air quality standards. Primary standards provide public health protection, including protecting the health of "sensitive"

317 Iron Horse Way
Suite 204
Providence, RI
02908
t 401.861.3070
800.286.2469
f 401.861.3076

www.fando.com

Connecticut
Massachusetts
Rhode Island
South Carolina

Mr. Michael Wood
June 17, 2016
Page 2 of 6

populations such as asthmatics, children, and the elderly. Secondary standards provide public welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings.

The EPA has set National Ambient Air Quality Standards for six principal pollutants, which are called "criteria" air pollutants. Periodically, the standards are reviewed and may be revised. The six principal pollutants are:

- Carbon Monoxide (CO)
- Lead (Pb)
- Nitrogen Dioxide (NO₂)
- Ozone (O₃)
- Particle Matter (PM) less than 2.5-microns - PM_{2.5}
- Particle Matter (PM) less than 10-microns - PM₁₀
- Sulfur Dioxide (SO₂)

At present, the Burrillville area is in attainment with National Ambient Air Quality Standards (NAAQS) established by the US EPA for all criteria.

Ambient Air Quality - Future Conditions

The predicted impact of the project on current ambient air quality conditions have been estimated by Invenenergy using an air quality dispersion model. The AERMOD model used by Invenenergy is the EPA-approved model for estimating pollutant concentration values at discrete off-site locations resulting from one or more stationary sources of air emissions. Estimated emissions from the facility during operation are entered into the model, including exhaust stack design data, site structures, and area topography. The model is then executed using 5 years of actual meteorological data for each pollutant during various future operational. Results are combined with background concentrations established by RIDEM and compared to the federal standards.

The modeling completed by Invenenergy and submitted to RIDEM demonstrated that the maximum predicted impacts for the proposed facility will not cause or contribute to air pollution in violation of the NAAQS for any of the scenarios considered.

According to Rhode Island Air Pollution Control Regulation No. 9 "Air Pollution Control Permits", the owner or operator shall provide an analysis of the impairment to visibility, soils, and vegetation that would occur as a result of the source or modification and general commercial, residential, industrial and other growth associated with the source or modification. The sole criterion for determining if an application is approvable with regard to impairment to visibility and soils shall be compliance with applicable provisions of Subsection 9.5.2(d). The sole criteria for

Mr. Michael Wood
June 17, 2016
Page 3 of 6

determining if an application is approvable with regard to impairment to vegetation shall be compliance with all secondary national ambient air quality standards under Subsection 9.5.2(b)(1)a. and compliance with the applicable provisions of Subsection 9.5.2(d).

The same air quality model used to predict off-site concentrations of NAAQS pollutants was used for air toxics. The air quality model results submitted with the to RIDEM in support of its air quality application demonstrated that the maximum predicted impacts due to the proposed project are below acceptable ambient levels set in Rhode Island Air Pollution Control Regulation No. 22 "Air Toxics".

General Air Comments

In general, the reports contain numerous instances of conflicting information, not just between the three reports (which is to be expected, since the submittal timeframe spanned almost seven months), but also within the same report.

For example, all of the location data (coordinates) for on-site buildings and stack locations presented in Table 3 Modeling Input Parameters was different from the location data contained within the model files. When asked about the discrepancy (see Town Data Request 7-24), Invenergy responded that Table 3 "was not updated to reflect" the most recent information used in the model. Typically, when an applicant acknowledges an error affecting an entire table, a copy of an updated/corrected table is provided. No updated table was provided with Response 7-24.

When it was noted that the property line displayed on Figures 2,4, and 5 of the Air Modeling Report was not consistent with the model's receptor locations (see Town Data Request 7-22), Invenergy noted that the proposed property line has changed once again since the model was completed. The response indicated that changes to the property line would not impact the air modeling results, since the receptors with the highest concentration values presented in the modeling summary tables were located beyond both the original and revised facility property lines. It is difficult to verify this claim, since the location data for the highest pollutant concentration value receptor are not contained within the table.

Typically, when an applicant acknowledges a change to a modeling parameter, such as stack location or property line, the model input files are updated and a copy provided to the permitting agency along with a copy of the model output files demonstrating compliance is maintained with the change. No updated model files were provided with Response 7-22.

Most regulatory standards for off-site receptor locations are based on the location of a facility's property line, while some are based upon the facility's fence line. When asked to provide a legal description of both the property line and fence line (see Town Data Request 7-1), Invenergy

Mr. Michael Wood
June 17, 2016
Page 4 of 6

responded by providing a copy of the current Site Arrangement for the facility. The figure indicated the location of the proposed Property Line, but no reference to the proposed Fence Line could be found on the figure or in the response text. In addition, Invenergy did not provide a legal description for either the Property Line or the Fence Line as part of the response.

When asked to clarify whether the model's discrete boundary receptors represented the Property Line or the Fence Line (see Town Data Request 7-22), Invenergy did not provide the requested clarification. Instead the response indicated the property line has changed without any mention of the Fence Line.

For emission rates not based on US EPA AP-42, Invenergy was asked to provide a copy of the emission factor reference source/document (see Town Data Request 7-7). The response to 7-7 only included a copy of the reference document used to estimate metals from combustion of ULSD in the combustion turbines. No documentation of the source used to calculate emissions from the combustion turbines for criteria pollutants, ammonia, sulfuric acid, and formaldehyde was provided. The response indicates that these values "were provided by the equipment manufacturer."

Typically, an applicant will provide a copy of Equipment Data Sheet, Emission Test Report, and/or correspondence with the manufacturer to document the basis for emissions. Without this documentation, it is difficult to verify that emission rates have been appropriately selected for the proposed operating conditions.

When asked to clarify the discrepancy between the 6.1-lb/year Acrolein emission rate listed on Table 2 and the 35-lb/year shown on Table A-2 (see Town Data Request 7-13), Invenergy responded that Table A-2 was correct. Similar to the response concerning the errors found in Table 3, the response did not include an updated Table 2.

In developing the questions for the Town to submit as Data Request #7, we did not include all errors identified in the three reports, rather we identified errors believed to be representative of the types of issues uncovered during our review. We anticipated our questions to cause Invenergy to reexamine the content of each report and correct the information submitted to RIDEM by providing updated report text, tables, figures, etc. For example, we did not include any questions regarding the following items located in the reports, since we were confident that they were plainly errors and would easily be identified by Invenergy as such during their review.:

- In Table A-2, the Benzene emission factor for combustion turbine ULSD is listed as 1.2E-05-lb/MMBtu which is the same as for natural gas instead of the 5.50E-05-lb/MMBtu listed in AP-42.

Mr. Michael Wood
June 17, 2016
Page 5 of 6

- In Table 16 and Table A-2 the hourly emission rate of Sulfuric Acid at 3.69-lb/hr for the combustion turbines on natural gas which considers only a single turbine, rather than the correct 7.46-lb/hr emission rate that considers both turbines.
- In Table 16 and Table A-2 The hourly emission rate of Sulfuric Acid for the combustion turbines on ULSD only considered one turbine, rather than two.
- In Table 16 and Table A-2 The hourly emission rate of Ammonia for the combustion turbines on both natural gas and ULSD only considered one turbine, rather than two.

Finally, we didn't include anything in our questions regarding errors found within the model input files themselves, since we thought that such obvious mistakes would be identified during updates to the model related to changes in the property line and/or fence line receptor locations. Some of the model input file errors identified include:

- For the 5-year average NO₂ Start-Up Shut-Down model scenario, the location for the ACS8 emission source is located almost 2-miles away from its actual location, almost 3,000-meters south of the Algonquin Compressor Station.
- For the five single year CO Start-Up Shut-Down model scenarios, the location for the ACSGH1 emission source is located almost 40-miles west of its actual location, 60-kilometers west of Algonquin Compressor Station.

Health Risk Assessment Report

While the Health Risk Assessment Report indicates the project will conform and comply with all relevant standards, we find it difficult to verify the report's conclusions based on the issues we've identified within the reports in the absence of updated data/tables/figures/model files to correct the errors located to-date. While none of the issues appear to be significant enough on their own to necessarily change the compliance demonstration from pass to fail, we are simply not in a position to confirm that assumption since we are unable to evaluate the situation when all of the errors have been adequately addresses and presented in a consistent manner.

MTBE

Assuming the proposed treatment system for Well 3A performs as-designed and removes all MTBE from the groundwater, we don't anticipate any MTBE air emissions. The treatment system consists of two granular activated carbon (GAC) units in series to remove MTBE and other pollutants from the groundwater. The estimated pollutant loading at the proposed pumping rate (700-gallons per hour) has not been verified through the use of pump tests. Should breakthrough occur, we asked about the expected fraction of MTBE that would be expected to volatilize and what fraction would be expected to go to the Burrillville sewer (see Town Data Request 10-1). Unfortunately, the response from Invenenergy did not contain any information related to the



Mr. Michael Wood
June 17, 2016
Page 6 of 6

estimated fraction of MTBE expected to volatilize versus the estimated fraction expected to be discharged to the sewer.

Carbon Credits

The Regional Greenhouse Gas Initiative (RGGI) is a collaboration of nine NE states that set a CO₂ budget for each state. There is a quarterly auction where entities bid on allowances. The money goes to the States and is used for energy efficiency projects. See: <http://www.dem.ri.gov/rggi/>

The carbon credits that will be purchased by Invenergy could be produced in any of the nine member states. Generally, CO₂ emissions are not a local issue but rather a global issue.

Please let me know if you have questions or comments regarding our review to date.

Sincerely,

Eric P. Epner, PE
Vice President