



MEMORANDUM

DATE: October 2, 2018

TO: Sol Ucciani, Vanguard Renewables
20 Walnut Street
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FROM: John Hinckley, QEP

RE: Air Quality Evaluation of the Salisbury AD1 Project
Goodrich Farm
615 Shard Villa Road
Salisbury, Vermont

PROJECT NO: 8848-000

INTRODUCTION

Salisbury AD 1, LLC (“Salisbury AD 1”) proposes to construct and operate an anaerobic digester (“AD”) project at the Goodrich Farm in Salisbury. The project received a Section 248 Certificate of Public Good (“CPG”) from the Vermont Public Utility Commission (“PUC” or “Commission”) on April 8, 2016 (“the As-Approved Project”).¹ Lincoln RNG is no longer pursuing development of the project, and will transfer the CPG to Salisbury AD 1, subject to the Commission’s prior approval. Salisbury AD 1 has revised the As-Approved Project’s design in various respects (“the Proposed Modifications”). GeoInsight, Inc. (“GeoInsight”) was retained to evaluate the Proposed Modifications in terms of any new potential impacts related to air emissions from the final Project design (“Final Project”). GeoInsight is also currently preparing a Construction and Operating Permit application (“Air Permit Application”) to the Vermont DEC Air Quality & Climate Division (“AQCD”) for the air pollutant emissions (emissions) from the Final Project.

For the first evaluation, we compared the final design of the Project, as reflected by the Proposed Modifications, with the As-Approved Project. We note that the As-Approved Project had not yet applied for an Air Permit through AQCD, and is not yet built. In particular, we compared the aspects of the Final and As-Approved Projects’ designs that could affect ambient air quality. In

¹ See Docket #8596.

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the second evaluation, we evaluated the Final Project design's continued compliance with the air quality criterion of Section 248 (described in more detail below).

FIRST EVALUATION: COMPARISON OF THE FINAL AND AS-APPROVED PROJECTS

The As-Approved and Final Project designs were compared according to the following categories. The comparison is summarized below in Table 1.

- 1. Renewable Natural Gas (“RNG”) production capacity.** Both the As-Approved and Final Project designs would/ will produce RNG as their sole product. The Final Project will produce approximately 42,000 cubic feet per year (MCF/year) more pipeline quality RNG than the As-Approved Project. This corresponds to approximately 24 percent more RNG production.
- 2. Fuel burning equipment.** The As-Approved Project included one gas-fired boiler and a gas-fired flare. The Final Project design includes two gas-fired boilers, a gas-fired flare, gas-fired combined heat and power (CHP) equipment, and a diesel-fired backup generator to be operated if the CHP is offline for maintenance and for routine testing.
- 3. Type of fuel used in fuel burning equipment.** The As-Approved Project would burn uncleaned biogas from the anaerobic digester (digester gas) in its boiler. Under the Final Project design, digester gas which has been cleaned via scrubbing equipment (pipeline quality renewable natural gas) will be burned in the CHP equipment and boiler. Ultra-low sulfur diesel (ULSD) will be burned in its backup generator. Pipeline quality gas burns cleaner than digester gas because impurities such as hydrogen sulfide (H₂S) are filtered out of the biogas before combustion. The flares in both project designs would burn very limited amounts of digester gas.
- 4. Emission controls.** Both the As-Approved and Final Project designs include equipment to control odor and H₂S emissions at approximately the same levels.
- 5. Off-site emission reductions.** The RNG from both the As-Approved and Final Project designs was/is intended to reduce air pollutant emissions currently produced at Middlebury College from the combustion of No. 6 oil burned in campus boilers. No. 6 oil combustion overall produces more criteria pollutant, hazardous air pollutant (HAP), and greenhouse gas (GHG) emissions than pipeline quality RNG.
- 6. Air Permitting.** Both the As-Approved and Final Project designs would/will require an Air Permit from the AQCD for the emissions associated with the fossil fuel burning equipment listed above. Both Projects would/will be permitted as a minor source of air pollution (minor source).



Table 1: Comparison of As-Approved and Final Project Designs.

Category	As-Approved Project	Final Project Design
RNG Production Capacity (MCF/year)	130,000	172,000
Level of Air Permitting Required	Minor source air permit	Minor source air permit
Fuel Burning Equipment	one gas-fired boiler and one gas-fired flare	two gas-fired boilers, one gas fired CHP, one back-up diesel-fired generator, one gas-fired flare
Pipeline quality gas burned in on-site equipment?	No	Yes
Emission controls?	Odor and H2S controls	Odor and H2S controls
Will the Project reduce emissions off-site?	Yes	Yes

SECOND EVALUATION: FINAL PROJECT DESIGN'S COMPLIANCE WITH SECTION 248 AIR QUALITY CRITERIA

We evaluated whether the Final Project Design remains compliant with 30 V.S.A. § 248(b)(5) (undue air pollution and greenhouse gas impacts), as the PUC found was the case for the As-Approved Project.

As discussed, the Final Project will be regulated by the AQCD as a minor source of air pollution. While it will include more emission sources than the As-Approved Project, it will be equipped with emission controls that will be reviewed by the AQCD and approved through the Air Permit.

As noted above, the CHP will burn cleaner-burning, pipeline quality gas, and the only other additional emission source—a backup generator—will be used when the CHP is shut down for periodic maintenance or for unexpected reasons.

Salisbury AD 1 estimates that the Project will purchase approximately 25,000 MCF/yr of pipeline natural gas from Vermont Gas to cover the CHP's energy usage. In that way, the Project will not need to use RNG for its own operations, and the entire 172,000 MCF/yr of RNG from the Final Project will be sold to Vermont Gas and Middlebury College. Thus, the "net" gas from the Project is 147,000 MCF/yr, which is approximately 22% greater than the net RNG production for the As-Approved Project design, which would have had a net gas output of approximately 120,500 MCF/yr.² In addition, the As-Approved Project would have relied on

² The As-Approved Project estimated the gross production of 130,000 MCF/yr. As its boiler would use 9,464 MCF/year of biomethane to operate, the net gas production would be 120,536 MCF/year. See Steckler PFT, p. 21.



three-phase power brought to the Site, increasing electricity demand (and therefore emissions) from power plants providing power to the Independent System Operator New England (ISO New England) electric power transmission grid. In summary, the Final Project will produce significantly more RNG than the As-Approved Project. As a result, it will reduce existing air-pollutant emissions from Middlebury College. Since each unit of RNG displaces a unit of nonrenewable natural gas, the greater RNG production also results in an incremental increase in air quality benefits.

Because the CHP and back-up diesel generator will be required to meet stringent state and federal air pollutant emission limits, and given the increased production of RNG and use of pipeline quality gas, the Final Project design will remain compliant with the Section 248 air quality criteria.

CONCLUSIONS

For all of these reasons, the Final Project design will not alter the conclusion that the Project will not cause undue air pollution or undue adverse impacts related to greenhouse gas emissions.