STATE OF VERMONT
PUBLIC SERVICE BOARD

Petition of Ampersand Gilman Hydro, LP, for approval of a twenty-year power purchase agreement between Ampersand Gilman Hydro, LP and the Rule 4.100 Purchasing Agent	))))	Docket No. 8840

PREFILED DIRECT TESTIMONY OF A.J. GOULDING

Dated September 2, 2016

Summary: Mr. Goulding's testimony supports the Petition of Ampersand Gilman Hydro, LP for Rule 4.100 approval of a power purchase agreement, and provides testimony on the Project's compliance with Rule 4.100 and the substantive criteria of Section 248(b), as required by Rule 4.104(H).

Q1. Please state your name, occupation, and business address.

A1. My name is A.J. Goulding. I am President of London Economics International LLC (LEI), a global economic, financial, and strategic advisory professional services firm specializing in energy, water, and infrastructure. My business address is 717 Atlantic Avenue, Suite 1A, Boston, MA 02111.

My relationship to Ampersand Gilman Hydro, LP is that under an outsourcing arrangement with LEI, I serve as the Managing Member.

Q2. What is the purpose of your testimony?

A2. My testimony supports the Petition of Ampersand Gilman Hydro, LP ("AGH") for Rule 4.100 approval of a power purchase agreement with Vermont Electric Power Producers, Inc. ("VEPPI") in its capacity as the State's purchasing agent on behalf of Vermont's electric distribution utilities. I provide testimony on the Project's compliance with Rule 4.100 and the substantive criteria of Section 248(b), as required by Rule 4.104(H).

Q3. Please describe your professional background, qualifications and experience.

A3. A description of my background, qualifications and experience are provided in the attached curriculum vitae, *Exhibit AGH-AJG-1*.

Q4. Have you previously testified before the Public Service Board?

A4. Yes, in Docket 7770 (GMP-CVPS Merger), and Docket 7478 (Section 231 CPG for Gilman Hydro).

Q5. Please describe the Petitioner.

A5. The Project is owned by Ampersand Gilman Hydro, LP, a limited partnership formed in the State of Delaware and registered with the Vermont Secretary of State's Office. AGH's principal business address is 717 Atlantic Avenue, Suite 1A, Boston, MA 02111.

Project Description and Overview

Q6. Please provide an overview of the Project.

A6. The Gilman Hydro Project is an existing 4.9 megawatt (MW) hydroelectric generation facility located at the Gilman Dam on the Connecticut River, off of Riverside Avenue in Gilman, Vermont. The Project is licensed by the Federal Energy Regulatory Commission (FERC Hydroelectric Project P-2392-004), and is a self-certified qualifying facility under 16 U.S.C.A. 796(17)(C) and 18 C.F.R. Part 292.

By Order dated December 4, 2008, the Board approved the transfer of the Project from its prior owner, Dalton Hydro LLC, to AGH. At the same time, the Board issued a Section 231 CPG to AGH and its affiliated entities to own and operate the Project.

The interconnecting utility is Green Mountain Power Corporation ("GMP").

By this Petition, AGH is proceeding under Vermont's "Small Power Production and Cogeneration" program, Rule 4.100 ("the 4.100 Program"). Under the 4.100 Program, AGH has entered into a long term, non-levelized Power Purchase Agreement ("PPA") with Vermont Electric Power Producers, Inc. ("VEPPI"), subject to Board approval. VEPPI is the agent designated by the State to purchase energy on behalf of Vermont utilities from in-state renewable energy projects that are "qualifying facilities" under Rule 4.100.

I would also note that by Order dated June 21, 2016, the Board approved a one-year PPA for the Project under Rule 4.100. The long term PPA will commence after the one-year PPA expires.

Q7. Has the Petitioner provided notice of this Petition to VEPPI and all Vermont retail electric utility companies?

A7. Yes, AGH provided notice with a copy of its petition, by letter dated September 2, 2016.

Q8. Please describe the power purchase agreement for which the Petitioner seeks Board approval.

A8. AGH received a power purchase agreement ("the Gilman Hydro PPA") from VEPPI on July 14, 2016. It is my understanding that although the Board has not approved a standard form Rule 4.100 contract, the Gilman Hydro PPA is materially the same as the other PPAs provided by VEPPI under Rule 4.100 within the past year or so, with the exception of the project-specific attachments (which include, among other things, the agreed-upon rates).

A copy of the Gilman Hydro PPA is attached as ***Exhibit AGH-AJG-2***.

Q9. What are the rates and what is the term agreed upon in the Draft PPA?

A9. The rates and term are set forth in Attachment E to the Gilman Hydro PPA. AGH has elected firm, non-levelized rates for energy and capacity for a 20-year term.

Q10. Please describe how the Project satisfies the substantive criteria of 30 V.S.A. § 248(b), pursuant to PSB Rule 4.104(H).

A10. Please see my responses below. I would note that because the Gilman Hydro Project is an existing FERC-licensed facility, it is exempt from obtaining a section 248 CPG under federal law. Section 248 was recently amended to make clear that "hydroelectric generation facilities subject to licensing jurisdiction under the Federal Power Act" do not require a CPG. 30 V.S.A. § 248(a)(2).

As the Project was constructed over thirty years ago, there will be no construction or modifications to the Project associated with the approval of the PPA. Thus, there will be no impact of any kind with regard to the vast majority of the Section 248 criteria. It is my understanding that in a recent 4.100 docket, the Board nonetheless required the petitioner to come forward with evidence to show that a similar project satisfied Sections 248(b)(2), (3), and (4). For the reasons set forth below, the Gilman Project satisfies those criteria.

SECTION 248 CRITERIA

Orderly Development of the Region – 30 V.S.A. § 248(b)(1)

Q11. Will the sale of the Project's power under Rule 4.100 unduly interfere with the orderly development of the region?

A11. No. The Project has been in place for decades — its original FERC license was issued to the Gilman Paper Company on May 17, 1965. AGH is not planning any changes at the Project in connection with this PPA. Thus no impacts on orderly development will result from the sale of the Project's output to VEPPI under Rule 4.100.

Need for the Project – 30 V.S.A. § 248(b)(2)

Q12. Is the sale of the Project's power under Rule 4.100 "required to meet the need for present and future demand for service which could not otherwise be provided in a more cost-effective manner through energy conservation programs and measures and energy-efficiency and load management measures, including those developed pursuant to the provisions of subsection 209(d), section 218c, and subsection 218(b) of … title [30]"?

A12. Yes. First, the Public Utilities Regulatory Policies Act ("PURPA"), which is implemented in Vermont under PSB Rule 4.100, requires utilities to purchase energy from qualifying facilities as a mechanism to provide small power producers with access to wholesale energy markets that would otherwise be monopolized by utilities. PURPA reflects Congress's determination that small power production is needed in the energy market to curb rates and increase efficiency. Thus, there is a need for power from qualifying facilities like the Gilman Hydro Project to realize PURPA's goals

Secondly, AGH is not a regulated electric utility providing retail electric service. My understanding is that under Board case law, "the developer of a merchant plant ha[s] no obligation to provide energy efficiency and load-management services." *Petition of Georgia Mountain Community Wind, LLC*, Docket No. 7508 (Vt. Pub. Serv. Bd. June 11, 2010). Therefore, "a merchant project that addresses the regional need for power would comply with the statutory standard" for Section 248(b)(2). *Id. See also Petition of Entergy Nuclear Vermont Yankee, LLC*, Docket No. 6812, slip op. at 21–22 (Vt. Pub. Serv. Bd. Mar. 15, 2004).

This Project will help to meet the continued need for power in Vermont. It will also reduce the amount of power purchased by Vermont utilities on the regional wholesale

market, helping to address the ongoing power needs in New England. ISO-NE forecasts increasing energy use and peak demand for the New England region and Vermont in its annual 2015 Regional System Plan ("RSP"), prepared in accordance with its Open Access Transmission Tariff and approved by the FERC. The RSP: (i) forecasts future annual energy use and peak loads and the need for resources, (ii) provides information about the resources that can meet the identified needs, and (iii) describes transmission projects for the region that could meet the identified needs. According to the 2015 RSP, loads for New England and Vermont are expected to grow as follows:

	Net Energy for Load (GWh)			Summer Peak Loads (MW) 50/50			Winter Peak Loads (MW) 50/50		
	2015	2024	CAGR*	2015	2024	CAGR*	2015/16	2024/25	CAGR*
Vermont	6,750	7,210	0.7	1,105	1,190	0.9	1,090	1,165	0.7
New England	138,745	152,280	1.0	28,395	31,905	1.3	22,740	24,175	0.7

* Compound Annual Growth Rate.

See http://www.iso-ne.com/system-planning/system-plans-studies/rsp.

Moreover, over the past few years, a number of large power plants in New England have retired or announced their intention to retire. According to an April 21, 2014 presentation by Gordon van Welie, ISO-NE President and CEO, "ISO estimates up to 8,300 MW of non-gas-fired generation is 'at risk' for retirement by 2020 (28 older oil and coal units). If all retire, ISO estimates 6,300 MW of new or repowered capacity will be needed in the region." *See* http://www.iso-ne.com/pubs/pubcomm/pres_spchs/2014/van_welie_interdependencies_4-21-14.pdf.

The Project also creates RECs that could be used to satisfy various regulatory requirements in New England states, including the renewable energy standard ("RES") established by Vermont Public Act No. 56 (2015). Act 56 requires that at least 55 percent of

each utility's supply portfolio consist of renewable energy beginning in 2017, increasing to 75 percent in 2032 ("Tier 1 resources"). 30 V.S.A. § 8005(a)(1). In addition, 1 percent of each utility's supply portfolio must consist of distributed renewable generation beginning in 2017, increasing to 10 percent in 2032 ("Tier 2 resources"). *Id.* § 8005(a)(2). As a distributed generation facility, this Project's RECs may be used to satisfy either tier. *Id.* § 8005(a)(1)(C). Thus, the Project is needed specifically as a source of renewable, distributed generation.

System Stability and Reliability – 30 V.S.A. § 248(b)(3)

Q13. Will the sale of the Project's power under Rule 4.100 adversely affect system stability and reliability?

A13. The Project does not and will not adversely affect system stability and reliability, as a result of entering into the Gilman Hydro PPA or otherwise. The Project is an operating FERC-licensed facility that is already safely interconnected into the electric grid, and has been so since at least 2008 when AGH became the owner of the Project and the interconnection agreement was entered into.

Economic Benefit to the State – 30 V.S.A. § 248(b)(4)

Q14. Will the sale of the Project's power under Rule 4.100 result in an economic benefit to the State and its residents?

A14. Yes, the purchase of power from the Gilman Hydro Project under the Rule 4.100 Contract will result in an economic benefit to the State and its residents within the meaning of 30 V.S.A. § 248(b)(4).

The Project contributes positively to the local and state economy through employment of local State residents, and the payment of municipal, education, property and other taxes. The Project employs Vermont-based businesses/contractors for operations and maintenance related activities, and employs Vermont-based full time employees for site operation and administration.

In addition, there is economic value to the State in entering a long-term contract, as it provides a hedge and rate certainty to customers in an otherwise volatile electricity spot price environment.

Further, as noted above, the Project creates RECs and thus contributes to the supply of RECs needed to meet what will be a growing demand in the coming years, helping to hold down REC prices, and ultimately rates.

Finally, as a hydropower facility, the Project emits no greenhouse gases in generating power, and offsets power that would otherwise be generated by carbon-emitting plants elsewhere. The average emission rate for electrical generation in the New England region is 0.329 metric tons of CO2 per megawatt-hour (MWh). *See* ISO New England, 2014 ISO New England Electric Generator Air Emissions Report (2016). Given the Project's historic average of 25,000 MWH annual generation, the GHG reduction from the Project will be 8,225 tons *each year* over the life of the PPA—164,500 tons over the course of the PPA.

The carbon offset by the Project has considerable value. The Board has found the external cost of CO_2 emissions to be $88 per metric ton ($80 per short ton), based on the Avoided-Energy-Supply-Component ("AESC") Study Group's 2013 avoided cost report. *See Order approving updated avoided costs for use by the Energy Efficiency Utilities*, Docket No. EEU-2011-02 (Vt. Pub. Serv. Bd. Oct. 17, 2011). The 2015 AESC avoided cost report states that

the external cost of CO_2 emissions is $110 per metric ton ($100 per short ton) in 2015 dollars. AESC, AVOIDED ENERGY SUPPLY COSTS IN NEW ENGLAND: 2015 REPORT 4-29 (rev. Apr. 3, 2015).[1] At the cost of $110 per metric ton, the value of the CO_2 externalities avoided as a result of the Project is $18,095,000 over the life of the PPA.

Outstanding Resource Waters – 30 V.S.A. § 248(b)(5) and (b)(8)

Q15. Will the Project, as a result of the sale of power under Rule 4.100, meet the Outstanding Resource Waters criterion?

A15. Yes. The Project is an existing hydroelectric facility, its operation will not change as a result of the PPA, and thus it will not create new impacts during the PPA term. Moreover, the Project is located on the Connecticut River, which is not designated as an Outstanding Resource Water by the State.

Air Pollution – 10 V.S.A. § 6086(a)(1)

Q16. Will the Project, as a result of the sale of power under Rule 4.100, meet the Air Pollution criterion?

A16. Yes. The Project is an existing hydroelectric facility, its operation will not change as a result of the PPA, and thus it will not create new impacts during the PPA term.

Water Pollution – 10 V.S.A. § 6086(a)(1)

Q17. Will the Project, as a result of the sale of power under Rule 4.100, meet the Water Pollution criterion?

[1] *Available at* http://www.ct.gov/deep/lib/deep/energy/aescinnewengland2015.pdf.

A17. Yes. The Project is an existing hydroelectric facility, its operation will not change as a result of the PPA, and thus it will not create new impacts during the PPA term.

Headwaters – 10 V.S.A. § 6086(a)(1)(A)

Q18. Will the Project, as a result of the sale of power under Rule 4.100, meet the Headwaters criterion?

A18. Yes. The Project is an existing hydroelectric facility, its operation will not change as a result of the PPA, and thus it will not create new impacts during the PPA term. In addition, the Project is not located in a headwater.

Waste Disposal – 10 V.S.A. § 6086(a)(1)(B)

Q19. Will the Project, as a result of the sale of power under Rule 4.100, meet the Waste Disposal criterion?

A19. Yes. The Project is an existing hydroelectric facility, its operation will not change as a result of the PPA, and thus it will not create new waste streams during the PPA term. Any incidental waste generated during operations is disposed of in accordance with applicable waste laws.

Water Conservation – 10 V.S.A. § 6086(a)(1)(C)

Q20. Will the Project, as a result of the sale of power under Rule 4.100, meet the Water Conservation criterion?

A20. Yes. The Project is an existing hydroelectric facility, its operation will not change as a result of the PPA, and thus this criterion is inapplicable.

Floodways – 10 V.S.A. § 6086(a)(1)(D)

Q21. Will the Project, as a result of the sale of power under Rule 4.100, meet the Floodways criterion?

A21. Yes. The Project is an existing hydroelectric facility on the Connecticut River, its operation will not change as a result of the PPA, and thus it will not create new impacts with regard to flood waters, peak discharge, or public health, safety and welfare during the PPA term.

Streams – 10 V.S.A. § 6086(a)(1)(E)

Q22. Will the Project, as a result of the sale of power under Rule 4.100, meet the Streams criterion?

A22. Yes. The Project is not located on or adjacent to a stream. In any event, The Project is an existing hydroelectric facility on the Connecticut River, its operation will not change as a result of the PPA, and thus it will not create new impacts during the PPA term.

Shorelines – 10 V.S.A. § 6086(a)(1)(F)

Q23. Will the Project, as a result of the sale of power under Rule 4.100, meet the Shoreline criterion?

A23. Yes. The Project is an existing hydroelectric facility on the Connecticut River, its operation will not change as a result of the PPA, and thus it will not create new impacts on shorelines during the PPA term.

Moreover, 10 V.S.A. § 6086(a)(1)(F) states that "a permit will be granted whenever it is demonstrated by the applicant that, in addition to all other criteria, the development or subdivision of shorelines must of necessity be located on a shoreline in order to fulfill the

purpose of the development or subdivision . . . ." A hydroelectric dam must, of necessity, be located on a shoreline in order to fulfill its purpose, which is to generate electricity by damming a river.

Wetlands – 10 V.S.A. § 6086(a)(1)(G)

Q24. Will the Project, as a result of the sale of power under Rule 4.100, meet the Wetland criterion?

A24. Yes. The Project is an existing hydroelectric facility, its operation will not change as a result of the PPA, and thus it will not create new impacts during the PPA term.

Sufficiency of Water, Burden on Existing Water Supply – 10 V.S.A. § 6086(a)(2), (3)

Q25. Will the Project, as a result of the sale of power under Rule 4.100, meet the Water Supply criterion?

A25. Yes. The Project is an existing hydroelectric facility, its operation will not change as a result of the PPA, and thus it will not create new impacts during the PPA term. The Project will continue to utilize its existing water supply, which is sufficient for its needs.

Soil Erosion – 10 V.S.A. § 6086(a)(4)

Q26. Will the Project, as a result of the sale of power under Rule 4.100, meet the Soil Erosion criterion?

A26. Yes. The Project is an existing hydroelectric facility, its operation will not change as a result of the PPA, and thus it will not create new impacts during the PPA term.

Transportation Systems – 10 V.S.A. § 6086(a)(5)

Q27. Will the Project, as a result of the sale of power under Rule 4.100, meet the Transportation criterion?

A27. Yes. The Project is an existing hydroelectric facility, its operation will not change as a result of the PPA, and thus it will not create new impacts during the PPA term.

Educational Services – 10 V.S.A. § 6086(a)(6)

Q28. Will the Project, as a result of the sale of power under Rule 4.100, meet the Educational Services criterion?

A28. Yes. The Project is an existing hydroelectric facility, its operation will not change as a result of the PPA, and thus it will not create new impacts during the PPA term.

Municipal Services – 10 V.S.A. § 6086(a)(7)

Q29. Will the Project, as a result of the sale of power under Rule 4.100, meet the Municipal Services criterion?

A29. Yes. The Project is an existing hydroelectric facility, its operation will not change as a result of the PPA, and thus it will not create new impacts during the PPA term.

Aesthetics – 10 V.S.A. § 6086(a)(8)

Q30. Will the Project, as a result of the sale of power under Rule 4.100, meet the Aesthetics criterion?

A30. Yes. The Project is an existing hydroelectric facility, its operation will not change as a result of the PPA, and thus it will not create new impacts during the PPA term.

Historic Sites – 10 V.S.A. § 6086(a)(8)

Q31. Will the Project, as a result of the sale of power under Rule 4.100, meet the Historic Sites criterion?

A31. Yes. The Project is an existing hydroelectric facility, its operation will not change as a result of the PPA, and thus it will not create new impacts during the PPA term.

Rare and Irreplaceable Natural Areas – 10 V.S.A. § 6086(a)(8)

Q32. Will the Project, as a result of the sale of power under Rule 4.100, meet the Rare and Irreplaceable Natural Areas criterion?

A32. Yes. The Project is an existing hydroelectric facility, its operation will not change as a result of the PPA, and thus it will not create new impacts during the PPA term.

Necessary Wildlife Habitat – 10 V.S.A. § 6086(a)(8)(A)

Q33. Will the Project, as a result of the sale of power under Rule 4.100, meet the Wildlife criterion?

A33. Yes. The Project is an existing hydroelectric facility, its operation will not change as a result of the PPA, and thus it will not create new impacts during the PPA term.

Development Affecting Public Investments – 10 V.S.A. § 6086(a)(9)(K)

Q34. Will the Project, as a result of the sale of power under Rule 4.100, meet the Public Investments criterion?

A34. Yes. The Project is an existing hydroelectric facility, its operation will not change as a result of the PPA, and thus it will not create new impacts during the PPA term.

Greenhouse Gas Impacts – 30 V.S.A. § 248(b)(5)

Q35. Will the Project, as a result of the sale of power under Rule 4.100, meet the Greenhouse Gas criterion?

A35. Yes. The Project is an existing hydroelectric facility, its operation will not change as a result of the PPA, and thus it will not create new impacts during the PPA term. Further, it emits no greenhouse gases in the course of generating power. As such, its continued operation avoids the need for fossil fuel burning facilities to generate the same power, thus offsetting greenhouse gases that would otherwise be released into the atmosphere.

Public Health and Safety – 30 V.S.A. § 248(b)(5)

Q36. Will the Project, as a result of the sale of power under Rule 4.100, meet the Public Health and Safety criterion?

A36. Yes. The Project is an existing hydroelectric facility operating under a FERC license, its operation will not change as a result of the PPA, and thus it will not create new impacts during the PPA term. Moreover, the Project operates and will continue to operate in accordance with its FERC license.

Integrated Resource Planning – 30 V.S.A. § 248(b)(6)

Q37. Will the Project, as a result of the sale of power under Rule 4.100, meet the Integrated Resource Planning criterion?

A37. This provision does not apply to projects, like this one, sponsored by private developers rather than regulated distribution utilities. Moreover, utilities are obliged to purchase power

from qualifying facilities by PURPA and Board Rule 4.100, independent of their integrated resources plans.

Comprehensive Energy Plan – 30 V.S.A. § 248(b)(7)

Q38. Will the Project, as a result of the sale of power under Rule 4.100, comply with the Vermont Comprehensive Electric Plan?

A38. Yes. The Comprehensive Energy Plan states that "Hydropower has many benefits. It is renewable, has low emissions of GHGs, and contributes to the stability of the electric grid. Vermont-based hydropower also can support the local economy through jobs and taxation. For all these reasons, Vermont should preserve its use of the local hydropower resources and support environmentally sound in-state hydropower development." https://outside.vermont.gov/sov/webservices/Shared%20Documents/2016CEP_Final.pdf.

Transmission Facilities – 30 V.S.A. § 248(b)(10)

Q39. As a result of the sale of power under Rule 4.100, will the Project be served economically by existing or planned transmission facilities without undue adverse effect on Vermont utilities or customers?

A39. Yes. The Project is an existing hydroelectric facility, its operation and interconnection to the electric grid will not change as a result of the PPA, and thus it will not require any new transmission facilities.

Q40. Does this conclude your testimony at this time?

A40. Yes, it does.