



December 19, 2016

Low Impact Hydropower Institute
PO Box 194
Harrington Park, New Jersey, 07640

Re: LIHI Application for Certification
Vergennes Hydroelectric Project
FERC No. P-2674-VT

To Whom It May Concern:

As part of Green Mountain Power's application for Low Impact Hydropower Institute (LIHI) certification, I hereby attest the following:

The material presented in the application is true and complete. I acknowledge the Institute may suspend or revoke the certification should the impacts of the project cause non-compliance with the certification criteria.

I understand the primary goal of LIHI's certification program is public benefit. The Governing Board and its agents are not responsible for financial or other private consequences of its certification decisions. The undersigned Applicant agrees to hold LIHI, the Governing Board, and its agents harmless for any decision rendered on this or other applications or on any other action pursuant to the Low Impact Hydropower Institute's certification program.

Thank you, and please contact me at john.greena@greenmountainpower.com or at 802-770-3213 with any questions.

Sincerely,

John
Greenan
John C. Greenan
Engineer

Digitally signed by John Greenan
DN: cn=John Greenan, o=Green
Mountain Power, ou,
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ower.com, c=US
Date: 2016.12.19 10:22:11 -0500

LOW IMPACT HYDROPOWER INSTITUTE

APPENDIX B – QUESTIONNAIRE

April 2014 REVISION

Background Information	
1) Name of the Facility as used in the FERC license/exemption.	Vergennes Hydroelectric Project (FERC No. 2674)
2) Applicant's complete contact information (please use Appendix D, Project Contact Form)	<p>Green Mountain Power Corporation 2152 Post Road Rutland, Vermont 05701</p> <p>Please see Appendix A for the Project Contact Information Form.</p>
3) Location of Facility including (a) the state in which Facility is located; (b) the river on which Facility is located; (c) the river-mile location of the Facility dam; (d) the river's drainage area in square miles at the Facility intake; (e) the location of other dams on the same river upstream and downstream of the Facility; and (f) the exact latitude and longitude of the Facility dam.	<p>(a) Vermont (b) Otter Creek, a tributary to Lake Champlain (c) Located at river mile (RM) 7.6 (d) Drainage area of approximately 866 square miles (e) Upstream of the Vergennes Project is Weybridge Dam at RM 19.5, the Huntington Falls Dam at RM 21, the Beldens Dam at RM 23, the Middlebury Lower Dam at RM 24, the Proctor Dam at RM 64.2, the Center Rutland Dam at RM 71, the Ripley Mills Dam at RM 72, and the Emerald Lake Dam at RM 100. (f) Vergennes Dam: 44° 9'59.80"N 73°15'22.11"W</p> <p>Please see Appendix B for a Project location map.</p>
4) Installed capacity.	The Project has an authorized installed capacity of 2.6 MW.
5) Average annual generation.	The Project's annual gross generation output for the period

	October 1, 2013 through September 30, 2014 was 11,405 MWh.
6) Regulatory status.	<p>FERC issued the original license for the Vergennes Project to Green Mountain Power Corporation (GMP) on June 29, 1979. The license expired on May 31, 1999. On May 30, 1997, GMP filed an application for a new license for the Project. As no change in the Project's current capacity was proposed, FERC issued a new license on July 30, 1999 (Appendix C). On April 5, 2007 GMP filed for a license amendment, reflecting turbine rehabilitation at Plant 9. FERC issued the amendment on February 26, 2008 (Appendix C).</p> <p>In a letter dated November 13, 2007, FERC concluded that a failure to release aesthetic and recreational minimum flows at various times in August 2007 due to miscalculations are considered violations of Project license Article 403 (Appendix C). No enforcement actions or penalties were recommended by the FERC as no adverse effects were reported and GMP acted promptly to correct the problem. To avoid any future miscalculations on flows, GMP installed an elevation alarm to the plant monitoring and control system.</p>
7) Reservoir volume and surface area measured at the normal maximum operating level.	The reservoir volume for the Project is 133 acres and the normal maximum operating level is 134.28 feet msl.
8) Area occupied by non-reservoir facilities (e.g., dam, penstocks, powerhouse).	The Project consists of three concrete overflow dams, divided by two instream islands and one 29-foot-long non-overflow dam; a north forebay with trashracks, headgates and two steel penstocks; the north powerhouse (Plant 9B); the south forebay with trashracks, headgates, two surge tanks and two penstocks; the south powerhouse (Plant 9); and appurtenant facilities. The Project Boundary occupied by

	primary Project features, not including reservoirs, is approximately 7 acres.
9) Number of acres inundated by the Facility.	344 acres at normal maximum surface elevation.
10) Number of acres contained in a 200-foot zone extending around entire reservoir.	A total of approximately 616.5 acres are included within the 200 ft zone extending around the Project reservoir.
11) Contacts for Resource Agencies and non-governmental organizations	Please find included in Appendix D, a list of contacts from the relevant resource agencies and non-governmental organizations that have been involved in proceedings involving the operations of the Project either during the relicensing process or thereafter.
12) Description of the Facility, its mode of operation (i.e., peaking/run of river) and photographs, maps and diagrams.	Please find included in Appendix E, a description of the Vergennes Hydroelectric Project, its mode of operation, photographs, Project plans, and maps.
Questions for “New” Facilities Only: If the Facility you are applying for is “new” (i.e., an existing dam that added or increased power generation capacity after August of 1998) please answer the following questions to determine eligibility for the program.	
13) When was the dam associated with the Facility completed?	The Vergennes Dam was completed in 1912.
14) When did the added or increased generation first generate electricity? If the added or increased generation is not yet operational, please answer question 18 as well.	The two existing Plant 9 turbines were replaced with new double discharge Francis turbines in 2005 and 2006. The new installed capacity of the entire station is 2,600 kW, an increase of 200 kW since 2005.
15) Did the added or increased power generation capacity require or include any new dam or other diversion structure?	No.
16) Did the added or increased capacity include or require a change in water flow through the facility that worsened conditions for fish, wildlife, or water quality (for example, did operations change from run-of-river to peaking)?	No. The increased capacity was a result of repairing and replacing the units; the units were originally installed in

	<p>1912 with runners replaced in 1928. The units had become mechanically unreliable, and therefore posed a significant maintenance concern.</p> <p>The repair and replacement projects increased the hydraulic capacity by a nominal amount (approximately 13 cfs), and did not alter the operation of the Project, in that the Project continued to operate run-of-river with minimum flows. The increased capacity did not require a change in water flow that worsened conditions for fish, wildlife, or water quality as concluded by the Vermont Department of Environmental Conservation (VDEC) (Appendix F).</p>	
<p>17 (a) Was the existing dam recommended for removal or decommissioning by resource agencies, or recommended for removal or decommissioning by a broad representation of interested persons and organizations in the local and/or regional community prior to the added or increased capacity?</p> <p>(b) If you answered “yes” to question 17(a), the Facility is not eligible for certification, unless you can show that the added or increased capacity resulted in specific measures to improve fish, wildlife, or water quality protection at the existing dam. If such measures were a result, please explain.</p>	(a) No.	
<p>18 (a) If the added or increased generation is not yet operational, has the increased or added generation received regulatory authorization (e.g., approval by the Federal Energy Regulatory Commission)? If not, the facility is not eligible for consideration; and</p> <p>(b) Are there any pending appeals or litigation regarding that authorization? If so, the facility is not eligible for consideration.</p>	<p>(a) N/A, the increased generation is operational and has received authorization</p> <p>(b) No.</p>	
A. Flows	PASS	FAIL
1) Is the Facility in Compliance with Resource Agency Recommendations issued after December 31, 1986 regarding flow conditions for fish and wildlife protection, mitigation and enhancement (including in-stream flows, ramping and peaking rate conditions, and seasonal and episodic instream	YES, on April 15, 1999, the Vermont Department of Environmental Conservation	NO = Fail

<p>flow variations) for both the reach below the tailrace and all bypassed reaches?</p>	<p>(VDEC) issued a Section 401 Water Quality Certification (WQC) for the Vergennes Project, subject to certain conditions (Appendix C).</p> <p>The Project operates as a strict run-of-river project. The WQC states that “Conversion of the project to run-of-the-river will provide for the protection of downstream habitat” (p. 18).</p> <p>GMP maintains spill over the spillways to support aesthetics using the following schedule: April 1-Oct 31: 150 cfs daytime and 75 cfs nighttime Nov 1-Dec 15: 100 cfs daytime and 50 cfs nighttime Dec 16-Mar 31: No special flows.</p> <p>The Project is additionally operated such that one generating unit of Plant 9 is given first priority for use of diverted water for power production from April 1 to June 15 (to protect walleye and lake sturgeon) and from September 15 to November 15 (to protect landlocked Atlantic salmon). GMP commences operation of Plant 9B after the flows through Plant 9 exceed 350</p>	
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	<p>cfs during these specified time periods.</p> <p>Please see Appendix G for the Project's 2000 Monitoring and Operations Plan, FERC's Order Modifying and Approving Monitoring and Operations Plan, 2011, 2008, and 2007 minimum flow compliance letters (2014 and 2012 letters available as CEII only).</p> <p>The Project has operated in compliance with flow requirements since its 2007 flow violation due to an error found in the flow calculation sheet used to maintain flow requirements in accordance with License Articles 401, 402, 403, and 404. GMP immediately corrected the flow sheets and set an elevation alarm point on the Scada plant monitoring and control system so to properly maintain flows.</p> <p>GMP is currently consulting with VDEC in regards to flow compliance review. On August 25, 2016 GMP supplied VDEC with 2014-2015 Project operations data for review. GMP supplied VDEC with requested follow-up information on</p>	
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	December 16, 2016. Per email dated, December 19, 2015, the VDEC will provide a compliance review as soon as possible (see emails in Appendix G).	
2) If there is no flow condition recommended by any Resource Agency for the Facility, or if the recommendation was issued prior to January 1, 1987, is the Facility in Compliance with a flow release schedule, both below the tailrace and in all bypassed reaches, that at a minimum meets Aquatic Base Flow standards or “good” habitat flow standards calculated using the Montana-Tennant method?	N/A	
3) If the Facility is unable to meet the flow standards in A.2., has the Applicant demonstrated, and obtained a letter from the relevant Resource Agency confirming that demonstration, that the flow conditions at the Facility are appropriately protective of fish, wildlife, and water quality?	N/A	NO = Fail
B. Water Quality	PASS	FAIL
<p>1) Is the Facility either:</p> <p>a) In Compliance with all conditions issued pursuant to a Clean Water Act Section 401 water quality certification issued for the Facility after December 31, 1986? Or</p> <p>b) In Compliance with the quantitative water quality standards established by the state that support designated uses pursuant to the federal Clean Water Act in the Facility area and in the downstream reach?</p>	<p>(a) Yes, the facility is in compliance with all conditions issued pursuant to the Clean Water Act Section 401 Water Quality Certification (WQC) issued on April 15, 1999 by the VDEC. According to the WQC (p. 18), “There are no identified problems with respect to dissolved oxygen concentrations. Some slight enhancement may occur, however, due to the applicant’s proposal to</p>	NO = Fail

	<p>provide a continuous spillage during the summer and fall. Spillage over the cascade causes turbulent entrainment of oxygen in the water.”</p> <p>In 2006 GMP repaired/replaced Unit #1 turbine. The increased capacity did not require a change in water flow that worsened conditions for fish, wildlife, or water quality as concluded by the Vermont Department of Environmental Conservation (VDEC) (Appendix F).</p> <p>In 2009 GMP conducted penstock and intake repair and replacement work. Per Condition I of the WQC, GMP applied for and received prior approval of the maintenance and repair work from VDEC. A copy of VDEC approval and associated conditions is included in Appendix F.</p> <p>GMP is currently consulting with VDEC in regards to compliance review. VDEC will supply review of all project compliance aspects</p>	
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	<p>once it has completed review of project flow and operation data (Appendix G).</p> <p>(b) N/A</p>	
<p>2) Is the Facility area or the downstream reach currently identified by the state as not meeting water quality standards (including narrative and numeric criteria and designated uses) pursuant to Section 303(d) of the Clean Water Act?</p>	<p>The lower Otter Creek below Vergennes Dam is listed on the 2016 303(d) list for <i>E. coli</i>, and impaired uses include contact recreation and fish consumption. This area is located below the Vergennes Wastewater Treatment Facility and downstream of the Vergennes Project, Otter Creek is classified as impaired because of <i>E. coli</i> presence and mercury presence in fish tissue. Please see Appendix H to view the 2012 U.S. EPA's Water Body Report generated for lower Otter Creek and a list of links to applicable websites depicting water quality ratings.</p>	
<p>3) If the answer to question B.2 is yes, has there been a determination that the Facility does not cause, or contribute to, the violation?</p>	<p>Yes, the Vergennes Hydroelectric Project does not contribute to the impaired waters occurring within Otter Creek. The Vermont DEC concluded that the presence of <i>E.coli</i> is caused by periodic and</p>	<p>NO = Fail</p>

	reoccurring overflows at wastewater treatment plant pump stations located in Vergennes and that the presence of mercury is due to atmospheric deposition. Please see Appendix H to view the 2012 U.S. EPA's Water Body Report.	
C. Fish Passage and Protection	PASS	FAIL
1) Are anadromous and/or catadromous fish present in the Facility area or are they know to have been present historically?	<p>Lake sturgeon, landlocked Atlantic salmon, and walleye occur downstream of the Project and run Otter Creek from Lake Champlain seasonally (See Appendix I for VDEC letter dated June 2, 1998 and FERC's 1998 Environmental Assessment). It is believed that these species may use areas downstream of the Project for spawning.</p> <p>Sturgeon and Atlantic salmon are naturally occurring potamodromous species within the Lake Champlain Basin. Lake sturgeon in Vermont are classified as an endangered species and the extent to which lake sturgeon enter Otter Creek from Lake Champlain and occur below the Project is unclear, though, the Otter Creek is</p>	

	<p>classified as a historic spawning area for the species (FERC 1998; Fisheries Technical Committee 2009).</p> <p>Natural populations of Atlantic salmon were extirpated from Lake Champlain Basin approximately 150 years ago (USFWS 2015). Today landlocked Atlantic salmon are stocked in the lower Otter Creek below the Vergennes Project by the Vermont Agency of Natural Resources (VANR) and U.S. Fish and Wildlife Service (USFWS).</p> <p>Walleye is a potamodromous species as well, but is not a native species to the Lake Champlain Basin. The VANR stocks this species in Otter Creek for recreational angling (USGS 2015).</p>	
2) Is the Facility in Compliance with Mandatory Fish Passage Prescriptions for upstream and downstream passage of anadromous and catadromous fish issued by Resource Agencies after December 31, 1986?	N/A	NO = Fail
3) Are there historic records of anadromous and/or catadromous fish movement through the Facility area, but anadromous and/or catadromous fish do not presently move through the Facility area (e.g., because passage is blocked at a downstream dam or the fish no longer have a migratory run)?	3) Sturgeon and Atlantic salmon are naturally occurring potamodromous species within the Lake Champlain Basin. Lake	

<p>a) If the fish are extinct or extirpated from the Facility area or downstream reach, has the Applicant demonstrated that the extinction or extirpation was not due in whole or part to the Facility?</p> <p>b) If a Resource Agency Recommended adoption of upstream and/or downstream fish passage measures at a specific future date, or when a triggering event occurs (such as completion of passage through a downstream obstruction or the completion of a specified process), has the Facility owner/operator made a legally enforceable commitment to provide such passage?</p>	<p>sturgeon in Vermont are classified as an endangered species due to overharvest of the sturgeon stock, presence of dams, and degraded water quality (NYDEC 2015). The extent to which lake sturgeon historically entered and currently enter the Otter Creek from Lake Champlain is unclear (FERC 1998). There is no agency recommendation for fish passage at the Project, but the Project does provide flows from April 1 to June 15 to protect lake sturgeon.</p> <p>Natural populations of Atlantic salmon were extirpated from Lake Champlain Basin approximately 150 years ago due to the presence of dams and the degradation of riverine spawning areas (USFWS 2015). Today landlocked Atlantic salmon are stocked in the lower Otter Creek below the Vergennes Project by the VANR and USFWS. There is no agency recommendation for fish passage at the Project, but the Project does provide flows from September 15 to November 15 to protect landlocked Atlantic salmon.</p>	<p>NO = Fail</p> <p>NO = Fail</p>
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	<p>Walleye is a potamodromous species as well, but is not a native species to the Lake Champlain Basin and therefore does not have a historic presence in the Lake Champlain Basin (USGS 2015). There is no agency recommendation for fish passage at the Project, but the Project does provide flows from April 1 to June 15 to protect walleye.</p> <p>3a) Natural populations of Atlantic salmon were extirpated from Lake Champlain Basin approximately 150 years ago due to the presence of dams and the degradation of riverine spawning areas (USFWS 2015). Atlantic salmon were extirpated from the Lake Champlain Basin before the Vergennes dam was constructed in 1912. Although dams are considered one of the main causes for salmon extirpation in the Lake Champlain Basin, the Vergennes dam was built after the fact and cannot be attributed to the cause of the salmon extirpation in the Lake Champlain Basin.</p> <p>Today landlocked Atlantic salmon are stocked in the lower</p>	
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	<p>Otter Creek below the Vergennes Project by the VANR and USFWS.</p> <p>3b) N/A - No recommendation.</p>	
<p>4) If, since December 31, 1986:</p> <p>a) Resource Agencies have had the opportunity to issue, and considered issuing, a Mandatory Fish Passage Prescription for upstream and/or downstream passage of anadromous or catadromous fish (including delayed installation as described in C.3.a above), and</p> <p>b) The Resource Agencies declined to issue a Mandatory Fish Passage Prescription,</p> <p>c) Was a reason for the Resource Agencies' declining to issue a Mandatory Fish Passage Prescription one of the following: (1) the technological infeasibility of passage, (2) the absence of habitat upstream of the Facility due at least in part to inundation by the Facility impoundment, or (3) the anadromous or catadromous fish are no longer present in the Facility area and/or downstream reach due in whole or part to the presence of the Facility?</p>	<p>Please see Appendix I to view a December 2, 2015 email from the USFWS confirming that there are still no fishway prescriptions recommended for the Project.</p> <p>GMP is currently consulting with VDEC in regards to compliance review. VDEC will supply review of all project compliance aspects once it has completed review of project flow and operation data (Appendix G).</p>	YES = Fail
<p>5) If C4 was not applicable:</p> <p>a) Are upstream and downstream fish passage survival rates for anadromous and catadromous fish at the dam each documented at greater than 95% over 80% of the run using a generally accepted monitoring methodology? Or</p> <p>b) If the Facility is unable to meet the fish passage standards in 5.a, has the Applicant either i) demonstrated, and obtained a letter from the U.S. Fish and Wildlife Service or National Marine Fisheries Service confirming that demonstration, that the upstream and downstream fish passage measures (if</p>	N/A	NO = Fail

any) at the Facility are appropriately protective of the fishery resource, or ii) committed to the provision of fish passage measures in the future and obtained a letter from the U.S. Fish and Wildlife Service or the National Marine Fisheries Service indicating that passage measures are not currently warranted?		
6) Is the Facility in Compliance with Mandatory Fish Passage Prescriptions for upstream and/or downstream passage of Riverine fish?	<p>N/A, no fishway prescriptions or reservations of authority were filed under Section 18 of the FPA in the 1999 License. Please see Appendix I to view a December 2, 2015 email from the USFWS confirming current Project compliance.</p> <p>GMP is currently consulting with VDEC in regards to compliance review. VDEC will supply review of all project compliance aspects once it has completed review of project flow and operation data (Appendix G).</p>	NO = Fail
7) Is the Facility in Compliance with Resource Agency Recommendations for Riverine, anadromous and catadromous fish entrainment protection, such as tailrace barriers?	Yes, the Project is in compliance with resource agency recommendations for fish entrainment protection. Project structures are designed to discourage fish entrainment. The Plant 9 intake is equipped with a trashrack that has a running length of approximately 19 feet with a 10% slope and is constructed of 3-inch by 1/4-inch	NO = Fail

	<p>steel bars with 1-inch clear spacing. The Plant 9B intake trashrack has a running length of approximately 15 feet-10 inches and has a vertical height of approximately 14 feet. The rack bars are constructed of 3-inch by 3/8- inch steel bars with a 2-inch clear spacing between bars.</p> <p>In accordance with the WQC Condition F <i>Prevention of Fish Entrainment at Intakes</i>, GMP must consult with the Department of Fish and Wildlife when a trashrack for either plant is scheduled for replacement in order to obtain Vermont DEC approval for the design. In a letter dated September 11, 2008, the Vermont DEC approved of the emergency trashrack replacement at Plant 9. Please see Appendix I for a copy of Vermont DEC's letter approving the in-kind design of the new trashrack.</p>	
D. Watershed Protection	PASS	FAIL
1) Is there a buffer zone dedicated for conservation purposes (to protect fish and wildlife habitat, water quality, aesthetics and/or low-impact recreation) extending 200 feet from the average annual high water line for at least 50% of the shoreline, including all of the undeveloped shoreline?	No.	NO = Go to D2
2) Has the Facility owner/operator established an approved watershed enhancement fund that: 1) could achieve within the project's watershed the ecological and recreational equivalent of land protection in D.1, and 2) has	No.	NO = Go to D3

the agreement of appropriate stakeholders and state and federal resource agencies?		
3) Has the Facility owner/operator established through a settlement agreement with appropriate stakeholders, with state and federal resource agencies agreement, an appropriate shoreland buffer or equivalent watershed land protection plan for conservation purposes (to protect fish and wildlife habitat, water quality, aesthetics and/or low impact recreation)?	No shoreland buffer or watershed land protection plans have been established through settlement agreements with stakeholders for the Project.	NO = Go to D4
4) Is the facility in compliance with both state and federal resource agencies recommendations in a license approved shoreland management plan regarding protection, mitigation or enhancement of shorelands surrounding the project?	N/A – A shoreland management plan was never recommended for the Vergennes Hydroelectric Project. Please refer to the 1999 License included in Appendix C.	No = Fail
E. Threatened and Endangered Species Protection	PASS	FAIL
1) Are threatened or endangered species listed under state or federal Endangered Species Acts present in the Facility area and/or downstream reach?	<p>In a letter dated October 12, 2015, the USFWS lists two species protected under the Federal Endangered Species Act that may occur within the Project area: Indiana Bat (endangered species) and Northern long-eared bat (threatened species) (Appendix J). Both bat species are additionally classified as endangered species by the state of Vermont (VTFWD 2015).</p> <p>Per emails exchanged with Vermont Fish and Wildlife staff, Lake sturgeon, identified as an endangered species by the State of Vermont may have presence</p>	

	<p>downstream of the Project, while the black sandshell (state endangered species) fragile papershell (state endangered species), pink heelsplitter (state endangered species), pocketbook mussel (state endangered species), and giant floater (state threatened species) have been documented to occur downstream of the Project. Additionally, creeping love-grass and green dragon are rare and state threatened plant species, respectively, that may occur within the Project vicinity.</p> <p>See Appendix J for Vermont Fish and Wildlife email dated November 9, 2016 confirming presence of the identified bat species. Please additionally see Appendix J for the December 6, 2016 email from Vermont Fish and Wildlife confirming potential presence of the lake sturgeon, black sandshell, fragile papershell, pink heelsplitter, pocketbook mussel, and giant floater and the December 19, 2016 email from the Vermont Fish and Wildlife confirming potential presence of the creeping love-grass and the green dragon.</p>	
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<p>2) If a recovery plan has been adopted for the threatened or endangered species pursuant to Section 4(f) of the Endangered Species Act or similar state provision, is the Facility in Compliance with all recommendations in the plan relevant to the Facility?</p>	<p>In 2007 the “Indiana Bat (<i>Myotis sodalists</i>) Draft Recovery Plan: First Revision” was developed by the USFWS (USFWS 2007). To reclassify the Indiana bat to threatened status, the Plan outlines the following objectives:</p> <ul style="list-style-type: none"> • Permanent protection of 80 percent of Priority 1 hibernacula; • A minimum overall population number equal to the 2005 estimate (457,000); • Documentation of a positive population growth rate over five sequential survey periods. <p>The Project operates in a run-of-river mode providing natural feeding conditions for any bats that may utilize the area for feeding purposes. The Project area does not have any classified critical habitat for the Indiana Bat. GMP is in compliance with the current goals for the strategic plan and will continue to comply with resource agency recommendations.</p> <p>In 2009 a “Strategic Plan for Lake Champlain Fisheries” was published by the Lake</p>	<p>NO = Fail</p>
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	<p>Champlain Fish and Wildlife Management Cooperative's Fisheries Technical Committee (Fisheries Technical Committee 2009).</p> <p>The Plan includes the following goals listed for lake sturgeon:</p> <ul style="list-style-type: none"> • Enhance fish passage for landlocked Atlantic salmon and lake sturgeon. • Monitor and assess lake sturgeon in Vermont rivers including the Missisquoi, Lamoille, Winooski River, and Otter Creek. • Recover lake sturgeon populations sufficient for removal from Vermont's list of endangered species. <p>The Project provides flows for the protection of lake sturgeon from April 1 to June 15 each year and will continue to work within the guidelines of the strategic plan.</p>	
3) If the Facility has received authorization to incidentally Take a listed species through: (i) Having a relevant agency complete consultation pursuant to ESA Section 7 resulting in a biological opinion, a habitat recovery plan, and/or (if needed) an incidental Take statement; (ii) Obtaining an incidental	N/A	NO = Fail

Take permit pursuant to ESA Section 10; or (iii) For species listed by a state and not by the federal government, obtaining authorization pursuant to similar state procedures; is the Facility in Compliance with conditions pursuant to that authorization?		
<p>4) If a biological opinion applicable to the Facility for the threatened or endangered species has been issued, can the Applicant demonstrate that:</p> <p>a) The biological opinion was accompanied by a FERC license or exemption or a habitat conservation plan? Or</p> <p>b) The biological opinion was issued pursuant to or consistent with a recovery plan for the endangered or threatened species? Or</p> <p>c) There is no recovery plan for the threatened or endangered species under active development by the relevant Resource Agency? Or</p> <p>d) The recovery plan under active development will have no material effect on the Facility's operations?</p>	N/A	NO = Fail
<p>5) If E.2 and E.3 are not applicable, has the Applicant demonstrated that the Facility and Facility operations do not negatively affect listed species?</p>	<p>The Project area and operations do not negatively affect federally listed or state listed endangered and threatened species.</p> <p>The Indiana bat and northern long-eared bat may feed within the Project boundary, but the boundary does not contain critical habitat for either species (Appendix J). The continued operation of the Project is not anticipated to negatively affect</p>	NO = Fail

	<p>Indiana or northern long-eared bats that may utilize the area.</p> <p>Because the Project operates in a run-of-river mode, operations are not anticipated to negatively affect lake sturgeon, sand darter, or mussel populations located downstream of the Project. During Project relicensing, the VANR concluded that run-of-river Project operations would not negatively affect mussel populations (see Appendix I for FERC's 1998 Environmental Assessment). Additionally, within the Project's WQC, the VANR prescribed that the Project provide flows from April 1 to June 15 for the protection of lake sturgeon (Appendix C). By providing such flows, the Project does not negatively affect lake sturgeon.</p> <p>Additionally, because of existing run-of -river operations, the Project is not anticipated to negatively affect the creeping love-grass or green dragon.</p> <p>Please see Appendix J for a December 2, 2015 letter from the USFWS confirming that Project operates in compliance, a</p>	
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	<p>November 9, 2016 email from Vermont Department of Fish and Wildlife confirming the Project does not negatively affect the Indiana bat or northern long-eared bat, and a December 19, 2016 email from the Vermont Department of Fish and Wildlife confirming no negative affects to the creeping love-grass or green dragon. Per email dated December 7, 2016 (Appendix J), the Vermont Department of Fish and Wildlife will provide their final comments on remaining species through the VDEC. The VDEC will supply these final comments upon completion of Project flow and operations data review.</p>	
F. Cultural Resource Protection	PASS	FAIL
<p>1) If FERC-regulated, is the Facility in Compliance with all requirements regarding Cultural Resource protection, mitigation or enhancement included in the FERC license or exemption?</p>	<p>Yes, per License Article 405, GMP implements the “Programmatic Agreement Among the Federal Energy Regulatory Commission, the Advisory Council on Historic Preservation and the Vermont State Historic Preservation Officer for Managing Historic Properties that May be Affected by Issuance of a License Issuing</p>	<p>NO = Fail</p>

	<p>to Green Mountain Power Corporation for the Continued Operation and Maintenance of the Vergennes Hydroelectric Power Project in Vermont” executed on February 4, 1999, which includes the Cultural Resources Management Plan (CRMP) for the Project.</p> <p>In compliance with the 1999 Programmatic Agreement and 1999 License Article 405, GMP submitted on August 2, 2000, a Cultural Resource Management Plan (CRMP). On January 8, 2001, FERC issued an Order Approving the CRMP and required that GMP file an annual report of activities conducted under the CRMP with the SHPO. As documented within FERC’s E-Library, GMP has subsequently submitted CRMP Annual Reports for the years 2004, 2006-2014, and 2016.</p> <p>In accordance with the 1999 PA, GMP entered into a Memorandum of Understanding on March 15, 2004 with David Shlansky, FERC, and the Vermont State Historic Preservation Officer to convey project boundary lands listed on</p>	
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	<p>the National Register of Historic Places and to ensure their proper continued management. GMP additionally developed a Memorandum of Agreement (MOA) on August 26, 2014 with the Vermont State Historic Preservation Officer and FERC for removal of the Benton Wheelhouse, a historic component of the Project. A corresponding Section 106 Report, describing the property, its history, the proposed action, and structure condition, was submitted with the MOA.</p> <p>Please view Appendix K for a live link list to the Project's 2000 CRMP filing, 2001 FERC Approval of the CRMP, annual CRMP compliance filings and for Memorandum of Agreements (MOA) between the FERC, Vermont State Historic Preservation Officer, and GMP for the amendment of project boundaries and removal of the Benton Wheelhouse.</p> <p>Multiple emails were sent to the Vermont Division for Historic Preservation for Project compliance review. Per voicemail dated September 21,</p>	
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	2015, Scott Dillon from the Division recommended that, due to work overload constraints at the Division, GMP conduct a compliance review for the Project and provide a summary of the results to the Division for final review. A cultural resources compliance review was provided to the Division on September 19, 2016, and follow-up emails have been sent to the Division regarding this submission. Emails concerning Project compliance review follow-up as well as a copy of the submitted summary of Project compliance are included within (Appendix K).	
2) If not FERC-regulated, does the Facility owner/operator have in place (and is in Compliance with) a plan for the protection, mitigation or enhancement of impacts to Cultural Resources approved by the relevant state or federal agency or Native American Tribe, or a letter from a senior officer of the relevant agency or Tribe that no plan is needed because Cultural Resources are not negatively affected by the Facility?	N/A	NO = Fail
G. Recreation	PASS	FAIL
1) If FERC-regulated, is the Facility in Compliance with the recreational access, accommodation (including recreational flow releases) and facilities conditions in its FERC license or exemption?	Yes, the Vergennes Hydroelectric Project is in compliance with the 1999 FERC License Article 406 <i>Recreation Plan</i> . Please see Appendix L for the Project Recreation Plan developed in consultation with	NO = Fail

	<p>the City of Vergennes, the VDEC, and the Vermont Division of Historic Preservation, the FERC Order Approving the Recreation Plan, and the 2015 Form 80 for the Vergennes Project (Appendix L).</p> <p>There are four formal recreation sites within the Project area:</p> <ul style="list-style-type: none"> • Settler's Park: Located just upstream of the Project provides a parking area and a car-top boat launch. • Canoe Portage: The boat launch at Settler's Park serves as the take-out and City Falls Park serves as the Put-In. • Vergennes Falls Park: Is owned and operated by the City of Vergennes and located downstream of the Project. The park offers walking paths, shoreline fishing, picnic areas, and a boat launch. • Plant 9 Fishing Platform: Located adjacent to the Plant 9 Powerhouse the platform provides universal fishing access. <p>The MacDonough Park is an</p>	
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	<p>informal recreation site owned and operated by the City of Vergennes. The park is located downstream of the Project on the east bank and offers views of Vergennes Falls.</p> <p>A map of the Project's recreational facilities is also included in Appendix L.</p> <p>Per Article 406, GMP included the following improvements at the Project: (a) directional and interpretive signs for recreation in the project area; (b) improved access for small boats and parking at Settler's Park; (c) improved trail, shoreline fishing access, vegetative plantings, and picnic area along the western bank near Plant 9; (d) construction of a disabled-accessible fishing platform on the western bank near Plant 9; (e) installation of portable toilet facilities, including disabled-accessible facilities; and (f) installation of signs interpreting the history of Vergennes Falls and the surrounding historic structures.</p> <p>Revised Exhibit R drawings were approved by FERC on April 14,</p>	
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	<p>2008 (Appendix L).</p> <p>Per the August 2015 FERC Environmental Inspection Report (Appendix L), it was determined that the boat ramp was in need of repair and that a missing interpretative sign was in need of replacement. Within GMP's January 4, 2016 letter (Appendix L), it was recorded that repairs to the boat ramp were completed in December 2015 but that the replacement of the missing interpretative sign remained incomplete. GMP reported that the City of Vergennes possessed the missing sign and was continuing to work with the City to complete its reinstallation. Per FERC Letter dated January 27, 2016 (Appendix L), repairs to the boat ramp were approved and a deadline of June 6, 2016 was set for completion of the sign reinstallation. On June 6, 2016 (Appendix L) GMP filed a letter and photo evidence to show that the missing interpretative had been re-installed at the Project.</p>	
2) If not FERC-regulated, does the Facility provide recreational access, accommodation (including recreational flow releases) and facilities, as Recommended by Resource Agencies or other agencies responsible for recreation?	N/A	NO = Fail

3) Does the Facility allow access to the reservoir and downstream reaches without fees or charges?	Yes, the Vergennes Hydroelectric Project provides free access to the Project reservoir and downstream reaches. All Project recreation sites are free to the public. As described above, the Project provides access to the Otter Creek waters through boat launches, a canoe portage trail, and fishing access sites. Please see the Project Recreation Plan in Appendix L for more details.	NO = Fail
H. Facilities Recommended for Removal	PASS	FAIL
1) Is there a Resource Agency Recommendation for removal of the dam associated with the Facility?	No, the Project is operating under a 1999 FERC License and has not been recommended for removal.	YES = Fail

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Vermont Fish and Wildlife Department (VTFWD). 2008. Rare and Uncommon Animals of Vermont - Nongame and Natural Heritage Program. February 3, 2008. [Online] URL:

http://www.vtfishandwildlife.com/library/Reports_and_Documents/NonGame_and_Natural_Heritage/Rare_Threatened_and_Endangered_Species%20%20---%20lists/Rare_and_Uncommon_Animals_of_Vermont.pdf [Accessed March 5, 2010].

Vermont Marble Power Division of Omya, Inc. (VMPD). 2009. Initial Study Report for the Otter Creek Hydroelectric Project (FERC No. 2558). Accession No.: 20090206-5210. Filed February 6, 2009.

APPENDIX A

PROJECT CONTACT INFORMATION FORM

PROJECT CONTACT FORM

Project Name: Vergennes Hydroelectric Project

FERC No. P-2674

Project Owner/Operator:

Name and Title Josh Castonguay, Director, Generation and Renewable Innovation

Company Green Mountain Power Corporation

Phone (802) 655-8754

Email address Jason.Castonguay@greenmountainpower.com

Please include this email address in LIHI e-newsletter distribution _____

Mailing Address 163 Acorn Lane, Colchester, Vermont 05446

Consulting firm that manages LIHI program participation (if applicable):

Name Andrew Qua, Senior Regulatory Coordinator

Company Kleinschmidt Associates

Phone (207) 416-1246

Email address Andy.Qua@KleinschmidtGroup.com

Please include this email address in LIHI e-newsletter distribution _____

Mailing Address P.O. Box 650, 141 Main Street, Pittsfield, Maine 04967

Party responsible for compliance with LIHI certification requirements:

Name and Title John Greenan, Environmental Engineer

Phone (802) 770-3213

Email address John.Greenan@greenmountainpower.com

Please include this email address in LIHI e-newsletter distribution X

Mailing Address 2152 Post Road, Rutland, Vermont 05701

Party responsible for accounts payable:

Name and Title Jason Lisai, Generation Manager

Phone (802) 655-8723

Email address FIP@greenmountainpower.com; lisai@greenmountainpower.com

Mailing Address Accounts Payable Processor, 2152 Post Road, Rutland, Vermont, 05701

John Greenan

Digitally signed by John Greenan
DN: cn=John Greenan, o=Green Mountain Power, ou,
email=john.greenan@greenmountainpower.com,
c=US
Date: 2016.12.19 10:38:46 -0500

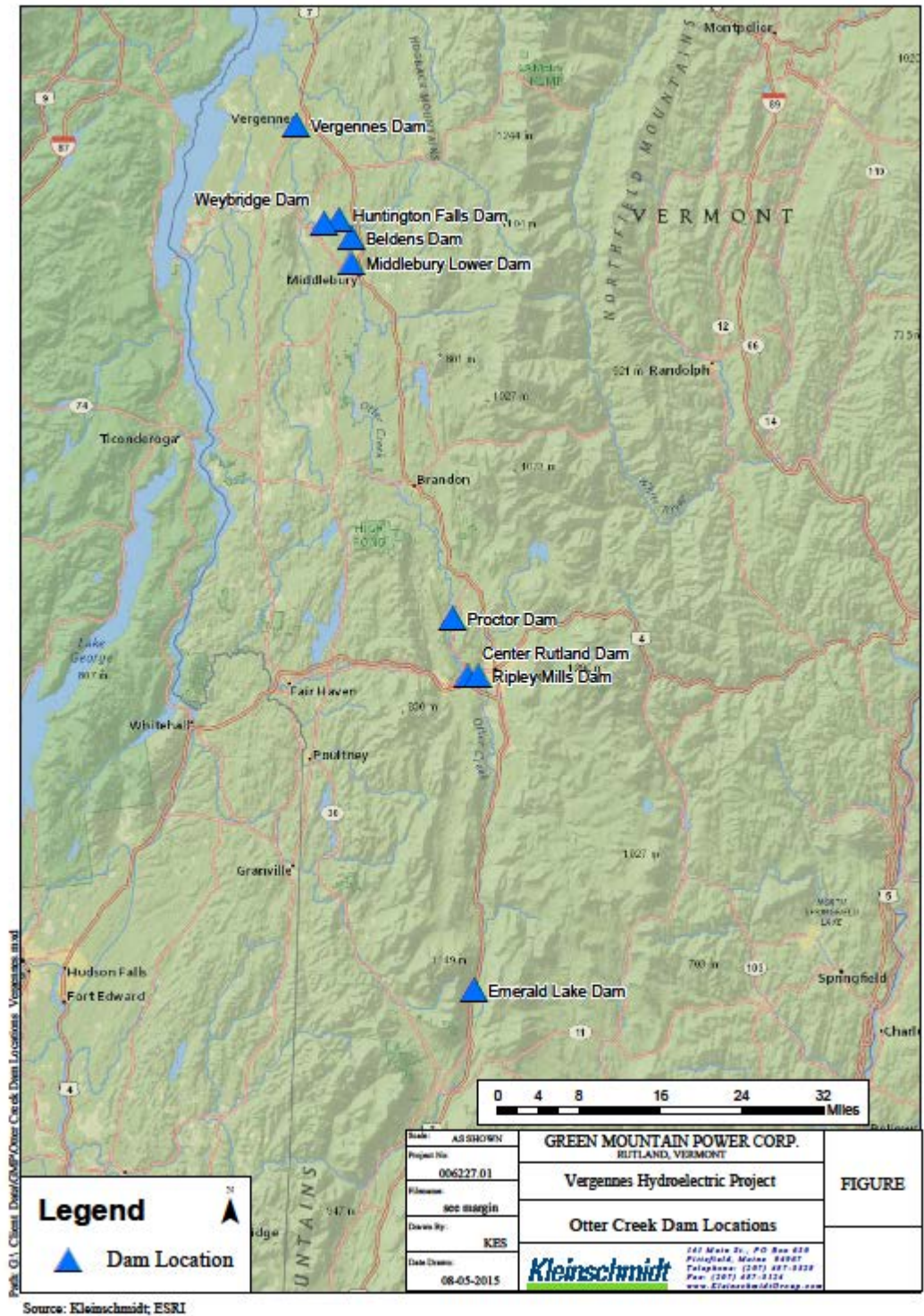
Project Owner/Operator Signature

19 Dec 16

Date

APPENDIX B

PROJECT LOCATION MAP



APPENDIX C

LICENSE AND COMPLIANCE

88 FERC ¶ 62,095

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Green Mountain Power Corporation

Project No. 2674-003
Vermont

ORDER ISSUING NEW LICENSE
(Major Project)

INTRODUCTION

JUL 30 1999

On May 30, 1997, Green Mountain Power Corporation (GMP) filed an application for a new license under Part I of the Federal Power Act (FPA) ¹ for the continued operation and maintenance of the 2.4-megawatt (MW) Vergennes Hydroelectric Project No. 2674, located on Otter Creek in the City of Vergennes, Addison County, Vermont. ²

The Commission issued the original license for the Vergennes Project to GMP on June 29, 1979. ³ The license expired on May 31, 1999. GMP proposes no change in the project's current capacity. For the reasons discussed below, I will issue a new license to GMP for the Vergennes Project No. 2674.

BACKGROUND

On September 23, 1997, the Commission issued a public notice of the application for a major license for the Vergennes Project. ⁴ Motions to intervene were filed by the Vermont Agency of Natural Resources (VANR) (dated November 3, 1997) and the U.S. Department of the Interior (dated November 13, 1997). No party objected to the issuance of this license. Comments received from interested agencies and individuals

¹16 U.S.C. §797(e).

²Otter Creek, a tributary to Lake Champlain, is a navigable waterway of the United States to a point upstream from the Center Rutland Project (FERC Project No.2445), located in Rutland County. See 34 FPC 540, 541 (1965). The Vergennes Project is located at river mile 7.6 and within the navigable portion of Otter Creek.

³7 FERC ¶ 61,323 (1979).

⁴62 F.R. 50920 (1997).

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have been fully considered in determining whether and under what conditions to issue this license.

On February 20, 1998, the Commission issued a public notice that the Vergennes Project was ready for environmental analysis and solicited comments, recommendations, and final terms and conditions.⁵ The VANR filed comments on June 1, 1998.

On August 13, 1998, the Commission issued a draft environmental assessment (DEA) for this project based on the staff's independent analysis. The DEA recommended that the project be licensed with the enhancement measures recommended by the licensee and with additional staff-recommended environmental measures. Comments filed on the DEA have been addressed in the final environmental assessment (FEA), which was issued on October 16, 1998, and is attached to this order.

The Commission staff also prepared a Safety and Design Assessment for the project, which is available in the Commission's public file.

PROJECT DESCRIPTION

The Vergennes Project is an existing, licensed hydroelectric facility owned and operated by the Green Mountain Power Corporation, on Otter Creek, about 7.6 miles upstream from Lake Champlain. The total existing installed capacity of the project is 2.4 MW, with average annual generation of 9.45 gigawatt-hours. GMP proposes no structural modifications for the project. The Vergennes Project's principal features consist of: three concrete gravity overflow dams, divided by two instream islands; a 29-foot-long, non-overflow dam and two powerhouses located on the north (Plant 9) and south banks (Plant 9B) of Otter Creek with a total installed capacity of 2.4 MW; an 8.8-mile-long, 133-acre reservoir, and appurtenant facilities. A more detailed description of project works is contained in ordering paragraph (B)(2).

The project will be converted from a daily peaking mode, to run-of-river operation with one generating facility operated remotely from GMP's Dispatch Center located in Colchester, Vermont, and the other two generating units controlled manually by an on-site operator. In the past, the reservoir level fluctuated about 1.5 feet daily during peaking operations; these fluctuations will not occur with run-of-river operation. The project had a dependable generating capacity averaging about 1.3 MW which will be

⁵63 F.R. 9790 (1998).

reduced to an annual average generating capacity of 1.194 MW, based on the proposed changes for the project.

APPLICANT'S PLANS AND CAPABILITIES

In accordance with Sections 10(a)(2)(C) and 15(a)(2) of the FPA, I have evaluated GMP's record as a licensee for these areas in considering the issuance of a new license: (1) conservation efforts; (2) compliance history and ability to comply with the new license; (3) safe management, operation, and maintenance of the project; (4) ability to provide efficient and reliable electric service; (5) need for power; (6) transmission line improvements; (7) cost effectiveness of the plans; and (8) actions affecting the public.

Here are the findings:

1. Consumption Efficiency Improvement Program (Section 10(a)(2)(C))

Staff has reviewed the details of GMP's conservation program and conclude that GMP is making a good faith effort to conserve electricity, reduce peak-hour demands, and to support the objectives of Section 10(a)(2)(C) of the FPA.

2. The Compliance History, and Plans and Abilities of the Applicant to Comply with the Articles, Terms, and Conditions of Any License Issued to It and Other Applicable Provisions of Part I of the FPA (Sections 15(a)(2)(A) and 15(a)(3)(A))

Staff has reviewed GMP's license application and compliance history with the existing license in an effort to judge its ability to comply with the articles, terms, and conditions of any license issued, and with other applicable provisions of this part of the FPA. Staff concludes that GMP's overall record of making timely filings and compliance with its license is satisfactory.

Based on that review, staff concludes GMP has or can acquire the resources and expertise necessary to carry out its plans and comply with all articles, terms and conditions of a new license.

3. The Plans and Abilities of the Applicant to Manage, Operate, and Maintain the Project Safely (Section 15(a)(2)(B))

The Division of Dam Safety and Inspections has reviewed the project safety of the Vergennes Project and concludes that the dams and other project works are safe and that

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GMP's record of managing, operating, and maintaining the project facilities has continuously complied with our standards for project safety.

Staff concludes that GMP's plans to manage, operate, and maintain the project safely are adequate.

4. The Plans and Abilities of the Applicant to Operate and Maintain the Project in a Manner Most Likely to Provide Efficient and Reliable Electric Service (Section 15(a)(2)(C))

GMP has operated the project for more than 88 years to provide a continuous and reliable, stable source of power to meet the energy demands of its customers.

Staff has reviewed GMP's load forecast and resource planning to meet energy and capacity requirements over the long term for efficient and reliable electric service, as well as its plans to maintain the project facilities. Staff concludes that GMP is likely to continue to operate and maintain the project in a manner that provides efficient and reliable electric service under a new license.

5. The Need of the Applicant Over the Short and Long Term for the Electricity Generated by the Project to Serve Its Customers (Section 15(a)(2)(D))

The Project is located in the New England Power Pool (NEPOOL) subregion of the Northeast Power Coordinating Council, as defined by the North American Electric Reliability Council. NEPOOL forecasts an average annual growth rate for 1998 through 2007 of 1.9 percent for the summer peak demand and 1.7 percent for the winter peak demand. These values are higher than last year's corresponding forecasts of about 1 percent and 1.2 percent, respectively. These growth rate projections support the finding of a long-term need for electricity generated by the Vergennes Project.

The Vergennes Project plays an integral role in providing power for more than 82,000 customers in 65 Vermont municipalities and in providing firm power, via the transfer of power, to other New England utilities.

Staff therefore concludes that there is a short and long-term need for the power from the Vergennes Project and that GMP has the ability to meet these power needs.

6. The Impact of Receiving or Not Receiving the Project License on the Operation, Planning and Stability of Applicant's Transmission System (Section 15(a)(2)(E))

GMP does not anticipate that project power flows will significantly influence system losses, although system losses of power are likely to increase if GMP does not receive a license. There would be no need for new construction of transmission facilities or upgrading existing facilities. The Vergennes Project does provide ancillary services such as local voltage/VAR support to the power transmission system in the area. By providing power support to local area loading factors, the power generated by the project offsets deliveries that are required on the area transmission-distribution systems. Loss of power generated by the Vergennes Project could require the acceleration of future transmission upgrades. Therefore, staff concludes there is a positive effect of the continued operation of the Vergennes Project on the local transmission system.

7. Whether the Plans of the Applicant will be Achieved, to the Greatest Extent Possible, in a Cost Effective Manner (Section 15(a) (2) (F))

The conversion of project operation from a peaking mode to a run-of-river mode, in conjunction with mitigation and enhancement measures required by the new license, reduces gross value of the energy produced by \$25,200, based on an average cost of power produced by the project of about \$37 per megawatt hour (MWh). GMP has determined that the continued operation and relicensing of the Vergennes Project is the least cost alternative available to them.

Staff concludes that the Vergennes Project, as currently configured and as operated as described in this order, will fully develop and use the economical hydropower potential of the site in a cost-effective manner.

8. Actions Affecting the Public

GMP plans to protect and enhance aquatic, aesthetic, recreational, and cultural resources at the project by operating the project in a run-of-river mode; operating the project in a manner that will provide a continuous outflow from Plant 9 to enhance fishery resources using the tailrace area; releasing aesthetic flows at the Vergennes Project dams; implementing recreational measures that would include access for small boats, parking, improved trails, installing signs to interpret the history of Vergennes Falls and the surrounding structures, installing a disabled-accessible fishing platform and portable toilets; and implementing the provisions of the Programmatic Agreement.

WATER QUALITY CERTIFICATION

Under Section 401(a)(1) of the Clean Water Act (CWA) ⁶, the Commission may not issue a license for a hydroelectric project unless the certifying agency has either issued a water quality certification for the project or has waived certification by failing to act on a request for certification within a reasonable period of time, not to exceed one year. ⁷ Section 401(d) of the CWA provides that state certification shall become a condition on any federal license or permit that is issued. ⁸

On April 15, 1999, the VDEC issued a Section 401 WQC for the Vergennes Project, subject to certain conditions. VDEC's WQC includes 17 conditions, the substantive ones of which we summarize here, and which are attached in full as Appendix A to this order: ⁹ (a) operate and maintain the project according to the conditions set forth in the WQC; (b) operate the project in a run-of-river mode with specific ratios of dispersion of the daytime flows released over Vergennes Falls during those times when the project is not operating (e.g., generating power); (c) suspend bypass flows during flashboard replacement; (d) develop a project operating plan; (e) develop a monitoring plan for estimating inflows to the impoundment, impoundment levels, and flow releases from the project powerhouses; (f) consult with the Vermont Department of Fish and Wildlife prior to replacing project trashracks at Plants 9 and 9B; (g) provide turbine rating curves to VDEC within two years of license issuance; (h) develop a debris

⁶33 U.S.C. § 1341(a)(1).

⁷Section 401(a)(1) requires an applicant for a federal license or permit to conduct any activity that may result in any discharge into navigable waters to obtain from the state in which the discharge originates certification that any such discharge will comply with applicable water quality standards.

⁸33 U.S.C. § 1341(d).

⁹As we have acknowledged in *Kennebec Water Power Company*, 81 FERC ¶ 61,254 (1997), we are required by the decision of the United States Court of Appeals in *American River, et al. v. FERC*, 129 F.3d 99 (1997), to accept all conditions in a water quality certification as conditions on a license even if we believe that the conditions may be outside the scope of Section 401. While we have included certain of the provisions as license articles, all of the Section 401 conditions are conditions to this license. In any event, nothing in the conditions of the water quality certification shall be viewed as restricting the Commission's ability or the licensee's obligation, under the Federal Power Act, to take timely action necessary to protect human life or the environment.

disposal plan in consultation with the VDEC and file the plan with the Commission within 120 days of license issuance; (i) file maintenance and repair work proposals with the VDEC prior to any such work being initiated that could affect water quality or state water quality standards; (j) provide safe public access to the project; (k) construct and maintain recreational facilities consistent with a recreation plan approved by VDEC; (l) implement erosion control measures as necessary and related to recreational use of project lands; (m) allow VDEC to conduct compliance inspections of the project area to ensure WQC conditions are met; (n) post the WQC in the powerhouse; (o) seek VDEC approval of any project changes that would affect the WQC conditions; (p) allow VDEC to reopen the license at any time to assure compliance with the WQC conditions; and (q) provide continuing jurisdiction for the VDEC to alter the terms and conditions of the WQC as needed to ensure state water quality laws are being met.

Section 401(d) of the CWA provides that the state certification shall become a condition on any federal license or permit that is issued. The conditions of the WQC are attached in full as Appendix A of this license order and included as part of this license. Most of the WQC conditions are included in specific license articles in this license order and all our license conditions are consistent with the terms of the WQC.

SECTION 18 FISHWAY PRESCRIPTION

Section 18 of the FPA authorizes the Secretary of the Interior or the Secretary of Commerce to prescribe fishways at Commission-licensed projects. ¹⁰ No Section 18 prescriptions were filed.

COASTAL ZONE MANAGEMENT ACT

Section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA), 16 U.S.C. § 1456(3)(A), states that the Commission cannot issue a license for a project within or affecting the state's coastal zone, unless the state CZMA agency concurs with the license applicant's certification of consistency with the state CZMA program. The state of Vermont does not have a CZMA program and, therefore, no coastal zone consistency certification is needed for this project.

¹⁰Section 18 of the FPA, 16 U.S.C. § 811, states: "The Commission shall require the construction, maintenance, and operation by a licensee at its own expense...such fishways as may be prescribed by the Secretary of Commerce or the Secretary of the Interior, as appropriate."

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RECOMMENDATIONS OF FEDERAL AND STATE FISH AND WILDLIFE AGENCIES

Section 10(j) of the FPA ¹¹ requires the Commission, when issuing a license, to include license conditions based on recommendations of federal and state fish and wildlife agencies, submitted pursuant to the Fish and Wildlife Coordination Act, to "adequately and equitably protect, mitigate damages to, and enhance, fish and wildlife (including related spawning grounds and habitat)" affected by the project.

No agency filed timely recommendations pursuant to Section 10(j). The staff evaluated VANR's comments concerning fish and wildlife resources that were filed on June 1, 1998, in the DEA under Section 10(a) because they were filed late. However, all of VANR's recommendations are included in the terms and conditions for this license.

COMPREHENSIVE PLANS

Section 10(a)(2) of the FPA ¹² requires the Commission to consider the extent to which a project is consistent with Federal and state comprehensive plans for improving, developing, or conserving waterways affected by the project. Under Section 10(a)(2), Federal and state agencies filed with the Commission 23 plans that address various resources in Vermont. Of these, I identified and reviewed 10 plans relevant to the project. ¹³ No inconsistencies were found.

¹¹16 U.S.C. § 803(j)(1).

¹²16 U.S.C. § 803.

¹³(1) Lake Champlain Fish and Wildlife Policy Committee and Technical Committee. 1981. A strategic plan for development of salmonid fisheries in Lake Champlain. Albany, New York. Waterbury, VT. 19 pp.; (2) Vermont Agency of Environmental Conservation. 1983. Vermont state comprehensive outdoor recreation plan, 1983-1988. Montpelier, VT. June 1983. 195pp. and appendices; (3) Vermont Agency of Environmental Conservation. 1986. Vermont Rivers Study. Waterbury, VT. 236pp.; (4) Vermont Agency of Natural Resources. Department of Environmental Conservation. 1988. Hydropower in Vermont: an assessment of environmental problems and opportunities. Waterbury, VT. May 1988. Two volumes; (5) Vermont Agency of Natural Resources. Department of Forests, Parks and Recreation. 1988. Vermont recreation plan. Waterbury, VT. 128 pp. Plus map, nine supplemental task group reports, and a 52-page resident recreation survey; (6) Vermont Agency of Natural Resources.

(continued...)

COMPREHENSIVE DEVELOPMENT

Sections 4(e) and 10(a)(1) of the FPA ¹⁴ require the Commission, in acting on applications for license, to give equal consideration to the power and development purposes and to the purposes of energy conservation, the protection, mitigation of damage to, and enhancement of fish and wildlife, the protection of recreational opportunities, and the preservation of other aspects of environmental quality. Any license issued shall be such as in the Commission's judgment will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all beneficial public uses. The decision to license this project, and the terms and conditions included herein, reflect such consideration.

In determining whether a proposed project will be best adapted to a comprehensive plan for developing a waterway for beneficial public purposes, pursuant to Section 10(a)(1) of the FPA, the Commission considers a number of public interest factors, including the economic benefits of project power.

Under the Commission's approach to evaluating the economics of hydropower projects, as articulated in Mead Corporation, Publishing Paper Division, ¹⁵ the Commission employs an analysis that uses current costs to compare the costs of the project and likely alternative power with no forecasts concerning potential future inflation, escalation, or deflation beyond the license issuance date. The basic purpose of the Commission's economic analysis is to provide a general estimate of the potential power benefits and the costs of a project, and reasonable alternatives to project power.

(...continued)

Department of Forests, Parks and Recreation. Wetlands Steering Committee. 1988. Wetlands component of the 1988 Vermont recreation plan. Waterbury, VT. July 1988. 43 pp.; (7) U.S. Fish and Wildlife Service. Canadian Wildlife Service. 1986. North American waterfowl management plan. Department of the Interior. May 1986. 19 pp.; (8) U.S. Fish and Wildlife Service. Undated. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, D.C. 11 pp.; (9) U.S. Fish and Wildlife Service. 1989. Final environmental impact statement--restoration of Atlantic Salmon to New England Rivers. Department of the Interior, New Corner, MA. May 1989. 88 pp.; and (10) National Park Service. 1982. The nationwide rivers inventory. Department of the Interior, Washington, D.C. January 1982. 432 pp.

¹⁴16 U.S.C. §§ 797(e) and 803(a)(1).

¹⁵72 FERC ¶ 61,027 (1995).

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The estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license.

An economic analysis of the Vergennes Project new license, as proposed by the staff, and based on current economic conditions, without future escalation or inflation, would produce an average of 9,455 MWh per year over a 30-year license period. The annual value of this energy is about \$286,700 (or about 30 mills per kilowatt-hour (mills/kWh) in 1998 dollars, based on the average cost of alternative capacity and energy in the region. The annual cost of producing this energy is about \$349,900 (or about 37 mills/kWh). Therefore, the project, with environmental measures, would produce power at an annual cost of about \$63,200 (or about 6.6 mills/kWh) more than the currently available alternative. However, based on the overall record in this proceeding, I conclude that it is in the public interest to license the project and leave to GMP the decision of whether or not to accept a license and to continue operating the project.

The FEA analyzes the effects associated with issuance of a new license for the Vergennes Project. The FEA recommends a variety of measures to protect and enhance the environmental resources, which are adopted, as discussed herein. Staff's recommended environmental measures were developed after considering the comments made by the state and federal resource agencies and other commenting entities.

Based on the review and evaluation of the project, as proposed by the Applicant, and with the additional staff-recommended environmental measures, I conclude that the continued operation and maintenance of the project in the manner required by the license, will protect and enhance fish and wildlife resources, water quality, recreational, aesthetic, and cultural resources. The electricity generated from renewable water power resources will be beneficial because it will continue to offset the use of fossil-fueled, steam-electric generating plants, thereby conserving nonrenewable resources and reducing atmospheric pollution and greenhouse effects. I, therefore, find that the Vergennes Project, with the recommended measures, is best adapted to a comprehensive plan for the use, conservation, and development of the waterway for beneficial public purposes.

I am requiring the licensee to implement at the Vergennes Project, the environmental measures summarized below:

(1) Operate the project in a run-of-river mode to protect and enhance water quality, fishery resources, and recreational resources (Article 401);

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(2) Operate the project in a manner that one generating unit of Plant 9 shall be given first priority for use of water diverted from Otter Creek for power production during the period from April 1 to June 15 (to protect walleye and lake sturgeon) and from September 15 to November 15 (to protect landlocked Atlantic salmon). Plant 9B shall commence operating only after flows through Plant 9 exceed 350 cfs (Article 402);

(3) Release minimum flows over the spillways at the Vergennes Project (Article 403);

(4) Develop a monitoring and operations plan to monitor run-of-river operations, first priority use of river flows to Plant 9, and aesthetic flow releases over Vergennes Falls (Article 404);

(5) Implement the provisions of the Programmatic Agreement (Article 405);

(6) Develop and implement a final recreation plan (Article 406); and

(7) Monitor recreation use of the project area (Article 407).

LICENSE TERM

Section 15 of the FPA ¹⁶ specifies that any license issued shall be for a term determined to be in the public interest, but the term may not be less than 30 years nor more than 50 years. The Commission's policy establishes 30-year terms for those projects that propose little or no redevelopment, new construction, new capacity, or enhancement; 40-year terms for those projects that propose a moderate amount of redevelopment, new construction, new capacity or enhancement; and 50-year terms for those projects that propose extensive redevelopment, new construction, new capacity or enhancement. ¹⁷

GMP is not proposing redevelopment of the project, nor am I requiring enhancement measures that would justify a longer term. Accordingly, the license for the Vergennes Project will have a term of 30 years.

SUMMARY OF FINDINGS

¹⁶16 U.S.C. § 808(e).

¹⁷See, City of Danville, Virginia, 58 FERC ¶ 61,318 (1992).

The FEA, issued on October 16, 1998, contains background information, analysis of impacts, support for related license articles, and the basis for a finding of no significant impact on the environment. The design of this project is consistent with the engineering standards governing dam safety. The project will be safe if operated and maintained in accordance with the requirements of this license. Analysis of related issues is provided in the Safety and Design Assessment, which is available in the Commission's public files for this project. Issuance of this license is not a major Federal action significantly affecting the quality of the human environment.

Based upon a review of the agency and public comments filed on the project, and staff's independent analysis pursuant to Sections 4(e) and 10(a)(2) of the FPA, I conclude that issuing a license for the Vergennes Project, with the required environmental measures and other special license conditions, would not conflict with any planned or authorized development, and would be best adapted to the comprehensive development of Otter Creek for beneficial public uses.

The Director orders:

(A) This license is issued to Green Mountain Power Corporation (licensee) to operate and maintain the Vergennes Project for a period of 30 years, effective June 1, 1999. This license is subject to the terms and conditions of the FPA, which is incorporated by reference as part of this license, and subject to the regulations the Commission issues under the provisions of the FPA.

(B) The project consists of:

(1) All lands, to the extent of the licensee's interests in those lands, enclosed by the project boundary shown by Exhibit G.

<u>Exhibit</u>	<u>FERC No.2674-</u>	<u>Showing</u>
1	1006	Project Boundary
2	1007	Project Boundary

(2) Project works consisting of: (a) three concrete overflow dams, each about 10 feet high, with a total length of 231 feet, having a crest elevation of about 132.78 feet above mean sea level (msl), surmounted by 1.5-foot-high flashboards, and a 29-foot-long, non-overflow dam; (b) an 8.8-mile-long, 133 acre surface area reservoir

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with a 200 acre-foot usable storage capacity at normal water surface elevation of 134.28 feet msl; (c) the north forebay with trashracks, headgates, and two, 7-foot-diameter steel penstocks; (d) the north powerhouse, known as Plant 9B, having a 1,000-kW generating unit; (e) the south forebay, with trashracks, headgates, two surge tanks, and two, 10-foot-diameter penstocks; (f) the south powerhouse, Plant 9, with two, 700-kw generating units; (g) the generator leads from Plant 9 to the Vergennes substation and the 950-foot-long, 2,400-volt overhead generator leads from Plant 9B to the Vergennes substation; and (h) appurtenant facilities.

The project works generally described above are more specifically shown and described by those portions of exhibits A and F shown below:

Exhibit A:

Sections (c) and (d), entitled Powerhouses and Substation/Transmission Lines, describing the existing mechanical, electrical and transmission equipment, filed on May 30, 1997, with the application for license.

<u>Exhibit F drawings</u>	<u>FERC No.2674-</u>	<u>Showing</u>
Sheet F-1	1001	Headworks Plan 9&9B
Sheet F-2	1002	9 Powerhouse Plan Elevation & Section
Sheet F-3	1003	9 Headworks Plan Elevation & Section
Sheet F-4	1004	9B Powerhouse Plan Elevation & Section
Sheet F-5	1005	9B Headworks Plan Elevation & Section

(3) All of the structures, fixtures, equipment, or facilities used to operate or maintain the project and located within the project boundary, all portable property that may be employed in connection with the project and located within or outside the project boundary, and all riparian or other rights that are necessary or appropriate in the operation or maintenance of the project.

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(C) The Exhibits A, F, and G described above are approved and made part of the license.

(D) This license is subject to all the articles, except Article 20, that are set forth in Form L-3 (October 1975), entitled "Terms and Conditions of License for Constructed Major Project Affecting Navigable Waters of the United States," and the following additional articles:

Article 201. The licensee shall pay the United States an annual charge for the purposes of reimbursing the United States for the cost of administering Part I of the Federal Power Act, as determined by the Commission. The authorized installed capacity for that purpose is 2,400 kilowatts.

Article 202. The licensee shall clear and keep clear to an adequate width lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes of the project which results from the clearing of lands or from the maintenance or alteration of project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. All clearing of the lands and disposal of the unnecessary material shall be done with due diligence and to the satisfaction of the authorized representative of the Commission and in accordance with appropriate Federal, State, and local statutes and regulations.

Article 203. Pursuant to Section 10(d) of the Federal Power Act, a specified reasonable rate of return upon the net investment in the project shall be used for determining surplus earnings of the project for the establishment and maintenance of amortization reserves. The licensee shall set aside in a project amortization reserve account at the end of each fiscal year one half of the project surplus earnings, if any, in excess of the specified rate of return per annum on the net investment. To the extent that there is a deficiency of project earnings below the specified rate of return per annum for any fiscal year, the licensee shall deduct the amount of that deficiency from the amount of any surplus earnings subsequently accumulated, until absorbed. The licensee shall set aside one-half of the remaining surplus earnings, if any, cumulatively computed, in the project amortization reserve account. The licensee shall maintain the amounts established in the project amortization reserve account until further order of the Commission.

The specified reasonable rate of return used in computing amortization reserves shall be calculated annually based on current capital ratios developed from an average of 13 monthly balances of amounts properly includible in the licensee's long-term debt and

proprietary capital accounts as listed in the Commission's Uniform System of Accounts. The cost rate for such ratios shall be the weighted average cost of long-term debt and preferred stock for the year, and the cost of common equity shall be the interest rate on 10-year government bonds (reported as the Treasury Department's 10-year constant maturity series) computed on the monthly average for the year in question plus four percentage points (400 basis points).

Article 204. If the licensee's project was directly benefitted by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement during the term of the original license (including extensions of that term by annual licenses), and if those headwater benefits were not previously assessed and reimbursed to the owner of the headwater improvement, the licensee shall reimburse the owner of the headwater improvement for those benefits, at such time as they are assessed, in the same manner as for benefits received during the term of this new license.

Article 205. Within 45 days of the date of issuance of the license, the licensee shall file three sets of aperture cards of the approved exhibit drawings. The sets must be reproduced on silver or gelatin 35mm microfilm and mounted on type D (3-1/4" x 7-3/8") aperture cards.

Prior to microfilming, the FERC Drawing Number (2674-1001 through 1007) shall be shown in the margin below the title block of the approved drawing. After mounting, the FERC Drawing Number must be typed on the upper right corner of each aperture card. Additionally, the Project Number, FERC exhibit (e.g., F-1, G-1, etc.), Drawing Title, and date of this license shall be typed on the upper left corner of each aperture card.

Two sets of aperture cards must be filed with the Secretary of the Commission. The remaining set of aperture cards shall be filed with the Commission's New York Regional Office.

Article 301. Within 90 days of completion of construction of facilities authorized by this license (recreational facilities), the licensee shall file for approval, revised Exhibits F and G to show those project facilities as-built.

Article 401. The licensee shall operate the project in a run-of-river mode for the protection and enhancement of water quality, fisheries, and recreational resources of Otter Creek.

The licensee shall at all times act to minimize the fluctuation of the reservoir surface elevation by maintaining a discharge from the project so that, at any point in time, flows, as measured immediately downstream from the project tailrace, shall equal instantaneous inflow to the project.

Run-of-river operation may be temporarily modified if required by operating emergencies beyond the control of the licensee, including to the extent necessary to facilitate flashboard replacement, or for short periods upon mutual agreement between the licensee and the Vermont Agency of Natural Resources. If the flow is so modified, the licensee shall notify the Commission as soon as possible, but no later than 10 days after each such incident.

Article 402. The licensee shall operate the Vergennes Project in a manner such that one generating unit of Plant 9 shall be given first priority for use of water diverted from Otter Creek for power production during the period from April 1 to June 15 (to protect walleye and lake sturgeon) and from September 15 to November 15 (to protect landlocked Atlantic salmon). The licensee shall bring one unit of Plant 9 on line first and provide a continuous outflow from Plant 9 at all times that the project is operating during these seasonal time periods. The licensee may commence operation of Plant 9B only after the flows through Plant 9 exceed 350 cfs. The licensee shall specify the operating rule for these two seasonal time periods in the operations and monitoring plan required in Article 404.

Article 403. The licensee shall release the following minimum flows over the spillways at the Vergennes Project for the protection and enhancement of aesthetic and recreational resources of Otter Creek:

<u>Period</u>	<u>Flow</u>
April 1 through October 31	
Daytime	150 cfs
Nighttime	75 cfs
November 1 through December 15	
Daytime	100 cfs
Nighttime	50 cfs

The licensee shall specify the distribution of these releases over the three spillways in the operations and monitoring plan required in Article 404. For the purpose of this article, daytime is defined as one-half hour before sunrise to one-half hour after

sunset. Nighttime is defined as one-half hour after sunset to one-half hour before sunrise.

These flows may be temporarily modified if required by operating emergencies beyond the control of the licensee, or for short periods upon mutual agreement between the licensee and the Vermont Agency of Natural Resources. If the flow is so modified, the licensee shall notify the Commission as soon as possible, but no later than 10 days after each such incident.

Article 404. Within 120 days of the date of issuance of the license, the licensee shall file with the Commission, for approval, a monitoring and operations plan to monitor run-of-river operations, first priority use of river flows to Plant 9, and aesthetic flow releases over Vergennes Falls as required respectively by Articles 401, 402, and 403.

The plan shall include, at a minimum;

- (1) a schedule for implementing the plan;
- (2) a schedule for installing all flow and water level measuring devices;
- (3) the identification of the planned locations of the flow measuring devices;
- (4) the method of data collection, including the design of each of the recording devices, and provisions for providing data to the regulatory agencies in a timely manner;
- (5) the identification of an operating rule for seasonally diverting water from Otter Creek to Plants 9 and 9B;
- (6) identification of the proposed apportionment of aesthetic flow releases over the three project spillways during the hours when the project is not operating;
- (7) the identification of flow management techniques to be used to address bypass flows and refill of the project impoundment during flashboard replacement; and

- (8) a schedule for providing the rating curves depicting the head-flow-to power relationship for the project to the Commission and to the Vermont Department of Environmental Conservation.

The licensee shall prepare the plan after consultation with the U.S. Geological Survey, the Vermont Department of Environmental Conservation, and the City of Vergennes. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Article 405. Upon the effective date of this license, the licensee shall implement the "Programmatic Agreement Among the Federal Energy Regulatory Commission, the Advisory Council on Historic Preservation, and the Vermont State Historic Preservation Officer for Managing Historic Properties That May Be Affected By A License Issuing to Green Mountain Power Corporation For the Continued Operation and Maintenance of the Vergennes Hydroelectric Power Project in Vermont," executed on February 4, 1999, including but not limited to the Cultural Resources Management Plan (CRMP) for the project. In the event that the Programmatic Agreement is terminated, the licensee shall implement the provisions of its approved CRMP. The Commission reserves the authority to require changes to the CRMP at any time during the term of the license. If the Programmatic Agreement is terminated prior to Commission approval of the CRMP, the licensee shall obtain Commission approval before engaging in any ground-disturbing activities or taking any other action that may affect any Historic Properties within the project's Area of Potential Effect.

Article 406. Within 60 days of the date of issuance of the license, the licensee shall develop and file a final recreation plan for Commission approval, that includes provisions for, but not necessarily limited to, the following:

- (1) installation of directional and interpretive signs for recreation in the project area;

- (2) improved access for small boats and parking at Settlers Park;
- (3) improved trail, shoreline fishing access, vegetative plantings, and picnic area along the western bank near Plant 9;
- (4) construction of a disabled-accessible fishing platform on the western bank near Plant 9;
- (5) installation of portable toilet facilities (including disabled-accessible facilities); and
- (6) installation of signs interpreting the history of Vergennes Falls and the surrounding historic structures.

The licensee shall develop the final recreation plan in conjunction with the Cultural Resources Management Plan required in Article 405, so that recreational improvements do not conflict with the cultural resources in the project area. The licensee shall construct the facilities after consultation with the Vermont Agency of Natural Resources, the Vermont Division for Historic Preservation, and the City of Vergennes. These facilities shall be shown on as-built drawings filed pursuant to this license.

The licensee shall include with the recreation plan a construction schedule, the entity responsible for operation and maintenance of the facilities, costs for the construction and yearly maintenance of each facility, a discussion of how the recreational facilities are visually compatible with the project area, a description of erosion control measures to be used during construction, documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments and recommendations are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment on the plan before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the recreation plan. Upon Commission approval, the licensee shall implement the recreation plan, including any changes required by the Commission.

Article 407. The licensee, after consultation with the Vermont Agency of Natural Resources, the Vermont Division for Historic Preservation, and the City of Vergennes (City), shall monitor recreation use of the project area in the vicinity of the Plant 9

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tailrace to determine whether existing parking related to recreational use in the tailrace area is adequate. Monitoring shall begin within six years of the issuance of this license and be reported to the Commission in accordance with Section 8 of the Commission's regulations (18 CFR § 8.11), which requires the filing of "FERC Form No. 80." The report shall include:

- (1) annual recreational use figures for the vicinity of the Plant 9 tailrace;
- (2) a discussion of the adequacy of the licensee's parking facilities in the Plant 9 vicinity to meet recreation demand, including a discussion regarding the need to provide additional or improved parking at the site;
- (3) a description of the methodology used to collect all data;
- (4) if there is a need for additional or improved parking facilities, a plan proposed by the licensee to accommodate parking needs at the site;
- (5) documentation of consultation with the Vermont Department of Natural Resources, the Vermont Division for Historic Preservation, and the City; and
- (6) specific descriptions of how the agencies' and the City's comments are accommodated by the report.

The licensee shall allow a minimum of 30 days for the agencies and the City to comment and to make recommendations prior to filing the report with the Commission.

Article 408. Within 120 days of the date of issuance of the license, the licensee shall file with the Commission, for approval, a debris disposal plan for the Vergennes Project. The plan shall provide for the proper disposal of debris associated with project operation, including trashrack debris.

The licensee shall prepare the plan after consultation with the Vermont Department of Environmental Conservation. The licensee shall include with the plan documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agency, and specific descriptions of how the agency's comments are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agency to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the plan. Upon Commission approval, the licensee shall implement the plan, including any changes required by the Commission.

Article 409. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee also shall have continuing responsibility to supervise and control the use and occupancies for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article.

If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee shall take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and water for which the licensee may grant permission without prior Commission approval are:

- (1) landscape plantings;
- (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 watercraft at a time and where said facility is intended to serve single-family type dwellings; and
- (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee shall require multiple use and occupancy of facilities for access to project lands or waters. The licensee shall also ensure, to the satisfaction of the

Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee shall: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the reservoir shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of, project lands for: (1) replacement, expansion, realignment, or maintenance of bridges and roads for which all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69 kilovolts or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project reservoir.

No later than January 31 of each year, the licensee shall file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed. If no conveyance was made during the prior calendar year, the licensee shall inform the Commission and the Regional Director in writing no later than January 31 of each year.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all

necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 watercraft at a time and are located at least one-half mile from any other private or public marina; (6) recreational development consistent with an approved Exhibit R or approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from the edge of the project reservoir at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year.

At least 45 days before conveying any interest in project lands under this paragraph (d), the licensee must submit a letter to the Director, Office of Hydropower Licensing, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked exhibit G or K map may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Director, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

(1) Before conveying the interest, the licensee shall consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee shall determine that the proposed use of the lands to be conveyed is not inconsistent with any approved exhibit R or approved report on recreational resources of an exhibit E; or, if the project does not have an approved exhibit R or approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include the following covenants running with the land: (i) the use of the lands conveyed shall not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; and (ii) the

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grantee shall take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project.


(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised exhibit G or K drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project shall be consolidated for consideration when revised exhibit G or K drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article shall not apply to any part of the public lands and reservations of the United States included within the project boundary.

(E) The licensee shall serve copies of any Commission filing required by this order on any entity specified in this order to be consulted on matters related to that filing. Proof of service on these entities must accompany the filing with the Commission.

(F) This order is issued under authority delegated to the Director and constitutes final agency action. Requests for rehearing by the Commission may be filed within 30 days of the date of issuance of this order, pursuant to 18 C.F.R. Section 385.713. The filing of a request for rehearing does not operate as a stay of the effective date of this order or of any other date specified in this order, except as specifically ordered by the Commission. The licensee's failure to file a request for rehearing shall constitute acceptance of this order.


J. Mark Robinson
Director
Division of Licensing and Compliance

Appendix A

Water Quality Certification for the Vergennes Project (FERC No. 2674), Issued by the Vermont Department of Environmental Conservation on April 15, 1999.

Water Quality Certification (33 U.S.C. §1341)

In the matter of: Green Mountain Power Corporation
 25 Green Mountain Drive
 P.O. Box 850
 South Burlington, Vermont 05402

APPLICATION FOR VERGENNES HYDROELECTRIC PROJECT

The Water Quality Division of the Vermont Department of Environmental Conservation (the Department) has reviewed a water quality certification application filed by Green Mountain Power Corporation (the applicant) for the Vergennes Hydroelectric Project. The application was originally filed in May 1997; the application was subsequently withdrawn and refiled with the Department by letter dated April 28, 1998. The application was reviewed under the Vermont Water Quality Standards adopted by the Water Resources Board on April 2, 1997, in accordance with Section 1-01(A) *Applicability*. The application includes the applicant's Federal Energy Regulatory Commission (FERC) license application, filed with FERC under a cover letter dated May 29, 1997.

The Department held a public hearing on April 7, 1999 under the rules governing certification and received testimony during the hearing and, as written filings, until April 12, 1999. Attached as Appendix A is a copy of the Department's responsiveness summary.

The Department, based on the application and record before it, makes the following findings and conclusions:

I. Background/General Setting

1. Otter Creek, Vermont's longest river, flows about one hundred miles from its source at Emerald Lake in Dorset to its mouth at Lake Champlain in Ferrisburgh. The river has been heavily developed for hydroelectric power generation, hosting

seven active dams on the mainstem. Vergennes Dam is the lowest dam in the system, and the only one owned and operated by the applicant. The other dams are owned by Central Vermont Public Service Corporation (CVPS) and OMYA, Inc. The Vergennes Electric Company developed this site in 1911-12 for the Burlington Traction Company, which produced electricity to operate Burlington's trolley system. The Vergennes Electric Company was acquired by a holding company, Peoples Light and Power Corporation, in 1926, and that corporation later became Green Mountain Power Corporation.

2. Vergennes Dam is located at a large natural cascade located at River Mile 7.4, directly downstream of the Vermont Route 22A bridge. The civil works are located entirely within the City of Vergennes. The project impounds a reach of river almost nine miles in length, about three quarters of the way up to the Weybridge hydroelectric dam (River Mile 19.5; normal tailwater elevation 143.3 feet NGVD), which is operated by CVPS. All but nine feet of the total drop (about 46 feet) from the CVPS dam's tailwater to Lake Champlain is harnessed for electrical production by the Vergennes Project.
3. Of Otter Creek's 936 square mile watershed, the project utilizes runoff from an area of 866 square miles.
4. The Federal Energy Regulatory Commission licensed the project on June 29, 1979, with the term of the license running from June 1, 1949 through May 29, 1999. Federal jurisdiction over the project was determined based on the Commission having found in 1965 that the Otter Creek is a navigable waterway.

II. Project and Civil Works

5. The project has powerhouses located on both riverbanks. The main plant, Plant 9, is on the south bank. The powerhouse, built in 1911, is a two-story brick structure. Water is transported about 110 feet to the powerhouse via two 10-foot diameter concrete-encased penstocks that transition into two 9-foot diameter steel penstocks. The powerhouse contains its two original Holyoke Machine Company horizontal Francis turbines, each driving generators with a capacity of 700 kW. The net head at the powerhouse is estimated at 35 feet, reflecting a loss of about two feet from the static head. The penstock entrances are protected by a trashrack 19 feet in length, with a clear spacing between the bars of one inch.
6. Powerhouse 9B, a 1943 reinforced concrete structure, contains a single James Leffel & Company vertical Francis turbine that drives a 1,000 kW generator. From the forebay, two 7-foot steel penstocks carry water to the turbine. The

penstock entrance is protected by a trashrack 16 feet in length and 14 feet high, with a clear spacing between the bars of two inches.

7. The existing dam consists of three concrete overflow sections and one concrete non-overflow section spanning the riverbanks and two midstream islands. The south island is occupied by an abandoned grist mill and a storage building. A pump house formerly used by the municipal water system is located on the smaller north island. The spillway connecting the two islands is 60 feet long, with a crest elevation of 132.78 feet NGVD. An 84-foot section of spillway, crest elevation of 132.52 feet NGVD, connects the Plant 9B forebay with the pumphouse island. The southern spillway, 87 feet in length with a crest elevation of 132.49 feet NGVD, connects the grist mill island with the Plant 9 forebay. Flashboards 1.5 feet in height are normally maintained on the spillways to raise the full impoundment height to elevation 134.28 feet NGVD. Due to the differences in the spillway crest elevations, this results in the side spillway flashboard being set about three inches lower than the center spillway boards. The channel entrance losses for the two plants result in the local headpond elevation being lower by the three-inch difference, so the headpond is maintained at the top of the center flashboards without spillage occurring over the lower side spillway flashboards. The flashboards on the north and south spillways generally fail when overtopped by 2.0 - 2.5 feet of water.
8. The headpond is normally cycled for generation over the 1.5 foot range created by the flashboards. The bedrock formation directly upstream of the dam prevents the headpond from being drawn more than about half a foot below the concrete crest. The average elevation of the bedrock profile at the Vermont Route 22A bridge is about 130 feet NGVD (*Application for License for Major Water Power Project 5 Megawatts or Less for the Vergennes Hydroelectric Project, FERC No. 2674, May 1997, vol. 1, p. E(4)-6*). The headpond is contained within the riverbanks. When full, the headpond has a surface area of about 133 acres and provides about 200 acre-feet of useable storage.
9. The two stations are operated independently. Plant 9B is operated remotely from the applicant's Colchester dispatch center. Plant 9 is a manned station. Personnel adjust the units as necessary during the day; when they leave at the end of the day, the units are left with a fixed gate position, and the dispatch center controls the project discharge via Plant 9B.
10. The plant, with its total installed capacity of 2,400 kW, produces an average annual output of 10,288,000 kWh based on records from 1967 to 1992.

III. River Hydrology and Streamflow Regulation

11. The flow of Otter Creek is regulated by several of the hydroelectric facilities in the basin. Four hydroelectric dams are located on the river mainstem between Vergennes and Middlebury. Starting at Vergennes and going upstream, the four are Weybridge (River Mile 19.5), Huntington Falls (River Mile 21.0), Beldens (River Mile 23.0), and Middlebury Lower (River Mile 24.7). The Weybridge and Middlebury Lower projects are owned by CVPS and are currently going through federal relicensing, lagging the Vergennes Project by about one year. The Huntington Falls and Beldens facilities are owned by OMYA, Inc. and were redeveloped under a license amendment issued in 1986 to increase the installed capacity at both facilities.
12. The Beldens and Huntington Falls plants are operated as strict run-of-the-river facilities. As such, they no longer regulate flows to preferentially generate on peak. CVPS proposes to operate the Middlebury Lower facility to a strict run-of-the-river operation under its new license. The utility, however, proposes to maintain a daily cycle operation at the Weybridge facility except during the spring period, April 15 - June 15. As proposed, the station would maintain a minimum release of 250 cfs; during generation, releases would vary from the single turbine's capacity range of 450 cfs to 1,600 cfs, plus the 125 cfs to be maintained as a bypass flow. (*Application for New License for Major Project (5 MW or Less) - Weybridge Project*, May 1994, Volume I)
13. Other dams in the basin also influence flows at Vergennes. CVPS operates seasonal storage reservoirs at Chittenden Dam and Goshen Dam, in the East Creek and Leicester River watersheds, respectively. Because these dams control only a minor portion of the watershed, the effect on flows in the lower portion of the Otter Creek basin are slight.
14. The Vergennes Project historically has operated as a daily cycle plant with a 1.5-foot operating cycle behind the flashboards. Plant 9 has a hydraulic range of about 140 cfs (single unit at minimum capacity) to 700 cfs (two units at 350 cfs maximum); Plant 9B's single unit has a range of about 200 cfs to 480 cfs. Combined total capacity is about 1,180 cfs. With impoundment cycling, the project has theoretically been able to utilize all flows in a range of 0 to 1,180 cfs. Higher flows are spilled.
15. Under the existing operating rule, one of the units in Plant 9 is used for operation when the generation flow is less than 200 cfs. From 200 cfs to 480 cfs, the Plant 9B unit is used for generation. When generation flows exceed 480 cfs, one of

Plant 9 units is brought on line, and the Plant 9B unit is adjusted to match the flow. For generation flows in excess of 830 cfs, all three units are on line.

16. Since 1903, the U.S. Geological Survey has operated a surface water gaging station (No. 04282500) on Otter Creek in Middlebury. The gage records flows from 73% of the watershed above Vergennes. Based on the gage, the following flow statistics can be estimated for the Vergennes site:

Mean annual flow	1,380 cfs
Annual runoff	21.64 inches
10% exceeds	3,200 cfs
50% exceeds	870 cfs
90% exceeds	360 cfs
7Q10	216 cfs

17. Backwater from Lake Champlain influences the lower reach of Otter Creek up to Vergennes Falls. Lake levels historically have varied over a range of elevations from about 93 feet NGVD to 101 feet NGVD. During a typical year, the lake elevation varies from its spring high of 99 feet NGVD to its fall low of 94 feet NGVD. The minimum riverbed elevation at the project tailraces is 89 feet NGVD. Water levels below the Falls are dependent on the lake level and the river flow; measurements taken by the applicant during 1996 indicate that the project tailwater elevation is ranges from about 0.5 feet to 1.5 feet higher than the lake level.

Applicant proposal for relicensing:

18. The applicant proposes to operate the Vergennes Project as a strict run-of-the-river project. Effectively, this would result in the project maintaining a stable headpond and passing the flows received from the upstream Weybridge Hydroelectric Project without reregulation. Channel storage between the two dams and the influence of the Lemon Fair River, a major intervening tributary of Otter Creek with 89 square miles of watershed area, would tend to dampen Weybridge's peaking effects.
19. The applicant would maintain spillage over the spillways to support aesthetics using the following schedule:

April 1 - Oct. 31	150 cfs daytime and 75 cfs nighttime
Nov. 1 - Dec. 15	100 cfs daytime and 50 cfs nighttime

Dec. 16 - March 31 No special flows

Daytime would be defined as half an hour before sunrise to half an hour after sunset.

20. The relicensing of projects upstream of Vergennes will require all stations to maintain conservation flows. Based on the gage data, extreme drought conditions are on the order of 200-250 cfs. With a project minimum turbine capacity of 140 cfs and the proposed bypass flow schedule, the project will be able to utilize almost all flows less than its maximum capacity of 1,180 cfs.
21. The applicant proposes to automate Plant 9 so that it can be operated remotely similar to Plant 9B.

IV. Standards Designation

22. Otter Creek has been designated by the Vermont Water Resources Board as Class B waters. The Water Resources Board has also designated the entire reach from Huntington Falls Dam to Lake Champlain as warm water fish habitat.
23. Class B stream reaches are managed to achieve and maintain a high level of quality compatible with certain beneficial values and uses. Values are high quality habitat for aquatic biota, fish and wildlife and a water quality that consistently exhibits good aesthetic value; uses are public water supply with filtration and disinfection, irrigation and other agricultural uses, swimming, and recreation. (Standards, Section 3-03(A) *Class B Waters: Management Objectives*)
24. The dissolved oxygen standard for warm water fish habitat streams is 5 mg/l and 60 percent saturation at all times. Depending on ambient stream temperature conditions, the temperature standard limits increases to values between 1.0 and 5.0 deg F from background. (Standards, Section 3-01(B)(2) *Temperature*) The turbidity standard is 25 NTU. (Standards, Section 3-03(B)(1) *Turbidity*)
25. Under the general water quality criteria, all waters, except mixing zones, are managed to achieve, as in-stream conditions, aquatic habitat with "[n]o change from background conditions that would have an undue adverse effect on the composition of the aquatic biota, the physical or chemical nature of the substrate or the species composition or propagation of fishes." (Standards, Section 3-01(B)(5) *Aquatic Habitat*)

26. Standards Section 2-02(B) *Hydrology: Artificial Flow Conditions* requires that "[t]he flow of waters shall not be controlled or substantially influenced by man-made structures or devices in a manner that would result in an undue adverse effect on any existing use, beneficial value or use or result in a level of water quality that does not comply with these rules." The project dam is a man-made structure that artificially regulates water levels and streamflows.

Present status:

27. By letter dated December 30, 1998, the Department issued, under Section 303(d) of the Federal Clean Water Act, a list of waters considered to be impaired based on water quality monitoring efforts. The so-called "Part A" list indicates that Otter Creek, for the seven mile reach below the Vergennes municipal wastewater treatment facility, has a contact recreation (eg. swimming) impairment due to pathogens that enter the river from periodic treatment lagoon overflows. The reach from the project dam to Lake Champlain is also impaired by mercury contamination, which affects fish consumption.
28. Also by letter dated December 30, 1998, the Department issued a draft four-part list, *List of Priority Surface Waters*. Part F lists those surface waters where water quality or habitat are being altered by flow regulation, obstructions, and other water level manipulations. The reach directly below Vergennes Dam, including Vergennes Falls, is listed for flow impacts on aesthetics and aquatic life support.

V. Water Chemistry

29. Pursuant to requests by the Agency and the U.S. Fish and Wildlife Service, the applicant sampled dissolved oxygen and temperature weekly through the summer of 1996 (June 25 through August 27), at and upstream of the dam. Available data from this study and an earlier 1982 study completed by the Department suggested that dissolved oxygen standards are met on the Lower Otter Creek. Unfortunately, the data had several shortcomings related to the lack of critical low-flow conditions and collection during daylight hours, when algal photosynthetic oxygen production becomes a major influence on the dissolved oxygen regime.
30. The applicant, therefore, performed additional water quality sampling of dissolved oxygen and temperature conditions at the project during the summer of 1997. This data was filed with the Department by letter dated February 2, 1998. Compared to the 1996 data set, the 1997 data was collected during flow conditions that better reflected critical water quality conditions. All samples conformed to the dissolved oxygen standards applicable to warm water fish habitat. During the lowest flows

experienced during summer sampling (about 260 cfs, or 20% above the 7Q10 flow, on August 8, 1997 at 0500), the dissolved oxygen concentration directly upstream of the dam was at saturation (8.7 mg/l). On August 17 at 0515, a sample collected at the same station measured 8.0 mg/l, or 87% saturation.

VI. Aquatic Biota and Habitat

31. Class B waters are managed for high quality habitat for aquatic biota (Standards Section 3-03(A) Class B Waters: Management Objectives). Aquatic biota are defined in Standards Section 1-01(B) Definitions as "organisms that spend all or part of their life cycle in or on the water." Included, for example, are fish, aquatic insects, amphibians, and some reptiles, such as turtles.
32. Otter Creek is managed to support both cold water and warm water fish. Fish found between Weybridge and Vergennes dams include northern pike, perch, smallmouth bass, brown trout, pan fish, and minnows. Northern pike are especially abundant. Downstream of Vergennes, the river is influenced by Lake Champlain and is managed as part of the overall Champlain ecosystem. Fish found in this reach include the state-listed endangered lake sturgeon (*Acipenser fulvescens*), landlocked Atlantic salmon, steelhead rainbow trout, walleye, pike, and bass.
33. Lake sturgeon use has been documented through sightings and records of the fish having been caught by anglers. Since sightings are generally in the spring, that has been interpreted as evidence that the fish are continuing to exhibit spawning behavior. The fish is being considered for listing as federally endangered.
34. As part of New York State and Vermont's salmonid fishery development plant for Lake Champlain, both steelhead and salmon are stocked downstream of Vergennes Dam. A fishery for these two species exists at the base of the Falls and downstream. There may also be some level of spawning use in this reach.
35. Small spawning runs of walleye enter Otter Creek in the early spring. The most suitable spawning habitat is believed to be nearest the Falls. Post-spawn walleyes also use the lower Otter Creek for feeding, and this use provides an important fishery from mid-May through much of June.
36. An angler survey completed by the applicant indicated that anglers preferred the bass fishery, the spring walleye fishery, and the fall salmon fishery. The most common access was found to be directly below the two powerhouses, with most

use occurring on the Plant 9 side of the river. Anglers showed a preference for fishing during flow releases.

37. Lower Otter Creek also contains a rich diversity of mussel species. On August 15 and 16, 1996, the applicant completed a mussel survey below the dam at the same time it completed substrate mapping. Due primarily to the lack of unconsolidated substrates, there was an absence of live mussels in the first 200 feet below the Falls. Mussels were found to be most common in the Vergennes Falls Park area and across from the city dock. A total of 115 live specimens were found, with the dominant species of the seven being the eastern elliptio (*Elliptio complanata*). Small numbers of three rare species were found: fragile papershell (*Leptodea fragilis*), pink heelsplitter (*Potamilus alatus*), and pocketbook mussel (*Lampsilis ovata*). The Vermont Endangered Species Committee has recently recommended these species for listing as endangered. Another species found at Vergennes, the giant floater (*Pyganodon grandis*), was also found; the Committee is proposing this species for listing as threatened. A state-threatened species found in the late 1970s, black sandshell (*Ligumia recta*) was not recovered; this mussel species is now proposed for listing as endangered. Shells of fluted-shell (*Lasmigona costata*) were also found during the applicant's survey; this species is also proposed for listing as endangered.
38. Plant operations were determined to have very little effect on the distribution of mussels downstream. Mean column velocity measurements were taken at several locations where mussels were found, and the velocities were very low even with the powerhouse operating at a high discharge. The river channel directly below Vergennes Falls is about 500 feet wide and several feet deep. The large waterway area results in the current quickly dissipating below the project tailraces.

Flow needs for fish protection

39. The conversion of the project to a true run-of-the-river operation, with instantaneous inflow equaling instantaneous outflow, reduces the potential project impacts on downstream aquatic habitat. Substrate mapping information obtained by the applicant indicated that the best spawning substrate for walleye and sturgeon exists near the Plant 9 tailrace. The applicant's angler survey data and results from past electrofishing done by the Department of Fish and Wildlife suggests that fish are preferentially attracted to the Plant 9 tailrace when that station is operating. In fact, when neither plant is operating or when only Plant 9B is operating, a relatively small number of salmon are caught when electrofishing is done during the fall run.

40. Based on this information, the applicant has proposed giving Plant 9 first call status during the spring and fall fish runs. Plant 9 would be brought on line first and maintained on line at all times that the project is operating during the seasonal time periods. The time periods under this proposal are April 1 through June 15 and September 15 through November 15.

Fish passage/movement

41. Historically, migratory fish from Lake Champlain ascended many of its tributaries to access spawning waters. To meet the goals of the bistate plan for the development of the Lake's salmonid fishery (*A Strategic Plan for Development of Salmonid Fisheries in Lake Champlain*, NYS Department of Environmental Conservation, October 4, 1977), upstream and downstream passage provisions are being sought at dams on certain Lake tributaries. In Vermont, the Winooski River and the Lamoille River are included in this effort; however, this initiative has not been extended to Otter Creek as the other tributaries present a better opportunity for coldwater fish spawning.
42. Fish injury and mortality due to intake entrainment and trashrack impingement has been investigated. The entrance at Plant 9B was found to present the highest risk due to the faster approach velocity and the larger 2-inch clear spacing between the bars in the trashrack. An approach velocity of 2.6 fps was estimated at a six-inch distance from the rack. As part of the relicensing, the applicant states that consideration will be given to using racks with a one-inch clear spacing at such time as the racks need replacement (*Application for License for Major Water Power Project 5 Megawatts or Less for the Vergennes Hydroelectric Project*, FERC No. 2674, May 1997, vol. 1, p. E(3)-37).

VII. Wildlife and Wetlands

43. Extensive wetlands are associated with the reach of Otter Creek below Vergennes Falls. From the river mouth upstream five miles is a wetland complex designated as the Otter Creek Marsh Wildlife Management Area. The complex includes approximately 1,500 acres of shallow to deep marsh habitat. Dead Creek, a major tributary, enters Otter Creek from the south about half way up the five-mile section.
44. Based on the National Wetland Inventory maps, thirty Class Two wetlands comprising about 50 acres in total area border the impoundment from the City of Vergennes up to the Lemon Fair confluence. The surrounding land use in this area is predominately agricultural. Little if any forested areas remain along this reach of Otter Creek. Most of these wetlands in the impoundment area are emergent, probably dominated by cattails, rushes and sedges. Many areas along the shoreline

of Otter Creek do not have a buffer except for these wetlands. The wetlands filter water from agricultural land runoff before it enters the Otter Creek and act as habitat for wildlife and fish.

45. Due to the proposal to convert the project to run-of-the-river operation, no site specific wetland assessments of the area were completed for this project. Conversion of the project to run-of-the-river will stabilize the water level during normal operations and provide an opportunity for wetlands to become more diverse.

VIII. Rare and Endangered Plants and Animals; Outstanding Natural Communities

The Vermont Endangered Species Law (10 V.S.A. § 5401 to 5403) governs activities related to the protection of endangered and threatened species.

46. As discussed above, the reach below Vergennes Falls provides habitat for several mussel species that are proposed for state listing as endangered or threatened and for the state-endangered lake sturgeon. The relatively recent introduction of zebra mussels in Lake Champlain is a particular concern with respect to the maintenance of populations of the native mussel species.
47. The downstream wetlands contains several rare plant species. Green dragon (*Arisaema dracontium*), last found in the Otter Creek Marsh in 1993, is listed as threatened.

IX. Shoreline Erosion

48. Shoreline reconnaissance for bank erosion problems was completed in September 1996. Under full reservoir conditions, the impoundment depth varies from about 6 to 8 feet upstream of the Vermont Route 22A bridge to less than 3 feet at the upstream project limits, about 8.8 miles from the dam.
49. Cultivated farmland borders the mid and upper sections of the impoundment.
50. The river courses through soils that are classified as Vergennes series in the U.S. Department of Agriculture Soil Survey system. These soils are moderately well drained clays with low permeability and moderate to high erosion potential.
51. During the reconnaissance work, observations were made with the impoundment level set at the spillway crest. Erosion problems were predominantly found in the mid-to-upper portions of the impoundment. Shoreline erosion in the 1.5-foot

operating zone was found to consist primarily of minor laminations within the clayey soils of the riverbank and ice scour that has exposed tree root systems. The investigators concluded that these conditions are typical for streams of this type and unrelated to the impoundment cycling. The most significant erosion stemmed from agricultural use, including cattle paths, cropland management, and lack of vegetative buffers, and from the normal meander progression associated with alluvial streams.

X. Recreational Use

52. The reach of Otter Creek below Vergennes Falls is heavily used for recreation. The City of Vergennes maintains Vergennes Falls Park, which is located on the south bank a short distance below Plant 9. The 6.5-acre park provides a boat ramp, a picnic area, walking paths, and shoreline fishing. On the opposite side of the river, the municipality manages MacDonough Park, which includes a boat docking facility. The facility serves boat traffic to and from Lake Champlain. On the north bank upstream of Vermont Route 22A, the applicant furnishes carry-on boat access and parking at Settlers Park. The applicant also provides directional signage for portaging the dam.
53. The project area contains many historic and archeological resources related to Vergennes' rich history from the War of 1812 through the Industrial Age. The pumphouse on Pumphouse Island dates from 1874 and still houses the waterworks' original Flanders pump; restoration of the pumphouse is underway with assistance from the applicant. Norton Grist Mill (1877), with its former stable, is located on the other island; the mill is owned by the applicant, and repair and stabilization of the mill is included as part of the relicensing proposal.
54. The applicant proposes to complete several recreational improvements as part of the relicensing. Bank fishing access will be improved downstream of Plant 9 with the construction of a fishing platform that will meet Americans with Disabilities Act guidelines. This area will be linked with Vergennes Falls Park through construction of a shoreline path. The Settlers Park boat launch will be made more functional. Additional directional and interpretative signs will be installed; the interpretative signs will include information on the history of the Falls and its development.
55. The district fisheries biologist from the Department of Fish and Wildlife raised a concern that over time the parking on the south side of the river may become inadequate to serve the increasing number of anglers during the walleye run in the

spring. The applicant agreed to continue to monitor use as part of the FERC Form 80 process.

XI. Aesthetics

56. Vergennes Falls is segmented by the two islands into three cascades. These cascades are highly visible from several downstream vantage points, including Vergennes Falls Park and McDonough Park. Measured against natural conditions, past operation, especially with Plant 9B's construction in 1943, has resulted in a substantial loss of spillage over the Falls. With its total hydraulic capacity of 1,180 cfs, the project is able to utilize all of the river flow about two thirds of the time during an average year. During the summer recreational period, June - August, the project is able to prevent spillage over 80% of the time.
57. A special aesthetics flow study, including videotaping, was completed on October 14, 1996 to determine an appropriate level of spillage to restore the aesthetics value of the Falls. A study team comprised of the Vergennes city manager, personnel from the Department, Green Mountain Power Corporation, and the utility's consultant, Gomez and Sullivan Engineers. From four downstream locations, the team completed a qualitative evaluation of a range of special flow releases over the three spillway sections, which were rated individually and collectively at each flow. Observations were made looking at successively lower flows. For each target flow, the true flow rate varied somewhat over the observation period. Also, the end of the observations, it became apparent that the center spillway, although shorter, was discharging more water. The localized drawdown at the entrance channels for the two plants was responsible for reducing the spillage depths over those two spillways relative to the center spillway. The observation flows are shown in the following table.

Table 1. Flows (cfs) observed during aesthetics flow study and consensus ratings.

Vergennes Falls Spillway Consensus Ratings				
300	271-327	78-104 G G+ N G	117-129 G G+ G G	70-94 G+ G+ G G-
200	262-274	72-97 G G+ N G+	117-123 G G+ G G	70-75 G+ G+ G+ G-
150	192-223	50-67 G G+ N G+	93-103 G+ G+ G G-	49-54 G+ G+ G G-

100	146-167	31-40 G G N G	78-88 G G G G-	35-39 G G G- G-
50	100-113	19-23 F G- N F+	63-68 G- G- G F+	17-22 G- G- F- F+

Ratings are from four vantage points: in order, Vergennes Falls Park, McDonough Park, below Plant 9B, and below Plant 9. Ratings are Poor, Fair, Good, Excellent, and Not Visible. Where there was a split rating, the higher one is used (eg. G- to G is called G).

58. Aesthetic value was rated from poor to excellent, and judgements were made as to whether the change in value between flows was significantly worse, worse, the same, better, or significantly better. All team members agreed that a substantial reduction in aesthetic values occurred when flows dropped from the target flows of 100 cfs to 50 cfs. The team judged the aesthetic value as having diminished slightly when flows were reduced from the target of 150 cfs to 100 cfs. Department staff on the team were of the opinion that aesthetics was enhanced when target flows increased above 150 cfs, but only slightly. As indicated in Finding 19 above, the primary aesthetics flow proposed by the applicant is 150 cfs. This flow would be provided during the daylight hours from April through October.
59. As part of relicensing, the applicant will be improving the appearance of the Norton Grist Mill. Work will include installing period-appropriate window sash in the building where windows have been removed and replaced with plywood. The historic building is a prominent structure in the Vergennes Falls setting.

XIII. State Comprehensive River Plans

The Agency, pursuant to 10 V.S.A. Chapter 49, is mandated to create plans and policies under which Vermont's water resources are managed and uses of these resources are defined. The Agency must, under Chapter 49 and general principles of administrative law, act consistently with these plans and policies, whenever possible.

Hydropower in Vermont, An Assessment of Environmental Problems and Opportunities (May 1988)

60. The Department publication *Hydropower in Vermont, An Assessment of Environmental Problems and Opportunities* is a state comprehensive river plan. The hydropower study, which was initiated in 1982, indicated that hydroelectric development has a tremendous impact on Vermont streams. Artificial regulation of natural stream flows and the lack of adequate minimum flows at the sites were

found to have reduced to a large extent the success of the state's initiatives to restore the beneficial values and uses for which the affected waters are managed.

61. With respect to the Vergennes Hydroelectric Project, the plan recommended that additional studies be completed with respect to five topics: dissolved oxygen, potential for dewatering of downstream habitat during low lake levels, extent and cause of impoundment siltation, status of recreational development, and need for spillage for aesthetics. All of these topics were considered in relicensing studies at the Department's request.

1993 Vermont Recreation Plan

62. The *1993 Vermont Recreation Plan* (Department of Forests, Parks and Recreation), through extensive public involvement, identified water resources and access as top priority issues. The planning process disclosed that recreational use of surface waters is increasing, resulting in greater concern about water quality, public access to Vermont's waters, and shoreland development.

63. The Water Resources and Access Policy is:

It is the policy of the State of Vermont to protect the quality of the rivers, streams, lakes, and ponds with scenic, recreational, cultural and natural values and to increase efforts and programs that strive to balance competing uses. It is also the policy of the State of Vermont to provide improved public access through the acquisition and development of sites that meet the needs for a variety of water-based recreational opportunities.

64. Enhancement of access and improved flow management would be compatible with this policy and balance the competing uses of recreation and hydropower. Failure to provide access would exacerbate a critical state recreational problem.

65. Another priority issue identified in the Recreation Plan is the loss or mismanagement of scenic resources. The plan notes "[t]he protection of the scenic and visual resources in Vermont is paramount if Vermont is to maintain its renowned charm and character."

66. The Scenic Resources Protection and Enhancement Policy is:

It is the policy of the State of Vermont to initiate and support programs that identify, enhance, plan for, and protect the scenic character and rural traditions of Vermont.

XIV. Analysis

Water Chemistry

67. There are no identified problems with respect to dissolved oxygen concentrations. Some slight enhancement may occur, however, due to the applicant's proposal to provide a continuous spillage during the summer and fall. Spillage over the cascade causes turbulent entrainment of oxygen in the water.

Flow Needs in Stream Reaches for Habitat Protection

68. Conversion of the project to run-of-the-river will provide for the protection of downstream habitat. First call operation of Plant 9 in the spring and fall, as proposed, will attract fish to the Plant 9 tailrace and potentially provide enhanced spawning opportunities for walleye and sturgeon. Water levels in the wetlands complex at the Otter Creek Marsh Wildlife Management Area are probably not influenced by project operations; however, conversion to run-of-the-river will assure that no conflicts will occur.
69. Bypass flows will provide localized habitat improvement where highly oxygenated water will exist prior to mixing with the water in the downstream channel. The entrained bubbles in that zone will provide cover for fish.
70. Flashboards are removed in anticipation of high flows. During the refill of the impoundment following flashboard reinstallation, true run-of-the-river operation is not feasible as water will be going into storage. Given that, this certification is being conditioned to allow up to 10% of project inflow to be placed in storage.

Impoundment Habitat

71. No wetlands habitats associated with the impoundment were identified. Impoundment aquatic habitat, including the wetland habitats, will be protected by the cessation of impoundment cycling. Occasional loss of the flashboards will result in the impoundment dropping 1.5 feet, but this relatively small drop in water surface is not expected to result in significant habitat damage.

Screening

72. The 2-inch bar spacing on the Plant 9B trashrack may promote fish entrainment. By condition of this certification, the applicant shall be required to consult the

Department of Fish and Wildlife at the time the trashrack for either plant is scheduled for replacement, and to obtain Department approval for the design.

Recreation and Aesthetics

73. Vermont Water Quality Standards require the protection of existing water uses, including the use of water for recreation. Standards also requires the management of the waters of the State to improve and protect water quality in such a manner that the beneficial uses and values associated with a water's classification are attained. (Standards Section 1-03 *Anti-degradation Policy*)
74. Beneficial values and uses of Class B waters include water that exhibits good aesthetic value and swimming and recreation. (Standards Section 3-03(A) *Class B Waters: Management Objectives*) Standards Section 2-02(B) *Hydrology: Artificial Flow Conditions* prohibits regulation of river flows in a manner that would result in an undue adverse effect on any existing use, beneficial value or use.
75. Conversion of the project to run-of-the-river operation and preferential operation of Plant 9 will enhance angling opportunities below the project.
76. The applicant will be preparing a final recreation plan for the project. By condition of this certification, the applicant shall be required to obtain Department approval of the plan, including related erosion control provisions. The applicant's proposal, with continued access to the river, will provide support for the designated use of recreation.
77. The applicant does not propose any additional parking facilities at this time; however, the adequacy of parking will be monitored as part of the FERC Form 80 process. This is a special concern during the spring walleye fishery.
78. The consensus of the aesthetics study team was that increasing flows above the target flow of 150 cfs did not substantially improve the aesthetics of the Falls. The management objective for Class B waters is to attain good aesthetic value. At the target flow of 100 cfs (actual flow of 146-167 cfs), the three cascades were consensus rated as good; under that condition, the center cascade carried almost twice as much flow as the other two cascades due to the channel entrance head loss discussed in findings 7 and 57. According to the consensus ratings, the center cascade requires disproportionately higher flows to maintain its aesthetic value. A flow distribution similar to that provided during the target flow of 100 cfs will achieve good aesthetic value: 35 cfs for the Plant 9 and Plant 9B cascades and 80 cfs for the center cascade. This certification is being conditioned consistent with

the bypass flow schedule proposed by the applicant, but with the additional constraint that the 150 cfs flow be distributed over the three spillways as 35 cfs/80 cfs/35 cfs. The lower nighttime and late fall/winter flows are acceptable as proposed. The nighttime flow of 75 cfs will maintain the aesthetic integrity of the Falls and provide viewing opportunities under the reduced nighttime visibility, as well as provide white noise that masks the noise from traffic on Vermont Route 22A. Special winter flows for aesthetics are unnecessary as the dominant visible feature during the winter is the ice formation on the falls.

Erosion

79. Erosion, if severe, can impair recreational use and cause turbidity and the discharge of suspended solids, potentially violating the standards for those parameters (Turbidity: Standards Section 3-03(B)(1); Total Suspended Solids: Standards Section 3-01(B)(7)). The applicant identified significant erosion areas along the impoundment; however, the problems appeared to be unrelated to daily cycling of the impoundment for enhanced power production.

Debris

80. The applicant does not provide information on the handling and disposal of trashrack debris and other project related debris. The depositing or emission of debris and other solids to state waters violates the state solid waste laws and Standards, Section 3-01(B)(7) *Settleable solids, floating solids, oil, grease, scum, or total suspended solids*. A plan is being required as a condition of this certification.

General Conclusions

81. The project, if operated consistent with the conditions of this certification, will support the designated uses for Class B waters (Standards Section 3-03(A) *Class B Waters: Management Objectives*); will not have a significant impact on aquatic biota, fish or wildlife such that the existing populations would have their viability impaired (Standards Section 1-03(B)(2)(a) *Anti-degradation Policy: Protection of Existing Uses*); and will not significantly degrade the use of the water body for recreation, fishing, water supply or commercial purposes (Standards Section 1-03(B)(2)(a) *Anti-degradation Policy: Protection of Existing Uses*).
82. As required under Standards Section 2-02 *Hydrology*, the applicant's artificial regulation of flows, if consistent with the conditions of this certification, will not result in an undue adverse effect on any existing or designated use, including high quality habitat for aquatic biota, fish and wildlife. In making this determination, the

Water Quality Policy (10 V.S.A. § 1250) has been considered, including the need to allow beneficial and environmentally sound development.

83. All of the restrictions and conditions set forth herein, in conjunction with the applicant's proposal, are necessary to ensure compliance with all applicable provisions of the Vermont Water Quality Standards and other appropriate requirements of state law.

ACTION OF THE DEPARTMENT

Based on its review of the applicant's proposal and the above findings, the Department concludes that there is reasonable assurance that operation and maintenance of the Vergennes Hydroelectric Project as proposed by the applicant and in accordance with the following conditions will not cause a violation of Vermont Water Quality Standards and will be in compliance with sections 301, 302, 303, 306, and 307 of the Federal Clean Water Act, P.L. 92-500, as amended, and other appropriate requirements of state law:

A. The applicant shall operate and maintain this project consistent with the findings and conditions of this certification, where those findings and conditions relate to protection of water quality and support of designated and existing uses under Vermont Water Quality Standards and other appropriate requirements of state law.

B. **Flow Management.** Except as allowed in Condition C below, the facility shall be operated in a true run-of-the-river mode where instantaneous flows below the project shall equal instantaneous inflow to the impoundment at all times. When the facility is not operating, all flows shall be spilled at the dam. Minimum bypass flows shall be provided in accordance with the following schedule:

April 1 - Oct. 31 150 cfs daytime and 75 cfs nighttime

Nov. 1 - Dec. 15 100 cfs daytime and 50 cfs nighttime

Dec. 16 - March 31 No special flows

The 150 cfs daytime flow shall be apportioned between the spillways with 80 cfs at the center spillway and 35 cfs at each of the two flanking spillways. The 100 cfs daytime flow shall be apportioned similarly. Daytime is one half hour before sunrise through one hour after sunset.

C. **Flow Management during Flashboard Replacement.** To the extent necessary to facilitate flashboard replacement, bypass flows may be suspended. During refill of the impoundment, up to 10% of instantaneous project inflow may be placed in storage.

D. **Plan for Method to Maintain Bypass Flows and Run-of-the-River Operating Conditions.** The applicant shall develop a plan, including descriptions, hydraulic design calculations, an implementation schedule, and

design drawings for the measures to be used to release the bypass flows set forth in Condition B and to maintain a stable headpond with true run-of-the-river operating conditions. After Department approval of the plan, the plan shall be filed with FERC no later than 120 days from the date of license issuance. FERC shall either approve the plan or return the plan to the applicant for revision to incorporate FERC-recommended changes. After revision, the applicant shall submit the plan to the Department for approval of the changes. The plan shall then be filed with FERC for final approval. The Department reserves the right of review and approval of any material changes made to the plan at any time.

- E. **Monitoring Plan for Impoundment and Flow Management.** The applicant shall develop a plan for continuous monitoring of flow releases at the project (below individual spillways and as discharged from each of the two powerhouses), impoundment levels, and estimated inflows. The applicant shall maintain continuous records of flows and impoundment levels and provide such records on a regular basis as per specifications of the Department. The plan shall be developed in consultation with the Department and the U.S. Fish and Wildlife Service. After Department approval of the plan, the plan shall be filed with FERC no later than 120 days from the date of license issuance. FERC shall either approve the plan or return the plan to the applicant for revision to incorporate FERC-recommended changes. After revision, the applicant shall submit the plan to the Department for approval of the changes. The plan shall then be filed with FERC for final approval. The Department reserves the right of review and approval of any material changes made to the plan at any time.
- F. **Prevention of Fish Entrainment at Intakes.** Prior to any future replacement of the Plant 9 or Plant 9B trashracks, the applicant shall consult with the Department of Fish and Wildlife with respect to appropriate bar clear spacing and file the trashrack design information with the Department of Environmental Conservation for approval prior to commencement of work.
- G. **Turbine Rating Curves.** The applicant shall provide the Department with a copy of the turbine rating curves, accurately depicting the flow/production relationship, for the record within two years of the issuance of the license.
- H. **Debris Disposal Plan.** The applicant shall develop a plan for proper disposal of debris associated with project operation, including trashrack debris. The plan shall be developed in consultation with the Department.

After Department approval of the plan, the plan shall be filed with FERC no later than 120 days from the date of license issuance. FERC shall either approve the plan or return the plan to the applicant for revision to incorporate FERC-recommended changes. After revision, the applicant shall submit the plan to the Department for approval of the changes. The plan shall then be filed with FERC for final approval. The Department reserves the right of review and approval of any material changes made to the plan at any time.

- I. **Maintenance and Repair Work.** Any proposals for project maintenance or repair work, including desilting, drawdowns below the spillway crest to facilitate repair/maintenance work, and tailrace dredging, shall be filed with the Department for prior review and approval, if said work may adversely affect water quality or cause less-than-full support of designated and existing uses of State waters.
- J. **Public Access.** The applicant shall allow public access to the project lands for utilization of public resources, subject to reasonable safety and liability limitations. Such access should be prominently and permanently posted so that its availability is made known to the public. Any proposed limitations of access to State waters to be imposed by the applicant shall first be subject to written approval by the Department. In cases where an immediate threat to public safety exists, access may be restricted without prior approval; the applicant shall so notify the Department and shall file a request for approval, if the restriction is to be permanent or long term, within 14 days of the restriction of access.
- K. **Recreational Facilities.** Recreational facilities shall be constructed and maintained consistent with a recreation plan approved by the Department. The plan shall be filed with the Department within 60 days of license issuance and shall include an implementation schedule. The applicant is advised to consult with the Department and the City of Vergennes in the development of plans. Where appropriate, the recreation plans shall include details on erosion control. Modifications to the recreation plan shall also be subject to Department approval over the term of the license.
- L. **Erosion Control.** Upon a written request by the Department, the applicant shall design and implement erosion control measures as necessary to address erosion occurring as a result of use of the project lands for recreation. Any work that exceeds minor maintenance shall be subject to prior approval by the Department and FERC.

- M. **Compliance Inspection by Department.** The applicant shall allow the Department to inspect the project area at any time to monitor compliance with certification conditions.
- N. **Posting of Certification.** A copy of this certification shall be prominently posted within the project powerhouse.
- O. **Approval of Project Changes.** Any change to the project that would have a significant or material effect on the findings, conclusions, or conditions of this certification, including project operation, must be submitted to the Department for prior review and written approval where appropriate and authorized by law and only as related to the change proposed.
- P. **Reopening of License.** The Department may request, at any time, that FERC reopen the license to consider modifications to the license as necessary to assure compliance with Vermont Water Quality Standards.
- Q. **Continuing Jurisdiction.** The Department reserves the right to add and alter the terms and conditions of this certification, when authorized by law and as appropriate to carry out its responsibilities during the life of the project with respect to water quality.

Wallace McLean
Director, Division of Water Quality
for Canute Dalmasse
Commissioner
Department of Environmental Conservation

Dated at Waterbury, Vermont
this 15th day of April, 1999.

BILLING CODE 6717-01-M

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Green Mountain Power Corporation) Project No. 2674-003 - VT

NOTICE OF AVAILABILITY OF ENVIRONMENTAL ASSESSMENT

(October 16, 1998)

In accordance with the National Environmental Policy Act of 1969 and the Federal Energy Regulatory Commission's (Commission's) regulations, 18 CFR Part 380 (Order No. 486, 52 F.R. 47897), the Office of Hydropower Licensing has reviewed the application for a new license for the existing Vergennes Hydroelectric Project, located in the city of Vergennes, Addison County, Vermont, and has prepared an Environmental Assessment (EA) for the project. In the EA, the Commission's staff has analyzed the potential environmental effects of the existing project and has concluded that approval of the project, as proposed with additional staff-recommended measures, would not constitute a major federal action significantly affecting the quality of the human environment.

Copies of the EA are available for review in the Public Reference Branch, Room 2-A, of the Commission's offices at 888 First Street, N.E., Washington, D.C. 20426.

Any comments should be filed within 30 days from the date of this notice and should be addressed to David P. Boergers, Secretary, Federal Energy Regulatory Commission, 888 First Street N.E., Room 1-A, Washington, D.C. 20426. Please affix "Vergennes Hydroelectric Project No. 2674" to the top page of all comments. For questions concerning preparation of the EA for this proposed action, please contact Lee Emery, E-mail address, lee.emery@ferc.fed.us, or telephone (202) 219-2779, Federal Energy Regulatory Commission, Office of Hydropower Licensing.

David P. Boergers
Secretary

ENVIRONMENTAL ASSESSMENT
FOR HYDROPOWER LICENSING

Vergennes Hydroelectric Project

FERC Project No. 2674

October 1998

Federal Energy Regulatory Commission
Office of Hydropower Licensing
Division of Licensing and Compliance
888 First Street, NE
Washington, DC 20426

October 1998

DC-A-14

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ACRONYMS AND ABBREVIATIONS

ADA	Americans with Disabilities Act
APE	Area of Potential Effect
cfs	cubic feet per second
CRMP	Cultural Resources Management Plan
CWA	Clean Water Act
DO	dissolved oxygen
EA	environmental assessment
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
FPA	Federal Power Act
FWS	U.S. Fish and Wildlife Service
GMP	Green Mountain Power Corporation
GWh	gigawatt-hours
Interior	U.S. Department of the Interior
kW	kilowatt
kWh	kilowatt-hour
mgd	million gallons per day
mg/l	milligram per liter
msl	mean sea level
MW	megawatt
NEPA	National Environmental Policy Act
NEPOOL	New England Power Pool
NERC	North American Electric Reliability Council
NHPA	National Historic Preservation Act
NNHP	Nongame and Natural Heritage Program
NPCC	Northeast Power Coordinating Council
National Register	National Register of Historic Places
PA	Programmatic Agreement
REA	Ready for Environmental Analysis
RM	river mile
ROR	run-of-river
SD1	Scoping Document 1
SHPO	State Historic Preservation Office
USGS	U.S. Geological Survey
VAEC	Vermont Agency of Environmental Conservation
VANR	Vermont Agency of Natural Resources
VDEC	Vermont Department of Environmental Conservation
VDFPR	Vermont Department of Forests, Parks and Recreation
VDFW	Vermont Department of Fish and Wildlife
VDHP	Vermont Division for Historic Preservation
VRP	Vermont Recreation Plan
WQC	Water Quality Certification
YOY	Young-of-the-Year

SUMMARY

On May 30, 1997, Green Mountain Power Corporation (GMP) filed an application with the Federal Energy Regulatory Commission (Commission) for a new license for the continued operation and maintenance of the Vergennes Hydroelectric Project, Project No. 2674, located on Otter Creek in the city of Vergennes, Vermont. The project would continue to have an installed capacity of 2.4 megawatts (MW) and would generate about 9.45 gigawatt-hours (GWh) of energy per year.

This environmental assessment (EA) analyzes the effects of the proposed action, the proposed action with additional staff-recommended measures, and no-action. Our analysis shows that the best alternative for the Vergennes Project to reduce or avoid adverse impacts on environmental resources is to issue a new license for the project with the following environmental measures: (1) convert the Vergennes Project from daily peaking to run-of-river (ROR) operation; (2) release aesthetic flows over Vergennes Falls as follows: April 1 through October 31--150 cfs daytime, 75 cfs nighttime; and November 1 through December 15--100 cfs daytime, 50 cfs nighttime; (3) give Plant 9 first call on water and provide a continuous outflow from Plant 9 during use of the project tailrace area by walleye, lake sturgeon, and landlocked Atlantic salmon during their spawning and egg incubation periods; (4) implement recreational enhancements to include: (a) directional and interpretive signs for recreation resources in the project area; (b) improve access for small boats and better define the parking area at Settler's Park; (c) improve the trail, shoreline fishing access, vegetative plantings, and picnic area along the western bank of the falls basin near Plant 9; (d) construct a disabled-accessible fishing platform on the western bank near Plant 9 in accordance with Americans with Disabilities Act guidelines; (e) install signs interpreting the history of the falls and the surrounding structures; and (f) install portable toilet facilities in the area below Vergennes Falls; (5) enhance aesthetics including windows and roof replacement at the former Norton's Grist Mill building located on an island overlooking Vergennes Falls; (6) implement the provisions of a Programmatic Agreement; and (7) develop and implement a plan to monitor ROR operation, aesthetic flow releases, and first priority flows to Plant 9. We discuss these measures in section V and summarize them in section VI of this EA.

Overall, these measures, along with the standard articles provided in any license issued for the project, would protect and

enhance water quality, fishery, terrestrial, aesthetic, recreational, and cultural resources.

Under the provisions of Section 10(j) of the Federal Power Act (FPA), each hydroelectric license issued by the Commission shall include conditions based on recommendations of federal and state fish and wildlife agencies, to adequately and equitably protect, mitigate damages to, and enhance fish and wildlife (including spawning grounds and habitat) affected by the project unless such recommendations are inconsistent with the Federal Power Act or other applicable law. No 10(j) recommendations were filed with the Commission in response to our notice of application ready for environmental analysis.

On May 23, 1997, GMP applied to the Vermont Department of Environmental Conservation (VDEC) for Water Quality Certification (WQC) for the Vergennes Project, as required by Section 401 of the Clean Water Act. GMP withdrew the application and submitted a new request for WQC to the VDEC on April 29, 1998, and the application is pending.

We issued a draft EA on August 13, 1998, with a request for comments from all parties in the proceeding. Comments received on the draft EA have been addressed in section V.C of this EA and in appendix A.

On the basis of our independent environmental analysis, we conclude that issuing a license for the Vergennes Hydroelectric Project as proposed by GMP, with the additional staff-recommended measures, would not be a major federal action significantly affecting the quality of the human environment.

ENVIRONMENTAL ASSESSMENT

Federal Energy Regulatory Commission
Office of Hydropower Licensing
Division of Licensing and Compliance
Washington, DC

VERGENNES HYDROELECTRIC PROJECT
FERC NO. 2674-003--VERMONT

I. APPLICATION

On May 30, 1997, Green Mountain Power Corporation (GMP or Applicant) filed with the Commission an application for a new major license for the Vergennes Hydroelectric Project, FERC No. 2674. The Vergennes Project is located in Addison County in the city of Vergennes, Vermont, on Otter Creek, about 7.6 miles upstream from Lake Champlain (figure 1). The project would continue to have an installed capacity of 2.4 MW and would generate about 9.45 Gwh of energy per year.

II. PURPOSE AND NEED FOR ACTION

A. Purpose of Action

The Commission must decide whether to license the Vergennes Project and what, if any, conditions should be placed on any license issued. In this EA, we assess the environmental and economic effects of operating the project as proposed by GMP, operating the project as proposed by GMP with additional staff-recommended measures, and no-action.

B. Need for Power

To assess the need for power, we reviewed GMP's present and future use of the project's power, together with that of the operating region in which the project would be located. GMP provides power to more than 82,000 customers in 65 Vermont municipalities. Sales in 1995 included the following classes of service: 32 percent residential, 35 percent commercial, and 33 percent industrial and others. In addition, GMP provides power to firm requirements customers in Vermont on a wholesale basis via wheeling arrangements^{1/} with other New England utilities

1/ The contracted use of electrical transmission facilities of one or more entities to transmit electrical power to another.

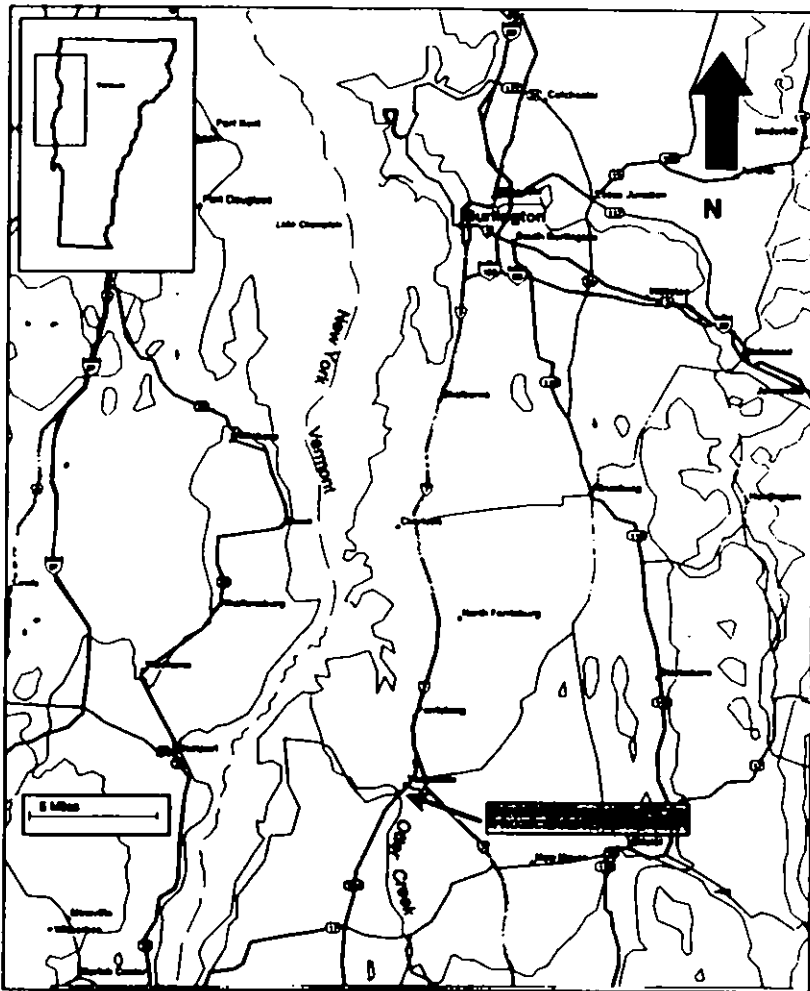


Figure 1. Location of the Vergennes Hydroelectric Project
(Source: DeLorme, 1995)

GMP would continue to sell power to its customers if issued a new license

The Vergennes Hydroelectric Project is located in the New England Power Pool (NEPOOL) subregion of the Northeast Power Coordinating Council (NPCC) region of the North American Electric Reliability Council (NERC). NEPOOL annually forecasts electrical supply and demand in the region for a 10 year period. NEPOOL's most recent report on annual supply and demand projections indicates that, for the period from 1997-2007, loads in the NEPOOL area will increase slightly, less than 1 percent annually; however, the planned capacity retirements plus additions will decrease supply slightly resulting in decreased reserve margins. These margins could fall below 15 percent for summer periods by 1998 for each year of the forecast.

The Vergennes Project has historically generated an annual average of about 10.288 GWh of power for GMP. In addition, the project displaces nonrenewable fossil fired generation and contributes to diversification of the generation mix in the NEPOOL region.

We conclude that the present and future use of the Vergennes Project's power, its displacement of nonrenewable fossil-fired generation, and contribution to a resource diversified generation mix support a finding that the power from the project would help meet both the short- and long-term need for power in the NEPOOL region.

III. PROPOSED ACTION AND ALTERNATIVES

A. Proposed Action

1. Project Description

The Vergennes Project's existing facilities (figure 2) include the following features: (1) three concrete overflow dams, each about 10 feet high, with a total length of 231 feet, and a crest elevation of about 132.78 feet above mean sea level (msl), surmounted by 1.5-foot-high flashboards, and a 29-foot-long, non-overflow dam; (2) an 8.8-mile-long, 133 acre surface area reservoir with a 200 acre-foot usable storage capacity at normal water surface elevation of 134.28 feet msl; (3) the north forebay with trashracks, headgates, and two, 7-foot-diameter steel penstocks; (4) the north powerhouse, Plant 9B, with a 1,000-kilowatt (kW) generating unit; (5) the south forebay, with trashracks, headgates, two surge tanks, and two, 10-foot-diameter penstocks; (6) the south powerhouse, Plant 9, with two, 700-kW

(7) the generator leads from plant 9 to the Vergennes substation and the 950-foot-long, 2,400-volt overhead generator leads from plant 9B to the Vergennes substation; and

(8) appurtenant facilities.

2. Existing Project Operations

GMP currently operates the Vergennes Project as a daily peaking project with a typical reservoir fluctuation of about 1.5 feet utilizing a 200-acre-foot impoundment storage capacity. The operating range for Plant 9 is between 140 cubic feet per second (cfs) and 700 cfs, and plant 9B is between 200 and 480 cfs, for a total hydraulic capacity of about 1,180 cfs. The two powerhouse have independent operation systems, with Plant 9B operated remotely from GMP's Colchester, Vermont, Dispatch Center, and Plant 9 controlled manually by on-site operators. The existing average annual generation for both Plant 9 and Plant 9B is 10,288 GWh.

3. Proposed Operations and Environmental Measures

GMP proposes to convert the Vergennes Project from daily peaking to run-of-river (ROR) operation. 2/ GMP also proposes additional project operation modifications and several enhancement measures as a result of consultation with the Vermont Agency of Natural Resources (VANH) and the city of Vergennes. GMP proposes the following measures:

- | Release aesthetic flows over Vergennes Falls as follows: | |
|--|--|
| April 1 through October 31 | 150 cfs daytime (¼ hour before sunrise to ¼ hour after sunset), 75 cfs nighttime |
| November 1 through December 15 | 100 cfs (¼ hour before sunrise to ¼ hour after sunset), 50 cfs nighttime |
| December 16 through March 31 | No aesthetic flows released |

2/ Where outflow approximates inflow on an instantaneous basis.

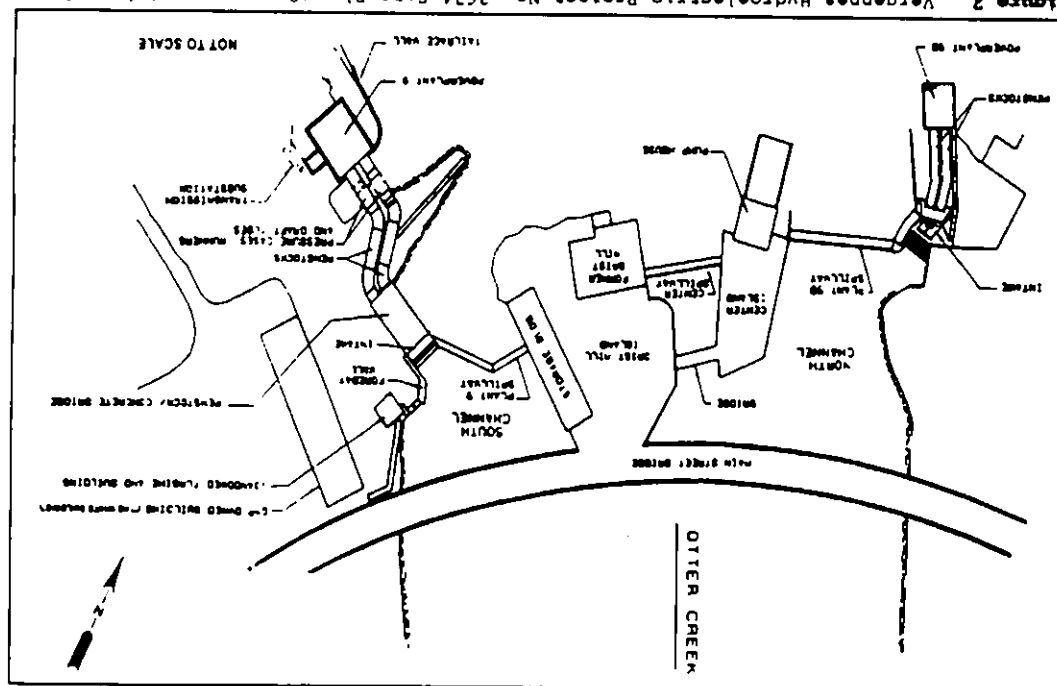


Figure 2.
GMP, 1997).

1967/4 Site Plan : Source : modified from

- Give Plant 9 first call on water and provide a continuous outflow from Plant 9 at all times that the project is operating to enhance use of the project tailrace area by walleye, lake sturgeon, and landlocked Atlantic salmon during their spawning and egg incubation periods (April 1 to June 15 and from September 15 to November 15).

GMP also proposes to: (1) develop directional and interpretive signs for recreation in the project area; (2) improve access for small boats and better define the parking area at Settler's Park; (3) improve the trail, shoreline fishing access, vegetative plantings, and picnic area along the western bank of the falls basin (the area immediately below the falls) downstream of Plant 9; (4) construct a disabled-accessible fishing platform on the western bank near Plant 9 in accordance with Americans with Disabilities Act (ADA) guidelines; (5) install signs interpreting the history of the falls and the surrounding structures; and (6) enhance project aesthetics by including windows and roof replacement at the former Norton's Grist Mill building located on an island overlooking Vergennes Falls. GMP proposes that the final designs for the proposed recreation enhancements would be developed post-licensing in consultation with the VANR and the city of Vergennes.

B. Proposed Action with Additional Staff-Recommended Measures

In addition to GMP's proposed actions, the staff recommends several additional environmental enhancement measures, including: (1) develop and implement a plan to monitor compliance with the revised flow regime (ROR operation, resequencing of the operation of Plant 9 for fish attraction flows, and aesthetic flow releases) in consultation with the VANR, U.S. Fish and Wildlife Service (FWS), U.S. Geological Survey (USGS), and the city of Vergennes; (2) provide portable toilet facilities (including disabled-accessible facilities) in the vicinity of the area below Vergennes Falls (the number and location to be determined in consultation with the city of Vergennes); (3) develop final design drawings for the proposed recreational enhancements in consultation with the SHPO, VANR, and the city of Vergennes; and (4) implement the provisions of a Programmatic Agreement (PA).

C. No-action

Under the no-action alternative, the project would continue to operate under the terms and conditions of the existing license. No measures to protect or enhance existing environmental resources would be implemented. We use this alternative to establish baseline environmental conditions for comparison with other alternatives.

IV. CONSULTATION AND COMPLIANCE

A. Agency Consultation and Interventions

The Commission's regulations require applicants to consult with appropriate state and federal environmental resource agencies and the public before filing a license application. This consultation is the first step in complying with the Fish and Wildlife Coordination Act, the Endangered Species Act, the National Historic Preservation Act (NHPA), and other federal statutes. Pre-filing consultation must be complete and documented in accordance with Commission regulations.

Organizations and individuals may petition to intervene and become a party to subsequent proceedings. On September 23, 1997, we issued a public notice of application for a major license for the Vergennes Project. In response to that notice, the following entities filed motions to intervene, but not in opposition to the proceeding:

<u>Intervenors</u>	<u>Date of Motion</u>
Vermont Agency of Natural Resources	November 3, 1997
U.S. Department of the Interior	November 13, 1997

We address intervenor concerns in the environmental analysis section (section V) of this EA.

On February 20, 1998, we issued a notice of ready for environmental analysis (REA). The VANR filed comments on June 1, 1998, in response to the REA.

On August 13, 1998, we issued a public notice for the Vergennes Project stating that the draft EA was available for comment. The following entities provided comments for the Vergennes Project:

<u>Entities</u>	<u>Date of Letter</u>
Green Mountain Power	September 11, 1998
Vermont Agency of Natural Resources	September 17, 1998

We address all environmental concerns in the appropriate sections of this EA.

B. Scoping

Before preparing this EA, we conducted scoping to determine what issues and alternatives should be addressed. A Scoping Document (SD1) was prepared by the staff and distributed on November 20, 1997, to federal, state, and local resource

agencies, nongovernmental organizations, and other parties to facilitate their participation in the scoping process. Two scoping meetings were publicly noticed and held on December 11, 1997, in the city of Vergennes, Vermont, to request oral comments on the project. A court reporter recorded all comments and statements made at the scoping meetings, and the transcripts of these meetings are part of the Commission's public record for the project.

C. Mandatory Requirements

1. Section 18 Fishway Prescription

Section 18 of the Federal Power Act (FPA) states that the Commission shall require construction, maintenance, and operation by a licensee of such fishways as may be prescribed by the Secretary of the Interior or the Secretary of Commerce, as appropriate. No Section 18 prescriptions were filed in response to the REA notice that was issued for this project on February 20, 1998.

2. Water Quality Certification

Under Section 401(a)(1) of the Clean Water Act (CWA), license applicants must obtain either state certification that any discharge from a project would comply with applicable provisions of the CWA or a waiver of certification by the appropriate state agency. Section 401(a)(1) permits the Commission to deem certification waived if the certifying agency fails to act on a Water Quality Certification (WQC) request within a reasonable period of time, not to exceed 1 year.

On May 23, 1997, GMP applied to the Vermont Department of Environmental Conservation (VDEC) for WQC for the Vergennes Project, as Section 401 of the CWA requires. GMP withdrew the application and submitted a new WQC request to the VDEC on April 29, 1998; the application is pending.

V. ENVIRONMENTAL ANALYSIS

In this section, we provide the general description of the Otter Creek drainage area, including a discussion of environmental resources in the project area that may be subject to cumulative effects from the project when considered in combination with other actions affecting the resources. Then, for each resource, we describe the affected environment, the environmental effects and recommendations, and the unavoidable adverse effects of the proposed action with staff-recommended measures.

We address in detail those resources that would be affected by the proposed operation of the Vergennes Project, and include analysis of comments by interested parties on proposed operation. Unless mentioned otherwise, the source of our information is the license application (GMP, 1997) and supplemental filings by GMP.

A. General Description of the Otter Creek Drainage Area

Otter Creek originates in East Dorset, Vermont, extends about 100 miles to Lake Champlain, and its river basin has a total drainage area of about 936 square miles. The Vergennes Project is located at the top of a natural falls about 7.6 miles upstream of Lake Champlain. The upper portion of Otter Creek from its origin at river mile (RM) 100, to the village of Proctor, Vermont (RM 60) is characterized by rapid flows and moderately steep gradients. The middle portion of Otter Creek from Proctor to Vergennes (RM 7.6) consists of a mix of slow, meandering stream sections with elevation drops over a series of dams. The lower portion of Otter Creek, from the base of Vergennes dam to Lake Champlain, is generally flat, with water elevations in this reach influenced by seasonal variations of lake levels in Lake Champlain.

Otter Creek is a regulated river consisting of 10 dams over a total distance of about 100 miles (table 1). There are no dams between RM 64 and 27.2; there are five dams in the lower 27 miles between Middlebury and Vergennes. There are four hydroelectric projects located upstream of the Vergennes Project, including: Middlebury Lower (FERC No. 2777), Beldens (FERC No. 2558), Huntington Falls (FERC No. 2558), and Weybridge (FERC No. 2731). The Vergennes Project is the most downstream dam on Otter Creek. The Weybridge Project (about 12 miles upstream from the Vergennes Project), operates in a peaking mode.

Table 1. Dams on Otter Creek and significant tributary dams
(Source: CMP, 1997, as modified by staff)

Name	Location	Approx. RM	Height of dam (feet)	Approx impoundment usable storage (acre-feet)
Emerald Lake	Dorset	100	2	22.96
Center Rutland	Rutland	72	10	34.43
Chittendon Reservoir	East Creek, tributary to Otter Creek	N/A	58	1,7217.63
Ripley Mills	Rutland	70.8	4	11.48
Sutherland Falls	Proctor	64.2	7	275.48
Middlebury Lower	Middlebury	27.2	10	45.91
Beldens	New Haven	23.0	24	252.52
Huntington Falls	New Haven	21.0	31	234.16
Weybridge	Weybridge	19.5	36	608.36
Vergennes	Vergennes	7.6	12	200

B. Scope of Cumulative Effects Analysis

According to the Council on Environmental Quality's Regulations for implementing the National Environmental Policy Act (NEPA) (§1508.7), a cumulative impact is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Based on the license application, comments from agencies and other interested entities, and our preliminary analysis, we reviewed all resources to determine if they could be affected in a cumulative manner by the Vergennes Project. We used this review to determine the geographic and temporal scope of our cumulative effects analysis. We identified possible cumulative effects on fisheries resources and cultural resources at the Vergennes Project.

1. Geographic Scope

The geographic scope of our cumulative effects analysis defines the physical limits or boundaries of the proposed action's effects on the fisheries resources and cultural resources.

Our geographic scope of analysis for assessing potential cumulative effects on fisheries resources and cultural resources includes the Otter Creek river basin from Middlebury Lower dam at RM 27.2 to Lake Champlain. The operation of the Vergennes Project and other hydroelectric projects on Otter Creek could cumulatively affect fish because of turbine entrainment mortality or by disrupting spawning success by changing flows during spawning migrations. We chose this geographic scope because of direct and indirect effects of project operations and other activities potentially affecting the resources within the river basin.

2. Temporal Scope

The temporal scope includes a discussion of the past, present, and future actions and their effects on fisheries resources and cultural resources. Based on a license term, the temporal scope looks 30 to 50 years into the future, concentrating on the effects on the resources from reasonably foreseeable future actions. The historical discussion, by necessity, is limited to the amount of available information for the resource.

C. Proposed Action with Additional Staff-Recommended Measures

1. Water Resources

a. Affected environment:

Water Quantity

Average inflows to the Vergennes Project impoundment range from a low of 610 cfs in September to a high of 3,161 cfs in April, based on prorated stream flow data from a USGS gage station in Middlebury, Vermont (table 2). Average (mean) flows in the river exceed the hydraulic capacity of the project during 5 months of the year. The Vergennes impoundment's current daily fluctuation limit using storage is normally 1.5 feet below its normal full pond water surface elevation of 134.28 feet msl. Plant 9's operating flow range is about 140 to 700 cfs, and the operating flow range for Plant 9B is about 200 to 480 cfs. Total hydraulic capacity of the project turbines is about 1,180 cfs.

Table 2. Vergennes Project annual and monthly flow duration
(Source: GMP, 1997, as modified by the staff)

	Median flow (cfs)	Mean flow (cfs)	Maximum flow (cfs)	Minimum flow (cfs)
January	786	1,006	5,315	266
February	851	1,165	6,502	271
March	1,535	1,967	9,017	271
April	2,993	3,161	10,397	266
May	1,806	2,030	8,295	266
June	857	1,034	6,940	135
July	470	671	4,076	123
August	406	639	5,070	119
September	431	610	3,599	126
October	623	946	3,896	155
November	1,026	1,241	3,922	178
December	1,135	1,463	5,663	316
Annual	867	1,316	10,397	119

Derived from USGS Gage No. 04282500, Otter Creek at Middlebury, VT, water years 1960 to 1992, adjusted to 1.293 drainage area ratio.

The maximum flow in Otter Creek was 10,397 cfs as measured at the Middlebury gage, about 20 miles upstream of Vergennes dam, for water years 1960 through 1992. The 7Q10, the lowest flow that can be expected to occur in any given 10-year period for a duration of 7 days, for the Vergennes Project is 204 cfs. There are no consumptive water uses in the immediate project area.

To determine if any sections of the stream below the project were dewatered during low Lake Champlain water levels, GMP conducted a study that compared lake levels with Vergennes tailwater levels. GMP found that, even at the lowest lake level of elevation 93.47 feet (period of record 1960 to 1990), there were no dewatered sections of stream downstream of the dam under any flow conditions.

Water Quality

The Vergennes wastewater treatment facility is located about 1,500 feet downstream of Vergennes dam. Due to this facility's discharges, the Vermont Water Resources Board designates the stretch of the river downstream of the dam to Lake Champlain as a Class B Waste Management Zone, meaning that there are permitted discharges of treated wastes within this stream reach. Lower Otter Creek to Lake Champlain (including Vergennes) also is classified as an Effluent Limitation Segment. Such segments meet water quality standards when effluent standards are applied and no load allocations are necessary. Four other wastewater treatment facilities discharge into Otter Creek upstream of the Vergennes Project (Table 3).

Table 3. Summary of pertinent permit effluent limits for Vermont wastewater discharges in the Otter Creek basin (Source: GMP, 1997, as modified by the staff)

Facility	River mile	Flow (mgd)	BOD (mg/l)
Vergennes	7.4	0.66	30; 50
Middlebury	25.2	2.2	30; 50
Proctor	63.8	0.325	30; 50
Rutland	71.0	6.8	10; 50
Wallingford	84.8	0.12	22.5; 37.5

Annual average; mgd= millions of gallons per day

BOD= biological oxygen demand; mg/l= milligrams per liter; the first value is the allowable monthly average, the second value is the allowable daily maximum.

Sediment loads in Otter Creek are high because of the predominance of erodible clay soils and intensive agriculture in the basin. The area below the dam, even relatively close to the powerhouse discharge, is covered with a fine layer of silt that is easily resuspended. Some of this silt probably is resuspended during high flow events, leading to short-term increased turbidity.

The VANR's Water Quality Division requested (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated March 20, 1997) that GMP conduct a study to determine if upstream and downstream dissolved oxygen (DO) concentrations show either actual or potential deficits under critical conditions (high temperature and low flow). As part of GMP's study, it collected grab samples upstream and downstream of

the dam, beginning in the early morning well before sunrise, when DO concentrations are expected to be at daily minimum levels. The study supplemented a DO study that GMP conducted during the summer of 1996, as reported in the license application.

Overall water quality in Otter Creek, as measured during the 1997 DO survey, is excellent, with DO levels in the river averaging full to super-saturation (Aquaterra, 1997). DO concentrations were all above 7.0 milligrams per liter (mg/l) even though all samples were collected before sunrise when DO concentrations are expected to be lowest. DO in the Vergennes impoundment ranged from 8.00 to 11.55 mg/l (91 to 141 percent saturation) in 1997. DO immediately downstream of Vergennes dam ranged from 7.65 to 10.90 mg/l (87 to 133 percent saturation). During 1996, the DO concentrations ranged from 8.00 to 8.85 mg/l (90 to 101 percent saturation) in the impoundment and 7.85 to 8.85 mg/l (89 to 100 percent saturation) immediately downstream of the dam.

The Vergennes Project currently meets all Class B DO criteria for state water quality standards. The VANR indicates that Otter Creek from Weybridge to Lake Champlain, for the purposes of state water quality standards, is considered warmwater fish habitat (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated March 20, 1997). The state DO criteria for warmwater fisheries is 5 mg/l or 60 percent saturation at all times.

b. Environmental effects and recommendations: GMP proposes to convert the Vergennes Project from daily peaking operations to ROR, where outflow approximates inflow on an instantaneous basis. As the VANR requested (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated March 20, 1997), GMP agreed, as a result of negotiations with the VANR and the city of Vergennes, to release the following flows over the dams and waterfalls: 150 cfs daytime (½ hour before sunrise to ½ hour after sunset) and 75 cfs nighttime from April 1 through October 31; 100 cfs daytime and 50 cfs nighttime from November 1 through December 15; and no aesthetic flow from December 16 through March 31 (aesthetic flows are discussed in section V.C.4).

Our Analysis

Water Quantity

The Vergennes Project provides no seasonal storage. The conversion from daily peaking to ROR operation would minimize daily fluctuations of the impoundment and changes in downstream flow.

Conversion of the project to ROR operation would not substantially change water depths in Otter Creek downstream of the project because this reach is predominantly influenced by Lake Champlain water surface elevations (based on our review of hydrographs of Lake Champlain water surface elevations compared to Vergennes tailwater elevations).

Project operations influence the velocity regime immediately downstream of the project powerhouses and dams, which affects the local aquatic habitat. Therefore, we analyze these effects in section V.C.2, Aquatic Resources. We present our analysis of aesthetic flows at the project in section V.C.4, Land Use and Aesthetic Resources.

GMP does not propose to develop and implement a plan to monitor compliance with ROR operation. Resource agencies also have not recommended that GMP develop such a plan. However, we consider a monitoring plan important to document project operation at the Vergennes Project. We recommend an operations monitoring plan be filed for Commission approval that includes a description of the use of generation records, the exact locations and designs of impoundment and downstream water level recording devices, other measures as necessary, and an implementation schedule. The plan should include provisions to furnish the results of the monitoring to the Commission and the resource agencies. Because development and implementation of an operations monitoring plan would reduce the economic benefit of the project, we discuss the need for this plan further in section VII.

Water Quality

Stabilization should reduce localized erosion occurring as a consequence of the approximately ± 1.5 foot daily fluctuation in water levels and therefore reduce turbidity levels and sediment load. The elimination of off-peak low flows would provide for improved assimilation of discharges from the Vergennes wastewater treatment facility located about 1,500 feet downstream of Vergennes dam.

Our review of DO data provided by GMP indicates that existing project operations result in water quality that is in

compliance with applicable state standards. The spilling of 150 cfs over the dams and waterfalls would increase aeration and could slightly increase DO during the low flow summer months.

C. Unavoidable adverse effects: Even with the incorporation of state-of-the-art erosion and sedimentation control measures into the final design of GMP's proposed recreational enhancements, there still may be a minor, short-term increase in sedimentation to Otter Creek.

2. Aquatic Resources

a. Affected environment:

Fisheries Resources

The section of Otter Creek that extends from the Vergennes Project upstream to Middlebury Lower dam (the upstream boundary for the cumulative impact assessment) is characterized by mostly slow water habitats segmented by elevation drops at existing dams. Otter Creek upstream of Middlebury has extensive and highly productive wild trout populations. The Vermont Department of Fish and Wildlife (VDFW) manages this reach of Otter Creek between Vergennes and Middlebury as a mixed warmwater and coolwater fishery. The 12 miles of stream between the Vergennes Project and the next upstream facility, the Weybridge Hydroelectric Project, supports a fishery of primarily warmwater species, including northern pike, yellow perch, smallmouth bass, several panfish species, and a variety of minnows. The VANR indicates that northern pike are particularly abundant in the Vergennes to Weybridge reach (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated June 30, 1995). Coldwater species that are present in this 12-mile portion of the river include brown and rainbow trout, although VDFW considers the presence of trout just upstream of Vergennes dam to be incidental (notes of telephone conversation between Dave Callum, Fisheries Biologist, VDFW, and Michele Dunn, Licensing Coordinator, Gomez & Sullivan Engineers, Utica, NY, dated January 12, 1995).

Water elevations in the reach from the rock falls, on which the dam sits, to the river's confluence with Lake Champlain depends on Lake Champlain levels, and on the river's discharge. Aquatic habitat downstream of the project consists of flat, slow moving water bounded by extensive marshes and forested wetlands. Important fish species below the Vergennes Project include lake sturgeon (a state-listed endangered species), landlocked Atlantic salmon, steelhead trout, walleye, northern pike, and largemouth

and smallmouth bass. Eastern sand darter (a state-listed threatened species), also may occur downstream of the dam according to the Vermont Nongame and Natural Heritage Program (NNHP) (letter from Everett Marshall, Data Manager, NNHP, Waterbury, VT, to Michele Dunn, Licensing Coordinator, Gomez & Sullivan Engineers, Utica, NY, dated January 23, 1995).

The extent to which lake sturgeon enter Otter Creek from Lake Champlain and occur below the Vergennes Project is unclear. Local residents state that they are unaware of sturgeon being seen or caught by anglers in the lower river (scoping meeting transcript, December 11, 1992). The VANR, however, states that lake sturgeon occur in the lower section of Otter Creek and that they have been caught by anglers. Additionally, the VANR notes the occurrence of one individual lake sturgeon observed by VANR biologists in lower Otter Creek in the spring of 1995. The VANR states that adult lake sturgeon exhibiting spawning behavior have been sighted in Otter Creek (primarily by anglers) during spring months (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated June 30, 1995). The VANR reports sightings of lake sturgeon below Vergennes as recently as late May 1998 (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to David Boergers, Secretary, Commission, Washington, DC, dated September 17, 1998).

Management of landlocked Atlantic salmon and steelhead trout below Vergennes is part of the development plans implemented for salmonid fisheries in Lake Champlain. Atlantic salmon and steelhead trout are stocked in the lower river below the Vergennes Project, enhancing an important recreational fishery for these species immediately downstream of the dam. The VANR states that salmon and steelhead may spawn at the base of the dam (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated June 30, 1995). VANR notes that the number of adult salmon and steelhead that return to Otter Creek during spawning runs may increase in future years due to a lamprey (an introduced predator of salmonids and other larger species of fish) control program that is being conducted on Lake Champlain.

An important walleye fishery also exists downstream of the Vergennes Project. Walleye enter Otter Creek from Lake Champlain in early spring to spawn. A fishery for post-spawned walleye that feed in the lower river exists from mid-May through most of June. The VDFW is considering stocking hatchery-reared walleye

prior to the year 2000 as part of a management plan to increase the walleye spawning run downstream of the Vergennes Project.

Results of GMP's spring angler survey indicate that the majority of anglers interviewed (56 percent) fished from shore in the vicinity of the Plant 9 tailrace. Anglers indicated that the Plant 9 tailrace was preferred because of the quality of fishing at this location, the ease of access, and the ability to catch preferred species. Some anglers stated that discharge levels from the powerhouses influenced where they chose to fish. Many anglers interviewed during the spring period reported that they were not targeting any species in particular, but those anglers with a preference often targeted walleye (which can legally be caught beginning on the first Saturday in May). The survey also indicated that fall anglers demonstrated a preference for catching salmon, trout, and, to a slightly lesser extent, walleye.

GMP conducted studies to assess the effects of project operation on the various habitats used by downstream fish populations. During these studies, GMP mapped bathymetry and substrate and developed velocity profiles in the falls basin area. GMP also examined the effect of Lake Champlain water levels on the Vergennes tailrace elevation to determine effects on tailrace depth and velocity distributions. Based on resource agency requests and concerns, the studies focused on spawning habitat for walleye, lake sturgeon, and steelhead trout during the spring and early summer (for Atlantic salmon during the fall) and availability of holding areas for adult salmon and steelhead.

The studies identified spawning habitats for each species of interest using depth and substrate profiles coupled with spot velocity measurements taken when one powerhouse was generating and the other was offline or operating at a reduced level (190 cfs from Plant 9). Hydrographs of Lake Champlain levels, Vergennes tailwater levels, and the thalweg (minimum river bottom elevation) also were used to assess water depths during the specified spawning periods.

Based on the results of GMP's studies, we conclude that there is adequate habitat for walleye and sturgeon spawning during the spring and early summer months. Suitable spawning areas for these species could increase during periods of high flow and spillage. Spawning habitat for Atlantic salmon and steelhead trout downstream of the project is limited, mainly because preferred substrates are sparse. Most substrate suitable for salmon and steelhead spawning (gravel) is embedded with sand or silt, in water that is generally too deep for spawning, or located in areas below the dam that are wetted only during high spring flows. Suitable habitat exists for adult salmon and

steelhead to use as holding areas during their spawning migrations

Mussel Distribution

At the request of the VANR and the FWS, GMP conducted a mussel survey on August 15 and 16, 1996, in conjunction with a substrate mapping survey to establish data on the extent of mussel beds within the project area. The survey focused on the possible presence of the black sandshell mussel, a state-threatened species that was found at the site in the late 1970's, and three other rare mussel species: fragile papershell, pink heelsplitter, and pocketbook mussel.

The mussel survey demonstrated that the freshwater mussel populations downstream of the Vergennes Project are diverse and abundant in areas where appropriate substrate was found (loose, unconsolidated substrates where mussels are able to burrow and overwinter). In the area where the black sandshell mussel was found in the 1970's, specimens collected included, among other species, fragile papershells, pink heelsplitters, pocketbook mussels, and giant floaters, all rare species. No black sandshell mussels were collected. None of the mussels in the Lake Champlain basin, including those identified above, are listed under the federal Endangered Species Act, nor are they presently being considered as candidates (letter from Susanne von Oettingen, Acting Supervisor, FWS, Concord, NH, to Craig Myotte, Assistant Vice President, GMP, South Burlington, VT, dated June 27, 1995).

b. Environmental effects and recommendations:

Fisheries Resources

Instream Flows. Flow releases from the Vergennes Project could affect important habitats for several important fish species. The VANR states that walleye, lake sturgeon, Atlantic salmon, and steelhead trout may use areas downstream of the project for spawning. The VANR also is concerned about holding areas for adult salmonid spawners, feeding areas for post-spawned walleye, and incubation habitat for lake sturgeon. Project operation also may affect rearing habitat for juvenile salmonids. The VANR considers downstream distribution of flows across the river channel the primary flow-related issue given the project's proposed conversion to ROR operation (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated March 20, 1997).

No entity has expressed concern about the effect of project operations on the eastern sand darter, a state-listed threatened species. The preferred habitat for eastern sand darter is sand bottomed areas in streams and rivers and sandy shoals in lakes, sometimes overlain by a thin layer of silt (Scott and Crossman, 1973).

GMP proposes to operate the Vergennes Project as a ROR facility. GMP would also release flows over the dam for aesthetic purposes during the spring and fall. In addition, GMP would maintain outflow from Plant 9 by operating at least one turbine during walleye and sturgeon spawning and incubation periods and during the fall when Atlantic salmon are present until the hydraulic capacity of one unit is reached (350 cfs). When flows exceed 350 cfs through Plant 9, GMP proposes to commence operating Plant 9B. GMP proposes to continue operating one unit at Plant 9 and Plant 9B when flows are between 480 cfs and 830 cfs. When flows exceed 830 cfs, GMP would continue to operate Plant 9B and both units at Plant 9.

The VANR agrees with GMP's proposal to provide continuous outflow from Plant 9 from April 1 to June 15 (walleye and sturgeon spawning and steelhead migration) and September 15 to November 15 (presence of Atlantic salmon adults) (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated March 20, 1997).

Baseload operation (at least 350 cfs or project inflow) of Plant 9 during these times would provide continuous flows to the western side of Otter Creek, which the VANR considers important for walleye, sturgeon, Atlantic salmon, and steelhead fisheries.

In comments provided in response to the draft EA, the VANR clarifies that its definition of first call is to bring Plant 9 on line first and maintain it on line at all times that the project is operating during the seasonal time periods, as described above. The VANR indicates that use of Plant 9B is acceptable when flows exceed 350 cfs (the hydraulic capacity of one unit) via Plant 9 plus spillage for aesthetic purposes (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to David Boergers, Secretary, Federal Energy Regulatory Commission, Washington, D.C., dated September 17, 1998).

Our Analysis

There is a reasonable amount of circumstantial evidence available that sportfish are attracted to the Plant 9 tailrace flows more than to Plant 9B tailrace flows. Anglers most commonly fish along the western shoreline when Plant 9 is

generating, suggesting that, under these conditions, they are more successful in catching fish. Analysis of the VDFW's fall electroshocking data for salmon in the falls basin (the area immediately below the falls) indicates that, when Plant 9 is operating, salmon are often collected; if only Plant 9B is operating or neither plant is operating, fewer salmon are collected. These data demonstrate the importance of flows in this portion of the river to sportfish habitat.

GMP proposes to operate at least one unit of Plant 9 during the spring walleye, lake sturgeon, and steelhead spawning periods and during the fall landlocked Atlantic salmon spawning and congregating period. When the hydraulic capacity of one unit (350 cfs) is reached at Plant 9, GMP proposes to commence operating Plant 9.

GMP's proposed operating rule would avoid the existing sudden shift of water from the western side of the river (Plant 9) to the east side of the river (Plant 9B) when inflows to the project exceed 200 cfs. However, inflows to the project nearly always exceed 200 cfs (see table 2), and the enhancement value of this change in operating rules would be minimal. At project flows between 200 cfs and 480 cfs (or at inflows over 350 cfs during periods of aesthetic flow releases), the operating rule would change from the existing conditions.

GMP's proposed first call on one unit at Plant 9 would provide additional flows to the tailrace along the western side of Otter Creek and would enhance potential spawning habitat for walleye and lake sturgeon in the spring and landlocked salmon in the fall. At project inflows over 480 cfs (or at inflows over 630 cfs during periods of aesthetic flow releases), the operating rule would be essentially the same as the existing conditions.

During the spring (April 1 to June 15), flows are most likely to influence potential spawning of walleye, steelhead, and lake sturgeon. Walleye most likely spawn in April in Otter Creek, although some walleye spawning may also occur in early May. Walleye spawn in high velocity water (2.0 to 3.5 feet per second [fps]) over gravel and cobble at depths of 1.9 to 6.0 feet. Substrate and depth immediately downstream of the project would be suitable for walleye spawning, based on our comparison of GMP's substrate and bathymetric mapping with published criteria presented in GMP's license application. Velocity mapping during November indicated that, when Plant 9 was operating with a discharge of 520 cfs, downstream flows occasionally exceeded 2.0 fps. When Plant 9B was operating at nearly full capacity (473 cfs), downstream flows did not exceed 2.0 fps.

GMP points out that during the spring, there would be substantially higher flows, and corresponding velocities would probably exceed 2.0 fps more frequently. Typical flows during April and May exceed the 1,180 cfs hydraulic capacity of the project (see table 2), meaning that the operating rule for the project would primarily influence walleye spawning during dry years. Nevertheless, at flows less than 1,180 cfs, distributing flows preferentially to Plant 9 (with its higher hydraulic capacity) would increase walleye spawning habitat in the tailrace area. We conclude that, especially during the dry years, spawning success of walleye likely would be enhanced if Plant 9 were operated on a first call basis.

Spawning habitat for steelhead in the tailwaters is limited by the amount of suitable substrate (clean gravel). There is one small area of clean gravel downstream of Grist Mill island that would typically be submerged during the expected April spawning period for steelhead. GMP indicates that this gravel bar would most likely be exposed by June or July, and because egg incubation can take from 1 to 3 months, this gravel may be unsuitable for spawning due to potential dewatering. We consider it likely that this gravel bar would normally remain submerged during egg incubation, which, according to Raleigh et al. (1984), usually takes 28 to 40 days. Incubation time is shorter at higher temperatures and, by late June, temperature measured in the tailwaters during 1996 was about 20°C (7 to 12°C is considered optimal for incubation). If steelhead spawning occurs in the tailwaters, probably most eggs would hatch by the end of May. Although fry would remain in the gravel for about 2 weeks after hatching (Raleigh et al., 1984), based on GMP's typical spring hydrograph, most gravel would still be submerged by mid-June. Successful steelhead egg incubation also requires flows of between 1.6 and 3.0 fps. Velocity mapping indicates that flows near the gravel bar with high Plant 9 flows were nearly 0 fps. Suitable velocities at the gravel bar are more likely to be a function of the amount of water spilling over the western spillway than the operation of Plant 9. We therefore conclude that spawning success of steelhead would be unrelated to the operating rules of the Vergennes Project.

If lake sturgeon spawn in the Vergennes tailwaters, they are likely to seek water that is 1.3 to 4.9 feet deep, but can spawn up to depths of 15.4 feet, at velocities of 0.5 to 3.3 fps over gravel, cobble, and boulder substrates. Spawning typically occurs from early May to mid-June based on published criteria presented in GMP's license application. Our review of GMP's substrate mapping indicates large areas of ledge, sand, and silt in the Plant 9B tailrace, whereas much of the area immediately downstream of the Plant 9 tailrace is gravel, cobble, and boulder. GMP's hydrographs show that water depths in the tailwaters during the spring spawning season average 10 feet,

which is within the upper spawning limit of lake sturgeon. We conclude that preferentially releasing water from Plant 9 during May and through June 15 (first call) would attract any spawning lake sturgeon that may be present in Otter Creek to an area that would enhance the probability of spawning success.

Landlocked Atlantic salmon require similar substrate (clean gravel) as steelhead do for successful spawning. We reviewed GMP's substrate and typical fall week hydrograph and conclude that from September 15 to November 15 the only area of suitable substrate for spawning (the gravel bar downstream of Grist Mill island) normally would be exposed. We therefore consider it unlikely that there would be any successful landlocked salmon spawning immediately downstream of the Vergennes Project. Preferential releases from Plant 9 seem to attract landlocked salmon to the western side of Otter Creek. This concentration of fish may increase the catch per unit of effort for local anglers, but is unlikely to have a bearing on the productivity of the landlocked salmon population. We conclude that operating under GMP's flow regime could provide enhancements to the fall fishery for landlocked salmon.

Our review of GMP's substrate mapping indicates that there may be suitable habitat for the eastern sand darter downstream of the project. However, the local distribution of sand and silt most likely is determined primarily by high flow events, over which GMP has no control. Therefore, we conclude that existing and proposed project operations would have little effect on the habitat for eastern sand darters (if they are present in Otter Creek).

We recommend that GMP specify the operating rules for the Vergennes Project. The rules should incorporate providing continuous outflow from Plant 9 at all times that the project is operating from April 1 through June 15 and September 15 through November 15 to enhance potential spawning habitat for walleye and lake sturgeon and to attract landlocked salmon to the western side of Otter Creek during the fall angling season. The rules should also provide for use of Plant 9B during the spring and fall seasons when flows through Plant 9 exceed 350 cfs (the hydraulic capacity of one unit).

As discussed previously, flows of 350 cfs through Plant 9 would enhance potential spawning habitat for walleye, lake sturgeon, and landlocked salmon on the western side of Otter Creek. We consider a plan to document the operation of Plant 9 on a first call basis to be important in confirming the environmental enhancements expected from these flow-related measures. Therefore, we recommend a plan be submitted for Commission approval that includes a description of the use of generation records, the exact locations and designs of

impoundment and downstream water level recording devices, and an implementation schedule. The plan should include provisions to furnish the results of the monitoring to the Commission and the resource agencies.

Fish Entrainment and Impingement. The intake structures for each powerhouse are separated by three overflow dam sections separated by two midstream islands. The Plant 9 intake consists of a trashrack structure with two headgates. The trashracks have 1-inch clear bar spacing. Water velocity on the upstream side of the Plant 9 trashracks at a normal water surface elevation is about 1.8 fps. The Plant 9B intake has a trashrack structure with 2-inch clear bar spacing. The water velocity at the face of the Plant 9B trashracks at normal surface elevation is about 2.6 fps.

GMP does not propose any measures to reduce entrainment-related impacts, other than to consider the installation of 1 inch clear-spaced bar racks at the Plant 9B intake when the existing trashracks are replaced.

The VANR states that Vergennes Project intake velocities are within acceptable limits and would minimize entrainment and impingement of fish. Consequently, the VANR is not now requesting protective measures pertaining to entrainment related impacts for the Vergennes Project (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated March 20, 1997). However, the VANR requests that, when the trashracks at Plant 9B need to be replaced, GMP should consider replacing the existing 2-inch clear-spaced bar racks with bar racks that have a maximum clear spacing of 1.5 inches.

Our Analysis

Most riverine fish entrained at hydroelectric projects are small (less than 8 inches long) (EPRI, 1992). Entrainment of catchable-size sportfish should be minimal at Plant 9 because the trashrack bar spacing is narrow (1-inch clear) and water velocities are less than 2 fps allowing fish to escape entrainment and impingement. Given the proposed project's configuration, fish in the vicinity of the trashracks would be able to escape additional impingement by traveling a short distance at burst swimming speed.^{1/} Some catchable-size fish could be entrained through the Plant 9B intake, which has a bar spacing of 2-inch clear and intake velocities of about 2.6 fps.

^{1/} See Beamish (1978) for data on burst swimming speeds for fish.

Although the resource agencies are not pursuing additional downstream fish protection measures at the project, they have requested that GMP consider installing 1.5-inch, clear-spaced bar racks on the intake of Plant 9B when the existing trashracks are replaced. Based on this request, GMP stated that it would consider installing 1-inch, clear-spaced bar racks in the future. The installation of narrow-spaced bar racks with either 1- or 1.5 inch clear bar spacing would not reduce the entrainment of most fish that probably pass through the Plant 9B turbine (i.e., YOY fish less than 8 inches long). Conversely, entrainment of fish that constitute a harvestable component of upstream populations may be reduced with narrower spaced bar racks. In this instance, based on the fish species present, there would be little difference between the 1 inch or 1.5 inch trashracks in protecting the larger sportfish from entrainment.

Turbine mortality of small fish (less than 8 inches long) usually is low (less than 10 percent) (EPRI, 1992). Based on a comparison of the fisheries at the Vergennes Project with other sites for which entrainment studies have been conducted (EPRI, 1992; 1995), we conclude that the turbine mortality rate at the Vergennes Project probably is low because most fish that are entrained are YOY. Further, turbine mortality of adult sportfish should be minimal because the narrow bar spacing and low intake velocities at both powerhouses would limit the entrainment of most catchable-size fish. There are no state- or federally-listed endangered or threatened species upstream of the project that are subject to entrainment and turbine mortality at the project.

Based on our analysis, we conclude that entrainment at the Vergennes Project is not adversely affecting the fisheries resources in Otter Creek, and we find that additional protective measures are not needed at this time. In areas with high debris loading, small spaced racks may clog and cause high velocity hot spots in front of the racks where fish could become impinged. We recommend that the VANR and GMP consult on the appropriate spacing (e.g., 1 or 1.5 inch) when the existing racks are in need of replacement and consider such factors as debris loading and impingement. Any proposal to change the spacing of the trashracks in the future should be submitted to the Commission, along with resource agency comments, as a request to amend the license.

Mussel Distribution

Based on a review of the information made available in the draft application, the VANR concluded that the proposed conversion of the project to ROR adequately addresses any issues related to the protection of the mussel populations at the Vergennes Project (letter from Jeffrey Cueto, Principal

Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated March 20, 1997). No other party has commented on the potential effects of GMP's proposed operations on mussel populations in the project vicinity. We also conclude that the existing diverse and abundant mussel community downstream of the project would not be adversely affected, and may be enhanced, by the proposed operation of the project.

C. Cumulative effects: Turbine entrainment mortality and instream flow fluctuations could have potential cumulative effects that may be adversely affecting Otter Creek fisheries. We selected the 27.1 miles of Otter Creek that extend from Middlebury Lower dam to Lake Champlain as the geographic scope for assessment of cumulative impacts. Five hydroelectric projects (including Vergennes and Middlebury Lower) are located within the selected geographic boundaries. Although some turbine mortality most likely is occurring at each project, we conclude that the cumulative effects are minor for the following reasons:

- (1) there is no anadromous fish production upstream of the Vergennes Project (i.e., little to no cumulative mortality of highly migratory fish);
- (2) most entrainment probably consists of YOY fish, which usually suffer less than 10 percent mortality during turbine passage; and
- (3) fish populations change from primarily warmwater species to coolwater species from downstream to upstream projects (probably due to changes in Otter Creek habitats associated with stream gradient), which likely reduces downstream movements of most species (populations are likely to be local and would not depend on recruitment from upstream or downstream areas).

Instream flow fluctuations produced by the projects within the defined geographic scope may be affecting spawning activities of some species. GMP's proposal to convert to ROR operation would reduce any such impacts downstream of the Vergennes Project. Inflow, however, is controlled by Weybridge, the next upstream project, which operates in a peaking mode. The long distance between these two projects moderates the effects of upstream peaking and the adverse cumulative effects on the resources. The degree of resultant habitat influence of fluctuating flows below Vergennes due to upstream project operations would be minimized by the effects of Lake Champlain backing water up to Vergennes dam.

d. Unavoidable adverse effects: There would continue to be some entrainment of fish at this and other upstream hydropower projects on Otter Creek. Entrainment would likely continue to occur at the Vergennes Project, consisting primarily of YOY centrarchids, with minimal adverse effects on these populations and the existing sport fishery in Otter Creek.

3. Terrestrial Resources

a. Affected environment:

Botanical Resources

The project impoundment is riverine in nature, and the shoreline areas are composed predominantly of forest habitat, although the width of the woody vegetative buffer between the impoundment and active agricultural land varies dramatically. The lower Otter Creek, downstream of the project dam, has extensive palustrine, emergent marshes (designated as PEM by the wetland classification system presented in Cowardin et al., 1979) and floodplain broadleaved, deciduous forests (designated PF01 by the Cowardin et al., 1979, classification scheme). The shoreline of this segment of the river is frequently flooded and influenced by Lake Champlain.

Spring overflows create natural levees that support PF01 swamps. The floodplain forests have been altered by timber harvesting and by cattle grazing (letter from Everett Marshall, Data Manager, Vermont NNHP, Waterbury, VT, to Michele Dunn, Licensing Coordinator, Gomez & Sullivan Engineers, Utica, NY, dated January 23, 1995).

The lowlands behind the natural levees are comprised of palustrine emergent wetlands and palustrine scrub-shrub swamps dominated by broadleaved deciduous vegetation (designated as PSS1 by the National Wetland Inventory), which are rarely visited by people except perhaps for waterfowl hunting. To maintain this type of wetland community, these areas retain standing water or saturated soil conditions throughout the year. These marsh areas along the lower Otter Creek are characterized by the NNHP as the most impressive and most extensive natural community within the lower Otter Creek basin. Species associated with the PEM areas include: giant bur-reed, common arrow-head, narrow-leaved cattail, white water-lily, pickerelweed, and buttonbush. Species identified within the PF01 areas include: silver maple, wood-nettle, white grass, hog-peanut, and ostrich fern.

The NNHP identified several rare plant species growing in the floodplain in the region from the mouth of Otter Creek upstream to Vergennes dam. The species identified include: arrowleaf, cattail sedge, water-hemp, narrow blue-eyed-grass, and

lance leaved loosestrife, and the green dragon. Although all of these species are considered rare in Vermont, only the green dragon is classified as threatened by the state. In addition, the NNHP identified uncommon plants that could potentially occur in the project area, including: within the PEM areas--false hop sedge, slender bulrush, salt marsh bulrush, and Smith's bulrush; along riverine emergent marsh areas (designated REM by the National Wetland Inventory) May-fruited false loosestrife and marsh horsetail; and within the PF01 areas--false mermaidweed.

Wildlife Resources

The vegetated buffer zone along the project impoundment most likely serves as travel corridor for birds and mammals, which are typically important in agricultural settings where large expanses of open land offer little concealment. The diverse wetlands downstream of the project offer a variety of habitats for migratory water birds as well as many resident mammal species. There are no deer wintering areas within the project area and black bear habitat, considered by the VDFW to be a critical habitat type, also does not occur in the project vicinity. Species of mammals, amphibians, reptiles, and birds likely to be found in the project area are typical of those expected to occur elsewhere in the Champlain Valley.

The NNHP identified potential rare animal species that may exist in the project area, including: osprey (state endangered); the least bittern (state species of concern); fragile papershell mussel (state species of concern); the pink heelsplitter mussel (state species of concern); the giant floater mussel; pocketbook mussel; the eastern sand darter (state threatened); the black sandshell mussel (state endangered); and the lake sturgeon (state endangered). We discuss mussel abundance and distribution (including rare species collected by GMP), lake sturgeon, and eastern sand darter in section V.C.2, Aquatic Resources.

Threatened and Endangered Species

There are no plant or animal species that are federally listed as threatened or endangered known to occur in the project vicinity (personal communication between Pat Meslowski, Senior Preservation Planner, Louis Berger & Associates, Inc., Needham, MA, and Susanne von Oettingen, Acting Supervisor, FWS, Concord, NH, on July 23, 1998).

b. Environmental effects and recommendations: GMP proposes no specific measures pertaining to terrestrial resources and indicates that because Lake Champlain backs up to the base of Vergennes Falls, project operations have little influence on the water surface elevation downstream of the dam. The FWS states that it is unclear as to whether the regulated flows in Otter

Creek had altered the hydrology of the wetlands downstream of the project, particularly because Lake Champlain backs up water into lower Otter Creek (letter from Susanne von Oettingen, Acting Supervisor, FWS, Concord, NH, to Craig Myotte, Assistant Vice President, GMP, South Burlington, VT, dated June 27, 1995). The FWS also indicates that a return to ROR operation may be a step in the direction of restoring any altered wetland hydrology.

Our Analysis

The existing operation of the Vergennes Project as a peaking facility resulted in periods when little flow was released from the project. If releases from the project were the primary factor in determining the downstream water surface elevation, the water level would decrease during periods of reduced flow and riparian wetlands could be adversely influenced. However, accounts of the existing wetlands downstream of the project by the NNHP indicates that they are thriving and support a rich community of plants and wildlife. GMP's proposed conversion to ROR operation would eliminate periods when little flow is released from the project which would further stabilize the downstream water surface elevation compared to existing conditions.

We reviewed the GMP hydrographs that compared the water surface elevation above msl of Lake Champlain as measured at Burlington (about 3 miles north of the confluence of Otter Creek with Lake Champlain) to the Vergennes tailwater elevation as measured in the tailrace of Plant 9. The differences in water surface elevation above msl ranged from about 0.6 to 1.5 feet, which could be accounted for by friction and stream gradient.^{4/} The Vergennes Project is located 7.6 miles upstream of Lake Champlain. We conclude that, because the water surface of Lake Champlain is essentially the same as the Vergennes tailwater elevation, lake water surface elevations are responsible for establishing the hydrology of the riparian wetlands for most of the year. In addition, flood events in Otter Creek also are likely to periodically inundate riparian habitat. The limited storage capacity of the Vergennes impoundment would not allow GMP to control flood events either with existing or proposed project operations. We conclude that present and proposed project operations have virtually no bearing on the water surface elevation and the riparian wetland habitat downstream of the project.

^{4/} Friction associated with the streambed (measured by "Mannings N") can cause flowing water to back up. Gradient (the difference in streambed elevation between two points) causes water to flow in a specific direction.

c. Unavoidable adverse effects: None.

4. Land Use and Aesthetic Resources

a. Affected environment: The Vergennes Project is directly surrounded by land classified by the Addison County Regional Planning Commission as built-up, urban, or residential. Land uses in the project vicinity include agricultural, rural residential, scattered forest lands, brush lands, and light manufacturing, and most lands surrounding the project boundary are privately owned. The project impoundment extends about 9 miles upstream, and it is surrounded primarily by agricultural lands. Water flows over the dam or through the project and enters a basin formed below the falls (falls basin), which covers an area of about 8 surface acres.

The prominent aesthetic features of the project area are the water flow over the dam at the natural rock ledge and the surrounding historic structures and project facilities (see figure 3). Vergennes dam is founded on a natural rock ledge forming a waterfall with a vertical drop of 35 to 40 feet, depending on the water level at the base of the falls. Water is spilled over three concrete sections of the dam (the center, Plant 9, and Plant 9B spillways), which are topped by 1.5-foot flashboards. The sections of the dam that do not receive any overflow are composed of two midstream islands (see figure 2). Located on these islands are two historic structures that contribute to the scenic nature of the area. These structures, Norton's Grist Mill on Grist Mill island and the pumphouse on Center island, were constructed in the late 1800s and have since fallen into disuse and disrepair. The city of Vergennes, with funding support from GMP, recently made improvements to Center island, including new lighting, fencing, and landscaping.

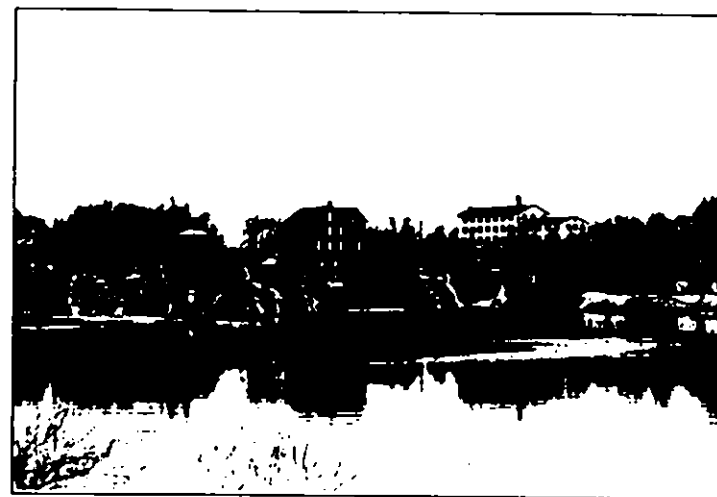


Figure 3. Vergennes Falls and Lower Otter Creek Basin
(Source: Louis Berger & Associates, Inc., 1998)

The area below Vergennes Falls (the falls basin) is heavily used by boaters during the summer months, and it provides direct viewing of the scenic Vergennes Falls and historic structures. Boaters can access this area by traveling upriver from Lake Champlain. Two prime shoreline areas in the falls basin are used to view the project's scenic resources: the Vergennes Falls Park, downstream of the dam on the south side of the creek, and the city-owned docking facilities at MacDonough Park on the north side of the river.

GMP currently operates the Vergennes Project as a daily peaking project with a limited daily fluctuation of 1.5 feet. The inflow to the Vergennes Project is controlled by the upstream Weybridge Project. Historically, flows outside of the operating range of the two generating plants (minimum 140 cfs, maximum 1,180 cfs) have been passed over the three spillways except for minor flashboard leakage. There are no low-level outlets or other means of discharge at the spillways other than over the fixed crest spillways or through the generating facilities.

Table 4 summarizes the approximate existing flow exceedance in Otter Creek at the Vergennes Project based on prorated flow data from USGS gaging station No. 04282500 in Middlebury,

Vermont, located approximately 19 miles upstream of the project. The average inflows to the project impoundment range from a low of 610 cfs in September to a high of 3,161 cfs in April.

Table 4. Estimated flows in Otter Creek at the Vergennes Project (Source: Staff)

Month	Estimated flow exceedance (cfs)				
	10%	25%	50%	75%	100%
January	2,025	1,150	800	600	300
February	2,425	1,475	850	600	300
March	3,900	2,800	1,525	800	300
April	4,900	3,850	3,000	2,200	250
May	3,550	2,700	1,800	1,050	350
June	1,850	1,250	850	575	150
July	1,350	700	475	375	150
August	1,350	750	425	300	150
September	1,300	690	430	300	150
October	2,350	1,150	650	375	150
November	2,450	1,750	1,025	650	200
December	2,700	1,800	1,150	800	300

USGS gage at Middlebury prorated to Vergennes site by a factor of 1.293; period of record, water years 1960-1992.

GMP evaluated six different aesthetic enhancement target flows. Due to the hydraulic configuration of the river and power plants, control of the center spillway lagged behind that of the Plant 9 and Plant 9B spillways, and a uniform depth of flow and discharge across each spillway could not be obtained. Subsequently, the actual flows were greater than the targeted flows. The actual flows were computed for the aesthetic flow study period based on measurement of the head on the flashboards and application of a discharge coefficient rating curve for a sharp-crested weir configuration. Table 5 summarizes the target flows and the computed actual flows for the study period.

Table 5. Aesthetic flow study target and actual flows (Source: GMP, 1997)

Target flows	Actual flow range (cfs)
300	271-327
200	262-295
150	192-223
100	146-167
50	100-113

A study team composed of representatives from the VANR, the VDEC, the city of Vergennes, and GMP evaluated the flows. The study team evaluated the effect of various flows over Vergennes Falls based on the dimensions of sound, exposed rockface, and veil effect. The study team was divided in its opinion of the higher target flows of 200 and 300 cfs; some members found that these flows were considerably better than lower flows, others did not see much difference or thought that lower flows were preferable. The study team members generally agreed that the 150 cfs target flow was better than the 100 cfs target flow, though not substantially so. All members thought that the target flow of 100 cfs was substantially better than the 50 cfs target flow.

b. Environmental effects and recommendations: GMP proposes the release of aesthetic flows over Vergennes Falls based on the results of the evaluations conducted during the aesthetic flow study and the subsequent consultation among the VANR, the city of Vergennes, and GMP. From April 1 to October 31, GMP proposes daytime aesthetic flow releases of 150 cfs and nighttime flow of 75 cfs. From November 1 through December 15, GMP proposes a daytime aesthetic flow of 100 cfs and a nighttime flow of 50 cfs. GMP proposes no aesthetic releases from December 16 through March 31. In addition to the aesthetic flow releases, GMP proposes to contribute \$40,000 for aesthetic enhancements to Norton's Grist Mill to restore the windows and replace the roof.

The VANR states that the distribution of GMP's proposed aesthetic flows among the three spillways should be determined through post-licensing consultation (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to David P. Boergers, Acting Secretary, FERC, Washington, DC, dated June 1, 1998).

Our Analysis

Table 6 summarizes estimated exceedance flows over Vergennes dam under existing conditions and under GMP's proposed aesthetic flows. GMP's proposed aesthetic flow releases would provide greater and more consistent aesthetic flows over Vergennes dam

from May through October. Proposed aesthetic flows during April would provide a minor increase in aesthetic flow opportunities. Aesthetic flows from November through December 15 would occur about twice as often as they do under the existing conditions. GMP proposes no aesthetic flows from December 16 through March 31, and, therefore, flows over Vergennes dam would remain the same as under existing conditions for this same time period.

The proposed aesthetic flows would enhance the overall aesthetics of Vergennes falls during May through October, the prime recreation season, when the greatest viewing opportunities would occur. As demonstrated during the aesthetic flow study, the distribution of flows over each spillway could vary. We recommend, therefore, that GMP develop an operation and monitoring plan in consultation with the VANR and the city of Vergennes, which determines the allocation of the aesthetic flows over the spillways. We consider documentation of aesthetic flow releases to be important in confirming the environmental enhancements expected from these flow-related measures. We also discuss the operation and monitoring plan in section V.C.1, Water Resources.

GMP's proposed improvements to Norton's Grist Mill would help restore the building's historic character and enhance the overall aesthetic resources of the project area. The proposed fishing access platform in the vicinity of the Plant 9 tailrace, however, could potentially alter the aesthetic and historic character of the area below the dam. We recommend, therefore, that GMP develop the final design for the fishing platform in consultation with the VANR, SHPO, and the city of Vergennes to ensure that the fishway facilities would be compatible with the scenic qualities of the Vergennes Historic District.

Table 6. Estimated occurrence of aesthetic flows over Vergennes dam (Source: Staff)

Veiling flow	Month	GMP's proposal	Existing conditions
1 inches (about 150 cfs)	April	100%	90%
	May	100%	65%
	June	100%	20%
	July	100%	10%
	August	100%	10%
	September	100%	10%
	October	100%	20%
2 inches (about 100 cfs)	November	100%	40%
	December (1-15)	100%	45%
Greater than 0 inch	December (16-31)	55%	55%
	January	30%	30%
	February	40%	40%
	March	65%	65%

Estimated exceedance flows based on USGS Gaging Station No. 04282500 located in Middlebury, VT, from water years 1960 to 1992.

Based on provision of daytime flows; proposed nighttime flows are 75 cfs April-October and 50 cfs November-December 15.

5. Recreation Resources

a. Affected environment: The Vermont Rivers Study (VAEC, 1986) designates Otter Creek from North Dorset, roughly 90 miles upstream of the Vergennes Project, to Lake Champlain as a recreational boating area. Primary recreational use in the project area includes shoreline and boat fishing, motor boating, canoeing, picnicking, hiking, and sightseeing.

Within the project vicinity, the city of Vergennes provides many outdoor recreation facilities, including parks, school fields, playgrounds, outdoor pathways, tennis courts, a municipal forest, an ice skating rink, and a swimming pool. Recreation areas downstream of the project area include the Ferrisburg town beach, the lower Otter Creek Wildlife Management Area, access to the little Otter Creek recreation area, and many recreation areas surrounding Lake Champlain.

Settler's Park, owned by GMP and located just upstream of the Vergennes Project, provides limited parking and a car-top boat launch. A canoe portage runs from Settler's Park, crosses Main Street onto a sidewalk running across the Route 22A bridge, and descends to the western bank of the falls basin (see figure 4). Downstream of the Route 22A bridge, located on two midstream islands at Vergennes dam, are the city-owned former Norton's Grist Mill and the former pumphouse. Grist Mill island is connected to the shore from the Route 22A bridge, and Center island is connected to the shore by a footbridge. The city of Vergennes intends to develop the pumphouse on Center island for future recreational and tourism use. The city of Vergennes and GMP recently collaborated on the restoration of the pumphouse on Center island, adding new lights, decorative railings, and landscaping. Both islands and the structures add to the scenic and historical nature of the project area.

The river reach downstream of the project (and below Vergennes Falls) is a popular area for boating and fishing and provides direct access to Lake Champlain. Vergennes Falls Park, a 6.5-acre park owned and operated by the city of Vergennes, is located on the south bank of Otter Creek downstream of the project and extends between the falls and the city of Vergennes wastewater treatment plant. The park offers a system of walking paths, picnic areas, shoreline fishing areas, and a boat launch. Across the river from Vergennes Falls Park, municipal boat docks at MacDonough Park are largely used by boaters from Lake Champlain. Both the boat docks at MacDonough Park and the facilities at Vergennes Falls Park attract many visitors wishing to view the falls at the project. The falls basin area is heavily used by boaters who come upstream from Lake Champlain to view the scenic falls and the historic area.

A 1996 angler study conducted by GMP for the area below the dam showed that, during the spring period, about 56 percent of the fishing occurred along the shoreline bordering Plant 9 and 20 percent occurred on shoreline bordering Plant 9B, about 21 percent occurred along the shorelines adjacent to the city park and city boat dock area, and about 3 percent of the angling was from boats in the falls basin area (see section V.C.3 for more details on the angler survey).

The Vermont Department of Forests Parks and Recreation (VDFPR) prepared a Vermont Recreation Plan (VRP) in 1993, which assesses outdoor recreation resources, needs, and natural

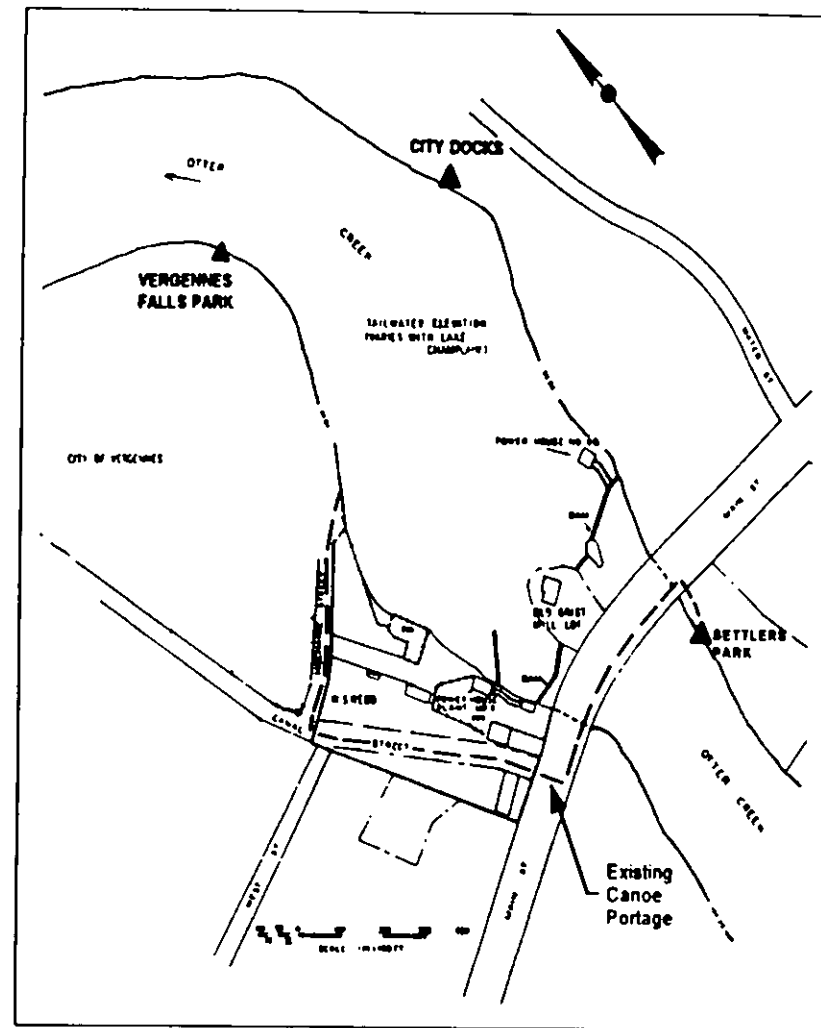


Figure 4. Current Recreation Sites and Features Within the Vergennes Project Area (Source: modified from GMP, 1997)

resources for the state of Vermont. The VRP defined four recreation needs relevant to the project area, including: (1) bicycle paths linking neighborhoods, schools, and commercial areas of towns; (2) signs/marks identifying existing trails; (3) acquiring and protecting open space; and (4) developing new park areas and facilities.

In its 1997 Municipal Development Plan (November 11, 1997), the city of Vergennes identified a number of concerns and recommendations for the area above the falls and the area below the falls. Some of the concerns and recommendations in the area above the falls include: replacing the existing canoe portage route from Settler's Park to the lower river with a route along the western bank that would be less dangerous; changing GMP fencing restrictions to make the pumphouse more accessible to the public; adding additional vehicular parking and access; and adding educational signs about the falls and the hydropower project. In addition, the city of Vergennes proposes to stabilize and restore the pumphouse and link walking trails in the upper basin with those in the falls basin area.

Concerns and recommendations presented in the Municipal Development Plan for the area below the falls include: an over building in the vicinity of the municipal boat docks; removing fallen trees, driftwood, and debris along the shoreline; improving and adding lighting and walkways along the river; adding picnic tables, grills, and a playground; improving the health of vegetation along the shoreline; adding disabled-accessible fishing areas; and keeping boat dockage at current levels to minimize the threat of increased pollution from increased boat traffic. The city of Vergennes also proposes to upgrade the municipal docks at MacDonough Park and to add lighting, picnicking facilities, and walking trails in this area.

b. Environmental effects and recommendations: GMP, in consultation with the VANR and the city of Vergennes, developed proposed recreation enhancement measures, including: (1) development of directional and interpretive signs for recreation in the project area; (2) improved access for small boats and better definition of the parking area at Settler's Park; (3) trail, shoreline fishing access, vegetative plantings, and picnic area improvements along the western bank near Plant 9; (4) construction of a disabled-accessible fishing platform on the western bank near Plant 9 in accordance with ADA guidelines; and (5) installation of signs interpreting the history of the falls and the surrounding structures. GMP proposes to develop the final designs for the proposed recreation enhancements after licensing in consultation with the VANR and the city of Vergennes.

The VANR states that the existing portage route, although not ideal, is adequate, and that the proposed use of the existing stairs on the east side of the river would not be suitable for a new portage route and would be impossible to retrofit. The VANR also states that the current route crossing the Route 22A bridge is acceptable as part of the portage route (letter from Rose Paul, Chief of Policy and Planning, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated April 25, 1997). The VANR also states concerns that increased fishing pressure during the spring walleye run may necessitate expansion of parking and that monitoring of this issue should occur as part of the post-licensing FERC Form 80 process (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to David P. Boergers, Acting Secretary, FERC, Washington, DC, dated June 1, 1998).

Local citizens commented during the scoping meeting (December 11, 1997) on the effects of the proposed project on recreation resources in the area. Commenters stated that there is a need for public toilet facilities in the shoreline area immediately below Vergennes Falls.

Our Analysis

Public fishing access would be enhanced by the proposed disabled-accessible fishing platform, trail improvements, and improved shoreline access. GMP's angler survey found that the majority of angling (56 percent) occurred in the vicinity of the Plant 9 tailrace. The proposed fishing platform would enhance access for anglers in this area. The proposed fishing platform would be located in a visually significant area and within the Vergennes Historic District (see sections V.C.4.a and V.C.5). Development of final plans in consultation with the VANR, the SHPO, and the city of Vergennes would help ensure compatibility of the facility with the surrounding historic character. In addition, increased fishing and recreational use in this area may lead to the need for increased parking capacity in the vicinity of the falls basin and tailrace area over the term of the license. Monitoring the recreational use of this area as part of the post-licensing FERC Form 80 process would help ensure that adequate parking facilities in this area would be provided over the term of the license.

Picnicking and sightseeing would be enhanced as a result of proposed trail and picnic area improvements. These improvements would make the shoreline more attractive and increase the usable area for picnickers and sightseers by linking the area below Plant 9 to Vergennes Falls Park. These improvements would help support the heavy use of this area that occurs as a result of easy access by boaters from Lake Champlain and the attraction for viewing the aesthetics of the falls and historic area. As noted

during the scoping meeting, toilet facilities are needed within the area below Vergennes Falls during the summer peak period of recreational use. Portable toilet facilities would help meet this need during the high use period.

The proposed directional signs would enhance use for recreationalists who are not familiar with the recreational opportunities in the project area. The proposed interpretive signs would enhance the educational and historical experience of the recreational users within the project area. The proposed directional signs also would enhance and provide a clearer demarcation of the existing canoe portage route. In addition, the proposed signs and recreational enhancements would help facilitate the city of Vergennes enhancement plans for the areas above and below the falls.

The proposed ROR operation would decrease water level fluctuation upstream of the dam and would slightly enhance recreational use along the shoreline areas because exposed shoreline areas would be slightly reduced and water level elevations would be more stable. The proposed aesthetic flows would enhance the recreational experience of recreational boaters, anglers, and shoreline visitors to the falls basin area (see section V.C.4).

We recommend that GMP implement its proposed recreational enhancements. We also recommend that the development of the final design and plan of the proposed recreation enhancements be conducted in consultation with the VANR, SHPO, and the city of Vergennes to ensure compatibility of these enhancements with the existing historic and scenic character of the area. In addition, we recommend that GMP install portable toilet facilities (including disabled-accessible facilities) in the area below Vergennes Falls, the number and location to be determined in consultation with the city of Vergennes. We also recommend that GMP review the potential need for additional parking related to increased recreational use in the tailrace area as part of the post-licensing FERC Form 80 process. GMP's proposed recreational enhancements with our recommended supplemental measures would enhance the recreational opportunities within the project area.

c. Unavoidable adverse effects: None.

6. Cultural Resources

a. Affected environment:

Historical Resources

The Vergennes Project's area of potential effect (APE) includes the land in the vicinity of the dam and powerhouses, and

the shoreline along Otter Creek that is influenced by the operation of the project.

The Vergennes Project facilities are situated within the boundary of the Vergennes Historic District, which was listed in the National Register of Historic Places (National Register) in 1976. The nomination form prepared for the District included as contributing elements the GMP-owned Plant 9 powerhouse, Norton's Grist Mill and storage building (a former horse shed), the Monkton Iron Works tunnel, former Vermont Shade Roller Company building, and former Plant 9 office/storehouse (see figure 2). The Vergennes pumphouse, historically and currently owned by the city of Vergennes, and the former Benton Machine Shop wheelhouse (not owned by GMP), are also contributing elements. An historical assessment, conducted in 1997 in association with GMP's relicensing application process, updated and expanded the identification of elements contributing to the significance of the Vergennes Historic District to include the Vergennes Project dam, Plant 9 intake structure and penstocks, and Plant 9B intake, penstocks, substructure and generating components. The VDHP has not yet commented on GMP's historical assessment.

The project facilities, illustrative of Vermont's hydroelectric plant design and construction to about World War II, represent the continued use of the falls as a source of power. The concrete overflow dam constructed between 1912-1918, with its spillways controlled by timber flashboards, Plant 9 intake installed in 1912 with its vertical gates controlled by cast iron headworks, and Plant 9's riveted steel penstocks, are representative of typical divided-flow installations throughout the State of Vermont during this period and into the 1920's. The construction of an additional generating plant (Plant 9B) in 1943 represents the importance of hydropower to the Vergennes community and illustrates the change and modernization in hydro design and construction.

The former Benton Machine Shop wheelhouse and Norton's Grist Mill and storage building (a former horse shed) are vacant and boarded up. GMP currently leases a portion of the former Vermont Shade Roller Company building (also called the "white building") to B.F. Goodrich for temporary storage of paperwork. The city-owned Vergennes pumphouse, although unused, has been somewhat stabilized and rehabilitated by efforts initiated by the city and funded in part by GMP.

As a revitalization measure, the city of Vergennes' Municipal Development Plan proposes to create a "gateway" to the city in the area around Vergennes Falls, including portions of the Vergennes Historic District. To this end, the city is working with the owners of vacant properties, including GMP as

owner of Norton's Grist Mill and the former Vermont Shade Roller Company building, to find tenants for these properties.

Archeological Resources

The Vermont Archeological Inventory maintained by the Vermont Division for Historic Preservation (VDHP) identifies 19 Native American archeological sites within the project area. The Vermont Archeological Inventory lists only two historic period archeological sites within the project boundary. Sites VT-AD-146 (former Monkton Iron Works) and VT-AD-147 (creamery) were destroyed in the course of constructing the city's wastewater treatment plant located near Vergennes Falls Park, but a portion of a tunnel once associated with the iron works remains extant, and is a contributing element to the Vergennes Historic District. The Monkton Iron Works Company was the first known business operating below the falls on the current site of the Plant 9 powerhouse. This company supplied most of the iron work and ammunition used by Thomas McDonough and his fleet when they defeated the British on lake Champlain in the Battle of Plattsburgh.

A Phase IA archeological survey commissioned by GMP concluded that the full extent of shoreline along the project impoundment should be considered sensitive for Native American archeological sites. The Phase IA archeological survey noted the potential for European-American archeological sites in proximity to the Vergennes Project along both sides of Otter Creek to the upper project limits. The survey did not, however, include location or identification of any specific sites. The VDHP has not yet commented on GMP's Phase IA archeological survey report.

According to a field investigation of the project impoundment (GMP, 1996), the shoreline is experiencing soil erosion and sedimentation, particularly in the middle and upper reaches. One of the Native American sites is located in an area experiencing noticeable erosion. Soil erosion and sedimentation along the Vergennes impoundment is due to, but not limited to, the current peaking mode of project operation, high flow conditions, and erodible clay soils, lack of a buffer zone between the river corridor and adjacent cultivated farmland, and the presence of cattle use along the shoreline.

b. Environmental effects and recommendations: Responding to the VANR's review of its draft license application, GMP agreed to replace the deteriorated windows and roof of Norton's Grist Mill. These actions would contribute to the stabilization and protection of this contributing element in the Vergennes Historic District. GMP also agreed to construct an ADA-compliant fishing access platform on the western bank of Otter Creek between the Plant 9 powerhouse and the city park immediately downstream, an

area which is within the boundary of the Vergennes Historic District.

Our Analysis

Vergennes Falls has been used for hydropower industry since the middle of the 18th century, and electric power has been generated from the falls since the 1890's. The Vergennes Hydroelectric Project, built between 1911 and 1943, possesses significance in the context of hydroelectric power plant design and construction in the state of Vermont. The historic project components meet National Register Criterion C by possessing properties "that embody the distinctive characteristics of a type, period, or method of construction" (GMP, 1997). Continued operation and maintenance of the Vergennes Project with additional staff-recommended measures would maintain its historic facilities for the purpose for which they were originally designed and built, and would therefore, be beneficial to the National Register-listed Vergennes Historic District.

GMP's proposal to operate the project in ROR mode would eliminate the 1.5-foot reservoir drawdown required under the current peaking mode. While elimination of the drawdown may reduce some localized erosion within the fluctuation zone, it would not eliminate it, soils, erodible clay, bank steepness, and stream geometry (see section V.C.1, Water Resources, for further discussion). Consequently, known and as yet unknown archeological sites along the project impoundment may be affected by continued soil erosion.

GMP's proposal to replace the deteriorated roof and windows of Norton's Grist Mill could result in adverse effects on the Vergennes Historic District through alteration of an element contributing to the district's significance. The Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings, are intended to ensure that rehabilitation measures avoid or minimize actions that may diminish characteristics that qualify Historic Properties for the National Register. Adherence to these guidelines in consultation with the Vermont State Historic Preservation Officer (SHPO) would ensure that adverse effects on the National Register-listed Vergennes Historic District arising from replacement of Norton's Grist Mill's roof and windows would be avoided or minimized.

GMP's proposal to construct a disabled-accessible fishing access platform below the Plant 9 powerhouse would introduce a new structure within the boundary of the Vergennes Historic District. Consultation with the SHPO concerning the design and materials of the platform would avoid introduction of an element out of character with the Historic District that might diminish

the characteristics for which the District has been listed in the National Register.

To protect the Historic Properties and archeological sites, we recommend that a PA be developed and executed pursuant to Section 106 of the National Historic Preservation Act and the regulations of the Advisory Council, 36 CFR Part 800.

The PA would require the licensee to develop, for Commission approval, and, upon approval, implement, a Cultural Resources Management Plan (CRMP). The CRMP would accomplish several purposes, one of which would be to specify a procedure for continued project operation and maintenance without loss of its historic integrity.

c. Cumulative effects: Continuing to operate and maintain the Vergennes Hydroelectric Project, the repair of Norton's Grist Mill, and the addition of a fishing platform, could have potential cumulative effects on the Vergennes Historic District which is an Historic Property of statewide significance. GMP's proposal to continue operating and maintaining the Vergennes Project with our recommended CRMP would maintain the historic character and use of the project facilities, and would therefore provide beneficial cumulative effects by preserving resources of statewide significance over the next 30 to 50 years. GMP's proposal to repair Norton's Grist Mill with our recommended CRMP would have beneficial effects on the Vergennes Historic District by ensuring that any alteration to Norton's Grist Mill would be done in a manner that would preserve the historic integrity of this resource of statewide significance.

GMP's proposal to add a fishing platform with our recommended CRMP would ensure that the fishing platform is designed to be compatible with the historic character of the Vergennes Historic District.

We conclude that GMP's proposed action, along with our recommendations, would have a beneficial cumulative effect on cultural resources by protecting and enhancing the physical characteristics and qualities of historical association that have qualified the Vergennes Historic District for listing in the National Register as a resource of statewide importance.

d. Unavoidable adverse effects: None.

D. No-action

Under the no-action alternative, GMP would continue to operate the project under the terms of the original license. No proposed environmental enhancements would be implemented.

VI. DEVELOPMENTAL ANALYSIS

In this section, we analyze the project's use of Otter Creek's available water resources to generate hydropower; estimate the economic benefits of the proposed project; and estimate the cost of various environmental protection, mitigation, and enhancement measures and the effects of these measures on project operations.

A. Power and Economic Benefits of the Project

We based the value of the project's power benefits on the costs of operating alternative resources in GMP's system. This value yields a reasonable estimate of project value for the purposes of our economic studies, which are (1) to provide a basis for measuring the economic benefits of proposed project operation and (2) to provide a basis for estimating the cost of replacing power for any staff alternatives that would reduce project generation and/or capacity.

The value of the project power is the cost of the cheapest, most reasonable generation resource available in the region. This resource is a natural gas-fueled combined-cycle electric plant. The cost of new combined-cycle generating capacity is about \$109/kW-year (at a fixed charge rate of 14 percent). Our estimate of the fuel cost (based on fuel consumption at a heat rate of 6,200 Btu/kWh) is \$16.5 mills/kWh. We estimated the 1998 fuel cost based on information in Energy Information Administration, Supplement to the Annual Energy Outlook, March 1998. At a 90 percent capacity factor, the total cost of firm power and energy would be \$30.32 mills/kWh. Table 7 summarizes the values that we use for key parameters in our analysis.

Table 7. Summary of key parameters for economic analysis of GMP's proposed Vergennes Project (Source: Staff)

Parameter	Value
Period of analysis	30 years
Term of financing	20 years
Interest/discount rate	10.0 percent ¹
Escalation rate	0 percent
Federal tax rate	34 percent
Local tax rate	3 percent
Insurance rate	0.25 percent of cost to construct
Operation and maintenance cost (1997) ²	\$264,173
Net investment	\$0 ³
Energy value (1998)	16.5 mills/kWh
Capacity value (1998)	109 \$/kW-yr
Total power value (alternate generation)	30.32 mills/kWh
Application preparation cost	\$570,000

¹ The discount rate of 10 percent is typical for this type of analysis and reflects the cost of borrowing money.

² GMP's 1997 FERC Form #1, page 411.

³ GMP's application did not provide a value for net investment. The staff assumes that the net investment is effectively \$0.

We used these assumptions to analyze the economics of the proposed project, which consist of operation of the Vergennes Project with GMP's proposed environmental and safety measures. Table 8 summarizes the annual costs of GMP's proposed enhancements for the Vergennes Project.

Table 8. Summary of annual costs of GMP's proposed enhancements for the Vergennes Project (Source: Staff)

Protection, mitigation, or enhancement measures	Capital cost ¹ (1998\$)	Operation & maintenance (1998\$)	Annual cost (1998\$)
Provide first call flows for fish resources	\$0	\$0	\$3,100
Provide seasonal aesthetic flows ²	\$0	\$0	\$22,100
Recreation enhancements	\$166,000	\$0	\$24,900
Provide improvements to Grist Mill building	\$40,000	\$0	\$6,000
Provide automatic controls	\$100,000	\$0	\$15,000

¹ GMP identified capital improvement and economic assumptions in its application.

² GMP proposes to release flows that would result in a loss of 0.103 GWh of energy generation annually.

³ GMP proposes to provide aesthetic flows that would result in a loss of 0.7299 GWh of energy generation annually.

Based on these assumptions, we estimate that the annual net benefit of GMP's proposed Vergennes Project would be about -\$62,000 (-6.56 mills/kWh).

The estimated average annual output of the project would be 9.4551 GWh. This would provide annual power value of \$286,700, and an annual net cost of \$348,700 for the project.

B. Cost of Environmental Protection, Mitigation, and Enhancement Measures

In this section, we present the annual costs of the proposed action with additional staff-recommended measures.

Based on the proposed action with additional staff-recommended measures, we estimate that the annual benefit would be about 9.45 GWh of energy annually or about -\$63,200 (-6.68

mills/kWh). Each measure recommended by the staff could affect project economics through costs (capital expenditures, operation and maintenance, etc.). Table 9 summarizes the costs and net benefits associated with the staff's recommended enhancements.

Table 9. Summary of annual costs of the staff-recommended enhancements for GMP's proposed Vergennes Project (Source: Staff)

Protection, mitigation, or enhancement measures ¹	Capital cost (1998\$)	Operation & maintenance (1998\$)	Annual cost (1998\$)
Develop and implement a plan to monitor ROR, aesthetic flows, first call flows for fish resources	\$5,000	\$500	\$1,300
Execute a PA and develop and implement a CRMP	\$5,000	\$0	\$800

¹ Cost of recommendations for portable toilets and final design drawings for recreation enhancements are considered to be minor and can be accommodated into the recreation development costs that GMP proposes. Costs associated with our first call flow allocations also would be minor.

The staff estimated the O&M costs.

For the Vergennes Project, the enhancements that GMP proposes would increase capital costs by \$306,000. In addition to the proposed action, the additional staff-recommended measures would increase capital costs by \$10,000.

Table 10 summarizes the capacity, energy, power value, project cost, and net benefits for each of the alternatives for the project. In section VII, Comprehensive Development and Recommended Alternative, we discuss both the economic and environmental basis for the staff-recommended alternative.

Table 10. Summary of net annual benefits of alternatives for GMP's proposed Vergennes Project (Source: Staff)

	GMP's proposed action	Proposed action with additional staff-recommended measures	No-action
Annual generation	9.455 GWh	9.455 GWh	10.288 GWh
Installed capacity	2.4 MW	2.4 MW	2.4 MW
Annual power value (\$)	286,700 30.32 mills/kWh	286,700 30.32 mills/kWh	311,900 30.32 mills/kWh
Annual cost (\$)	348,700 36.88 mills/kWh	349,900 37 mills/kWh	330,400 32.11 mills/kWh
Net annual benefit (\$)	(62,000) (6.56 mills/kWh)	(63,200) (6.68 mills/kWh)	(18,500) (1.79 mills/kWh)

Note: All costs and benefits are levelized over 30 years.

Our evaluation of the economics of the proposed action and the proposed action with additional staff-recommended measures appears to cost more than currently available market pricing or alternative power costs. Based on the record in this proceeding, we conclude that it is in the public interest to license the project, and leave to GMP the decision of whether or not to continue operating the existing project.

C. No-action

Under the no action alternative, the project would continue to operate under the current mode of operation, and no new environmental protection, mitigation, or enhancement measures would be implemented.

The annual cost of the existing project, including carrying charges on application preparation cost is about \$330,400 (32.11 mills/kWh), for the existing generation of about 10.288 GWh of energy annually. We estimated that the cost of alternative power is about 30.32 mills/kWh. Therefore, the existing project would produce power at an annual cost of about \$-18,500 (-1.79 mills/kWh) more than the currently available alternative.

D. Pollution Abatement

The Vergennes Project would generate about 9.4551 GWh of electricity annually. This amount of hydropower generation, when contrasted with the generation of an equal amount of energy produced by fossil-fueled facilities, avoids the unnecessary emission of atmospheric pollutants. Assuming that the 9.4551 GWh of power produced by the project would be replaced by an equal amount of power produced by natural gas-fired utilities, then generating electrical power equivalent to that produced by the Vergennes Project would require combustion of about 97 million cubic feet of natural gas annually. In addition, removal of pollutants from the emissions produced by burning fossil fuels to those levels presently achievable by state-of-the-art technology would cost about \$5,000 (1998\$) annually.

VII. COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10(a)(1) of the FPA require the Commission to give equal consideration to all uses of the waterway on which the project is located. When we review a hydropower project, we consider the water quality, fish and wildlife, recreational, and other nondevelopmental values of the involved waterway equally with its electric energy and other developmental values. In determining whether, and under what conditions, to license a project, the Commission must weigh the various economic and environmental tradeoffs involved in the decision.

This section contains the basis for, and a summary of, our recommendations to the Commission for the licensing of the Vergennes Project. We weigh the costs and benefits of our recommended alternative against other proposed measures.

A. Recommended Alternative

Based on our independent review and evaluation of the proposed action, the proposed action with additional staff-recommended measures, and no-action, we select the proposed action with our additional recommended environmental measures as the recommended alternative.

We recommend this alternative because: (1) issuance of a license would allow GMP to operate the project as a dependable source of electric energy; (2) the 9.4551 GWh project would avoid the need for an equivalent amount of fossil-fuel fired electric generation and capacity, continuing to help conserve these nonrenewable energy resources and reduce atmospheric pollution; and (3) the recommended measures would protect fish and terrestrial resources, improve public use of recreation facilities and resources, improve multiple use and management of project lands, improve aesthetics, and maintain and protect

historic and archeological resources within the area affected by project operations.

We recommend including the following measures in any license issued for the Vergennes Project:

- (1) Convert the Vergennes Project from daily peaking to ROR operation, where outflow approximates inflow on an instantaneous basis.
- (2) Release aesthetic flows over Vergennes Falls as follows: April 1 through October 31--150 cfs daytime (¼ hour before sunrise to ¼ hour after sunset), 75 cfs nighttime; November 1 through December 15--100 cfs (¼ hour before sunrise to ¼ hour after sunset), 50 cfs nighttime; December 16 through March 31--no aesthetic flows released.
- (3) Give Plant 9 first call (bring on line first and provide a continuous outflow at all times that the project is operating) during periods of potential use of the project tailrace area by walleye and lake sturgeon during their spawning and egg incubation periods (April 1 to June 15) and from September 15 through November 15 (the period when landlocked salmon may concentrate in the project tailwaters).
- (4) Implement recreational enhancements to include: (1) directional and interpretive signs for recreation in the project area; (2) improve access for small boats and better define the parking area at Settler's Park; (3) improve the trail, shoreline fishing access, vegetative planting, and picnic area along the western bank of the lower Otter Creek in the falls basin near Plant 9; (4) construct a disabled-accessible fishing platform on the western bank near Plant 9 in accordance with ADA guidelines; (5) install signs interpreting the history of the falls and the surrounding structures; (6) install portable toilet facilities in the area below Vergennes Falls; and (7) enhance aesthetics including windows and roof replacement at the former Norton's Grist Mill building on Grist Mill island overlooking Vergennes Falls. The final designs for the recreational enhancements should be developed in consultation with the VANR, SHPO, and the city of Vergennes.
- (5) Implement the provisions of a PA to protect Historic Properties and archeological sites.
- (6) Develop and implement a plan to monitor ROR operation, aesthetic flow releases, and first call flows to Plant 9 for fish resources in consultation with the VANR, FWS, USGS, and the city of Vergennes. This plan, to be submitted for

Commission approval, should include a description of the use of generation records and the exact locations and designs of impoundment and downstream water level recording devices, and an implementation schedule. The plan should include provisions to furnish the results of the monitoring to the Commission and the resource agencies. Upon Commission approval, GMP should implement the approved plan, including any changes to the plan made by the Commission, according to the approved schedule.

Implementation of these measures would improve recreational and aesthetic opportunities; protect aquatic, terrestrial, and cultural resources in the project area; and provide for the best use of the waterway.

The costs of some of these measures would reduce the net benefit of the project. As discussed in section VI, we estimate that the project as proposed by GMP would cost more than currently available alternative power. Our proposed additional environmental measures would increase this economic gap. Specifically, four of our additional recommended measures would reduce the economic benefits of the project. These include: (1) develop and implement a flow monitoring plan; (2) install portable toilet facilities (including disabled-accessible facilities) in the area below Vergennes Falls; (3) develop final design drawings for recreational enhancements in consultation with the VANR, SHPO, and the city of Vergennes; and (4) implement the provisions of a PA.

1. Develop and Implement a Flow Monitoring Plan

GMP does not propose to monitor ROR operation, first call flows for fish resources, or aesthetic flows. Because habitat suitability, fish passage, aesthetic, and historic resources could be affected by inconsistent flow releases and water surface elevations, compliance with our recommended flow releases and water level management regime should be monitored.

We recommend that GMP develop and implement a monitoring plan for the Vergennes Project that would provide for measuring and reporting ROR flows (see section V.C.1), first call flows for fish resources (see section V.C.2), and aesthetic flows (see section V.C.4). The plan should be developed in consultation with the VANR, FWS, USGS, and the city of Vergennes. We estimate that the current annual cost of this monitoring and documentation of compliance with the recommended flows would be \$1,300. The capital cost associated with the preparation of this plan would be modest. Requiring the plan, however, would provide the resource agencies and the Commission with useful and necessary information, and allow the Commission to determine compliance

with operational requirements that may be included in any license that may be issued for the Vergennes Project.

2. Install Portable Toilet Facilities

GMP does not propose to install any toilet facilities. During the scoping process, local residents commented on the need for toilet facilities in the area below Vergennes Falls during the recreation season. Portable toilet facilities would help meet this need during the peak recreation season. We recommend, therefore, that GMP provide portable toilet facilities with the number and location of these facilities to be determined in consultation with the city of Vergennes (see section V.C.5). We estimate that the costs of these facilities would be minor relative to the overall costs of the recreational enhancements.

3. Develop Final Design Drawings for Recreation Enhancements in Consultation with the VANR, SHPO, and the City of Vergennes

GMP proposes to develop final designs for the proposed recreation enhancements in consultation with the VANR and the city of Vergennes. The proposed facilities could affect the historic character of the Vergennes Historic District. We recommend, therefore, in addition to consultation with the VANR and the city of Vergennes, that GMP also consult with the SHPO in the development of the final design of the recreation enhancements (see section V.C.6). We estimate that this consultation would not increase GMP's estimated costs for recreation enhancements. Costs associated with SHPO consultation are included in our estimated costs for the CRMP.

4. Implement the Provisions of a PA

Specifically, GMP has not proposed to develop or implement a PA. However, a proposed CRMP is included in GMP's license application as appendix 4. A PA would contain a stipulation requiring the licensee to prepare, and upon Commission approval, implement, a CRMP, in consultation with the SHPO, addressing the management of Historic Properties and archeological sites within the project's APE and consideration of the effects of recreational enhancements. The proposed CRMP would serve as an outline for the management of Historic Properties and be incorporated into a final CRMP (see section V.C.6). We estimate that the current annual cost of preparing the CRMP would be \$800, a relatively minor amount in relation to total costs.

B. Conclusion

Based on our review of the agency and public comments filed on the project, and on our independent analysis pursuant to sections 4(e), 10(a)(1), and 10(a)(2) of the FPA, we conclude that licensing the Vergennes Project as proposed by GMP with additional staff-recommended measures, would provide for the best comprehensive development of Otter Creek.

VIII. CONSISTENCY WITH FISH AND WILDLIFE RECOMMENDATIONS

Under the provisions of Section 10(j) of the FPA, each hydroelectric license issued by the Commission shall include conditions based on recommendations of federal and state fish and wildlife agencies submitted to adequately and equitably protect, mitigate damages to, and enhance fish and wildlife (including spawning grounds and habitat) affected by the project. No 10(j) recommendations were filed by state and federal resource agencies in response to our notice of application ready for environmental analysis. We evaluated the VANR comments that were filed on June 1, 1998, under Section 10(a).

IX. CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2) of the FPA requires the Commission to consider the extent to which a project is consistent with federal and state comprehensive plans for improving, developing, and conserving waterways affected by the project. Under Section 10(a)(2), federal and state agencies filed 23 plans that address various resources in Vermont. Ten of these plans address

resources relevant to the Vergennes Project.^{5/} No conflicts were found with the plans.

X. FINDING OF NO SIGNIFICANT IMPACT

With our recommended protection and enhancement measures, relicensing of the Vergennes Project would protect fish and terrestrial resources, improve public use of recreation facilities and resources, and improve aesthetics. With our recommended consultation with the SHPO, execution of the PA, and development and implementation of a CRMP, no significant effects on cultural resources are expected.

- 5/ (1) Lake Champlain Fish and Wildlife Policy Committee and Technical Committee. 1981. A strategic plan for development of salmonid fisheries in Lake Champlain. Albany, New York. Waterbury, VT. 19 pp.; (2) Vermont Agency of Environmental Conservation. 1983. Vermont state comprehensive outdoor recreation plan, 1983-1988. Montpelier, VT. June 1983. 195 pp. and appendices; (3) Vermont Agency of Environmental Conservation. 1986. Vermont Rivers Study. Waterbury, VT. 236 pp.; (4) Vermont Agency of Natural Resources. Department of Environmental Conservation. 1988. Hydropower in Vermont: an assessment of environmental problems and opportunities. Waterbury, VT. May 1988. Two volumes; (5) Vermont Agency of Natural Resources. Department of Forests, Parks and Recreation. 1988. Vermont recreation plan. Waterbury, VT. 128 pp. plus map, nine supplemental task group reports, and a 52-page resident recreation survey; (6) Vermont Agency of Natural Resources. Department of Forests, Parks and Recreation. Wetlands Steering Committee. 1988. Wetlands component of the 1988 Vermont recreation plan. Waterbury, VT. July 1988. 43 pp.; (7) Fish and Wildlife Service. Canadian Wildlife Service. 1986. North American waterfowl management plan. Department of the Interior. May 1986. 19 pp.; (8) U.S. Fish and Wildlife Service. Undated. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, DC. 11 pp.; (9) U.S. Fish and Wildlife Service. 1989. Final environmental impact statement - restoration of Atlantic Salmon to New England Rivers. Department of the Interior. Newton Corner, MA. May 1989. 88 pp.; (10) National Park Service. 1982. The nationwide rivers inventory. Department of the Interior, Washington, DC. January 1982. 432 pp.

Based on our independent analysis, issuance of a license for the Vergennes Project as proposed by GMP with additional staff recommended measures would not constitute a major federal action significantly affecting the quality of the human environment.

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Appendix A: Comments on the Draft Environmental Assessment

Comment letters on the Draft EA issued August 13, 1998,
appear in the following order:

<u>Entity</u>	<u>Date of Letter</u>
Green Mountain Power	September 11, 1998
Vermont Agency of Natural Resources	September 17, 1998

Response to Comments of
Green Mountain Power Corporation
on the Draft Environmental Assessment for the
Vergennes Project
September 11, 1998

GREEN MOUNTAIN POWER CORPORATION
100 Main Street, Suite 1000, Vergennes, VT 05491
90 SEP 16 04 33

September 11, 1998

David P. Bourgart, Secretary
Federal Energy Regulatory Commission
400 First Street, N.E.
Room 1-A
Washington, DC 20426

Re: Vergennes Hydroelectric
Project, FERC Project No. 2674-VT

Dear Mr. Bourgart:

GMP-1

Green Mountain Power Corporation (GMP) has reviewed the FERC's Draft Environmental Assessment (DEA) for the Vergennes Hydroelectric Project (FERC Project No. 2674-VT), dated August 13, 1998, and is hereby filing their comments. The FERC recommended GMP's proposed enhancements with additional staff-recommended measures.

GMP-2

GMP takes exception with one staff-recommended measure. The FERC recommended that both units of Plant 9 be operated on a first call on water basis, from April 1 through June 15. The reason for this recommendation is to enhance potential spawning habitat for walleye and lake sturgeon. GMP proposes to operate at least one unit of Plant 9.

GMP-3

Based on the analysis of the fisheries resources, it was determined that operating one unit at Plant 9 would provide sufficient structure flows. The Vermont Agency of Natural Resources reported by letter dated March 20, 1998 that GMP maintain outflow from Plant 9 during spring spawning season, which GMP has proposed in the license application.

GMP-4

Energy loss information regarding GMP's proposed flow operation of Plant 9 was compared to the FERC recommendation. GMP's proposed operating one unit at Plant 9 for the period between April 1 and June 15 for walleye and sturgeon spawning as well as the period between September 15 and November 15. Using the FERC recommendation of Plant 9 getting first call on water for its two units (700 cfs) for the period between April 1 and June 15, an additional loss of energy was computed to be 30,000 K-w. GMP does not believe that this additional loss of energy is justified by the potential small fisheries gain that will be achieved.

GMP-5

Thank you for your consideration of this matter.

Very truly yours,

Craig T. Myette
Craig T. Myette
Vice President

C:\News

Enclosed - 2 copies

cc: Service List

980915-0202-2

GMP-1 No response required.

GMP-2 Please see our response to VANR-5.

GMP-3 VANR's definition of first call as presented in its letter of March 20, 1997, was not clear. VANR clarified its definition in response to the Draft EA. Please see our response to VANR-5.

GMP-4 In its comments on the draft EA, the VANR indicates that it agrees with GMP's proposal to provide continuous outflow from Plant 9 during seasonal time period by giving first call on water to one unit in Plant 9. Therefore, we agree with your comments and revised our analysis and recommendations in section V.C.2.b accordingly (see our response to VANR-5).

GMP-5 No response required.



State of Vermont

Department of Fish and Wildlife
Department of Forest, Parks and Recreation
Department of Environmental Conservation
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1-800-245-2121 VOTED-ONLY

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OFFICE OF THE SECRETARY AGENCY OF NATURAL RESOURCES
50 SEP 21 PM 1:13
Department of Environmental Conservation

FEDERAL ENERGY
REGULATORY
COMMISSION

WATER QUALITY DIVISION
103 South Main Street
Building 10 North
Waterbury, VT 05671-0400

802-245-2121
Fax 802-241-3287

September 17, 1998

COMMENTS ON DRAFT ENVIRONMENTAL ASSESSMENT

VERGENNES HYDROELECTRIC PROJECT
FERC PROJECT NO. 2874 — *COJ*
GREEN MOUNTAIN POWER CORPORATION

VANR-1

David P. Boergers, Secretary
Federal Energy Regulatory Commission
888 First Street, NE, Room 1-A
Washington, D.C. 20426

Dear Secretary Boergers:

VANR-1

The Vermont Agency of Natural Resources (Agency) hereby files comments on the Draft Environmental Assessment (draft EA) for the Vergennes Hydroelectric Project, for which a "Notice of Availability of Draft Environmental Assessment" was issued on August 13, 1998. The Agency is substantially in agreement with the conclusions reached by FERC staff in the draft EA. The environmental and public use issues have been thoroughly explored, and we appreciate FERC staff's general support of the mitigation and enhancement measures developed between the licensee, the Agency, and other parties.

Section V.C.2. Aquatic Resources

a. Affected stockmen:

Fishery Resources

VANR-2

In this section, on p. 17, lake sturgeon use of the reach below Vergennes Falls is discussed. The text indicates that the Agency had stated in its June 30, 1995 letter to the licensee that sturgeon may be spawning below the project dam. That could be inferred from what we had stated, but technically we only stated that sturgeon have been exhibiting spawning behavior by ascending the river in the spring. This occurs in other major lake tributaries that historically supported

980924-0209-3
Repared Office: Bureau of Fish and Wildlife Management, September 21, 1998

Response to Comments of
the Vermont Agency of Natural Resources
on the Draft Environmental Assessment for the
Vergennes Project
September 17, 1998

VANR-1 No response required.

VANR-2 We have modified the text in section V.C.2.a to reflect your clarification and added new text to reflect more recent sighting of Lake Sturgeon below Vergennes dam.

Secretary Rogers
September 17, 1998
Item 2

VANR-2 spawning as well. Spawning unfortunately has not been documented, however. By way of an update, there have been reported sightings ofurgeon below Vergennes as recently as the last week of May 1998.

VANR-3 There is a typo in the first full paragraph of p. 17. The scoping meeting was in December 1997, not 1998.

VANR-4 In the first paragraph of p. 18, it is stated that fall anglers showed a preference for catching salmon and walleye. Anglers in the fall predominantly target salmon and trout. The survey indicates that bass are also popular, but they are not a seasonal fishery. The survey question may not have been entirely clear in that the anglers interviewed in the fall may have been indicating that they also fish for walleye, but in the spring.

B. Environmental effects and recommendations:

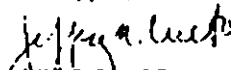
VANR-5 The interpretation of a "first call" operating rule discrepancy between GMP and the Agency is incorrect. The Agency's goal was to have preferential operation of Plant 9 by bringing that station on first and maintaining it on line as long as the project is operating during the seasonal time periods. We did not ask GMP to keep Plant 9 off line until Plant 9 reached full capacity of both units. Use of Plant 9B is acceptable to the Agency when flows exceed 350 cfs via Plant 9 plus spillage. We apologize for not making this clear previously.

Section VI.A. Power and Economic Benefits of the Project

VANR-6 Footnote 4 (related to conversion in run-of-river) for Table 8 does not seem to be associated with application preparation cost.

VANR-7 Thank you for the opportunity to comment on the draft EA.

Sincerely yours,


Jeffrey R. O'Neil, P.E.
Chief Hydrologist

cc: Mr. John R.
FTR on vanr list

VANR-3 We have corrected the typographical error in section V.C.2.a as suggested.

VANR-4 We reviewed the responses to question 10 of the GMP angler survey and note that fall anglers prefer salmon (34 percent), trout (13 percent), and walleye (8 percent). We have revised the text in section V.C.2.a accordingly.

VANR-5 Thank you for the clarification on the definition of "first call." While our interpretation of "first call" would have provided some additional habitat benefit, we agree that your definition of "first call" (bringing one unit of Plant 9 on line first and maintaining a continuous outflow of at least 350 cfs from Plant 9 during the seasonal time periods) would provide a continuous and adequate outflow on the western side of the tailrace to enhance fisheries resources. We have revised our analysis and recommendations and modified the text accordingly.

VANR-6 We agree and delete footnote 4.

VANR-7 No response required.

Form L-3
(October, 1975)

FEDERAL ENERGY REGULATORY COMMISSION

TERMS AND CONDITIONS OF LICENSE FOR CONSTRUCTED
MAJOR PROJECT AFFECTING NAVIGABLE
WATERS OF THE UNITED STATES

Article 1. The entire project, as described in this order of the Commission, shall be subject to all of the provisions, terms, and conditions of the license.

Article 2. No substantial change shall be made in the maps, plans, specifications, and statements described and designated as exhibits and approved by the Commission in its order as a part of the license until such change shall have been approved by the Commission: Provided, however, That if the Licensee or the Commission deems it necessary or desirable that said approved exhibits, or any of them, be changed, there shall be submitted to the Commission for approval a revised, or additional exhibit or exhibits covering the proposed changes which, upon approval by the Commission, shall become a part of the license and shall supersede, in whole or in part, such exhibit or exhibits theretofore made a part of the license as may be specified by the Commission.

Article 3. The project area and project works shall be in substantial conformity with the approved exhibits referred to in Article 2 herein or as changed in accordance with the provisions of said article. Except when emergency shall require for the protection of navigation, life, health, or property, there shall not be made without prior approval of the Commission any substantial alteration or addition not in conformity with the approved plans to any dam or other project works under the license or any substantial use of project lands and waters not authorized herein; and any emergency alteration, addition, or use so made shall thereafter be subject to such modification and change as the Commission may direct. Minor changes in project works, or in uses of project lands and waters, or divergence from such approved exhibits may be made if such changes will not result in a decrease in efficiency, in a material increase in cost, in an adverse environmental impact, or in impairment of the general scheme of development; but any of such minor changes made without the prior approval of the Commission, which in its judgment have produced or will produce any of such results, shall be subject to such alteration as the Commission may direct.

Article 4. The project, including its operation and maintenance and any work incidental to additions or alterations authorized by the Commission, whether or not conducted upon lands of the United States, shall be subject to the inspection and supervision of the Regional Engineer, Federal Energy Regulatory Commission, in the region wherein the project is located, or of such other officer or agent as the Commission may designate, who shall be the authorized representative of the Commission for such purposes. The Licensee shall cooperate fully with said representative and shall furnish him such

information as he may require concerning the operation and maintenance of the project, and any such alterations thereto, and shall notify him of the date upon which work with respect to any alteration will begin, as far in advance thereof as said representative may reasonably specify, and shall notify him promptly in writing of any suspension of work for a period of more than one week, and of its resumption and completion. The Licensee shall submit to said representative a detailed program of inspection by the Licensee that will provide for an adequate and qualified inspection force for construction of any such alterations to the project. Construction of said alterations or any feature thereof shall not be initiated until the program of inspection for the alterations or any feature thereof has been approved by said representative. The Licensee shall allow said representative and other officers or employees of the United States, showing proper credentials, free and unrestricted access to, through, and across the project lands and project works in the performance of their official duties. The Licensee shall comply with such rules and regulations of general or special applicability as the Commission may prescribe from time to time for the protection of life, health, or property.

Article 5. The Licensee, within five years from the date of issuance of the license, shall acquire title in fee or the right to use in perpetuity all lands, other than lands of the United States, necessary or appropriate for the construction maintenance, and operation of the project. The Licensee or its successors and assigns shall, during the period of the license, retain the possession of all project property covered by the license as issued or as later amended, including the project area, the project works, and all franchises, easements, water rights, and rights or occupancy and use; and none of such properties shall be voluntarily sold, leased, transferred, abandoned, or otherwise disposed of without the prior written approval of the Commission, except that the Licensee may lease or otherwise dispose of interests in project lands or property without specific written approval of the Commission pursuant to the then current regulations of the Commission. The provisions of this article are not intended to prevent the abandonment or the retirement from service of structures, equipment, or other project works in connection with replacements thereof when they become obsolete, inadequate, or inefficient for further service due to wear and tear; and mortgage or trust deeds or judicial sales made thereunder, or tax sales, shall not be deemed voluntary transfers within the meaning of this article.

Article 6. In the event the project is taken over by the United States upon the termination of the license as provided in Section 14 of the Federal Power Act, or is transferred to a new licensee or to a non-power licensee under the provisions of Section 15 of said Act, the Licensee, its successors and assigns shall be responsible for, and shall make good any defect of title to, or of right of occupancy and use in, any of such project property that is necessary or appropriate or valuable and serviceable in the maintenance and operation of the project, and shall pay and discharge, or shall assume responsibility for payment and discharge of, all liens or encumbrances upon the project or project property created by the Licensee or created or incurred after the issuance of the license: Provided, That the provisions of this article are not intended to require the Licensee, for the purpose of transferring the project to the United States or to a new licensee, to acquire any different title to, or right of occupancy and use in, any of such project property than was necessary to acquire for its own purposes as the Licensee.

Article 7. The actual legitimate original cost of the project, and of any addition thereto or betterment thereof, shall be determined by the Commission in accordance with the Federal Power Act and the Commission's Rules and Regulations thereunder.

Article 8. The Licensee shall install and thereafter maintain gages and stream-gaging stations for the purpose of determining the stage and flow of the stream or streams on which the project is located, the amount of water held in and withdrawn from storage, and the effective head on the turbines; shall provide for the required reading of such gages and for the adequate rating of such stations; and shall install and maintain standard meters adequate for the determination of the amount of electric energy generated by the project works. The number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, shall at all times be satisfactory to the Commission or its authorized representative. The Commission reserves the right, after notice and opportunity for hearing, to require such alterations in the number, character, and location of gages, meters, or other measuring devices, and the method of operation thereof, as are necessary to secure adequate determinations. The installation of gages, the rating of said stream or streams, and the determination of the flow thereof, shall be under the supervision of, or in cooperation with, the District Engineer of the United States Geological Survey having charge of stream-gaging operations in the region of the project, and the Licensee shall advance to the United States Geological Survey the amount of funds estimated to be necessary for such supervision, or cooperation for such periods as may mutually agreed upon. The Licensee shall keep accurate and sufficient records of the foregoing determinations to the satisfaction of the Commission, and shall make return of such records annually at such time and in such form as the Commission may prescribe.

Article 9. The Licensee shall, after notice and opportunity for hearing, install additional capacity or make other changes in the project as directed by the Commission, to the extent that it is economically sound and in the public interest to do so.

Article 10. The Licensee shall, after notice and opportunity for hearing, coordinate the operation of the project, electrically and hydraulically, with such other projects or power systems and in such manner as the Commission may direct in the interest of power and other beneficial public uses of water resources, and on such conditions concerning the equitable sharing of benefits by the Licensee as the Commission may order.

Article 11. Whenever the Licensee is directly benefitted by the construction work of another licensee, a permittee, or the United States on a storage reservoir or other headwater improvement, the Licensee shall reimburse the owner of the headwater improvement for such part of the annual charges for interest, maintenance, and depreciation thereof as the Commission shall determine to be equitable, and shall pay to the United States the cost of making such determination as fixed by the Commission. For benefits provided by a storage reservoir or other headwater improvement of the United States, the Licensee shall pay to the Commission the amounts for which it is billed from time to time for such headwater benefits and for the cost of making the determinations pursuant to the then current regulations of the Commission under the Federal Power Act.

Article 12. The United States specifically retains and safeguards the right to use water in such amount, to be determined by the Secretary of the Army, as may be necessary for the purposes of navigation on the navigable waterway affected; and the operations of the Licensee, so far as they affect the use, storage and discharge from storage of waters affected by the license, shall at all times be controlled by such reasonable rules and regulations as the Secretary of the Army may prescribe in the interest of navigation, and as the Commission may prescribe for the protection of life, health, and property, and in the interest of the fullest practicable conservation and utilization of such waters for power purposes and for other beneficial public uses, including recreational purposes, and the Licensee shall release water from the project reservoir at such rate in cubic feet per second, or such volume in acre-feet per specified period of time, as the Secretary of the Army may prescribe in the interest of navigation, or as the Commission may prescribe for the other purposes hereinbefore mentioned.

Article 13. On the application of any person, association, corporation, Federal agency, State or municipality, the Licensee shall permit such reasonable use of its reservoir or other project properties, including works, lands and water rights, or parts thereof, as may be ordered by the Commission, after notice and opportunity for hearing, in the interests of comprehensive development of the waterway or waterways involved and the conservation and utilization of the water resources of the region for water supply or for the purposes of steam-electric, irrigation, industrial, municipal or similar uses. The Licensee shall receive reasonable compensation for use of its reservoir or other project properties or parts thereof for such purposes, to include at least full reimbursement for any damages or expenses which the joint use causes the Licensee to incur. Any such compensation shall be fixed by the Commission either by approval of an agreement between the Licensee and the party or parties benefitting or after notice and opportunity for hearing. Applications shall contain information in sufficient detail to afford a full understanding of the proposed use, including satisfactory evidence that the applicant possesses necessary water rights pursuant to applicable State law, or a showing of cause why such evidence cannot concurrently be submitted, and a statement as to the relationship of the proposed use to any State or municipal plans or orders which may have been adopted with respect to the use of such waters.

Article 14. In the construction or maintenance of the project works, the Licensee shall place and maintain suitable structures and devices to reduce to a reasonable degree the liability of contact between its transmission lines and telegraph, telephone and other signal wires or power transmission lines constructed prior to its transmission lines and not owned by the Licensee, and shall also place and maintain suitable structures and devices to reduce to a reasonable degree the liability of any structures or wires falling or obstructing traffic or endangering life. None of the provisions of this article are intended to relieve the Licensee from any responsibility or requirement which may be imposed by any other lawful authority for avoiding or eliminating inductive interference.

Article 15. The Licensee shall, for the conservation and development of fish and wildlife resources, construct, maintain, and operate, or arrange for the construction, maintenance, and

operation of such reasonable facilities, and comply with such reasonable modifications of the project structures and operation, as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Interior or the fish and wildlife agency or agencies of any State in which the project or a part thereof is located, after notice and opportunity for hearing.

Article 16. Whenever the United States shall desire, in connection with the project, to construct fish and wildlife facilities or to improve the existing fish and wildlife facilities at its own expense, the Licensee shall permit the United States or its designated agency to use, free of cost, such of the Licensee's lands and interests in lands, reservoirs, waterways and project works as may be reasonably required to complete such facilities or such improvements thereof. In addition, after notice and opportunity for hearing, the Licensee shall modify the project operation as may be reasonably prescribed by the Commission in order to permit the maintenance and operation of the fish and wildlife facilities constructed or improved by the United States under the provisions of this article. This article shall not be interpreted to place any obligation on the United States to construct or improve fish and wildlife facilities or to relieve the Licensee of any obligation under this license.

Article 17. The Licensee shall construct, maintain, and operate, or shall arrange for the construction, maintenance, and operation of such reasonable recreational facilities, including modifications thereto, such as access roads, wharves, launching ramps, beaches, picnic and camping areas, sanitary facilities, and utilities, giving consideration to the needs of the physically handicapped, and shall comply with such reasonable modifications of the project, as may be prescribed hereafter by the Commission during the term of this license upon its own motion or upon the recommendation of the Secretary of the Interior or other interested Federal or State agencies, after notice and opportunity for hearing.

Article 18. So far as is consistent with proper operation of the project, the Licensee shall allow the public free access, to a reasonable extent, to project waters and adjacent project lands owned by the Licensee for the purpose of full public utilization of such lands and waters for navigation and for outdoor recreational purposes, including fishing and hunting: Provided, That the Licensee may reserve from public access such portions of the project waters, adjacent lands, and project facilities as may be necessary for the protection of life, health, and property.

Article 19. In the construction, maintenance, or operation of the project, the Licensee shall be responsible for, and shall take reasonable measures to prevent, soil erosion on lands adjacent to streams or other waters, stream sedimentation, and any form of water or air pollution. The Commission, upon request or upon its own motion, may order the Licensee to take such measures as the Commission finds to be necessary for these purposes, after notice and opportunity for hearing.

Article 20. The Licensee shall clear and keep clear to an adequate width lands along open conduits and shall dispose of all temporary structures, unused timber, brush, refuse, or other material unnecessary for the purposes

of the project which results from the clearing of lands or from the maintenance or alteration of the project works. In addition, all trees along the periphery of project reservoirs which may die during operations of the project shall be removed. All clearing of the lands and disposal of the unnecessary material shall be done with due diligence and to the satisfaction of the authorized representative of the Commission and in accordance with appropriate Federal, State, and local statutes and regulations.

Article 21. Material may be dredged or excavated from, or placed as fill in, project lands and/or waters only in the prosecution of work specifically authorized under the license; in the maintenance of the project; or after obtaining Commission approval, as appropriate. Any such material shall be removed and/or deposited in such manner as to reasonably preserve the environmental values of the project and so as not to interfere with traffic on land or water. Dredging and filling in a navigable water of the United States shall also be done to the satisfaction of the District Engineer, Department of the Army, in charge of the locality.

Article 22. Whenever the United States shall desire to construct, complete, or improve navigation facilities in connection with the project, the Licensee shall convey to the United States, free of cost, such of its lands and rights-of-way and such rights of passage through its dams or other structures, and shall permit such control of its pools, as may be required to complete and maintain such navigation facilities.

Article 23. The operation of any navigation facilities which may be constructed as a part of, or in connection with, any dam or diversion structure constituting a part of the project works shall at all times be controlled by such reasonable rules and regulations in the interest of navigation, including control of the level of the pool caused by such dam or diversion structure, as may be made from time to time by the Secretary of the Army.

Article 24. The Licensee shall furnish power free of cost to the United States for the operation and maintenance of navigation facilities in the vicinity of the project at the voltage and frequency required by such facilities and at a point adjacent thereto, whether said facilities are constructed by the Licensee or by the United States.

Article 25. The Licensee shall construct, maintain, and operate at its own expense such lights and other signals for the protection of navigation as may be directed by the Secretary of the Department in which the Coast Guard is operating.

Article 26. If the Licensee shall cause or suffer essential project property to be removed or destroyed or to become unfit for use, without adequate replacement, or shall abandon or discontinue good faith operation of the project or refuse or neglect to comply with the terms of the license and the lawful orders of the Commission mailed to the record address of the Licensee or its agent, the Commission will deem it to be the intent of the Licensee to surrender the license. The Commission, after notice and opportunity for hearing, may require the Licensee to remove any or all structures, equipment and power lines within the project boundary and to take any such other action necessary to restore the project waters, lands, and

facilities remaining within the project boundary to a condition satisfactory to the United States agency having jurisdiction over its lands or the Commission's authorized representative, as appropriate, or to provide for the continued operation and maintenance of nonpower facilities and fulfill such other obligations under the license as the Commission may prescribe. In addition, the Commission in its discretion, after notice and opportunity for hearing, may also agree to the surrender of the license when the Commission, for the reasons recited herein, deems it to be the intent of the Licensee to surrender the license.

Article 27. The right of the Licensee and of its successors and assigns to use or occupy waters over which the United States has jurisdiction, or lands of the United States under the license, for the purpose of maintaining the project works or otherwise, shall absolutely cease at the end of the license period, unless the Licensee has obtained a new license pursuant to the then existing laws and regulations, or an annual license under the terms and conditions of this license.

Article 28. The terms and conditions expressly set forth in the license shall not be construed as impairing any terms and conditions of the Federal Power Act which are not expressly set forth herein.

122 FERC ¶ 62,181
UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Green Mountain Power Corporation

Project No. 2674-029

ORDER AMENDING LICENSE, APPROVING AS-BUILT EXHIBITS,
AND REVISING ANNUAL CHARGES

(Issued February 26, 2008)

On April 5, 2007, Kleinschmidt Associates, on behalf of the Green Mountain Power Corporation, licensee for the Vergennes Hydroelectric Project, FERC No. 2674, filed as-built Exhibit A and Exhibit F drawings reflecting turbine rehabilitation at Plant 9. The project is located on Otter Creek in the City of Vergennes, Addison County, Vermont. The project does not occupy any federal lands.

BACKGROUND

On May 3, 2006, the licensee filed a letter stating its intent to perform turbine rehabilitation work at Plant 9 of the Vergennes Project. By letter dated May 16, 2006, the Commission informed the licensee that the proposed modifications were considered maintenance activities and therefore, did not require an amendment of the license at that time. In addition, the May 16, 2006 letter requested the licensee to file within 90 days after completion of the rehabilitation work, revised Exhibit A and any necessary exhibit drawings to reflect the as-built conditions.

REVIEW

Revised Exhibits

In the April 5, 2007 filing, the licensee submitted a revised Exhibit A describing the two refurbished turbine generating units at Plant 9. The revised exhibit also states that the refurbished units do not require surge towers. Therefore, the project description has been updated to reflect that the two surge towers, as authorized in the project license, have been removed. The revised Exhibit A accurately reflects the as-built conditions of the project, conforms to the Commission's rules and regulations, and is approved by this order.

The filing also includes revised and new Exhibit F drawings showing the as-built conditions at the project. In addition to an index sheet, the licensee filed ten drawing sheets; however, three of them (2, 3, and 4) are not approved by this order. These three

drawings depict plan and section details of the demolition or removal of items at Plant 9, which do not warrant Commission approval. Our review of the remaining Exhibit F drawings finds that they conform to the Commission's rules and regulations, and are approved by this order. Ordering paragraph (D) of this order requires the licensee to file the approved drawings in aperture card and electronic file formats.

Installed Capacity

The April 5, 2007 filing states that the turbine rehabilitation work, which was done in 2005 and 2006, has resulted in an improvement in the generating capacity of both Unit 1 and Unit 2 at Plant 9. The licensee expects these efficiency improvements to increase the average annual generation at the Vergennes Project by 2,388 MWh, an approximately 23 percent increase over the existing average annual generation. A breakdown of the ratings of the generating units before (existing) and after refurbishment, as well as the dates of commencement of operation of the refurbished units, are shown in Table 1 below.¹

Table 1.

Powerhouse (Plant 9) Unit No.	Existing Generator Capacity (kW)	Refurbished Generator Capacity (kW)	Existing Turbine Capacity (kW)	Refurbished Turbine Capacity (kW)	Date of Commencement of Operation
Unit 1	700	800	738	852	January 16, 2007
Unit 2	700	800	738	852	January 24, 2006

Section 11.1(i) of the Commission's regulations states that the authorized installed capacity means the lesser of the ratings of the generator or turbine units. The rating of a generator is the product of the continuous-load capacity rating of the generator in kilovolt-amperes (kVA) and the system power factor in kW/kVA. The rating of a turbine is the product of the turbine's capacity in horsepower (hp) at best gate (maximum efficiency point) opening under the manufacturer's rated head times a conversion factor of 0.75 kW/hp.

Our review of the capacity ratings of the refurbished units found that the ratings for the two turbines are greater than the generator ratings for each unit. Pursuant to section 11.1(i) of the regulations, the authorized capacity of the two units should be based on the ratings of the generators. To reflect the change in generating capacity in the

¹ On February 22, 2007, Kleinschmidt Associates, on behalf of the licensee, made a filing in support of its request for certification for a renewable energy production tax credit for the efficiency improvements due to the turbine rehabilitation work done at Plant 9. The filing states that Unit 1 and Unit 2 were placed into service on January 16, 2007, and January 24, 2006, respectively.

Project No. 2674-029

3

project license, this order revises the installed capacity and the annual charges under Article 201.² Section 11.1(d)(6) of the Commission's regulations state that the assessments commence on the date of commencement of project operation. In the event that project operation commences during a fiscal year, the charges will be prorated based on the date on which operation commenced.

The Director orders:

(A) The license for the Vergennes Hydroelectric Project, FERC No. 2674, is amended as provided by this order, effective the day this order is issued, unless otherwise stated.

(B) The revised Exhibit A filed on April 5, 2007, conforms to the Commission's rules and regulations, and is approved and made part of the license.

(C) The following Exhibit F drawings filed on April 5, 2007, conform to the Commission's rules and regulations, and are approved and made part of the license. Superseded exhibits are eliminated from the license.

Exhibit No.	FERC Drawing No.	Licensee's Drawing No.	Drawing Title	Superseded FERC Drawing No.
F-6	2674-1009	1	Vergennes No. 9 Turbine Rehabilitation Existing General Site Plan	—
F-7	2674-1010	5	Vergennes No. 9 Turbine Rehabilitation New Turbine Civil Plan	2674-1002
F-8	2674-1011	6	Vergennes No. 9 Turbine Rehabilitation New Turbine – Mounting Bracket Plan, Sections and Details	—
F-9	2674-1012	7	Vergennes No. 9 Turbine Rehabilitation New Turbine and Frame Civil Assembly	2674-1002
F-10	2674-1013	8	Vergennes No. 9 Turbine Rehabilitation New Turbine and Frame Mechanical Assembly	—
F-11	2674-1014	9	Vergennes No. 9 Turbine Rehabilitation New Turbine Transverse Sections	—
F-12	2674-1015	10	Vergennes No. 9 Turbine Rehabilitation New Turbine Support Steel Framing Details	—

² The existing total installed capacity at the Vergennes Project is 2,400 kW (1,400 kW at Plant 9 and 1,000 kW at Plant 9B). With the 100 kW increase in capacity at both Unit 1 and Unit 2 at Plant 9, the total installed capacity at the Vergennes Project increases from 2,400 kW to 2,600 kW.

Project No. 2674-029

4

(D) Within 45 days of the date of issuance of this order, the licensee shall file the approved exhibit drawings in aperture card and electronic file formats.

a) Three sets of the approved exhibit drawings shall be reproduced on silver or gelatin 35mm microfilm. All microfilm shall be mounted on type D (3-1/4" X 7-3/8") aperture cards. Prior to microfilming, the FERC Drawing Number (i.e., P-2674-1009 through P-2674-1015) shall be shown in the margin below the title block of the approved drawing. After mounting, the FERC Drawing Number shall be typed on the upper right corner of each aperture card. Additionally, the Project Number, FERC Exhibit (i.e., F-6, etc.), Drawing Title, and date of this order shall be typed on the upper left corner of each aperture card. See Figure 1.

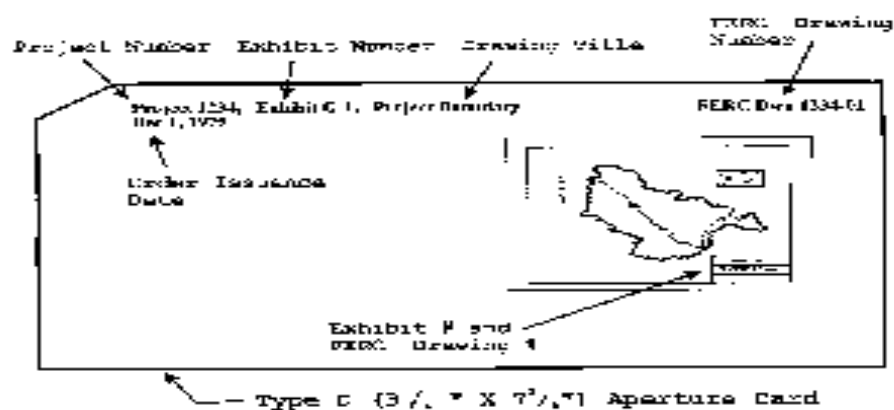


Figure 1. Sample Aperture Card Format

Two of the sets of aperture cards shall be filed with the Secretary of the Commission, ATTN: OEP/DHAC. The third set shall be filed with the Commission's Division of Dam Safety and Inspections New York Regional Office.

b) The licensee shall file two separate sets of exhibit drawings in electronic raster format with the Secretary of the Commission, ATTN: OEP/DHAC. A third set shall be filed with the Commission's Division of Dam Safety and Inspections New York Regional Office. Each drawing must be a separate electronic file, and the file name shall include: FERC Drawing Number, FERC Exhibit, Drawing Title, date of this order, and file extension [i.e., P-2674-1009, F-6, Vergennes No. 9 Turbine Rehabilitation Existing General Site Plan, MM-DD-YYYY.TIF]. Electronic drawings shall meet the following format specification:

Project No. 2674-029

5

IMAGERY - black & white raster file
FILE TYPE – Tagged Image File Format, (TIFF) CCITT Group 4
RESOLUTION – 300 dpi
DRAWING SIZE FORMAT – 24” X 36” (min), 28” X 40” (max)
FILE SIZE – less than 1 MB

(E) Ordering paragraph (B)(2) of the license is revised, in part, to read as follows:

Project works consisting of:...(e) the south forebay, with trashracks, headgates, and two, 10-foot-diameter penstocks; (f) the south powerhouse, Plant 9, with two, 800-kW generating units;...

(F) Article 201 of the license is amended to read as follows:

The licensee shall pay the United States an annual charge for the purposes of reimbursing the United States for the cost of administering Part I of the Federal Power Act, as determined by the Commission. The authorized installed capacity for that purpose is 2,500 kW effective January 24, 2006, and 2,600 kW effective January 16, 2007.

(G) This order constitutes final agency action. Requests for rehearing by the Commission may be filed within 30 days of the date of issuance of this order, pursuant to 18 C.F.R. §385.713.

William Guey-Lee
Chief, Engineering and Jurisdiction Branch
Division of Hydropower Administration
and Compliance

FEDERAL ENERGY REGULATORY COMMISSION
Washington, D. C. 20426

OFFICE OF ENERGY PROJECTS

Project No. 2674-031-Vermont
Vergennes Hydroelectric Project
Green Mountain Power Corporation

NOV 13 2007

Mr. Jon A. Soter, P.E.
Plant Engineering Manager
Green Mountain Power Corp
163 Acorn Lane
Colchester, VT 05446-6611

RE: Minimum flow requirements

Dear Mr. Soter:

We received your report filed on September 6, 2007, regarding compliance with the flow release requirement under license article 403 for the Vergennes No. 9 Hydro Project¹ (1999 Order). The Vergennes Project is located on Otter Creek in the City of Vergennes, Addison County, Vermont.

BACKGROUND

License article 403 requires the licensee to release the following minimum flows over the spillways at the Vergennes Project for the protection and enhancement of aesthetic and recreational resources of Otter Creek:

Time Period		Flow in cubic feet per second (cfs)
(1) April 1 through October 31		
	Daytime	150 cfs
	Nighttime	75 cfs
(2) November 1 through December 15		
	Daytime	100 cfs
	Nighttime	50 cfs

¹ See Order Issuing New License (Major Project), 88 FERC ¶ 62,095 (issued July 30, 1999).

Project No. 2674-031

2

The licensee is required to specify distribution of these releases over the three spillways in the operations and monitoring plan required in license article 404. For the purpose of article 403, daytime is defined as one-half hour before sunrise to one-half hour after sunset. Nighttime is defined as one-half hour after sunset to one-half hour before sunrise. These flows may be temporarily modified if required by operating emergencies beyond the control of the licensee, or for short periods upon mutual agreement between the licensee and the Vermont Agency of Natural Resources. If the flow is so modified, the licensee is required to notify the Commission as soon as possible, but no later than 10 days after each such incident.

REPORT

Your report states that during various times in August 2007, daytime aesthetic flows at the project were not maintained in accordance with license conditions. You found an error in the flow calculation sheets used to maintain flow requirements in accordance with license articles 401, 402,² 403, and 404. Specifically, you state that the data put into the flow calculation sheet was calculating flows based on “no flashboards” being installed on the dam. Your report indicates that you detected the error on August 31 and rectified the problem immediately by taking Vergennes hydro unit No. 2 offline to allow greater spillage over the dam.

Based on corrected flow data sheets, the 150 cfs daytime aesthetic flow requirements was not met on: (1) August 2 through August 3, 2007 (with the lowest total flashboard discharge being 105 cfs); (2) August 6 through August 7, 2007 (with the lowest total flashboard discharge being 115 cfs); (3) August 12 through August 15, 2007 (with the lowest total flashboard discharge being 89 cfs); (4) August 17, 2007 (with the lowest total flashboard discharge being 139 cfs); and (5) August 21 through the morning of August 31, 2007 when the error was detected (with the lowest total flashboard discharge being 114 cfs).

You report that calculated aesthetic flows throughout the time period were generally greater than 100 cfs, but the calculated values did drop as low as 89 cfs (compared to the required 150 cfs) on one occasion. Your report provided all of the necessary flow calculation data sheets for the time period. You indicate that you have corrected the flow sheets and are adding constraints and setting an elevation alarm point

² License article 401 requires the licensee to operate in a run-of-river mode and license article 402 requires the licensee to operate the project so that generating unit of Plant No. 9 is given first priority for use of water diverted from Otter Creek from April 1 to June 15 and from September 15 to November 15.

Project No. 2674-031

3


onto the SCADA plant monitoring and control system to prevent future occurrence of this problem. You state that with implementation of these actions, you are confident that you will be able to maintain required aesthetic flows in the future.

CONCLUSIONS

After reviewing the available information, we have concluded that failure to release the aesthetic and recreational minimum flow requirement at various times in August 2007, are considered violations of license article 403. However, no enforcement actions or penalties are recommended at this time. Although the deficiencies were caused by human error with respect to the project's flow calculation sheets, no adverse effects were reported and you acted promptly to correct the problem. In addition, review of the Commission's records indicate that you do not have a history of compliance problems of this nature. To avoid such incidents in the future, you are installing an elevation alarm to the plant monitoring and control system. Also, as required you filed timely incident reports with the resource agencies and the Commission, in accordance with license article 403.

Thank you for your report and cooperation in this matter. If you have any questions, please contact CarLisa Linton at (202) 502-8416.

Sincerely,


George H. Taylor
Chief, Biological Resources Branch
Division of Hydropower Administration
and Compliance

APPENDIX D

RESOURCE AGENCY CONTACTS

Contact Name	Organization	Position	Street Address	Street Address 2	Town	State	Zipcode	Phone	Email	Last Date of Contact	Nature of Discussion	Assessment of Ongoing Working Relationships
Eric Davis	Vermont Department of Environmental Conservation	River Ecologist	1 National Life Drive	Davis Building, 6th Floor	Montpelier	Vermont	05620	802-490-6180	Eric.Davis@vermont.gov	12/19/2016	Review of Operation/Flow Data	Good ongoing relationship.
Bob Popp	Vermont Fish and Wildlife Department	Botanist	5 Perry Street	Suite 40	Barre	Vermont	05641	802-476-0127	bob.popp@vermont.gov	12/19/2016	LIHI Compliance Review	Good ongoing relationship.
Chet Mackenzie	Vermont Fish and Wildlife Department	Fisheries Program Manager	271 North Main Street	Suite 215	Rutland	Vermont	05701	802-786-3864	Chet.Mackenzie@vermont.gov	12/7/2016	LIHI Compliance Review	Good ongoing relationship.
Mrk Ferguson	Vermont Fish and Wildlife Department	Zoologist	1 National Life Drive	Davis 2	Montpelier	Vermont	05620	802-279-3422	Mark.Ferguson@vermont.gov	12/7/2016	LIHI Compliance Review	Good ongoing relationship.
Scott Dillon	Vermont Division for Historic Preservation	Survey Archeologist	1 National Life Drive	Davis Building, 6th Floor	Montpelier	Vermont	05620	802-272-7358	scott.dillon@vermont.gov	11/21/2016	Request for compliance information RE: LIHI compliance review	Good ongoing relationship.
Jeff Crocker	Vermont Department of Environmental Conservation	Streamflow Protection Coordinator	1 National Life Drive	Davis Building, 6th Floor	Montpelier	Vermont	05620	802-490-6151	jeff.crocker@vermont.gov	11/10/2016	Review of Operation/Flow Data	Good ongoing relationship.
Scott Darling	Vermont Fish and Wildlife Department	Program Manager, Wildlife Management Program	271 North Main Street	Suite 215	Rutland	Vermont	05701	802-786-0040	scott.darling@state.vt.us	11/9/2016	Provided Bat Species Review	Good ongoing relationship.
Julianne Rosset	U.S. Fish and Wildlife Service	Fish and Wildlife Biologist	103 East Plumtree Road		Sunderland	Massachusetts	01375	413-548-8002	Julianne_rosset@fws.gov	12/2/2015	LIHI Compliance Review	Good ongoing relationship.
Laura Trieschmann	Vermont Division for Historic Preservation	State Historic Preservation Officer	1 National Life Drive	Davis Building, 6th Floor	Montpelier	Vermont	05620	802-828-3222	laura.trieschmann@vermont.gov	3/15/2015	SHPO for Removal of Benton Wheelhouse	Good ongoing relationship.

APPENDIX E

VERGENNES HYDROELECTRIC PROJECT DESCRIPTION

DESCRIPTION OF FACILITY AND MODE OF OPERATION

The Vergennes Hydroelectric Project is an existing licensed project (FERC No. 2674), located at river mile 7.6 on the Otter Creek in Addison County, Vermont. The project's two powerhouses, intake structures, three dams, and tailrace lie within the City of Vergennes. The project location is shown in Appendix B. The general project area extends from approximately 8.8 miles above the dam to just below the powerhouses. The project currently generates power using an average gross head of 37 feet developed between the project's impoundment and tailwater.

The Vergennes Project includes two powerhouses; Plant 9 located on the south bank of Otter Creek and Plant 9B located on the north bank. The two powerhouses are separated by three concrete spillway sections that are divided apart by two instream islands and one 29-foot-long non-overflow dam. Center Island divides the 9B Spillway from the Center Spillway and the Grist Mill Island divides the center spillway from the Plant 9 Spillway. Each of the spillways are approximately 10-feet-high, with a total length of 231 feet and a crest elevation of about 132.78 feet mean sea level (msl).

The Plant 9B station was originally constructed in 1943 and consists of a single 1,000 kw vertical Francis turbine directly connected to a generator. The runner for this plant was replaced in 1985. The Plant 9 station consisted of two identical 700 kw horizontal Francis turbines prior to the replacement of turbine #2 in 2005 and the replacement of turbine #1 in 2006. The upgraded Unit 2 began commercial operation on January 24, 2006, and Unit 1 came on-line on January 16, 2007. The plant was originally constructed in 1912. The runners were replaced in 1928 and the Unit No. 1 and No. 2 generators were rewound in 1946 and 1970, respectively.

The two existing Plant 9 turbines were replaced with new double discharge Francis turbines each rated at 1137 Hp and 35.5 ft of net head with a maximum hydraulic capacity of 363 cfs. The new modern design units will increase, mainly, the efficiency of the units with a moderate increase (13 cfs) in the hydraulic capacity of the units. The new installed capacity of the entire station is 2,600 kW; an increase of 200 kW since 2005. The modern, high efficiency units will result in an estimated increase of 2,388 MWh of

total annual net energy production at the facility over the Historic Generation Baseline. The drainage area above the Vergennes dam is approximately 866 square miles. GMP currently operates the Vergennes Project as a run-of-river project. Plant 9's operating flow range is approximately 140 cfs to 726 cfs while the operating flow range for Plant 9B is approximately 200 cfs to 480 cfs. The total hydraulic capacity of the project turbines is approximately 1,206 cfs. The authorized installed capacity at the Project is 2,600 kW.

The Project operates in a strict run-of-river mode. GMP maintains spill over the spillways to support aesthetics and uses the following flow schedule:

April 1-Oct 31: 150 cfs daytime and 75 cfs nighttime

Nov 1-Dec 15: 100 cfs daytime and 50 cfs nighttime

Dec 16-Mar 31: No special flows.

Project Photos



PHOTO 1 OVERVIEW OF VERGENNES PROJECT



PHOTO 2 UPSTREAM VIEW OF VERGENNES PROJECT



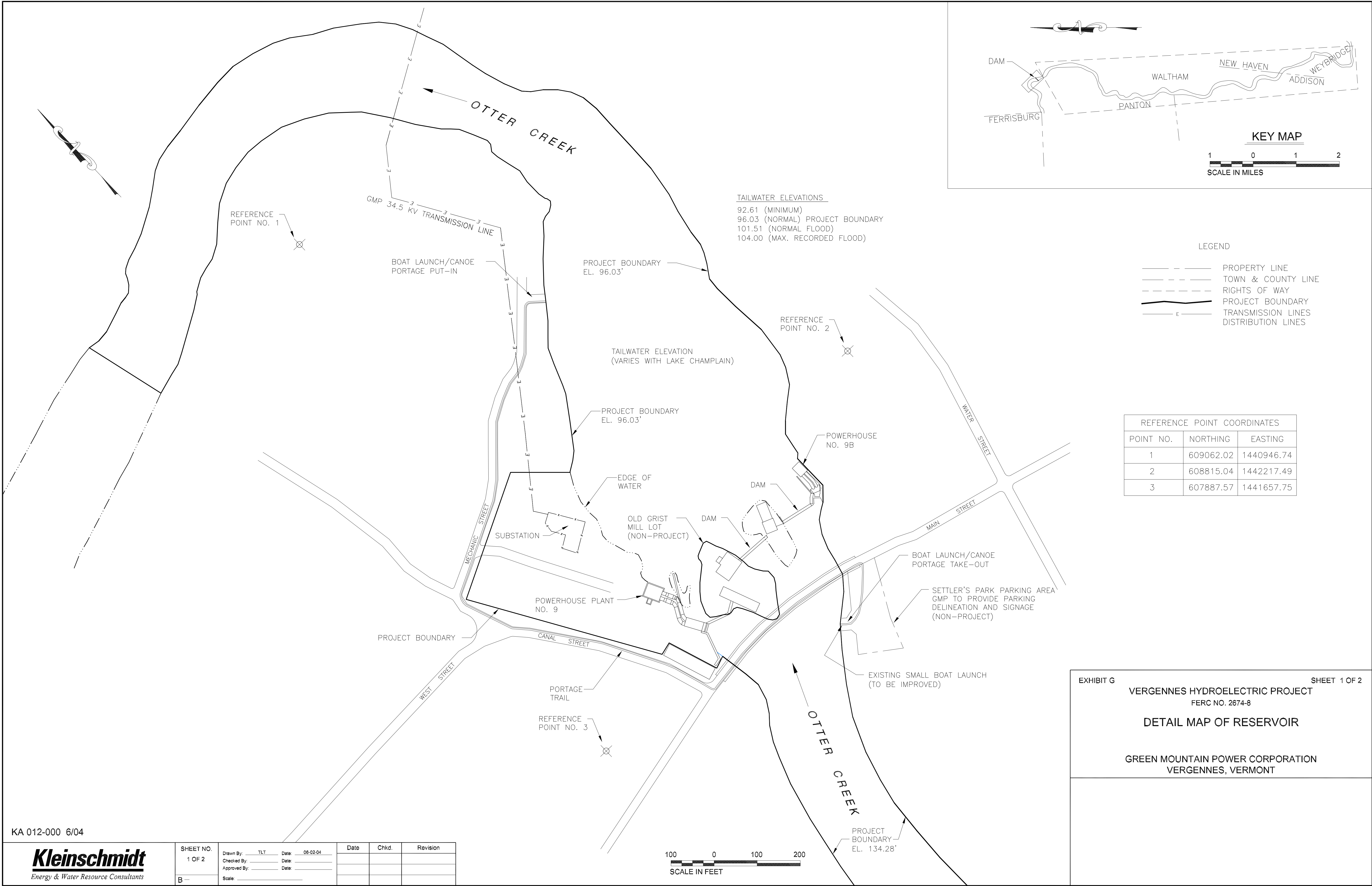
PHOTO 3 PLANT 9 INTAKE, PENSTOCKS, AND POWERHOUSE



PHOTO 4 PLANT 9B INTAKE, PENSTOCKS, AND POWERHOUSE



PHOTO 5 PLANT 9 POWERHOUSE TURBINES



TAILWATER ELEVATIONS
92.61 (MINIMUM)
96.03 (NORMAL) PROJECT BOUNDARY
101.51 (NORMAL FLOOD)
104.00 (MAX. RECORDED FLOOD)

TAILWATER ELEVATION
(VARIES WITH LAKE CHAMPLAIN)

LEGEND

- PROPERTY LINE
- TOWN & COUNTY LINE
- RIGHTS OF WAY
- PROJECT BOUNDARY
- E— TRANSMISSION LINES
- DISTRIBUTION LINES

REFERENCE POINT COORDINATES

POINT NO.	NORTHING	EASTING
1	609062.02	1440946.74
2	608815.04	1442217.49
3	607887.57	1441657.75

EXHIBIT G

SHEET 1 OF 2

VERGENNES HYDROELECTRIC PROJECT
FERC NO. 2674-8

DETAIL MAP OF RESERVOIR

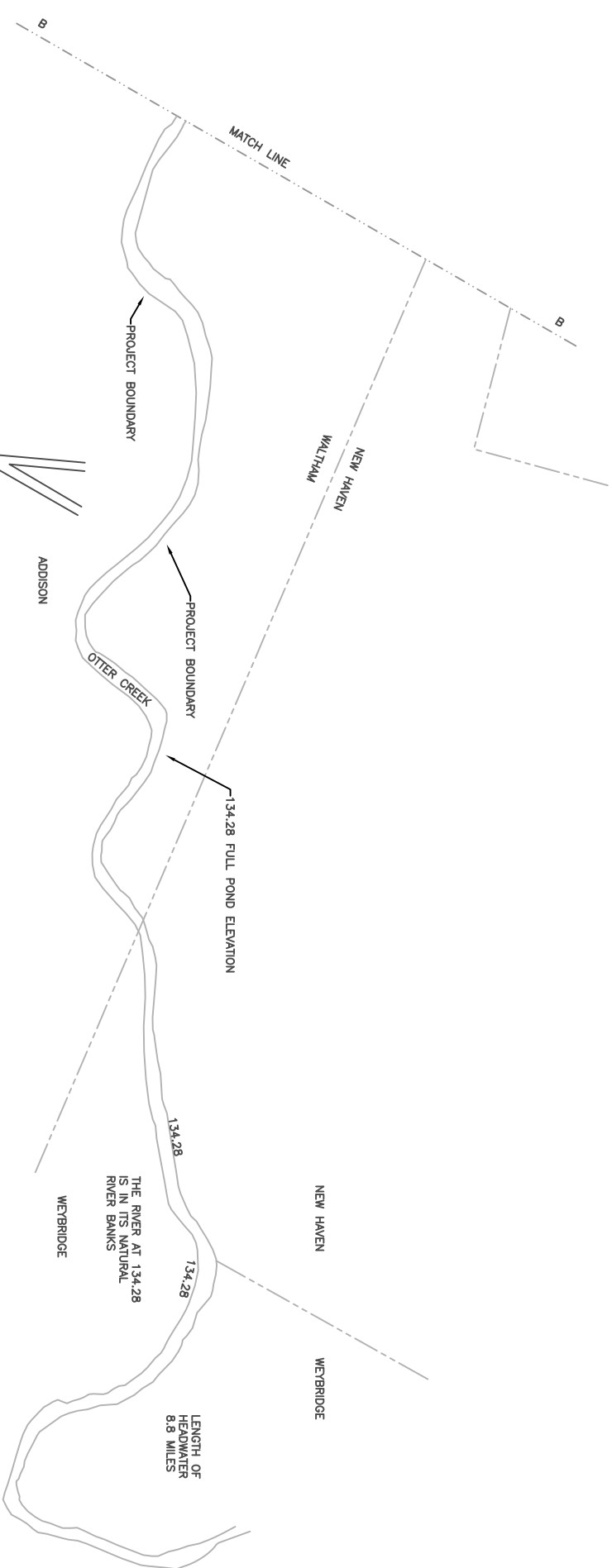
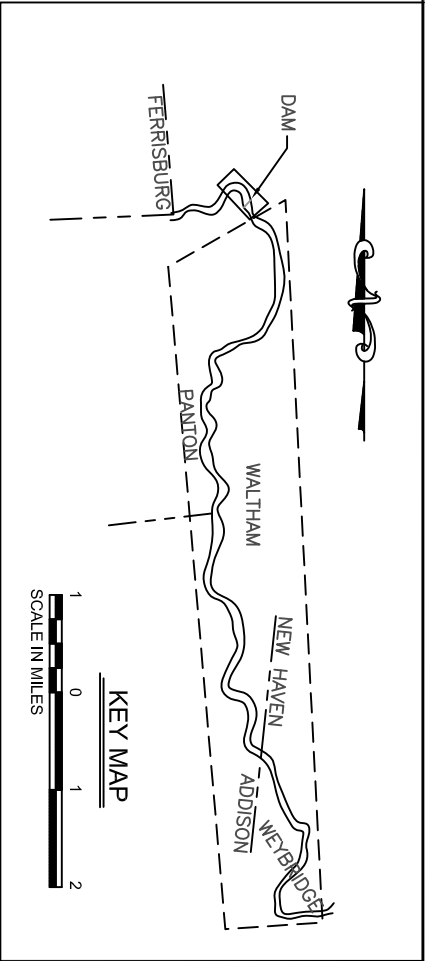
GREEN MOUNTAIN POWER CORPORATION
VERGENNES, VERMONT

KA 012-000 6/04

Kleinschmidt
Energy & Water Resource Consultants

SHEET NO.	Drawn By:	Date:	Date:	Chkd.	Revision
1 OF 2	TLT	06-02-04			
	Checked By:				
	Approved By:				
B	Scale:				

100 0 100 200
SCALE IN FEET



Kleinschmidt Energy & Water Resource Consultants	SHEET NO. 2 OF 2		Drawn By: TSW	Date: 11-30-04	Date	Chkd.	Revision
	B-		Checked By:	Date:			

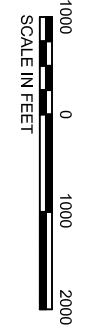


EXHIBIT G

VERGENNES HYDROELECTRIC PROJECT
FERC NO. 2674-8

SHEET 2 OF 2

DETAIL MAP OF RESERVOIR

GREEN MOUNTAIN POWER CORPORATION
VERGENNES, VERMONT

APPENDIX F

INCREASED CAPACITY REVIEW



May 3, 2006

Magalie R. Salas, Secretary
Federal Energy Regulatory Commission
888 First Street N.E.
Washington, DC 20426

Green Mountain Power Corp
Vergennes #9 Project (FERC No. 2674) Turbine Repair/ Runner Replacement

Dear Secretary Salas:

We are hereby notifying you of a scheduled repair/replacement of the Unit #1 turbine at the Vergennes #9 Project, located on Otter Creek in Vergennes, Vermont. The Project was granted a new license by the Commission by Order Issuing New License, Major Project, on July 30, 1999 (88 FERC ¶ 62, 095). The repair/replacement work is almost identical in nature to that conducted for Unit #2 in 2005, which was reviewed and verbally approved (no license amendment required) by Mohamad Fayyad of your office on September 13, 2005. I have also notified Vermont Agency of Natural Resources (VANR) of the proposed repair/replacement work and have enclosed a copy of their response.

Unit #1 is a triple runner horizontal Francis unit that was originally installed in 1912. The unit's runners were replaced in 1928 and have since become mechanically unreliable, posing a significant maintenance concern. Therefore, as with Unit #2, GMP plans to repair and replace the Unit #1 turbine's mechanical components with one new double-runner unit in the same configuration as the original unit. The existing pressure case, draft tubes, and runners, which are located external to Plant #9 building, will be removed to allow for replacement of the turbine at the same centerline elevation. The turbine and pressure case are located above the tailwater, therefore cofferdams or work within the waterway will not be necessary. The turbine will be further isolated by closing the headgate during construction. The proposed work is planned to occur between August 1, 2006 through October 31, 2006. Downstream flows will continue to be passed through the site's other two turbines and over the crest of the dam throughout the

Magalie R. Salas

May 3, 2006

2.

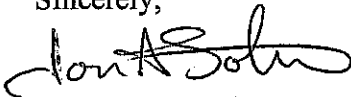
construction period, as necessary to meet the Project's mandated minimum flow requirements. Attached is a plan sheet that shows the general work area and point of access.

Similar to the replacement performed for Unit #2, the existing 333 cfs/700 kW capacity Unit #1 will be replaced with a 350 cfs, 826 kW turbine. However, unlike Unit #2, the existing Unit #1 generator has a capacity of only 700 kW. Therefore, the generator will also be rewound to 1000 KVA (800 kW) in conjunction with the proposed turbine maintenance efforts increasing the unit output about 100 kW.

Since there is no work proposed within the waterway, the Project will maintain minimum flows as mandated by the Project's FERC license and 401 Certification throughout the construction period, and there will be no significant increase in the Project capacity, it is our understanding that there are no jurisdictional activities which would trigger the need for state or federal permits. We would appreciate confirmation of our understanding and that the Project license be modified to note the minor change in unit capacity.

Please feel free to contact me with any questions or comments at (802) 655-8777, or via e-mail at soter@gmpvt.com or the address below.

Sincerely,



Jon A. Soter, P.E.

Plant Engineering Manager

JAS/ms

Enclosures

Cc: J. Cueto, VANR
R. Finucane, VANR
M. Fayyad, FERC
P. Puglese, FERC NYRO
W. Jordan, VT Public Service Board
M. Lefebvre, ACOE
M. Dunlap P.E., Kleinschmidt
A. Murray, Kleinschmidt



State of Vermont

Department of Fish and Wildlife
Department of Forests, Parks, and Recreation
Department of Environmental Conservation
State Geologist
RELAY SERVICES FOR THE HEARING IMPAIRED
1-800-253-0191 TDD>Voice
1-800-253-0195 Voice>TDD

AGENCY OF NATURAL RESOURCES
Department of Environmental Conservation
FACILITIES ENGINEERING DIVISION
103 South Main Street
Laundry Building
Waterbury, VT 05671-0511

TEL 802-241-3758

November 22, 2005

Jon Soter, P.E.
Green Mountain Power Corporation
163 Acorn Lane
Colchester, VT 05446

RE: Vergennes No. 9 Hydroelectric Project – FERC No. 2674
Plant 9 Unit #1 Repair/Replacement

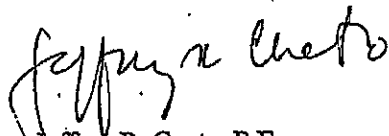
Dear Mr. Soter:

Thank you for your e-mail notification of this date for the planned replacement of Unit #1 at the Vergennes No. 9 Hydroelectric Project. You indicate that construction will be isolated from the river and that the management of flows and the headpond level will be consistent with the terms of the license throughout the work period. Your letter also indicates that, as with the recent replacement of Unit #2, the work will result in a nominal increase in the hydraulic capacity of the unit. The estimated increase is about 17 cfs, which is a small fraction of the total project capacity of 1,180 cfs.

With the understanding that any earth disturbance will be very limited and well less than one acre and that no fills or cofferdamming in the river will be necessary, the proposed work as described in your letter does not raise any obvious concerns nor does it trigger the need to get any permits from the Department of Environmental Conservation. Please take the normal precautions to prevent the discharge of chemicals or construction debris to the river. Also, normal measures should be taken to minimize soil disturbance and removal of riparian vegetation and to control erosion.

Thank you for bringing this project to our attention.

Very truly yours,


Jeffrey R. Cueto, P.E.
Chief Hydrologist

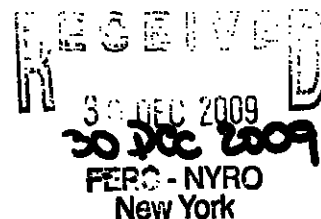
c Fred Nicholson, Stream Alteration Engineer

Submission Contents

Notice of repair/replacement of unit #1 hydro turbine fercrehab050306watt.pdf.....	1-3
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December 9, 2009



Mr. Peter Valeri
Federal Energy Regulatory Commission
New York Regional Office
19 West 34th Street, Suite 400
New York, NY 10001

Re: P-2674-VT, Vergennes Plant # 9
EAP Exemption Review

Dear Mr. Valeri:

In accordance with Section 12.21 of the Commission regulations, we have completed a comprehensive review of the necessity for an emergency action plan for the above referenced project. The Vergennes hydropower project, including plants 9 and 9B and the three spillways, are classified as a low hazard dam. To the best of our knowledge, there have not been any changes at, above or below the project that would change the hazard potential of the project.

Should you require any further information relative to the above, please do not hesitate to contact me at (802) 655-8432, via e-mail at voyer@greenmountainpower.biz or at the address below.

Sincerely,

A handwritten signature in black ink, appearing to read "John B. Voyer III".

John B Voyer III.
Manager of Power Production

Cc: Sharon Lucia

December 09, 2009

Mr. Peter Valeri
Federal Energy Regulatory Commission
New York Regional Office
19 West 34th Street, Suite 400
New York, NY 10001

Re: P-2674-VT, Vergennes Plant # 9
2009 Minimum flow compliance

Dear Mr. Valeri:


This letter is written to summarize minimum flow compliance in accordance with Articles 401, 402 and 403 of Green Mountain Power Corporation's (GMP) license at its Vergennes plant #9 during calendar year 2009.

The Vergennes project is required to operate run-of-river with the Plant #9 unit given first priority during spring and fall and minimum flows over the spillway from April 1st through December 15th.

Discussions with the plant operators and a review of the plant records for calendar year 2009 have confirmed that the minimum flows over the spillways were maintained at the project with the following exception.

Throughout 2009 Green Mountain Power has worked with Jeff Cueto of the Vermont Agency of Natural Resources as well as the New York Regional Office of the FERC to receive approval to repair the headworks portion of the dam at the Vergennes project. A request was placed with the VT ANR for a temporary modification to the flow management under Article 403 of our FERC license. I have included a copy of the letter approving our request for your review. Although the construction was not started due to high river flows throughout the summer, some repairs were necessary to allow us to generate throughout the winter. It was during these repairs as part of our temporary agreement with the VT ANR that 9b was allowed to operate independently of any generation on the number 9 side. This temporary modification lasted from September 15 until unit 2 was brought online October 16th.

Should you require any further information relative to the above, please do not hesitate to contact me at (802) 665-8432, via e-mail at voyer@greenmountainpower.biz or at the address below.

Sincerely,

John B. Voyer III
Manager of Power Production

Cc: Sharon Lucia



Vermont Department of Environmental Conservation

Dam Safety and Hydrology Section

103 South Main Street

[phone] 802-241-3758

Waterbury, VT 05671-0511

[fax] 802-244-4516

<http://www.anr.state.vt.us/dec/fed/dss.htm>

Agency of Natural Resources

DISTRIBUTED ELECTRONICALLY

June 15, 2009

John B. Voyer III
 Manager of Plant Operations
 Green Mountain Power Corporation
 163 Acorn Lane
 Colchester, VT 05446-6611

RE: Vergennes Hydroelectric Project – FERC Project No. 2674
 Intake and Penstock Repair/Replacement Project
 Water Quality Certification

Dear Mr. Voyer:

By letter dated June 2, 2009, Kleinschmidt Associates filed on behalf of Green Mountain Power a request for approval of the project intake and penstock repair/replacement project at the Vergennes Hydroelectric Project on Otter Creek. The Vergennes Hydroelectric Project is subject to the conditions of a water quality certification issued by the Agency of Natural Resources on April 15, 1999, including a condition requiring prior approval of maintenance and repair projects involving the river (Condition I). The Agency hereby approves the proposed project under Condition I subject to the following conditions:

1. Care will be taken to limit the removal of riparian vegetation; the limits of disturbance shall be clearly marked out prior to the start of construction to avoid unnecessary soil disturbance and vegetation removal;
2. A restoration plan for disturbed riverbank areas (including, in addition to the riverbank itself, the area between the upstream parking area and the top of bank) shall be filed with the Agency; the plan is subject to Agency approval and shall include an implementation schedule; the plan shall use native riparian plants and limit hard structural stabilization to only those areas where necessary for long-term stability;
3. The temporary access fills shall be fully removed and original grades restored as soon as practicable in the construction sequence; when regrading the top-of-bank area at the upstream access, consideration will be given to how to convey stormwater runoff in a manner that avoids potential scour or gulying of the riverbank;
4. For each calendar week of construction, a progress report shall be filed with the Department of Environmental Conservation Hydrology Section no later than the following Tuesday; said report shall include information on project status; erosion prevention and sediment control

John Voyer
June 15, 2009
Page 2

measures in place; daily rainfall; and highwater conditions (with associated hourly headpond elevations) that are encountered;

5. Turbid water, exceeding 10 NTUs, pumped or siphoned from the work area shall only be discharged into a containment area where sediment can settle out or otherwise be treated; turbid water, exceeding 10 NTUs, shall not be discharged into the river;
6. The final cofferdamming method and top-of-cofferdam elevations shall be filed before the start of installation;
7. The upstream cofferdam will only be installed with the south-spillway flashboards in place and the headpond below the top of the flashboards (flashboards removed from the north and center spillways throughout the project);
8. Flow management (run-of-river operations and minimum flows) downstream and in the bypassed channels shall be consistent with the provisions of the water quality certification and FERC license at all times except for the suspension of spillage over the south spillway;
9. Every reasonable precaution is to be taken to prevent the discharge of petrochemicals, debris, and wet concrete to State waters; machinery shall be fueled away from State waters and shall be in good mechanical condition in terms of integrity of hoses, seals, and gaskets; during concrete pours, water shall not be displaced from forms into State waters; wash water from ready-mix trucks shall not be discharged into State waters directly or indirectly via storm sewers;
10. The contractor shall be provided with a copy of this approval letter before the start of work; and
11. The Department of Environmental Conservation Hydrology Section shall be notified at least 24 hours before the start of construction and again immediately upon the completion of construction to arrange a joint site inspection.

Condition B of the water quality certification and Article 403 of the license prescribe minimum spillage flows at the Project and the apportionment between the three spillways. Article 403 requires mutual agreement between the licensee and the Agency for temporary modification of the flow requirements. The Agency hereby approves the modification subject to Green Mountain Power maintaining the following minimum flows over the center and north spillways:

Through October 31	Daytime	Center 80 cfs North 35 cfs
	Nighttime	Center and North 75 cfs combined
November – December	Daytime	Center 53 cfs North 23 cfs
	Nighttime	Center and North 50 cfs combined

The Agency, in granting this approval, accepts no legal responsibility for any damage direct or indirect of whatever nature and by whomever suffered arising out of the project described. The scope of the Agency's review has not extended to the structural adequacy of the proposed cofferdamming system or to the impact of the intake cofferdam on upstream flood risk.

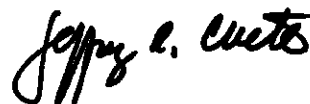
John Voyer
June 15, 2009
Page 3

This approval is only for the work described. Any additional work or changes in procedure must be approved in advance by the Agency.

The Agency maintains continuing jurisdiction over the project to address water quality issues that may arise and to assure compliance with Vermont Water Quality Standards.

Please contact me if you have any questions.

Very truly yours,

A handwritten signature in black ink, appearing to read "Jeffrey R. Cueto". The signature is fluid and cursive, with the first name "Jeffrey" being more prominent.

Jeffrey R. Cueto, P.E.
Chief Hydrologist

- c Pete LaFlamme, Director, Water Quality Division
- Chet Mackenzie, Dept. of Fish and Wildlife
- Chris Brunelle, Rivers Management
- Rob Evans, Rivers Management
- Mike Adams, COE
- Tom Kahl, P.E., KA
- Allison Murray, KA

Voyer, John

From: Cueto, Jeff [Jeff.Cueto@state.vt.us]
Sent: Tuesday, September 15, 2009 2:52 PM
To: Voyer, John
Cc: Tom Kahl; Allison Murray; Wentworth, Rod; Mackenzie, Chet
Subject: RE: Vergennes Project

John – The authorization that we gave you on 6/17 anticipated that the project would extend past September 15, the starting date for the Plant 9/Plant 9B priority restriction. The full project didn't get off the ground unfortunately. The restriction runs through November 15. As I understand it, Plant 9 should be back on line during the first week of October. Please do what you can to bring the project back into conformance as soon as practicable. We would appreciate notification of when that occurs. Spring compliance is particularly important for the support of spawning by sturgeon (state listed) and walleye in and near the Plant 9 tailrace area. If you are considering taking Plant 9 off line before June 16, please consult with us early as we may not be able to accept too early a date.

Jeff

<{{{> **Jeffrey R. Cueto, P.E., Chief Hydrologist**
 <{{{> VT Department of Environmental Conservation
 <{{{> Dam Safety and Hydrology Section
 <{{{> Facilities Engineering Division, Laundry Bldg.
 <{{{> 103 South Main Street, Waterbury, VT 05671-0511
 <{{{> (802) 241-3758
 <{{{> jeff.cueto@state.vt.us

From: Voyer, John [mailto:voyer@greenmountainpower.biz]
Sent: Monday, September 14, 2009 3:00 PM
To: Cueto, Jeff
Cc: Tom Kahl; Allison Murray
Subject: Vergennes Project

Hi Jeff,

Attached is the letter that I mentioned filling with the FERC on September 8, 2009. The letter was to inform them that due to high river flows seen at the project this summer we have been unable to install the cofferdam and start the headworks project. At this time we have decided to postpone the project until the spring of 2010 in order to avoid the cost and risk associated with constructing the project in the winter months.

We have scheduled divers to asses the intake structure below the water line and plan to make some temporary repairs so that we can run the turbines on the 9 side throughout the winter. We are also in the process of replacing the thrust bearing pedestals to increase generator stability. We hope to have the repairs completed by the first week in October. As part of the agencies approval of the project you had granted us a temporary modification to article 401 of our FERC license allowing us to run 9b independent of flows through our units on the 9 side. I would like to request that we be allowed to operate under this modification as we complete the repairs to the #9 side intake and units.

Thank you,

John Voyer
 Green Mountain Power
 O: (802) 655-8432
 C: (802) 324-6816

12/21/2009

APPENDIX G

FLOWS



KLEINSCHMIDT ASSOCIATES
Consulting Engineers & Scientists

ORIGINAL

75 Main Street PO Box 576 • Pittsfield, Maine 04967 • Phone: 207-487-3328 • Fax: 207-487-3124 • www.KAssociates.com

February 28, 2000

VIA FEDERAL EXPRESS

David P. Boergers, Secretary
Federal Energy Regulatory Commission
Mail Code DLC, HL-11.2
888 1st Street NE
Washington, DC 20426

Green Mountain Power Corporation
Vergennes Project (FERC No. 2674)-008
Monitoring and Operations Plan

RECEIVED
FEDERAL ENERGY
REGULATORY COMMISSION
MAR -1 AM 10:52
OFFICE OF THE
SECRETARY

Dear Secretary Boergers:

Enclosed for filing are an original and eight copies of the referenced Monitoring and Operations Plan for Green Mountain Power Corporation's Vergennes Project. This plan is filed pursuant to Article 404 of the new license for the project issued by the Commission on July 30, 1999 (88 FERC ¶ 62,095).

As required by Article 404, the licensee has consulted with the City of Vergennes, the Vermont Department of Environmental Conservation, and the United States Geological Survey. A record of the consultation is included as an appendix to the plan. No comments were received from the City of Vergennes or the U.S. Geological Survey. Comments dated February 16, 2000 from the Vermont Department of Environmental Conservation suggested several changes and clarifications to a draft plan sent for their review, and these have been largely incorporated.

Some final information and specifications of the equipment to be used to implement the provisions of this plan are not available at this time. A new automated operating control system for the Project's Plant 9 powerhouse is currently under design. The plan indicates that this information will be filed with the Commission and appended to the plan as soon as it is available, but no later than 120 days after the plan's approval.

The Department of Environmental Conservation recommends that the Vergennes Project headpond response to fluctuating inflows caused by cycling at the upstream Weybridge Project be examined, and that the flow regime downstream of the Vergennes Project be predicted. As required by its license, the Vergennes Project will be operated as a run-of-river project. As described in the plan, output from a headpond elevation sensor located just upstream of the dam will be monitored and the project will be operated to maintain a consistent level. The flow regime downstream of the project will be the same as that upstream, except that inflow variations are likely to be "smoothed" as they pass through the project, as the DEC's letter suggests. The extent of this effect will become apparent through the operations data to be regularly reported to the DEC as described in the plan.

West Columbia, SC
803-822-3177

Strasburg, PA
717-687-7211

Fairfax Station, VA
703-690-4897

Chester, CT
860-526-2358

FERC DOCKETED

MAR

1 2000

3-5013

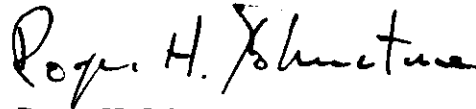
0003170187.3

lm

Please contact us at (207) 487-3328 if there are any questions regarding this filing.

Sincerely,

KLEINSCHMIDT ASSOCIATES

A handwritten signature in black ink, appearing to read "Roger H. Johnstone". The signature is fluid and cursive, with the first name "Roger" and last name "Johnstone" clearly distinguishable.

Roger H. Johnstone
Licensing Coordinator

RHJ:swo

Encl.

cc: A. Sidoti, FERC (NYRO)
J. Soter, GMP
T. Kahl, KA
R. Friday, City of Vergennes
J. Cueto, Vermont Agency of Natural Resources
USGS Water Resources Division

GREEN MOUNTAIN POWER CORPORATION

VERGENNES HYDROELECTRIC PROJECT
(FERC No. 2674)-008

MONITORING AND OPERATIONS PLAN

LICENSE ARTICLE No. 404

February 2000

Prepared by:

KLEINSCHMIDT ASSOCIATES
Consulting Engineers, Scientists & Planners

GREEN MOUNTAIN POWER CORPORATION

VERGENNES HYDROELECTRIC PROJECT
(FERC No. 2674)

MONITORING AND OPERATIONS PLAN
LICENSE ARTICLE No. 404

February 2000

Prepared by:

KLEINSCHMIDT ASSOCIATES
Consulting Engineers, Scientists & Planners

GREEN MOUNTAIN POWER CORPORATION

VERGENNES PROJECT (FERC No. 2674)

MONITORING AND OPERATIONS PLAN LICENSE ARTICLE 404

Green Mountain Power Corporation (GMP) owns and operates the Vergennes Project, which is licensed by the Federal Energy Regulatory Commission (FERC, or the Commission) as Project No. 2674.

Article 401 of the FERC license issued July 30, 1999 (88 FERC ¶62,095) requires GMP to operate the project in a run-of-river mode for the protection and enhancement of water quality, fisheries, and recreational resources of Otter Creek. GMP is to act at all times to minimize the fluctuation of the reservoir surface elevation by maintaining a discharge from the project so that at any point in time flows as measured immediately downstream from the project tailrace, shall equal instantaneous inflow to the project. The normal impoundment elevation is at El. 134.28.

Article 402 of the license requires GMP to operate the project in a manner such that one generating unit of Plant 9 shall be given first priority for use of water diverted from Otter Creek for power production during the period from April 1 through June 15 (to protect walleye and lake sturgeon) and from September 15 through November 15 (to protect landlocked Atlantic salmon). GMP is to bring one unit of Plant 9 on line first and provide a continuous flow from Plant 9 at all times that the project is operating during these seasonal time periods. GMP may commence operation of Plant 9B only after the flows through Plant 9 exceed 350 cfs.

Article 403 requires GMP to release the following minimum flows over the spillways at the project for the protection and enhancement of aesthetic and recreational resources of Otter Creek:

<u>Period</u>	<u>Flow</u>
April 1 through October 31	
Daytime	150 cfs
Nighttime	75 cfs
November 1 through December 15	
Daytime	100 cfs
Nighttime	50 cfs

For the purposes of Article 403, daytime is defined as one-half hour before sunrise to one-half hour after sunset and nighttime is defined as one-half hour after sunset to one-half hour before sunrise. The water quality certification further requires that the 150 cfs April through October daytime flow be apportioned between the spillways with 80 cfs at the center spillway and 35 cfs at each of the two flanking spillways, and that the 100 cfs November through December 15 daytime flow be similarly apportioned.

Run-of-river operation or provision of minimum aesthetic flows may be temporarily modified if required by operating emergencies beyond GMP's control, including to the extent necessary to facilitate flashboard replacement, or for short periods upon mutual agreement between GMP and the Vermont Agency of Natural Resources.

This plan, which describes how the required flows will be provided and how provision of these flows and maintenance of the required impoundment elevation will be monitored, has been prepared in accordance with Articles 402, 403, and 404 of the project license.

Run-of-River Operation

Run-of-river operation of the project will be accomplished and monitored through continuous monitoring of the impoundment elevation by a pressure transducer located sufficiently upstream of the project structures to be unaffected by local effects of the unit drawdowns or flow distributions over the spillways. Output from the impoundment elevation monitor will be tied into the automated control system currently under design for Plant 9. The impoundment level monitor would be located near Center Island located just upstream of the project and shown on the attached figure. Normal impoundment elevation will be maintained approximately 0.1 feet below the tops of the existing 1.5 foot high flashboards when river flows are less than the project's maximum approximate hydraulic capacity of 1180. The top of the 1.5 foot high spillway flashboards will be El. 134.0 for the north and south spillways and El. 134.28 for the center spillway. Keeping the wooden flashboards from overtopping along all three spillways substantially reduces the risk of premature and unnecessary flashboard failure. The actual headpond elevation at the pressure sensor will be field calibrated to achieve the condition of no overtopping with the water level approximately 0.1 feet below the top of the wooden flashboards at all three spillways during various station discharges. Note that with the project operating at its full hydraulic capacity of 1180 cfs, there is an approximately 3 inch localized headpond drawdown at both the north and south spillways compared to the center spillway. During this condition the headpond sensor, which will approximate the headpond at the center spillway removed from localized intake drawdown effects, will record the headpond at approximately El. 134.18.

To insure adequate flow below the project during refill of the impoundment following flashboard replacement or other similar necessary maintenance, such refill will be limited to a rate of 1" per hour; unless a slower refill is required to allow the project to pass 90% of project inflow during refill.

Plant 9 Minimum Flow

During the periods from April 1 through June 15 and from September 15 through November 15 Plant 9 will be given first priority use of water diverted from Otter Creek for power production. The 350 cfs threshold will be monitored by unit output. Turbine rating curves will be filed with the Commission and appended to this plan as soon as they are available, no later than 120 days after the plan is approved. Under the project's run-of-river operation, impoundment elevation will be maintained at the upper elevation when flows are at or below station capacity except for periods when the flashboards are temporarily down. Head on the units, therefore, will not typically vary between that created by the flashboards up and flashboards down conditions.

Aesthetic Spillway Flow

Flashboards Up

When the flashboards are in place between April 1 and December 15, the required aesthetic flows will be passed through openings located in the bottom of the wooden boards. For example, openings approximately 3.35" high equally spaced along 25% of each of the two side spillways would pass the required 35 cfs along each spillway. A 3" high opening along the entire length of the center spillway (60 feet) would discharge the required 80 cfs. This opening height was selected because it would allow leaves and smaller debris to pass without being caught on the boards and obstructing the flow. The submerged orifice discharge would reduce the impact of the 3" localized drawdown near the plants' intakes. In the arrangement described above, a 3" reduction in the head on the openings would reduce the flow discharge by only about 4.3%. This variation should be undetectable. Supporting calculations are attached.

This method of providing aesthetic flows will probably require some additional maintenance to keep the spaces along the bottom of the flashboards free from large debris which may collect and disrupt the aesthetic flows over the spillways. Most of the large river debris loading, however, occurs during the spring freshet when the flashboards would not be in place. Also, the 3" and larger opening height should help prevent obstruction by leaves and other smaller debris.

GMP expects that determining the size and placement of flashboard openings at the two side spillways will require some refinement over the initial few years, and will continue to consult with the City of Vergennes and the Vermont Agency of Natural Resources until a final arrangement is determined, proven, and agreed upon. Under the configuration currently proposed, aesthetic spills would not be reduced at night; the required daytime spills would be provided at all times.

Flashboards Down

During some periods of the year, such as after storm events, a portion or the entire length of the wooden flashboards will be down. The Vermont Agency of Natural Resources has indicated that it will not be necessary to provide the required minimum flows in the specified apportionment between the three spillways when the flashboards are down. The total minimum required will continue to be provided. Lost flashboards will be replaced as soon as this task may be practically and safely accomplished, with the impoundment maintained at between 6 inches and 1 foot below the permanent crest elevation. This will normally be within two weeks of the return of project inflows to within the hydraulic capacity of the station.

Instrumentation and Control

The impoundment level would be measured in the main impoundment at a location on the Center Island sufficiently upstream of the project structures to be unaffected by local effects of the unit drawdowns or flow distributions over the spillways. This sensor would be connected to the generating units' logic control. Rating curves for each spillway for both the flashboards up and flashboards down condition will be filed with the Commission and appended to this plan as soon as they are available, no later than 120 days following the plan's approval. Using the real time impoundment elevation data, and the respective rating curves, the turbine gate positions

would be continuously set to provide the required elevations and flows. These settings would be computed by the automated control system currently under design for the project.

Head-Flow-to Power Curves, Data Management

GMP will provide head-flow-to power rating curves for the project to the Commission and to the Vermont Department of Environmental Conservation within 120 days of the Commission's approval of this plan. The main impoundment elevation and hourly flow (from each plant, and the project total) data will be recorded hourly and will be provided to the DEC on a monthly basis, and to other regulatory agencies within 30 days of the agencies' request for same. The flow data will be graphed along with adjusted Middlebury USGS gage data as requested by the DEC. In addition, a staff gage calibrated in hundredths of a foot will be located at an accessible location for independent monitoring. If run-of-river operation or aesthetic spill flows are interrupted, the GMP will notify the Commission as soon as possible, but no later than ten days after each such incident.

Agency Consultation

Documentation of agency consultation is attached as Appendix B.

9

OTTER CREEK

MAIN STREET BRIDGE

OTTER CREEK

NORTH CHANNEL

FOOT BRIDGE

CENTER ISLAND

CENTER SPILLWAY

GRIST MILL

INTAKE

PLANT NO. 9B SPILLWAY

PUMP
HOUSE

PENSTOCKS

PLANT
NO. 9B

APPROXIMATE FOOT OF TRAIL

2400 VOLT SPINNE & CONTROL CIRCUITS

CANAL STREET

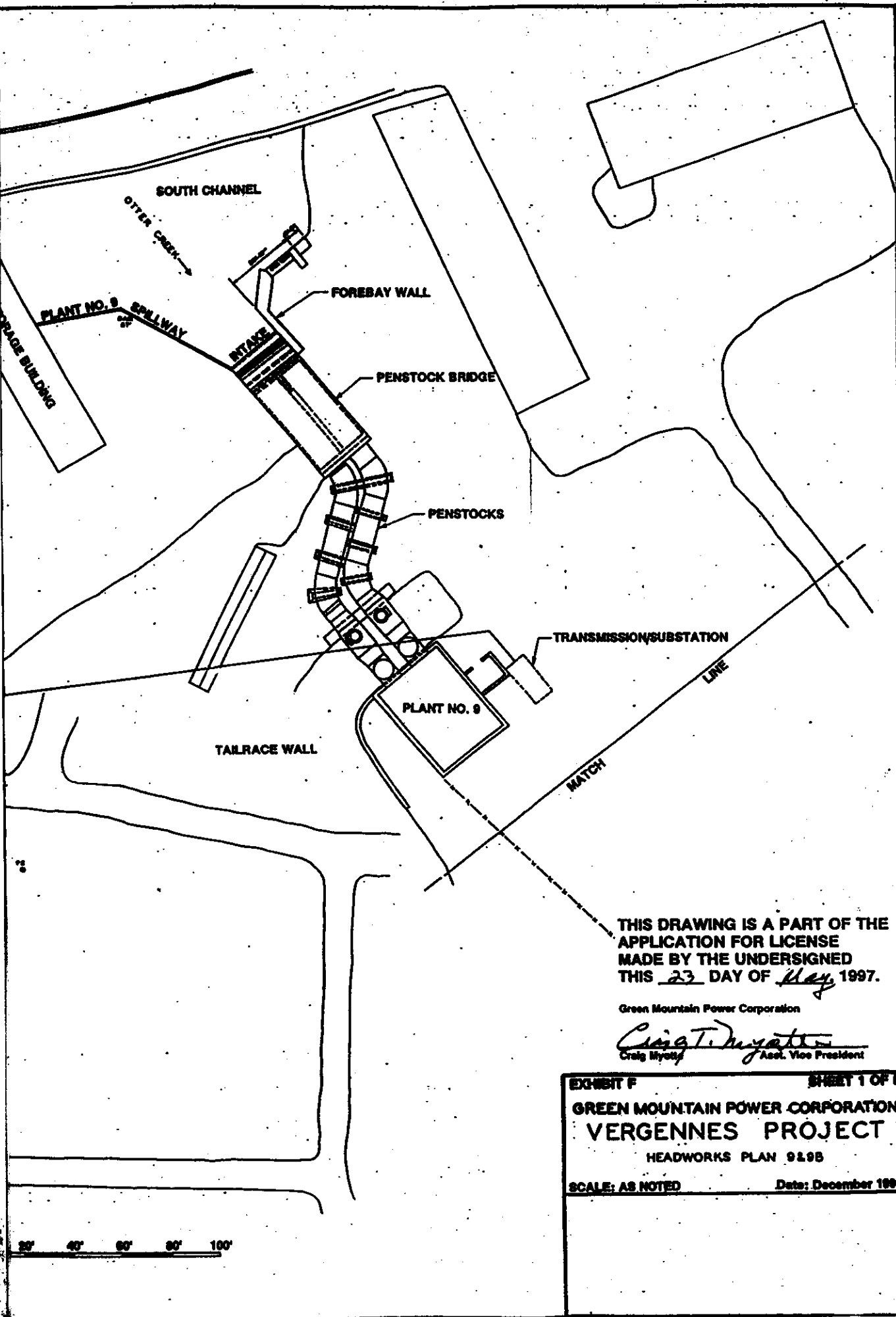
LINE

MATCH

STORAGE BUILDING

DISTRIBUTION SUB

20' 10' 0"



THIS DRAWING IS A PART OF THE
APPLICATION FOR LICENSE
MADE BY THE UNDERSIGNED
THIS 23 DAY OF May 1997.

Green Mountain Power Corporation

Craig T. Myatt
Craig Myatt Asst. Vice President

EXHIBIT F

SHEET 1 OF 5

GREEN MOUNTAIN POWER CORPORATION
VERGENNES PROJECT

HEADWORKS PLAN 9295

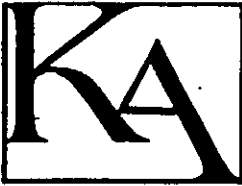
SCALE: AS NOTED

Date: December 1996

0' 20' 40' 60' 80' 100'

APPENDIX A

MINIMUM FLOW CALCULATIONS



CALCULATION SHEET

Project:

Vergennes

By:

JZK

Date:

11/11/92

Subject:

Minimum Flow Compliance

Checked:

Mw

Date:

4/24/93

B) OPTION 2 - HOLES IN BOTTOM
OF SIDE SPILLWAY
FLASHBOARDS

Adjust Center Boards to pass 80 cfs

At no drawdown effect

Water EL 134.82

Crust EL 132.50 (avg)

2132 ft

Make Top Board EL 135.0 to prevent
overtopping

$$Q = C A \sqrt{2gh} \quad \text{submerged orifice,}$$

use $C = 0.6$

$$h = 2.32 - 0.12 = 2.2 \text{ ft}$$

$$\text{req'd } A = \frac{Q}{C \sqrt{2gh}} = \frac{35 \text{ cfs}}{0.6 \sqrt{2(32.2)(2.2)}}$$

$$A = \frac{35}{7.142} = 4.9 \text{ ft}^2$$

$$\text{For } 85' \text{ (avg) opening } H = \frac{4.9}{85} = 0.06' = 0.69'$$

Too small



CALCULATION SHEET

Page:

7

Project No.:

By:

TZA 11/11/99

Date:

Checked:

mz

Date:

2/20/00

Lower Board height all 3 sections
 by 0.75' $\Rightarrow h = 2.2 - 0.70 = 1.5'$

$$A = \frac{35}{(0.6) \sqrt{2(32.2)(1.5)}} = 5.94 \text{ ft}^2$$

$$H = \frac{5.94}{85} = 0.069' = 0.83' \checkmark$$

It only have holes over 25%

$$H = 0.83'' \times 4 = 3.35'' \text{ high.}$$

This would be acceptable as leaves
 and small sticks would pass through.

With Pond Drawn down 3" (0.25')
 At one end

$$\text{Say Ave } H = 1.5' - \frac{0.25'}{2} = 1.375'$$

$$Q = (0.6) \left(\frac{3.35''}{12} \right) \left(\frac{85}{4} \right) \sqrt{2(32.2)(1.375)}$$

$$Q = 33.5 \text{ cfs} \checkmark$$

$$\% \text{ change} = \frac{35 - 33.5}{35} \times 100 = 4.3\% \text{ difference}$$

APPENDIX B

AGENCY CONSULTATION



State of Vermont

Department of Fish and Wildlife
Department of Forests, Parks and Recreation
Department of Environmental Conservation
State Geologist
RELAY SERVICE FOR THE HEARING IMPAIRED
1-800-253-0191 TDD>Voice
1-800-253-0195 Voice>TDD

AGENCY OF NATURAL RESOURCES
Department of Environmental Conservation

WATER QUALITY DIVISION
103 South Main Street
Building 10 North
Waterbury, VT 05671-0408

802-241-3770
Fax #:802-241-3287

February 16, 2000

Roger H. Johnstone
Licensing Coordinator
Kleinschmidt Associates
PO Box 576
Pittsfield, ME 04967

Re: Vergennes Project - FERC Project No. 2674
Article 404 Monitoring and Operations Plan

Dear Mr. Johnstone:

The Agency is in receipt of the draft monitoring and operations plan for the Vergennes Project, submitted by letter dated January 26, 2000 for comment pursuant to Article 404 of the federal license. Please note that the plan is also subject to the approval of the Department of Environmental Conservation pursuant to conditions D and E of the Project's water quality certification (April 15, 1999). Herein we provide several comments on the draft plan.

Run-of-River Operation

The text indicates that a pressure transducer will be installed at the Main Street bridge and that an automated control system is currently being designed for Plant 9. Because the upstream Weybridge hydroelectric plant operates in a peaking mode, inflows to the Vergennes headpond are highly variable. The Weybridge Project is currently in relicensing, and its license expiration date is May 31, 2000. I would expect that the Vergennes headpond may somewhat dampen the flow fluctuation. However, the monitoring plan does not provide information on the how much headpond variability will be programmed into the Vergennes system. The headpond response to typical fluctuating inflows caused by cycling at Weybridge should be examined, and information should be provided on how the operating system at Vergennes will react and what the downstream flow regime will be. Ideally, the system will smooth out the fluctuations with minimal change in headpond elevation. The capabilities of the pressure transducer and the system controller logic should be clearly explained in the plan.

The headpond surface area at Vergennes is very large. Reasonably accurate estimation of inflow may not be possible using only a headpond sensor. The plan should include consideration of the Middlebury U.S.G.S. gage and direct monitoring of the Weybridge operation. Flows at the Middlebury gage may fairly accurately represent natural basin inflows. Flows could be prorated based on drainage area to estimate the inflow hydrograph to Weybridge.¹ The intermediate hydroelectric facilities between Middlebury and Weybridge operate in a run-of-river mode.

When discussing flashboard replacement, the plan indicates that the headpond would be refilled at a rate of one inch per hour, or less if necessary to allow the project to pass a flow of 7Q10. This is unclear. As licensed, the downstream flow requirement during refill is 90% of project inflows—not 7Q10. Spillage can be suspended during the refill period. The plan should provide a table or graph showing the attainable refill rates and times based on project inflow. If project hydraulic capacity is a factor in determining when flashboard installation can be done, that should be indicated in the plan.

If the headpond is drawn below the spillway crest to facilitate the installation of the flashboards, the maximum drawdown elevation should be provided.

A staff gage, calibrated in hundredths of a foot, should be placed at an accessible location for monitoring. The relationship between the staff gage and NGVD datum should be provided to our office.

Plant 9 Minimum Flow

The text cites a dam crest elevation of 132.78 feet. My understanding is that this is the elevation of the center spillway crest. The other spillways are lower; 132.49 feet for the south crest and 132.52 feet for the north crest.

Aesthetic Spillway Flow

The plan proposes 3.35-inch slots between the spillway crests and the bottom of the flashboards for a quarter of the north and south spillways and a 3.0-inch slot for the full length of the center spillway. Supporting calculations will have to be provided for any proposal before it can be approved. The plan does not include proposals for how the nighttime discharge would be provided and how the other seasonal spillages would be provided. For a day/night variation,

¹Figure E(3)-9 of the license application displays the relationship between the Middlebury gage and project inflows. This data could be used to estimate an adjustment factor with further refinement based on experience. If the headpond transient is relatively small, then the project operation could be governed primarily by the gage data with an override based on pond level.

either the slots would have to be physically modified twice daily or the headpond elevation would have to be manipulated. Neither seems desirable. Alternately, the daytime flow could govern, with no overnight reduction.

For the flashboards-out situation, the plan is to lower the concrete crest 0.57 feet in order to maintain the required flow distribution. This would place the center crest about 0.3 foot below the flanking crests. To avoid having to modify the dam crest, I would suggest simply stipulating to a reasonably short length of time for reinstallation of the boards after the highwater event and providing a higher proportion of the spillage over the flanking spillways during that period. Even with the differing spillway elevations, some flow will be discharged over the center spillway. The plan should also address conditions of partial flashboard failure, which is common at some sites. The plan should quantify and characterize flashboard failure experience at Vergennes for the spillage period.

The use of slots over only one quarter of the north and south spillways would change the spillage distribution over those spillways and possibly the bedrock cascades. It is important to provide a full veil of water over the spillways to properly address aesthetic concerns. Some experimentation may be necessary to optimize the locations and lengths of the slots. Please explain how this issue will be handled.

Head-Flow-to-Power Curves, Data Management

The spillway and unit rating curves should be included in the plan, not 120 days after plan approval, if that information is to be used as the basis for compliance. The records must include hourly flow (total and each plant) and headpond elevation (0.01-foot precision) data, as well as flashboard status. It would be difficult for a regulatory agency to check compliance if it has to transform the generation records into flows. The hourly flows should be plotted, and the graph should include the adjusted Middlebury gage data for comparison. Any compliance problems should be brought to our attention within one or two workdays. The 10-day period is unreasonable. Initially, records should be provided monthly within 21 days following the end of the calendar month being monitored. The reporting period can be lengthened as experience with the system is gained and consistent compliance is demonstrated. The records should be provided on a CD or a 3.5-inch diskette as spreadsheet files in Microsoft Excel or Corel Quattro Pro.

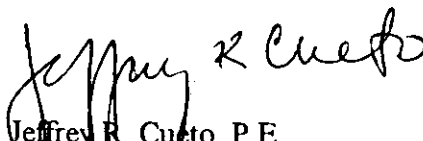
Records should also be kept with respect to functionality of the spillage slots. If they need frequent maintenance to keep them clear of debris, it may be prudent to investigate alternatives.

Roger H. Johnstone
February 16, 2000
Page 4

To enhance the ability of the operators to use the plan, it would be helpful to include a tabular summary of the plan, with citations to the plan text for special circumstances that cannot be readily incorporated in the table.

Please contact me if you have any questions. The final draft should be filed with our office for approval.

Very truly yours,



Jeffrey R. Cuto, P.E.
Principal Hydrologist

c Secretary Boergers, FERC
Laura Eaton-Poole, U.S. Fish and Wildlife Service
Randy Friday, Manager, City of Vergennes
Jon Soter, GMP



KLEINSCHMIDT ASSOCIATES
Consulting Engineers & Scientists

75 Main Street PO Box 576 • Pittsfield, Maine 04967 • Phone: 207-487-3328 • Fax: 207-487-3124 • www.KAssociates.com

January 26, 2000

Randy Friday, City Manager
City of Vergennes
P.O. Box 35
Vergennes, VT 05491

Green Mountain Power Corporation
Vergennes Project (FERC No. 2674)
Draft Monitoring and Operations Plan

Dear Mr. Friday:

Enclosed for your review is a draft Monitoring and Operations Plan for Green Mountain Power Corporation's Vergennes Project. This plan describes how the project will be operated to maintain run-of-river operation and minimum bypass flows for fisheries and aesthetic resources. Please provide any formal comments or recommendations on the draft plan to us by February 25, 2000, although I expect to speak with you again before that.

Please contact me at (207) 487-3328 or by e-mail at RogerJ@KAssociates.com if you have any questions regarding the draft plan.

Sincerely,

KLEINSCHMIDT ASSOCIATES

Roger H. Johnstone
Licensing Coordinator

RHJ:swo
Encl.

cc: Paul Vachon, Vergennes Partnership Inc.
Jon Soter, GMP
Tom Kahl, KA

J:\012-052\Copy of Draft recplan to Vergennes.doc

West Columbia, SC
803-822-3177

Strasburg, PA
717-687-7211

Fairfax Station, VA
703-690-4897

Chester, CT
860-526-2358

East Syracuse, NY
315-463-5013



KLEINSCHMIDT ASSOCIATES
Consulting Engineers & Scientists

75 Main Street PO Box 576 • Pittsfield, Maine 04967 • Phone: 207-487-3328 • Fax: 207-487-3124 • www.KAssociates.com

January 26, 2000

Jeffrey R. Cueto, P.E.
Vermont Agency of Natural Resources
Dept. of Environmental Conservation
Water Quality Division
103 South Main Street
Building 10 North
Waterbury, VT 05671-0408

Green Mountain Power Corporation
Vergennes Project (FERC No. 2674)
Draft Monitoring and Operations Plan

Dear Mr. Cueto:

Enclosed for your review is a draft Monitoring and Operations Plan for Green Mountain Power Corporation's Vergennes Project. This plan describes how the project will be operated to maintain run-of-river operation and minimum bypass flows for fisheries and aesthetic resources. Please provide any formal comments or recommendations on the draft plan to us by February 25, 2000.

Please contact me at (207) 487-3328 or by e-mail at RogerJ@KAssociates.com if you have any questions regarding the draft plan.

Sincerely,

KLEINSCHMIDT ASSOCIATES

Roger H. Johnstone
Licensing Coordinator

RHJ:swo
Encl.

cc: Jon Soter, GMP
Tom Kahl, KA

J:\012-052\Copy of Draft recplan to VANR.doc

West Columbia, SC
803-822-3177

Strasburg, PA
717-687-7211

Fairfax Station, VA
703-690-4897

Chester, CT
860-526-2358

East Syracuse, NY
315-463-5013



KLEINSCHMIDT ASSOCIATES
Consulting Engineers & Scientists

file
MASTER FILE

75 Main Street PO Box 576 • Pittsfield, Maine 04967 • Phone: 207-487-3328 • Fax: 207-487-3124 • www.KAssociates.com

January 26, 2000

U.S. Geological Survey
Water Resources Division
361 Commerce Way
Pembroke, NH 03275

Green Mountain Power Corporation
Vergennes Hydropower Project (FERC No. 2674)
Draft Monitoring and Operations Plan

Dear Reader:

Enclosed for your review is a draft Monitoring and Operations Plan for Green Mountain Power Corporation's Vergennes Project. This plan describes how the project will be operated to maintain run-of-river operation and minimum bypass flows for fisheries and aesthetic resources. Please provide any formal comments or recommendations on the draft plan to us by February 25, 2000.

Please contact me at (207) 487-3328 or by e-mail at RogerJ@KAssociates.com if you have any questions regarding the draft plan.

Sincerely,

KLEINSCHMIDT ASSOCIATES

Roger H. Johnstone
Licensing Coordinator

RHJ:swo
Encl.

cc: Jon Soter, GMP
Tom Kahl, KA

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92 FERC 12,119

UNITED STATES OF AMERICA
FEDERAL ENERGY REGULATORY COMMISSION

Green Mountain Power Corp.

Project No. 2674-008

ORDER MODIFYING AND APPROVING MONITORING
AND OPERATIONS PLAN

(Issued August 09, 2000)

Green Mountain Power Corporation (licensee), filed on March 1, 2000, its monitoring and operations plan under article 404 of the license for the Vergennes Project (FERC NO. 2674). The project is located on Otter Creek in the City of Vergennes, Addison County, Vermont.

BACKGROUND

Article 404 requires the licensee to file with the Commission, for approval, a monitoring and operations plan to monitor run-of-river operations, first priority use of river flows to Plant 9, and aesthetic flow releases over Vergennes Falls as required respectively by articles 401, 402, and 403. The plan is to include: (1) a schedule for implementing the plan; (2) a schedule for installing all flow and water level measuring devices; (3) the identification of the planned locations of the flow measuring devices; (4) the method of data collection, including the design of each of the recording devices, and provisions for providing data to the regulatory agencies in a timely manner; (5) the identification of an operating rule for seasonally diverting water from Otter Creek to Plants 9 and 9B; (6) identification of the proposed apportionment of aesthetic flow releases over the three project spillways during hours when the project is not operating; (7) the identification of flow management techniques to be used to address bypass flows and refill of the project impoundment during flashboard replacement; and (8) a schedule for providing the rating curves depicting the head-flow-to power relationship for the project to the Commission and to the Vermont Department of Environmental Conservation (VDEC).

LICENSEE'S PLAN

A. Run-Of-River Operation

Run-of-river operation will be accomplished and monitored through continuous monitoring of the impoundment elevation by a pressure transducer located sufficiently upstream of the project structures. Output from the impoundment elevation monitor will be tied into the automated control system currently under design for Plant 9. The

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Project No. 2674-008

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impoundment level monitor would be located near Center Island just upstream of the project. Normal impoundment elevation will be maintained approximately 0.1 feet below the tops of the existing 1.5-foot high flashboards when river flows are less than the project's maximum approximate hydraulic capacity of 1180 cubic feet per second (cfs). The top of the 1.5-foot high spillway flashboards will be at elevation 134.0 feet for the north and south spillways and elevation 134.28 feet for the center spillway. Keeping the wooden flashboards from overtopping along all three spillways substantially reduces the risk of premature and unnecessary flashboard failure. The actual headpond elevation at the pressure sensor will be field calibrated to achieve the condition of no overtopping with the water level approximately 0.1 feet below the top of the wooden flashboards at all three spillways during various station discharges. With the project operating at its full capacity of 1180 cfs, there is an approximately 3-inch localized headpond drawdown at both the north and the south spillways compared to the center spillway. During this condition, the headpond sensor, which will approximate the headpond at the center spillway removed from localized intake drawdown effects, will record the headpond at approximately elevation 134.18 feet.

To ensure adequate flow below the project during refill of the impoundment following flashboard replacement or other similar necessary maintenance, such refill will be limited to a rate of 1-inch per hour; unless a slower refill is required to allow the project to pass 90% of project inflow during refill.

B. Plant 9 Minimum Flow

During the periods from April 1 through June 15 and from September 15 through November 15, Plant 9 will be given first priority use of water diverted from Otter Creek for power production. The 350 cfs threshold will be monitored by unit output. Turbine rating curves will be filed with the Commission and appended to this plan as soon as they are available, no later than 120 days after the plan is approved. Under the project's run-of-river operation, impoundment elevation will be maintained at the upper elevation when flows are at or below station capacity except for periods when the flashboards are temporarily down. Head on the units, therefore, will not typically vary between that created by the flashboards up and flashboards down conditions.

C. Aesthetic Spillway Flow

Flashboards Up

When the flashboards are in place between April 1 and December 15, the required aesthetic flows will be passed through openings located in the bottom of the wooden boards. For example, openings approximately 3.35 inches high equally spaced along 25% of each of the two side spillways would pass the required 35 cfs along each spillway. A 3-inch high opening along the entire length of the center spillway (60 feet) would discharge the required 80 cfs. This opening height was selected because it would allow leaves and smaller debris to pass without being caught on the boards and obstructing flow. The submerged orifice discharge would reduce the impact of the 3-inch localized drawdown near the plants' intakes. In the arrangement described above, a 3-inch reduction in the head on the openings would reduce the flow discharge by only about 4.3%. This variation should be undetectable.

This method of providing aesthetic flows will probably require some additional maintenance to keep the spaces along the bottom of the flashboards free from large debris which may collect and disrupt the aesthetic flows over the spillways. Most of the large river debris loading, however, occurs during the spring freshet when the flashboards would not be in place. Also, the 3-inch and larger opening height should help prevent obstruction by leaves and other smaller debris.

The licensee expects that determining the size and placement of flashboard openings at the two side spillways will require some refinement over the initial few years, and will continue to consult with the City of Vergennes and the Vermont Agency of Natural Resources (VANR) until a final arrangement is determined, proven, and agreed upon. Under the configuration currently proposed, aesthetic spills would not be reduced at night; the required daytime spills would be provided at all times.

Flashboards Down

During some periods of the year, such as after storm events, a portion or the entire length of the wooden flashboards will be down. The VANR has indicated that it will not be necessary to provide the required minimum flows in the specified apportionment between the three spillways when the flashboards are down. The total minimum required flow will continue to be provided. Lost flashboards will be replaced as soon as this task may be practically and safely accomplished, with the impoundment maintained at between six inches and one foot below the permanent crest elevation. This will normally be within two weeks of the return of project inflows to within the hydraulic capacity of the station.

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D. Instrumentation and Control

The impoundment level would be measured in the main impoundment at a location on the Center Island sufficiently upstream of the project structures to be unaffected by local effects of the unit drawdowns or flow distributions over the spillways. This sensor would be connected to the generating units' logic control. Rating curves for each spillway for both the flashboards up and flashboards down condition will be filed with the Commission and appended to this plan as soon as they are available, no later than 120 days following the plan's approval. Using the real time impoundment elevation data, and the respective rating curves, the turbine gate positions would be continuously set to provide the required elevation and flows. These settings would be computed by the automated control system currently under design for the project.

E. Head-Flow-to Power Curves, Data Management

The licensee will provide head-flow-to power rating curves for the project to the Commission and to the VDEC within 120 days of the Commission's approval of this plan. The main impoundment elevation and flow (from each plant, and the project total) data will be recorded hourly and will be provided to the VDEC on a monthly basis, and to other regulatory agencies within 30 days of the agencies' request for the same. The flow data will be graphed along with the adjusted Middlebury U.S. Geological Survey (USGS) gage data as requested by the VDEC. In addition, a staff gage calibrated in hundredths of a foot will be located at an accessible location for independent monitoring. If run-of-river operation or aesthetic spill flows are interrupted, the licensee will notify the Commission as soon as possible, but no later than ten days after each such incident.

AGENCY COMMENTS

The VANR, by letter dated February 16, 2000, concurred with the licensee's plan and provided recommendations which the licensee incorporated into its plan. The City of Vergennes and the USGS did not comment on the plan.

DISCUSSION AND CONCLUSIONS

The licensee consulted with the resource agencies in preparation of the monitoring and operations plan and incorporated the agencies comments into its final plan. The licensee's plans meet the requirements of article 404 of the license and should adequately monitor and document the licensee's operation.

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It is Commission's standard practice to require the licensee to report any deviation from its requirements. After reviewing the licensee's report, Commission staff can make a determination as to whether modifications to project operations or facilities are necessary. So that the Commission can monitor the licensee's compliance with the operational requirements of articles 401, 402, and 403 the licensee should be required to notify the Commission of any deviations from the requirements specified in those articles. Based upon the licensee's report and the Commission's evaluation of the incident, the Commission should reserve the right to require modifications to project facilities and operations to ensure compliance with the specific requirements in articles 401, 402, and 403.

Given the licensee has indicated it may take up to 120 days before it can provide a turbine rating curve and a spillway rating curve, the licensee should be required to file this information within 120 days of issuance of this order. The licensee's monitoring and operations plan, with the above modification, should be adequate to document the licensee's compliance and should, therefore, be approved.

The Director orders:

(A) The licensee's monitoring and operations plan under article 404 of the license for the Vergennes Project (FERC No. 2674), filed on March 1, 2000, as modified by paragraphs (B) and (C) below, is approved.

(B) The licensee shall file its turbine rating curve and spillway rating curve for the Vergennes Project within 120 days of the date of this order.

(C) If the run-of-river operation or minimum flows as measured by the approved monitoring system, deviates from the requirements of articles 401, 402, and/or 403, the licensee shall file a report with the Commission within 30 days of the date that the data becomes available regarding the incident. The report shall, to the extent possible, identify the cause, severity, and duration of the incident, and any observed or reported adverse environmental impacts resulting from the incident. The report shall also include: (1) operational data necessary to determine compliance with articles 401, 402, and/or 403; (2) a description of any corrective measures implemented at the time of occurrence and the measures implemented or proposed to ensure that similar incidents do not recur; and (3) comments or correspondence, if any, received from the resource agencies regarding the incident. Based on the report and the Commission's evaluation of the incident, the Commission reserves the right to require modifications to project facilities and operations to ensure future compliance.

Project No. 2674-008

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(D) The licensee shall file an original and seven copies of any filing required by this order with:

The Secretary
Federal Energy Regulatory Commission
Mail Code: DHAC, PJ-12.3
888 First Street, N.E.
Washington, D.C. 20426

(E) This order constitutes final agency action. Requests for rehearing by the Commission may be filed within 30 days of the date of issuance of this order, pursuant to 18 CFR § 385.713.

A handwritten signature in black ink, reading "Rebecca M. Martin". The signature is fluid and cursive, with the first name "Rebecca" being more prominent than the last name "Martin".

Rebecca M. Martin
Team Leader
Division of Hydropower Administration
and Compliance



December 29, 2011

Mr. Peter Valeri
Federal Energy Regulatory Commission
New York Regional Office
19 West 34th Street, Suite 400
New York, NY 10001

Re: P-2674-VT, Vergennes Plant # 9
2011 Minimum flow compliance

Dear Mr. Valeri:

This letter is written to summarize minimum flow compliance in accordance with Articles 401, 402 and 403 of Green Mountain Power Corporation's (GMP) license at its Vergennes plant #9 during calendar year 2011.

The Vergennes project is required to operate run-of-river with the Plant #9 unit given first priority during spring and fall and minimum flows over the spillway from April 1st through December 15th.

Discussions with the plant operators and a review of the plant records for calendar year 2011 have confirmed that the minimum flows over the spillways were maintained at the project.

Should you require any further information relative to the above, please do not hesitate to contact me at (802) 655-8723, via e-mail at lisai@greenmountainpower.com or at the address below.

Sincerely,

A handwritten signature in black ink, appearing to read "J. Lisai", is written over a horizontal line.

Jason L. Lisai
Power Production Supervisor
Green Mountain Power
163 Acorn Lane
Colchester, VT 05446-6611

Cc: Sharon Lucia

Document Content(s)

FERC_#9_122911_eap.PDF.....1-2

FERC#9_122911_minflow.PDF.....3-3

Dec 14, 2006

**Mr. Peter Valeri
Federal Energy Regulatory Commission
New York Regional Office
19 West 34th Street, Suite 400
New York, NY 10001**

Dear Mr. Valeri:

The Vergennes project is required to operate run-of-river with the Plant #9 unit given first priority during spring and fall and minimum flows over the spillway from April 1st through December 15th. Discussions with the plant operators and a review of the plant records for calendar year 2007 have confirmed that the minimum flow requirements have been met at the project.

Should you require any further information relative to the above, please do not hesitate to contact me at (802) 665-8432, via e-mail at voyer@greenmountainpower.biz or at the address below.

Sincerely,

John B. Vane III

John B Voyer III
Manager of Power Production

Cc: Sharon Lucia

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December 27, 2007

Dec 31, 2007

Mr. Charles P. Goggins
Federal Energy Regulatory Commission
New York Regional Office
19 West 34th Street, Suite 400
New York, NY 10001

Re: P-2674-VT, Vergennes Plant # 9
2007 Minimum flow compliance

Dear Mr. Goggins:

This letter is written to summarize minimum flow compliance in accordance with Articles 401, 402 and 403 of Green Mountain Power Corporation's (GMP) license at its Vergennes plant #9 during calendar year 2007.

The Vergennes project is required to operate run-of-river with the Plant #9 unit given first priority during spring and fall and minimum flows over the spillway from April 1st through December 15th. Discussions with the plant operators and a review of the plant records for calendar year 2007 have confirmed that the minimum flow requirements have been met at the project with the exception of the flow deficiencies during August of 2007 and reported to the Secretary via letter dated September 6, 2007.

Should you require any further information relative to the above, please do not hesitate to contact me at (802) 665-8777, via e-mail at soter@gmpvt.com or at the address below.

Sincerely,

A handwritten signature in black ink, appearing to read "Jon A. Soter", written over a horizontal line.

Jon A. Soter, P.E.
Plant Engineering Manager
JAS/ms

Cc: Sharon Lucia

From: [Davis, Eric](#)
To: [Katie Sellers](#)
Cc: [Crocker, Jeff](#); [Andy Qua](#); [Greenan, John](#); [Jennifer Jones](#)
Subject: RE: LIHI Certification - Request For Vermont DEC Feedback on Essex 19 and Vergennes
Date: Monday, December 19, 2016 1:31:44 PM
Attachments: [image003.png](#)

Hi Katie,

Thanks for clarifying the elevation of the dam crest to put the headpond level in context. I'll review and provide feedback as soon as possible.

Thanks,
Eric

Eric Davis, River Ecologist

1 National Life Drive, Main 2
Montpelier, VT 05620-3522
802-490-6180 / eric.davis@vermont.gov
<http://www.watershedmanagement.vt.gov/rivers>
(Please note my new e-mail address, effective July 27, 2015)



See what we're up to on our [Blog](#). [Flow](#).

From: Katie Sellers [mailto:Katie.Sellers@KleinschmidtGroup.com]
Sent: Friday, December 16, 2016 12:06 PM
To: Davis, Eric <Eric.Davis@vermont.gov>
Cc: Crocker, Jeff <Jeff.Crocker@vermont.gov>; Andy Qua <Andy.Qua@KleinschmidtGroup.com>; Greenan, John <John.Greenan@greenmountainpower.com>; Jennifer Jones <Jennifer.Jones@KleinschmidtGroup.com>
Subject: RE: LIHI Certification - Request For Vermont DEC Feedback on Essex 19 and Vergennes

Hi Eric – Thanks again for your ongoing review. I have received feedback on this and 0 ft. as currently marked on the graphs, represents the crest of the Vergennes dam.

Do let us know if you have any follow-up questions on this.

Best,
Katie

Katie Sellers
Regulatory Coordinator
Kleinschmidt

Office: 207-416-1218

www.KleinschmidtGroup.com



From: Davis, Eric [<mailto:Eric.Davis@vermont.gov>]

Sent: Thursday, November 10, 2016 5:03 PM

To: Katie Sellers <Katie.Sellers@KleinschmidtGroup.com>

Cc: Crocker, Jeff <Jeff.Crocker@vermont.gov>; Andy Qua <Andy.Qua@KleinschmidtGroup.com>

Subject: RE: LIHI Certification - Request For Vermont DEC Feedback on Essex 19 and Vergennes

Hi Katie,

I'm in the process of reviewing the Vergennes operations data. I do have a question regarding headpond level that will aid in the Agency's review.

The Flow Management and Monitoring Plan states, "Normal impoundment elevation will be maintained approximately 0.1 feet below the tops of the existing 1.5-foot high flashboards when river flows are less than the project's maximum approximate hydraulic capacity of 1180 cubic feet per second (cfs)." And, "The top of the 1.5-foot high spillway flashboards will be at elevation 134.0 feet for the north and south spillways and elevation 134.28 feet for the center spillway."

The headpond elevation in the operations data provided is not tied in to an elevation. Could you provide the elevation for 0 feet on the graphs, so that I can put the headpond level into perspective of what is required by the plans?

Thanks,
Eric

Eric Davis, *River Ecologist*

1 National Life Drive, Main 2

Montpelier, VT 05620-3522

802-490-6180 / eric.davis@vermont.gov

<http://www.watershedmanagement.vt.gov/rivers>

(Please note my new e-mail address, effective July 27, 2015)



VERMONT DEPARTMENT OF
ENVIRONMENTAL CONSERVATION

**WATERSHED
MANAGEMENT DIVISION**

RIVERS PROGRAM

See what we're up to on our [Blog](#). [Flow](#).

From: Katie Sellers [<mailto:Katie.Sellers@KleinschmidtGroup.com>]
Sent: Wednesday, November 02, 2016 4:24 PM
To: Davis, Eric <Eric.Davis@vermont.gov>
Cc: Crocker, Jeff <Jeff.Crocker@vermont.gov>; Andy Qua <Andy.Qua@KleinschmidtGroup.com>
Subject: RE: LIHI Certification - Request For Vermont DEC Feedback on Essex 19 and Vergennes

Hi Eric – Want to follow-up on the Vergennes part of this review.
We are hoping to file this LIHI application by the end of the month as it must be due to LIHI no later than Dec 31.

Thank you for your help with this,
Katie

Katie Sellers
Regulatory Coordinator
Kleinschmidt
Office: 207-416-1218
www.KleinschmidtGroup.com



From: Davis, Eric [<mailto:Eric.Davis@vermont.gov>]
Sent: Monday, October 03, 2016 10:41 AM
To: Katie Sellers <Katie.Sellers@KleinschmidtGroup.com>
Cc: Crocker, Jeff <Jeff.Crocker@vermont.gov>; Andy Qua <Andy.Qua@KleinschmidtGroup.com>
Subject: RE: LIHI Certification - Request For Vermont DEC Feedback on Essex 19 and Vergennes

Good morning Katie,

In regards to Essex 19, the Agency (with DFW taking the lead) and the USFWS have conducted multiple site visits and identified immediate term issues with operation of the fish passage, as well as some longer term modifications that will be needed. The USFWS communicated these issues to GMP last week, and discussions are on-going. We won't be commenting on the Essex 19 project until all parties reach consensus on the path forward.

Regarding the Vergennes project, I've discussed some of the information needs with DFW. I have not yet been able to review the operations data to confirm compliance with points 1 & 3 below. I anticipate being able to provide comments by 10/31.

Thanks,
Eric

Eric Davis, *River Ecologist*

1 National Life Drive, Main 2
Montpelier, VT 05620-3522
802-490-6180 / eric.davis@vermont.gov
<http://www.watershedmanagement.vt.gov/rivers>
(Please note my new e-mail address, effective July 27, 2015)



See what we're up to on our [Blog, Flow](#).

From: Katie Sellers [<mailto:Katie.Sellers@KleinschmidtGroup.com>]
Sent: Monday, October 03, 2016 7:50 AM
To: Davis, Eric <Eric.Davis@vermont.gov>
Cc: Crocker, Jeff <Jeff.Crocker@vermont.gov>; Andy Qua <Andy.Qua@KleinschmidtGroup.com>
Subject: RE: LIHI Certification - Request For Vermont DEC Feedback on Essex 19 and Vergennes

Good Morning Eric – Just following-up on this review for Essex 19 and Vergennes. Do let us know if you have any additional information needs.

Thank you,
Katie

Katie Sellers
Regulatory Coordinator
Kleinschmidt
Office: 207-416-1218
www.KleinschmidtGroup.com



From: Katie Sellers
Sent: Thursday, August 25, 2016 8:22 AM
To: Davis, Eric <Eric.Davis@vermont.gov>
Cc: 'Crocker, Jeff' <Jeff.Crocker@vermont.gov>; Andy Qua <Andy.Qua@KleinschmidtGroup.com>
Subject: RE: LIHI Certification - Request For Vermont DEC Feedback on Essex 19 and Vergennes

Hi Eric,

Thank you again for your feedback. Attached, you will find one year (2014-2015) of operations data for both Vergennes Hydroelectric Project and Essex 19 Hydroelectric Project available for review.

Upon initial review of the LIHI Certification application, LIHI has additionally asked for your review/confirmation of the following items:

Essex 19:

- 1) Project compliance with minimum flows and ramping rate conditions as prescribed by Conditions I and F of the Water Quality Certification.
- 2) Project compliance with mandated fish passage requirements
- 3) Project compliance with all conditions issued pursuant to the water quality certification
- 4) Verify that the 1995 Water Quality Certificate is still valid

Vergennes Project:

- 1) Project compliance with the water quality certificate flow requirements (including aesthetic flows)
- 2) Verify that the 1999 water quality certificate is still valid
- 3) Project compliance with all conditions issued pursuant to the 1999 water quality certification
- 4) Confirm no riverine or anadromous fish passage requirements at this time
- 5) Reasons why fish passage has not been required even though the FERC license has been amended recently
- 6) Confirm the facility does not negatively affect any threatened or endangered species

Do let me know if you have any questions during your review of these items.

Thank you in advance for your time,
Katie

Katie Sellers

Regulatory Coordinator

Kleinschmidt

Office: 207-416-1218

www.KleinschmidtGroup.com



From: Davis, Eric [<mailto:Eric.Davis@vermont.gov>]

Sent: Wednesday, August 26, 2015 2:41 PM
To: Katie Sellers <Katie.Sellers@KleinschmidtGroup.com>
Cc: Crocker, Jeff <Jeff.Crocker@vermont.gov>
Subject: RE: LIHI Certification - Request For Vermont DEC Feedback

Dear Ms. Sellers,

The Vermont Department of Environmental Conservation has received your request for feedback regarding compliance of the Vergennes, Essex 19, and Otter Creek hydroelectric projects with water quality certification conditions.

- In order to verify compliance of the Vergennes Hydroelectric Project with the flow management conditions prescribed by Condition B of the Water Quality Certification issued for the project, the Department kindly requests one year of operations data.
- Similarly, in order to verify compliance of the Essex 19 Hydroelectric Project with the minimum flows and ramping rate conditions prescribed by Conditions I and F of the Water Quality Certification issued for the project, the Department kindly requests one year of operations data.
- The Department is not requesting operations data for the Otter Creek Hydroelectric Project at this time.

Please also be aware that while the Department is more than happy to provide feedback for these projects, a meaningful review may not be possible within 15 days.

Thank you,
Eric

Eric Davis, River Ecologist

1 National Life Drive, Main 2
Montpelier, VT 05620-3522
802-490-6180 / eric.davis@vermont.gov
(Please note my new e-mail address, effective July 27, 2015: eric.davis@vermont.gov)
<http://www.watershedmanagement.vt.gov/rivers>



See what we're up to on our [Blog, Flow](#).

From: Crocker, Jeff
Sent: Wednesday, August 19, 2015 3:27 PM
To: Davis, Eric
Subject: FW: LIHI Certification - Request For Vermont DEC Feedback

FYI

From: Katie Sellers [<mailto:Katie.Sellers@KleinschmidtGroup.com>]
Sent: Wednesday, August 19, 2015 3:26 PM
To: Crocker, Jeff
Cc: Laura Cowan
Subject: LIHI Certification - Request For Vermont DEC Feedback

Dear Mr. Crocker,

Kleinschmidt Associates is assisting Green Mountain Power (GMP) with applying for certifications from the Low Impact Hydropower Institute (LIHI) for the Vergennes Hydroelectric Project (FERC No. 2674), Otter Creek Hydroelectric Project (FERC No. 2558), and the Essex 19 Hydroelectric Project (FERC No. 2513). LIHI is a non-profit organization dedicated to reducing the impacts of hydropower generation through the certification of hydropower projects that have avoided or reduced their environmental impacts pursuant to LIHI criteria.

As part of the application process, LIHI requests correspondence from relevant resource agencies to confirm that projects are in compliance with prescriptions and license articles. To that end, Kleinschmidt is requesting feedback from regulatory agencies to confirm validity and compliance with relevant prescriptions and/or articles.

Attached, you will find questionnaires for Vergennes Hydroelectric Project, Otter Creek Hydroelectric Project, and Essex 19 Hydroelectric Project. If you could please complete each of the enclosed questionnaires and return to my attention, Katie Sellers, by email (katie.sellers@kleinschmidtgroup.com) within 15 days of receipt, it would be much appreciated.

Thank you in advance for your time,

Katie Sellers

Katie Sellers
Regulatory Coordinator
Kleinschmidt
Office: 207-416-1218
www.KleinschmidtGroup.com



August 25, 2016

VIA EMAIL

Mr. Eric Davis
Vermont Department of Environmental Conservation
1 National Life Drive, Main 2
Montpelier, VT 05620

2014-2015 Operations Data for Vergennes Hydroelectric Project (FERC No. 2674) and Essex 19 Hydroelectric Project (FERC No. 2558).

Dear Mr. Davis:

In response to your August 26, 2015 email request, Kleinschmidt Associates (Kleinschmidt) on behalf of Green Mountain Power (GMP), herein provides one year (2014-2015) of operations data for both the Vergennes Hydroelectric Project (FERC No. 2674) and Essex 19 Hydroelectric Project (FERC No. 2558).

The attached 2014-2015 data depicts project generation, headpond level, and river flow to display operations occurring at the Vergennes Project (Attachment A) and Essex 19 Project (Attachment B). Flow data was prorated for the Vergennes Project and flow data for Essex 19 Project was obtained from USGS Gage 4290500. Fluctuations in headpond levels shown in the Vergennes Project graphs correlate to changes in river flow and are generally not products of operations. Period short term drops in generation are typically a result of unit trips associated with dramatic increases in inflow. The project's strict run-of-river operations are represented within the data. Fluctuations in headpond levels shown in the Essex 19 Project graphs correlate to both changes in river flow during run-of-river operations and to modified peaking operations as prescribed in the 1993 Water Quality Certificate. Daily ups and downs in generation are attributed to inflow and daily pulsing occurring at the upstream Waterbury Hydroelectric Project (FERC No. 2090). The project's compliance with peaking operations is represented within the data.

Should you have any questions during this review please contact me at 207-416-1218 or at Katie.Sellers@KleinschmidtGroup.com.

Sincerely,

KLEINSCHMIDT ASSOCIATES

A handwritten signature in black ink that reads "Katie Sellers".

Katie Sellers
Regulatory Coordinator

KES:TMJ

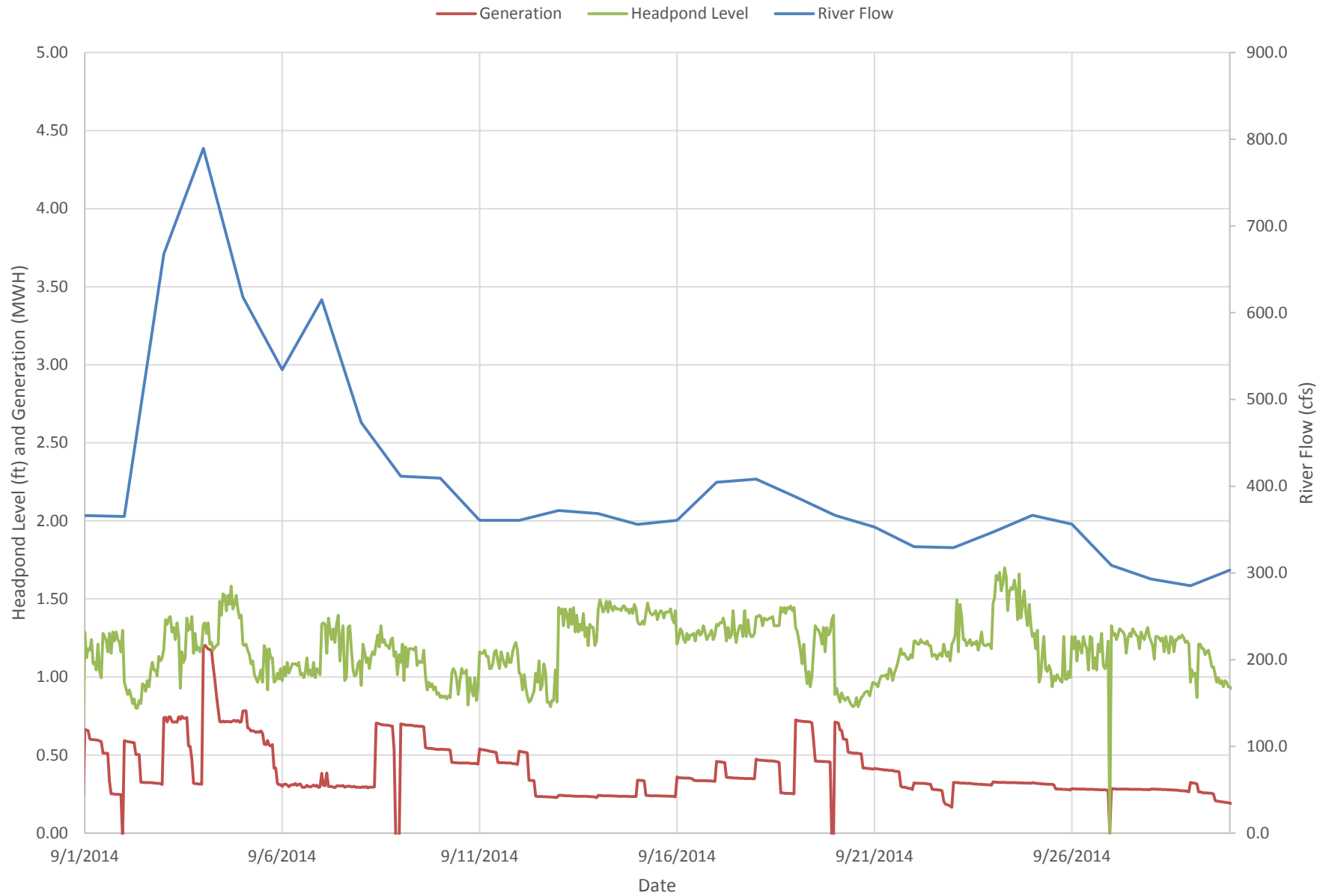
Attachments: Attachment A – Vergennes Project Operations Data 2014-2015
Attachment B – Essex 19 Project Operations Data 2014-2015

\\\\kleinschmidtusa.com\\Condor\\Jobs\\006\\227\\Docs\\Vergennes LIHI\\Agency Correspondence\\Responses\\001 Vermont DEC_Operations Write-up_Vergennes_Essex 19_8_25_2016.docx

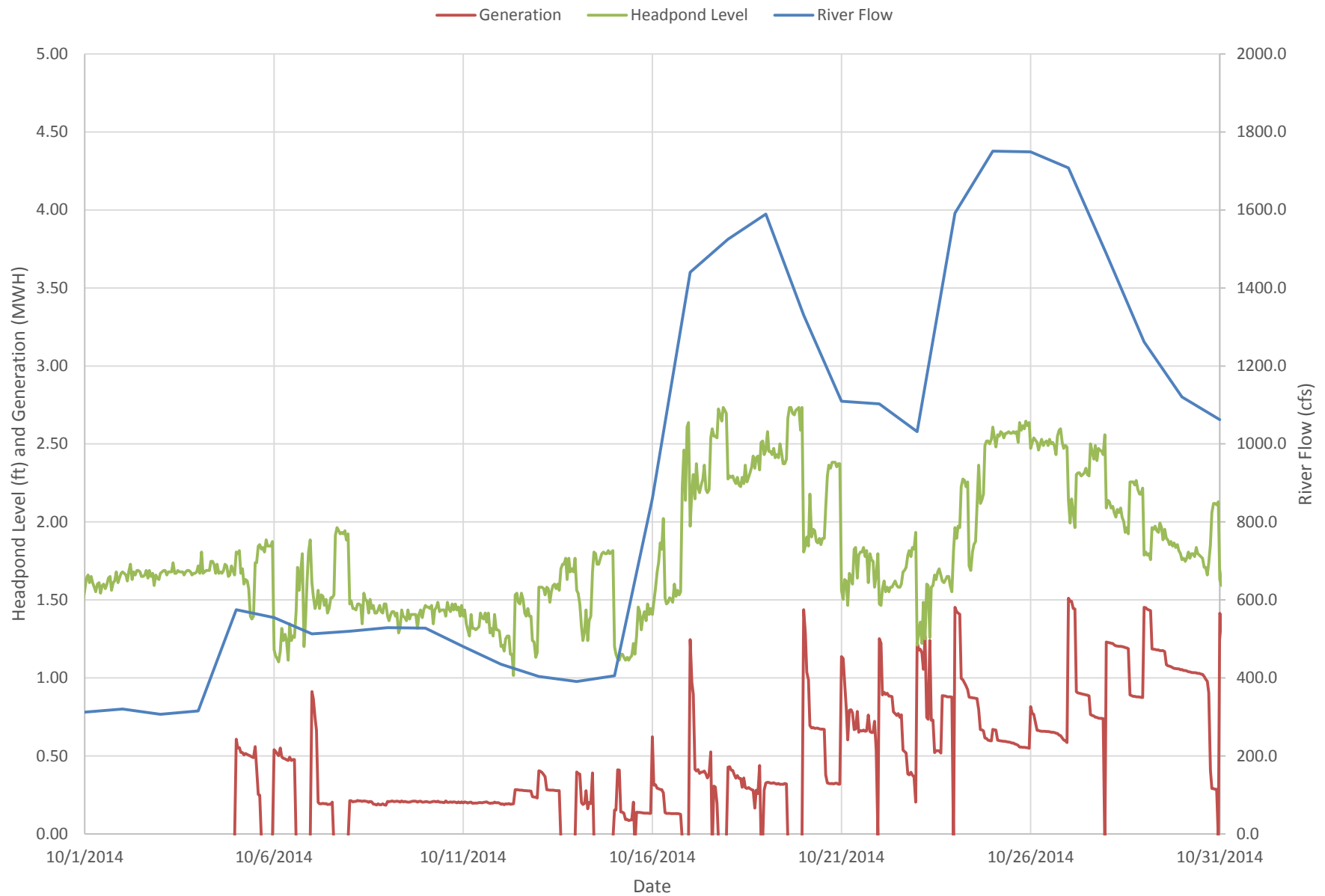
ATTACHMENT A

VEREGENNES PROJECT OPERATIONS DATA 2014-2015

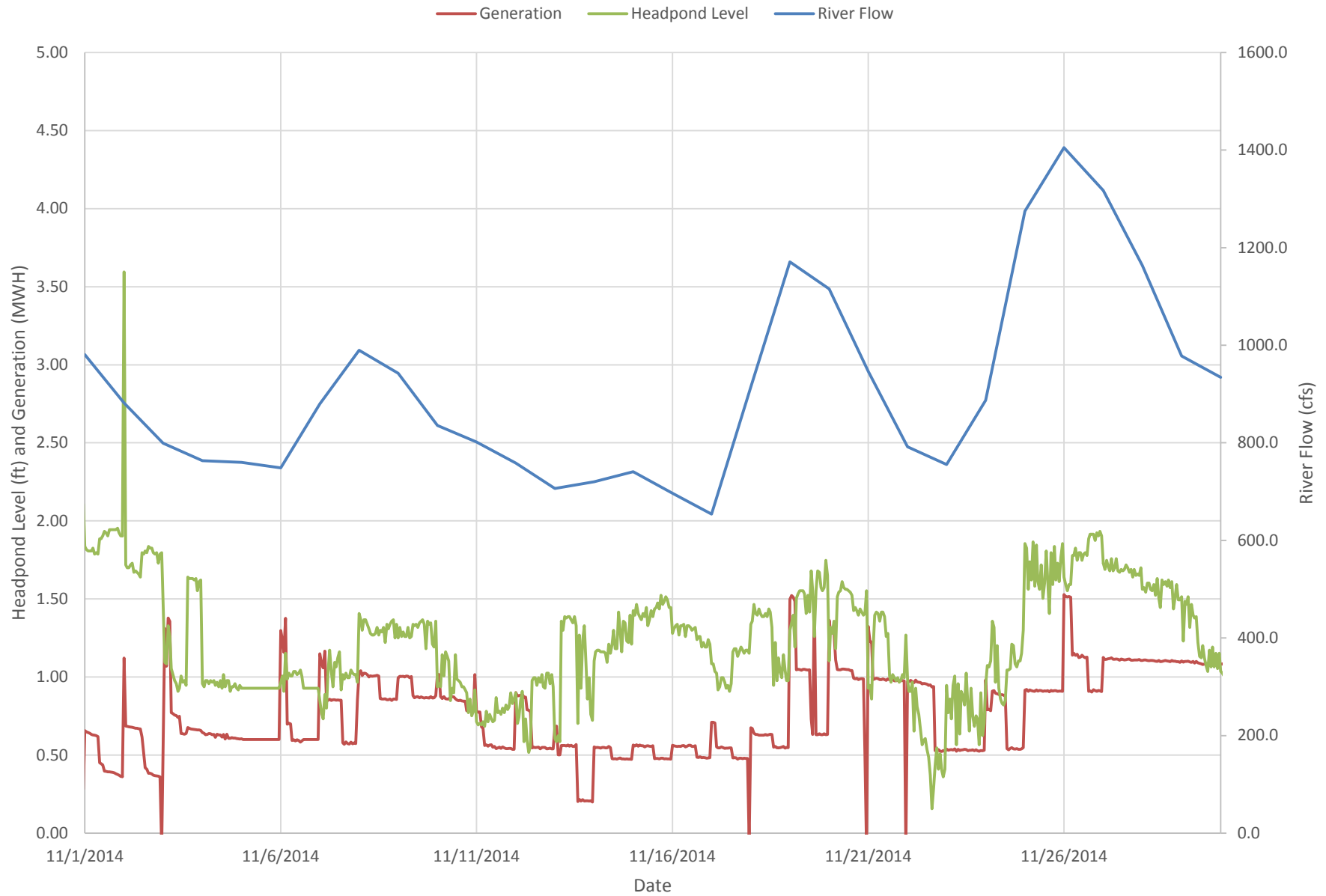
Vergennes Generation, Headpond Data, and Flow - September 2014



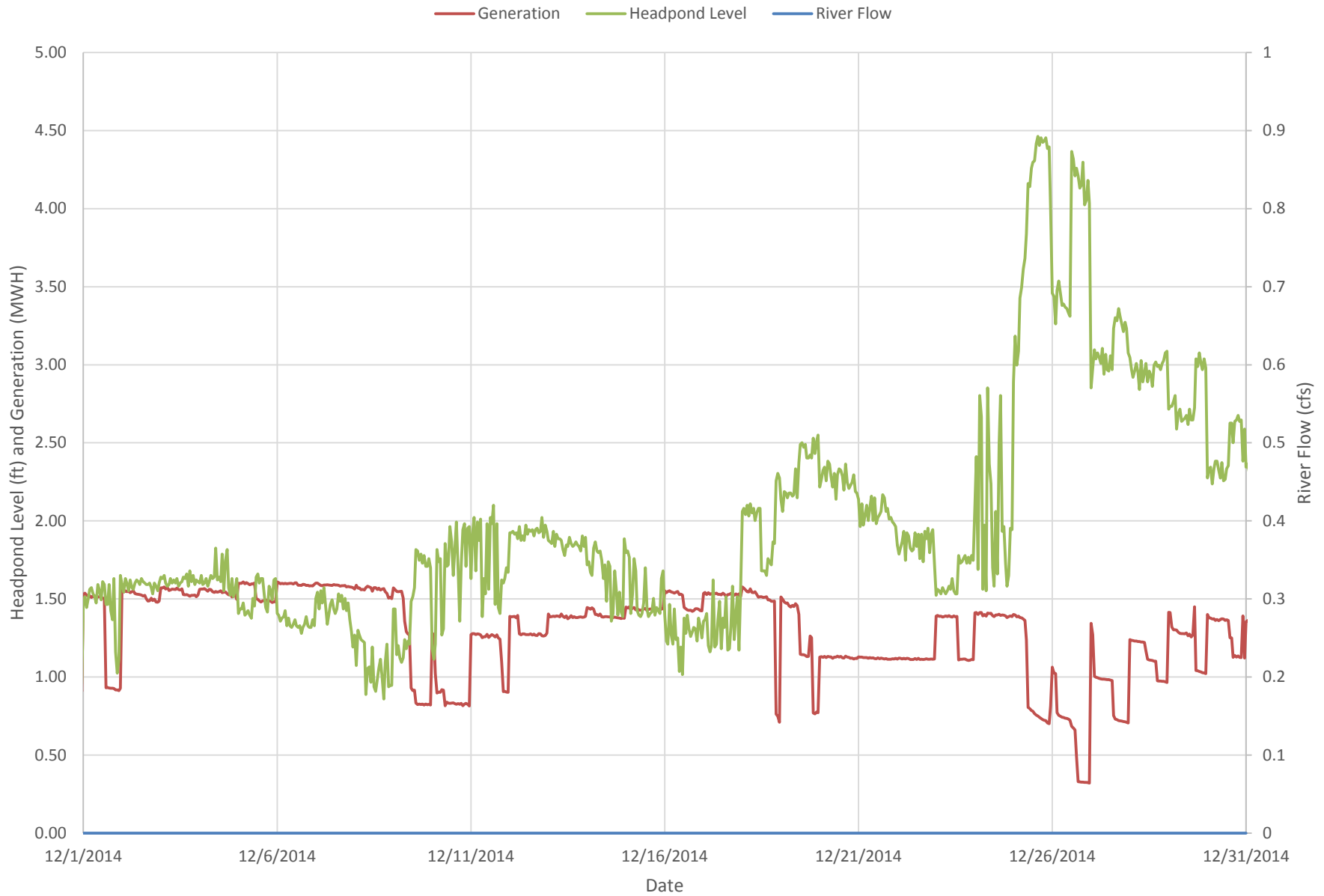
Vergennes Generation and Headpond Data - October 2014



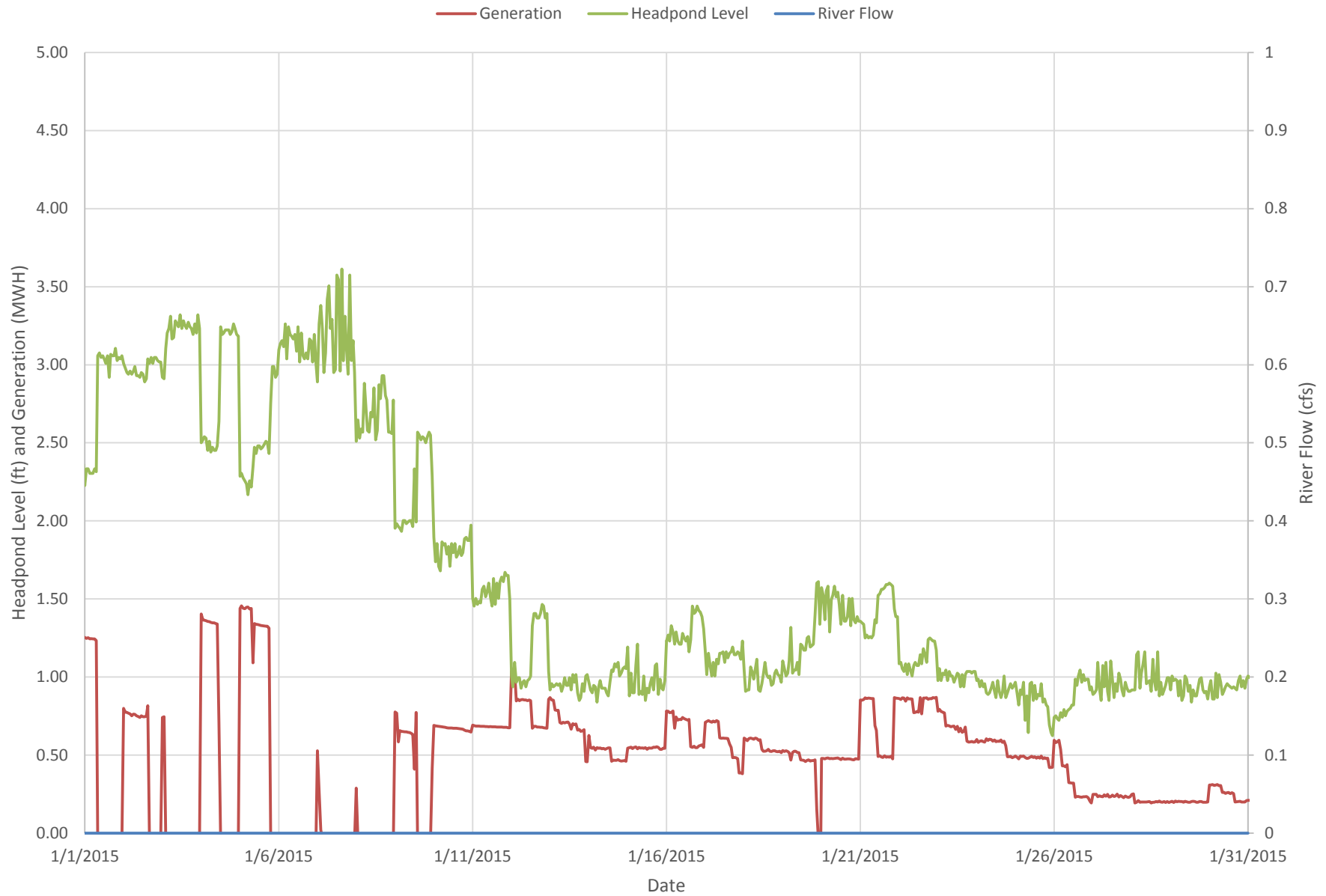
Vergennes Generation and Headpond Data - November 2014



Vergennes Generation and Headpond Data - December 2014



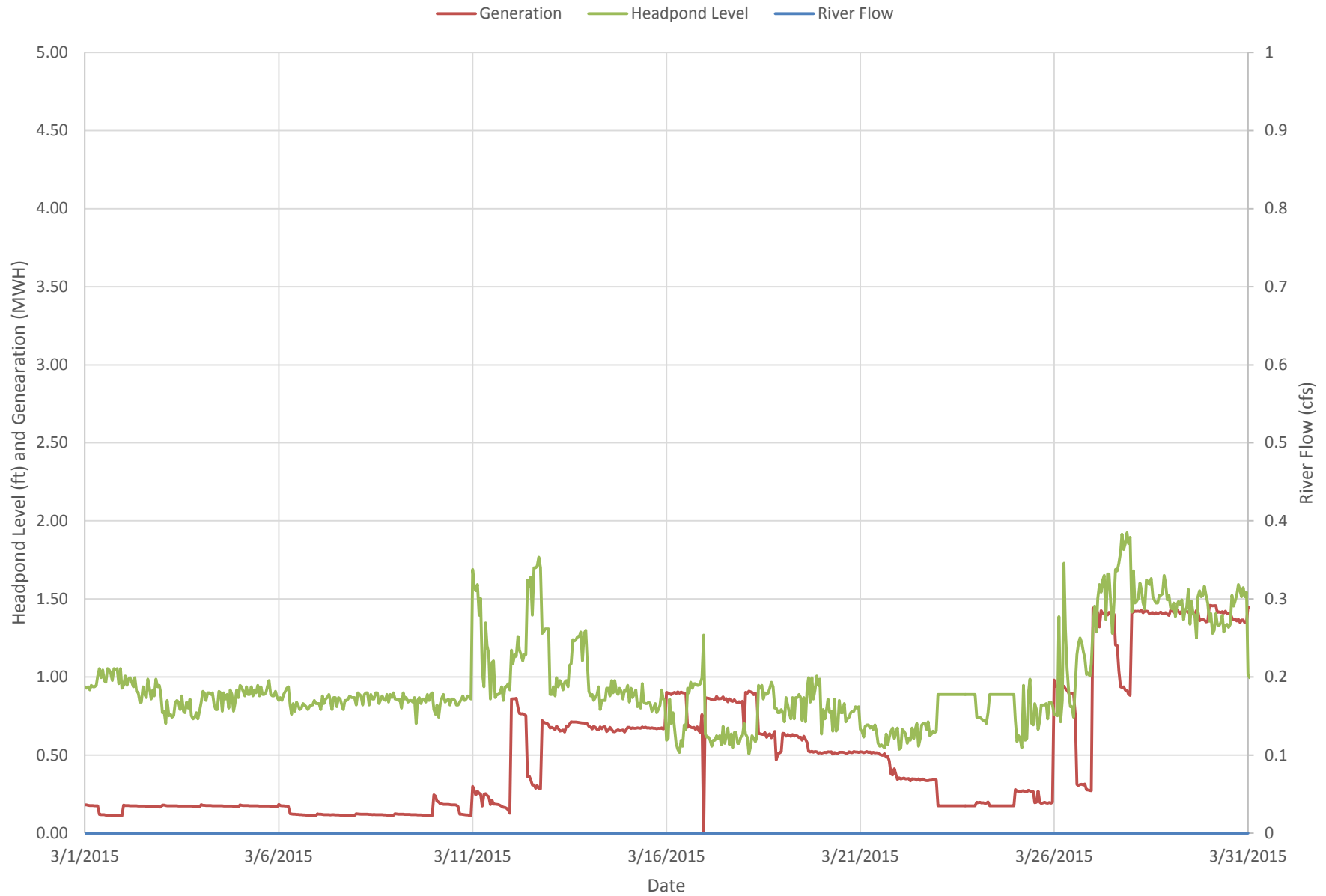
Vergennes Generation and Headpond Data - January 2015



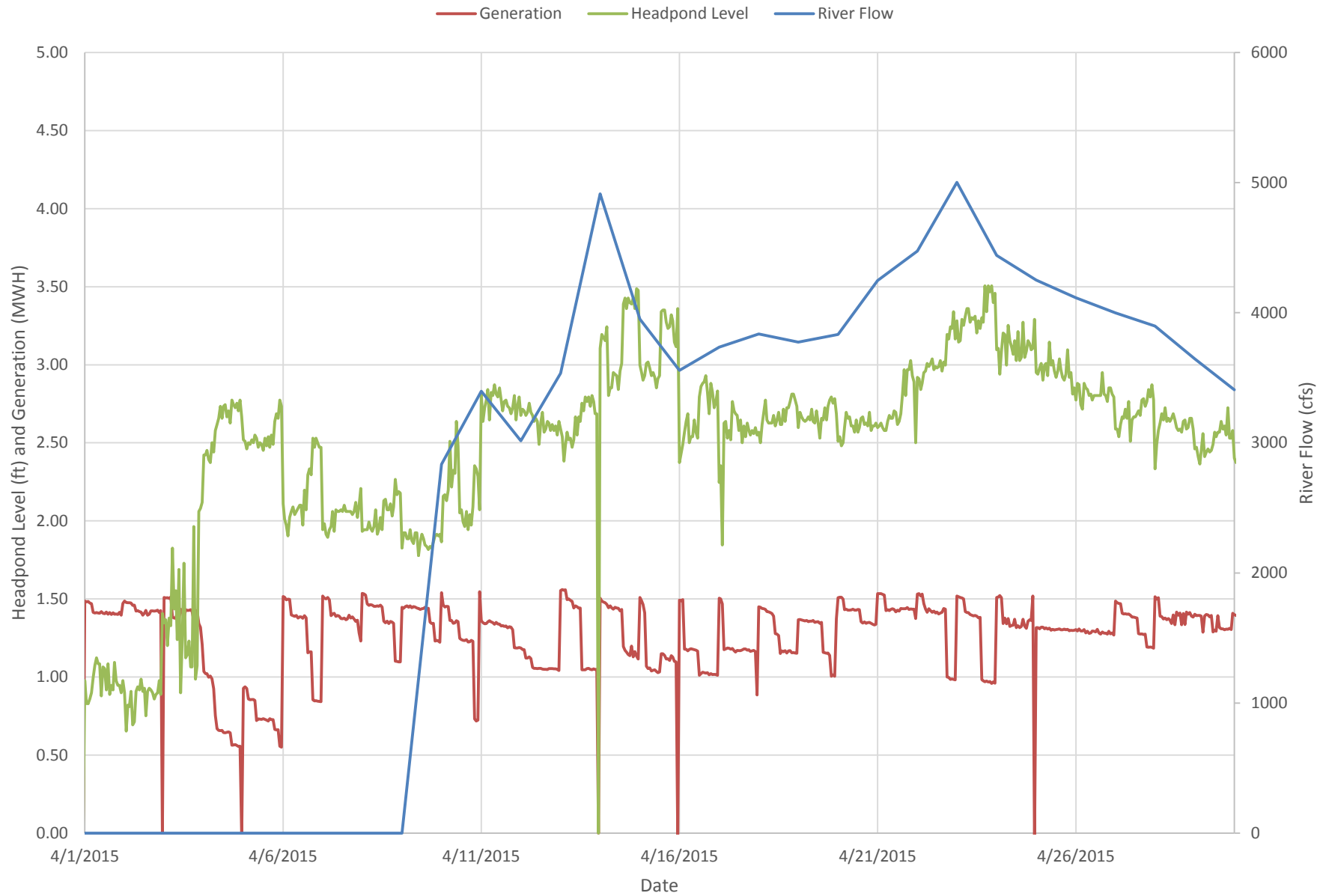
Vergennes Generation and Headpond Data - February 2015



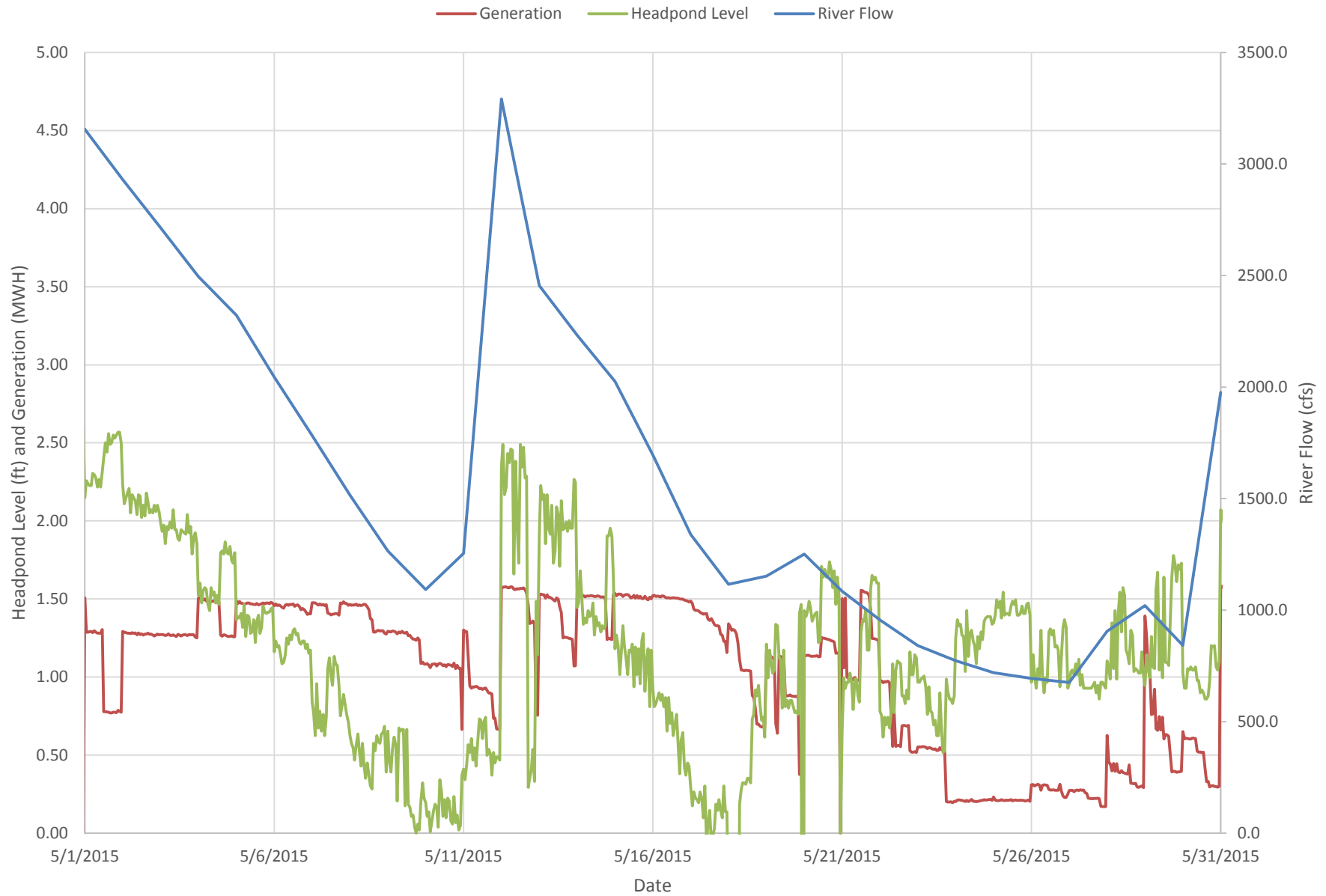
Vergennes Generation and Headpond Data - March 2015



Vergennes Generation and Headpond Data - April 2015



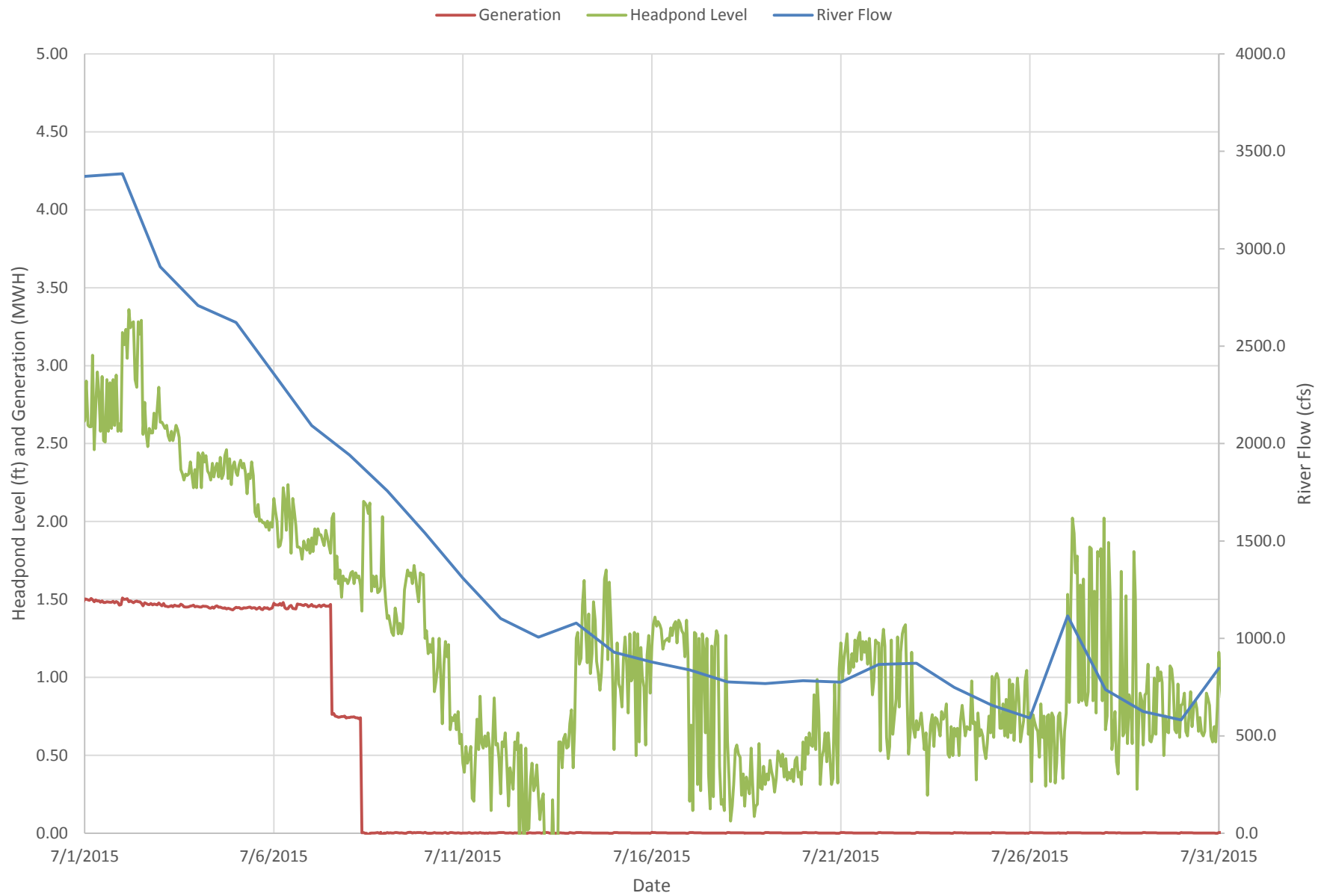
Vergennes Generation and Headpond Data - May 2015



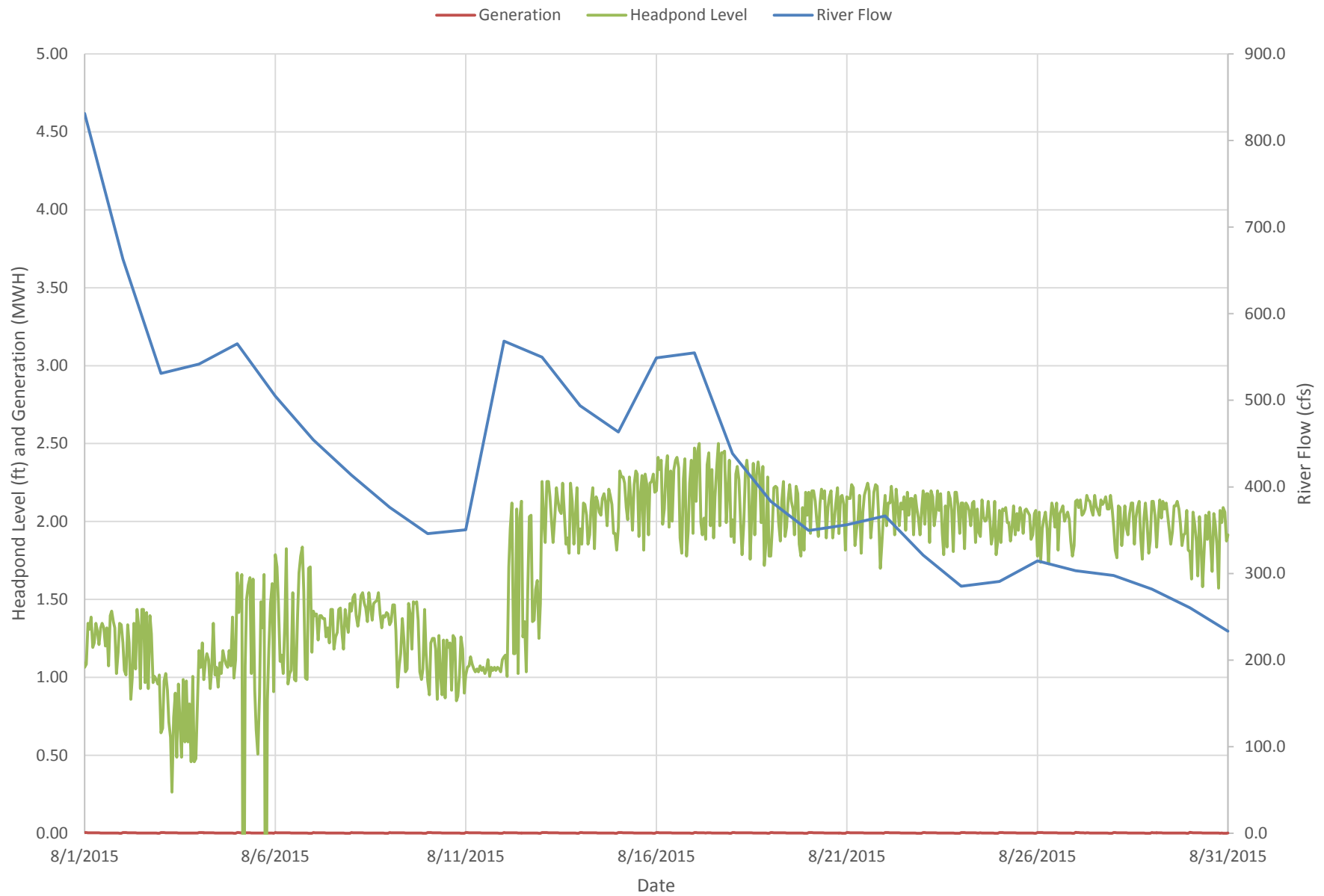
Vergennes Generation and Headpond Data - June 2015



Vergennes Generation and Headpond Data - July 2015



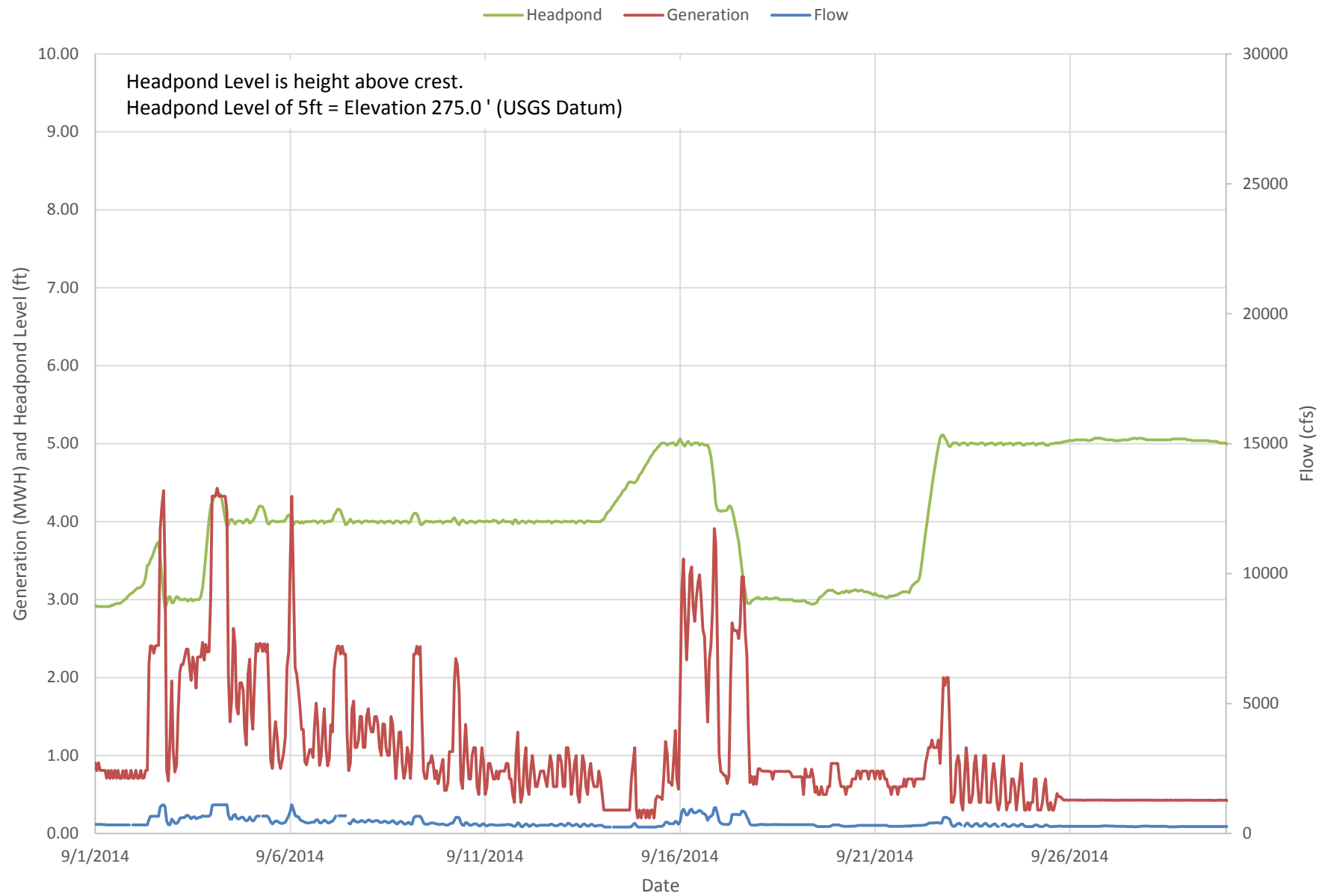
Vergennes Generation and Headpond Data - August 2015



ATTACHMENT B

ESSEX 19 PROJECT OPERATIONS DATA 2014-2015

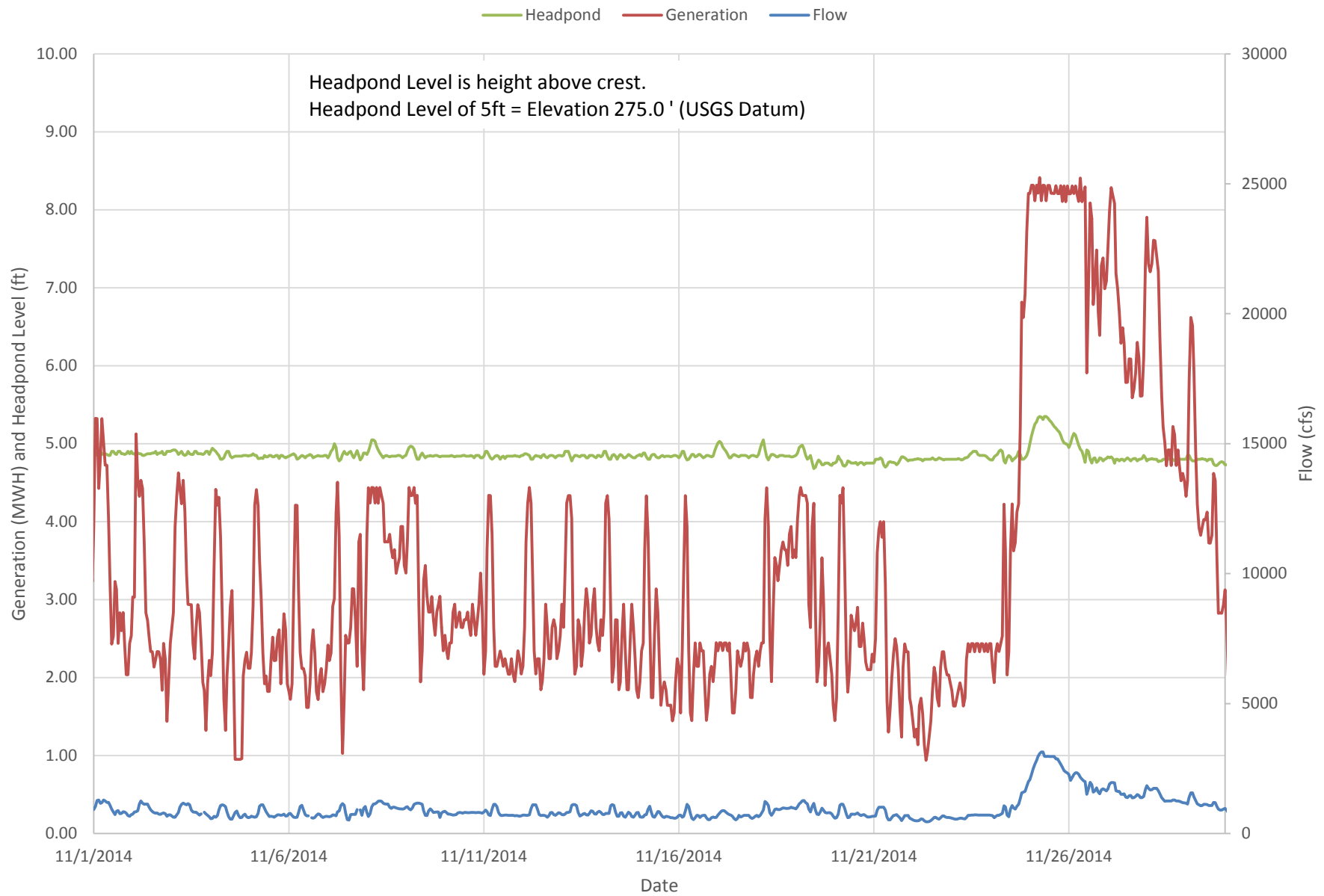
Essex - Generation, Flow, Headpond Data - September 2014



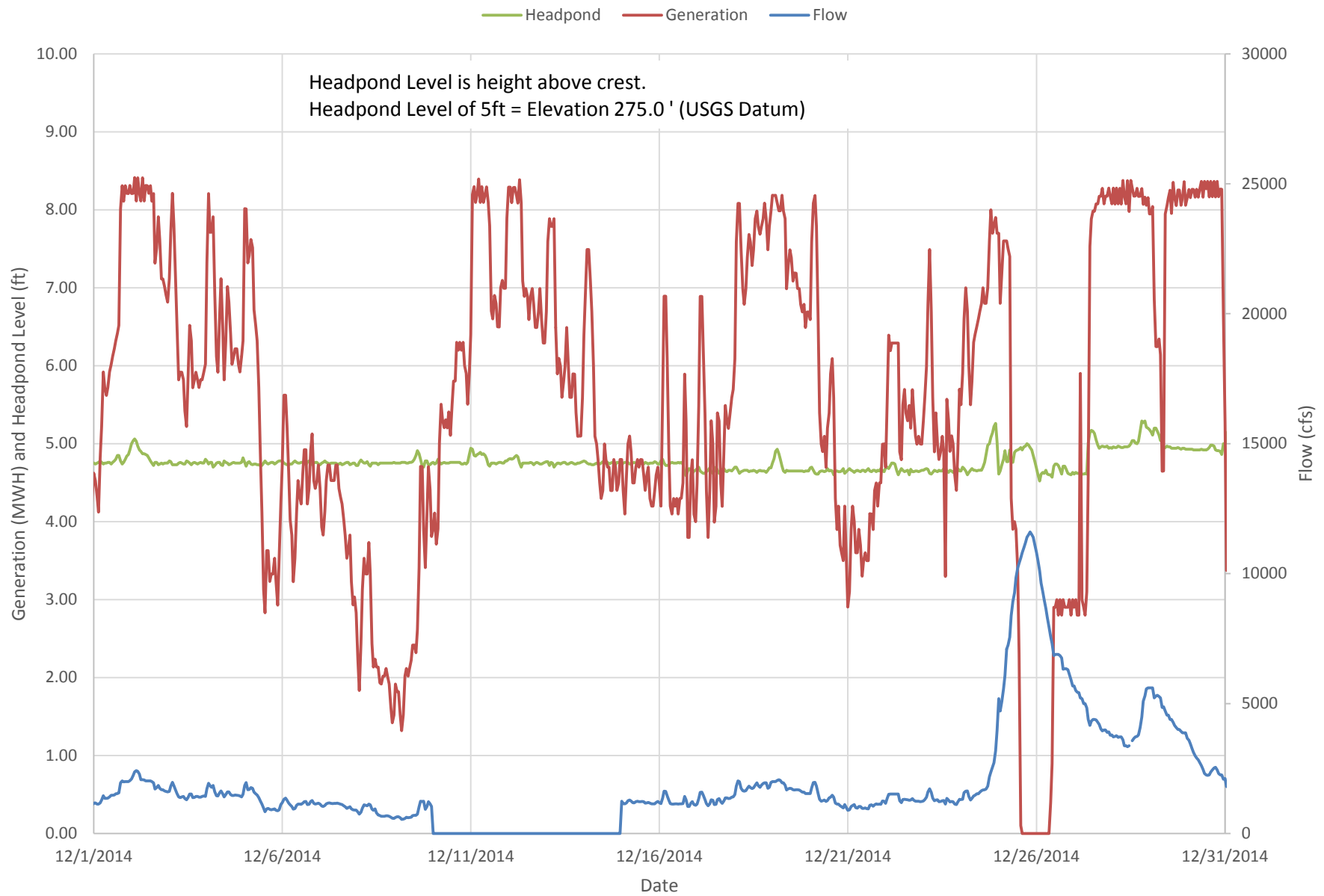
Essex - Generation, Flow, Headpond Data - October 2014



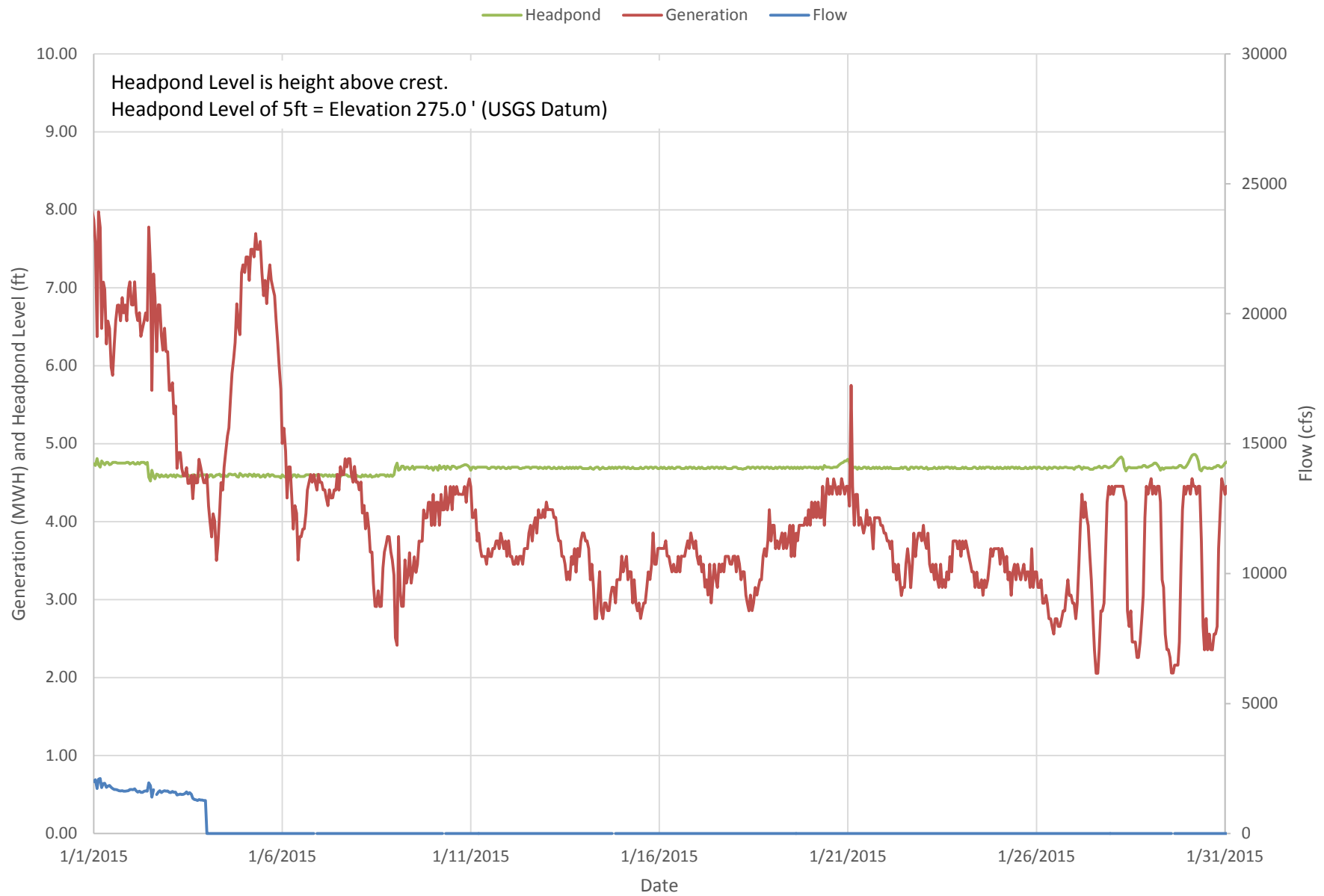
Essex - Generation, Flow, Headpond Data - November 2014



Essex - Generation, Flow, Headpond Data - December 2014



Essex - Generation, Flow, Headpond Data - January 2015



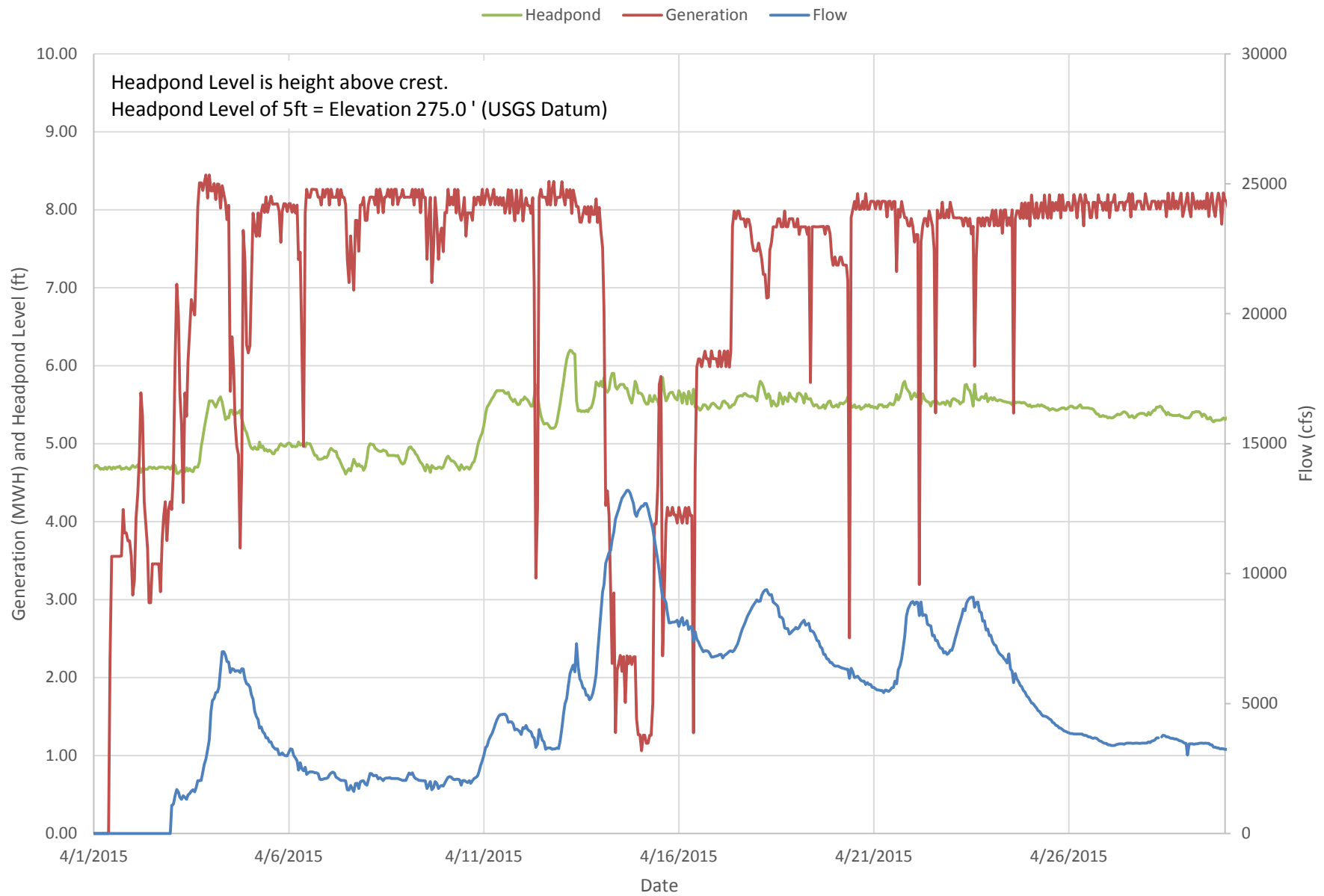
Essex - Generation, Flow, Headpond Data - February 2015



Essex - Generation, Flow, Headpond Data - March 2015



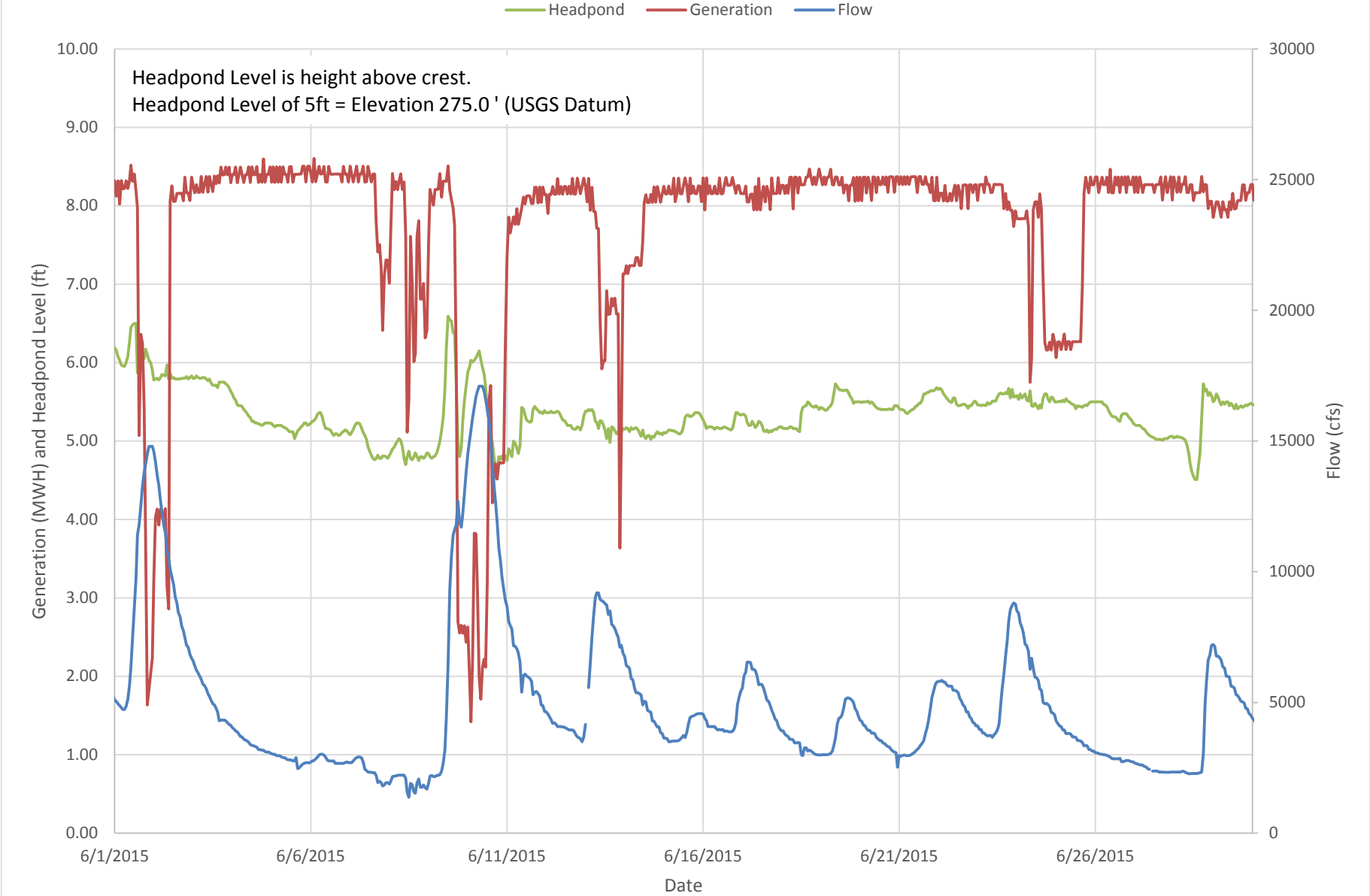
Essex - Generation, Flow, Headpond Data - April 2015



Essex - Generation, Flow, Headpond Data - May 2015



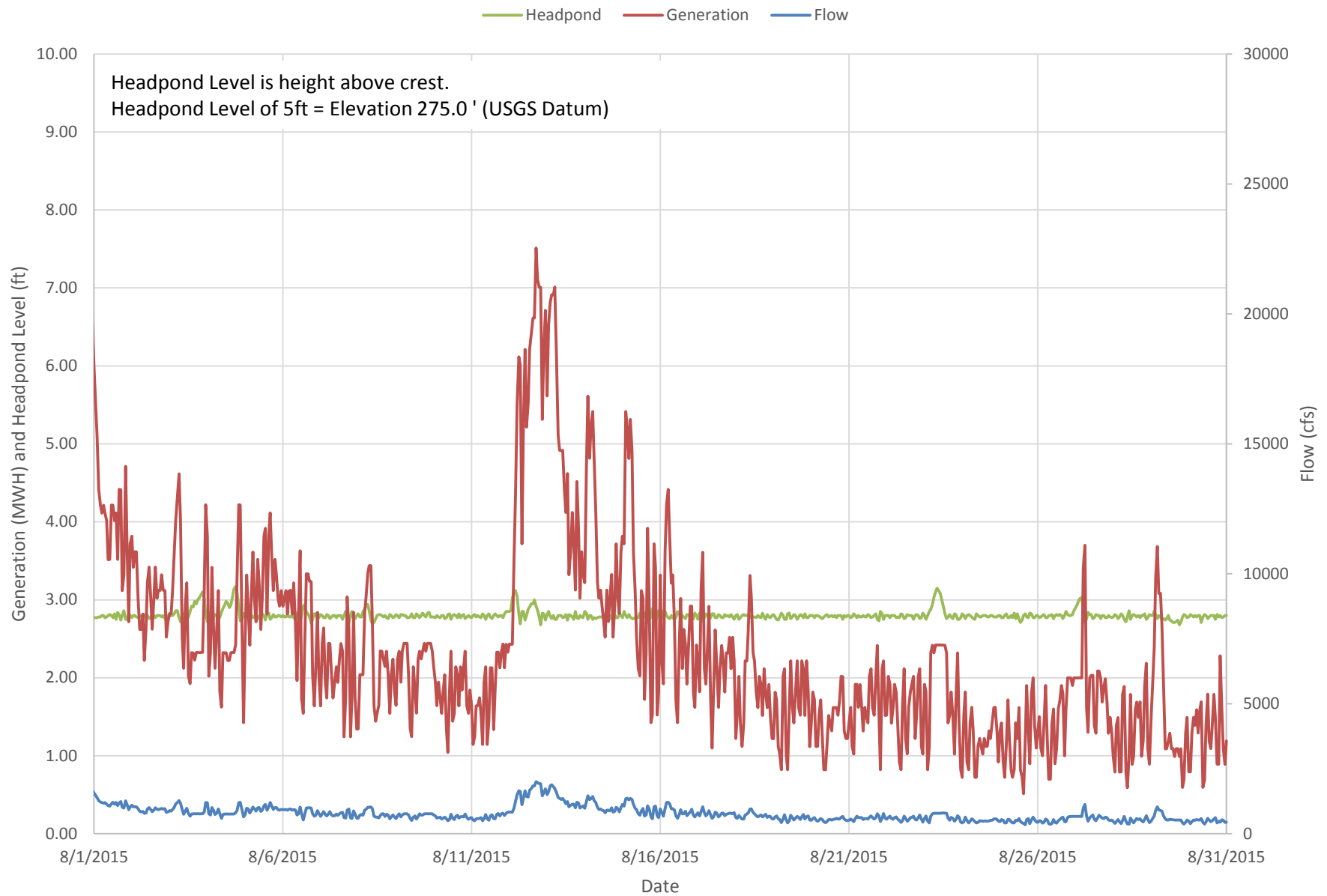
Essex - Generation, Flow, Headpond Data - June 2015



Essex - Generation, Flow, Headpond Data - July 2015



Essex - Generation, Flow, Headpond Data - August 2015



APPENDIX H

WATER QUALITY



[Return to home page](#)

On This Page

- [Water Quality Assessment Status](#)
- [Causes of Impairment](#)
- [Probable Sources Contributing to Impairments](#)
- [TMDLs That Apply to This Waterbody](#)
- [Previous Causes of Impairment Now Attaining All Uses](#)

State: [Vermont](#)

Waterbody ID: VT03-01.02

Location: Otter Creek mainstem below the Vergennes WWTF - mercury segment and E. coli segment both

State Waterbody Type: River

EPA Waterbody Type: Rivers and Streams

Water Size: 7.6

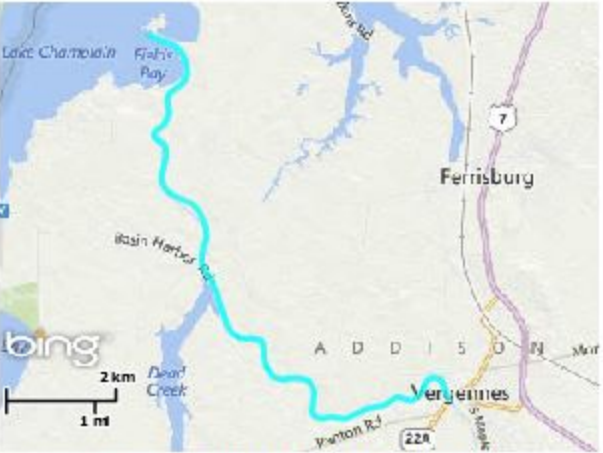
Units: miles

Watershed Name: [Otter](#)

[Waterbody History Report](#)

Data are also available for these years: [2010](#)

2012 Waterbody Report for Lower Otter Creek below Vergennes



Click on the waterbody for an interactive map

Features

- [About This Database \(Integrated Report\)](#)
- [Assessing Water Quality \(Questions and Answers\)](#)
- [Integrated Reporting Guidance](#)
- [Previous National Water Quality Reports](#)
- [EnviroMapper for Water](#)
- [AskWATERS](#)
- [EPA WATERS Homepage](#)
- [Exchange Network](#)
- [Assessment Database](#)
- [Statewide Statistical Surveys](#)
- [How's My Waterway Local Search tool](#)
- [Pollution Categories Summary Document](#)
- [Nitrogen and Phosphorus Pollution Data Access Tool \(NPDAT\)](#)

Water Quality Assessment Status for Reporting Year 2012

The overall status of this waterbody is Impaired.

[Description of this table](#)

Designated Use	Designated Use Group	Status
Aesthetic	Aesthetic Value	Good
Aquatic Biota, Wildlife, And Aquatic Habitat	Fish, Shellfish, And Wildlife Protection And Propagation	Good
Boating, Fishing, And Other Recreational Uses	Recreation	Good
Fish Consumption	Aquatic Life Harvesting	Impaired
Public Water Supply	Public Water Supply	Not Assessed
Swimming And Other Primary Contact Recreation	Recreation	Impaired

[Top of page](#)

Causes of Impairment for Reporting Year 2012

[Description of this table](#)

Cause of Impairment	Cause of Impairment Group	Designated Use(s)	State TMDL Development Status
Escherichia Coli (E. Coli)	Pathogens	Swimming And Other Primary Contact Recreation	TMDL needed
Mercury in Fish Tissue	Mercury	Fish Consumption	TMDL completed

[Top of page](#)

Probable Sources Contributing to Impairment for Reporting Year 2012

[Description of this table](#)

Probable Source	Probable Source Group	Cause(s) of Impairment
Atmospheric Deposition - Acidity	Atmospheric Deposition	Mercury in Fish Tissue
Combined Sewer Overflows	Municipal Discharges/Sewage	Escherichia Coli (E. Coli)

LIST OF APPLICABLE WEBSITES:

http://dec.vermont.gov/sites/dec/files/documents/WSMD_WaterQualityStandards_2014.pdf

[http://dec.vermont.gov/watershed/laws#2016 WQS](http://dec.vermont.gov/watershed/laws#2016_WQS)

http://epadev.induscorp.com/waters10/attains_waterbody.control?p_list_id=VT03-01.02&p_cycle=2012&p_report_type=T

http://dec.vermont.gov/sites/dec/files/documents/WSMD_mapp_303d_Part_A_2016_final_complete.pdf

http://dec.vermont.gov/sites/dec/files/documents/WSMD_mapp_PartAList_2014.pdf

APPENDIX I

FISH PASSAGE AND PROTECTION



State of Vermont

Department of Fish and Wildlife
 Department of Forests, Parks and Recreation
 Department of Environmental Conservation
 State Geologist
 RELAY SERVICE FOR THE HEARING IMPAIRED
 1-800-253-0191 TDD>Voice
 1-800-253-0195 Voice>TDD

AGENCY OF NATURAL RESOURCES
 Department of Environmental Conservation

WATER QUALITY DIVISION
 103 South Main Street
 Building 10 North
 Waterbury, VT 05671-0408

802-241-3770
 Fax #:802-241-3287

June 1, 1998

COMMENTS RECOMMENDATIONS TERMS AND CONDITIONS

VERGENNES HYDROELECTRIC PROJECT PROJECT NUMBER 2674-003 GREEN MOUNTAIN POWER CORPORATION

FILED
 OFFICE OF THE SECRETARY
 98 JUN -2 PM12:39
 FEDERAL ENERGY
 REGULATORY COMMISSION

David P. Boergers, Acting Secretary
 Federal Energy Regulatory Commission
 888 First Street, NE
 Washington, DC 20426

Dear Acting Secretary Boergers:

The Vermont Agency of Natural Resources (Agency) herein files comments on the Vergennes Hydroelectric Project, for which a "Notice of Application for New Major License" was issued February 20, 1998. An application for a water quality certification is presently before the Agency. The application was filed on April 28, 1998. The Agency's intention is to draft and publicly notice a decision on that application by mid-summer. Prior to the filing of the license application, the Agency met several times with the licensee, the U.S. Fish and Wildlife Service, and the City of Vergennes to discuss appropriate mitigation and enhancements. We believe that the general agreement reached during those meetings is accurately reflected in the final application. The noticed public draft certification will reflect this agreement; comments received from the public may result in changes to our current position, if those changes are determined to be necessary to meet the requirements of Section 401.

FERC - DOCKETED

Water Chemistry

JUN - 2 1998

The licensee performed additional water quality sampling of dissolved oxygen and temperature conditions at the project during the summer of 1997. This data was filed with the Agency by letter dated February 2, 1998. Compared to the 1996 data set, the 1997 data was collected

AA

980608-0425-3

during flow conditions that better reflected critical water quality conditions. All samples conformed to the dissolved oxygen standards for this reach of Otter Creek, which is designated as warm water fish habitat under Vermont Water Quality Standards. The dissolved oxygen criteria for warm water habitats is 5 mg/l or 60% saturation at all times. The licensee's sampling provides a reasonable level of confidence that dissolved oxygen standards will be met. Conversion of the project to run-of-river with a bypass flow, as proposed, will act to improve water quality relative to past operation.

Aquatic Habitat

The application reflects an agreement on how to distribute flows between the two plants, which are located on opposite banks of the river. Walleye, sturgeon, and landlocked Atlantic salmon run Otter Creek from Lake Champlain seasonally. The licensee is proposing to allocate certain flows to Plant 9 during appropriate calendar periods to address these species' preferential use of the Plant 9 tailrace when that station is operating. Spring flows for walleye and sturgeon would be provided from April 1 through June 15, and fall flows for salmon would be provided from September 15 through November 15. Lake sturgeon (*Acipenser fulvescens*) is a state listed endangered species.

Run-of-river operation has been determined, based on a special study, to adequately address concerns on the protection of the use of the downstream reach by mussels.

Recreation and Aesthetics

As noted in Exhibit E(5), the licensee has been working with the Agency and the City of Vergennes on planning for recreational improvements at the project site. There is general agreement on measures to be instituted, and the licensee has indicated that it will develop final design plans in consultation with the Agency and the City after license issuance. The Agency would want to review the plans both with respect to function and appearance. The post-licensing consultation should be required in the license.

There is a concern that increased fishing pressure during the spring walleye run may necessitate expansion of parking. This issue should be reviewed on an ongoing basis with the Agency and as part of the post-licensing FERC Form 80 process.

The licensee completed a special spillage flow aesthetics study, and the spillage flow regime proposed by the licensee will substantially improve aesthetics in an area that is highly accessible and receives a large amount of public use. Aesthetics is a designated use under Vermont Water Quality Standards for Class B waters. Since there are three separate spillways at the project, the Agency recommends that the particular distribution of flows among the three

Acting Secretary Boergers
June 1, 1998
Page 3

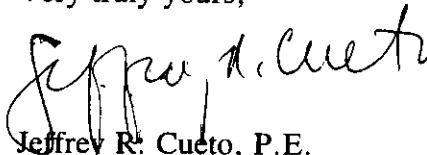
spillways be determined through post-licensing consultation; the total flow would remain fixed per the schedule proposed by the licensee.

Historical/Cultural Resources

The falls area has a rich history, including its use for hydropower as indicated in Section E(4) of the application. The project is located within the Vergennes Historic District and includes several contributing buildings. The Agency recommended and the licensee now proposes certain stabilization and enhancement measures for the Norton Grist Mill, which is a prominent site feature located on one of the islands at the top of the falls. As noted in Appendix 4 of the license application, the mill building has been vacant for some time; the roof is in poor condition, and the window sashes have been removed and the window bays filled in with plywood sheets. The licensee will make structural repairs to the roof, install new roofing, and install new window sash of appropriate design. These measures should be made a requirement of the license, with consultation of the Vermont Division for Historic Preservation to insure use of appropriate design and materials.

Thank you for your consideration of our comments.

Very truly yours,



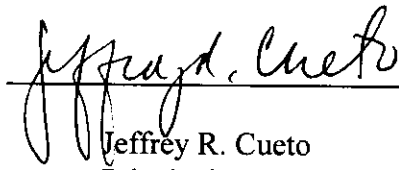
Jeffrey R. Cueto, P.E.
Principal Hydrologist

- c FERC Service list
- Stephen Sease, Planning Division
- Roderick Wentworth, DFW
- Mark Ferguson, Nongame and Natural Heritage Program
- Richard Sedano, Commissioner, DPS
- Giovanna Peebles, Division for Historic Preservation
- William Wandell, EPA Region I
- Laura Eaton-Poole, USFWS
- Mel Hawley, City of Vergennes
- Willem Jewett, Esq., WETNET
- Mark Robinson, Director, FERC-OHL, Div. of Licensing and Compliance

CERTIFICATE OF SERVICE

I, Jeffrey R. Cueto, hereby certify that I have this day served, by U.S. Mail, postage prepaid, a copy of the Vermont Agency of Natural Resources' Comments, Recommendations, Terms and Conditions on the Vergennes Hydroelectric Project (FERC No. 2674-003) Application for a New Major License upon each person designated on the attached Service List.

Dated this 1 day of June, 1998.



Jeffrey R. Cueto
Principal Hydrologist

Service List for P-2674

GREEN MOUNTAIN POWER CORP

Cust Num	Principal/Party Name/Address	Cust Num	Representative Name/Address
104573	MICHAEL J. SCARZELLO, P.E ENGINEER GREEN MOUNTAIN POWER CORPORATION (VT) 25 GREEN MOUNTAIN DRIVE POST OFFICE BOX 850 SOUTH BURLINGTON, VT 05407-0850	104573	CRAIG T. MYOTTE ASST. V. P. GREEN MOUNTAIN POWER CORPORATION (VT) 25 GREEN MOUNTAIN DRIVE POST OFFICE BOX 850 SOUTH BURLINGTON, VT 05407-0850
104573	MICHAEL J. SCARZELLO, P.E ENGINEER GREEN MOUNTAIN POWER CORPORATION (VT) 25 GREEN MOUNTAIN DRIVE POST OFFICE BOX 850 SOUTH BURLINGTON, VT 05407-0850	104573	MICHAEL A. MURPHY ESQUIRE GREEN MOUNTAIN POWER CORPORATION (VT) 25 GREEN MOUNTAIN DRIVE POST OFFICE BOX 850 SOUTH BURLINGTON, VT 05407-0850
100648	MICHAEL J. BARTLETT SUPERVISOR U.S. FISH & WILDLIFE SERVICE (NH) 400 RALPH PILL MARKETPLACE 22 BRIDGE STREET CONCORD, NH 03301-4901	100011	ALEXANDER R. HOAR U.S. FISH & WILDLIFE SERVICE (MA) 300 WESTGATE CENTER ROAD HADLEY, MA 01035-9589
151880	JUDITH M. STOLFO ESQUIRE U.S. DEPARTMENT OF THE INTERIOR (MA) OFFICE OF THE SOLICITOR ONE GATEWAY CENTER - SUITE 612 NEWTON, MA 02158-2802		
128157	ANDREW RAUBVOGEL, ESQUIRE 3RD FLOOR VERMONT AGENCY OF NATURAL RESOURCES 103 SO. MAIN STREET, CENTER BUILDING WATERBURY, VT 05676	110415	JEFFREY R. CUETO 10N-2D FLOOR VERMONT DEPT. OF ENVIRONMENTAL CONSERVN. THIRD FLOOR, CENTER BUILDING 103 S. MAIN STREET WATERBURY, VT 05671-0301

**ENVIRONMENTAL ASSESSMENT
FOR HYDROPOWER LICENSING**

Vergennes Hydroelectric Project

FERC Project No. 2674

Vermont

**Federal Energy Regulatory Commission
Office of Hydropower Licensing
Division of Licensing and Compliance
888 First Street, NE
Washington, DC 20426**

October 1998

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ACRONYMS AND ABBREVIATIONS

ADA	Americans with Disabilities Act
APE	Area of Potential Effect
cfs	cubic feet per second
CRMP	Cultural Resources Management Plan
CWA	Clean Water Act
DO	dissolved oxygen
EA	environmental assessment
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
FPA	Federal Power Act
FWS	U.S. Fish and Wildlife Service
GMP	Green Mountain Power Corporation
GWh	gigawatt-hours
Interior	U.S. Department of the Interior
kW	kilowatt
kWh	kilowatt-hour
mgd	million gallons per day
mg/l	milligram per liter
msl	mean sea level
MW	megawatt
NEPA	National Environmental Policy Act
NEPOOL	New England Power Pool
NERC	North American Electric Reliability Council
NHPA	National Historic Preservation Act
NNHP	Nongame and Natural Heritage Program
NPCC	Northeast Power Coordinating Council
National Register	National Register of Historic Places
PA	Programmatic Agreement
REA	Ready for Environmental Analysis
RM	river mile
ROR	run-of-river
SD1	Scoping Document 1
SHPO	State Historic Preservation Office
USGS	U.S. Geological Survey
VAEC	Vermont Agency of Environmental Conservation
VANR	Vermont Agency of Natural Resources
VDEC	Vermont Department of Environmental Conservation
VDFPR	Vermont Department of Forests, Parks and Recreation
VDFW	Vermont Department of Fish and Wildlife
VDHP	Vermont Division for Historic Preservation
VRP	Vermont Recreation Plan
WQC	Water Quality Certification
YOY	Young-of-the-Year

SUMMARY

On May 30, 1997, Green Mountain Power Corporation (GMP) filed an application with the Federal Energy Regulatory Commission (Commission) for a new license for the continued operation and maintenance of the Vergennes Hydroelectric Project, Project No. 2674, located on Otter Creek in the city of Vergennes, Vermont. The project would continue to have an installed capacity of 2.4 megawatts (MW) and would generate about 9.45 gigawatt-hours (GWh) of energy per year.

This environmental assessment (EA) analyzes the effects of the proposed action, the proposed action with additional staff-recommended measures, and no-action. Our analysis shows that the best alternative for the Vergennes Project to reduce or avoid adverse impacts on environmental resources is to issue a new license for the project with the following environmental measures: (1) convert the Vergennes Project from daily peaking to run-of-river (ROR) operation; (2) release aesthetic flows over Vergennes Falls as follows: April 1 through October 31--150 cfs daytime, 75 cfs nighttime; and November 1 through December 15--100 cfs daytime, 50 cfs nighttime; (3) give Plant 9 first call on water and provide a continuous outflow from Plant 9 during use of the project tailrace area by walleye, lake sturgeon, and landlocked Atlantic salmon during their spawning and egg incubation periods; (4) implement recreational enhancements to include: (a) directional and interpretive signs for recreation resources in the project area; (b) improve access for small boats and better define the parking area at Settler's Park; (c) improve the trail, shoreline fishing access, vegetative plantings, and picnic area along the western bank of the falls basin near Plant 9; (d) construct a disabled-accessible fishing platform on the western bank near Plant 9 in accordance with Americans with Disabilities Act guidelines; (e) install signs interpreting the history of the falls and the surrounding structures; and (f) install portable toilet facilities in the area below Vergennes Falls; (5) enhance aesthetics including windows and roof replacement at the former Norton's Grist Mill building located on an island overlooking Vergennes Falls; (6) implement the provisions of a Programmatic Agreement; and (7) develop and implement a plan to monitor ROR operation, aesthetic flow releases, and first priority flows to Plant 9. We discuss these measures in section V and summarize them in section VI of this EA.

Overall, these measures, along with the standard articles provided in any license issued for the project, would protect and

enhance water quality, fishery, terrestrial, aesthetic, recreational, and cultural resources.

Under the provisions of Section 10(j) of the Federal Power Act (FPA), each hydroelectric license issued by the Commission shall include conditions based on recommendations of federal and state fish and wildlife agencies, to adequately and equitably protect, mitigate damages to, and enhance fish and wildlife (including spawning grounds and habitat) affected by the project unless such recommendations are inconsistent with the Federal Power Act or other applicable law. No 10(j) recommendations were filed with the Commission in response to our notice of application ready for environmental analysis.

On May 23, 1997, GMP applied to the Vermont Department of Environmental Conservation (VDEC) for Water Quality Certification (WQC) for the Vergennes Project, as required by Section 401 of the Clean Water Act. GMP withdrew the application and submitted a new request for WQC to the VDEC on April 29, 1998, and the application is pending.

We issued a draft EA on August 13, 1998, with a request for comments from all parties in the proceeding. Comments received on the draft EA have been addressed in section V.C of this EA and in appendix A.

On the basis of our independent environmental analysis, we conclude that issuing a license for the Vergennes Hydroelectric Project as proposed by GMP, with the additional staff-recommended measures, would not be a major federal action significantly affecting the quality of the human environment.

ENVIRONMENTAL ASSESSMENT

Federal Energy Regulatory Commission
Office of Hydropower Licensing
Division of Licensing and Compliance
Washington, DC

VERGENNES HYDROELECTRIC PROJECT
FERC NO. 2674-003--VERMONT

I. APPLICATION

On May 30, 1997, Green Mountain Power Corporation (GMP or Applicant) filed with the Commission an application for a new major license for the Vergennes Hydroelectric Project, FERC No. 2674. The Vergennes Project is located in Addison County in the city of Vergennes, Vermont, on Otter Creek, about 7.6 miles upstream from Lake Champlain (figure 1). The project would continue to have an installed capacity of 2.4 MW and would generate about 9.45 Gwh of energy per year.

II. PURPOSE AND NEED FOR ACTION

A. Purpose of Action

The Commission must decide whether to license the Vergennes Project and what, if any, conditions should be placed on any license issued. In this EA, we assess the environmental and economic effects of operating the project as proposed by GMP, operating the project as proposed by GMP with additional staff-recommended measures, and no-action.

B. Need for Power

To assess the need for power, we reviewed GMP's present and future use of the project's power, together with that of the operating region in which the project would be located. GMP provides power to more than 82,000 customers in 65 Vermont municipalities. Sales in 1995 included the following classes of service: 32 percent residential, 35 percent commercial, and 33 percent industrial and others. In addition, GMP provides power to firm requirements customers in Vermont on a wholesale basis via wheeling arrangements^{1/} with other New England utilities.

^{1/} The contracted use of electrical transmission facilities of one or more entities to transmit electrical power to another.

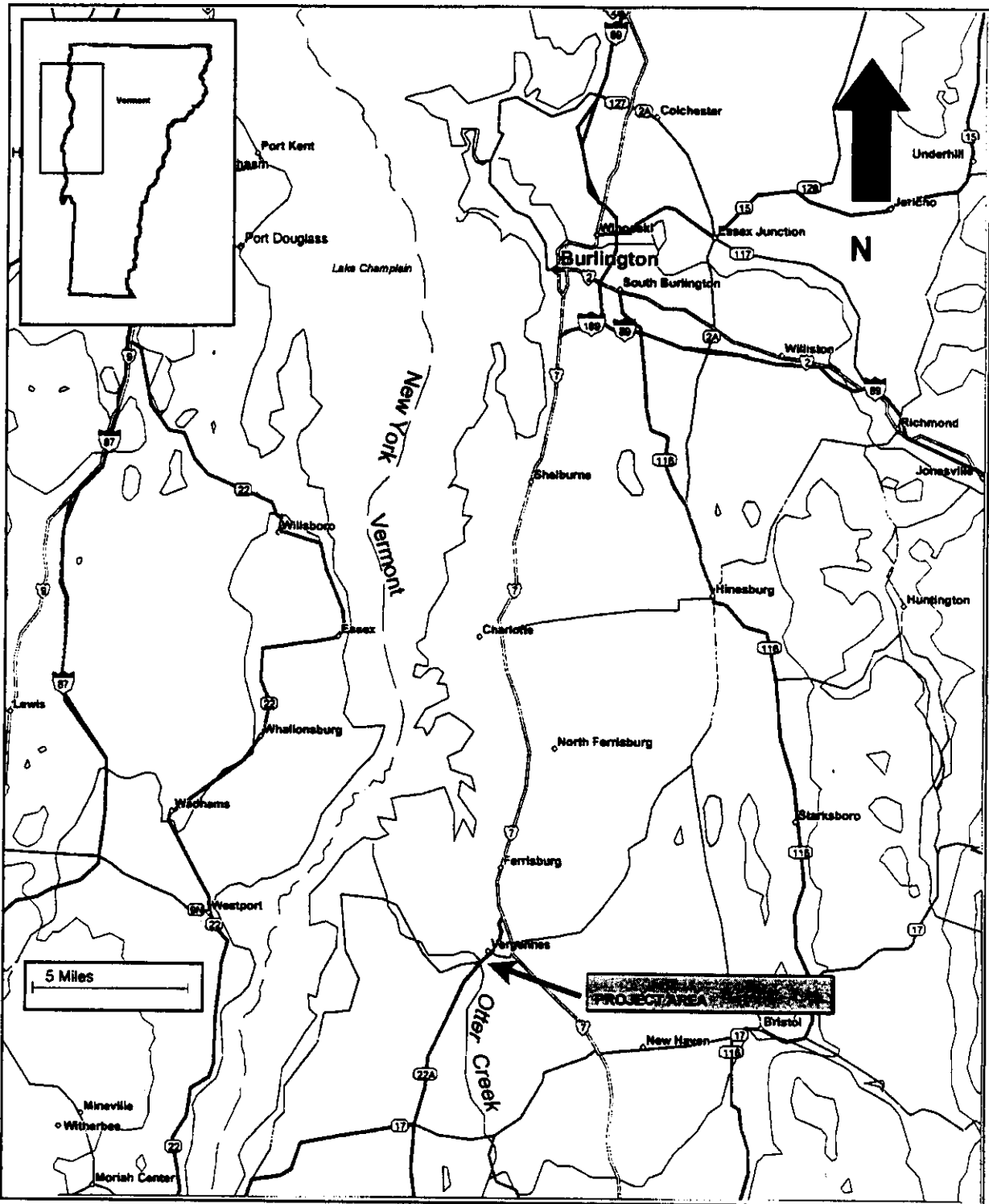


Figure 1. Location of the Vergennes Hydroelectric Project
(Source: DeLorme, 1995)

GMP would continue to sell power to its customers if issued a new license.

The Vergennes Hydroelectric Project is located in the New England Power Pool (NEPOOL) subregion of the Northeast Power Coordinating Council (NPCC) region of the North American Electric Reliability Council (NERC). NEPOOL annually forecasts electrical supply and demand in the region for a 10 year period. NEPOOL's most recent report on annual supply and demand projections indicates that, for the period from 1997-2007, loads in the NEPOOL area will increase slightly, less than 1 percent annually; however, the planned capacity retirements plus additions will decrease supply slightly resulting in decreased reserve margins. These margins could fall below 15 percent for summer periods by 1998 for each year of the forecast.

The Vergennes Project has historically generated an annual average of about 10.288 GWh of power for GMP. In addition, the project displaces nonrenewable fossil-fired generation and contributes to diversification of the generation mix in the NEPOOL region.

We conclude that the present and future use of the Vergennes Project's power, its displacement of nonrenewable fossil-fired generation, and contribution to a resource diversified generation mix support a finding that the power from the project would help meet both the short- and long-term need for power in the NEPOOL region.

III. PROPOSED ACTION AND ALTERNATIVES

A. Proposed Action

1. Project Description

The Vergennes Project's existing facilities (figure 2) include the following features: (1) three concrete overflow dams, each about 10 feet high, with a total length of 231 feet, and a crest elevation of about 132.78 feet above mean sea level (msl), surmounted by 1.5-foot-high flashboards, and a 29-foot-long, non-overflow dam; (2) an 8.8-mile-long, 133 acre surface area reservoir with a 200 acre-foot usable storage capacity at normal water surface elevation of 134.28 feet msl; (3) the north forebay with trashracks, headgates, and two, 7-foot-diameter steel penstocks; (4) the north powerhouse, Plant 9B, with a 1,000-kilowatt (kW) generating unit; (5) the south forebay, with trashracks, headgates, two surge tanks, and two, 10-foot-diameter penstocks; (6) the south powerhouse, Plant 9, with two, 700-kW

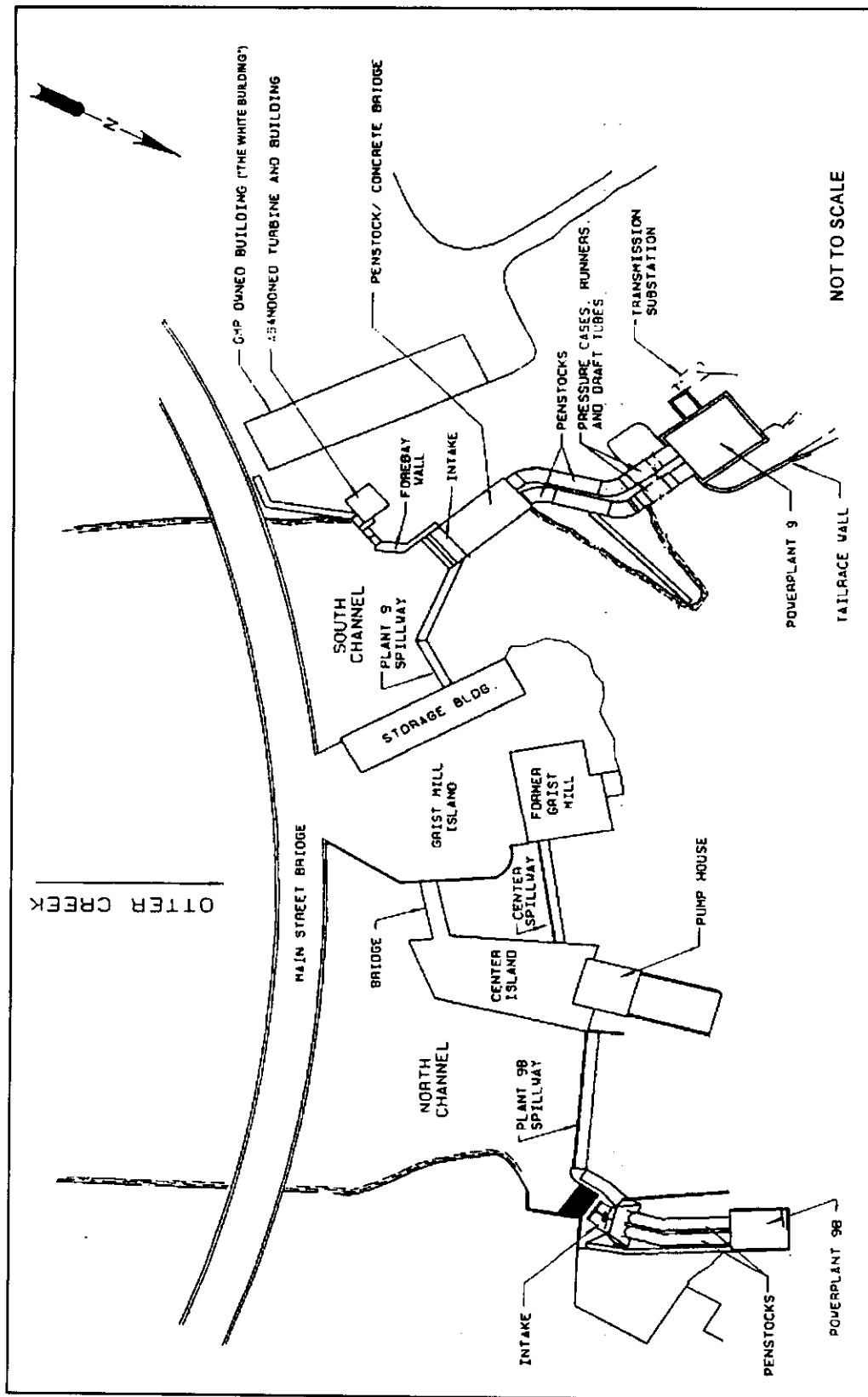


Figure 2. Vergennes Hydroelectric Project No. 2674 Site Plan (Source: modified from GMP, 1997).

generating units; (7) the generator leads from Plant 9 to the Vergennes substation and the 950-foot-long, 2,400-volt overhead generator leads from Plant 9B to the Vergennes substation; and (8) appurtenant facilities.

2. Existing Project Operations

GMP currently operates the Vergennes Project as a daily peaking project with a typical reservoir fluctuation of about 1.5 feet utilizing a 200-acre-feet impoundment storage capacity. The operating range for Plant 9 is between 140 cubic feet per second (cfs) and 700 cfs, and Plant 9B is between 200 and 480 cfs, for a total hydraulic capacity of about 1,180 cfs. The two powerhouses have independent operation systems, with Plant 9B operated remotely from GMP's Colchester, Vermont, Dispatch Center, and Plant 9 controlled manually by on-site operators. The existing average annual generation for both Plant 9 and Plant 9B is 10.288 GWh.

3. Proposed Operations and Environmental Measures

GMP proposes to convert the Vergennes Project from daily peaking to run-of-river (ROR) operation.^{2/} GMP also proposes additional project operation modifications and several enhancement measures as a result of consultation with the Vermont Agency of Natural Resources (VANR) and the city of Vergennes. GMP proposes the following measures:

- Release aesthetic flows over Vergennes Falls as follows:

April 1 through October 31	150 cfs daytime (½ hour before sunrise to ½ hour after sunset), 75 cfs nighttime
November 1 through December 15	100 cfs (½ hour before sunrise to ½ hour after sunset), 50 cfs nighttime
December 16 through March 31	No aesthetic flows released

^{2/} Where outflow approximates inflow on an instantaneous basis.

- Give Plant 9 first call on water and provide a continuous outflow from Plant 9 at all times that the project is operating to enhance use of the project tailrace area by walleye, lake sturgeon, and landlocked Atlantic salmon during their spawning and egg incubation periods (April 1 to June 15 and from September 15 to November 15).

GMP also proposes to: (1) develop directional and interpretive signs for recreation in the project area; (2) improve access for small boats and better define the parking area at Settler's Park; (3) improve the trail, shoreline fishing access, vegetative plantings, and picnic area along the western bank of the falls basin (the area immediately below the falls) downstream of Plant 9; (4) construct a disabled-accessible fishing platform on the western bank near Plant 9 in accordance with Americans with Disabilities Act (ADA) guidelines; (5) install signs interpreting the history of the falls and the surrounding structures; and (6) enhance project aesthetics by including windows and roof replacement at the former Norton's Grist Mill building located on an island overlooking Vergennes Falls. GMP proposes that the final designs for the proposed recreation enhancements would be developed post-licensing in consultation with the VANR and the city of Vergennes.

B. Proposed Action with Additional Staff-Recommended Measures

In addition to GMP's proposed actions, the staff recommends several additional environmental enhancement measures, including: (1) develop and implement a plan to monitor compliance with the revised flow regime (ROR operation, resequencing of the operation of Plant 9 for fish attraction flows, and aesthetic flow releases) in consultation with the VANR, U.S. Fish and Wildlife Service (FWS), U.S. Geological Survey (USGS), and the city of Vergennes; (2) provide portable toilet facilities (including disabled-accessible facilities) in the vicinity of the area below Vergennes Falls (the number and location to be determined in consultation with the city of Vergennes); (3) develop final design drawings for the proposed recreational enhancements in consultation with the SHPO, VANR, and the city of Vergennes; and (4) implement the provisions of a Programmatic Agreement (PA).

C. No-action

Under the no-action alternative, the project would continue to operate under the terms and conditions of the existing license. No measures to protect or enhance existing environmental resources would be implemented. We use this alternative to establish baseline environmental conditions for comparison with other alternatives.

IV. CONSULTATION AND COMPLIANCE

A. Agency Consultation and Interventions

The Commission's regulations require applicants to consult with appropriate state and federal environmental resource agencies and the public before filing a license application. This consultation is the first step in complying with the Fish and Wildlife Coordination Act, the Endangered Species Act, the National Historic Preservation Act (NHPA), and other federal statutes. Pre-filing consultation must be complete and documented in accordance with Commission regulations.

Organizations and individuals may petition to intervene and become a party to subsequent proceedings. On September 23, 1997, we issued a public notice of application for a major license for the Vergennes Project. In response to that notice, the following entities filed motions to intervene, but not in opposition to the proceeding:

<u>Intervenors</u>	<u>Date of Motion</u>
Vermont Agency of Natural Resources	November 3, 1997
U.S. Department of the Interior	November 13, 1997

We address intervenor concerns in the environmental analysis section (section V) of this EA.

On February 20, 1998, we issued a notice of ready for environmental analysis (REA). The VANR filed comments on June 1, 1998, in response to the REA.

On August 13, 1998, we issued a public notice for the Vergennes Project stating that the draft EA was available for comment. The following entities provided comments for the Vergennes Project:

<u>Entities</u>	<u>Date of Letter</u>
Green Mountain Power	September 11, 1998
Vermont Agency of Natural Resources	September 17, 1998

We address all environmental concerns in the appropriate sections of this EA.

B. Scoping

Before preparing this EA, we conducted scoping to determine what issues and alternatives should be addressed. A Scoping Document (SD1) was prepared by the staff and distributed on November 20, 1997, to federal, state, and local resource

agencies, nongovernmental organizations, and other parties to facilitate their participation in the scoping process. Two scoping meetings were publicly noticed and held on December 11, 1997, in the city of Vergennes, Vermont, to request oral comments on the project. A court reporter recorded all comments and statements made at the scoping meetings, and the transcripts of these meetings are part of the Commission's public record for the project.

C. Mandatory Requirements

1. Section 18 Fishway Prescription

Section 18 of the Federal Power Act (FPA) states that the Commission shall require construction, maintenance, and operation by a licensee of such fishways as may be prescribed by the Secretary of the Interior or the Secretary of Commerce, as appropriate. No Section 18 prescriptions were filed in response to the REA notice that was issued for this project on February 20, 1998.

2. Water Quality Certification

Under Section 401(a)(1) of the Clean Water Act (CWA), license applicants must obtain either state certification that any discharge from a project would comply with applicable provisions of the CWA or a waiver of certification by the appropriate state agency. Section 401(a)(1) permits the Commission to deem certification waived if the certifying agency fails to act on a Water Quality Certification (WQC) request within a reasonable period of time, not to exceed 1 year.

On May 23, 1997, GMP applied to the Vermont Department of Environmental Conservation (VDEC) for WQC for the Vergennes Project, as Section 401 of the CWA requires. GMP withdrew the application and submitted a new WQC request to the VDEC on April 29, 1998; the application is pending.

V. ENVIRONMENTAL ANALYSIS

In this section, we provide the general description of the Otter Creek drainage area, including a discussion of environmental resources in the project area that may be subject to cumulative effects from the project when considered in combination with other actions affecting the resources. Then, for each resource, we describe the affected environment, the environmental effects and recommendations, and the unavoidable adverse effects of the proposed action with staff-recommended measures.

We address in detail those resources that would be affected by the proposed operation of the Vergennes Project, and include analysis of comments by interested parties on proposed operation. Unless mentioned otherwise, the source of our information is the license application (GMP, 1997) and supplemental filings by GMP.

A. General Description of the Otter Creek Drainage Area

Otter Creek originates in East Dorset, Vermont, extends about 100 miles to Lake Champlain, and its river basin has a total drainage area of about 936 square miles. The Vergennes Project is located at the top of a natural falls about 7.6 miles upstream of Lake Champlain. The upper portion of Otter Creek from its origin at river mile (RM) 100, to the village of Proctor, Vermont (RM 60) is characterized by rapid flows and moderately steep gradients. The middle portion of Otter Creek from Proctor to Vergennes (RM 7.6) consists of a mix of slow, meandering stream sections with elevation drops over a series of dams. The lower portion of Otter Creek, from the base of Vergennes dam to Lake Champlain, is generally flat, with water elevations in this reach influenced by seasonal variations of lake levels in Lake Champlain.

Otter Creek is a regulated river consisting of 10 dams over a total distance of about 100 miles (table 1). There are no dams between RM 64 and 27.2; there are five dams in the lower 27 miles between Middlebury and Vergennes. There are four hydroelectric projects located upstream of the Vergennes Project, including: Middlebury Lower (FERC No. 2777), Beldens (FERC No. 2558), Huntington Falls (FERC No. 2558), and Weybridge (FERC No. 2731). The Vergennes Project is the most downstream dam on Otter Creek. The Weybridge Project (about 12 miles upstream from the Vergennes Project), operates in a peaking mode.

Table 1. Dams on Otter Creek and significant tributary dams
(Source: GMP, 1997, as modified by staff)

Name	Location	Approx. RM	Height of dam (feet)	Approx. impoundment usable storage (acre-feet)
Emerald Lake	Dorset	100	2	22.96
Center Rutland	Rutland	72	10	34.43
Chittendon Reservoir	East Creek, tributary to Otter Creek	N/A	58	1,7217.63
Ripley Mills	Rutland	70.8	4	11.48
Sutherland Falls	Proctor	64.2	7	275.48
Middlebury Lower	Middlebury	27.2	10	45.91
Beldens	New Haven	23.0	24	252.52
Huntington Falls	New Haven	21.0	31	234.16
Weybridge	Weybridge	19.5	36	608.36
Vergennes	Vergennes	7.6	12	200

B. Scope of Cumulative Effects Analysis

According to the Council on Environmental Quality's Regulations for implementing the National Environmental Policy Act (NEPA) (§1508.7), a cumulative impact is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Based on the license application, comments from agencies and other interested entities, and our preliminary analysis, we reviewed all resources to determine if they could be affected in a cumulative manner by the Vergennes Project. We used this review to determine the geographic and temporal scope of our cumulative effects analysis. We identified possible cumulative effects on fisheries resources and cultural resources at the Vergennes Project.

1. Geographic Scope

The geographic scope of our cumulative effects analysis defines the physical limits or boundaries of the proposed action's effects on the fisheries resources and cultural resources.

Our geographic scope of analysis for assessing potential cumulative effects on fisheries resources and cultural resources includes the Otter Creek river basin from Middlebury Lower dam at RM 27.2 to Lake Champlain. The operation of the Vergennes Project and other hydroelectric projects on Otter Creek could cumulatively affect fish because of turbine entrainment mortality or by disrupting spawning success by changing flows during spawning migrations. We chose this geographic scope because of direct and indirect effects of project operations and other activities potentially affecting the resources within the river basin.

2. Temporal Scope

The temporal scope includes a discussion of the past, present, and future actions and their effects on fisheries resources and cultural resources. Based on a license term, the temporal scope looks 30 to 50 years into the future, concentrating on the effects on the resources from reasonably foreseeable future actions. The historical discussion, by necessity, is limited to the amount of available information for the resource.

C. Proposed Action with Additional Staff-Recommended Measures

1. Water Resources

a. Affected environment:

Water Quantity

Average inflows to the Vergennes Project impoundment range from a low of 610 cfs in September to a high of 3,161 cfs in April, based on prorated stream flow data from a USGS gage station in Middlebury, Vermont (table 2). Average (mean) flows in the river exceed the hydraulic capacity of the project during 5 months of the year. The Vergennes impoundment's current daily fluctuation limit using storage is normally 1.5 feet below its normal full pond water surface elevation of 134.28 feet msl. Plant 9's operating flow range is about 140 to 700 cfs, and the operating flow range for Plant 9B is about 200 to 480 cfs. Total hydraulic capacity of the project turbines is about 1,180 cfs.

Table 2. Vergennes Project annual and monthly flow duration
(Source: GMP, 1997, as modified by the staff)¹

	Median flow (cfs)	Mean flow (cfs)	Maximum flow (cfs)	Minimum flow (cfs)
January	786	1,006	5,315	266
February	851	1,165	6,502	271
March	1,535	1,967	9,017	271
April	2,993	3,161	10,397	266
May	1,806	2,030	8,295	266
June	857	1,034	6,940	135
July	470	671	4,076	123
August	406	639	5,070	119
September	431	610	3,599	126
October	623	946	3,896	155
November	1,026	1,241	3,922	178
December	1,135	1,463	5,663	316
Annual	867	1,316	10,397	119

¹ Derived from USGS Gage No. 04282500, Otter Creek at Middlebury, VT, water years 1960 to 1992, adjusted to 1.293 drainage area ratio.

The maximum flow in Otter Creek was 10,397 cfs as measured at the Middlebury gage, about 20 miles upstream of Vergennes dam, for water years 1960 through 1992. The 7Q10, the lowest flow that can be expected to occur in any given 10-year period for a duration of 7 days, for the Vergennes Project is 204 cfs. There are no consumptive water uses in the immediate project area.

To determine if any sections of the stream below the project were dewatered during low Lake Champlain water levels, GMP conducted a study that compared lake levels with Vergennes tailwater levels. GMP found that, even at the lowest lake level of elevation 93.47 feet (period of record 1960 to 1990), there were no dewatered sections of stream downstream of the dam under any flow conditions.

Water Quality

The Vergennes wastewater treatment facility is located about 1,500 feet downstream of Vergennes dam. Due to this facility's discharges, the Vermont Water Resources Board designates the stretch of the river downstream of the dam to Lake Champlain as a Class B Waste Management Zone, meaning that there are permitted discharges of treated wastes within this stream reach. Lower Otter Creek to Lake Champlain (including Vergennes) also is classified as an Effluent Limitation Segment. Such segments meet water quality standards when effluent standards are applied and no load allocations are necessary. Four other wastewater treatment facilities discharge into Otter Creek upstream of the Vergennes Project (table 3).

Table 3. Summary of pertinent permit effluent limits for Vermont wastewater discharges in the Otter Creek basin (Source: GMP, 1997, as modified by the staff)

Facility	River mile	Flow (mgd) ¹	BOD (mg/l) ²
Vergennes	7.4	0.66	30; 50
Middlebury	25.2	2.2	30; 50
Proctor	63.8	0.325	30; 50
Rutland	71.0	6.8	30; 50
Wallingford	84.8	0.12	22.5; 37.5

¹ Annual average; mgd= millions of gallons per day.

² BOD= biological oxygen demand; mg/l= milligrams per liter; the first value is the allowable monthly average, the second value is the allowable daily maximum.

Sediment loads in Otter Creek are high because of the predominance of erodible clay soils and intensive agriculture in the basin. The area below the dam, even relatively close to the powerhouse discharge, is covered with a fine layer of silt that is easily resuspended. Some of this silt probably is resuspended during high flow events, leading to short-term increased turbidity.

The VANR's Water Quality Division requested (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated March 20, 1997) that GMP conduct a study to determine if upstream and downstream dissolved oxygen (DO) concentrations show either actual or potential deficits under critical conditions (high temperature and low flow). As part of GMP's study, it collected grab samples upstream and downstream of

the dam, beginning in the early morning well before sunrise, when DO concentrations are expected to be at daily minimum levels. The study supplemented a DO study that GMP conducted during the summer of 1996, as reported in the license application.

Overall water quality in Otter Creek, as measured during the 1997 DO survey, is excellent, with DO levels in the river averaging full to super-saturation (Aquaterra, 1997). DO concentrations were all above 7.0 milligrams per liter (mg/l) even though all samples were collected before sunrise when DO concentrations are expected to be lowest. DO in the Vergennes impoundment ranged from 8.00 to 11.55 mg/l (91 to 141 percent saturation) in 1997. DO immediately downstream of Vergennes dam ranged from 7.65 to 10.90 mg/l (87 to 133 percent saturation). During 1996, the DO concentrations ranged from 8.00 to 8.85 mg/l (90 to 101 percent saturation) in the impoundment and 7.85 to 8.85 mg/l (89 to 100 percent saturation) immediately downstream of the dam.

The Vergennes Project currently meets all Class B DO criteria for state water quality standards. The VANR indicates that Otter Creek from Weybridge to Lake Champlain, for the purposes of state water quality standards, is considered warmwater fish habitat (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated March 20, 1997). The state DO criteria for warmwater fisheries is 5 mg/l or 60 percent saturation at all times.

b. Environmental effects and recommendations: GMP proposes to convert the Vergennes Project from daily peaking operations to ROR, where outflow approximates inflow on an instantaneous basis. As the VANR requested (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated March 20, 1997), GMP agreed, as a result of negotiations with the VANR and the city of Vergennes, to release the following flows over the dams and waterfalls: 150 cfs daytime (½ hour before sunrise to ½ hour after sunset) and 75 cfs nighttime from April 1 through October 31; 100 cfs daytime and 50 cfs nighttime from November 1 through December 15; and no aesthetic flow from December 16 through March 31 (aesthetic flows are discussed in section V.C.4).

Our Analysis

Water Quantity

The Vergennes Project provides no seasonal storage. The conversion from daily peaking to ROR operation would minimize daily fluctuations of the impoundment and changes in downstream flow.

Conversion of the project to ROR operation would not substantially change water depths in Otter Creek downstream of the project because this reach is predominantly influenced by Lake Champlain water surface elevations (based on our review of hydrographs of Lake Champlain water surface elevations compared to Vergennes tailwater elevations).

Project operations influence the velocity regime immediately downstream of the project powerhouses and dams, which affects the local aquatic habitat. Therefore, we analyze these effects in section V.C.2, Aquatic Resources. We present our analysis of aesthetic flows at the project in section V.C.4, Land Use and Aesthetic Resources.

GMP does not propose to develop and implement a plan to monitor compliance with ROR operation. Resource agencies also have not recommended that GMP develop such a plan. However, we consider a monitoring plan important to document project operation at the Vergennes Project. We recommend an operations monitoring plan be filed for Commission approval that includes a description of the use of generation records, the exact locations and designs of impoundment and downstream water level recording devices, other measures as necessary, and an implementation schedule. The plan should include provisions to furnish the results of the monitoring to the Commission and the resource agencies. Because development and implementation of an operations monitoring plan would reduce the economic benefit of the project, we discuss the need for this plan further in section VII.

Water Quality

Stabilization should reduce localized erosion occurring as a consequence of the approximately ± 1.5 foot daily fluctuation in water levels and therefore reduce turbidity levels and sediment load. The elimination of off-peak low flows would provide for improved assimilation of discharges from the Vergennes wastewater treatment facility located about 1,500 feet downstream of Vergennes dam.

Our review of DO data provided by GMP indicates that existing project operations result in water quality that is in

compliance with applicable state standards. The spilling of 150 cfs over the dams and waterfalls would increase aeration and could slightly increase DO during the low flow summer months.

c. Unavoidable adverse effects: Even with the incorporation of state-of-the-art erosion and sedimentation control measures into the final design of GMP's proposed recreational enhancements, there still may be a minor, short-term increase in sedimentation to Otter Creek.

2. Aquatic Resources

a. Affected environment:

Fisheries Resources

The section of Otter Creek that extends from the Vergennes Project upstream to Middlebury Lower dam (the upstream boundary for the cumulative impact assessment) is characterized by mostly slow water habitats segmented by elevation drops at existing dams. Otter Creek upstream of Middlebury has extensive and highly productive wild trout populations. The Vermont Department of Fish and Wildlife (VDFW) manages this reach of Otter Creek between Vergennes and Middlebury as a mixed warmwater and coolwater fishery. The 12 miles of stream between the Vergennes Project and the next upstream facility, the Weybridge Hydroelectric Project, supports a fishery of primarily warmwater species, including northern pike, yellow perch, smallmouth bass, several panfish species, and a variety of minnows. The VANR indicates that northern pike are particularly abundant in the Vergennes to Weybridge reach (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated June 30, 1995). Coldwater species that are present in this 12-mile portion of the river include brown and rainbow trout, although VDFW considers the presence of trout just upstream of Vergennes dam to be incidental (notes of telephone conversation between Dave Callum, Fisheries Biologist, VDFW, and Michele Dunn, Licensing Coordinator, Gomez & Sullivan Engineers, Utica, NY, dated January 12, 1995).

Water elevations in the reach from the rock falls, on which the dam sits, to the river's confluence with Lake Champlain depends on Lake Champlain levels, and on the river's discharge. Aquatic habitat downstream of the project consists of flat, slow moving water bounded by extensive marshes and forested wetlands. Important fish species below the Vergennes Project include lake sturgeon (a state-listed endangered species), landlocked Atlantic salmon, steelhead trout, walleye, northern pike, and largemouth

and smallmouth bass. Eastern sand darter (a state-listed threatened species), also may occur downstream of the dam according to the Vermont Nongame and Natural Heritage Program (NNHP) (letter from Everett Marshall, Data Manager, NNHP, Waterbury, VT, to Michele Dunn, Licensing Coordinator, Gomez & Sullivan Engineers, Utica, NY, dated January 23, 1995).

The extent to which lake sturgeon enter Otter Creek from Lake Champlain and occur below the Vergennes Project is unclear. Local residents state that they are unaware of sturgeon being seen or caught by anglers in the lower river (scoping meeting transcript, December 11, 1997). The VANR, however, states that lake sturgeon occur in the lower section of Otter Creek and that they have been caught by anglers. Additionally, the VANR notes the occurrence of one individual lake sturgeon observed by VANR biologists in lower Otter Creek in the spring of 1995. The VANR states that adult lake sturgeon exhibiting spawning behavior have been sighted in Otter Creek (primarily by anglers) during spring months (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated June 30, 1995). The VANR reports sightings of lake sturgeon below Vergennes as recently as late May 1998 (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to David Boergers, Secretary, Commission, Washington, DC, dated September 17, 1998).

Management of landlocked Atlantic salmon and steelhead trout below Vergennes is part of the development plans implemented for salmonid fisheries in Lake Champlain. Atlantic salmon and steelhead trout are stocked in the lower river below the Vergennes Project, enhancing an important recreational fishery for these species immediately downstream of the dam. The VANR states that salmon and steelhead may spawn at the base of the dam (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated June 30, 1995). VANR notes that the number of adult salmon and steelhead that return to Otter Creek during spawning runs may increase in future years due to a lamprey (an introduced predator of salmonids and other larger species of fish) control program that is being conducted on Lake Champlain.

An important walleye fishery also exists downstream of the Vergennes Project. Walleye enter Otter Creek from Lake Champlain in early spring to spawn. A fishery for post-spawned walleye that feed in the lower river exists from mid-May through most of June. The VDFW is considering stocking hatchery-reared walleye

prior to the year 2000 as part of a management plan to increase the walleye spawning run downstream of the Vergennes Project.

Results of GMP's spring angler survey indicate that the majority of anglers interviewed (56 percent) fished from shore in the vicinity of the Plant 9 tailrace. Anglers indicated that the Plant 9 tailrace was preferred because of the quality of fishing at this location, the ease of access, and the ability to catch preferred species. Some anglers stated that discharge levels from the powerhouses influenced where they chose to fish. Many anglers interviewed during the spring period reported that they were not targeting any species in particular, but those anglers with a preference often targeted walleye (which can legally be caught beginning on the first Saturday in May). The survey also indicated that fall anglers demonstrated a preference for catching salmon, trout, and, to a slightly lesser extent, walleye.

GMP conducted studies to assess the effects of project operation on the various habitats used by downstream fish populations. During these studies, GMP mapped bathymetry and substrate and developed velocity profiles in the falls basin area. GMP also examined the effect of Lake Champlain water levels on the Vergennes tailrace elevation to determine effects on tailrace depth and velocity distributions. Based on resource agency requests and concerns, the studies focused on spawning habitat for walleye, lake sturgeon, and steelhead trout during the spring and early summer (for Atlantic salmon during the fall) and availability of holding areas for adult salmon and steelhead.

The studies identified spawning habitats for each species of interest using depth and substrate profiles coupled with spot velocity measurements taken when one powerhouse was generating and the other was offline or operating at a reduced level (190 cfs from Plant 9). Hydrographs of Lake Champlain levels, Vergennes tailwater levels, and the thalweg (minimum river bottom elevation) also were used to assess water depths during the specified spawning periods.

Based on the results of GMP's studies, we conclude that there is adequate habitat for walleye and sturgeon spawning during the spring and early summer months. Suitable spawning areas for these species could increase during periods of high flow and spillage. Spawning habitat for Atlantic salmon and steelhead trout downstream of the project is limited, mainly because preferred substrates are sparse. Most substrate suitable for salmon and steelhead spawning (gravel) is embedded with sand or silt, in water that is generally too deep for spawning, or located in areas below the dam that are wetted only during high spring flows. Suitable habitat exists for adult salmon and

steelhead to use as holding areas during their spawning migrations.

Mussel Distribution

At the request of the VANR and the FWS, GMP conducted a mussel survey on August 15 and 16, 1996, in conjunction with a substrate mapping survey to establish data on the extent of mussel beds within the project area. The survey focused on the possible presence of the black sandshell mussel, a state-threatened species that was found at the site in the late 1970's, and three other rare mussel species: fragile papershell, pink heelsplitter, and pocketbook mussel.

The mussel survey demonstrated that the freshwater mussel populations downstream of the Vergennes Project are diverse and abundant in areas where appropriate substrate was found (loose, unconsolidated substrates where mussels are able to burrow and overwinter). In the area where the black sandshell mussel was found in the 1970's, specimens collected included, among other species, fragile papershells, pink heelsplitters, pocketbook mussels, and giant floaters, all rare species. No black sandshell mussels were collected. None of the mussels in the Lake Champlain basin, including those identified above, are listed under the federal Endangered Species Act, nor are they presently being considered as candidates (letter from Susanne von Oettingen, Acting Supervisor, FWS, Concord, NH, to Craig Myotte, Assistant Vice President, GMP, South Burlington, VT, dated June 27, 1995).

b. Environmental effects and recommendations:

Fisheries Resources

Instream Flows. Flow releases from the Vergennes Project could affect important habitats for several important fish species. The VANR states that walleye, lake sturgeon, Atlantic salmon, and steelhead trout may use areas downstream of the project for spawning. The VANR also is concerned about holding areas for adult salmonid spawners, feeding areas for post-spawned walleye, and incubation habitat for lake sturgeon. Project operation also may affect rearing habitat for juvenile salmonids. The VANR considers downstream distribution of flows across the river channel the primary flow-related issue given the project's proposed conversion to ROR operation (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated March 20, 1997).

No entity has expressed concern about the effect of project operations on the eastern sand darter, a state-listed threatened species. The preferred habitat for eastern sand darter is sand-bottomed areas in streams and rivers and sandy shoals in lakes, sometimes overlain by a thin layer of silt (Scott and Crossman, 1973).

GMP proposes to operate the Vergennes Project as a ROR facility. GMP would also release flows over the dam for aesthetic purposes during the spring and fall. In addition, GMP would maintain outflow from Plant 9 by operating at least one turbine during walleye and sturgeon spawning and incubation periods and during the fall when Atlantic salmon are present until the hydraulic capacity of one unit is reached (350 cfs). When flows exceed 350 cfs through Plant 9, GMP proposes to commence operating Plant 9B. GMP proposes to continue operating one unit at Plant 9 and Plant 9B when flows are between 480 cfs and 830 cfs. When flows exceed 830 cfs, GMP would continue to operate Plant 9B and both units at Plant 9.

The VANR agrees with GMP's proposal to provide continuous outflow from Plant 9 from April 1 to June 15 (walleye and sturgeon spawning and steelhead migration) and September 15 to November 15 (presence of Atlantic salmon adults) (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated March 20, 1997).

Baseload operation (at least 350 cfs or project inflow) of Plant 9 during these times would provide continuous flows to the western side of Otter Creek, which the VANR considers important for walleye, sturgeon, Atlantic salmon, and steelhead fisheries.

In comments provided in response to the draft EA, the VANR clarifies that its definition of first call is to bring Plant 9 on line first and maintain it on line at all times that the project is operating during the seasonal time periods, as described above. The VANR indicates that use of Plant 9B is acceptable when flows exceed 350 cfs (the hydraulic capacity of one unit) via Plant 9 plus spillage for aesthetic purposes (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to David Boergers, Secretary, Federal Energy Regulatory Commission, Washington, D.C., dated September 17, 1998).

Our Analysis

There is a reasonable amount of circumstantial evidence available that sportfish are attracted to the Plant 9 tailrace flows more than to Plant 9B tailrace flows. Anglers most commonly fish along the western shoreline when Plant 9 is

generating, suggesting that, under these conditions, they are more successful in catching fish. Analysis of the VDFW's fall electroshocking data for salmon in the falls basin (the area immediately below the falls) indicates that, when Plant 9 is operating, salmon are often collected; if only Plant 9B is operating or neither plant is operating, fewer salmon are collected. These data demonstrate the importance of flows in this portion of the river to sportfish habitat.

GMP proposes to operate at least one unit of Plant 9 during the spring walleye, lake sturgeon, and steelhead spawning periods and during the fall landlocked Atlantic salmon spawning and congregating period. When the hydraulic capacity of one unit (350 cfs) is reached at Plant 9, GMP proposes to commence operating Plant 9.

GMP's proposed operating rule would avoid the existing sudden shift of water from the western side of the river (Plant 9) to the east side of the river (Plant 9B) when inflows to the project exceed 200 cfs. However, inflows to the project nearly always exceed 200 cfs (see table 2), and the enhancement value of this change in operating rules would be minimal. At project flows between 200 cfs and 480 cfs (or at inflows over 350 cfs during periods of aesthetic flow releases), the operating rule would change from the existing conditions.

GMP's proposed first call on one unit at Plant 9 would provide additional flows to the tailrace along the western side of Otter Creek and would enhance potential spawning habitat for walleye and lake sturgeon in the spring and landlocked salmon in the fall. At project inflows over 480 cfs (or at inflows over 630 cfs during periods of aesthetic flow releases), the operating rule would be essentially the same as the existing conditions.

During the spring (April 1 to June 15), flows are most likely to influence potential spawning of walleye, steelhead, and lake sturgeon. Walleye most likely spawn in April in Otter Creek, although some walleye spawning may also occur in early May. Walleye spawn in high velocity water (2.0 to 3.5 feet per second [fps]) over gravel and cobble at depths of 1.9 to 6.0 feet. Substrate and depth immediately downstream of the project would be suitable for walleye spawning, based on our comparison of GMP's substrate and bathymetric mapping with published criteria presented in GMP's license application. Velocity mapping during November indicated that, when Plant 9 was operating with a discharge of 520 cfs, downstream flows occasionally exceeded 2.0 fps. When Plant 9B was operating at nearly full capacity (473 cfs), downstream flows did not exceed 2.0 fps.

GMP points out that during the spring, there would be substantially higher flows, and corresponding velocities would probably exceed 2.0 fps more frequently. Typical flows during April and May exceed the 1,180 cfs hydraulic capacity of the project (see table 2), meaning that the operating rule for the project would primarily influence walleye spawning during dry years. Nevertheless, at flows less than 1,180 cfs, distributing flows preferentially to Plant 9 (with its higher hydraulic capacity) would increase walleye spawning habitat in the tailrace area. We conclude that, especially during the dry years, spawning success of walleye likely would be enhanced if Plant 9 were operated on a first call basis.

Spawning habitat for steelhead in the tailwaters is limited by the amount of suitable substrate (clean gravel). There is one small area of clean gravel downstream of Grist Mill island that would typically be submerged during the expected April spawning period for steelhead. GMP indicates that this gravel bar would most likely be exposed by June or July, and because egg incubation can take from 1 to 3 months, this gravel may be unsuitable for spawning due to potential dewatering. We consider it likely that this gravel bar would normally remain submerged during egg incubation, which, according to Raleigh et al. (1984), usually takes 28 to 40 days. Incubation time is shorter at higher temperatures and, by late June, temperature measured in the tailwaters during 1996 was about 20°C (7 to 12°C is considered optimal for incubation). If steelhead spawning occurs in the tailwaters, probably most eggs would hatch by the end of May. Although fry would remain in the gravel for about 2 weeks after hatching (Raleigh et al., 1984), based on GMP's typical spring hydrograph, most gravel would still be submerged by mid-June. Successful steelhead egg incubation also requires flows of between 1.6 and 3.0 fps. Velocity mapping indicates that flows near the gravel bar with high Plant 9 flows were nearly 0 fps. Suitable velocities at the gravel bar are more likely to be a function of the amount of water spilling over the western spillway than the operation of Plant 9. We therefore conclude that spawning success of steelhead would be unrelated to the operating rules of the Vergennes Project.

If lake sturgeon spawn in the Vergennes tailwaters, they are likely to seek water that is 1.3 to 4.9 feet deep, but can spawn up to depths of 15.4 feet, at velocities of 0.5 to 3.3 fps over gravel, cobble, and boulder substrates. Spawning typically occurs from early May to mid-June based on published criteria presented in GMP's license application. Our review of GMP's substrate mapping indicates large areas of ledge, sand, and silt in the Plant 9B tailrace, whereas much of the area immediately downstream of the Plant 9 tailrace is gravel, cobble, and boulder. GMP's hydrographs show that water depths in the tailwaters during the spring spawning season average 10 feet,

which is within the upper spawning limit of lake sturgeon. We conclude that preferentially releasing water from Plant 9 during May and through June 15 (first call) would attract any spawning lake sturgeon that may be present in Otter Creek to an area that would enhance the probability of spawning success.

Landlocked Atlantic salmon require similar substrate (clean gravel) as steelhead do for successful spawning. We reviewed GMP's substrate and typical fall week hydrograph and conclude that from September 15 to November 15 the only area of suitable substrate for spawning (the gravel bar downstream of Grist Mill island) normally would be exposed. We therefore consider it unlikely that there would be any successful landlocked salmon spawning immediately downstream of the Vergennes Project. Preferential releases from Plant 9 seem to attract landlocked salmon to the western side of Otter Creek. This concentration of fish may increase the catch per unit of effort for local anglers, but is unlikely to have a bearing on the productivity of the landlocked salmon population. We conclude that operating under GMP's flow regime could provide enhancements to the fall fishery for landlocked salmon.

Our review of GMP's substrate mapping indicates that there may be suitable habitat for the eastern sand darter downstream of the project. However, the local distribution of sand and silt most likely is determined primarily by high flow events, over which GMP has no control. Therefore, we conclude that existing and proposed project operations would have little effect on the habitat for eastern sand darters (if they are present in Otter Creek).

We recommend that GMP specify the operating rules for the Vergennes Project. The rules should incorporate providing continuous outflow from Plant 9 at all times that the project is operating from April 1 through June 15 and September 15 through November 15 to enhance potential spawning habitat for walleye and lake sturgeon and to attract landlocked salmon to the western side of Otter Creek during the fall angling season. The rules should also provide for use of Plant 9B during the spring and fall seasons when flows through Plant 9 exceed 350 cfs (the hydraulic capacity of one unit).

As discussed previously, flows of 350 cfs through Plant 9 would enhance potential spawning habitat for walleye, lake sturgeon, and landlocked salmon on the western side of Otter Creek. We consider a plan to document the operation of Plant 9 on a first call basis to be important in confirming the environmental enhancements expected from these flow-related measures. Therefore, we recommend a plan be submitted for Commission approval that includes a description of the use of generation records, the exact locations and designs of

impoundment and downstream water level recording devices, and an implementation schedule. The plan should include provisions to furnish the results of the monitoring to the Commission and the resource agencies.

Fish Entrainment and Impingement. The intake structures for each powerhouse are separated by three overflow dam sections separated by two midstream islands. The Plant 9 intake consists of a trashrack structure with two headgates. The trashracks have 1-inch clear bar spacing. Water velocity on the upstream side of the Plant 9 trashracks at a normal water surface elevation is about 1.8 fps. The Plant 9B intake has a trashrack structure with 2-inch clear bar spacing. The water velocity at the face of the Plant 9B trashracks at normal surface elevation is about 2.6 fps.

GMP does not propose any measures to reduce entrainment-related impacts, other than to consider the installation of 1-inch clear-spaced bar racks at the Plant 9B intake when the existing trashracks are replaced.

The VANR states that Vergennes Project intake velocities are within acceptable limits and would minimize entrainment and impingement of fish. Consequently, the VANR is not now requesting protective measures pertaining to entrainment-related impacts for the Vergennes Project (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated March 20, 1997). However, the VANR requests that, when the trashracks at Plant 9B need to be replaced, GMP should consider replacing the existing 2-inch clear-spaced bar racks with bar racks that have a maximum clear spacing of 1.5 inches.

Our Analysis

Most riverine fish entrained at hydroelectric projects are small (less than 8 inches long) (EPRI, 1992). Entrainment of catchable-size sportfish should be minimal at Plant 9 because the trashrack bar spacing is narrow (1-inch clear) and water velocities are less than 2 fps allowing fish to escape entrainment and impingement. Given the proposed project's configuration, fish in the vicinity of the trashracks would be able to escape additional impingement by traveling a short distance at burst swimming speed.^{3/} Some catchable-size fish could be entrained through the Plant 9B intake, which has a bar spacing of 2-inch clear and intake velocities of about 2.6 fps.

^{3/} See Beamish (1978) for data on burst swimming speeds for fish.

Although the resource agencies are not pursuing additional downstream fish protection measures at the project, they have requested that GMP consider installing 1.5-inch, clear-spaced bar racks on the intake of Plant 9B when the existing trashracks are replaced. Based on this request, GMP stated that it would consider installing 1-inch, clear-spaced bar racks in the future. The installation of narrow-spaced bar racks with either 1- or 1.5-inch clear bar spacing would not reduce the entrainment of most fish that probably pass through the Plant 9B turbine (i.e., YOY fish less than 8 inches long). Conversely, entrainment of fish that constitute a harvestable component of upstream populations may be reduced with narrower spaced bar racks. In this instance, based on the fish species present, there would be little difference between the 1 inch or 1.5 inch trashracks in protecting the larger sportfish from entrainment.

Turbine mortality of small fish (less than 8 inches long) usually is low (less than 10 percent) (EPRI, 1992). Based on a comparison of the fisheries at the Vergennes Project with other sites for which entrainment studies have been conducted (EPRI, 1992; 1995), we conclude that the turbine mortality rate at the Vergennes Project probably is low because most fish that are entrained are YOY. Further, turbine mortality of adult sportfish should be minimal because the narrow bar spacing and low intake velocities at both powerhouses would limit the entrainment of most catchable-size fish. There are no state- or federally-listed endangered or threatened species upstream of the project that are subject to entrainment and turbine mortality at the project.

Based on our analysis, we conclude that entrainment at the Vergennes Project is not adversely affecting the fisheries resources in Otter Creek, and we find that additional protective measures are not needed at this time. In areas with high debris loading, small spaced racks may clog and cause high velocity hot spots in front of the racks where fish could become impinged. We recommend that the VANR and GMP consult on the appropriate spacing (e.g., 1 or 1.5 inch) when the existing racks are in need of replacement and consider such factors as debris loading and impingement. Any proposal to change the spacing of the trashracks in the future should be submitted to the Commission, along with resource agency comments, as a request to amend the license.

Mussel Distribution

Based on a review of the information made available in the draft application, the VANR concluded that the proposed conversion of the project to ROR adequately addresses any issues related to the protection of the mussel populations at the Vergennes Project (letter from Jeffrey Cueto, Principal

Hydrologist, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated March 20, 1997). No other party has commented on the potential effects of GMP's proposed operations on mussel populations in the project vicinity. We also conclude that the existing diverse and abundant mussel community downstream of the project would not be adversely affected, and may be enhanced, by the proposed operation of the project.

c. Cumulative effects: Turbine entrainment mortality and instream flow fluctuations could have potential cumulative effects that may be adversely affecting Otter Creek fisheries. We selected the 27.1 miles of Otter Creek that extend from Middlebury Lower dam to Lake Champlain as the geographic scope for assessment of cumulative impacts. Five hydroelectric projects (including Vergennes and Middlebury Lower) are located within the selected geographic boundaries. Although some turbine mortality most likely is occurring at each project, we conclude that the cumulative effects are minor for the following reasons:

- (1) there is no anadromous fish production upstream of the Vergennes Project (i.e., little to no cumulative mortality of highly migratory fish);
- (2) most entrainment probably consists of YOY fish, which usually suffer less than 10 percent mortality during turbine passage; and
- (3) fish populations change from primarily warmwater species to coolwater species from downstream to upstream projects (probably due to changes in Otter Creek habitats associated with stream gradient), which likely reduces downstream movements of most species (populations are likely to be local and would not depend on recruitment from upstream or downstream areas).

Instream flow fluctuations produced by the projects within the defined geographic scope may be affecting spawning activities of some species. GMP's proposal to convert to ROR operation would reduce any such impacts downstream of the Vergennes Project. Inflow, however, is controlled by Weybridge, the next upstream project, which operates in a peaking mode. The long distance between these two projects moderates the effects of upstream peaking and the adverse cumulative effects on the resources. The degree of resultant habitat influence of fluctuating flows below Vergennes due to upstream project operations would be minimized by the effects of Lake Champlain backing water up to Vergennes dam.

d. Unavoidable adverse effects: There would continue to be some entrainment of fish at this and other upstream hydropower projects on Otter Creek. Entrainment would likely continue to occur at the Vergennes Project, consisting primarily of YOY centrarchids, with minimal adverse effects on these populations and the existing sport fishery in Otter Creek.

3. Terrestrial Resources

a. Affected environment:

Botanical Resources

The project impoundment is riverine in nature, and the shoreline areas are composed predominantly of forest habitat, although the width of the woody vegetative buffer between the impoundment and active agricultural land varies dramatically. The lower Otter Creek, downstream of the project dam, has extensive palustrine, emergent marshes (designated as PEM by the wetland classification system presented in Cowardin et al., 1979) and floodplain broadleaved, deciduous forests (designated PF01 by the Cowardin et al., 1979, classification scheme). The shoreline of this segment of the river is frequently flooded and influenced by Lake Champlain.

Spring overflows create natural levees that support PF01 swamps. The floodplain forests have been altered by timber harvesting and by cattle grazing (letter from Everett Marshall, Data Manager, Vermont NNHP, Waterbury, VT, to Michele Dunn, Licensing Coordinator, Gomez & Sullivan Engineers, Utica, NY, dated January 23, 1995).

The lowlands behind the natural levees are comprised of palustrine emergent wetlands and palustrine scrub-shrub swamps dominated by broadleaved deciduous vegetation (designated as PSS1 by the National Wetland Inventory), which are rarely visited by people except perhaps for waterfowl hunting. To maintain this type of wetland community, these areas retain standing water or saturated soil conditions throughout the year. These marsh areas along the lower Otter Creek are characterized by the NNHP as the most impressive and most extensive natural community within the lower Otter Creek basin. Species associated with the PEM areas include: giant bur-reed, common arrow-head, narrow-leaved cattail, white water-lily, pickerelweed, and buttonbush. Species identified within the PF01 areas include: silver maple, wood-nettle, white grass, hog-peanut, and ostrich fern.

The NNHP identified several rare plant species growing in the floodplain in the region from the mouth of Otter Creek upstream to Vergennes dam. The species identified include: arrowleaf, cattail sedge, water-hemp, narrow blue-eyed-grass, and

lance-leaved loosestrife, and the green dragon. Although all of these species are considered rare in Vermont, only the green dragon is classified as threatened by the state. In addition, the NNHP identified uncommon plants that could potentially occur in the project area, including: within the PEM areas--false hop sedge, slender bulrush, salt marsh bulrush, and Smith's bulrush; along riverine emergent marsh areas (designated REM by the National Wetland Inventory)--May-fruited false loosestrife and marsh horsetail; and within the PF01 areas--false mermaidweed.

Wildlife Resources

The vegetated buffer zone along the project impoundment most likely serves as travel corridor for birds and mammals, which are typically important in agricultural settings where large expanses of open land offer little concealment. The diverse wetlands downstream of the project offer a variety of habitats for migratory water birds as well as many resident mammal species. There are no deer wintering areas within the project area and black bear habitat, considered by the VDFW to be a critical habitat type, also does not occur in the project vicinity. Species of mammals, amphibians, reptiles, and birds likely to be found in the project area are typical of those expected to occur elsewhere in the Champlain Valley.

The NNHP identified potential rare animal species that may exist in the project area, including: osprey (state endangered); the least bittern (state species of concern); fragile papershell mussel (state species of concern); the pink heelsplitter mussel (state species of concern); the giant floater mussel; pocketbook mussel; the eastern sand darter (state threatened); the black sandshell mussel (state endangered); and the lake sturgeon (state endangered). We discuss mussel abundance and distribution (including rare species collected by GMP), lake sturgeon, and eastern sand darter in section V.C.2, Aquatic Resources.

Threatened and Endangered Species

There are no plant or animal species that are federally listed as threatened or endangered known to occur in the project vicinity (personal communication between Pat Weslowski, Senior Preservation Planner, Louis Berger & Associates, Inc., Needham, MA, and Susanne von Oettingen, Acting Supervisor, FWS, Concord, NH, on July 23, 1998).

b. Environmental effects and recommendations: GMP proposes no specific measures pertaining to terrestrial resources and indicates that because Lake Champlain backs up to the base of Vergennes Falls, project operations have little influence on the water surface elevation downstream of the dam. The FWS states that it is unclear as to whether the regulated flows in Otter

Creek had altered the hydrology of the wetlands downstream of the project, particularly because Lake Champlain backs up water into lower Otter Creek (letter from Susanne von Oettingen, Acting Supervisor, FWS, Concord, NH, to Craig Myotte, Assistant Vice President, GMP, South Burlington, VT, dated June 27, 1995). The FWS also indicates that a return to ROR operation may be a step in the direction of restoring any altered wetland hydrology.

Our Analysis

The existing operation of the Vergennes Project as a peaking facility resulted in periods when little flow was released from the project. If releases from the project were the primary factor in determining the downstream water surface elevation, the water level would decrease during periods of reduced flow and riparian wetlands could be adversely influenced. However, accounts of the existing wetlands downstream of the project by the NNHP indicates that they are thriving and support a rich community of plants and wildlife. GMP's proposed conversion to ROR operation would eliminate periods when little flow is released from the project which would further stabilize the downstream water surface elevation compared to existing conditions.

We reviewed the GMP hydrographs that compared the water surface elevation above msl of Lake Champlain as measured at Burlington (about 3 miles north of the confluence of Otter Creek with Lake Champlain) to the Vergennes tailwater elevation as measured in the tailrace of Plant 9. The differences in water surface elevation above msl ranged from about 0.6 to 1.5 feet, which could be accounted for by friction and stream gradient.^{4/} The Vergennes Project is located 7.6 miles upstream of Lake Champlain. We conclude that, because the water surface of Lake Champlain is essentially the same as the Vergennes tailwater elevation, lake water surface elevations are responsible for establishing the hydrology of the riparian wetlands for most of the year. In addition, flood events in Otter Creek also are likely to periodically inundate riparian habitat. The limited storage capacity of the Vergennes impoundment would not allow GMP to control flood events either with existing or proposed project operations. We conclude that present and proposed project operations have virtually no bearing on the water surface elevation and the riparian wetland habitat downstream of the project.

4/ Friction associated with the streambed (measured by "Mannings N") can cause flowing water to back up. Gradient (the difference in streambed elevation between two points) causes water to flow in a specific direction.

c. Unavoidable adverse effects: None.

4. Land Use and Aesthetic Resources

a. Affected environment: The Vergennes Project is directly surrounded by land classified by the Addison County Regional Planning Commission as built-up, urban, or residential. Land uses in the project vicinity include agricultural, rural residential, scattered forest lands, brush lands, and light manufacturing, and most lands surrounding the project boundary are privately owned. The project impoundment extends about 9 miles upstream, and it is surrounded primarily by agricultural lands. Water flows over the dam or through the project and enters a basin formed below the falls (falls basin), which covers an area of about 8 surface acres.

The prominent aesthetic features of the project area are the water flow over the dam at the natural rock ledge and the surrounding historic structures and project facilities (see figure 3). Vergennes dam is founded on a natural rock ledge forming a waterfall with a vertical drop of 35 to 40 feet, depending on the water level at the base of the falls. Water is spilled over three concrete sections of the dam (the center, Plant 9, and Plant 9B spillways), which are topped by 1.5-foot flashboards. The sections of the dam that do not receive any overflow are composed of two midstream islands (see figure 2). Located on these islands are two historic structures that contribute to the scenic nature of the area. These structures, Norton's Grist Mill on Grist Mill island and the pumphouse on Center island, were constructed in the late 1800s and have since fallen into disuse and disrepair. The city of Vergennes, with funding support from GMP, recently made improvements to Center island, including new lighting, fencing, and landscaping.

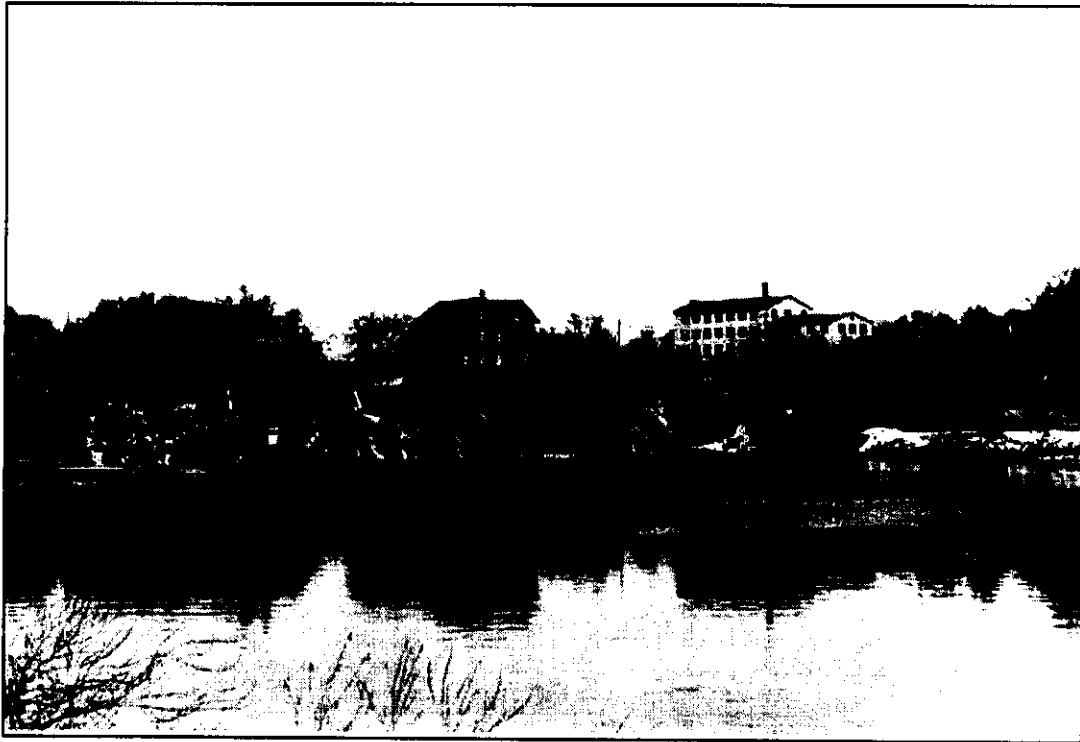


Figure 3. Vergennes Falls and Lower Otter Creek Basin
(Source: Louis Berger & Associates, Inc., 1998)

The area below Vergennes Falls (the falls basin) is heavily used by boaters during the summer months, and it provides direct viewing of the scenic Vergennes Falls and historic structures. Boaters can access this area by traveling upriver from Lake Champlain. Two prime shoreline areas in the falls basin are used to view the project's scenic resources: the Vergennes Falls Park, downstream of the dam on the south side of the creek, and the city-owned docking facilities at MacDonough Park on the north side of the river.

GMP currently operates the Vergennes Project as a daily peaking project with a limited daily fluctuation of 1.5 feet. The inflow to the Vergennes Project is controlled by the upstream Weybridge Project. Historically, flows outside of the operating range of the two generating plants (minimum 140 cfs, maximum 1,180 cfs) have been passed over the three spillways except for minor flashboard leakage. There are no low-level outlets or other means of discharge at the spillways other than over the fixed crest spillways or through the generating facilities.

Table 4 summarizes the approximate existing flow exceedance in Otter Creek at the Vergennes Project based on prorated flow data from USGS gaging station No. 04282500 in Middlebury,

Vermont, located approximately 19 miles upstream of the project. The average inflows to the project impoundment range from a low of 610 cfs in September to a high of 3,161 cfs in April.

Table 4. Estimated flows in Otter Creek at the Vergennes Project¹ (Source: Staff)

Month	Estimated flow exceedance (cfs)				
	10%	25%	50%	75%	100%
January	2,025	1,150	800	600	300
February	2,425	1,475	850	600	300
March	3,900	2,800	1,525	800	300
April	4,900	3,850	3,000	2,200	250
May	3,550	2,700	1,800	1,050	350
June	1,850	1,250	850	575	150
July	1,350	700	475	375	150
August	1,350	750	425	300	150
September	1,300	690	430	300	150
October	2,350	1,150	650	375	150
November	2,450	1,750	1,025	650	200
December	2,700	1,800	1,150	800	300

¹ USGS gage at Middlebury prorated to Vergennes site by a factor of 1.293; period of record, water years 1960-1992.

GMP evaluated six different aesthetic enhancement target flows. Due to the hydraulic configuration of the river and power plants, control of the center spillway lagged behind that of the Plant 9 and Plant 9B spillways, and a uniform depth of flow and discharge across each spillway could not be obtained. Subsequently, the actual flows were greater than the targeted flows. The actual flows were computed for the aesthetic flow study period based on measurement of the head on the flashboards and application of a discharge coefficient rating curve for a sharp-crested weir configuration. Table 5 summarizes the target flows and the computed actual flows for the study period.

Table 5. Aesthetic flow study target and actual flows (Source: GMP, 1997)

Target flows	Actual flow range (cfs)
300	271-327
200	262-295
150	192-223
100	146-167
50	100-113

A study team composed of representatives from the VANR, the VDEC, the city of Vergennes, and GMP evaluated the flows. The study team evaluated the effect of various flows over Vergennes Falls based on the dimensions of sound, exposed rockface, and veil effect. The study team was divided in its opinion of the higher target flows of 200 and 300 cfs; some members found that these flows were considerably better than lower flows, others did not see much difference or thought that lower flows were preferable. The study team members generally agreed that the 150 cfs target flow was better than the 100 cfs target flow, though not substantially so. All members thought that the target flow of 100 cfs was substantially better than the 50 cfs target flow.

b. Environmental effects and recommendations: GMP proposes the release of aesthetic flows over Vergennes Falls based on the results of the evaluations conducted during the aesthetic flow study and the subsequent consultation among the VANR, the city of Vergennes, and GMP. From April 1 to October 31, GMP proposes daytime aesthetic flow releases of 150 cfs and nighttime flow of 75 cfs. From November 1 through December 15, GMP proposes a daytime aesthetic flow of 100 cfs and a nighttime flow of 50 cfs. GMP proposes no aesthetic releases from December 16 through March 31. In addition to the aesthetic flow releases, GMP proposes to contribute \$40,000 for aesthetic enhancements to Norton's Grist Mill to restore the windows and replace the roof.

The VANR states that the distribution of GMP's proposed aesthetic flows among the three spillways should be determined through post-licensing consultation (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to David P. Boergers, Acting Secretary, FERC, Washington, DC, dated June 1, 1998).

Our Analysis

Table 6 summarizes estimated exceedance flows over Vergennes dam under existing conditions and under GMP's proposed aesthetic flows. GMP's proposed aesthetic flow releases would provide greater and more consistent aesthetic flows over Vergennes dam

from May through October. Proposed aesthetic flows during April would provide a minor increase in aesthetic flow opportunities. Aesthetic flows from November through December 15 would occur about twice as often as they do under the existing conditions. GMP proposes no aesthetic flows from December 16 through March 31, and, therefore, flows over Vergennes dam would remain the same as under existing conditions for this same time period.

The proposed aesthetic flows would enhance the overall aesthetics of Vergennes falls during May through October, the prime recreation season, when the greatest viewing opportunities would occur. As demonstrated during the aesthetic flow study, the distribution of flows over each spillway could vary. We recommend, therefore, that GMP develop an operation and monitoring plan in consultation with the VANR and the city of Vergennes, which determines the allocation of the aesthetic flows over the spillways. We consider documentation of aesthetic flow releases to be important in confirming the environmental enhancements expected from these flow-related measures. We also discuss the operation and monitoring plan in section V.C.1, Water Resources.

GMP's proposed improvements to Norton's Grist Mill would help restore the building's historic character and enhance the overall aesthetic resources of the project area. The proposed fishing access platform in the vicinity of the Plant 9 tailrace, however, could potentially alter the aesthetic and historic character of the area below the dam. We recommend, therefore, that GMP develop the final design for the fishing platform in consultation with the VANR, SHPO, and the city of Vergennes to ensure that the fishway facilities would be compatible with the scenic qualities of the Vergennes Historic District.

Table 6. Estimated occurrence of aesthetic flows over Vergennes dam¹ (Source: Staff)

Veiling flow	Month	GMP's proposal ²	Existing conditions
3 inches (about 150 cfs)	April	100%	90%
	May	100%	65%
	June	100%	20%
	July	100%	10%
	August	100%	10%
	September	100%	10%
	October	100%	20%
	November	100%	40%
2 inches (about 100 cfs)	December (1-15)	100%	45%
	December (16-31)	55%	55%
Greater than 0 inch	January	30%	30%
	February	40%	40%
	March	65%	65%

¹ Estimated exceedance flows based on USGS Gaging Station No. 04282500 located in Middlebury, VT, from water years 1960 to 1992.

² Based on provision of daytime flows; proposed nighttime flows are 75 cfs April-October and 50 cfs November-December 15.

5. Recreation Resources

a. Affected environment: The Vermont Rivers Study (VAEC, 1986) designates Otter Creek from North Dorset, roughly 90 miles upstream of the Vergennes Project, to Lake Champlain as a recreational boating area. Primary recreational use in the project area includes shoreline and boat fishing, motor boating, canoeing, picnicking, hiking, and sightseeing.

Within the project vicinity, the city of Vergennes provides many outdoor recreation facilities, including parks, school fields, playgrounds, outdoor pathways, tennis courts, a municipal forest, an ice skating rink, and a swimming pool. Recreation areas downstream of the project area include the Ferrisburg town beach, the lower Otter Creek Wildlife Management Area, access to the little Otter Creek recreation area, and many recreation areas surrounding Lake Champlain.

Settler's Park, owned by GMP and located just upstream of the Vergennes Project, provides limited parking and a car-top boat launch. A canoe portage runs from Settler's Park, crosses Main Street onto a sidewalk running across the Route 22A bridge, and descends to the western bank of the falls basin (see figure 4). Downstream of the Route 22A bridge, located on two midstream islands at Vergennes dam, are the city-owned former Norton's Grist Mill and the former pumphouse. Grist Mill island is connected to the shore from the Route 22A bridge, and Center island is connected to the shore by a footbridge. The city of Vergennes intends to develop the pumphouse on Center island for future recreational and tourism use. The city of Vergennes and GMP recently collaborated on the restoration of the pumphouse on Center island, adding new lights, decorative railings, and landscaping. Both islands and the structures add to the scenic and historical nature of the project area.

The river reach downstream of the project (and below Vergennes Falls) is a popular area for boating and fishing and provides direct access to Lake Champlain. Vergennes Falls Park, a 6.5-acre park owned and operated by the city of Vergennes, is located on the south bank of Otter Creek downstream of the project and extends between the falls and the city of Vergennes wastewater treatment plant. The park offers a system of walking paths, picnic areas, shoreline fishing areas, and a boat launch. Across the river from Vergennes Falls Park, municipal boat docks at MacDonough Park are largely used by boaters from Lake Champlain. Both the boat docks at MacDonough Park and the facilities at Vergennes Falls Park attract many visitors wishing to view the falls at the project. The falls basin area is heavily used by boaters who come upstream from Lake Champlain to view the scenic falls and the historic area.

A 1996 angler study conducted by GMP for the area below the dam showed that, during the spring period, about 56 percent of the fishing occurred along the shoreline bordering Plant 9 and 20 percent occurred on shoreline bordering Plant 9B, about 21 percent occurred along the shorelines adjacent to the city park and city boat dock area, and about 3 percent of the angling was from boats in the falls basin area (see section V.C.3 for more details on the angler survey).

The Vermont Department of Forests Parks and Recreation (VDFPR) prepared a Vermont Recreation Plan (VRP) in 1993, which assesses outdoor recreation resources, needs, and natural

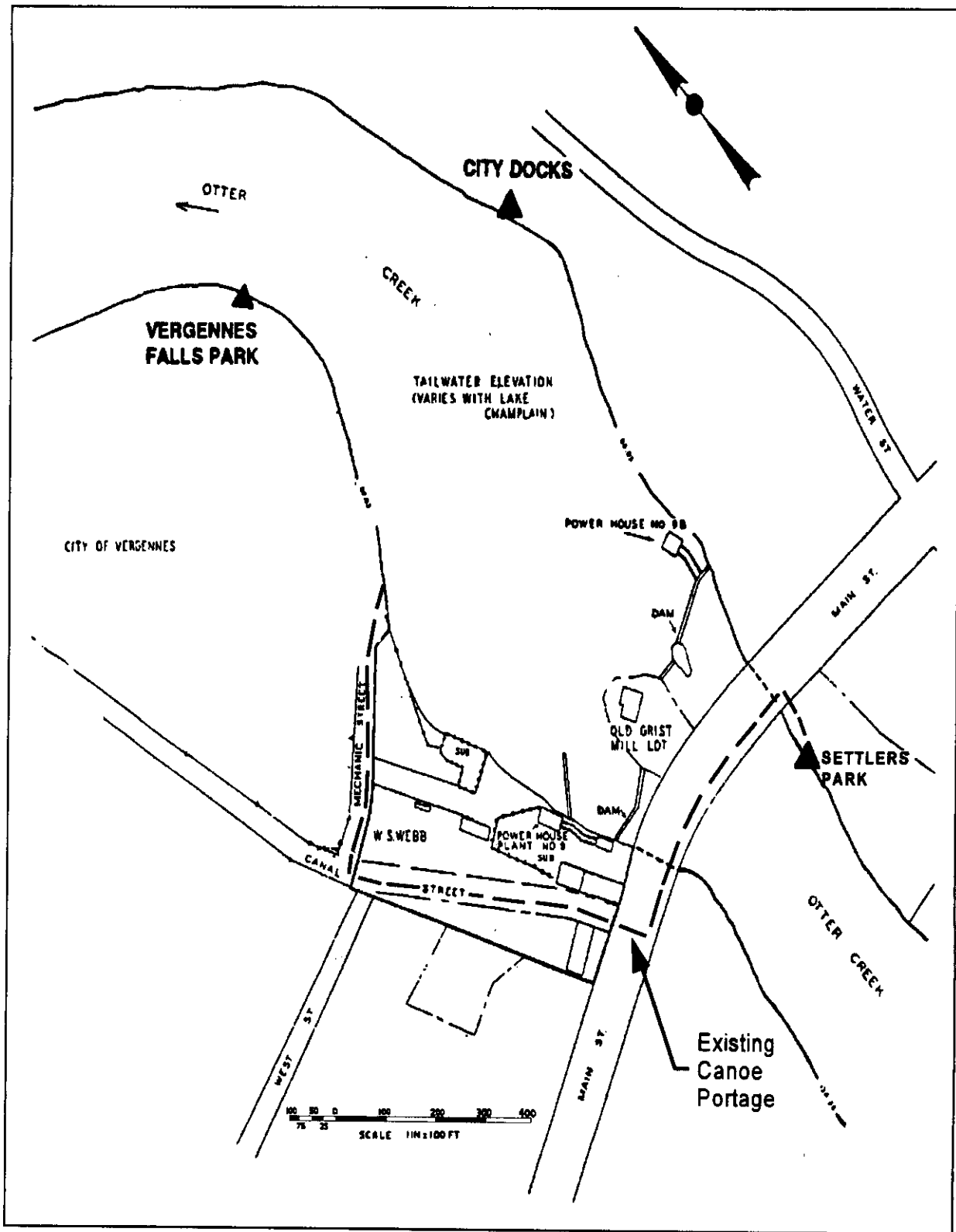


Figure 4. Current Recreation Sites and Features Within the Vergennes Project Area (Source: modified from GMP, 1997)

resources for the state of Vermont. The VRP defined four recreation needs relevant to the project area, including: (1) bicycle paths linking neighborhoods, schools, and commercial areas of towns; (2) signs/marks identifying existing trails; (3) acquiring and protecting open space; and (4) developing new park areas and facilities.

In its 1997 Municipal Development Plan (November 11, 1997), the city of Vergennes identified a number of concerns and recommendations for the area above the falls and the area below the falls. Some of the concerns and recommendations in the area above the falls include: replacing the existing canoe portage route from Settler's Park to the lower river with a route along the western bank that would be less dangerous; changing GMP fencing restrictions to make the pumphouse more accessible to the public; adding additional vehicular parking and access; and adding educational signs about the falls and the hydropower project. In addition, the city of Vergennes proposes to stabilize and restore the pumphouse and link walking trails in the upper basin with those in the falls basin area.

Concerns and recommendations presented in the Municipal Development Plan for the area below the falls include: an over-building in the vicinity of the municipal boat docks; removing fallen trees, driftwood, and debris along the shoreline; improving and adding lighting and walkways along the river; adding picnic tables, grills, and a playground; improving the health of vegetation along the shoreline; adding disabled-accessible fishing areas; and keeping boat dockage at current levels to minimize the threat of increased pollution from increased boat traffic. The city of Vergennes also proposes to upgrade the municipal docks at MacDonough Park and to add lighting, picnicking facilities, and walking trails in this area.

b. Environmental effects and recommendations: GMP, in consultation with the VANR and the city of Vergennes, developed proposed recreation enhancement measures, including: (1) development of directional and interpretive signs for recreation in the project area; (2) improved access for small boats and better definition of the parking area at Settler's Park; (3) trail, shoreline fishing access, vegetative plantings, and picnic area improvements along the western bank near Plant 9; (4) construction of a disabled-accessible fishing platform on the western bank near Plant 9 in accordance with ADA guidelines; and (5) installation of signs interpreting the history of the falls and the surrounding structures. GMP proposes to develop the final designs for the proposed recreation enhancements after licensing in consultation with the VANR and the city of Vergennes.

The VANR states that the existing portage route, although not ideal, is adequate, and that the proposed use of the existing stairs on the east side of the river would not be suitable for a new portage route and would be impossible to retrofit. The VANR also states that the current route crossing the Route 22A bridge is acceptable as part of the portage route (letter from Rose Paul, Chief of Policy and Planning, VANR, Waterbury, VT, to Michael Scarzello, Water Resources Engineer, GMP, South Burlington, VT, dated April 25, 1997). The VANR also states concerns that increased fishing pressure during the spring walleye run may necessitate expansion of parking and that monitoring of this issue should occur as part of the post-licensing FERC Form 80 process (letter from Jeffrey Cueto, Principal Hydrologist, VANR, Waterbury, VT, to David P. Boergers, Acting Secretary, FERC, Washington, DC, dated June 1, 1998).

Local citizens commented during the scoping meeting (December 11, 1997) on the effects of the proposed project on recreation resources in the area. Commenters stated that there is a need for public toilet facilities in the shoreline area immediately below Vergennes Falls.

Our Analysis

Public fishing access would be enhanced by the proposed disabled-accessible fishing platform, trail improvements, and improved shoreline access. GMP's angler survey found that the majority of angling (56 percent) occurred in the vicinity of the Plant 9 tailrace. The proposed fishing platform would enhance access for anglers in this area. The proposed fishing platform would be located in a visually significant area and within the Vergennes Historic District (see sections V.C.4.a and V.C.5). Development of final plans in consultation with the VANR, the SHPO, and the city of Vergennes would help ensure compatibility of the facility with the surrounding historic character. In addition, increased fishing and recreational use in this area may lead to the need for increased parking capacity in the vicinity of the falls basin and tailrace area over the term of the license. Monitoring the recreational use of this area as part of the post-licensing FERC Form 80 process would help ensure that adequate parking facilities in this area would be provided over the term of the license.

Picnicking and sightseeing would be enhanced as a result of proposed trail and picnic area improvements. These improvements would make the shoreline more attractive and increase the usable area for picnickers and sightseers by linking the area below Plant 9 to Vergennes Falls Park. These improvements would help support the heavy use of this area that occurs as a result of easy access by boaters from Lake Champlain and the attraction for viewing the aesthetics of the falls and historic area. As noted

during the scoping meeting, toilet facilities are needed within the area below Vergennes Falls during the summer peak period of recreational use. Portable toilet facilities would help meet this need during the high use period.

The proposed directional signs would enhance use for recreationalists who are not familiar with the recreational opportunities in the project area. The proposed interpretive signs would enhance the educational and historical experience of the recreational users within the project area. The proposed directional signs also would enhance and provide a clearer demarcation of the existing canoe portage route. In addition, the proposed signs and recreational enhancements would help facilitate the city of Vergennes enhancement plans for the areas above and below the falls.

The proposed ROR operation would decrease water level fluctuation upstream of the dam and would slightly enhance recreational use along the shoreline areas because exposed shoreline areas would be slightly reduced and water level elevations would be more stable. The proposed aesthetic flows would enhance the recreational experience of recreational boaters, anglers, and shoreline visitors to the falls basin area (see section V.C.4).

We recommend that GMP implement its proposed recreational enhancements. We also recommend that the development of the final design and plan of the proposed recreation enhancements be conducted in consultation with the VANR, SHPO, and the city of Vergennes to ensure compatibility of these enhancements with the existing historic and scenic character of the area. In addition, we recommend that GMP install portable toilet facilities (including disabled-accessible facilities) in the area below Vergennes Falls, the number and location to be determined in consultation with the city of Vergennes. We also recommend that GMP review the potential need for additional parking related to increased recreational use in the tailrace area as part of the post-licensing FERC Form 80 process. GMP's proposed recreational enhancements with our recommended supplemental measures would enhance the recreational opportunities within the project area.

c. Unavoidable adverse effects: None.

6. Cultural Resources

a. Affected environment:

Historical Resources

The Vergennes Project's area of potential effect (APE) includes the land in the vicinity of the dam and powerhouses, and

the shoreline along Otter Creek that is influenced by the operation of the project.

The Vergennes Project facilities are situated within the boundary of the Vergennes Historic District, which was listed in the National Register of Historic Places (National Register) in 1976. The nomination form prepared for the District included as contributing elements the GMP-owned Plant 9 powerhouse, Norton's Grist Mill and storage building (a former horse shed), the Monkton Iron Works tunnel, former Vermont Shade Roller Company building, and former Plant 9 office/storehouse (see figure 2). The Vergennes pumphouse, historically and currently owned by the city of Vergennes, and the former Benton Machine Shop wheelhouse (not owned by GMP), are also contributing elements. An historical assessment, conducted in 1997 in association with GMP's relicensing application process, updated and expanded the identification of elements contributing to the significance of the Vergennes Historic District to include the Vergennes Project dam, Plant 9 intake structure and penstocks, and Plant 9B intake, penstocks, substructure and generating components. The VDHP has not yet commented on GMP's historical assessment.

The project facilities, illustrative of Vermont's hydroelectric plant design and construction to about World War II, represent the continued use of the falls as a source of power. The concrete overflow dam constructed between 1912-1918, with its spillways controlled by timber flashboards, Plant 9 intake installed in 1912 with its vertical gates controlled by cast iron headworks, and Plant 9's riveted steel penstocks, are representative of typical divided-flow installations throughout the State of Vermont during this period and into the 1920's. The construction of an additional generating plant (Plant 9B) in 1943 represents the importance of hydropower to the Vergennes community and illustrates the change and modernization in hydro design and construction.

The former Benton Machine Shop wheelhouse and Norton's Grist Mill and storage building (a former horse shed) are vacant and boarded up. GMP currently leases a portion of the former Vermont Shade Roller Company building (also called the "white building") to B.F. Goodrich for temporary storage of paperwork. The city-owned Vergennes pumphouse, although unused, has been somewhat stabilized and rehabilitated by efforts initiated by the city and funded in part by GMP.

As a revitalization measure, the city of Vergennes' Municipal Development Plan proposes to create a "gateway" to the city in the area around Vergennes Falls, including portions of the Vergennes Historic District. To this end, the city is working with the owners of vacant properties, including GMP as

owner of Norton's Grist Mill and the former Vermont Shade Roller Company building, to find tenants for these properties.

Archeological Resources

The Vermont Archeological Inventory maintained by the Vermont Division for Historic Preservation (VDHP) identifies 19 Native American archeological sites within the project area. The Vermont Archeological Inventory lists only two historic period archeological sites within the project boundary. Sites VT-AD-146 (former Monkton Iron Works) and VT-AD-147 (creamery) were destroyed in the course of constructing the city's wastewater treatment plant located near Vergennes Falls Park, but a portion of a tunnel once associated with the iron works remains extant, and is a contributing element to the Vergennes Historic District. The Monkton Iron Works Company was the first known business operating below the falls on the current site of the Plant 9 powerhouse. This company supplied most of the iron work and ammunition used by Thomas McDonough and his fleet when they defeated the British on lake Champlain in the Battle of Plattsburgh.

A Phase IA archeological survey commissioned by GMP concluded that the full extent of shoreline along the project impoundment should be considered sensitive for Native American archeological sites. The Phase IA archeological survey noted the potential for European-American archeological sites in proximity to the Vergennes Project along both sides of Otter Creek to the upper project limits. The survey did not, however, include location or identification of any specific sites. The VDHP has not yet commented on GMP's Phase IA archeological survey report.

According to a field investigation of the project impoundment (GMP, 1996), the shoreline is experiencing soil erosion and sedimentation, particularly in the middle and upper reaches. One of the Native American sites is located in an area experiencing noticeable erosion. Soil erosion and sedimentation along the Vergennes impoundment is due to, but not limited to, the current peaking mode of project operation, high flow conditions, and erodible clay soils, lack of a buffer zone between the river corridor and adjacent cultivated farmland, and the presence of cattle use along the shoreline.

b. Environmental effects and recommendations: Responding to the VANR's review of its draft license application, GMP agreed to replace the deteriorated windows and roof of Norton's Grist Mill. These actions would contribute to the stabilization and protection of this contributing element in the Vergennes Historic District. GMP also agreed to construct an ADA-compliant fishing access platform on the western bank of Otter Creek between the Plant 9 powerhouse and the city park immediately downstream, an

area which is within the boundary of the Vergennes Historic District.

Our Analysis

Vergennes Falls has been used for hydropower industry since the middle of the 18th century, and electric power has been generated from the falls since the 1890's. The Vergennes Hydroelectric Project, built between 1911 and 1943, possesses significance in the context of hydroelectric power plant design and construction in the state of Vermont. The historic project components meet National Register Criterion C by possessing properties "that embody the distinctive characteristics of a type, period, or method of construction" (GMP, 1997). Continued operation and maintenance of the Vergennes Project with additional staff-recommended measures would maintain its historic facilities for the purpose for which they were originally designed and built, and would therefore, be beneficial to the National Register-listed Vergennes Historic District.

GMP's proposal to operate the project in ROR mode would eliminate the 1.5-foot reservoir drawdown required under the current peaking mode. While elimination of the drawdown may reduce some localized erosion within the fluctuation zone, it would not eliminate it, soils, erodible clay, bank steepness, and stream geometry (see section V.C.1, Water Resources, for further discussion). Consequently, known and as yet unknown archeological sites along the project impoundment may be affected by continued soil erosion.

GMP's proposal to replace the deteriorated roof and windows of Norton's Grist Mill could result in adverse effects on the Vergennes Historic District through alteration of an element contributing to the district's significance. The Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings, are intended to ensure that rehabilitation measures avoid or minimize actions that may diminish characteristics that qualify Historic Properties for the National Register. Adherence to these guidelines in consultation with the Vermont State Historic Preservation Officer (SHPO) would ensure that adverse effects on the National Register-listed Vergennes Historic District arising from replacement of Norton's Grist Mill's roof and windows would be avoided or minimized.

GMP's proposal to construct a disabled-accessible fishing access platform below the Plant 9 powerhouse would introduce a new structure within the boundary of the Vergennes Historic District. Consultation with the SHPO concerning the design and materials of the platform would avoid introduction of an element out of character with the Historic District that might diminish

the characteristics for which the District has been listed in the National Register.

To protect the Historic Properties and archeological sites, we recommend that a PA be developed and executed pursuant to Section 106 of the National Historic Preservation Act and the regulations of the Advisory Council, 36 CFR Part 800.

The PA would require the licensee to develop, for Commission approval, and, upon approval, implement, a Cultural Resources Management Plan (CRMP). The CRMP would accomplish several purposes, one of which would be to specify a procedure for continued project operation and maintenance without loss of its historic integrity.

c. Cumulative effects: Continuing to operate and maintain the Vergennes Hydroelectric Project, the repair of Norton's Grist Mill, and the addition of a fishing platform, could have potential cumulative effects on the Vergennes Historic District which is an Historic Property of statewide significance. GMP's proposal to continue operating and maintaining the Vergennes Project with our recommended CRMP would maintain the historic character and use of the project facilities, and would therefore provide beneficial cumulative effects by preserving resources of statewide significance over the next 30 to 50 years. GMP's proposal to repair Norton's Grist Mill with our recommended CRMP would have beneficial effects on the Vergennes Historic District by ensuring that any alteration to Norton's Grist Mill would be done in a manner that would preserve the historic integrity of this resource of statewide significance.

GMP's proposal to add a fishing platform with our recommended CRMP would ensure that the fishing platform is designed to be compatible with the historic character of the Vergennes Historic District.

We conclude that GMP's proposed action, along with our recommendations, would have a beneficial cumulative effect on cultural resources by protecting and enhancing the physical characteristics and qualities of historical association that have qualified the Vergennes Historic District for listing in the National Register as a resource of statewide importance.

d. Unavoidable adverse effects: None.

D. No-action

Under the no-action alternative, GMP would continue to operate the project under the terms of the original license. No proposed environmental enhancements would be implemented.

VI. DEVELOPMENTAL ANALYSIS

In this section, we analyze the project's use of Otter Creek's available water resources to generate hydropower; estimate the economic benefits of the proposed project; and estimate the cost of various environmental protection, mitigation, and enhancement measures and the effects of these measures on project operations.

A. Power and Economic Benefits of the Project

We based the value of the project's power benefits on the costs of operating alternative resources in GMP's system. This value yields a reasonable estimate of project value for the purposes of our economic studies, which are (1) to provide a basis for measuring the economic benefits of proposed project operation and (2) to provide a basis for estimating the cost of replacing power for any staff alternatives that would reduce project generation and/or capacity.

The value of the project power is the cost of the cheapest, most reasonable generation resource available in the region. This resource is a natural gas-fueled combined-cycle electric plant. The cost of new combined-cycle generating capacity is about \$109/kW-year (at a fixed charge rate of 14 percent). Our estimate of the fuel cost (based on fuel consumption at a heat rate of 6,200 Btu/kWh) is \$16.5 mills/kWh. We estimated the 1998 fuel cost based on information in Energy Information Administration, Supplement to the Annual Energy Outlook, March 1998. At a 90 percent capacity factor, the total cost of firm power and energy would be \$30.32 mills/kWh. Table 7 summarizes the values that we use for key parameters in our analysis.

Table 7. Summary of key parameters for economic analysis of GMP's proposed Vergennes Project (Source: Staff)

Parameter	Value
Period of analysis	30 years
Term of financing	20 years
Interest/discount rate	10.0 percent ¹
Escalation rate	0 percent
Federal tax rate	34 percent
Local tax rate	3 percent
Insurance rate	0.25 percent of cost to construct
Operation and maintenance cost (1997) ²	\$264,173
Net investment	\$0 ³
Energy value (1998)	16.5 mills/kWh
Capacity value (1998)	109 \$/kW-yr
Total power value (alternate generation)	30.32 mills/kWh
Application preparation cost	\$570,000

¹ The discount rate of 10 percent is typical for this type of analysis and reflects the cost of borrowing money.

² GMP's 1997 FERC Form #1, page 411.

³ GMP's application did not provide a value for net investment. The staff assumes that the net investment is effectively \$0.

We used these assumptions to analyze the economics of the proposed project, which consist of operation of the Vergennes Project with GMP's proposed environmental and safety measures. Table 8 summarizes the annual costs of GMP's proposed enhancements for the Vergennes Project.

Table 8. Summary of annual costs of GMP's proposed enhancements for the Vergennes Project (Source: Staff)

Protection, mitigation, or enhancement measures	Capital cost ¹ (1998\$)	Operation & maintenance (1998\$)	Annual cost (1998\$)
Provide first call flows for fish resources ²	\$0	\$0	\$3,100
Provide seasonal aesthetic flows ³	\$0	\$0	\$22,100
Recreation enhancements	\$166,000	\$0	\$24,900
Provide improvements to Grist Mill building	\$40,000	\$0	\$6,000
Provide automatic controls	\$100,000	\$0	\$15,000

¹ GMP identified capital improvement and economic assumptions in its application.

² GMP proposes to release flows that would result in a loss of 0.103 GWh of energy generation annually.

³ GMP proposes to provide aesthetic flows that would result in a loss of 0.7299 GWh of energy generation annually.

Based on these assumptions, we estimate that the annual net benefit of GMP's proposed Vergennes Project would be about -\$62,000 (-6.56 mills/kWh).

The estimated average annual output of the project would be 9.4551 GWh. This would provide annual power value of \$286,700, and an annual net cost of \$348,700 for the project.

B. Cost of Environmental Protection, Mitigation, and Enhancement Measures

In this section, we present the annual costs of the proposed action with additional staff-recommended measures.

Based on the proposed action with additional staff-recommended measures, we estimate that the annual benefit would be about 9.45 GWh of energy annually or about -\$63,200 (-6.68

mills/kWh). Each measure recommended by the staff could affect project economics through costs (capital expenditures, operation and maintenance, etc.). Table 9 summarizes the costs and net benefits associated with the staff's recommended enhancements.

Table 9. Summary of annual costs of the staff-recommended enhancements for GMP's proposed Vergennes Project
(Source: Staff)

Protection, mitigation, or enhancement measures ¹	Capital cost (1998\$)	Operation & maintenance (1998\$)	Annual cost (1998\$)
Develop and implement a plan to monitor ROR, aesthetic flows, first call flows for fish resources	\$5,000	\$500 ²	\$1,300
Execute a PA and develop and implement a CRMP	\$5,000	\$0	\$800

¹ Cost of recommendations for portable toilets and final design drawings for recreation enhancements are considered to be minor and can be accommodated into the recreation development costs that GMP proposes. Costs associated with our first call flow allocations also would be minor.

² The staff estimated the O&M costs.

For the Vergennes Project, the enhancements that GMP proposes would increase capital costs by \$306,000. In addition to the proposed action, the additional staff-recommended measures would increase capital costs by \$10,000.

Table 10 summarizes the capacity, energy, power value, project cost, and net benefits for each of the alternatives for the project. In section VII, Comprehensive Development and Recommended Alternative, we discuss both the economic and environmental basis for the staff-recommended alternative.

Table 10. Summary of net annual benefits of alternatives for GMP's proposed Vergennes Project (Source: Staff)

	GMP's proposed action	Proposed action with additional staff- recommended measures	No-action
Annual generation	9.455 GWh	9.455 GWh	10.288 GWh
Installed capacity	2.4 MW	2.4 MW	2.4 MW
Annual power value (\$)	286,700 30.32 mills/kWh	286,700 30.32 mills/kWh	311,900 30.32 mills/kWh
Annual cost (\$)	348,700 36.88 mills/kWh	349,900 37 mills/kWh	330,400 32.11 mills/kWh
Net annual benefit (\$)	(62,000) (6.56 mills/kWh)	(63,200) (6.68 mills/kWh)	(18,500) (1.79 mills/kWh)

Note: All costs and benefits are levelized over 30 years.

Our evaluation of the economics of the proposed action and the proposed action with additional staff-recommended measures appears to cost more than currently available market pricing or alternative power costs. Based on the record in this proceeding, we conclude that it is in the public interest to license the project, and leave to GMP the decision of whether or not to continue operating the existing project.

C. No-action

Under the no-action alternative, the project would continue to operate under the current mode of operation, and no new environmental protection, mitigation, or enhancement measures would be implemented.

The annual cost of the existing project, including carrying charges on application preparation cost is about \$330,400 (32.11 mills/kWh), for the existing generation of about 10.288 GWh of energy annually. We estimated that the cost of alternative power is about 30.32 mills/kWh. Therefore, the existing project would produce power at an annual cost of about \$-18,500 (-1.79 mills/kWh) more than the currently available alternative.

D. Pollution Abatement

The Vergennes Project would generate about 9.4551 GWh of electricity annually. This amount of hydropower generation, when contrasted with the generation of an equal amount of energy produced by fossil-fueled facilities, avoids the unnecessary emission of atmospheric pollutants. Assuming that the 9.4551 GWh of power produced by the project would be replaced by an equal amount of power produced by natural gas-fired utilities, then generating electrical power equivalent to that produced by the Vergennes Project would require combustion of about 97 million cubic feet of natural gas annually. In addition, removal of pollutants from the emissions produced by burning fossil fuels to those levels presently achievable by state-of-the-art technology would cost about \$5,000 (1998\$) annually.

VII. COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10(a)(1) of the FPA require the Commission to give equal consideration to all uses of the waterway on which the project is located. When we review a hydropower project, we consider the water quality, fish and wildlife, recreational, and other nondevelopmental values of the involved waterway equally with its electric energy and other developmental values. In determining whether, and under what conditions, to license a project, the Commission must weigh the various economic and environmental tradeoffs involved in the decision.

This section contains the basis for, and a summary of, our recommendations to the Commission for the licensing of the Vergennes Project. We weigh the costs and benefits of our recommended alternative against other proposed measures.

A. Recommended Alternative

Based on our independent review and evaluation of the proposed action, the proposed action with additional staff-recommended measures, and no-action, we select the proposed action with our additional recommended environmental measures as the recommended alternative.

We recommend this alternative because: (1) issuance of a license would allow GMP to operate the project as a dependable source of electric energy; (2) the 9.4551 GWh project would avoid the need for an equivalent amount of fossil-fuel fired electric generation and capacity, continuing to help conserve these nonrenewable energy resources and reduce atmospheric pollution; and (3) the recommended measures would protect fish and terrestrial resources, improve public use of recreation facilities and resources, improve multiple use and management of project lands, improve aesthetics, and maintain and protect

historic and archeological resources within the area affected by project operations.

We recommend including the following measures in any license issued for the Vergennes Project:

- (1) Convert the Vergennes Project from daily peaking to ROR operation, where outflow approximates inflow on an instantaneous basis.
- (2) Release aesthetic flows over Vergennes Falls as follows: April 1 through October 31--150 cfs daytime ($\frac{1}{2}$ hour before sunrise to $\frac{1}{2}$ hour after sunset), 75 cfs nighttime; November 1 through December 15--100 cfs ($\frac{1}{2}$ hour before sunrise to $\frac{1}{2}$ hour after sunset), 50 cfs nighttime; December 16 through March 31--no aesthetic flows released.
- (3) Give Plant 9 first call (bring on line first and provide a continuous outflow at all times that the project is operating) during periods of potential use of the project tailrace area by walleye and lake sturgeon during their spawning and egg incubation periods (April 1 to June 15) and from September 15 through November 15 (the period when landlocked salmon may concentrate in the project tailwaters).
- (4) Implement recreational enhancements to include: (1) directional and interpretive signs for recreation in the project area; (2) improve access for small boats and better define the parking area at Settler's Park; (3) improve the trail, shoreline fishing access, vegetative planting, and picnic area along the western bank of the lower Otter Creek in the falls basin near Plant 9; (4) construct a disabled-accessible fishing platform on the western bank near Plant 9 in accordance with ADA guidelines; (5) install signs interpreting the history of the falls and the surrounding structures; (6) install portable toilet facilities in the area below Vergennes Falls; and (7) enhance aesthetics including windows and roof replacement at the former Norton's Grist Mill building on Grist Mill island overlooking Vergennes Falls. The final designs for the recreational enhancements should be developed in consultation with the VANR, SHPO, and the city of Vergennes.
- (5) Implement the provisions of a PA to protect Historic Properties and archeological sites.
- (6) Develop and implement a plan to monitor ROR operation, aesthetic flow releases, and first call flows to Plant 9 for fish resources in consultation with the VANR, FWS, USGS, and the city of Vergennes. This plan, to be submitted for

Commission approval, should include a description of the use of generation records and the exact locations and designs of impoundment and downstream water level recording devices, and an implementation schedule. The plan should include provisions to furnish the results of the monitoring to the Commission and the resource agencies. Upon Commission approval, GMP should implement the approved plan, including any changes to the plan made by the Commission, according to the approved schedule.

Implementation of these measures would improve recreational and aesthetic opportunities; protect aquatic, terrestrial, and cultural resources in the project area; and provide for the best use of the waterway.

The costs of some of these measures would reduce the net benefit of the project. As discussed in section VI, we estimate that the project as proposed by GMP would cost more than currently available alternative power. Our proposed additional environmental measures would increase this economic gap. Specifically, four of our additional recommended measures would reduce the economic benefits of the project. These include: (1) develop and implement a flow monitoring plan; (2) install portable toilet facilities (including disabled-accessible facilities) in the area below Vergennes Falls; (3) develop final design drawings for recreational enhancements in consultation with the VANR, SHPO, and the city of Vergennes; and (4) implement the provisions of a PA.

1. Develop and Implement a Flow Monitoring Plan

GMP does not propose to monitor ROR operation, first call flows for fish resources, or aesthetic flows. Because habitat suitability, fish passage, aesthetic, and historic resources could be affected by inconsistent flow releases and water surface elevations, compliance with our recommended flow releases and water level management regime should be monitored.

We recommend that GMP develop and implement a monitoring plan for the Vergennes Project that would provide for measuring and reporting ROR flows (see section V.C.1), first call flows for fish resources (see section V.C.2), and aesthetic flows (see section V.C.4). The plan should be developed in consultation with the VANR, FWS, USGS, and the city of Vergennes. We estimate that the current annual cost of this monitoring and documentation of compliance with the recommended flows would be \$1,300. The capital cost associated with the preparation of this plan would be modest. Requiring the plan, however, would provide the resource agencies and the Commission with useful and necessary information, and allow the Commission to determine compliance

with operational requirements that may be included in any license that may be issued for the Vergennes Project.

2. Install Portable Toilet Facilities

GMP does not propose to install any toilet facilities. During the scoping process, local residents commented on the need for toilet facilities in the area below Vergennes Falls during the recreation season. Portable toilet facilities would help meet this need during the peak recreation season. We recommend, therefore, that GMP provide portable toilet facilities with the number and location of these facilities to be determined in consultation with the city of Vergennes (see section V.C.5). We estimate that the costs of these facilities would be minor relative to the overall costs of the recreational enhancements.

3. Develop Final Design Drawings for Recreation Enhancements in Consultation with the VANR, SHPO, and the City of Vergennes

GMP proposes to develop final designs for the proposed recreation enhancements in consultation with the VANR and the city of Vergennes. The proposed facilities could affect the historic character of the Vergennes Historic District. We recommend, therefore, in addition to consultation with the VANR and the city of Vergennes, that GMP also consult with the SHPO in the development of the final design of the recreation enhancements (see section V.C.6). We estimate that this consultation would not increase GMP's estimated costs for recreation enhancements. Costs associated with SHPO consultation are included in our estimated costs for the CRMP.

4. Implement the Provisions of a PA

Specifically, GMP has not proposed to develop or implement a PA. However, a proposed CRMP is included in GMP's license application as appendix 4. A PA would contain a stipulation requiring the licensee to prepare, and upon Commission approval, implement, a CRMP, in consultation with the SHPO, addressing the management of Historic Properties and archeological sites within the project's APE and consideration of the effects of recreational enhancements. The proposed CRMP would serve as an outline for the management of Historic Properties and be incorporated into a final CRMP (see section V.C.6). We estimate that the current annual cost of preparing the CRMP would be \$800, a relatively minor amount in relation to total costs.

B. Conclusion

Based on our review of the agency and public comments filed on the project, and on our independent analysis pursuant to sections 4(e), 10(a)(1), and 10(a)(2) of the FPA, we conclude that licensing the Vergennes Project as proposed by GMP with additional staff-recommended measures, would provide for the best comprehensive development of Otter Creek.

VIII. CONSISTENCY WITH FISH AND WILDLIFE RECOMMENDATIONS

Under the provisions of Section 10(j) of the FPA, each hydroelectric license issued by the Commission shall include conditions based on recommendations of federal and state fish and wildlife agencies submitted to adequately and equitably protect, mitigate damages to, and enhance fish and wildlife (including spawning grounds and habitat) affected by the project. No 10(j) recommendations were filed by state and federal resource agencies in response to our notice of application ready for environmental analysis. We evaluated the VANR comments that were filed on June 1, 1998, under Section 10(a).

IX. CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2) of the FPA requires the Commission to consider the extent to which a project is consistent with federal and state comprehensive plans for improving, developing, and conserving waterways affected by the project. Under Section 10(a)(2), federal and state agencies filed 23 plans that address various resources in Vermont. Ten of these plans address

resources relevant to the Vergennes Project.^{5/} No conflicts were found with the plans.

X. FINDING OF NO SIGNIFICANT IMPACT

With our recommended protection and enhancement measures, relicensing of the Vergennes Project would protect fish and terrestrial resources, improve public use of recreation facilities and resources, and improve aesthetics. With our recommended consultation with the SHPO, execution of the PA, and development and implementation of a CRMP, no significant effects on cultural resources are expected.

-
- 5/ (1) Lake Champlain Fish and Wildlife Policy Committee and Technical Committee. 1981. A strategic plan for development of salmonid fisheries in Lake Champlain. Albany, New York. Waterbury, VT. 19 pp.; (2) Vermont Agency of Environmental Conservation. 1983. Vermont state comprehensive outdoor recreation plan, 1983-1988. Montpelier, VT. June 1983. 195 pp. and appendices; (3) Vermont Agency of Environmental Conservation. 1986. Vermont Rivers Study. Waterbury, VT. 236 pp.; (4) Vermont Agency of Natural Resources. Department of Environmental Conservation. 1988. Hydropower in Vermont: an assessment of environmental problems and opportunities. Waterbury, VT. May 1988. Two volumes; (5) Vermont Agency of Natural Resources. Department of Forests, Parks and Recreation. 1988. Vermont recreation plan. Waterbury, VT. 128 pp. plus map, nine supplemental task group reports, and a 52-page resident recreation survey; (6) Vermont Agency of Natural Resources. Department of Forests, Parks and Recreation. Wetlands Steering Committee. 1988. Wetlands component of the 1988 Vermont recreation plan. Waterbury, VT. July 1988. 43 pp.; (7) Fish and Wildlife Service. Canadian Wildlife Service. 1986. North American waterfowl management plan. Department of the Interior. May 1986. 19 pp.; (8) U.S. Fish and Wildlife Service. Undated. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, DC. 11 pp.; (9) U.S. Fish and Wildlife Service. 1989. Final environmental impact statement - restoration of Atlantic Salmon to New England Rivers. Department of the Interior. Newton Corner, MA. May 1989. 88 pp.; (10) National Park Service. 1982. The nationwide rivers inventory. Department of the Interior, Washington, DC. January 1982. 432 pp.

Based on our independent analysis, issuance of a license for the Vergennes Project as proposed by GMP with additional staff-recommended measures would not constitute a major federal action significantly affecting the quality of the human environment.

XI. LITERATURE CITED

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XII. LIST OF PREPARERS

- Lee Emery--Task Monitor (Fisheries Biologist; M.S., Zoology)
- Kevin Young--Deputy Project Manager (M.S., Aquatic Sciences)
- Steve Amaral--Fishery Resources (Fisheries Biologist; M.S.,
Fisheries Biology)
- Martha Bowers--Cultural Resources (Architectural Historian; M.A.,
American History)
- Alynda Foreman--Water Resources (Ecologist; M.S., Great Lakes
Research and Education, Multidisciplinary Studies)
- Karen Hardy--Recreation, Aesthetics, and Land Use Resources
(Recreation Planner; M.L.A., M.U.R.P., Regional Planning)
- Douglas Hjorth--Terrestrial and Water Resources (Aquatic
Ecologist; M.A., Biology)
- Chris Orphanides--Recreation and Land Use Resources (B.A.,
Environmental Studies and History)
- Douglas Phethean--Need for Power, Developmental Resources
(Engineer; B.S., Electrical Engineering)
- Denise Short--Technical Editor (B.A., English)

Appendix A: Comments on the Draft Environmental Assessment

Comment letters on the Draft EA issued August 13, 1998, appear in the following order:

<u>Entity</u>	<u>Date of Letter</u>
Green Mountain Power	September 11, 1998
Vermont Agency of Natural Resources	September 17, 1998

Response to Comments of
Green Mountain Power Corporation
on the Draft Environmental Assessment for the
Vergennes Project
September 11, 1998

GMP-1 No response required.

GMP-2 Please see our response to VANR-5.

GMP-3 VANR's definition of first call as presented in its letter of March 20, 1997, was not clear. VANR clarified its definition in response to the Draft EA. Please see our response to VANR-5.

GMP-4 In its comments on the draft EA, the VANR indicates that it agrees with GMP's proposal to provide continuous outflow from Plant 9 during seasonal time period by giving first call on water to one unit in Plant 9. Therefore, we agree with your comments and revised our analysis and recommendations in section V.C.2.b accordingly (see our response to VANR-5).

GMP-5 No response required.

GREEN MOUNTAIN POWER CORPORATION
100 Main Street, Suite 200
Vergennes, VT 05491-1000

SEP 14 1998

September 11, 1998

Re: Vergennes Hydroelectric
Project, FERC Project No. 2674-VT

David P. Berger, Secretary
Federal Energy Regulatory Commission
185 First Street, N.E.
Room 1-A
Washington, DC 20426

Dear Mr. Berger:

Green Mountain Power Corporation (GMP) has reviewed the FERC's Draft Environmental Assessment (DEA) for the Vergennes Hydroelectric Project (FERC Project No. 2674-VT), dated August 13, 1998, and is hereby filing these comments. The FERC recommended GMP's proposed enhancements with additional self-recommended measures.

GMP takes exception with one self-recommended measure. The FERC recommended that both units of Plant 9 be operated on a first call on water basis, from April 1 through June 15. The reason for this recommendation is to enhance potential spawning habitat for walleye and lake sturgeon. GMP proposes to operate at least one unit of Plant 9.

Based on the analysis of the Fisheries resources, it was determined that operating one unit at Plant 9 would provide sufficient structure flows. The Vermont Agency of Natural Resources requested by letter dated March 20, 1998 that GMP maintain outflow from Plant 9 during spring spawning season, which GMP has proposed in the license application.

Energy has information regarding GMP's proposed flow operation of Plant 9 was compared to the FERC recommendations. GMP's proposed operating one unit at Plant 9 for the period between April 1 and June 15 for walleye and sturgeon spawning as well as the period between September 15 and November 15. Using the FERC recommendations of Plant 9 getting first call on water for its two units (700 cfs) for the period between April 1 and June 15, an additional loss of energy was computed to be 30,000 Kwh. GMP does not believe that this additional loss of energy is justified by the potential small fisheries gain that will be achieved.

Thank you for your consideration of this matter.

Very truly yours,

Clayton M. Murphy
Craig J. Spoke
Vice President

U:\M\m

Enclosed - 3 copies

cc: Service List

980915.0202.3

SEP 14 1998



State of Vermont

Department of Fish and Wildlife
Division of Forests, Parks and Recreation
Forestlands and Environmental Conservation
Rural Building
100 SOUTH STREET, 3RD FLOOR
MONTPELIER, VT 05602
1-800-255-1162

ORIGINAL

OFFICE OF THE SECRETARY OF NATURAL RESOURCES
50 SEP 21 PM 1:13
FERNANDEZ ENERGY
REGULATORY
COMMISSION
100 South Main Street
Building 10 North
Windsorbury, VT 05671-4400
Tel: 800-255-1162
Fax: 800-255-1162

September 17, 1998

COMMENTS ON DRAFT ENVIRONMENTAL ASSESSMENT

VERGENNES HYDROELECTRIC PROJECT
FERC PROJECT NO. 2874 - CO-3
GREEN MOUNTAIN POWER CORPORATION

David P. Burgeon, Secretary
Federal Energy Regulatory Commission
888 First Street, NE, Room 1-A
Washington, D.C. 20426

Dear Secretary Burgeon:

The Vermont Agency of Natural Resources (Agency) hereby files comments on the Draft Environmental Assessment (draft EA) for the Vergennes Hydroelectric Project, for which a "Notice of Availability of Draft Environmental Assessment" was issued on August 13, 1998. The Agency is substantially in agreement with the conclusions reached by FERC staff in the draft EA. The environmental and public use issues have been thoroughly explored, and we appreciate FERC staff's general support of the mitigation and enhancement measures developed between the licensee, the Agency, and other parties.

Section V.C.2, Aquatic Resources

A. Affected environment:

Fisheries Resources

In this section, on p. 17, late surveyors use of the reach below Vergennes Falls is discussed. The text indicates that the Agency had stated in its June 30, 1995 letter to the licensee that surveyors may be spawning below the project dam. That could be inferred from what we had stated, but technically we only stated that surveyors have been exhibiting spawning behavior by ascending the river in the spring. This occurs in other major late tributaries that historically supported

980924-0209-3
Regional Office - Burlington, Vermont
September 21, 1998

VANR-1

VANR-2

Response to Comments of
the Vermont Agency of Natural Resources
on the Draft Environmental Assessment for the
Vergennes Project
September 17, 1998

VANR-1 No response required.

VANR-2 We have modified the text in section V.C.2.a to reflect your clarification and added new text to reflect more recent sighting of Lake Sturgeon below Vergennes dam.

Secretary Bongers
September 17, 1996
Page 2

spawning as well. Spawning unfortunately has not been documented, however. By way of an update, there have been reported sightings of sargento below Vergennes as recently as the last week of May 1996.

There is a typo in the first full paragraph of p. 17. The scoping meeting was in December 1997, not 1998.

In the first paragraph of p. 18, it is stated that fall anglers showed a preference for catching chinook and walleye. Anglers in the fall predominantly target salmon and trout. The survey indicates that bass are also popular, but they are not a seasonal fishery. The survey question may not have been clearly clear to that the anglers interviewed in the fall may have been indicating that they also fish for walleye, but in the spring.

b. Environmental effects and recommendations:

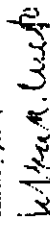
The interpretation of a "first call" operating rule discrepancy between GMP and the Agency is incorrect. The Agency's goal was to have preferential operation of Plant 9 by bringing that station on line first and maintaining it on line at all times that the project is operating during the seasonal time periods. We did not ask GMP to keep Plant 98 off line until Plant 9 reached full capacity of both units. Use of Plant 98 is acceptable to the Agency when flows exceed 350 cfs via Plant 9 plus spillage. We apologize for not making this clear previously.

Section VI.A. Power and Economic Benefits of the Project

Footnote 4 (related to conversion in run-of-river) for Table 8 does not seem to be associated with application preparation cost.

Thank you for the opportunity to comment on the draft EA.

Sincerely yours,


Jeffrey R. Collins, P. E.
Principal Hydrologist

cc: Clark Palmer, Jr.
FERC was not fax

VANR-3 We have corrected the typographical error in section V.C.2.a as suggested.

VANR-4 We reviewed the responses to question 10 of the GMP angler survey and note that fall anglers prefer salmon (34 percent), trout (13 percent), and walleye (8 percent). We have revised the text in section V.C.2.a accordingly.

VANR-5 Thank you for the clarification on the definition of "first call." While our interpretation of "first call" would have provided some additional habitat benefit, we agree that your definition of "first call" (bringing one unit of Plant 9 on line first and maintaining a continuous outflow of at least 350 cfs from Plant 9 during the seasonal time periods) would provide a continuous and adequate outflow on the western side of the tailrace to enhance fisheries resources. We have revised our analysis and recommendations and modified the text accordingly.

VANR-6 We agree and delete footnote 4.

VANR-7 No response required.



Vermont Department of Environmental Conservation

Agency of Natural Resources

Dam Safety and Hydrology Section

103 South Main Street

[phone] 802-241-3758

Waterbury, VT 05671-0511

[fax] 802-244-4516

<http://www.anr.state.vt.us/dec/fed/dss.htm>

September 11, 2008

John B. Voyer III
Manager of Plant Operations
Green Mountain Power
163 Acorn Lane
Colchester, VT 05446-6611

RE: Vergennes Hydroelectric Project – FERC Project No. 2674
Plant 9 Trashrack Replacement

Dear Mr. Voyer:

By letter dated May 28, 2008, you confirmed the information contained in your telephone call of August 29, 2008, that Green Mountain Power needed to proceed with emergency replacement of the trashrack at Vergennes Plant 9. Trashrack replacement at Vergennes is subject to Condition F of the water quality certification:

Prevention of Fish Entrainment at Intakes. Prior to any future replacement of the Plant 9 or Plant 9B trashracks, the applicant shall consult with the Department of Fish and Wildlife with respect to appropriate bar clear spacing and file the trashrack design information with the Department of Environmental Conservation for approval prior to commencement of work.

The trashrack is being replaced in kind with the same one-inch bar spacing. I contacted the Department of Fish and Wildlife, and that department does not object to the proposal as long as the bar spacing remains the same. Please consider this letter as approval of the trashrack replacement as proposed.

Green Mountain Power may wish to consider developing a design for the trashrack at Plant 9B and providing it to the Department of Fish and Wildlife for review. That way an approvable plan would be available for future use.

Please contact me if you have any questions.

Very truly yours,

A handwritten signature in black ink that reads "Jeffrey R. Cueto". The signature is written in a cursive, flowing style.

Jeffrey R. Cueto, P.E.
Chief Hydrologist

John Voyer
September 11, 2008
Page 2

c Rod Wentworth, VT Department of Fish and Wildlife
Melissa Grader, US Fish and Wildlife Service
John Warner, US Fish and Wildlife Service
FERC
Renny Perry, City Manager, Vergennes

Document Content(s)

TrashrackRepl.PDF.....1-2

From: [Rosset, Julianne](#)
To: [Katie Sellers](#)
Cc: Eric.Davis@vermont.gov; [Melissa Grader](#)
Subject: Vergennes LIHI Certification
Date: Wednesday, December 02, 2015 12:50:25 PM

Dear Ms. Sellers,

The U.S. Fish and Wildlife Service has received your request for feedback regarding compliance of the Vergennes Hydroelectric Project with the requirements of its license (FERC Project No. 2674).

The Service has reviewed the Project file and is not aware of any compliance issues at this time. However, we understand the Vermont Department of Environmental Conservation has requested operations data to ensure the Project is in compliance with flow management conditions prescribed by Condition B and minimum flows prescribed by Conditions I and F of the Water Quality Certification. We defer to the State and support any findings it may have based on its review of the operations data.

We are currently in the process of reviewing Essex 19 files (FERC Project No. 2513) and consulting with other agencies but hope to provide a response by the end of next week.

If you have any questions, please feel free to contact me (413-548-8002 x8120) or Melissa Grader (413-548-8002 x8124).

Kind regards,

Julianne Rosset

Julianne Rosset
U.S. Fish and Wildlife Service - New England Field Office
103 East Plumtree Road
Sunderland, MA 01375
413-548-8002 x8120
julianne_rosset@fws.gov

From: Katie Sellers
To: ["Melissa_Grader@fws.gov"](mailto:Melissa_Grader@fws.gov)
Cc: [Laura Cowan](#)
Subject: RE: LIHI Certification - Request for USFWS Feedback
Date: Wednesday, October 21, 2015 3:08:00 PM

Dear Ms. Grader,

To follow-up with my earlier emails regarding LIHI Certification and Project compliance review, I am hoping that you could take a moment to review Essex 19 Hydroelectric Project and Vergennes Hydroelectric Project compliance with the following listed license articles/requirements. A simple email response confirming Project compliance with the below requirements would suffice.

Essex 19 Hydroelectric Project (FERC Project No. 2513):

Could you please confirm that the Project continues to be in compliance with mandated fish passage requirements:

- 1995 License Article 410 "Downstream Fish Passage Monitoring Plan"
- 1995 License Article 408 "Trap and Truck Program"
- 1995 License Article 411 "Walleye Mortality Contingency Plan"

Vergennes Hydroelectric Project (FERC Project No. 2674):

Could you please confirm that "no fish passage requirements" remain the latest agency recommendation for this facility?

Thank you in advance for your time,
Katie Sellers

Katie Sellers
Regulatory Coordinator

Office: 207-416-1218
www.KleinschmidtGroup.com

From: Katie Sellers
Sent: Tuesday, September 08, 2015 3:27 PM
To: 'Melissa_Grader@fws.gov'
Cc: Laura Cowan; 'Scarzello, Michael'; Andy Qua
Subject: RE: LIHI Certification - Request for USFWS Feedback

Dear Ms. Grader,

Please let me know if you have any questions while reviewing Vergennes Hydroelectric Project, Otter Creek Hydroelectric Project, and Essex 19 Hydroelectric Project compliance with relevant prescriptions and/or license articles listed in the previously provided questionnaires.

Thank you for your help with the LIHI Certification process and I look forward to your responses.

Best,
Katie Sellers

Katie Sellers
Regulatory Coordinator

Office: 207-416-1218
www.KleinschmidtGroup.com

From: Katie Sellers
Sent: Wednesday, August 19, 2015 3:32 PM
To: 'Melissa_Grader@fws.gov' <Melissa_Grader@fws.gov>
Cc: Laura Cowan <Laura.Cowan@KleinschmidtGroup.com>
Subject: LIHI Certification - Request for USFWS Feedback

Dear Ms. Grader,

Kleinschmidt Associates is assisting Green Mountain Power (GMP) with applying for certifications from the Low Impact Hydropower Institute (LIHI) for the Vergennes Hydroelectric Project (FERC No. 2674), Otter Creek Hydroelectric Project (FERC No. 2558), and the Essex 19 Hydroelectric Project (FERC No. 2513). LIHI is a non-profit organization dedicated to reducing the impacts of hydropower generation through the certification of hydropower projects that have avoided or reduced their environmental impacts pursuant to LIHI criteria.

As part of the application process, LIHI requests correspondence from relevant resource agencies to confirm that projects are in compliance with prescriptions and license articles. To that end, Kleinschmidt is requesting feedback from regulatory agencies to confirm validity and compliance with relevant prescriptions and/or articles.

Attached, you will find questionnaires for Vergennes Hydroelectric Project, Otter Creek Hydroelectric Project, and Essex 19 Hydroelectric Project. If you could please complete each of the enclosed questionnaires and return to my attention, Katie Sellers, by email (katie.sellers@kleinschmidtgroup.com) within 15 days of receipt, it would be much appreciated.

Thank you in advance for your time,

Katie Sellers

Katie Sellers
Regulatory Coordinator

Office: 207-416-1218

Kleinschmidt

August 19, 2015

VIA EMAIL

Vergennes Hydroelectric Project (FERC No. 2674) Low Impact Hydroelectric Power Institute Certification Application

Dear Ms. Grader:

Kleinschmidt is assisting Green Mountain Power Corporation (GMP) with applying for a certification from the Low Impact Hydropower Institute (LIHI) for the Vergennes Hydroelectric Project (FERC No. 2674). LIHI is a non-profit organization dedicated to reducing the impacts of hydropower generation through the certification of hydropower projects that have avoided or reduced their environmental impacts pursuant to LIHI criteria. LIHI's Certification Program encourages a range of benefits associated with healthy rivers and enables low impact projects to access renewable energy markets. More information regarding LIHI, including a description of certification criteria, can be found at <http://www.lowimpacthydro.org>.

Kleinschmidt is preparing a LIHI certificate application demonstrating how the Vergennes Hydroelectric Project meets LIHI certification criteria. The application will include existing documentation describing Project history of compliance with the FERC licensing. In addition, the LIHI application requests correspondence from relevant resource agencies to confirm that the Project is in compliance with prescriptions and license articles.

Therefore, the purpose of this letter is to:

- Request that you confirm Vergennes Hydroelectric Project operations do not negatively affect any federal or state listed endangered or threatened species.

To that end, Kleinschmidt appreciates your assistance with the completion of the enclosed questionnaire. Please complete and return the enclosed questionnaire to my attention, Katie Sellers, by e-mail to Katie.Sellers@KleinschmidtGroup.com within 15 days of receipt.

Please call me at 207-416-1218 or email with any comments or questions that you might have.

Sincerely,

KLEINSCHMIDT ASSOCIATES



Katie Sellers
Regulatory Coordinator

KES:TMJ

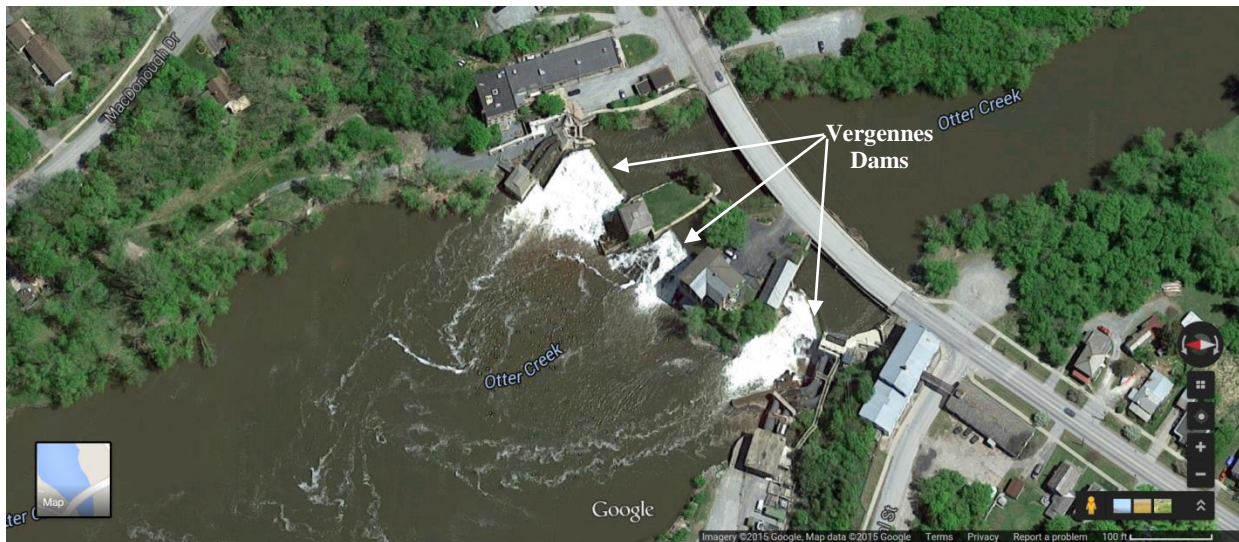
Attachment: LIHI Questionnaire

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Vergennes Hydroelectric Project (FERC No. 2674)

Low Impact Hydroelectric Power Facility Certification

Green Mountain Power Corporation is preparing to apply for certification with the Low Impact Hydropower Institute (LIHI) for the Vergennes Hydroelectric Project (FERC No. 2674). The Project is located on the Otter Creek in the City of Vergennes, Addison County, Vermont. Vergennes Project works consist of three concrete gravity overflow dams each approximately 10-ft-high, with a total length of 231 feet; one 29-ft-long non-overflow dam; two powerhouses; intake structures; four penstocks; three turbine-generator units; an 8.8 mile-long, 133 acre reservoir; and appurtenant facilities. The Vergennes Project is operated as a strict run-of-river facility. The Project has an authorized installed capacity of 2.6 MW and produces an average annual generation output of 11,405 MWh.



As part of the LIHI certification process, Kleinschmidt is requesting feedback from regulatory agencies to confirm validity of and compliance with relevant article(s) and condition(s). This questionnaire will assist with the documentation of Project's environmental compliance. Your assistance is greatly appreciated.

Vergennes Hydroelectric Project (FERC No. 2674)

Low Impact Hydroelectric Power Facility Certification

1. Contact Information for person completing the questionnaire:

Name & Title: _____

Organization: **U.S. Fish and Wildlife Service**

Address: _____

Phone: _____

Email: _____

2. To the best of your knowledge, do Vergennes Hydroelectric Project (FERC License No. 2674) operations negatively affect any federally or state listed endangered and threatened species?

☐ Yes

☐ No

☐ N/A or Unknown. If N/A or Unknown please explain:

If you have any additional comments, please provide them here: _____

**Please return this Questionnaire to Katie Sellers by email at
Katie.Sellers@KleinschmidtGroup.com within 15 days of receipt.**

APPENDIX J

THREATENED AND ENDANGERED SPECIES



United States Department of the Interior



FISH AND WILDLIFE SERVICE
New England Ecological Services Field Office
70 COMMERCIAL STREET, SUITE 300
CONCORD, NH 03301
PHONE: (603)223-2541 FAX: (603)223-0104
URL: www.fws.gov/newengland

Consultation Code: 05E1NE00-2016-SLI-0092

October 12, 2015

Event Code: 05E1NE00-2016-E-00111

Project Name: Vergennes Project

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF>

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (<http://www.fws.gov/windenergy/>) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm>; <http://www.towerkill.com>; and <http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment



United States Department of Interior
Fish and Wildlife Service

Project name: Vergennes Project

Official Species List

Provided by:

New England Ecological Services Field Office

70 COMMERCIAL STREET, SUITE 300

CONCORD, NH 03301

(603) 223-2541

<http://www.fws.gov/newengland>

Consultation Code: 05E1NE00-2016-SLI-0092

Event Code: 05E1NE00-2016-E-00111

Project Type: DAM

Project Name: Vergennes Project

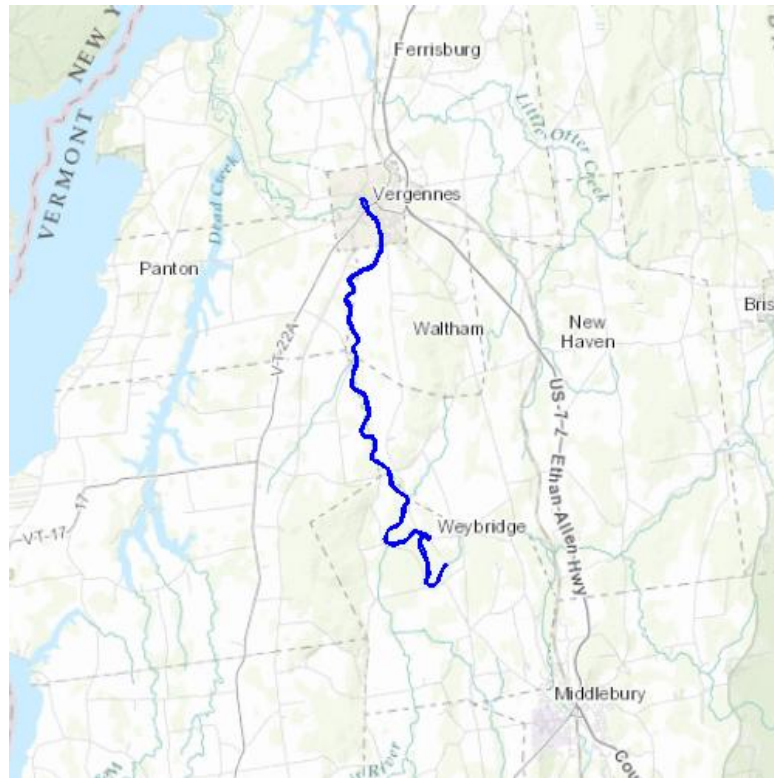
Please Note: The FWS office may have modified the Project Name and/or Project Description, so it may be different from what was submitted in your previous request. If the Consultation Code matches, the FWS considers this to be the same project. Contact the office in the 'Provided by' section of your previous Official Species list if you have any questions or concerns.



United States Department of Interior
Fish and Wildlife Service

Project name: Vergennes Project

Project Location Map:



Project Coordinates: The coordinates are too numerous to display here.

Project Counties: Addison, VT



United States Department of Interior
Fish and Wildlife Service

Project name: Vergennes Project

Endangered Species Act Species List

There are a total of 2 threatened or endangered species on your species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. Critical habitats listed under the **Has Critical Habitat** column may or may not lie within your project area. See the **Critical habitats within your project area** section further below for critical habitat that lies within your project. Please contact the designated FWS office if you have questions.

Mammals	Status	Has Critical Habitat	Condition(s)
Indiana bat (<i>Myotis sodalis</i>) Population: Entire	Endangered		
Northern long-eared Bat (<i>Myotis septentrionalis</i>)	Threatened		



United States Department of Interior
Fish and Wildlife Service

Project name: Vergennes Project

Critical habitats that lie within your project area

There are no critical habitats within your project area.

From: [Rosset, Julianne](#)
To: [Katie Sellers](#)
Cc: Eric.Davis@vermont.gov; [Melissa Grader](#)
Subject: Vergennes LIHI Certification
Date: Wednesday, December 02, 2015 12:50:25 PM

Dear Ms. Sellers,

The U.S. Fish and Wildlife Service has received your request for feedback regarding compliance of the Vergennes Hydroelectric Project with the requirements of its license (FERC Project No. 2674).

The Service has reviewed the Project file and is not aware of any compliance issues at this time. However, we understand the Vermont Department of Environmental Conservation has requested operations data to ensure the Project is in compliance with flow management conditions prescribed by Condition B and minimum flows prescribed by Conditions I and F of the Water Quality Certification. We defer to the State and support any findings it may have based on its review of the operations data.

We are currently in the process of reviewing Essex 19 files (FERC Project No. 2513) and consulting with other agencies but hope to provide a response by the end of next week.

If you have any questions, please feel free to contact me (413-548-8002 x8120) or Melissa Grader (413-548-8002 x8124).

Kind regards,

Julianne Rosset

Julianne Rosset
U.S. Fish and Wildlife Service - New England Field Office
103 East Plumtree Road
Sunderland, MA 01375
413-548-8002 x8120
julianne_rosset@fws.gov

From: Katie Sellers
To: ["Melissa_Grader@fws.gov"](mailto:Melissa_Grader@fws.gov)
Cc: [Laura Cowan](#)
Subject: RE: LIHI Certification - Request for USFWS Feedback
Date: Wednesday, October 21, 2015 3:08:00 PM

Dear Ms. Grader,

To follow-up with my earlier emails regarding LIHI Certification and Project compliance review, I am hoping that you could take a moment to review Essex 19 Hydroelectric Project and Vergennes Hydroelectric Project compliance with the following listed license articles/requirements. A simple email response confirming Project compliance with the below requirements would suffice.

Essex 19 Hydroelectric Project (FERC Project No. 2513):

Could you please confirm that the Project continues to be in compliance with mandated fish passage requirements:

- 1995 License Article 410 "Downstream Fish Passage Monitoring Plan"
- 1995 License Article 408 "Trap and Truck Program"
- 1995 License Article 411 "Walleye Mortality Contingency Plan"

Vergennes Hydroelectric Project (FERC Project No. 2674):

Could you please confirm that "no fish passage requirements" remain the latest agency recommendation for this facility?

Thank you in advance for your time,
Katie Sellers

Katie Sellers
Regulatory Coordinator

Office: 207-416-1218
www.KleinschmidtGroup.com

From: Katie Sellers
Sent: Tuesday, September 08, 2015 3:27 PM
To: 'Melissa_Grader@fws.gov'
Cc: Laura Cowan; 'Scarzello, Michael'; Andy Qua
Subject: RE: LIHI Certification - Request for USFWS Feedback

Dear Ms. Grader,

Please let me know if you have any questions while reviewing Vergennes Hydroelectric Project, Otter Creek Hydroelectric Project, and Essex 19 Hydroelectric Project compliance with relevant prescriptions and/or license articles listed in the previously provided questionnaires.

Thank you for your help with the LIHI Certification process and I look forward to your responses.

Best,
Katie Sellers

Katie Sellers
Regulatory Coordinator

Office: 207-416-1218
www.KleinschmidtGroup.com

From: Katie Sellers
Sent: Wednesday, August 19, 2015 3:32 PM
To: 'Melissa_Grader@fws.gov' <Melissa_Grader@fws.gov>
Cc: Laura Cowan <Laura.Cowan@KleinschmidtGroup.com>
Subject: LIHI Certification - Request for USFWS Feedback

Dear Ms. Grader,

Kleinschmidt Associates is assisting Green Mountain Power (GMP) with applying for certifications from the Low Impact Hydropower Institute (LIHI) for the Vergennes Hydroelectric Project (FERC No. 2674), Otter Creek Hydroelectric Project (FERC No. 2558), and the Essex 19 Hydroelectric Project (FERC No. 2513). LIHI is a non-profit organization dedicated to reducing the impacts of hydropower generation through the certification of hydropower projects that have avoided or reduced their environmental impacts pursuant to LIHI criteria.

As part of the application process, LIHI requests correspondence from relevant resource agencies to confirm that projects are in compliance with prescriptions and license articles. To that end, Kleinschmidt is requesting feedback from regulatory agencies to confirm validity and compliance with relevant prescriptions and/or articles.

Attached, you will find questionnaires for Vergennes Hydroelectric Project, Otter Creek Hydroelectric Project, and Essex 19 Hydroelectric Project. If you could please complete each of the enclosed questionnaires and return to my attention, Katie Sellers, by email (katie.sellers@kleinschmidtgroup.com) within 15 days of receipt, it would be much appreciated.

Thank you in advance for your time,

Katie Sellers

Katie Sellers
Regulatory Coordinator

Office: 207-416-1218

Kleinschmidt

August 19, 2015

VIA EMAIL

Vergennes Hydroelectric Project (FERC No. 2674) Low Impact Hydroelectric Power Institute Certification Application

Dear Ms. Grader:

Kleinschmidt is assisting Green Mountain Power Corporation (GMP) with applying for a certification from the Low Impact Hydropower Institute (LIHI) for the Vergennes Hydroelectric Project (FERC No. 2674). LIHI is a non-profit organization dedicated to reducing the impacts of hydropower generation through the certification of hydropower projects that have avoided or reduced their environmental impacts pursuant to LIHI criteria. LIHI's Certification Program encourages a range of benefits associated with healthy rivers and enables low impact projects to access renewable energy markets. More information regarding LIHI, including a description of certification criteria, can be found at <http://www.lowimpacthydro.org>.

Kleinschmidt is preparing a LIHI certificate application demonstrating how the Vergennes Hydroelectric Project meets LIHI certification criteria. The application will include existing documentation describing Project history of compliance with the FERC licensing. In addition, the LIHI application requests correspondence from relevant resource agencies to confirm that the Project is in compliance with prescriptions and license articles.

Therefore, the purpose of this letter is to:

- Request that you confirm Vergennes Hydroelectric Project operations do not negatively affect any federal or state listed endangered or threatened species.

To that end, Kleinschmidt appreciates your assistance with the completion of the enclosed questionnaire. Please complete and return the enclosed questionnaire to my attention, Katie Sellers, by e-mail to Katie.Sellers@KleinschmidtGroup.com within 15 days of receipt.

Please call me at 207-416-1218 or email with any comments or questions that you might have.

Sincerely,

KLEINSCHMIDT ASSOCIATES



Katie Sellers
Regulatory Coordinator

KES:TMJ

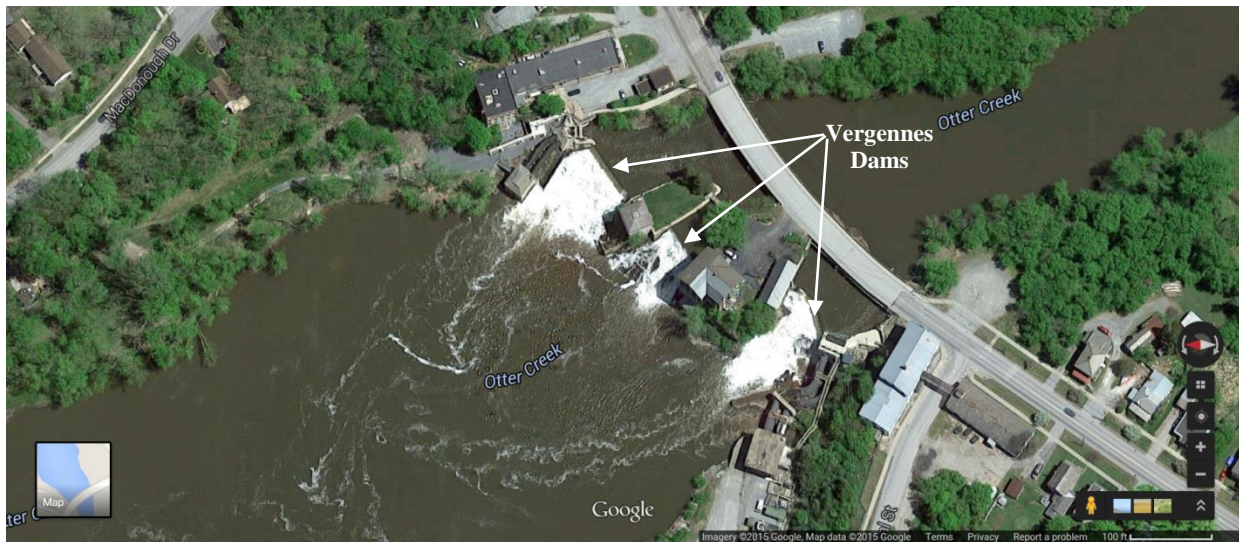
Attachment: LIHI Questionnaire

J:\006\227\Docs\Vergennes LIHI\Agency Correspondence\001 Vergennes_LIHI Agency Letter_USFWS.docx

Vergennes Hydroelectric Project (FERC No. 2674)

Low Impact Hydroelectric Power Facility Certification

Green Mountain Power Corporation is preparing to apply for certification with the Low Impact Hydropower Institute (LIHI) for the Vergennes Hydroelectric Project (FERC No. 2674). The Project is located on the Otter Creek in the City of Vergennes, Addison County, Vermont. Vergennes Project works consist of three concrete gravity overflow dams each approximately 10-ft-high, with a total length of 231 feet; one 29-ft-long non-overflow dam; two powerhouses; intake structures; four penstocks; three turbine-generator units; an 8.8 mile-long, 133 acre reservoir; and appurtenant facilities. The Vergennes Project is operated as a strict run-of-river facility. The Project has an authorized installed capacity of 2.6 MW and produces an average annual generation output of 11,405 MWh.



As part of the LIHI certification process, Kleinschmidt is requesting feedback from regulatory agencies to confirm validity of and compliance with relevant article(s) and condition(s). This questionnaire will assist with the documentation of Project's environmental compliance. Your assistance is greatly appreciated.

Vergennes Hydroelectric Project (FERC No. 2674)

Low Impact Hydroelectric Power Facility Certification

1. Contact Information for person completing the questionnaire:

Name & Title: _____

Organization: **U.S. Fish and Wildlife Service**

Address: _____

Phone: _____

Email: _____

2. To the best of your knowledge, do Vergennes Hydroelectric Project (FERC License No. 2674) operations negatively affect any federally or state listed endangered and threatened species?

☐ Yes

☐ No

☐ N/A or Unknown. If N/A or Unknown please explain:

If you have any additional comments, please provide them here: _____

**Please return this Questionnaire to Katie Sellers by email at
Katie.Sellers@KleinschmidtGroup.com within 15 days of receipt.**

From: [Darling, Scott](#)
To: [Katie Sellers](#)
Subject: RE: Vergennes Dam - Species Review for LIHI Application
Date: Wednesday, November 09, 2016 11:55:22 AM
Attachments: [image002.png](#)

Katie:

If no trees will be cut/harvested as a result of this project, then no impacts to both Indiana bats and northern long-eared bats can be expected. Thanks for soliciting our review.

Scott

Scott R. Darling, CWB
Wildlife Management Program Manager
Vermont Fish and Wildlife Department
271 North Main Street
Rutland, VT 05701
Office: 802-786-3862
scott.darling@vermont.gov

From: Katie Sellers [<mailto:Katie.Sellers@KleinschmidtGroup.com>]
Sent: Wednesday, November 09, 2016 10:12 AM
To: Darling, Scott <Scott.Darling@vermont.gov>
Subject: RE: Vergennes Dam - Species Review for LIHI Application

Hi Scott, No tree clearing. Nothing is changing at the facility.

Thanks for your review,
Katie

Katie Sellers
Regulatory Coordinator
Kleinschmidt
Office: 207-416-1218
www.KleinschmidtGroup.com



From: Darling, Scott [<mailto:Scott.Darling@vermont.gov>]
Sent: Wednesday, November 09, 2016 10:09 AM
To: Katie Sellers <Katie.Sellers@KleinschmidtGroup.com>
Subject: RE: Vergennes Dam - Species Review for LIHI Application

Katie:

Regarding the bats, will there be any trees cut for this project?

Scott

From: Katie Sellers [<mailto:Katie.Sellers@KleinschmidtGroup.com>]
Sent: Wednesday, November 02, 2016 4:07 PM
To: Kratzer, Jud <Jud.Kratzer@vermont.gov>; Darling, Scott <Scott.Darling@vermont.gov>
Subject: Vergennes Dam - Species Review for LIHI Application

Hi Jud and Scott, I have another LIHI application in need of threatened and endangered species review. This is for the Vergennes Project (FERC No. 2674) a run-of-river project located on the Otter Creek close to the River's outlet to Lake Champlain.

Upon reviewing the USFWS IPAC Report and FERC's 1998 Environmental Assessment for this Project, I developed a list of potential threatened and endangered species that may occur within this project area. Could you a) review the below species list to make sure it is accurate and/or suggest updates as appropriate; and b) review this list to confirm that the Project continues to not negatively affect any of the currently listed species that may occur within the Project area?

Species List:

Indiana Bat (endangered)
Northern Long-eared Bat (endangered)
Lake Sturgeon (endangered)
Eastern Sand Darter (threatened)
fragile papershell (endangered)
pink heelsplitter (endangered)
pocketbook mussel (endangered)
giant floater (threatened)

Do let me know if you have any follow-up questions.

Thank you!

Katie

Katie Sellers
Regulatory Coordinator

Kleinschmidt

Office: 207-416-1218

www.KleinschmidtGroup.com



From: [Mackenzie, Chet](#)
To: [Katie Sellers](#); [Ferguson, Mark](#)
Subject: RE: Vergennes Dam - Species Review for LIHI Application
Date: Wednesday, December 07, 2016 1:21:59 PM
Attachments: [image002.png](#)

Our comments on the impacts of the current operation will be submitted to DEC after internal review.

From: Katie Sellers [mailto:Katie.Sellers@KleinschmidtGroup.com]
Sent: Wednesday, December 07, 2016 11:36 AM
To: Ferguson, Mark <Mark.Ferguson@vermont.gov>
Cc: Mackenzie, Chet <Chet.Mackenzie@vermont.gov>
Subject: RE: Vergennes Dam - Species Review for LIHI Application

Thanks Mark, this is very helpful. I will touch base with Bob Popp on plants. I have already touched base and received feedback and confirmation that the project does not negatively affected listed bat species from Scott Darling.

Is there any chance you can provide a review of these threatened/endangered species to confirm the Project as it is currently operating (run of river) does not negatively affect them? Or is this something that needs to be provided to DEC, who will then relay the answer when they are done reviewing flows, water quality, etc?

Thanks again!
Katie

Katie Sellers
Regulatory Coordinator
Kleinschmidt
Office: 207-416-1218
www.KleinschmidtGroup.com



From: Ferguson, Mark [mailto:Mark.Ferguson@vermont.gov]
Sent: Tuesday, December 06, 2016 10:31 AM
To: Katie Sellers <Katie.Sellers@KleinschmidtGroup.com>
Cc: Mackenzie, Chet <Chet.Mackenzie@vermont.gov>
Subject: RE: Vergennes Dam - Species Review for LIHI Application

Katie,

Scott Darling or Alyssa Bennett should be contacted to confirm the bats. There are also numerous plants (some aquatic) that you may want to contact Bob Popp about.

For the rest of the aquatic species list, it is accurate except:

Eastern Sand Darter has not been reported from Otter Creek.

Black Sandshell (endangered) has been reported below the dam and should be added.

Silver Redhorse, a rare fish species, is also known downstream of the dam. It isn't listed as threatened or endangered.

Just to provide a complete list, there are some rare to uncommon birds known downstream in associated habitat:

Osprey (uncommon)

Common Gallinule (rare)

Least Bittern (rare)

Mark Ferguson

Natural Heritage Zoologist

Vermont Department of Fish & Wildlife

802-279-3422

New email address: mark.ferguson@vermont.gov

From: Katie Sellers [<mailto:Katie.Sellers@KleinschmidtGroup.com>]

Sent: Monday, December 05, 2016 3:35 PM

To: Mackenzie, Chet <Chet.Mackenzie@vermont.gov>; Ferguson, Mark <Mark.Ferguson@vermont.gov>

Subject: RE: Vergennes Dam - Species Review for LIHI Application

Hi Chet and Mark, I know you reserve LIHI responses for Vermont DEC, but is it possible for you to confirm the below list of state threatened or endangered species that may have presence within the Vergennes project area?

Thanks

Katie

Katie Sellers

Regulatory Coordinator

Kleinschmidt

Office: 207-416-1218

www.KleinschmidtGroup.com



From: Kratzer, Jud [<mailto:Jud.Kratzer@vermont.gov>]
Sent: Thursday, November 03, 2016 8:25 AM
To: Katie Sellers <Katie.Sellers@KleinschmidtGroup.com>; Darling, Scott <Scott.Darling@vermont.gov>
Cc: Mackenzie, Chet <Chet.Mackenzie@vermont.gov>; Ferguson, Mark <Mark.Ferguson@vermont.gov>
Subject: RE: Vergennes Dam - Species Review for LIHI Application

Hello Katie,

I am based in St. Johnsbury and focused on the northeastern part of the state. Chet MacKenzie is one of the fisheries biologists that works in the southwestern part of the state. Mark Ferguson is the guy that will be most informed on mussels. I have cc'ed them both.

Scott is still your bat man.

Jud

From: Katie Sellers [<mailto:Katie.Sellers@KleinschmidtGroup.com>]
Sent: Wednesday, November 02, 2016 4:07 PM
To: Kratzer, Jud <Jud.Kratzer@vermont.gov>; Darling, Scott <Scott.Darling@vermont.gov>
Subject: Vergennes Dam - Species Review for LIHI Application

Hi Jud and Scott, I have another LIHI application in need of threatened and endangered species review. This is for the Vergennes Project (FERC No. 2674) a run-of-river project located on the Otter Creek close to the River's outlet to Lake Champlain.

Upon reviewing the USFWS IPAC Report and FERC's 1998 Environmental Assessment for this Project, I developed a list of potential threatened and endangered species that may occur within this project area. Could you a) review the below species list to make sure it is accurate and/or suggest updates as appropriate; and b) review this list to confirm that the Project continues to not negatively affect any of the currently listed species that may occur within the Project area?

Species List:

Indiana Bat (endangered)

Northern Long-eared Bat (endangered)

Lake Sturgeon (endangered)

Eastern Sand Darter (threatened)
fragile papershell (endangered)
pink heelsplitter (endangered)
pocketbook mussel (endangered)
giant floater (threatened)

Do let me know if you have any follow-up questions.

Thank you!
Katie

Katie Sellers
Regulatory Coordinator
Kleinschmidt
Office: 207-416-1218
www.KleinschmidtGroup.com



From: [Mackenzie, Chet](#)
To: [Katie Sellers](#)
Cc: [Wentworth, Rod](#); [Davis, Eric](#)
Subject: RE: LIHI Certification - Request for Vermont Fish and Wildlife Feedback
Date: Friday, November 13, 2015 9:50:18 AM

Hello Katie:

We provide comments to DEC and they send LIHI replies for the Agency.

Chet

My e-mail has been changed to: chet.mackenzie@vermont.gov.

Chet MacKenzie
Fisheries Program Manager
Vermont Fish & Wildlife Dept.
271 North Main St., Suite 215
Rutland, VT 05701-2423
chet.mackenzie@vermont.gov
802-786-3864

From: Katie Sellers [<mailto:Katie.Sellers@KleinschmidtGroup.com>]
Sent: Wednesday, November 11, 2015 7:25 AM
To: Mackenzie, Chet; Wentworth, Rod
Subject: LIHI Certification - Request for Vermont Fish and Wildlife Feedback

Dear Chet and Rod,

Kleinschmidt Associates is assisting Green Mountain Power (GMP) with applying for certifications from the Low Impact Hydropower Institute (LIHI) for the Essex 19 Hydroelectric Project (FERC No. 2513) and Vergennes Hydroelectric Project (FERC No. 2674). LIHI is a non-profit organization dedicated to reducing the impacts of hydropower generation through the certification of hydropower projects that have avoided or reduced their environmental impacts pursuant to LIHI criteria.

As part of the application process, LIHI requests correspondence from relevant resource agencies to confirm that projects are in compliance with prescriptions and license articles. To that end, Kleinschmidt is requesting feedback from regulatory agencies to confirm validity and compliance with relevant prescriptions and/or articles.

If you could take a moment to review and confirm Essex 19 and Vergennes Project compliance with the following listed license articles/requirements it would be much appreciated. A simple email response confirming or commenting on Project compliance with the below requirements would suffice.

Essex 19 Hydroelectric Project (FERC Project No. 2513):

Could you please confirm that the Project continues to be in compliance with mandated fish passage

requirements:

- 1995 License Article 410 “Downstream Fish Passage Monitoring Plan”
- 1995 License Article 408 “Trap and Truck Program”
- 1995 License Article 411 “Walleye Mortality Contingency Plan”

Vergennes Hydroelectric Project (FERC Project No. 2674):

Could you please confirm that “no fish passage requirements” remain the latest agency recommendation for this facility?

Thank you in advance for your time and please do let me know if you have any questions,

Katie Sellers

Katie Sellers

Regulatory Coordinator

Kleinschmidt

Office: 207-416-1218

www.KleinschmidtGroup.com

From: [Popp, Bob](#)
To: [Katie Sellers](#)
Subject: RE: Plant Species Review for Vergennes Hydroelectric Project LIHI Certification
Date: Monday, December 19, 2016 1:44:00 PM
Attachments: [image002.png](#)

Katie, here is what we show for your project area

creeping love-grass (*Eragrostis hypnoides*). This is a rare to uncommon annual that grows along the shoreline and needs exposed mud to germinate so it relies on periodic drawdown to expose the shoreline. Most of the population is above the confluence with the Lemon Fair.

green dragon (*Arisaema dracontium*). State threatened plant that grows in floodplain forests.

Neither of these are likely to be impacted by your proposal of continuing run-of-river operations with no changes.

Thanks for checking with us.
Bob

Bob Popp
Department Botanist
VT. Dept of Fish & Wildlife
5 Perry St. Suite 40
Barre, VT. 05641

(802) 476-0127
bob.popp@vermont.gov

From: Katie Sellers [<mailto:Katie.Sellers@KleinschmidtGroup.com>]
Sent: Wednesday, December 14, 2016 9:42 AM
To: Popp, Bob <Bob.Popp@vermont.gov>
Subject: RE: Plant Species Review for Vergennes Hydroelectric Project LIHI Certification

Hi Bob, thanks for the follow-up. I have attached a quick map of the subject area as well as a zoom in of the dam, bypass reach, and downstream area. Essentially the area to be evaluated is the Project impoundment, dam and bypass reach area, downstream area, and immediate shorelines along those areas. The impoundment extends 8.8 miles upstream of the dam and the downstream area of influence extends 0.3 miles downstream of the dam.

This is an evaluation for continued run-of-river operations with no changes at the project.

Let me know if you have any further information needs.

Best,
Katie

Katie Sellers

Regulatory Coordinator

Kleinschmidt

Office: 207-416-1218

www.KleinschmidtGroup.com



From: Popp, Bob [<mailto:Bob.Popp@vermont.gov>]

Sent: Tuesday, December 13, 2016 2:08 PM

To: Katie Sellers <Katie.Sellers@KleinschmidtGroup.com>

Subject: RE: Plant Species Review for Vergennes Hydroelectric Project LIHI Certification

Hi Katie, would you provide a map of some sort that depicts the project area so we can target our search more effectively and assess and impacts?

Thanks,

Bob

Bob Popp

Department Botanist

VT. Dept of Fish & Wildlife

5 Perry St. Suite 40

Barre, VT. 05641

(802) 476-0127

bob.popp@vermont.gov

From: Katie Sellers [<mailto:Katie.Sellers@KleinschmidtGroup.com>]

Sent: Wednesday, December 07, 2016 11:47 AM

To: Popp, Bob <Bob.Popp@vermont.gov>

Subject: Plant Species Review for Vergennes Hydroelectric Project LIHI Certification

Good Morning Bob,

I am working on a Low Impact Hydropower Institute Certification Application for the Vergennes Project (FERC No. 2674) a run-of-river project located on the Otter Creek close to the River's outlet to Lake Champlain. The Project is owned and operated by Green Mountain Power.

Per conversations with Mark Ferguson regarding threatened and endangered species review for the

Project area, it was recommended that I make contact with you to gain your perspective on the threatened or endangered plant species that may be located in the Project area.

When possible, could you 1) provide a list of threatened or endangered plant species that may occur within the Vergennes Project area; and 2) provide a review of this list to confirm that the Project as it currently operates (run-of-river) continues to not negatively affect any of the currently listed species that may occur within the Project area?

Please let me know if you have any questions regarding this review.

Thank you!
Katie Sellers

Katie Sellers
Regulatory Coordinator
Kleinschmidt
Office: 207-416-1218
www.KleinschmidtGroup.com



APPENDIX K
CULTURAL RESOURCES

LIVE LINK LIST

2000 CRMP: http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=2078475

2001 FERC Approval of CRMP:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=3114497

2004 MOA:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=4187585

2004 CRMP Annual Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=4312413

2006 FERC Order Granting Extension of Time to File 2006 Annual Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=4427582

2006 CRMP Annual Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=4451114

FERC Acceptance of 2006 CRMP Annual Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=4459934

2007 CRMP Annual Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13534646

FERC Acceptance of 2007 CRMP Annual Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13542923

2008 FERC Order Granting Extension of Time to File 2008 Annual Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13639646

2008 CRMP Annual Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13651546

FERC Acceptance of 2008 CRMP Annual Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13705708

2009 Annual CRMP Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13741956

2010 CRMP Annual Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13836144

2011 CRMP Annual Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13943937

FERC Acceptance of 2011CRMP Annual Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13948242

2012 CRMP Annual Report:

http://elibrary.ferc.gov/0/idmws/file_list.asp?document_id=14041543

2013 CRMP Annual Report:

http://elibrary.ferc.gov/0/idmws/file_list.asp?document_id=14158206

2014 106 Report and MOA for Removal of Benton Wheelhouse:

http://elibrary.ferc.gov/0/idmws/file_list.asp?document_id=14231463

2014 CRMP Annual Report:

http://elibrary.ferc.gov/0/idmws/file_list.asp?document_id=14239657

2015 Signed Copy of MOA for Removal of Benton Wheelhouse:

http://elibrary.ferc.gov/0/idmws/file_list.asp?document_id=14312591

2016 CRMP Annual Report:

http://elibrary.ferc.gov/0/idmws/file_list.asp?document_id=14481658

From: Katie Sellers
To: ["ACCD.ProjectReview@vermont.gov"](mailto:ACCD.ProjectReview@vermont.gov)
Cc: ["Dillon, Scott"](#)
Subject: RE: Vergennes Hydroelectric Facility - Compliance Review
Date: Monday, November 21, 2016 8:22:00 AM
Attachments: [image002.png](#)

Good Morning – I am following-up on the below compliance review for Vergennes Dam.
Please let me know if you need any further information.

Thank you,
Katie

From: Katie Sellers
Sent: Wednesday, November 02, 2016 3:35 PM
To: 'ACCD.ProjectReview@vermont.gov' <ACCD.ProjectReview@vermont.gov>
Cc: 'Dillon, Scott' <Scott.Dillon@vermont.gov>; Andy Qua <Andy.Qua@KleinschmidtGroup.com>
Subject: RE: Vergennes Hydroelectric Facility - Compliance Review

Good Afternoon – I am following-up on the below compliance review for Vergennes Dam.
Please let me know if you need any further information.

Thank you,
Katie

From: Katie Sellers
Sent: Monday, October 03, 2016 8:07 AM
To: 'ACCD.ProjectReview@vermont.gov' <ACCD.ProjectReview@vermont.gov>
Cc: 'Dillon, Scott' <Scott.Dillon@vermont.gov>; Andy Qua <Andy.Qua@KleinschmidtGroup.com>
Subject: RE: Vergennes Hydroelectric Facility - Compliance Review

Good Morning – I am following-up on the below compliance review for Vergennes.
Please let me know if you need any further information.

Thank you,
Katie

Katie Sellers
Regulatory Coordinator

Office: 207-416-1218
www.KleinschmidtGroup.com



From: Katie Sellers

Sent: Monday, September 19, 2016 5:25 PM

To: 'ACCD.ProjectReview@vermont.gov' <ACCD.ProjectReview@vermont.gov>

Cc: 'Dillon, Scott' <Scott.Dillon@vermont.gov>

Subject: Vergennes Hydroelectric Facility - Compliance Review

Good Evening,

Attached for the Division's assessment, you will find a compliance review for Vergennes Hydroelectric Project (FERC No. 2674) operations under 1999 FERC License Article 405 and the 1999 Programmatic Agreement.

In accordance with the Low Impact Hydropower Institute (LIHI) certification process, Kleinschmidt Associates (Kleinschmidt), on behalf of Green Mountain Power Corporation (GMP), contacted the Vermont Division for Historic Preservation on September 21, 2015 with a review request to confirm Project compliance with the 1999 FERC License Article 405 and 1999 Programmatic Agreement, of which require a Cultural Resource Management Plan. On September 29, 2015, Scott Dillon of the Vermont Division for Historic Preservation contacted Kleinschmidt in reply to the requested compliance review. Mr. Dillon explained that due to limited staff and time needed to review projects for compliance, the Division would not be able to conduct the requested review. However, it was suggested that if Kleinschmidt conducted a compliance review for the Project and provided the Division with a compliance summary, the Division would then provide a final compliance determination.

As such, Kleinschmidt has conducted the attached compliance review for Vergennes Hydroelectric Project, and asks for the Division's final input and final compliance determination for Project activities conducted under License Article 405 and the Programmatic Agreement.

Thank you in advance for your time,
Katie Sellers

Katie Sellers

Regulatory Coordinator

Kleinschmidt

Office: 207-416-1218

www.KleinschmidtGroup.com



September 19, 2016

VIA EMAIL

Vermont Division for Historic Preservation
1 National Life Drive
Davis Building, 6th Floor
Montpelier, Vermont 05620-0501

Vergennes Hydroelectric Project (FERC No. 2674)
Cultural Resource Compliance Review for LIHI Certification

To whom it may concern:

Green Mountain Power Corporation (GMP) is preparing to apply for certification with the Low Impact Hydropower Institute (LIHI) for the Vergennes Hydroelectric Project (FERC No. 2674) (Project). The Project is located on the Otter Creek in the City of Vergennes, Addison County, Vermont. The Project consists of three concrete overflow dams; two powerhouses; intake structures; four penstocks; three turbine-generator units; an 8.8 mile-long, 133 acre reservoir; and appurtenant facilities. The Vergennes Project is operated as a strict run-of-river facility. The Project has an authorized installed capacity of 2.6 MW and produces an average annual generation output of 11,405 MWh.

In accordance with the LIHI certification process, Kleinschmidt Associates (Kleinschmidt), on behalf of GMP, contacted the Vermont Division for Historic Preservation (Division) on September 21, 2015 with a review request to confirm Project compliance with 1999 Federal energy Regulatory Commission (FERC) License Article 405 which requires the Licensee to implement the 1999 Programmatic Agreement. On September 29, 2015, Scott Dillon of the Vermont Division for Historic Preservation contacted Kleinschmidt in reply to the requested compliance review. Mr. Dillon explained that due to limited staff and time needed to review projects for compliance, the Division would not be able to conduct the requested review. However, it was suggested that if Kleinschmidt conducted a compliance review for the Project and provided the Division with a compliance summary, the Division would then provide a final compliance determination.

As such, Kleinschmidt has reviewed available documentation on FERC's E-Library. In compliance with the 1999 Project License Article 405 and the 1999 Programmatic Agreement (PA), GMP submitted on August 2, 2000, a Cultural Resource Management Plan (CRMP). On January 8, 2001, FERC issued an Order Approving the CRMP and required that GMP file an annual report of activities conducted under the CRMP with the SHPO. GMP has subsequently submitted Annual CRMP Reports, as evidenced on E-Library, for the years 2004, 2006-2014, and 2016. Please see Attachment A for a list of FERC E-Library links to submitted Annual CRMP Reports, available FERC Approvals, and the 2005 and 2015 Environmental Inspection Reports confirming Project compliance with License Article 405.

In accordance with the 1999 PA, GMP entered into a Memorandum of Understanding on March 15, 2004 with David Shlansky, FERC, and the Vermont State Historic Preservation Officer to convey project boundary lands listed on the National Register of Historic Places and to ensure their proper continued management. GMP additionally developed a Memorandum of Agreement (MOA) on August 26, 2014 with the Vermont State Historic Preservation Officer and FERC for removal of the Benton Wheelhouse, a historic component of the Project. A corresponding Section 106 Report, describing the property, its history, the proposed action, and structure condition, was submitted with the MOA. Please see Attachment B for a list of FERC E-library links to executed Project agreements.

In accordance with the above review, Kleinschmidt concludes that the Vergennes Hydroelectric Project continues to operate in compliance with 1999 License Article 405 and the 1999 PA. Kleinschmidt kindly asks the Vermont Division for Historic Preservation for concurrence with this review.

Please call me at 207-416-1218 or email at Katie.Sellers@KleinschmidtGroup.com with any comments or questions that you may have.

Sincerely,

KLEINSCHMIDT ASSOCIATES



Katie Sellers
Regulatory Coordinator

KES:TMJ

Attachments: Attachment A – Annual Cultural Resource Management Plan Report Compliance
Attachment B – Memorandum of Agreements

ATTACHMENT A

ANNUAL CULTURAL RESOURCE MANAGEMENT PLAN REPORT COMPLIANCE

2000 CRMP:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=2078475

2001 FERC Order Approving CRMP:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=2114961

2004 Annual CRMP Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=4312413

2005 Environmental Inspection Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=4378920

2006 FERC Order Granting Extension of Time to File 2006 Annual CRMP Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=4427582

2006 Annual CRMP Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=4451114

FERC Acceptance of 2006 Annual CRMP Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=4459934

2007 Annual CRMP Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13534646

FERC Acceptance of 2007 Annual CRMP Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13542923

2008 FERC Order Granting Extension of Time to File 2008 Annual CRMP Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13639646

2008 Annual CRMP Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13651546

FERC Acceptance of 2008 Annual CRMP Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13705708

2009 Annual CRMP Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13741956

2010 Annual CRMP Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13836144

2011 Annual CRMP Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13943937

FERC Acceptance of 2011 Annual CRMP Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=13948242

2012 Annual CRMP Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=14041543

2013 Annual CRMP Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=14158206

2014 Annual CRMP Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=14239657

2015 Environmental Inspection Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=14367064

2016 Annual CRMP Report:

http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=14481658

ATTACHMENT B

MEMORANDUM OF AGREEMENTS

2004 MOA:

http://elibrary.ferc.gov/0/idmws/file_list.asp?document_id=4187585

2014 Signed Copy of MOA for Removal of Benton Wheelhouse:

http://elibrary.ferc.gov/0/idmws/file_list.asp?document_id=14312591

106 Report for Removal of Benton Wheelhouse:

http://elibrary.ferc.gov/0/idmws/file_list.asp?document_id=14231463

APPENDIX L

RECREATION



KLEINSCHMIDT ASSOCIATES,
Consulting Engineers, Scientists & Planners

75 Main Street PO Box 576 • Pittsfield, Maine 04967 • Phone: 207-487-3328 • Fax: 207-487-3124 • www.KAssociates.com

May 25, 2000

VIA FEDERAL EXPRESS

David P. Boergers, Secretary
Federal Energy Regulatory Commission
Mail Code DLC, HL-11.2
888 1st Street NE
Washington, DC 20426

Green Mountain Power Corporation
Vergennes Project (FERC No. 2674)
Recreation Plan

FILED
OFFICE OF THE SECRETARY
00 MAY 26 AM 10:55
FEDERAL ENERGY
REGULATORY COMMISSION

009
ORIGINAL

Dear Secretary Boergers:

Enclosed for filing are an original and eight copies of the referenced Recreation Plan for Green Mountain Power Corporation's Vergennes Project. This plan is filed pursuant to Article 406 of the new license for the project issued by the Commission on July 30, 1999 (88 FERC ¶ 62,095).

As required by Article 406, the licensee has consulted with the City of Vergennes, the Vermont Agency of Natural Resources (VANR), and the Vermont Division for Historic Preservation. In addition, the licensee has also consulted with Vergennes Partnership Inc. A record of the consultation is included as an appendix to the plan. Drafts of the plan were submitted for review in December 1999 and again in April 2000. No comments were received from the Vermont Division for Historic Preservation on either draft. Both VANR and Vergennes Partnership submitted comments on the December draft, suggesting several changes and clarifications to the draft plans. These have been incorporated with the following exceptions.

On May 9, 2000 the Vermont Agency of Natural Resources submitted comments on the April draft of the plan. The VANR suggested that fill used for the fishing platform could be avoided by constructing the platform as a pier using pilings. GMP's concern is that using pilings for the pier will expose the structure to significant ice and debris damage unless the structure is heavily reinforced. Also, in discussions with the licensee both the City of Vergennes and Vergennes Partnership expressed their preference for the sheet pile structure shown, which matches the City's existing boat dock at the nearby MacDonough Park.

Another comment from the VANR concerned a proposed path connecting the Plant 9 area with the City's park. In discussions with the City of Vergennes and the Vergennes Partnership this path was ultimately eliminated from consideration in the plan. The original purpose of the path was to provide ADA-accessible access to the fishing pier. By adding ADA accessible parking near the fishing pier, GMP was able to eliminate the need for the path. In

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000601-0371-3

David P. Boergers, Secretary
March 25, 2000

2.

response to VANR's comments, eliminating the trail also allows GMP to maintain a visual buffer of trees between the park and GMP's substation. Finally, a potential safety hazard can be avoided by eliminating the path from the substation area.

Please contact myself or Mr. Thomas Kahl of Kleinschmidt Associates at (207) 487-3328 if there are any questions regarding this filing.

Sincerely,

KLEINSCHMIDT ASSOCIATES



Randall J. Dorman
Licensing Coordinator

RJD:swo
Encl.

cc: A. Sidoti, FERC (NYRO)
J. Soter, GMP
T. Kahl, KA
R. Friday, City of Vergennes
J. Cueto, Vermont Agency of Natural Resources
G. Peebles, Vermont Division for Historic Preservation
P. Vachon, Vergennes Partnership

FILED
OFFICE OF THE SECRETARY
00 MAY 26 AM 10:55
FEDERAL ENERGY
REGULATORY COMMISSION

ORIGINAL

GREEN MOUNTAIN POWER CORPORATION

VERGENNES HYDROELECTRIC PROJECT

(FERC NO. 2674)

Recreation Plan
License Article No. 406

May 2000

Prepared by:

KLEINSCHMIDT ASSOCIATES
Consulting Engineers, Scientists & Planners

FILED
OFFICE OF THE SECRETARY
00 MAY 26 AM 10:55
FEDERAL ENERGY
REGULATORY COMMISSION

ORIGINAL

GREEN MOUNTAIN POWER CORPORATION

VERGENNES HYDROELECTRIC PROJECT
(FERC NO. 2674)

Recreation Plan
License Article No. 406

May 2000

Prepared by:

KLEINSCHMIDT ASSOCIATES
Consulting Engineers, Scientists & Planners

GREEN MOUNTAIN POWER CORPORATION

VERGENNES HYDROELECTRIC PROJECT

FERC No. 2674

**RECREATION PLAN
LICENSE ARTICLE NO 406**

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Appendix B	Agency consultation
Appendix C	Soil Erosion and Sedimentation Control Plan
Appendix D	Seeding Specifications

GREEN MOUNTAIN POWER CORPORATION
VERGENNES HYDROELECTRIC PROJECT
FERC No. 2674

RECREATION PLAN
LICENSE ARTICLE NO 406

1.0 INTRODUCTION

On July 20, 1999, the Federal Energy Regulatory Commission (FERC, or the Commission) issued Green Mountain Power Corporation (GMP, or the licensee) a new 30-year license for the Vergennes Hydroelectric Project (FERC No. 2674; 88 FERC ¶62,095). The 2.4-megawatt (MW) project is located on Otter Creek in the City of Vergennes, Addison County, Vermont.

Article 406 of the license requires GMP to file a recreation plan with the FERC. Specifically, Article 406 states:

Article 406. Within 60 days of the date of issuance of the license, the licensee shall develop and file a final recreation plan for Commission approval, that includes provisions for, but not necessarily limited to the following:

- (1) installation of directional and interpretive signs for recreation in the project area;
- (2) improved access for small boats and parking at Settlers Park;
- (3) improved trail, shoreline fishing access, vegetative plantings and picnic area along the western bank near Plant 9;
- (4) construction of a disabled-accessible fishing platform on the western bank near Plant 9;
- (5) installation of portable toilet facilities (including disabled-accessible facilities);
- (6) installation of signs interpreting the history of Vergennes Falls and the surrounding historic structures.

The licensee shall develop the final recreation plan in conjunction with the Cultural Resources Management Plan required in Article 405, so that recreational improvements do not conflict with the cultural resources in the project area. The licensee shall construct the facilities after consultation with the Vermont Agency of Natural Resources, the Vermont Division for Historic Preservation, and the City of Vergennes. These facilities shall be shown on as-built drawings filed pursuant to this license.

The licensee shall include with the recreation plan a construction schedule, the entity responsible for operation and maintenance of the facilities, costs for the construction and yearly maintenance of each facility, a discussion of how the recreational facilities are visually compatible with the project area, a description of erosion control measures to be used during construction, documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments and recommendations are accommodated by the plan. The licensee shall allow a minimum of 30 days for the agencies to comment on the plan before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific information.

The Commission reserves the right to require changes to the recreation plan. Upon Commission approval, the licensee shall implement the recreation plan, including any changes required by the Commission.

On October 15, 1999 the licensee requested extension of the filing date for the recreation plan to January 26, 2000. The Commission issued an Order Granting Extension of Time on December 9, 1999. On January 25, 2000 the licensee requested further extension of the filling date to May 25, 2000.

1.1 Purpose

The purpose of this plan is to address the requirements of license Article 406 and provide a recreation plan for the Vergennes Hydroelectric Project consistent with the project setting and the present and foreseeable use of the project area, and compatible with both the state's views and the City of Vergennes' (the City) plans to encourage and enhance this use and to increase public appreciation of the unique features of the Vergennes Falls area. This plan will address the design, development, and implementation of specific recreational enhancements for the project.

1.2 Review by Agencies and Municipalities

An initial draft Recreation Plan based on the enhancements proposed in the license application was distributed to consulting agencies for their review and comment on December 23, 1999. Written comments were provided by the Vermont Agency of Natural Resources and the Vergennes Partnership, Inc. (the Partnership), a non-profit downtown revitalization organization of public officials, private individuals, groups, and businesses. The licensee met to discuss the plan with representatives of the City and the Partnership on several occasions over the first months of 2000, including an April 13, 2000 on-site meeting. A second draft of the plan was distributed for review and comment on April 25, 2000. The Vermont Agency of Natural Resources also submitted written comments on the second draft. The Vermont Division for Historic Preservation did not submit comments on either draft.

A third revision of the project drawings was presented to the City and the Vergennes Partnership on May 22, 2000, and comments are incorporated into the plan in this submittal. Comments on the draft plans are attached as an appendix and are referred below.

2.0 PROJECT SETTING

Otter Creek, Vermont's longest river, flows about one hundred miles from its source at Emerald Lake in Dorset to its mouth at Lake Champlain in Ferrisburgh. The river has been heavily developed for hydroelectric power generation, with seven dams on the mainstem. Vergennes dam is the lowest in the system, and the only one owned by the licensee. The Vergennes Electric Company developed this site in 1911-12 for the Burlington Traction Company, which produced electricity to operate Burlington's trolley system. In 1926 the Vergennes Electric Company was acquired by a holding company that later became Green Mountain Power Corporation. The dam is located at a large natural falls at River Mile 7.4 in Vergennes, directly downstream of the Vermont Route 22A (Main Street) bridge. The falls is segmented by two islands into three cascades.

The project facilities are situated within the boundary of the Vergennes Historic District, which is listed in the National Register of Historic Places. The area contains many historic and archaeological resources related to Vergennes' rich history from the War of 1812 through the industrial age. The pumphouse on Pumphouse Island dates from 1874 and still houses the waterworks' original Flanders pump. The pumphouse has recently been restored with GMP's assistance. The Norton Grist Mill (1877), along with its former stable, is located on the other island. The mill is currently owned by GMP, and its repair and stabilization is addressed in the Programmatic Agreement for Managing Historic Properties at the project. Other contributing elements in the vicinity listed on the Nominating Form for the National Register include the Plant 9 powerhouse, the Monkton Iron Works tunnel, the former Vermont Shade Roller Company building, the former Plant 9 office/storehouse, and the former Benton Machine Shop wheelhouse. Additional contributing elements identified since the District's nomination to the National Register include the dam, the Plant 9 intake structure and penstocks, and the Plant 9B intake, penstocks, substructure, and generating components.

As a revitalization measure, the City of Vergennes has undertaken the creation of a "gateway" to the city in the area around the falls, including portions of the Vergennes Historic District. To this end, the city is working with the owners of vacant properties of historical significance, including GMP's Norton Grist Mill and the former Vermont Shade Roller Company building, to find tenants for these properties.

3.0 EXISTING RECREATION SITES

Formal public recreational opportunities in the immediate area of the Vergennes Project include shoreline fishing access, a picnic area and a boat launch just downstream of the project, and a cartop boat launch located immediately upstream of the project in GMP's Settler's Park. The existing shoreline fishing access, picnic area, and boat launch are located in Vergennes Falls Park on the west bank just downstream of the Plant 9 powerhouse.

Primary recreational activities occurring in the project area include fishing, boating, picnicking, hiking, and sightseeing. Both motorized and nonmotorized boating are popular, and fishing occurs both from boats and the shoreline. Shoreline fishing access also occurs at the base of the falls and on the east bank near the Plant 9 powerhouse. Fishing occurs on GMP property and on private land from the falls to MacDonough Park. The river reach downstream of the dam provides a direct route to Lake Champlain. The Vermont Rivers Study has designated the entire segment of Otter Creek from North Dorset to Lake Champlain as a recreational boating area.

There are three formal recreation sites within the project area (Figure 1). These are:

Settler's Park

Settler's Park is located on the east bank of Otter Creek just upstream of the project and the Route 22A bridge. It is owned and operated by GMP and provides parking and a car-top boat launch.

Portage

There is an existing canoe portage at the project. The boat launch in Settler's Park serves as the takeout. The portage crosses to the west bank of Otter Creek over the Route 22A bridge, crosses Main Street by the Shade Roller building to Canal Street, and continues on to the boat launch at City Falls Park, which serves as the put-in.

Vergennes Falls Park

Vergennes Falls Park, owned and operated by the City of Vergennes, is located on the south bank of Otter Creek, downstream of the project. The park offers walking paths, shoreline fishing, picnic areas, and a boat launch, as well as scenic views of Vergennes Falls.

MacDonough Park, also owned and operated by the City of Vergennes, is located downstream of the project on the east bank of Otter Creek. It also offers dramatic views of Vergennes Falls, and is the site of the municipal docking facility.

4.0 RECREATION ENHANCEMENTS

GMP will provide recreational enhancements for project recreation sites as referenced in article 406 of the new license and described in this section. These measures will enhance the recreational experience of individuals using project resources by providing additional recreation opportunities, site amenities, and historic information.

4.1 Improvements to Settler's Park

GMP will improve the drainage characteristics of the existing boat launch to reduce the existing runoff scour, and reduce the steepness of the grade. Concrete planking is proposed to be installed on the final slope to the water to improve access for small trailered boats and to reduce erosion at this location. The licensee, the City, and the VANR agree that the intended use of this launching site will continue to be primarily for cartop and small trailered boats. The VANR comments that the extent of the improvement should be carefully planned to assure that larger boats are not launched from this location. This designed use will be reinforced with appropriate signage. The existing informal parking area will be upgraded and defined to a graveled lot sized to accommodate two cars with trailers and seven without. These improvements will facilitate and enhance existing public use of this area without introducing extensive or visually intrusive new facilities to this relatively undeveloped natural setting.

4.2 Improvement to Fishing Access below Plant 9

GMP will improve and expand public access to Otter Creek between and adjacent to Plant 9 and the City's Vergennes Falls Park. These improvements will include development of the area adjacent to the powerhouse for a universally-accessible fishing area and construction of a fishing platform for general use. As recommended by the City, the size of the proposed fishing platform has been decreased to approximately 18' by 30' to decrease its aesthetic impact.

4.3 Improvements to Fall Park

The licensee will remove accumulated debris from the land between Plant 9 and the City park. This area will be maintained for public use as a natural park by maintenance such as raking at least annually in the spring, tree trimming, and mowing grass. The licensee will provide an additional six picnic tables at the Park. Two will be designed to be ADA-accessible and associated with new ADA parking spaces. An ADA-accessible toilet will also be installed. The portage trail will put in at the existing boat launch at this location. The City indicates that existing parking at Vergennes Falls Park is sufficient to accommodate the level of increased use expected. The adequacy of existing parking will be evaluated along with that of other facilities every five years as described below.

All of these recreational enhancements will include appropriate directional and informational signage and vegetative plantings, as shown in the enclosed drawings. The interpretive signage will conform to the format that is being developed by the Lake Champlain Basin program. Interpretive signage highlighting the history of the Vergennes Falls area and the project structures will be installed near the public fishing facilities to be constructed near Plant 9 and at the Grist Mill. The content of these interpretive signs will be cooperatively developed by the local Vergennes Historical Society, the City of Vergennes, the Vergennes Partnership, VANR, the Vermont Division for Historical Preservation, and GMP.

5.0 IMPLEMENTATION

The recreation enhancements described in this plan will be undertaken within the context of the City's broader plan for increased public use of the Vergennes Falls area. GMP continues to support and participate in this broader plan and has entered into an agreement with the City, pending Federal and agency approval, whereby GMP will release funds reserved for construction of the enhancements described in this plan into an escrow account for the City's use as matching funds (see Appendix B, letter dated April 14, 2000).

As part of this agreement, the City will assume responsibility for construction of the recreational enhancements described in this plan. Implementation of this agreement will maximize the funding available for recreational improvements within the Vergennes Falls area and will ensure the best possible coordination of the provisions of this plan with those of the City's broader plan to enhance the public's use and historic appreciation of the area.

Both GMP and the City are mindful of the need to properly fit these facilities into the historic surroundings of the area. Accordingly, no construction or ground disturbance will be undertaken until the Cultural Resources Management Plan for the project is completed, approved, and implemented. Further, GMP will assume that soils within 200 feet of the top of the riverbank are sensitive for archeological information. Any ground disturbing activities will be preceded by an archaeological survey to determine any potential effects to potentially significant archeological resources.

5.1 Schedule

The recreation enhancements specified in this plan will be constructed within three years following approval of this plan by the Commission, and after the matching grant funds are made available. GMP currently estimates that grant funds for general enhancements and signage will be available in time for 2001

construction. Funds for the fishing pier should be available in time for 2002 construction, and funds for the Settlers' Park should be available for either the 2001 or 2002 construction. Plantings are generally conducted in the fall following construction activities.

5.2 Construction, operation, and annual maintenance

As described above, the recreation enhancements of this plan will be constructed by the City of Vergennes, with funding provided by GMP. GMP will continue to operate and maintain existing and proposed recreational facilities located on its property. Operation and maintenance includes removing debris, annual raking, and other routine maintenance activities. GMP plans to conduct these maintenance activities using existing staff. As such, there should be no significant new annual costs associated with the facilities. Recreational facilities located on City property will be operated and maintained by the City.

5.3 Erosion and sediment control

Typical sediment and erosion controls are attached as Appendix C to this plan. Typical specifications for establishing grassed areas are attached as Appendix D. Detailed plans will be developed and submitted to the Vermont Agency of Natural Resources in the course of application for the state environmental permits required for the construction of the various facilities.

5.4 Periodic review and revision

In conjunction with its preparation of FERC Form 80s for the project, and as required by Article 407 of the new license, GMP will review this plan every five years. This review will include an assessment of the recreation facilities' capacity to accommodate their levels of use. If the facilities' use comes to exceed

their capacity, GMP will assess the need for improvements in consultation with the agencies and the City of Vergennes.

5.5 Filing of record drawings

Pursuant to Articles 301 and 406 of the project license, within 90 days of construction of the approved recreational facilities, GMP will file revised Exhibits F and G, showing these facilities as-built.

J:\012-052\4th Draft Rec Plan.doc

APPENDIX A
PROJECT DRAWINGS

APPENDIX B
AGENCY CONSULTATION

GREEN MOUNTAIN POWER COMPANY
VERGENNES HYDRO ELECTRIC PROJECT
FERC NO. 2674

Recreation Plan
License Article No 406

Agency Correspondence

DATE	FROM	TO	REGARDING
May 22, 2000	Paul Vachon, Vergennes Partnership Inc. and Randy Friday, City of Vergennes	Thomas L. Kahl, Kleinschmidt Associates	Comments on Drawings
May 9, 2000	Jeffrey R. Cueto, Vermont Agency of Natural Resources	Roger Johnstone, Kleinschmidt Associates	Comments on April 2000 Draft Recreation Plan
April 14, 2000	Jon Soter, Green Mountain Power	Randy Friday, City of Vergennes	Funds for Improvements
February 2, 2000	Randy Friday, City of Vergennes	Jon Soter, Green Mountain Power	Funds for Improvements
January 20, 2000	Jeffrey R. Cueto, Vermont Agency of Natural Resources	Roger Johnstone, Kleinschmidt Associates	Comments on December 1999 Draft Recreation Plan
January 4, 2000	Paul Vachon, Vergennes Partnership Inc.	Roger Johnstone, Kleinschmidt Associates	Comments on December 1999 Draft Recreation Plan

P125

May 22, 2000

Memo To: Thomas L. Kahl, P.E.
Kleinschmidt Associates Fax # 207 487-3124

From: Paul Vachon, Vergennes Partnership, & Randy Friday, City Manager

Subject: Review Comments on three recent drawings as part of GMP Recreation Plan

Copy to: Jon Soter, GMP

I have reviewed the subject drawings with Randy Friday and we have the following comments on the engineering drawings recently supplied.

Sheet 1

Location of handicapped parking and toilets. We agree with Jeff's concern and feel the parking and placement of these can be located closer to Canal Street, opposite the City's driveway shown on left side of Mechanic Street to minimize visual conflict. Plant trees to either side of the parking area, and screen the toilets with hedges or flowering shrubs. This relocation lengthens the paved walkway somewhat.

Add Sign 6 at corner of Mechanic St. and access road to GMP station directing visitor to picnic and toilets straight ahead; drawing attached.

Sheet 2

Stairway should be made of durable materials; concrete rather than pressure treated lumber is preferred. We are not too concerned about the aesthetics of a concrete stairway only 6-8 feet high. The dark metal railing will soften the visual impact when viewed from the side.

Purely for aesthetics, the three sections of handicapped railing should be placed so that both end sections of the railing are 42 inches high, with the three 32 inch high sections, spaced between the end sections. Rough drawing shown below for illustration of point.

Sheet 3

Signage Details: Suggest redesign of signs 1 & 2 to look like the attached sketch. Remove name of Vergennes and enlarge size of letters for Falls Park and arrow. How will these signs be supported and at what height? They will be on Route 22A and should probably be located before the Canal Street intersection rather than the position shown.

- * We don't really like the short stubby arrow. Show only one.
- * Add Sign 6 with detail as shown - picnic table and toilet.
- * Modify legend as appropriate for new sign symbols.

Call for clarifications as needed. We also wish to emphasize the importance of the note on sheet 1, "Remove debris from GMP property and rake annually". This also needs to be stated in the text of the recreation plan so it doesn't get lost in the drawing detail.

★

2075

BOAT LAUNCH/CANOE
PORTAGE PUT-IN

EXISTING BOAT RAMP

STANDARDS

STANDARDS

DESIGNATED PARKING SPACES

OPTION #2 - PLACE IN EXISTING

NOT AN OPTION

TWO UNISEX PORTABLE TOILETS -
ONE HANDICAPPED ACCESSIBLE AND
ONE REGULAR FROM MAY TO NOVEMBER

2 - WHEEL CHAIR
ACCESSIBLE PICNIC TABLES
FROM MAY TO NOVEMBER

NEW ASPHALT PAVED
PATH 5'-0" WIDE
5% MAXIMUM SLOPE

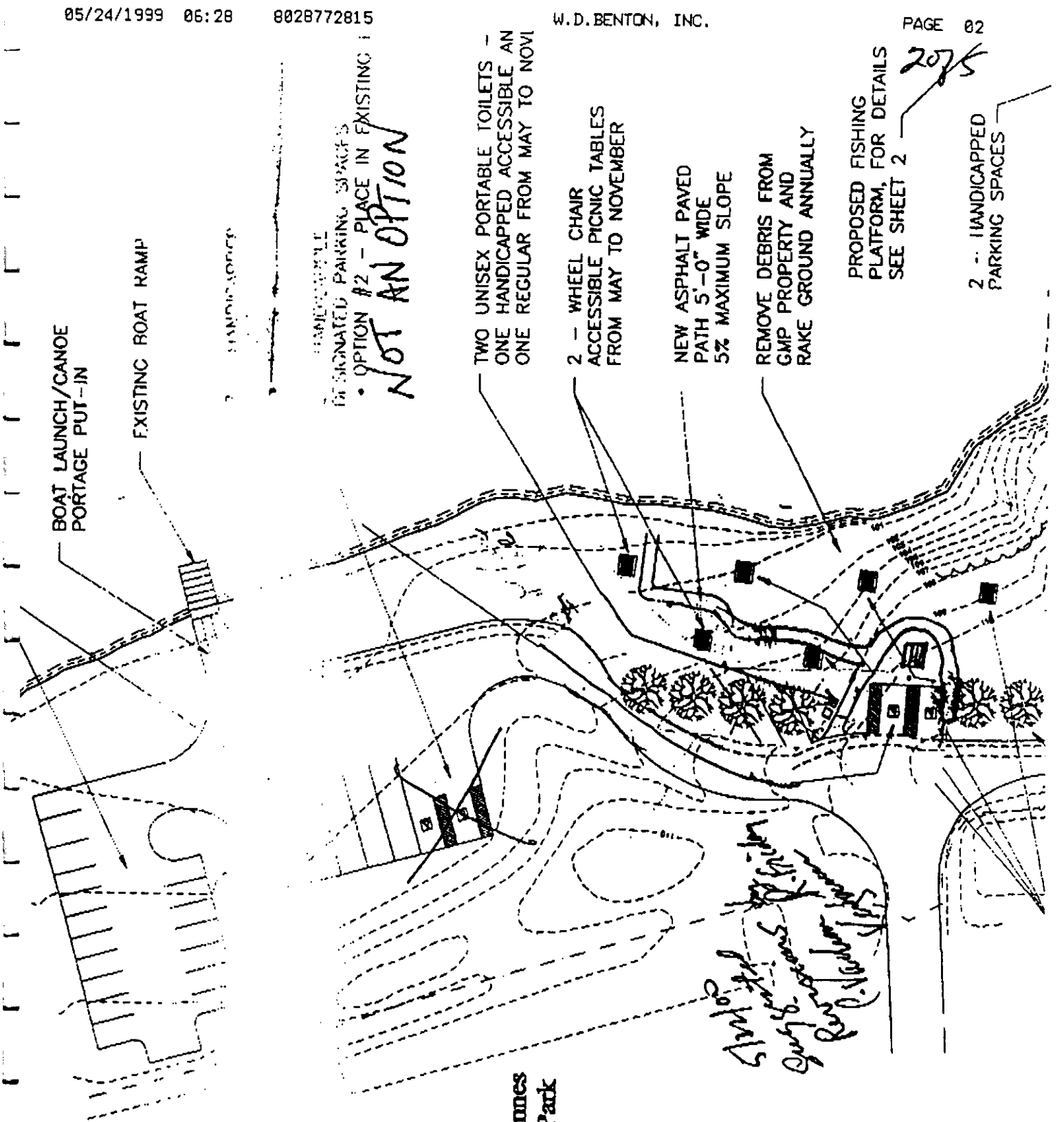
REMOVE DEBRIS FROM
GMP PROPERTY AND
RAKE GROUND ANNUALLY

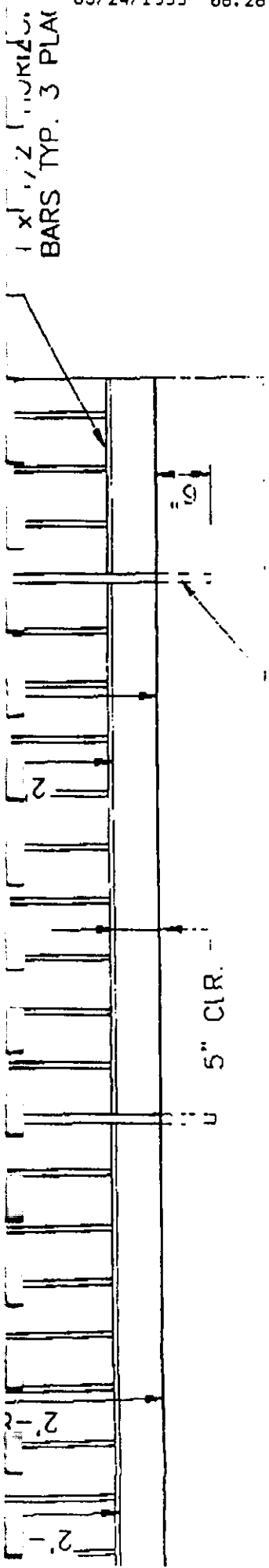
PROPOSED FISHING
PLATFORM, FOR DETAILS
SEE SHEET 2

2 - HANDICAPPED
PARKING SPACES

Vergennes
City Park

Start of
Quincy
Ramp
Ramp



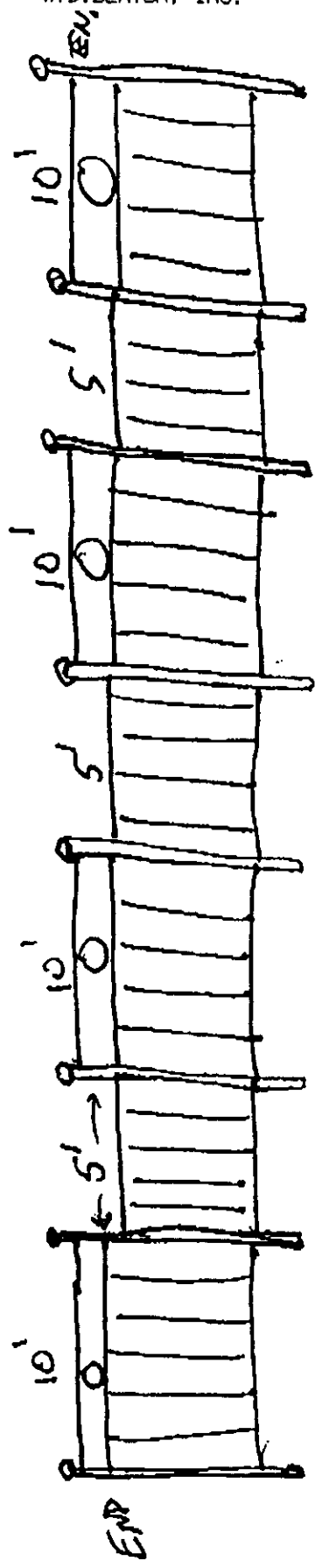


NOTE: IN GROUND EMBEDMENT
 A 8" DIA. x 4'-8" DEEP
 CONCRETE FOOTING

1

HANDRAIL TYPICAL DETAIL

3/4" - 1'-0"

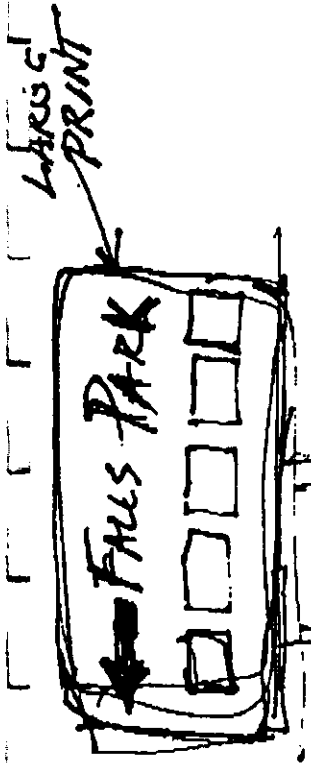


385

GREEN MOUNTAIN POWER CORPORATION
 VERGENNES, VERMONT
 VERGENNES HYDROELECTRIC PROJECT
 RECORD NO. 2674

Scale: AS SHOWN
 Project No: 012-052
 AutoCad Release: 14

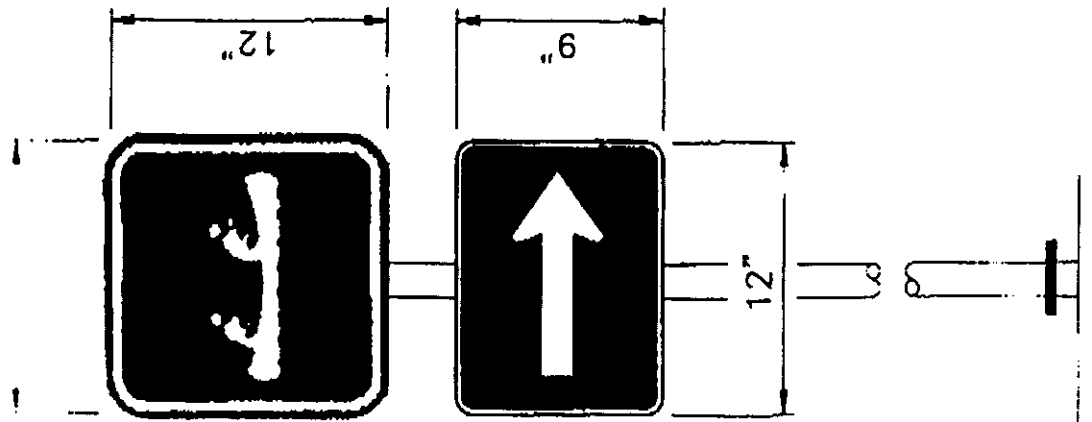
485



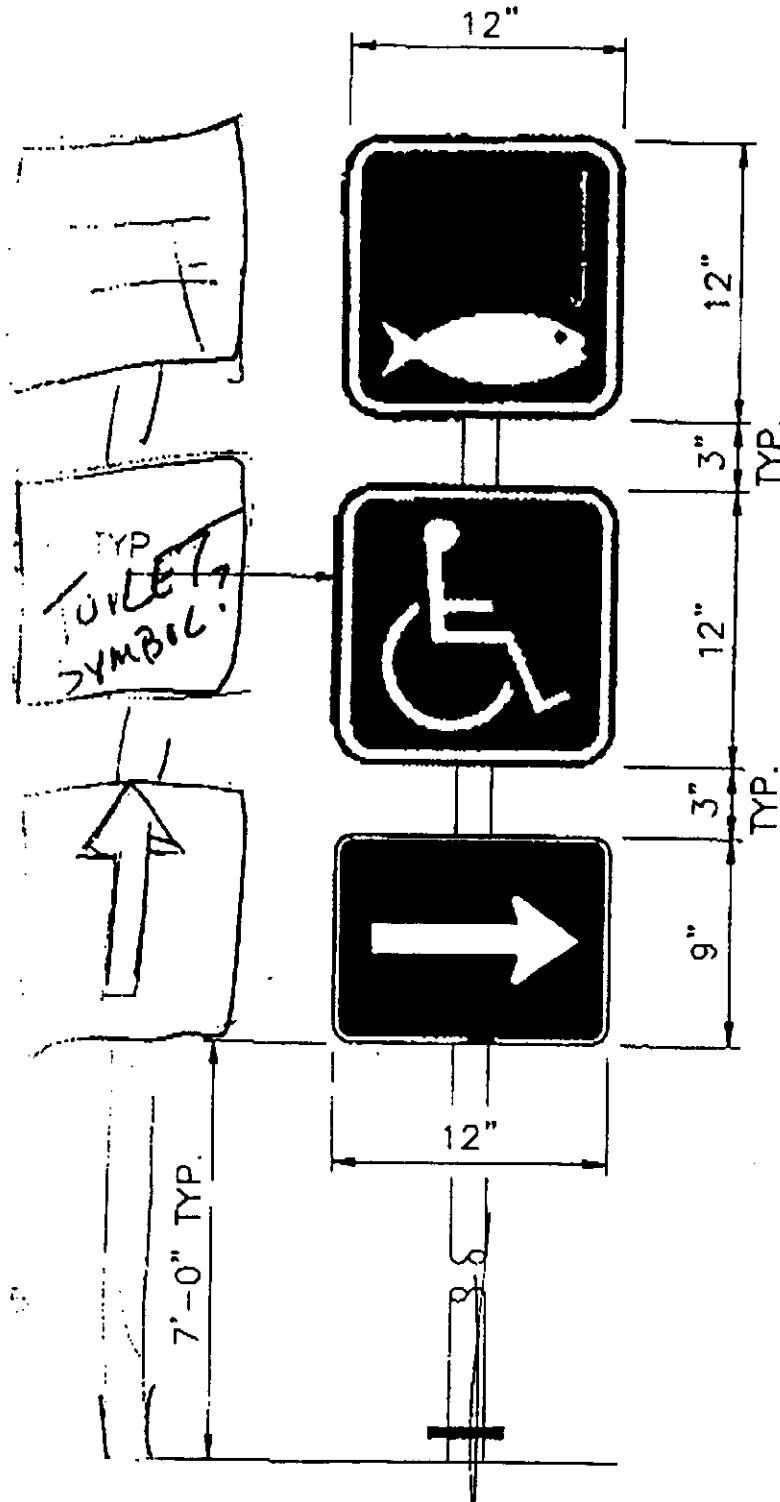
(A) Height ?
on 22A
Sign # 1 & 2

(B) Posts: 1 or 2

(C) Location per proximity to roadway & Lee Daffey lot?



5275



TYPE 5 SIGNAGE

1 1/2" = 1'-0"





State of Vermont

Department of Fish and Wildlife
Department of Forests, Parks and Recreation
Department of Environmental Conservation
State Geologist
RELAY SERVICE FOR THE HEARING IMPAIRED
1-800-253-0191 TDD>Voice
1-800-253-0195 Voice>TDD

012-111-1
TEL

AGENCY OF NATURAL RESOURCES
Department of Environmental Conservation

WATER QUALITY DIVISION
103 South Main Street
Building 10 North
Waterbury, VT 05671-0408

802-241-3770
Fax #:802-241-3287

May 9, 2000

Roger H. Johnstone
Licensing Coordinator
Kleinschmidt Associates
PO Box 576
Pittsfield, ME 04967

Re: Vergennes Project - FERC Project No. 2674
Article 406 Recreation Plan

Dear Mr. Johnstone:

By letter dated April 25, 2000, you filed the draft recreation plan with our office for comment. We had reviewed the prior draft and commented by letter dated January 20, 2000. As I had noted before, the plan will need Department approval under Condition K of the April 15, 1999 water quality certification.

I spoke with Giovanna Peebles of the Division for Historic Preservation concerning their review. They are interested in the status of the work on the Norton Grist Mill, which was to have replacement windows installed and the roof repaired. They will also be commenting on the modifications to Plant 9 shown on the plan sheet included with the draft recreation plan, specifically the door replacement, installation of Lexon plastic to replace broken window panes, and mounting of signs on the building.

I have forwarded a copy of the plans showing the fishing platform to our district fisheries biologist to get his ideas on functionality. One question I have is whether the fill could be avoided by constructing the structure as a pier using pilings. I think that type of design would tend to be less intrusive than using a steel sheetpiling retaining wall. The plan continues to show the rip rapped slope between the parking area and the platform; if this slope is above the river's high water level and is at a grade of 2.5:1, then it should be no problem to use plantings instead of rock. The structure itself is likely to need a stream alteration permit from our department and perhaps a Corps of Engineers permit as well.

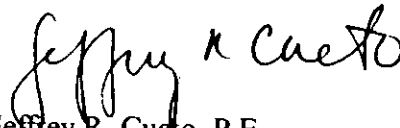
Roger Johnstone
May 9, 2000
Page 2

With respect to the layout for the picnic area, I would suggest trying to maintain a buffer between the shoreline and the path and picnic tables. It would be ideal to try to reestablish riparian vegetation along the shoreline in this short reach between the transformer substation and the City's boat launch. To improve the buffer, please consider moving the path/road intersection about 50 feet south to follow between the 101 and 102 foot contours. If feasible, it may be better to install the portable toilets on the left where the road enters the parking area. They may be easier to service at this location and would be further from the shoreline and closer to the handicapped parking.

The path proposed to connect the Plant 9 area with the City's park is not shown on the plans although it is mentioned in the plan document. As you move closer to developing final plans, perhaps a site meeting should be arranged with representatives from my department, the City and GMP to discuss the path route and design, as well as planting details. At the same time we could discuss the design for Settlers Park and any other outstanding details.

Several of the comments provided in our January 20, 2000 letter still pertain and are not repeated here; please include both letters with the recreation plan. Thank you for your consideration of our comments. Please contact me if you have any questions. Again, the final draft should be filed with our office for approval.

Very truly yours,



Jeffrey R. Cueto, P.E.
Principal Hydrologist

- c Brian Chipman, District Fisheries Biologist
- Giovanna Peebles, DHP
- Randy Friday, Manager, City of Vergennes
- Jon Soter, GMP

GREEN MOUNTAIN POWER CORPORATION

163 ACORN LANE • COLCHESTER, VT 05446 - 6611 • (802) 864-5731

April 14, 2000

Randy Friday
City Manager
City of Vergennes
P.O. Box 35
Vergennes, VT 05491

Dear Randy:

The City of Vergennes has asked Green Mountain Power Corporation ("GMP") to provide funds to be used as matching funds for an upcoming 'Vermont Byways' Grant to fund various recreational improvements in the City of Vergennes. We support the City's desire to maximize funding available for recreational improvements to the Vergennes basin.

GMP is obligated under its FERC license for its Vergennes hydroelectric project, issued in July 1999, to construct specific recreational enhancements stated in the license. Those enhancements are:

- (1) installation of directional and interpretive signs for recreation in the project area;
- (2) improved access for small boats and parking at Settlers Park;
- (3) improved trail, shoreline fishing access, vegetative plantings and picnic area along the western bank near Plant #9;
- (4) construction of a disabled-accessible fishing platform on the western bank near Plant #9;
- (5) installation of portable toilet facilities (including disabled-accessible facilities);
- (6) installation of signs interpreting the history of Vergennes Falls and the surrounding historic structures.

GMP is also required to file with FERC a recreational plan detailing construction, scheduling, costs and other information relating to the enhancements by May 26, 2000. GMP is to prepare the Recreational Plan after consultation with the Vermont Agency of Natural Resources ("ANR"), the Vermont Division for Historic Preservation ("VDHP") and the City of Vergennes.

GMP is willing to make available to the City an initial sum of \$43,000 to be used as matching funds for state and federal grant programs including, but not limited to, the Vermont Byways Grant in exchange for the City taking total responsibility for the construction of all items listed in the above paragraphs, as well as compliance with all FERC licensing requirements related to those items.

04/14/2000 11:31

0026559540

GMP ENERGY SERVICES

GMP's agreement to provide to the City the \$43,000 is subject to FERC approval of a Recreational Plan that includes designating the City of Vergennes' as the responsible party for construction of the enhancements. GMP will be responsible for maintenance of the above facilities constructed on GMP owned property. It is further subject to GMP and the City of Vergennes entering into an agreement, satisfactory to each of them, setting forth the terms, provisions and conditions each is undertaking in connection with fund availability and compliance with the FERC license recreational requirements (the "Cooperative Agreement"). However, GMP will make the \$43,000 available to the City immediately upon acceptance of this letter as the first step in the Cooperative Agreement to be held in escrow subject to release upon receiving the required approvals from FERC, ANR and the VDHP.

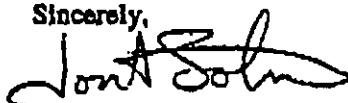
As discussed by GMP and the City of Vergennes, GMP is willing to reserve a total of \$166,000 for all of the FERC required projects specified in paragraphs 1-6 above. In further support of maximizing funding available for recreational improvements to the Vergennes basin, GMP agrees to work with the City, ANR, VDHP and FERC to enable the remaining \$123,000, less engineering costs incurred for recreational enhancements not anticipated to exceed \$8,000, to be released to the City over an agreed upon period in exchange for the City being responsible for all FERC required projects and based on the specifications approved by FERC.

In the event that any party, including the City, GMP, ANR, VDHP and FERC do not agree to support the conditions of this agreement, then the City shall incur no responsibility for any recreation enhancement projects in the FERC license and this agreement shall terminate. Responsibility for the FERC required recreational enhancements shall revert to GMP.

In the event that GMP ceases to exist as a Company for any reason whatsoever, this agreement and all of its provisions shall be the responsibility of its successors and assigns.

As always, we look forward to continuing our partnership with the City of Vergennes.

Sincerely,



Jon A. Soter, P.E.
Manager of Corporate Services

JAS/hk

Agreed to and Accepted
City of Vergennes

By: 

Kitty Oxholm - Deputy Mayor (04-14-2000)

CC. J. Soter
4/28/01**City of Vergennes, Vermont**

OLDEST CITY IN VERMONT

INCORPORATED IN 1768

AREA CODE 802 877-3637 / 877-2841
FAX NUMBER 802-877-1160

POST OFFICE BOX 35 / ZIP CODE 05491

TO: Green Mountain Power Corpor
Mr. Steve Terry - Vice President
163 Acorn Lane
Colchester, VT 05446

Post-It® Fax Note	7671	Date	2/2/00	# of Pages	1
To	Roger Johnstone	From	Jon Soter		
Co/Dept		Co.			
Phone #		Phone #			
Fax #	207-487-3124	Fax #			

FM: Randy Friday - City Manager

Please review + call me - Thankx.

RE: GMP FERC Project # 2674; Otter Creek Basin enhancements (Recreational Plan & Cultural Resource Management Plan)

January 26, 2000

Dear Steve,

Thanks for the meeting last week. I had an enjoyable time and sensed we all have some similar ideas to better the Basin area, while keeping GMP and the City interests in mind.

Since that time I have, very generally, discussed with the Council. GMP's doing only some improvements this summer. The improvements are noted in the FERC license as mandatory by end of the 2000 construction season. The Council had no overt negative reactions.

I have also, very specifically, discussed with Roger Johnstone the legal possibility of moving the project forward in the fashion we discussed. He represents GMP interests in the recreation plan engineering. According to him, FERC is amenable to GMP doing 'X' amount of improvements this summer, while bankrolling 'X' into a reserve account. As I understand it, the funds would be turned over to the City and left for implementation, with the stipulation that they be expended on Basin area improvements only, before a date likely dictated by FERC. To make this happen, FERC would need to see a 'partnership' of signators, including GMP, the City, and the State.

I feel this is a good route to pursue for all involved. GMP gets FERC off its back and Jon Soter has stated funds are already in place in this year's budget for improvements. The City can parlay the escrow money into a greater, grant-assisted pool of money. And, the State can feel it has helped usher in a beneficial GMP/City/State deal.

Referring to the "Budgetary Estimate for Recreation Enhancements" (Table E(5)-1) of the *Draft Recreation Plan (Dec., 1999)*, here is an overview of what I would like to see happen, on a case-by-case basis, using GMP cost figures. Please note they are nearly 4 years old and will have to be updated in the near future by adding 5-10% for Summer, 2000 construction costs.

Budgetary Estimate for Recreation Enhancements - Vergennes Hydro Project

Item	Construct in 2000, or escrow?	Constr. \$	Escrow
Trails for fishing access near city park	construct in 2000	\$12,000	
Picnic tables at access trails, etc.	construct in 2000	\$3,000	
Planting allowance	construct in 2000	\$10,000	
Fishing platform	escrow (re-design necessary)		\$23,000
Handicap parking signage	escrow (re-design necessary)		\$1,000
Granular backfill at platform	escrow (re-design necessary)		\$12,000
Timber stairs to platform	escrow (re-design necessary)		\$5,000
Mobilization/Demobilization	escrow		\$10,000
Care & Diversion of water	escrow		\$5,000
Clearing & grubbing	escrow		\$4,000
Excavation (stockpile, rip-wrap, etc.)	escrow		\$13,000
Heavy rip-wrap	escrow		\$3,000
Settler's Park improvements	escrow		\$7,500
Directional signage	construct in 2000	\$3,500	
Interpretive signage at Grist Mill	construct in 2000	\$2,000	
Miscell. Signage allowance	construct in 2000	\$1,000	
	subtotal = \$115,000	\$31,500	\$83,500
	Plus,		
	engrs. & mgmt. (20%) = \$23,000		\$23,000
	direct budget costs = \$138,000		
	contingency allow. (20%) = \$28,000		\$28,000
	Total (1997) Budget. Est. = \$168,000	\$31,500	\$134,500
Desire of City of Vergennes:		value	
access to Pumphouse Island; railings	should already be completed	\$0	
pedestrian striping across 22A (see ma	construct in 2000	\$1,500	
sidewalk & railing behind Benton bldg.	construct in 2000	\$10,000	
deed Settler's Park to City and restrict			
deed for use as Park & park, only. deed work in 2000		\$100	
continue Grist Mill improvements (roof)	should already be completed	\$0	
	Total benefit to City of Vergennes =	\$11,600	

If I can play something similar to the figures above to the Council, I can get their support in writing to the FERC. And, if that happens, I will try and make the *Cultural Resources Management Plan (CRMP)* implementation as cost-effective as possible for GMP. I know the CRMP has been viewed by some few in Vergennes as a good tool to make GMP throw more money at the Basin area; something I do not wish to have negatively impacting this arrangement.

I look forward to seeing you on Wednesday, Feb. 2nd at City Hall (8 a.m.).

Regards,


Randy

encl: GMP cost schedule of recreation plan improvements (1997)



State of Vermont

Department of Fish and Wildlife
Department of Forests, Parks and Recreation
Department of Environmental Conservation
State Geologist
RELAY SERVICE FOR THE HEARING IMPAIRED
1-800-253-0191 TDD>Voice
1-800-253-0195 Voice>TDD

AGENCY OF NATURAL RESOURCES
Department of Environmental Conservation
WATER QUALITY DIVISION

103 South Main Street
Building 10 North
Waterbury, VT 05671-0408

FAX 802-241-3287
TEL 802-241-3770

January 20, 2000

Roger H. Johnstone
Licensing Coordinator
Kleinschmidt Associates
P.O. Box 576
Pittsfield, ME 04967

RE: Vergennes Project - FERC Project No. 2674

Dear Mr. Johnstone:

By letter dated December 23, 1999, you filed a draft recreation plan for the Vergennes Project for our review under the consultation provisions of Article 406 of the federal license. Please note that the water quality certification, Condition K, requires Department approval:

Recreational Facilities. Recreational facilities shall be constructed and maintained consistent with a recreation plan approved by the Department. The plan shall be filed with the Department within 60 days of license issuance and shall include an implementation schedule. The applicant is advised to consult with the Department and the City of Vergennes in the development of plans. Where appropriate, the recreation plans shall include details on erosion control. Modifications to the recreation plan shall also be subject to Department approval over the term of the license.

The draft plan does not provide sufficient specific information to enable us to approve the plan at this time. The plan does not appear to have moved much beyond the level of detail provided in the license application. The Department is satisfied with the type, location, and scale of development proposed; however, the plan should provide the following:

Settlers Park: grading plans for the parking area; surface type (paved, crushed stone, gravel, grassed); traffic configuration; landscaping/riparian plantings; drainage; erosion control (including limits of disturbance and existing vegetation, especially in riparian zone), and design for ramp. With respect to the ramp, I note that concrete planks are proposed. My recollect was that the original upgrade was limited to addressing drainage problems (scour from lot runoff that enters the river via the ramp) and flattening the grade

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slightly. The use is intended to be for cartop boats and small trailered boats. The extent of improvement should be carefully planned to assure that larger boats are not putting in at this location. With improvements in grade and drainage, the use of concrete planks may not be necessary for the type of use intended. Mature vegetation along the shoreline should be preserved and supplement as appropriate.

Fishing platform: The location for the platform is a popular angling location at the Plant 9 tailrace. Three important considerations for the platform are functionality for the disabled, architectural attractiveness (the FERC article requires that the plan include a discussion of visual compatibility for the proposed improvements with the project area), and resistance to ice and flooding. The design plans show a crib structure that would be fully submerged under high lake levels. It would be accessed via a set of stairs at a 2:1 slope or via the trail. Presumably, disabled access would be via the trail (parking and directional signs to guide the disabled should be clarified in the plan). The area around the platform would be riprapped. Platform materials, flooring, and railing details are needed, as well as the method to be used to prevent the structure from being damaged during spring ice out and high water. Bioengineering alternatives to riprap and/or other methods to provide a more natural setting should be explored. Whether the area between the substation and Plant 9 will be available for public parking should be clarified.

The platform and bank stabilization work may require a state shoreland encroachment permit and a Corps Section 404 permit.

Other improvements at Plant 9. Details on the picnic area, toilet facility, parking, and plantings referenced on p. 7 are not provided.

Trail between the fishing platform and the City Park. Topographic information, grading specifications, trail design, and the extent of clearing and soils disturbance are not provided. The shoreline trail should be designed to follow existing contours and minimize regrading and removal of vegetation (Section E.1 of the erosion control plan mentions tree removal in this area). I assume the upper trail may need more work in order to provide disabled access. We would be glad to visit the site in the spring to discuss the design for the shoreline trail. Restoration of riparian vegetation is recommended for inclusion as part of this project, and we have a specialist on staff that would be able to advise on selection of native plantings; I note that \$10,000 has been allocated to plantings.

Portage. On the signpost at Settlers Park, a sign should be installed, facing the takeout, showing the portage trail configuration for river travelers. The recreation plan drawings should show the portage route. The put-in location is unclear. Information on the upstream safety buoys and the take-out warning sign should also be included in the plan.

Roger H. Johnstone
January 20, 2000
Page 3

Access below Plant 9B. The plan should clarify the availability of public access to the shoreline downstream of Plant 9B.

Erosion control. The erosion control plan in the appendix mentions a silt fence "along the alignment of project improvements as shown in Figure 10." I do not believe that the plan includes a Figure 10.

If borrow material (ref. Section E.3) is to be stored on site, the location should be specified. If the contractor is to use a staging area, details on that area should also be provided.

If grassed areas are to be established, then the specifications for topsoiling, seeding, lime and fertilizer, and mulching should be provided.

Section E.7 mentions riprapping of ditches and culvert outlets. Any proposed site drainage details should be shown on the plans. Grading plans for both Settlers Park and below Plant 9 have not been provided. Grass-lined swales are preferred to stone-lined ditches where feasible.

The Department should be contacted for a site inspection just before project completion.

Signage. The Department would appreciate being included in the consultation on the interpretive signs.

I understand that GMP has been in discussions with the City of Vergennes concerning the recreational plan and expect that this may in part be the reason for the lack of detail. The success of the plan hinges, however, on those details. Please revise the plan to address the comments I provide above. I would recommend requesting another extension from FERC in order to provide the necessary time to pull things together.


Very Truly Yours,

Stephan D. Lanphear
for Jeffrey R. Cueto
Principal Hydrologist

cc: Craig Myotte, GMP
Randy Friday, City of Vergennes
Laura-Eaton Poole, US Fish & Wildlife Service
Steve Sease

January 4, 2000

Memo to: Roger H. Johnstone, Licensing Coordinator, Kleinschmidt Associates

From: Paul Vachon, Director, Vergennes Partnership Inc. 

Subject: Vergennes Partnership Comments on GMP Article 406 Draft Recreation Plan

I regret to report that I find the subject plan incomplete, and lacking creativity or sensitivity to the history, scenic quality and educational opportunity that the City envisions for the Otter Creek Falls and basin. By your own proposal dated October 15, 1999, the plan was supposed to have been coordinated with the Cultural Resources Mgt. Plan, but cultural resources are virtually ignored in this sketchy report. I look forward to discussing these and other comments with you on Friday, January 7.

Specific comments follow.

1. p. 5 Shoreline fishing access also occurs at the base of the falls on the east bank near power house No. 9 B. Fishing occurs on GMP property and on private land (Benton and others) from the falls to the city Park (Macdonough Park). Access from Main Street to this existing fishing area, (and potential canoe portage location), is extremely dangerous since the public is forced to use a narrow, steep metal utility stairway that is designed solely (and perhaps appropriately) to provide access to power plant No. 9 B.
2. p.5 Settler's Park is located on the east bank of the river.
3. P. 6 The portage paragraph is poorly written. How can a take-out cross the bridge and descend the river bank? The description is not even close to being accurate. Canoeists must cross a busy, highway bridge, on narrow sidewalk, then cross the Route 22A without a crosswalk to a non defined sidewalk along the Shade Roller building, down canal street, turn at the access road and go to the City Falls Park for safe river access, not having to descend the river bank. Well, you get the idea I think.
4. P. 6 MacDonough Park is incorrectly spelled, and is located on the east bank.
5. Section 3.1 Existing boat access should be widened to ten feet wide, graded, crushed stone added, and concrete planks to enable safe, small boat launching with a trailer. Concrete planks should have a substantial stone base to prevent erosion around planks and be linked together to prevent movement due to ice and water flow. How will the parking area be delineated? Large boulders could be used effectively and would

prevent incursion into picnic area. Confer with City about adding picnic tables to grassed area beyond parking area.

6. Section 3.2 This section is vague and is not fully supported by details on the attached figures. The picnic ^{area} needs to be defined, the location of the portable toilet should be placed near the parking area, the vegetative plantings should be flowering shrubs and plantings that attract birds and wildlife. New trees should be placed above the ice damage line or otherwise protected. Removal of some dead trees should be done, but try to selectively leave a few that can serve as bird habitat.

GMP should consider redirecting the canoe portage away from the bridge crossing and rather along the east bank, down a wide, less steep stairway to the base of the falls at plant no. 9 B.

The fishing platform is too large for the need to be met. I find it visually overwhelming and I question whether we need to spend \$53,000 on a permanent platform. Will it withstand the ice and debris damage that will occur at this location? At minimum, I suggest reducing the size of the platform to 10'x30', with a small seating area on the next higher level. I'd like the engineers to consult with Jeff Provost, the Dock Doctor in Ferrisburg to evaluate a movable dock design. One that raises up and down perhaps, would be in keeping with the historic stairway and floating dock that was used at the Grist Mill, for example.

A paved walkway from the City parking area should be designed to gradually slope to the platform. A stairway should be added to provide fisherman safe access to the base of the falls near the powerhouse where the fishing is the best. A concrete pad about 4' by 12' would provide families a level place to stand and keep the kids safely away from the rip rap.

A walkway joining the stairway to the fishing platform could be built from midway down the stair. This would allow those who wish to fish a little further downstream a safe place to go.

7. Section 3.3 Absent. There is no section here on historic information as suggested in section 3.0. Historic information is a great way to help the public understand the history and mechanics of hydropower at the sight, and to describe the previous uses (Monkton Iron Works) that took place in the project area. Refer to the gateway report, page 14 for a sample of historic informational signage.

General signage proposed can be effective, attractive and more specific with references to Otter Creek Falls, Macdonough and Falls Park.

cc: Randy Friday, City Manager

8. *Signage needs to be coordinated with Scenic Byway uniform signage specs.*

APPENDIX C

SOIL EROSION AND SEDIMENTATION CONTROL PLAN

SOIL EROSION AND SEDIMENTATION CONTROL

1.0 INTRODUCTION

The following sections describe the measures to be utilized during the construction of the Green Mountain Power Company Vergennes Recreation Project. The purpose of this plan and the proposed soil erosion control measures is to minimize soil erosion and sediment transport off the project site during and after construction of the improvements. The approved plan will become part of the contract documents for the project.

The construction activities associated with the project will include the following major items:

- **Excavation and Backfill for Project Improvements**
- **Borrow, Stockpile and Disposal of Unsuitable Materials**
- **Planting of Vegetation for Landscaping**
- **Installation of Signs for Recreation Information**

The following sections describe the proposed protection measures and associated construction sequence.

- 2.0 Site Preparation
- 3.0 Excavation and Backfill Activities
- 4.0 Borrow, Stockpile and Disposal of Unsuitable Materials
- 5.0 Landscape Plantings
- 6.0 Installation of Information Signs
- 7.0 Inspection and Maintenance
- 8.0 Permanent Erosion Control Measures

2.0 SITE PREPARATION

The Contractor shall initiate the soil erosion and sediment control measures as described in this plan and as shown on the final design drawings that will be approved by all applicable agencies such as the Vermont Agency of Natural Resources (VANR) prior to exposing the ground surface in the designated construction areas. All construction areas potentially subjected to erosion shall be protected by silt fences.

During construction, the Contractor shall minimize the area disturbance of existing ground coverage such as shrubs, trees, and grass so that the smallest practical area of land is exposed at any one time during construction. At the earliest possible date, the Contractor shall establish the permanent erosion and sediment controls described in Section 8.0. The Contractor shall inspect and maintain the facilities or control measures until Owner's acceptance of the completed project, whereupon the Owner will assume maintenance responsibilities.

2.1 Clearing and Grubbing

During construction of the project, some trees may be removed between the existing Vergennes Falls Park and Plant 9. Prior to beginning the clearing activities, the Contractor shall place a row of silt fence along the alignment of the project improvements. The trees will be cut and stockpiled as directed by the Owner's personnel. Branches and slash may be chipped on site for use as wood chips or mulch or removed from the site and properly disposed in an approved landfill.

Upon completion of the clearing activities, the stumps within the improvement area will be removed and the site grubbed. This material shall be disposed of in accordance with Section 4.0 requirements and Local, State and Federal regulations.

3.0 EXCAVATION AND BACKFILL ACTIVITIES

Installing the proposed recreation improvements may require excavation of earth materials, rocks, and boulders as encountered. **All excavation and filling activities shall** occur on the **uphill side** of the silt fences. Excavating and backfilling for the new structures will use conventional construction techniques and methods. No bedrock excavation is anticipated.

4.0 BORROW, STOCKPILE AND DISPOSAL OF UNSUITABLE MATERIALS

The new construction may require gravel, crushed stone and borrow materials for the project improvements. These materials will be obtained from commercial pits within the project vicinity. The pits are not subject to control or operation by the project owner, and erosion control measures in the pits are the responsibility of the pit owner.

Borrow material may be temporarily stockpiled at the construction site until it is needed. The location of any borrow stockpile area shall be approved by the Owner prior to construction. Erosion control measures will be used to minimize the transport of sediment from the stockpiles. The downhill/down gradient side of the stockpile will be protected with an individual silt fence barrier. The surface of the stockpile which is subject to wind action will be seeded and mulched. Suitable overburden earthen materials will be used for backfill and slope stabilization activities. Excess earthen materials will be stockpiled as directed by the Owner and stabilized with seed and mulch.

Unsuitable soil materials will be disposed of at the Contractor's spoil area. The Contractor shall comply with all permit conditions applicable to the operation of the landfill's facility.

5.0 LANDSCAPE PLANTING

Landscape plantings will consist of grass, hedges, or tree plantings as shown on the drawings.

6.0 *SIGN INSTALLATION*

Installation of directional and interpretive signs is part of the project improvements for recreational access. The installation of the signs will generally be accomplished with post-hole diggers or with conventional construction equipment. No adverse impacts are anticipated from this activity.

7.0 *INSPECTION AND MAINTENANCE*

The Contractor will be required to seed and mulch disturbed ground in the project area within 7 days of stopping a construction activity. In no case will an area remain unprotected for longer than 7 days. Seeding shall be per the specification in Appendix D.

The Contractor will be required to inspect each soil erosion and sediment control structure (silt fences, dikes, hay bale berms, etc.) and newly seeded areas at least once per week and immediately following rain storms and other periods of heavy runoff. The Owner (or representative) will also inspect the site weekly to ensure that the erosion and sediment control structures are being installed and maintained according to this plan. The Owner (or representative) will notify the Contractor of observed deficiencies or additional measures necessary to maintain the sediment control structures. The Contractor, upon observing or receiving notification of deficiencies, will correct such deficiencies within 24 hours. The Contractor will maintain a weekly log of the condition of the sediment control measures, any sediment control problems, and additional measures or repair work necessary.

The Contractor will remove and properly dispose of all sediment collected at dikes, ditches or other areas. Sediment shall be removed from the sediment barriers when the reserve storage capacity is reduced by 20%.

As conditions require, the Contractor will cut/mow grass areas and remove cuttings before the grass reaches a height of 4 inches.

This program of inspection and maintenance will be initiated within 14 days of the project starting date and will remain in effect until project completion; at such time, the Owner

will assume responsibility for maintenance of the permanent erosion and sediment control measures.

8.0 PERMANENT EROSION CONTROL MEASURES

Upon substantial completion of the project, the temporary soil erosion and sediment control facilities will be removed as appropriate. The disturbed areas which are not to receive gravel, pavement or riprap surfacing, will be graded, loamed, seeded and mulched in accordance with the specification in Appendix D.

Riprap will be applied as shown on the final approved final design drawings to embankments, ditches, culvert outlets to prevent scour and soil erosion. Riprap for the project activities will be hard, durable, angularly-shaped stones or rock fragments free of cracks, seams, and objectionable materials. The VANR shall be notified approximately two weeks prior to the end of construction so that they can perform a final site inspection.

Upon establishing the permanent erosion control measures, and a sufficient "catch" of grass, the temporary erosion control measures will be removed and disposed of in accordance with Local, State and Federal regulations. The contractor shall re-seed all washouts and stabilize the project area prior to project acceptance.

APPENDIX D
SEEDING SPECIFICATION

SEEDING SPECIFICATION

1.0 GENERAL

1.1 Related Documents

Drawings and Contract apply to work of this section.

1.2 Description Of Work

The extent of seeding is specified herein and shown on the drawings. Seed all disturbed soil areas and all new shoulders, and designated areas.

1.3 Quality Assurance

- A. Submittals: Furnish certifications substantiating that materials comply with the specified requirements.
- B. The Contractor will be responsible for having topsoil used on the project tested at the Contractor's expense. Tests shall be made by a State Commercial Soil Testing Laboratory using methods approved by the Association of Official Agricultural Chemist or the State Agricultural Experiment Station. The Contractor shall furnish one copy of the soil analysis, which show pH factor, mechanical analysis, percentage of organic content, and recommended amendments to establish a satisfactory desired pH factor and supply of organics and nutrients to bring the soil up to a satisfactory level for planting.

The soil sample shall be taken from at least 3 different points in the soil stockpile or site, in a quantity sufficient to include the full range of soil conditions present.

2.0 PRODUCTS

2.1 Materials

- A. Topsoil: Fertile, friable, natural loam, surface soil, reasonably free of subsoil clay lumps, brush, weeds and other litter, and free of roots or rhizomes of "Witch Grass" (*Agropyron repens*), stumps, and stones larger than 1" in any dimension, and other extraneous or toxic matter harmful to plant growth. A pH of 5.3 to 6.0 is required. Topsoil shall not contain soluble salts higher than 500 parts per million and shall not contain more than 20 percent organic matter or less than 3 percent decayed organic material (humus). Phosphorus, nitrogen and potassium shall be in the medium to medium high range according to standard soil test results. The Owner and/or Landscape Architect reserves the right to reject, on or after delivery, any topsoil which does not, in their opinion, meet these Specifications. Soils existing on the site in the areas to be stripped for new road work may be stockpiled, screened and used for this purpose if they can meet the required specifications. Topsoil for planting beds shall be mixed with peat humus or compost at a ratio of three parts topsoil to one part humus.
- B. Humus: Ground or shredded peat that has been stockpiled at least one year prior to use, or commercial bagged peat. The use of sludge-wood ash compost, municipal compost, or wood waste humus from sources approved by the Vermont Agency of Natural Resources shall be allowable.
- C. Stockpile topsoil from construction areas and protect for future reuse by the Owner. The Owner will designate stockpile areas for the material in excess of the amount needed in this project.

2.2 Fertilizer

Commercial grade 10-10-10 for temporary seeding and 10-20-20 for permanent seeding, or as recommended by a Soil Testing Laboratory.

2.3 Lime

Natural limestone containing not less than 90% of total carbonates, ground to such fineness that not less than 100% passes a 10-mesh sieve, not less than 90% passes a 20-mesh sieve, and not less than 50% passes a 100-mesh sieve. Provide lime in the form of dolomitic limestone.

2.4 Seed

Provide seed from available commercial sources which do not contain more than 1% weed content, not less than 85% purity, and not less than 90% germination for each variety. The seed mixtures shall conform as follows:

For Permanent Seeding Mixture Use:

	<u>Application Rate</u>	<u>Recommended Variety</u>
Creeping Red Fescue	20 lbs/acre	Penn Lawn, Ensylva, or Wintergreen
Red Top	2 lbs/acre	
Tall Fescue	20 lbs/acre	Kentucky 31

For Temporary Seeding One of the Following:

	<u>Application Rates</u>
Winter Rye	112 lbs/acre
or	
Perennial Ryegrass	40 lbs/acre

2.5 Mulch

- A. For temporary mulch locations, provide organic mulch such as clean long-fibered hay or straw free from noxious weeds and other undesirable material, or a mulch consisting of wood cellulose fibers diluted in water. No material shall be used which is so wet, decayed or compacted as to

inhibit even and uniform spreading. No chopped hay, grass clippings, or other short fibered material shall be used. Hay or straw mulch shall be used with a mulch tackifier.

- B. Mulch: Shredded pine bark mulch. At least six months old, well rotted bark mulch, with chips no larger than four inches in any direction. No large peel strips shall be allowed. Color shall be a uniform dark brown. The mulch shall contain no foreign material injurious to plant growth. Samples shall be submitted to Owner's Representative for approval prior to installation.
- C. Apply appropriate mulch type for the condition areas being treated.
- D. Apply chemical anchoring binders or other means to anchor mulch in wind exposed areas.

3.0 EXECUTION

3.1 General

- A. Topsoil: Provide loam to a minimum depth of 3" or as indicated on drawings in all areas shown or disturbed by the Contractor.
- B. Contractor shall perform a soils test to determine pH, lime, and fertilizer requirements prior to adding lime or fertilizers, for the type of plants involved.
- C. Fertilizer: Apply at the rate determined by soils test or in lieu of soils test, at the rate of 800 lbs/acre.
- D. Lime: Apply at the rate determined by soils test or in lieu of soils test, at the rate of 3 tons/acre.

E. Seeding: Apply at the rates noted above. Increase by 10% if hydro-seeding.

F. Temporary mulch: Provide one of the following:

Hay or Straw:	90-100 bales/acre.
Wood Cellulose:	2000 lbs/acre
Chemical binders:	Apply according to Mfg's directions

3.2 Installation

- A. Rake and remove all rubbish, sticks, roots and stones larger than 1 1/2 inches from the subgrade of all areas to be loamed and seeded, and undisturbed project areas.
- B. Fertilizer and soil amendments in the amounts recommended by the testing laboratory shall be spread over topsoil and thoroughly tilled in to a depth of four inches. Application of fertilizer and limestone shall be done when the soil is moist and at least 24 hours before sowing the seed. Fertilizer and limestone shall not be applied together. To assure that soil, organic matter, and fertilizer are properly blended, several passes shall be made with the tiller in opposite directions. Fertilizer may be applied by hydraulic application in conjunction with hydroseeding operations.
- C. After soil amendments have been thoroughly tilled in to soil, the entire area shall be carefully raked to a smooth surface free of all depressions, lumps, clods, roots, or stones 1" or larger.
- D. All areas are to be rolled with a hand roller weighing not more than 100 pounds per foot of width. During the rolling all depressions caused by settlement of rolling shall be filled with additional topsoil and the surface shall be regraded and rolled until presenting a smooth and even finish to the required finish grade.

- E. Seed uniformly by hand, seeder, drill or hydroseeder. Normal seeding depth is 1/4 to 1/2 inch. Hydroseeding which are mulched may be left on the surface. Lightly rake seed into the surface, roll and mulch the surface. Water the area with a fine spray.
- F. Seeding shall occur as soon as practical but permanent seeding shall occur between April 1st and September 1st. After September 1st, use temporary seeding and mulch. Re-seed the following spring with permanent seeding and mulch. Dormant Seeding of the permanent mixture may be attempted by the Contractor following the September 1st date, but Contractor shall return the following spring and reseed any unsuccessful areas.
- G. Keep all areas watered and in good condition, reseeding if and when necessary until a good, healthy, uniform growth is established over the entire area. Maintain the seeded area in an approved condition until final acceptance of the Contract.
- H. On slopes, provide against washouts by an approved method. At the contractor's expense, regrade and reseed any washout which occurs, until a stable sod is established.
- I. Maintain the areas in grass in a neat manner by watering, mowing, and raking clippings and leaves until the project is completed.

UNITED STATES OF AMERICA 92 FERC 62,171
FEDERAL ENERGY REGULATORY COMMISSION

Green Mountain Power Corporation
2674-009

Project No.

ORDER APPROVING RECREATION PLAN

(Issued August 24,
2000)

On May 26, 2000, Green Mountain Power Corporation (GMP) filed a recreation plan for the Vergennes No. 9 Project, FERC No. 2674. This plan was filed pursuant to article 406 of the

1
license. The project is located on Otter Creek in the City of Vergennes, Addison County, Vermont.

BACKGROUND

Article 406 requires the licensee to file a final recreation plan for Commission approval that includes provisions for, but not necessarily limited to, the following:

- (1) directional and interpretive signs for recreation in the project area;
- (2) improved access for small boats and parking at Settlers Park;
- (3) improved trail, shoreline fishing access, vegetative plantings, and picnic area along the western bank near Plant 9;
- (4) construction of a disabled-accessible fishing platform on the western bank near Plant 9;
- (5) installation of portable toilet facilities (including disabled-accessible facilities); and
- (6) installation of signs interpreting the history of Vergennes Falls and the surrounding historic structures.

The licensee shall develop the final recreation plan in conjunction with the Cultural Resources Management Plan required

2
in article 405. The licensee shall construct the facilities

after consultation with the Vermont Agency of Natural Resources (VANR), the Vermont Division for Historic Preservation (VDHP), and the City of Vergennes (City).

1

See 88 FERC 62, 095 (1999).

2

The CRMP was filed on August 2, 2000.

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The licensee shall include with the recreation plan a construction schedule, the entity responsible for operation and maintenance of the facilities, costs for the construction and yearly maintenance of each facility, a discussion of how the recreational facilities are visually compatible with the project area, a description of erosion control measures to be used during construction, documentation of consultation, copies of comments and recommendations on the completed plan after it has been prepared and provided to the agencies, and specific descriptions of how the agencies' comments and recommendations are accommodated by the plan. The Commission reserves the right to require changes to the recreation plan. Upon Commission approval, the licensee shall implement the recreation plan, including any changes required by the Commission.

LICENSEE'S PROPOSAL

The licensee proposes to improve Settler's Park by improving the drainage at the existing boat launch and improving access for small-trailer boats. This would reduce erosion at the site. In addition, the licensee plans to upgrade the existing informal parking area. The upgrade will improve existing public use, but will be compatible with the undeveloped natural setting.

The licensee further proposes to improve and expand public access to Otter Creek between and adjacent to Plant 9 and the City's Vergennes Falls Park. An accessible fishing area and fishing platform will be constructed at the site. The licensee also proposes improving Falls Park by adding six picnic tables.

All recreational enhancements will include the appropriate directional and informational signage. The licensee also proposes placing interpretive signage describing the history of Vergennes Falls area and the project structures. These signs will be placed near the public fishing facilities. Their content will be developed by the Vergennes Historical Society, the City, the VANR, the Vergennes Partnership (Partnership), the VDHP, and the licensee.

The licensee states it had developed an agreement with the City for the construction of the recreation enhancements. It states this agreement will maximize the funding available for recreation improvements within the area and will ensure coordination with the City's broader plan. It further states that no construction or ground disturbance will be undertaken until the CRMP is approved and implemented. It plans to construct the facilities within three years of Commission approval of the recreation plan. Once the facilities are constructed, the licensee will continue to operate and maintain the facilities located on its property. As required by article 407, the licensee will review the plan every 5 years to address

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the capacity of the facilities and their ability to meet the needs of the public.

The licensee included its soil erosion and sedimentation control plan and seeding specifications for all areas which will be disturbed.

CONSULTATION

The licensee consulted with the appropriate agencies and incorporated the majority of the comments into the filing. It did not incorporate two comments from the VANR. The VANR suggested that the fishing platform could be constructed as a pier using pilings which would reduce the amount of fill needed. The licensee determined that using pilings as a pier would expose the structure to ice and debris damage. The VANR also requested a path connect the Plant 9 area with the City's park. Further discussions with the City and the Partnership led the licensee to eliminate the path from the plan because it was able to provide accessible parking near the fishing pier, thus eliminating the need for the path. It also reduced a potential safety hazard by eliminating the path from the substation area.

DISCUSSION AND CONCLUSION

The licensee's proposal meets the requirements of article 406. The enhanced recreation facilities will provide additional benefit. By working with the agencies, the licensee is able to provide the facilities while keeping with the natural setting of the area. We agree with the licensee's response to the VANR comments. By constructing the fishing platform as proposed, the licensee will reduce its maintenance costs while still providing adequate fishing opportunities. Regarding the path between Plan 9 and the City park, the licensee is able to provide access

without the requested path.

The licensee further states that it will not construct any sites until the CRMP is approved. This action will address the protection of any cultural resource sites at the project.

The recreation plan should be approved. The licensee is reminded that while it has an agreement with the City for the construction of the recreation facilities, it is ultimately responsible for the construction of the facilities approved as part of its recreation plan.

The Director orders:

(A) The recreation plan for the Vergennes No. 9 Project, filed on May 26, 2000, is approved.

Project No. 2674-009

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(B) The licensee shall construct the facilities within three years of the issuance date of this order. Pursuant to article 301, it shall file as-built drawings of the facilities for approval within 90 days of completion of construction. These drawings shall show the recreation facilities and their location with respect to other project features including the powerhouse and project boundary, where applicable.

(C) This order constitutes final agency action. Requests for rehearing by the Commission may be filed within 30 days of the date of issuance of this order, pursuant to 18 C.F.R. 385.713.

Hossein Ildari
Division of Hydropower

Administration

and Compliance

**Licensed Hydropower Development
Recreation Report****General Information:**

This form collects data on recreation amenities at projects licensed by FERC under the Federal Power Act (16 USC 791a-825r). This form must be submitted by licensees of all projects except those specifically exempted under 18 CFR 8.11 (c). For regular, periodic filings, submit this form on or before April 1, 2015. Submit subsequent filings of this form on or before April 1, every 6th year thereafter (for example, 2021, 2027, etc.). For initial Form No. 80 filings (18CFR 8.11(b)), each licensee of an unconstructed project shall file an initial Form No. 80 after such project has been in operation for a full calendar year prior to the filing deadline. Each licensee of an existing (constructed) project shall file an initial Form No. 80 after such project has been licensed for a full calendar year prior to the filing deadline. Filing electronically is preferred. (See <http://www.ferc.gov> for more information.) If you cannot file electronically, submit an original and two copies of the form to the: Federal Energy Regulatory Commission, Office of the Secretary, 888 First St., NE, Washington, DC 20426.

The public burden estimated for this form is three hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing the collection of information. Send comments regarding the burden estimate or any aspect of this collection of information, including suggestions for reducing burden, to: FERC via e-mail DataClearance@ferc.gov; or mail to 888 First Street NE, Washington, DC 20426 (Attention: Information Clearance Officer) and Office of Management and Budget (OMB), via e-mail to oina_submission@omb.eop.gov; or mail to OMB, Office of Information and Regulatory Affairs, Attention: Desk Officer for FERC, Washington, DC 20503. Include OMB Control Number 1902-0106 as a point of reference. No person shall be subject to any penalty for failing to comply with a collection of information if the collection of information does not display a valid control number (44 U.S.C. § 3512 (a)).

Instructions:

- All data reported on this form must represent publicly available recreation amenities and services located within the project boundary.
- To ensure a common understanding of terms, please refer to the Glossary on page 3.
- Report actual data for each item. If actual data are unavailable, then please estimate.
- Submit a completed form for each development at your project.

Schedule 1. General Data

1. Licensee Name: _____		Complete the following for each development if more than one.	
2. Project Name: _____		8. Reservoir Surface Area at Normal Pool (acres): _____	
3. Project Number: _____		9. Shoreline Miles at Normal Pool: _____	
4. Development Name: _____		10. Percent of Shoreline Available for Public Use: _____	
States Development/Project Traverses (List state with largest area within the development/project boundary first):		11. Data Collection Methods (enter percent for each method used; total must equal 100%):	
5. State #1: _____		_____ traffic count/trail count	
6. State #2: _____		_____ attendance records	
7. Type of Project License: Major _____		_____ staff observation	
(check one) Minor _____		_____ visitor counts or surveys	
		_____ estimate (explain)	
For 2014, enter only the licensee's annual recreational construction, operation, and maintenance costs for the development (project). Also, enter the annual recreational revenues for that year.			
Item	Licensee's Annual Recreation Costs and Revenues (In Whole Dollars)		
	Construction, Operation and Maintenance Costs		Recreation Revenues for Calendar Year
12. Dollar Values			
13. Length of Recreation Season: Summer: From (MM/DD) _____ To _____ Winter: From (MM/DD) _____ To _____			
Period	Number of visits to all recreational areas at development/project (in Recreation Days)		
	Annual Total		Peak Weekend Average (see Glossary)
14. Daytime			
15. Nighttime			

Respondent Certification: The undersigned certifies that he/she examined this report; and to the best of his/her knowledge, all data provided herein are true, complete, and accurate.

Legal Name_____
Title_____
Area Code/Phone No._____
Signature_____
Date Signed_____
Reporting Year Ending

Title 18 U.S.C.1001 makes it a crime for any person knowingly and willingly to make to any Agency or department of the United States any false, fictitious or fraudulent statement or misrepresentation as to any matter within its jurisdiction.

Schedule 2. Inventory of Publicly Available Recreation Amenities Within the Project Boundary

16. Enter data for each Recreation Amenity Type (a). For User Free (b) and User Fee (c) enter the number of publicly available recreation amenities, located within the project boundary, regardless of provider. For FERC Approved (d) enter the number of amenities identified under User Free (b) and User Fee (c) for which the licensee has an ongoing responsibility for funding or maintenance (see Glossary for further detail). For Capacity Utilization(f), of the total publicly available amenities (b) + (c), compare the average non-peak weekend use (see Glossary) for each recreation amenity type (during the recreation season, with the highest use, reported on Schedule 1, Item 13) with the total combined capacity of each amenity type and enter a percentage that indicates their overall level of use. For example, if all public boat launches are used to half capacity during the non-peak weekend days, enter 50% (should use exceed capacity for an amenity type, enter the appropriate percentage above 100).

Recreation Amenity Type (a)	Number of Recreation Amenities			Total Units (e)	Capacity Utilization (%) (f)
	User Free (b)	User Fee (c)	FERC Approved (d)		
Boat Launch Areas. Improved areas having one or more boat launch lanes (enter number in column e) and are usually marked with signs, have hardened surfaces, and typically have adjacent parking.				Lanes	
Marinas. Facilities with more than 10 slips on project waters, which include one or more of the following: docking, fueling, repair and storage of boats; boat/equipment rental; or sell bait/food (see Glossary FERC approved).				N/A	
Whitewater Boating. Put-ins/Take-outs specifically designated for whitewater access.				N/A	
Portages. Sites designed for launching and taking out canoes/kayaks and the improved, designated, and maintained trails connecting such sites (enter length of trail in column e).				Feet	
Tailwater Fishing. Platforms, walkways, or similar structures to facilitate below dam fishing.				N/A	
Reservoir Fishing. Platforms, walkways, or similar structures to facilitate fishing in the reservoir pool or feeder streams.				N/A	
Swim Areas. Sites providing swimming facilities (bath houses, designated swim areas, parking and sanitation facilities).				Acres	
Trails. Narrow tracks used for non-automobile recreation travel which are mapped and designated for specific use(s) such as hiking, biking, horseback riding, snowmobiling, or XC skiing (excludes portages, paths or accessible routes; See Glossary).				Miles	
Active Recreation Areas. Playground equipment, game courts/fields, golf/disc golf courses, jogging tracks, etc.				Acres	
Picnic Areas. Locations containing one or more picnic sites (each of which may include tables, grills, trash cans, and parking).				Sites	
Overlooks/Vistas. Sites established to view scenery, wildlife, cultural resources, project features, or landscapes.				Acres	
Visitor Centers. Buildings where the public can gather information about the development/project, its operation, nearby historic, natural, cultural, recreational resources, and other items of interest.				N/A	
Interpretive Displays. Signage/Kiosks/Billboards which provide information about the development/project, its operation, nearby historic, natural, cultural, recreational resources, and other items of interest.				N/A	N/A
Hunting Areas. Lands open to the general public for hunting.				Acres	
Winter Areas. Locations providing opportunities for skiing, sledding, curling, ice skating, or other winter activities.				Acres	
Campgrounds. Hardened areas developed to cluster campers (may include sites for tents, trailers, recreational vehicles [RV], yurts, cabins, or a combination, but excludes group camps).				Acres	N/A
Campsites. Sites for tents, trailers, recreational vehicles [RV], yurts, cabins, or a combination of temporary uses.				N/A	
Cottage Sites. Permanent, all-weather, buildings rented for short-term use, by the public, for recreational purposes.				N/A	
Group Camps. Areas equipped to accommodate large groups of campers that are open to the general public (may be operated by public, private, or non-profit organizations).				Sites	
Dispersed Camping Areas. Places visitors are allowed to camp outside of a developed campground (enter number of sites in clmn. e).				Sites	
Informal Use Areas. Well used locations which typically do not include amenities, but require operation and maintenance and/or public safety responsibilities					
Access Points. Well-used sites (not accounted for elsewhere on this form) for visitors entering project lands or waters, without trespassing, for recreational purposes (may have limited development such as parking, restrooms, signage).				N/A	
Other. Amenities that do not fit in the categories identified above. Please specify (if more than one, separate by commas):					

**Licensed Hydropower Development
Recreation Report****Glossary of FERC Form 80 Terms**

Data Collection Methods. (Schedule 1, Item 11) – If a percentage is entered for the estimate alternative, please provide an explanation of the methods used (if submitted on a separate piece of paper, please include licensee name, project number, and development name)

Development. The portion of a project which includes:

- (a) a reservoir; or
- (b) a generating station and its specifically-related waterways.

Exemption from Filing. Exemption from the filing of this form granted upon Commission approval of an application by a licensee pursuant to the provisions of 18 CFR 8.11(c).

General Public. Those persons who do not have special privileges to use the shoreline for recreational purposes, such as waterfront property ownership, water-privileged community rights, or renters with such privileges.

Licensee. Any person, state, or municipality licensed under the provisions of Section 4 of the Federal Power Act, and any assignee or successor in interest. For the purposes of this form, the terms licensee, owner, and respondent are interchangeable *except where*:

- (a) the *owner* or licensee is a subsidiary of a parent company which has been or is required to file this form; or
- (b) there is more than one owner or licensee, of whom only one is responsible for filing this form. Enter the name of the entity that is responsible for filing this report in Schedule 1, Item 2.1.

Major License. A license for a project of more than 1,500 kilowatts installed capacity.

Minor License. A license for a project of 1,500 kilowatts or less installed capacity.

Non-Peak Weekend. Any weekend that is not a holiday and thus reflects more typical use during the recreation season.

Number of Recreation Amenities. Quantifies the availability of natural or man-made property or facilities for a given recreation amenity type. This includes all recreation resources available to the public within the development/project boundary. The resources are broken into the following categories:

User Free (Schedule 2, column b) - Those amenities within the development/project that are free to the public;

User Fee (Schedule 2, column c) - Those amenities within the development/project where the licensee/facility operator charges a fee;

FERC Approved (Schedule 2, column d) – Those amenities within the development/project required by the Commission in a license or license amendment document, including an approved recreation plan or report. Recreation amenities that are within the project boundary, but were approved by the licensee through the standard land use article or by the Commission through an application for non-project use of project lands and waters, are typically not counted as FERC approved, unless they are available to the public, but may be counted as either user free or user fee resources. The total FERC approved amenities column does not necessarily have to equal the sum of user free and user fee amenities.

Peak Use Weekend. Weekends when recreational use is at its peak for the season (typically Memorial Day, July 4th & Labor Day). On these weekends, recreational use may exceed the capacity of the area to handle such use. Include use for all three days in the holiday weekends when calculating Peak Weekend Average for items 14 & 15 on Schedule 1.

Recreation Day. Each visit by a person to a development (as defined above) for recreational purposes during any portion of a 24-hour period.

Revenues. Income generated from recreation amenities at a given project/development during the previous calendar year. Includes fees for access or use of area.

Total Units (Schedule 2, column e) – Provide the total length, or area, or number that is appropriate for each amenity type using the metric provided.

Trails. Narrow tracks used for non-automobile recreation travel which are mapped and designated for specific use(s) such as hiking, biking, horseback riding, snowmobiling, or XC skiing. Trails are recreation amenities which provide the opportunity to engage in recreational pursuits, unlike paths (means of egress whose primary purpose is linking recreation amenities at a facility) or accessible routes (means of egress which meets the needs of persons with disability and links accessible recreation amenities and infrastructure at a facility).

Document Content(s)

P-2674-VERGENNES 9 & 9B.PDF.....1-3

UNITED STATES OF AMERICA 123 FERC ¶ 62,043
FEDERAL ENERGY REGULATORY COMMISSION

Green Mountain Power Corporation

Project No. 2674-028

ORDER APPROVING EXHIBIT R DRAWINGS

(Issued April 14, 2008)

On March 1, 2007, Green Mountain Power Corporation, licensee for the Vergennes Hydroelectric Project, FERC No. 2674, filed Exhibit R drawings. The project is located on Otter Creek in the City of Vergennes, Addison County, Vermont. The project does not occupy any federal lands.

REVIEW

The Exhibit R drawings are required pursuant to Article 406 of the Order Issuing New License¹ and ordering paragraph (B) of the Order Approving Recreation Plan.² The filing shows the locations of directional signs; parking ramp improvements at Settler's Park; vegetative plantings, shoreline fishing access, improvement trail at City Park; Americans with Disabilities Act (ADA)-accessible fishing platform and parking on the west bank; and the portable ADA-accessible toilet facilities and parking.

The exhibit drawings conform to the Commission's rules and regulations, and are approved by this order. The licensee labeled the drawings RD-3 and RD-4, which we are assigning them labels R-1 and R-2, respectively, as shown in ordering paragraph (A). In ordering paragraph (B) we are requiring the licensee to file the approved drawings in aperture card and electronic formats.

The Director orders:

(A) The following Exhibit R drawings, filed on March 1, 2007, are approved and made part of the license.

¹ See 88 FERC ¶ 62,095, Order Issuing New License issued July 30, 1999.

² See 92 FERC ¶ 62,171, Order Approving Recreation Plan issued August 24, 2000.

Exhibit	Licensee's Label	FERC No.	Title
R-1	RD-3	2674-1016	Recreation Drawing-Otter Creek East Shores Settler's Park Improvements
R-2	RD-4	2674-1017	Recreation Drawing-Otter Creek West Shores City Park Improvements

(B) Within 45 days of the date of issuance of this order, the licensee shall file the approved exhibit drawings in aperture card and electronic file formats.

a) Three sets of the approved exhibit drawings shall be reproduced on silver or gelatin 35mm microfilm. All microfilm shall be mounted on type D (3-1/4" X 7-3/8") aperture cards. Prior to microfilming, the FERC Project-Drawing Number (i.e., P- 2674-1016, etc.) shall be shown in the margin below the title block of the approved drawings. After mounting, the FERC Drawing Numbers shall be typed on the upper right corner of each Title, and date of this order shall be typed on the upper left corner of each aperture card. See Figure 1.

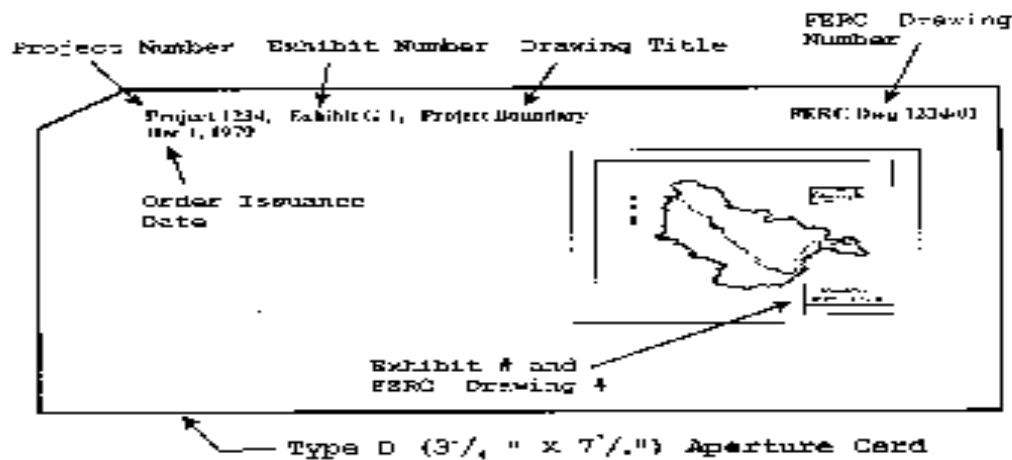


Figure 1 Sample Aperture Card Format

Two of the sets of aperture cards shall be filed with the Secretary of the Commission, ATTN: OEP/DHAC. The third set shall be filed with the Commission's Division of Dam Safety and Inspections New York Regional Office.

b) The licensee shall file two separate sets of exhibit drawings in electronic raster format with the Secretary of the Commission, ATTN: OEP/DHAC. A third set shall be filed with the Commission's Division of Dam Safety and Inspections New York Regional Office. Each drawing must be a separate electronic file, and the file name shall include: FERC Project-Drawing Number, FERC Exhibit, Drawing Title, date of this order, and file extension in the following format [P-2674-1016, R-1, Recreation Drawing-Otter Creek East Shores Settler's Park Improvements, MM-DD-YYYY.TIF]. Electronic drawings shall meet the following format specification:

IMAGERY - black & white raster file
FILE TYPE – Tagged Image File Format, (TIFF) CCITT Group 4
RESOLUTION – 300 dpi desired, (200 dpi min)
DRAWING SIZE FORMAT – 24” X 36” (min), 28” X 40” (max)
FILE SIZE – less than 1 MB desired

(C) This order constitutes final agency action. Requests for rehearing by the Commission may be filed within 30 days of the date of issuance of this order, pursuant to 18 C.F.R. § 385.713.

Mohamad Fayyad
Engineering Team Lead
Division of Hydropower Administration
and Compliance

Document Content(s)

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Legend

- Recreation Sites
- Canoe Portage



MacDonough Park

Vergennes Falls Park

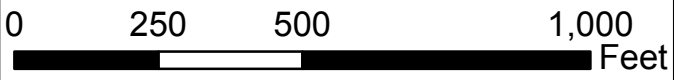
Vergennes Dam

Main Street

Plant 9 Fishing Platform

Settler's Park

Otter Creek



Scale:	AS SHOWN	GREEN MOUNTAIN POWER CORPORATION COLCHESTER, VT	
Project No:	012-092	VERGENNES HYDROELECTRIC PROJECT	
Filename:	Vergennes_Rec.mxd	VERGENNES DAM RECREATION MAP	
Drawn By:	AS2	Kleinschmidt Energy & Water Resource Consultants	
Date Drawn:	04-22-2008	141 Main St., PO Box 650 Pittsfield, Maine 04967 Telephone: (207) 487-3328 Fax: (207) 487-3124 www.KleinschmidtUSA.com	Figure 3-1

A. PROJECT PROFILE

The Vergennes Hydroelectric Project is located on Otter Creek in the city of Vergennes, Addison County, Vermont, about 7.6 miles upstream from the main channel of Lake Champlain.

The project's principal features consist of: three concrete gravity overflow dams, divided by two instream islands; a 29-foot-long, non-overflow dam and two powerhouses located on the north (Plant 9) and south banks (Plant 9B) of Otter Creek with a total installed capacity of 2.4 MW; an 8.8-mile-long, 133-acre reservoir, and appurtenant facilities.

The previous Environmental Inspection of the project was conducted on November 17, 2010. This was a special inspection scheduled to review the licensee's construction procedures during the rebuilding of the intake, headgates, trashracks, and penstock facilities. A review of soil erosion and pollution control was the primary motive for the inspection. The inspection revealed no significant public safety or environmental issues that required follow-up action.

B. INSPECTION FINDINGS

Requirements	Date of Requirement	Follow-up Needed	Photo Nos.
FISH AND WILDLIFE RESOURCES			
* Article 8 requires the licensee to install and maintain gages and stream gaging stations at the project.	O: 07/30/1999	No	1, 2, 3
* Article 15 requires licensee to construct, maintain, and operate, or arrange for the construction, maintenance, and operation of such reasonable facilities for the conservation and development of fish and wildlife species.	O: 07/30/1999	No	--
* Article 16 requires the licensee to permit the United States to construct or improve fish and wildlife facilities	O: 07/30/1999	No	--
Article 401 requires the licensee to operate in a run-of-river mode for the protection and enhancement of water quality, fisheries and recreational resources and to minimize fluctuation of the reservoir surface elevation.	O: 07/30/1999	No	--
Article 402 requires the licensee to operate in accordance to the "operating rule" for priority use of waters to Plant No. 9 from April 1 to June 15 (to protect walleye and lake sturgeon) and from September 15 to November 15 (to protect landlocked Atlantic salmon)	O: 07/30/1999	No	--

Requirements	Date of Requirement	Follow-up Needed	Photo Nos.
Article 403 requires the licensee to release minimum flows for the protection and enhancement of aesthetic and recreational resources of Otter Creek: April 1 through October 31 Daytime 150 cfs Nighttime 75 cfs November 1 through December 15 Daytime 100 cfs Nighttime 50 cfs Most Recent Annual Report filed: 02/07/2014	O: 07/30/1999	No	1
Article 404 requires the licensee to file a monitoring and operations plan to monitor run-of-river operations, first priority use of river flows to Plant No. 9 and aesthetic flow releases over Vergennes Falls as required by Articles 401, 402 and 403, respectively -Additions to final plan filed: 03/16/2001 -Order approving additions to final plan issued: 05/16/2001	O: 07/30/1999 F: 03/01/2000 AP: 08/09/2000	No	1
RECREATION RESOURCES			
*Article 17 requires the licensee to construct, maintain, and operate, or shall arrange for the construction, maintenance, and operation of such reasonable recreational facilities, including modifications thereto, such as access roads, wharves, launching ramps, beaches, picnic and camping areas, sanitary facilities, and utilities, giving consideration to the needs of the physically handicapped.	O: 07/30/1999	Yes	1, 6, 7
*Article 18 requires the licensee to allow free public access to project waters and adjacent lands.	O: 07/30/1999	No	1, 6, 7
Article 406 requires the licensee to develop and file a recreation plan -Recreation Report filed: 11/30/2006 -Letter Order approving Recreation Report issued: 12/20/2006 -Order Approving Exhibit R issued: 04/14/2008	O: 07/30/1999 F: 05/26/2000 O: 08/24/2000	No	1, 6, 7
Article 407 requires the licensee to monitor recreation use of the project area in the vicinity of the Plant 9 tailrace -Form 80 (Vergennes 9 and 9B) filed: 04/02/2015	O: 07/30/1999	No	--
CULTURAL RESOURCES			
Article 405 requires the licensee to implement the Programmatic Agreement executed on February 4, 1999, including, but not limited to, the Cultural Resources Management Plan (CRMP) -Most Recent Annual Report filed: 08/01/2014	O: 07/30/1999 F: 08/02/2000 AP: 01/08/2001	No	--
PUBLIC SAFETY			
Facilities and measures to ensure public safety (18 CFR, Part 12). -Public Safety Plan Filed: 12/04/2001	O: 07/30/1999	No	5, 7

Requirements	Date of Requirement	Follow-up Needed	Photo Nos.
OTHER ENVIRONMENTAL RESOURCES			
* Article 14 requires the licensee to place and maintain suitable structures and devices to reduce to a reasonable degree the liability of contact between its transmission lines and telegraph, telephone and other signal wires or power transmission lines constructed prior to its transmission lines and not owned by the licensee, and shall also place and maintain suitable structures and devices to reduce to a reasonable degree the liability of any structures or wires falling or obstructing traffic or endangering life.	O: 07/30/1999	No	--
* Article 19 requires the licensee to take measures to prevent soil erosion, stream sedimentation, and any form of water or air pollution.	O: 07/30/1999	No	--
* Article 21 requires the licensee to properly dispose dredged or excavated material and any such material removed or deposited shall be done in a manner as to preserve environmental values of the project.	O: 07/30/1999	No	--
Article 408 requires the licensee to file a debris disposal plan	O: 07/30/1999 F: 11/24/1999 AP: 04/09/2001	No	--
O: Ordered; 18 CFR: Title 18 Code of Federal Regulations; AP: Approved; A: Amended; F: Filed; AC: Accepted; R: Revised *Form L-3 Terms and Conditions of License for Constructed Major Project Affecting Navigable Waters of the United States, October 1975.			

C. Comments and Follow-Up

Based on file reviews, discussions, and field observations made during the inspection, no items of non-compliance were identified; however, two matters requiring follow-up action were noted during the inspections and are discussed below. The licensee was informed of the follow-up items on the day of the inspection and again by letter issued July 27, 2015. The following comments and observations are included:

(1) Fish & Wildlife Resources: The licensee operates the project in a run-of-river mode for the protection and enhancement of water quality, fisheries, and recreational resources while minimizing fluctuation of the elevation of the reservoir at all times (Articles 401, 402, 403, and 404). The licensee installed and maintains headpond transducers at the intakes of both powerhouses to monitor the elevation of the impoundment. The project is manned daily by staff operators and can be remotely monitored and operated from the licensee's offices in Colchester, Vermont. The licensee releases the minimum flow requirement in accordance with Article 403 from the three spillways (south, center and north) via orifices at the bottom of the flashboards for aesthetic flows at the falls and the protection of fishery resources. A USGS gage station (No. 04282500) upstream of the project on Otter Creek in Middlebury, Vermont, is referenced to provide verification of the minimum flow requirement. On the day of the

inspection, flows appeared to be in excess of the minimum flow requirement. The licensee submits an annual report verifying compliance with its minimum flow requirement (Articles 401, 402, and 403); the most recent report was filed on February 7, 2014. The licensee appears to be in compliance with its requirements with regards to fish and wildlife resources.

(2) Recreation Resources: Article 406 requires the licensee to develop and file a Recreation Plan for the enhancement of recreational facilities at the project. The Recreation Plan was approved on August 24, 2000 and provided for improvements to Settler's Park, the fishing access platform at the Plant No. 9 powerhouse, and to Vergennes Falls Park. Considerable progress has been made over the past decade in the implementation of the Recreation Plan and all recreational facilities are complete, including interpretive and directional signage, landscaping work, improved access for small boats and parking, portage routes, picnic tables, and portable toilets.

The recreational facilities and landscaping surrounding the facilities appeared to be in good condition with the exception of the boat ramp/portage take-out at the project. Due to storm flows, the geotextile mat covering the ramp has been unearthed and has folded upon itself, making the ramp unusable for trailer launches. To ensure safe public access to project waters, the licensee was requested in the follow up letter to repair and restore this boat ramp access site. Also, recreation signage located within the downstream picnic area at the project has been vandalized and is missing from its post. The licensee was requested to replace the missing sign.

The licensee filed its Recreation Report (Form 80) on March 2, 2015 and noted moderate use of facilities (Article 407). Overall, the licensee appears to be in compliance with its requirements with regard to recreation resources.

(3) Cultural Resources: The project is located within the Vergennes Historic District, which was listed in the National Register of Historic Places on September 3, 1976. The boundary of the historic district encompasses the entire complex of buildings and structures of the Vergennes Project. The penstocks and headworks structure are historically significant as contributing components of the Vergennes Project. The licensee monitors and manages the project and any archaeological and historic structures within the project's area of potential effect in a responsible manner and in accordance with the CRMP. By letter filed August 1, 2014, the licensee submitted its annual report on activities conducted in regards to cultural and historic resources. The licensee is aware of the consultation requirements with the SHPO prior to any construction or land disturbing activities set forth in Article 405.

(4) Public Safety: The licensee maintains fences, locked gates, lights and signs to warn and protect the public of the hazards of project operations and to restrict the public from project structures. The public safety devices were in good condition and appeared

to be adequate to ensure the safety of the public. The boat barrier with “Dam Ahead” barrels was in place during the inspection and appeared to be in good condition. The licensee filed a Public Safety Plan on December 4, 2001, which depicts the public safety devices installed at the project at their location. The licensee appears to be in compliance with its requirements with regard to public safety.

(5) Other Environmental Resources: No issues of soil erosion or pollution control that required follow-up were noted during this inspection. The interior of the powerhouse had proper containment procedures in place for oil and other liquid waste disposal. The licensee appears to be in compliance with its requirements with regard to other environmental resources.

D. Exhibits and Photographs

The following project and photo location maps and 8 photographs are provided to show the location of the project and to illustrate project features.

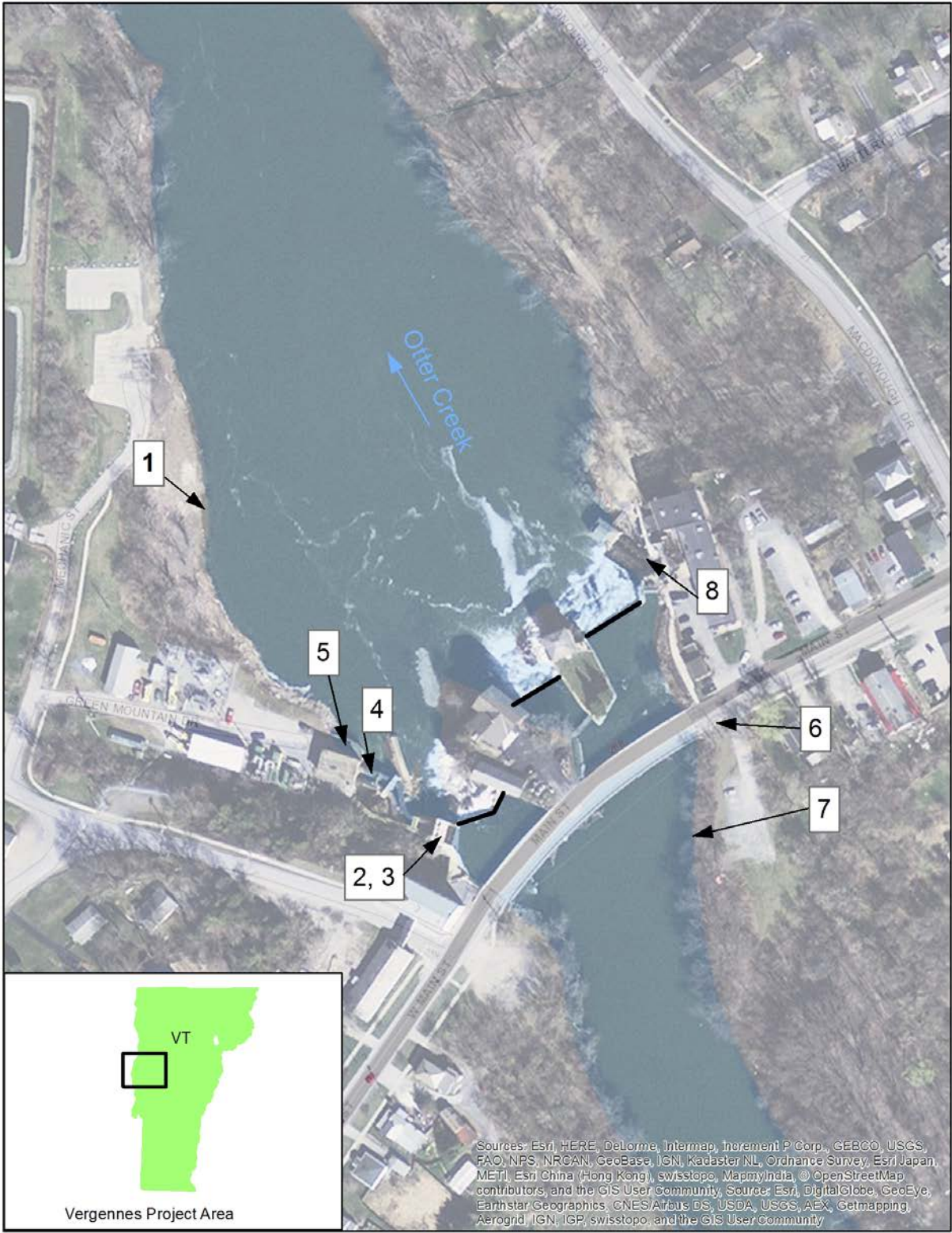


Photo location map for the Vergennes Hydroelectric Project FERC No. 2674.



Photo 1. Vergennes Project spilling more than the minimum flow; viewed from the public park.



Photo 2. Pond level transducer.



Photo 3. New headgates, intake, screen and monitoring equipment.



Photo 4. New Penstock.



Photo 5. Safety signage on powerhouse 9 with strobe and sirens.



Photo 6. Portage trail sign located above the dam.



Photo 7. Canoe take-out, boat ramp with damaged geotextile mat and boat barrier in the background.



Photo 8. Penstocks and 9b powerhouse located on the north shore; view of the public park on the opposite shore.

Document Content(s)

P-2674-003.PDF.....1-11



January 4, 2016

Mr. Erich Gaedeke
Federal Energy Regulatory Commission
Division of Hydropower Administration and Compliance
888 First Street, NE
Washington, DC 20426

Subject: Green Mountain Power Environmental Inspections Follow-up
Vergennes – FERC # 2674

Dear Mr. Gaedeke:

GMP received your 11 Dec letter wherein you directed GMP to provide specific suspense dates for two items that FERC identified during FERC's July 2015 environmental inspections at the Vergennes project. The first item, repairs to the upstream boat launch, is complete. The second item, replacement of a missing interpretive sign, remains incomplete.

GMP hired Fairbanks Mill, Inc. to make a late season repair to the boat launch. The repair occurred in early December and went well. The attached sketch outlines the means and methods the contractor used to make the repair.

GMP corresponded with the City of Vergennes in early December about the missing interpretive sign and also the city's master plan for improving the parks adjacent to the project. GMP agreed to reconvene with city officials and their consultants in early 2016. GMP also learned that the City of Vergennes possesses the sign and intends to work with the city and install the sign on or before 31 May.

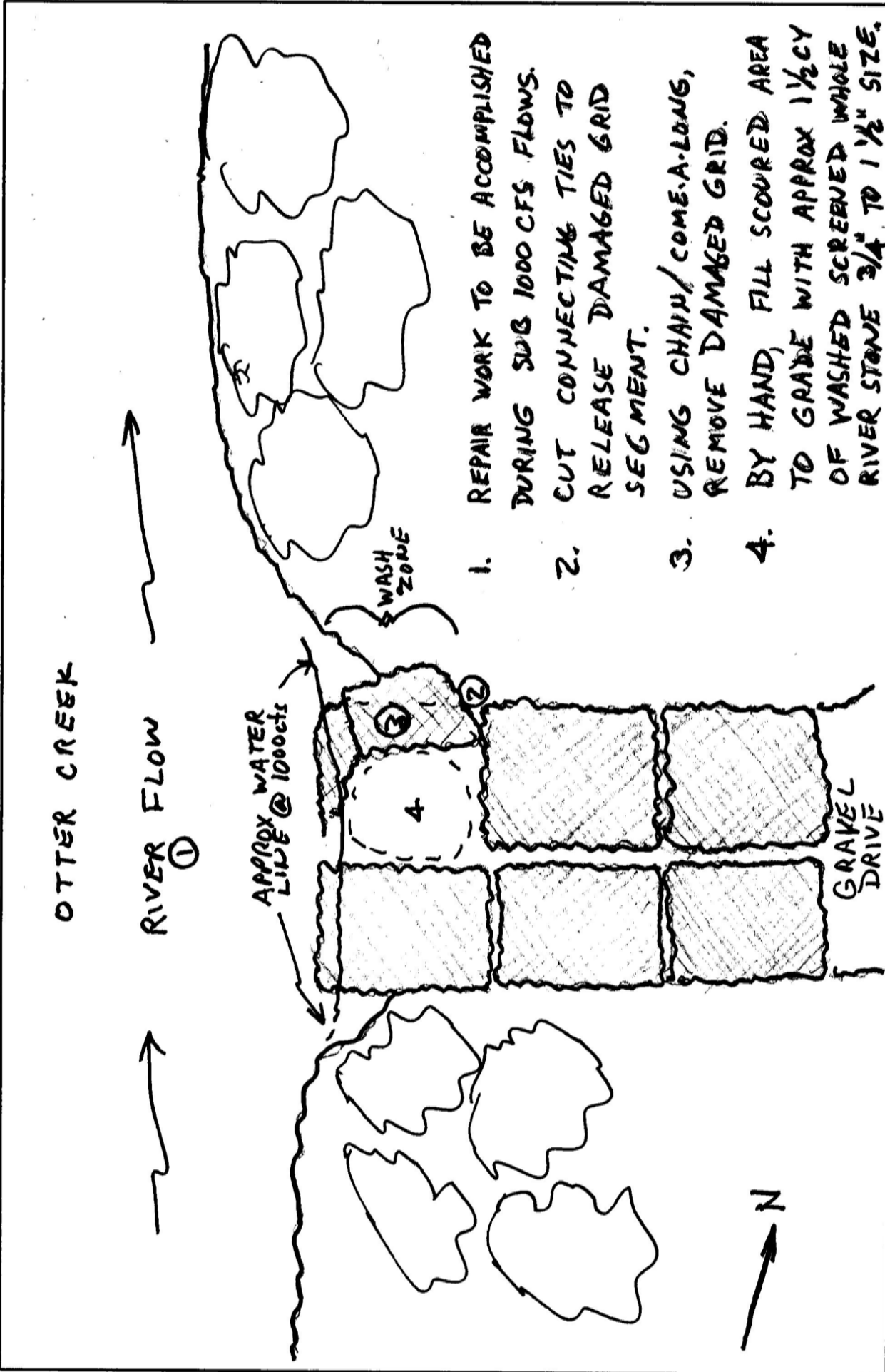
Please contact me at john.greenan@greenmountainpower.com or at (802)770-2195 if you have any additional questions or comments. Thank you.

Sincerely,



John C. Greenan
Engineer

Cc: J. Lisai – GMP e-mail
M. Scarzello – GMP e-mail



FAIRBANKS MILL ST. JOHNSBURY, VERMONT	WORK PLAN UPRIVER BOAT LAUNCH RAMP GMP VERGENNES HYDRO PLANT VERGENNES, VT			SCALE: nts	DRAWN BY: RFD
				DATE: 12/03/2015	DRAWING NO: 1
				Copyright Fairbanks Mill, Inc. 2015. Reproduction or distribution of this drawing in whole or in part without prior written consent of Fairbanks Mill, Inc. is prohibited.	

Document Content(s)

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**FEDERAL ENERGY REGULATORY COMMISSION
Washington, D. C. 20426**

OFFICE OF ENERGY PROJECTS

Project No. 2674-003 -- VT
Vergennes Project
Green Mountain Power
Corporation

January 27, 2016

Mr. John C. Greenan
Green Mountain Power Corporation
2152 Post Road
Rutland, VT 05701

Subject: 2015 Environmental Inspection of the Vergennes Project

Dear Mr. Greenan:

This is in response to your January 4, 2016 filing, filed in response to our December 11, 2015 letter regarding outstanding follow-up matters from the July 8 and 9, 2015 environmental inspection of the Vergennes Project No. 2674. Our December 2015 letter required that you file with the Commission, by January 4, 2016, a report regarding the progress of repairs to the upstream boat ramp/portage take-out and replacement of the missing interpretive signage at the downstream picnic area.

According to your filing, you state that repairs to the upstream boat launch were completed in early December. In addition, you included a sketch outlining the means and methods the contractor used to make the repairs. Regarding replacement of the interpretive sign, you state that you have corresponded with the City of Vergennes and plan to meet with City officials and their consultants in early 2016 to discuss the sign and the City's master plan for improving the parks adjacent to the project. You also indicate that you have learned that the City is in possession of the interpretive sign and intends to work with the City and install the sign by May 31, prior to the start of the 2016 recreation season.

Thank you for completing the repairs to the upstream boat launch. Based on your proposed schedule for installing the referenced interpretive sign, please file photo documentation with the Commission by June 6, 2016, documenting that the sign has been installed.

Project No. 2674-003

- 2 -

Thank you for your continued cooperation regarding these matters. If you have any questions, please contact me at 503-552-2716 or by email at erich.gaedeke@ferc.gov.

Sincerely,

Erich G. Gaedeke
Aquatic Resources Branch
Division of Hydropower
Administration and Compliance

Document Content(s)

P-2674-003.PDF.....1-2



June 6, 2016

Mr. Erich Gaedeke
Federal Energy Regulatory Commission
Division of Hydropower Administration and Compliance
888 First Street, NE
Washington, DC 20426

Subject: Green Mountain Power Environmental Inspections Follow-up
Vergennes – FERC # 2674

Dear Mr. Gaedeke:

GMP is responding to the most recent correspondence dated January 27, 2016 regarding the replacement of the missing interpretative signage at the downstream picnic area as noted in the July 8 and 9 2015 environmental inspection of the Vergennes Project No. 2674.

GMP has installed the missing interpretative sign at the downstream picnic area at the Vergennes Project. Please find attached a picture of the interpretative sign as installed.

Please contact me at john.greenan@greenmountainpower.com or at (802)770-2195 if you have any additional questions or comments. Thank you.

Sincerely,

John C. Greenan
Engineer

Cc: J. Lisai – GMP e-mail



Document Content(s)

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