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Central Vermont Public Service Corporation

VIA E-FILING

May 24, 2010

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
Mail Code DHAC, PJ-12.3
888 1st Street NE Room 1A
Washington, DC 20426

RE: Central Vermont Public Service Corporation
Carver Falls Hydroelectric Project (FERC No. 11475)

Section 106 Report and Memorandum of Agreement for Removal of Abandoned Penstock

Dear Secretary Bose:

This letter treats the responsibility of the Federal Energy Regulatory Commission (FERC) and its licensee, Central Vermont Public Service Corporation (CVPS), owner of the Carver Falls Hydroelectric Station, to comply with Section 106 of the National Historic Preservation Act and 36 CFR Part 800, the Federal regulations that implement Section 106.

The Carver Falls Hydroelectric Station was developed originally during 1893-94 at the namesake 80-foot falls of the Poultney River; the boundary between West Haven, VT and Hampton, NY follows the river channel. A Vermont firm constructed the generating station, although favorable terrain placed most of the buildings and structures on the New York side of the river. The small complex comprises a lengthy stone and concrete dam with integral intake structure(s) and gatehouse, abandoned and active steel penstocks, twin steel surge tanks, a stone powerhouse containing two generating units with a rated capacity of 1,900 kilowatts, and an electrical substation.

The subject of this action, the abandoned dual penstocks extend between the original stone intake structure and their truncated downstream ends near the active penstock just upstream from the surge tanks. The original riveted-steel north penstock and the 1922 riveted-steel south penstock rest on a series of stone masonry and concrete cradles atop piers of the same materials, The catastrophic 1927 flood destroyed several stone piers, and they were replaced with the extant concrete counterparts.

In November 2009, Hugh H. Henry prepared a National Register of Historic Places Registration Form for the "Carver Falls Hydroelectric Station." The Henry document concludes that the Carver Falls Project appears to meet the criteria of eligibility for listing in the National Register, and that the abandoned dual penstocks and concrete cradle piers contribute to its significance. The dual penstocks and concrete cradle piers retain historic integrity while being somewhat deteriorated from exposure to weathering.

The FERC issued a new thirty-year license for the Carver Falls Project on 25 February 2009. A condition of the license requires that CVPS remove the abandoned dual penstocks and "concrete cradles" within two years after

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the issuance of the license. CVPS plans to remove these penstocks and cradle piers during the summer of 2010 in order to comply with this condition. The stone masonry piers and cradles will remain in place to represent the original penstock position and alignment.

An architectural historian qualified under 36 CFR Part 61, Hugh H. Henry of Chester, VT has conducted documentary research on the penstocks, reviewed the required action, and prepared the Section 106 report accompanying this letter. Mr. Henry has determined that the action will have an "adverse effect" on the historic character and integrity of the hydroelectric project. The adverse effect involves the removal of original and historic properties, the dual penstocks and concrete cradle piers, that relate to the original (1893-94) engineering design and operation of the generating station.

CVPS will mitigate the adverse effect by documenting the dual penstocks and concrete cradle piers with 35mm black-and-white photographs and the Section 106 report. That report has already been completed and accompanies this letter, together with certain photographs for the purpose of your review of this required action. CVPS will conduct additional field measurement and black-and-white photography during the early summer of 2010 to complete the appropriate documentary treatment of the historic properties prior to their removal, and submit the resulting materials at that time.

A Memorandum of Agreement regarding the removal of the dual penstocks and concrete cradle piers has already been prepared. An original of that document accompanies this letter for approval and signature by the Commission.

Thank you for your attention to this matter. Please feel free to contact me at 802-747-5594 or via email at beliaso@cvps.com if you have any questions or comments regarding this filing.

Sincerely,

Beth Eliason
Environmental Engineer

Enclosures

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MEMORANDUM OF AGREEMENT

BETWEEN THE FEDERAL ENERGY REGULATORY COMMISSION

AND THE

NEW YORK STATE HISTORIC PRESERVATION OFFICER,

AND THE

VERMONT STATE HISTORIC PRESERVATION OFFICER

AND

CENTRAL VERMONT PUBLIC SERVICE CORPORATION

REGARDING PENSTOCK AND PIER REMOVAL AT THE CARVER FALLS HYDROELECTRIC PROJECT (FERC #11475) HAMPTON, NEW YORK AND WEST HAVEN, VERMONT

WHEREAS under the terms and conditions of Article 406 of the license the United States Federal Energy Regulatory Commission (FERC) issued to the Central Vermont Public Service Corporation (CVPS), and in compliance with the Programmatic Agreement FERC executed on August 14, 1997, CVPS must assess the potential effects of a proposed undertaking to historic properties. CVPS plans to remove the abandoned dual penstocks and concrete cradle piers at the Carver Falls Hydroelectric Project located in Hampton, NY and West Haven, VT. This project is being performed in order to comply with Condition 14 of Appendix A and Condition K of Appendix B of the FERC license, issued on February 25, 2009; and

WHEREAS the FERC has determined this action will have an effect on a property eligible for the National Register of Historic Places, and has consulted with the New York State Historic Preservation Officer (NYSHPO) and the Vermont State Historic Preservation Officer (VTSHPO) pursuant to 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act (16 U.S.C. 47Off .):

NOW, THEREFORE, the FERC, the NYSHPO, and the VTSHPO agree that the action shall be implemented in accordance with the following stipulations in order to take into account the effect of the action on historic properties.

STIPULATIONS

The FERC will ensure that the following measures will be carried out:

1. Prior to any removal or other alteration, a 36 CFR 61 qualified architectural historian shall document the abandoned dual penstocks and concrete cradle piers with 35mm black-and-white photographs. A summary report (the Section 106 Report) that describes the property, its history, the proposed action, and the current condition of the penstocks and cradle piers will accompany the photographs. This documentation will be completed in accordance with the Secretary of the Interior's Standards and Guidelines for Documentation and shall be submitted to the NYSHPO and the VTSHPO. Each State’s SHPO must review and approve this documentation prior to the onset of the removal.

a. At the time (February 2010) when this memorandum was prepared, winter conditions at the Carver Falls Hydroelectric Project prevented both the additional photography and field measurement necessary to complete the documentary record of the abandoned penstocks and concrete cradle piers. The appropriate photographs and measurements will be obtained when field conditions permit prior to the removal of the historic properties.

2. The 35mm black-and-white photographs of the abandoned dual penstocks and concrete cradle piers together with the Section 106 Report will constitute sufficient mitigation for this action.

3. Should any signatory party object within 30 days to any actions proposed pursuant to this agreement, the FERC shall consult with the objecting party to resolve the objection. lf the FERC determines that the objection cannot be resolved, the FERC shall request the comments of the Advisory Council on Historic Preservation pursuant to 36 CFR Section 800.6(b). Any Council comment provided in response to such a request will be taken into account by the FERC in accordance with 36 CFR Section 800.6(c)(2) with reference only to the subject of the dispute; the FERC's responsibility to carry out all actions under this agreement that are not the subjects of the dispute will remain unchanged.

Execution of this Memorandum of Agreement by the FERC, the NYSHPO, and the VTSHPO and implementation of its terms shall constitute evidence that the FERC has taken into account the effect of this undertaking on historic properties.

FEDERAL ENERGY REGULATORY COMMISSION

_____

By: Date:

NEW YORK STATE HISTORIC PRESERVATION OFFICER

_____

By: Date

VERMONT STATE HISTORIC PRESERVATION OFFICER

_____

By: Date

CONCURRING PARTY:

Central Vermont Public Service Corporation

_____

By: Date:

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SECTION 106 REPORT

CARVER FALLS HYDROELECTRIC PROJECT (FERC No. 11475)
REMOVAL OF ABANDONED DUAL PENSTOCKS

CENTRAL VERMONT PUBLIC SERVICE CORPORATION
HAMPTON, NEW YORK
FEBRUARY 2010

Abstract

This Section 106 report treats the required removal of the historic abandoned dual penstocks at the Carver Falls Hydroelectric Station, located on the Poultney River in the towns of Hampton, New York and West Haven, Vermont. The original construction of the generating station during 1893-94 included a single penstock supported by multiple stone masonry piers; a second penstock was added about 1905. The present north penstock may have been installed in 1893-94 while the south penstock replaced the c. 1905 counterpart probably in 1922. Some of the stone masonry piers were replaced by concrete counterparts after damage by the 1927 flood. Both riveted-steel penstocks were disconnected and abandoned in 1954, when the presently active single welded-steel penstock was installed along a different alignment. Subsequently, the dual penstocks have deteriorated in place, and are not suitable for use elsewhere.

The Carver Falls Hydroelectric Project has been evaluated as eligible for the National Register of Historic Places, and the abandoned dual penstocks contribute to its historic integrity. Nevertheless, based on an aesthetic opinion relating to the falls setting, the operating license issued by the Federal Energy Regulatory Commission on 25 February 2009 requires the owner of the Carver Falls Project, Central Vermont Public Service Corporation, to remove the abandoned penstocks and concrete cradles. The action will have an adverse effect on the historic properties of the generating station. The content of this report together with the accompanying and forthcoming black-and-white photographs will serve as mitigation for the removal of the abandoned penstocks.

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Introduction

This Section 106 report has been prepared to satisfy the requirements of 36 CFR Part 800 relating to a hydroelectric generating project licensed by the Federal Energy Regulatory Commission (FERC) and belonging to the Central Vermont Public Service Corporation (CVPS) of Rutland, Vermont. The specific subjects of this report are the abandoned dual penstocks and concrete cradle piers constructed between 1893-94 and 1928 at the Carver Falls Hydroelectric Project (FERC No. 11475) situated on the Poultney River in Hampton, New York and West Haven, Vermont.

The field work for this report was accomplished in September 2009 and February 2010 at the Carver Falls Hydroelectric Project, where the abandoned penstocks are sited on the Hampton, New York side of the river. The structural characteristics of the dual penstocks and cradle piers were recorded by hand-written notes. The single contemporary 35mm black-and-white photograph accompanying this report was taken on the same date in 2009. The other photographs were taken between 1893 and 1996; they document the historical development of the penstocks and piers.

Hugh H. Henry, a consulting architectural historian, performed the initial field work, including black-and-white photography and historical research in 2009, subsequently using that information to prepare this report. Michael Hanselman, CVPS Hydroelectric Foreman, performed additional field work in 2010. Elizabeth Eliason, CVPS Environmental Engineer, provided information about the required action to remove the penstocks.

Project Description

Situated at the namesake falls of the Poultney River on the Vermont-New York border, the Carver Falls Hydroelectric Project consists of a small complex of connected buildings and structures, principally an extended dam, penstocks, surge tanks, and the powerhouse containing electrical generating equipment with an installed capacity of 1,900 kilowatts. The dam incorporates two primary sections: the original (1893-94) stone spillway and abutting intake structure that have been encased in concrete, and, added in 1940, the longer concrete south extension with gatehouse and intake structure.

Dual steel penstocks that were originally connected to the stone intake structure have been abandoned in place on their stone masonry and concrete cradle piers. Installed in 1954, the presently active single steel penstock extends between the 1940 intake structure and a bifurcating section near dual steel surge tanks erected in 1951. Downstream of the bifurcating section, dual steel penstocks pass under the surge tanks and compressor shed, and descend abruptly to the 1893-94 powerhouse. The one-story (plus partly exposed basement), three-by-nine-bay, stone masonry, gable-roofed building contains two generating units that combine turbine, governor, generator, exciter, and switchgear with diverse origins.

The Federal Energy Regulatory Commission issued a new thirty-year operating license for the Carver Falls Hydroelectric Project on 25 February 2009. Conditions of the license (Condition 14 of Appendix A and Condition K of Appendix B) specify that CVPS must remove the "two abandoned, above-ground penstocks and concrete cradles. The stone cradles would remain." The term "cradle" apparently refers to the entire pier with the cradle top that supports the penstocks.

The required action involves the dismantling and removal of the dual steel penstocks that extend from near the downstream base of the original concrete-faced stone intake structure to their truncated downstream ends near the active single penstock. Additionally, the action will include the removal of the six concrete piers with cradles that support the downstream (westerly) roughly half-lengths of the penstocks; these concrete piers were constructed to replace original stone masonry piers destroyed by the

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1927 flood. The several extant stone masonry piers that support the upstream half-lengths will remain in place to mark the position and alignment of the removed penstocks.

Structural Description

Now disconnected at both their upstream and downstream ends, these abandoned dual penstocks extend from near the downstream base of the original intake structure abutting the south end of the north dam westward over the exposed bedrock of the cascades. Their truncated west ends approach the active penstock a short distance upstream from the point where the single penstock bifurcates near the surge tanks.

The north pipe may date to the original (1893-94) development of the generating station. Probably in 1922, the south pipe replaced a c. 1905 counterpart of smaller diameter. Both pipes rested originally on multiple stone masonry piers, and those remain in place under the upstream half-lengths of the pipes. The catastrophic flood of November 1927, however, destroyed several of the stone piers under the lower half-lengths, and those were replaced by the present concrete counterparts. Also, the force of the flood current broke a section of the south pipe above the destroyed piers, and it was replaced in kind.

The barrels of these cylindrical penstocks are fabricated of riveted plate steel; their original thickness of one-quarter inch has been reduced by corrosion and cavitation. The north pipe has a diameter of six feet while the south pipe measures five feet. The north pipe retains a length of 268 feet, more nearly representing its original length than the remaining 220-foot length of the south pipe.

Starting at the upstream end of the penstocks, several piers consist entirely of rubble stone masonry while the farthest downstream member of this group combines stone masonry topped by a concrete cradle. There follow six piers with cradles constructed entirely of concrete that carry the penstocks to an outcrop of bedrock. The third concrete pier from the downstream end contrasts with the others by entirely surrounding the penstocks to serve also as an anchor block; this pier stands in the lowest level of the cascades with the greatest flow of water coming from spillage at the south dam.

The concrete piers share roughly trapezoidal form with battered flanks. Their tops consist of dual saddles with semicircular forms corresponding to the curvature of the penstock barrels. The piers have uniform north-south lengths but their heights vary with their positions on the highly irregular surface of the exposed bedrock.

The tallest (anchor) pier rises to a height of 17 feet with its horizontal top surface being about one foot above the crown of the penstock barrels. Its north-south length tapers from 18 feet at the base to 14.75 feet at the top while its east-west thickness tapers from 5 feet at the base to 2.25 feet at the top. The adjacent upstream pier exemplifies the five non-anchor concrete piers. It rises about 12 feet in height with its cradle meeting only the lower half of the penstock barrels; it tapers in thickness from four feet at the base to two feet at the top. The adjacent downstream pier differs only by its lower height of 11 feet that reflects its reduced cradle position.

The specific dimensions and horizontal spacing of all the piers are not yet available owing to the difficulty and safety risk of field measurement during the winter months. CVPS will conduct an additional field survey during the summer of 2010 to obtain this factual information, together with additional documentary photographs, prior to removal of the concrete piers.

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Statement of Significance

The abandoned dual penstocks and supporting piers at the Carver Falls Hydroelectric Project possess significance for representing their structural types deriving from the 1890s, the formative period of the hydroelectric industry in New York and Vermont. These structures constitute primary components of the water conveyance system in the original engineering design accomplished by the Carver's Falls Power Co. at the Carver Falls station that now ranks among the oldest hydroelectric stations operating in New York and Vermont. Furthermore, they reflect the contemporary usage of structural materials (stone masonry and riveted steel plate) in early hydroelectric development.

The initial development of the water power available at the 80-foot Carver Falls of the Poultney River occurred probably during the 1770s. Joseph Carver and associates built an "iron and lumber mill" on the river near the falls, although the specific site remains unknown. After Carver's death in 1786, his son, Salmon, continued to operate the mill until it was destroyed by a flood. Other small-scale industries using hydro-mechanical power were developed during the middle 1800s at a cascades about one-half mile upstream from the falls; these also have disappeared, leaving only archeological sites to mark their location.

The successor to hydro-mechanical power made its formal entry into Vermont with the chartering of the first electric company in 1882. By 1890, electric service of some kind had been initiated in ten towns. This activity brought about renewed interest in Carver Falls with its obvious potential for generating electricity. In 1893, two prominent businessmen, Albert Tuttle, proprietor of Fair Haven slate quarries, and James R. Langdon of Montpelier, whose company operated granite quarries in Barre, VT, founded the Carver's [sic] Falls Power Co. Along with lighting in Fair Haven village, Tuttle and Langdon planned to "bring the electricity to heat residences, business places, and public buildings and to furnish power for the scores of quarries and mills in the town." Not surprisingly, Tuttle's own Eureka slate quarries were intended to receive electricity first.

A newspaper article in *The Troy* (NY) *Daily Times* of January 27, 1894 describes the development of the hydroelectric station, albeit indulging freely in the hyperbole typical of contemporary journalism. The new firm undertook its "engineering feat on a large scale" in June 1893 at the falls "said to furnish the best power in Vermont." The article gives a length of 350 feet for the dam "being built of rock pointed with Portland cement." The 110-foot spillway with a height of 25 feet was faced with sheet steel "in place of the ordinary stone coping;" the 10.5-by-4-foot sheets presumably were attached along the crest to protect the masonry.

Conveying water to the powerhouse, a "line of tubing" with a diameter of six feet was fabricated in 16-foot sections. The penstock rested on 13 stone masonry piers over the first 200 feet of its length downstream from the dam. The next 200 feet passed through a cut in the "limestone" bedrock to reach a point about 60 feet above the powerhouse, where the penstock turned an "acute angle" down the steep wall of the river gorge. This layout yielded a head of 116 feet, "sufficient to make a mighty power."

Taken probably in the fall of 1893, a photograph (see Appendix 1. Photograph 2) in the collection of CVPS documents the original construction of the stone masonry piers for the penstock. Looking upstream along the penstock alignment, the photograph records that the stone masonry dam and abutting intake structure along with the south wing wall were complete. The river then passed through an apparent mud gate at the base of the dam. Ten stone masonry piers with flat tops appear finished; three more short ones would follow at the upstream end of the row. This photograph reveals that the cradles to carry a penstock were added later. A rough horizontal-boarded tool shed stands next to the downstream end of the row. The intake structure lacked the gatehouse that would soon follow, and two circular holes through its base indicate the positions of the forthcoming penstocks.

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The effort to construct the powerhouse, according to the 1894 article, required "The utmost engineering ingenuity and skill." The "foothold" for the stone masonry building was dynamited from the bedrock of the gorge wall. By the date of the article, the generating equipment had not yet been installed. The article states that "three turbine wheels of 1,000 horsepower each" would drive "forty-four-inch pulleys," but does not mention the necessary shafting and belting that would connect in turn to a "Westinghouse dynamo of 125 horsepower" for generating the electricity. The writer anticipated completion of the project "in a few months," i.e., later in 1894. Furthermore, the Carver Falls project would achieve the significance of being "one of the most modern of power producing agencies in the world, being similar to the gigantic plan that promises to harness Niagara falls."

Other sources indicate that only a single turbine was installed initially, that being a 500-horsepower horizontal Alcott machine coupled to the 75-kilowatt generator producing 2300 volts. A c. 1895 photograph (see Appendix 1, photograph 3) in the CVPS collection records the single relatively large-diameter penstock that delivered water to the original turbine. The cylindrical, sectional, steel-plate penstock rested on stone masonry cradles that had been added on the north halves of the flat pier tops, leaving the south halves vacant.

A c. 1900 photograph (see Appendix 1, Photograph 4) in the CVPS series shows a minor change on the penstock piers. A continuous plank catwalk with a simple railing along its south side had been added along the previously vacant south halves of the pier tops, paralleling the single penstock. The second penstock hole through the intake structure remained unused. A more significant change appears atop the intake structure in the form of the one-story, wood-framed, gable-roofed gatehouse (later removed) of elongated rectangular plan. This photograph also shows the slender cylindrical steel vent tube that rose from the upstream end of the single penstock next to the intake structure.

A. c. 1905 photograph (see Appendix 1, Photograph 5) in the CVPS series documents the addition on the stone piers paralleling the original penstock of a cylindrical steel penstock with markedly smaller diameter. The new penstock also rested on stone masonry cradles adjoining the earlier counterparts, and emerged from the blocked-down second opening in the base of the intake structure. The plank catwalk had been displaced by the second penstock. Other sources indicate that a two-foot penstock was added by 1908 to deliver water to a pair of 125-horsepower Alcott turbines installed in the powerhouse.

A corporate change came to the Carver Falls Hydroelectric Project in 1901, when the owning firm was reorganized into the Fair Haven Electric Co. Then in 1912, possession passed from local to regional entities. On July 19, the Fair Haven Electric Co. conveyed its rights and ownership to the Rutland Railway Light and Power Co., operator of the street and interurban railway system based in the city of Rutland, eighteen miles east of Fair Haven. Only three days later, however, the railway firm in turn transferred the Carver Falls station to the Western Vermont Power and Light Co. Already in 1913, both the railway and latter firms were folded into the Colonial Light and Power Co., itself controlled by the Eastern Power and Light Co. of Virginia. About the same year, Western Vermont made changes in the powerhouse equipment at Carver's Falls, replacing the generators and one turbine.

The Colonial firm was reorganized as the Vermont Hydro-Electric Corp. in 1919, and in October of that year, the Western Vermont interests were transferred accordingly. Three years later (1922), Vermont Hydro-Electric undertook significant changes to increase the generating capacity at Carver Falls. The two-foot penstock was replaced by a five-foot counterpart to supply water to a new horizontal, 900-horsepower S. Morgan Smith turbine and 48O-kilowatt Westinghouse generator (the latter remains a component of generating Unit #2 in 2010).

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The most catastrophic flood in Vermont history struck in November 1927. Rampaging like rivers throughout the state, the Poultney River overwhelmed the Carver Falls dam. The stone spillway held in place but served to divert the enormous volume of water that breached the south wing wall and carved a broad chasm in the gravel bank to expose the shelving bedrock. Several stone piers supporting the dual penstocks were destroyed, and the five-foot south pipe was partly torn away. A year passed before Vermont Hydro-Electric undertook the repairs. But in December 1928, more high water damaged the partly built "temporary" timber-crib dam that replaced the previous wing wall; the timber-crib structure was then rebuilt in kind. Concurrently, six concrete piers were constructed to support the repaired penstocks with the cradles being poured integral to the piers.

The final corporate transfer of the Carver Falls station came in 1929. Eight Vermont firms controlled by the Insull pyramid, including Vermont Hydro-Electric, were merged into a new NEPSCO subsidiary, named the Central Vermont Public Service Corp. (CVPS), to become the largest electric utility in the state. Retaining the Rutland headquarters of its predecessor, CVPS gained possession of numerous hydroelectric generating stations on several Vermont rivers.

Despite the onset of the Great Depression, CVPS proceeded in 1932 to replace the original generating unit at Carver Falls with the present Unit No. 1, comprising the 1,700 horsepower S. Morgan Smith turbine and the 1,150 kilowatt Allis-Chalmers generator. Then in April 1940, springtime high water nearly destroyed the "temporary" timber-crib dam. This event precipitated another major physical change in the Carver Falls station, the construction of a permanent concrete south dam with its own intake structure. The latter, however, remained unused for another decade while the earlier dual penstocks continued in service.

The impetus for installing the new single penstock to replace the dual counterparts has not been discovered. However, by 1954, especially the north penstock probably had approached the end of its reliable service life, and needed replacement. Furthermore, the design of the 1940 concrete dam provided the intake structure necessary for a single penstock. And a single welded-steel penstock with larger diameter would prove more efficient than two smaller riveted-steel pipes regardless of their condition.

Accordingly, the upstream half of the water conveyance system was shifted from its original alignment on the south side of the falls to the present one along the south side of the shelving rock steps (cascades) exposed by the 1927 flood. The new welded-steel single penstock was coupled to existing pipe a short distance upstream from the bifurcation near the surge tanks. The dual penstocks were disconnected at their upstream ends at the original intake structure as well as their lower ends near the new pipe. Subsequently, the abandoned pipes and their cradle piers have been left in place to weather and deteriorate, ironically undamaged by any flooding.

Existing Documentation

The Carver Falls Hydroelectric Station has received recent comprehensive documentary treatment of its historic properties. In November 2009, Hugh H. Henry, a consulting architectural historian, prepared a National Register of Historic Places Registration Form entitled "Carver Falls Hydroelectric Station" together with accompanying photographs and plans. This document contains detailed architectural, structural, and mechanical descriptions of the major components of the generating station, including the penstocks, complemented by assessments of their historic integrity. Furthermore, the document presents an overview of the history of both hydro-mechanical and hydroelectric development at Carver Falls, and states the significance of the existing generating station and its historic properties.

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Evaluation of Eligibility for the National Register

The Henry 2009 document cited above concludes that the Carver Falls Hydroelectric Project appears eligible for listing in the National Register of Historic Places. Excepting only the electrical substation (erected in 1973), the buildings and structures – including the abandoned dual penstocks and cradle piers - contribute to the historic character of the hydroelectric station. Although altering somewhat the original engineering design, most of the structural changes have occurred within the historic (pre-1960) period. The Carver Falls Hydroelectric Project retains integrity of geographical location, hydraulic setting, structural materials, period workmanship, feeling of its industrial type, and association with Vermont owners and electrical usage.

Evaluation of Effect

The action of removing the abandoned dual penstocks would meet the criteria of adverse effect "when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association."

The dual penstocks represent the early period of the hydroelectric development at Carver Falls. Installed possibly during 1893-94, the north penstock along with its supporting stone masonry piers constitute components of the original engineering design of the generating station. Added probably in 1922 to replace a smaller counterpart, the south penstock probably accompanied the installation of a new generating unit with larger electrical output in the powerhouse. Accordingly, the south penstock reflects an historic change in the original engineering design that increased the electrical capacity of the generating station.

The removal of these two penstocks will leave only a number of stone masonry piers to mark the original penstock position and alignment between the stone dam and the surge tanks. This action will break the direct visual connection in the water conveyance system between the original intake structure and the powerhouse (the present active penstock follows a different alignment along the river bank to the south.). The result will alter the original (1893-94) engineering design and layout of the generating station in favor of the post-1940 arrangement.

Mitigation

The black-and-white photographs accompanying this report record the abandoned dual penstocks and cradle piers in both their present (September 2009) and historic (1893-1996) appearances. These photographs (and additional documentary photographs taken in 2010) together with the content of the Section 106 report will serve to mitigate the removal of the historic structural components.

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Carver, Richard; Marshall, Michigan. Letter tracing Carver family genealogy written to "Sir" [Michael Hanselman, CVPS operator of Carver Falls Hydroelectric Project]. December 6. 1985.

Photographs of Carver Falls dam and penstocks. 1893-1943. Collection of Central Vermont Public Service Corp., Rutland, VT.

Post cards depicting "Carver's Falls." c. 1905. Collection of Hugh H. Henry, Chester, VT.

Hanselman, Michael; CVPS hydroelectric foreman, Hampton, NY. Personal interviews by Hugh H. Henry. 2 September and 26 October 2009.

Qualifications of Consultant

The consultant who prepared this section 106 report, Hugh H. Henry, meets the requirements of 36 CFR Part 61 as a qualified architectural historian. Among a broad range of activities during three decades of professional experience, Mr. Henry has prepared National Register documentation and assessments of eligibility for several hydroelectric stations in Vermont.

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Appendix 1 – Photographs

This appendix contains a series of six enlarged black-and-white photographs that record both the present (September 2009) and historic (1893-1996) appearances of the abandoned dual penstocks and cradle piers at the Carver Falls Hydroelectric Project.

The following information applies to all photographs:

Carver Falls Hydroelectric Project
Hampton, Washington County, New York and West Haven, Rutland County, Vermont
Negative filed at Central Vermont Public Service Corp., Rutland, Vermont.

Photograph 1
Date: September 2009
Credit: Hugh H. Henry
Original north dam (left), original intake structure (center), and 940 south dam (right); Abandoned original north (left) and 1922 south penstocks with original stone masonry (center) and 1928 concrete piers in foreground; view looking northeast.

Photograph 2
Date: 1893
Credit: Photographer unknown
Newly constructed stone masonry piers lacking cradles, prior to installation of penstock(s); view looking east toward partly constructed stone dam and intake structure.

Photograph 3
Date: c. 1895?
Credit: Photographer unknown
Stone masonry piers with stone masonry cradles supporting original (north) penstock - south flank; view looking north.

Photograph 4
Date: c. 1900?
Credit: Photographer unknown
Original (north) penstock supported by stone masonry cradles atop stone masonry piers; wood plank catwalk along south halves of pier tops; view looking northeast toward original stone masonry dam and intake structure with gatehouse.

Photograph 5
Date: c. 1910?
Credit: Photographer unknown
Original north penstock (left) with diameter of six feet and c. 1905 south penstock with diameter of two feet supported by stone masonry cradles atop stone masonry piers; view looking northeast.

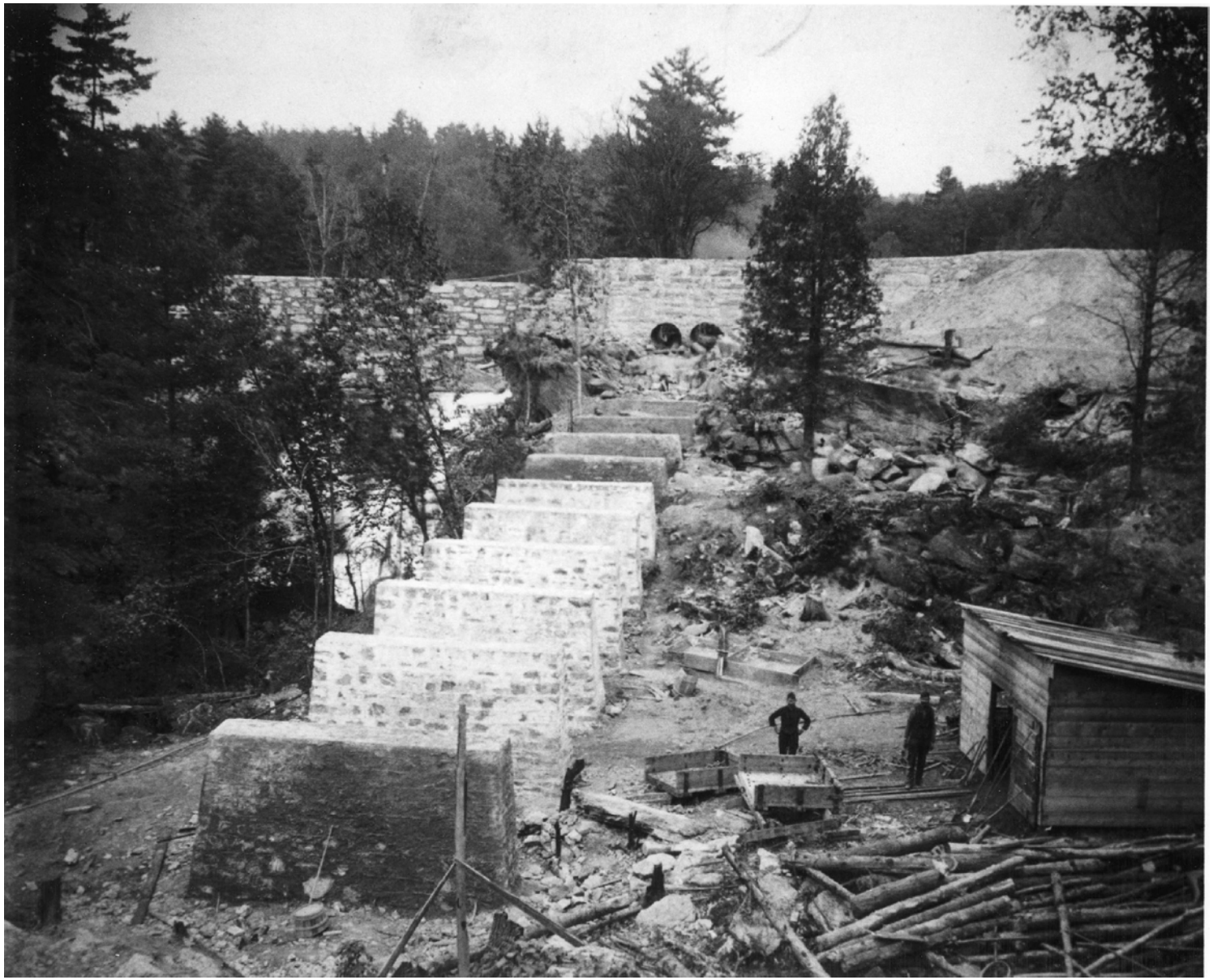
Photograph 6
Date: 1996
Credit: Gilbert R. Wideawake
Abandoned original (north) penstock - north flank and contiguous 1922 south penstock supported by stone masonry and concrete cradles atop original stone masonry (center) and 1928 concrete (right) piers; 1940 south dam and 1954 active single penstock in background; view looking south.

Photograph 1. Original dam (left) and intake structure (center): abandoned dual penstocks with concrete and stone masonry cradles and piers; view looking northeast. Date: September 2009

Carver Falls Hydroelectric Project
Hampton, Washington County, New York
West Haven, Rutland County, Vermont

Credit: Photographer unknown
Negative filed at CVPS, Rutland, VT

Photograph 2. Original construction of stone masonry piers prior to installation of penstock on cradles; view looking east.
Date: 1893



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Credit: Photographer unknown
Negative filed at CVPS, Rutland, VT

Photograph 3. Original (north) penstock installed on stone masonry cradles and piers; view looking north.
Date: c. 1895?

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Credit: Photographer unknown
Negative filed at CVPS, Rutland, VT

Photograph 4. Original (north) penstock on stone masonry cradles and piers; wood plank catwalk added along pier tops; view looking northeast. Date: c. 1900?

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West Haven, Rutland County, Vermont

Credit: Photographer unknown
Negative filed at CVPS, Rutland, VT

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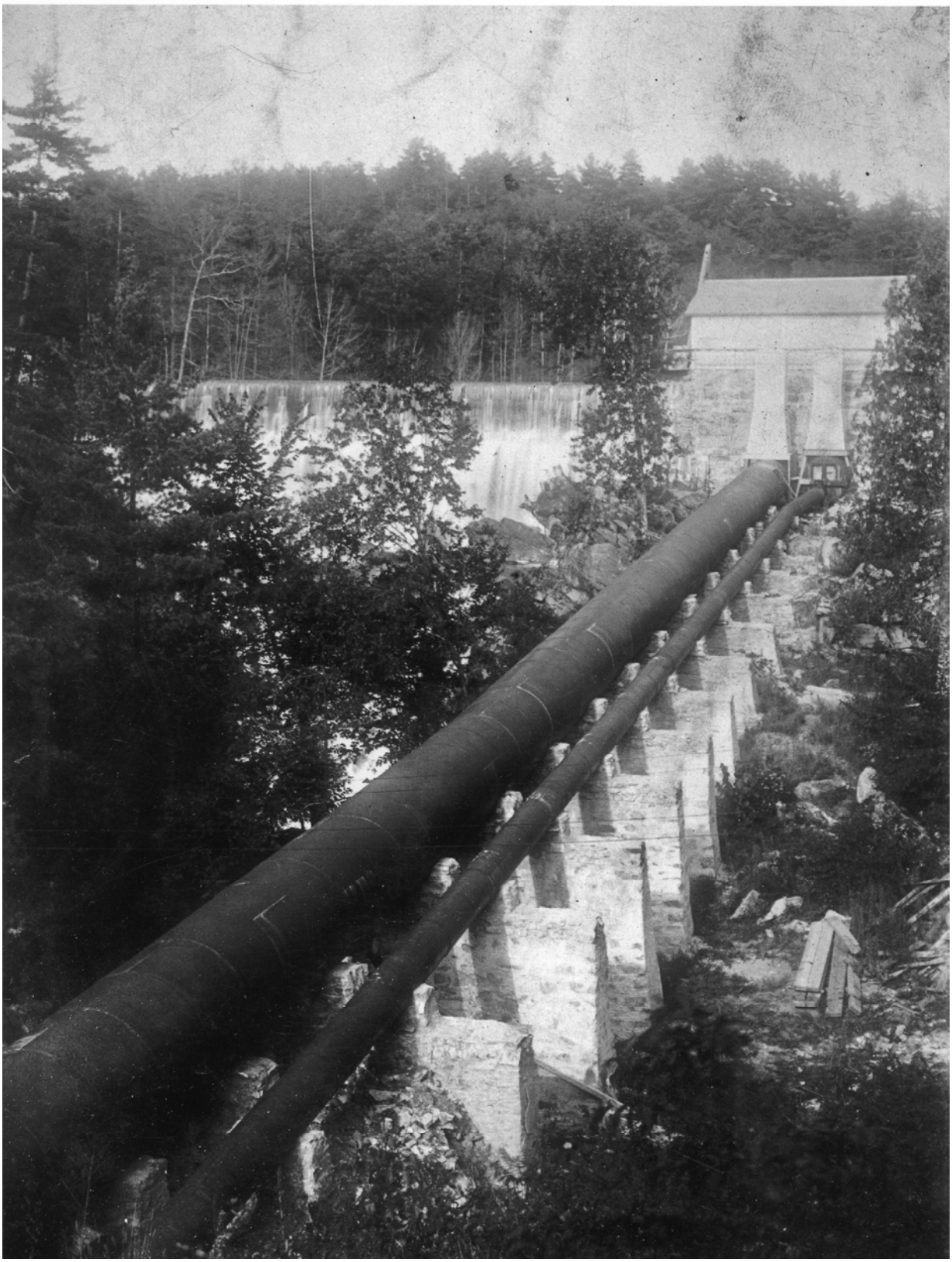
Photograph 5. Original (north) penstock and c. 1905 south penstock (right) on stone masonry cradles and piers; view looking northeast. Date: c. 1905?



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Credit: Photographer unknown
Negative filed at CVPS, Rutland, VT

Photograph 6. Abandoned dual penstocks – north flanks on stone masonry and concrete cradles and piers; south dam and active penstock in background; view looking south. Date: 1996

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Credit: Gilbert R. Wideawake
Negative filed at CVPS, Rutland, VT

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