

June 10, 2011

Thomas S. Burack, Commissioner  
New Hampshire Department of Environmental Services  
29 Hazen Drive; PO Box 95  
Concord, NH 03302-0095

RE: Gorham Paper And Tissue, LLC Natural Gas Pipeline Over and Across  
the Androscoggin River in the City of Berlin, New Hampshire

Dear Mr. Burack:

On behalf of Gorham Paper And Tissue, LLC ("GPT") we are providing an update regarding modifications to the Application of Androscoggin Valley Regional Refuse Disposal District ("District") for Exemption from the Approval And Certificate Requirements of RSA 162-H docketed with the Site Evaluation Committee ("Committee") as No. 2010-02 and for which the Committee issued its Decision and Order Granting Exemption from the Approval and Certificate Requirements of RSA 162-H on December 29, 2010 and requesting Committee confirmation that GPT may rely upon the December 29, 2010 Exemption issued to the District. The District assents to the proposed modifications.

On May 13, 2011 GPT acquired the Gorham Paper Mill (the "Mill") in Gorham, New Hampshire. GPT's first priority is to reopen the Mill. As further explained in the enclosed copies of GPT's Petition to the New Hampshire Public Utilities Commission ("NHPUC") filed simultaneous with this letter, GPT anticipates that construction for this project will need to be completed by **September 26, 2011** in order to ensure the economic viability of the Mill. To the extent the Committee's resources allow, we would greatly appreciate any effort that can be made to accommodate this need.

GPT intends to modify the project presented to the Committee by the District as discussed in greater detail in the attached submissions to the NHPUC. GPT will install and own the entire natural gas pipeline – the M&R Station and all parts of that pipeline from the PNGTS transmission line into the Mill. The landfill gas pipeline ("LFG") to the area of the M&R Station is not a part of the project. LFG pipeline will be owned partly by GPT and partly by the District. In order to reopen the Mill as quickly as possible, GPT intends to divide the project by constructing two separate pipelines- one short pipeline route from a tap into the Portland Natural Gas Transmission Services ("PNG") pipeline, to a Metering and Regulation Station, and thence over the Androscoggin via an abandoned railroad bridge owned by GPT to the Gorham Paper Mill. This bridge shall be repaired to be structurally sound prior to completion of construction of this pipeline route. This pipeline route will be roughly 4300 feet long and will include two separate pipelines- one for natural gas and the other for landfill gas. Construction of this natural gas pipeline will

Daniel Amory\*  
David J. Backer\*  
S. Campbell Badger\*  
Jerrold A. Crouter\*  
George T. Dilworth\*  
Jessica M. Emmons\*  
Peter C. Felmy\*  
Anthony T. Fratianne\*  
Sara S. Hellstedt\*  
Eric R. Herlan\*\*†  
Melissa A. Hewey\*\*†  
Michael E. High\*  
David M. Kallin\*  
John S. Kaminski\*  
Edward J. Kelleher\*  
Jeanne M. Kincaid\*\*†  
Peter D. Klein\*  
Benjamin E. Marcus\*  
Elek A. Miller\*  
Michael J. Murray\*  
Robert P. Nadeau\*  
Daine J. Nathanson\*\*†  
Jeffrey T. Piampiano\*  
William L. Plouffe\*  
Aaron M. Pratt\*\*†  
Harry R. Pringle\*  
Daniel J. Rose\*\*†  
George Royle V\*  
Gregory W. Sample\*  
David S. Sherman, Jr.\*  
Richard A. Shinay\*  
Kaighn Smith, Jr.\*  
Bruce W. Smith\*  
Richard A. Spencer\*\*†  
Christopher G. Stevenson\*  
E. William Stockmeyer\*\*†  
Amy K. Tchao\*\*†  
Joanna B. Tourangeau\*\*†  
M. Thomas Trenholm\*  
Matthew H. Upton†  
Gary D. Vogel\*  
Ronald N. Ward\*  
Brian D. Willing\*  
Gerald M. Zelin†

#### Consultants

Ann S. Chapman  
Policy & Labor Relations

Roger P. Kelley  
Labor Relations &  
Conflict Management

Michael J. Opuda Ph.D.  
Special Education

#### Of Counsel

Joseph L. Delefield III\*  
Robert L. Gips\*  
Donald A. Kopp\*  
Hugh G. E. MacMahon\*  
Harold E. Woodsum, Jr.\*

\* Admitted In Maine

† Admitted In New Hampshire

June 10, 2011

Page 2

allow the Mill economic feasibility and will be operational upon completion of this route. Two separate pipelines will also afford GPT greater operational flexibility with regard to equipment fueling.

Please do not hesitate to contact me with any questions. Thank you for your assistance with this matter.

Sincerely,



Joanna B. Tourangeau

JBT/al

Enclosures

Cc: Richard Arnold, GPT (without attachments)  
Austin Durant, GPT (without attachments)  
Ben Ward, GPT (without attachments)  
Jim Richards, Cianbro (without attachments)  
Jared Whitney, RH White (without attachments)  
Charles Willing, Esq., AVRRD (without attachments)

**STATE OF NEW HAMPSHIRE  
BEFORE THE  
PUBLIC UTILITIES COMMISSION**

PETITION OF GORHAM PAPER AND TISSUE, LLC FOR LICENSE TO CONSTRUCT  
AND MAINTAIN A NATURAL GAS PIPELINE OVER AND ACROSS THE  
ANDROSCOGGIN RIVER IN THE CITY OF BERLIN, NEW HAMPSHIRE

TO THE PUBLIC UTILITIES COMMISSION:

Gorham Paper And Tissue, LLC ("GPT"), hereby petitions the Public Utilities Commission ("Commission"), pursuant to RSA 371:17, for a license to construct and maintain a natural gas pipeline over and across the Androscoggin River in the City of Berlin, New Hampshire, and in support of its petition states as follows:

1. GPT, which has a business address of 72 Cascade Flats, Gorham, New Hampshire 03581, proposes to construct and operate a natural gas pipeline (the "Project") located in northern New Hampshire. The Project will supply GPT's paper mill, located in Gorham, New Hampshire (the "Gorham Mill") with natural gas as an alternative to the current use of No. 6 fuel oil currently used to fire the boilers that supply steam to the Gorham Mill's papermaking process.

2. GPT will contract with Portland Natural Gas Transmission System ("PNG") to furnish and install a 4" tap on the existing PNG 24" transmission line within the Public Service of New Hampshire ("PSNH") easement. PNG will perform wetland permitting associated with their work, perform the tap and provide appropriate fencing in the tap location upon completion.

3. GPT will contract with R.H. White Companies, Inc. to design and build the

Project. Cianbro Corporation will provide project oversight and management. Final design and engineering work for the Project is not yet complete. In order to facilitate review of the Project we attach preliminary documentation regarding the Project and anticipate provision of more fulsome location, design and engineering plans as they become available.

4. The natural gas pipeline will connect to the outlet flange of PNG's above ground check valve with 4" standard wall coated steel piping 36" below grade for approximately 1200-1400 linear feet to the proposed Metering and Regulating Station ("M&R Station"). (See Tab A for preliminary location plan.) The pipeline will be designed to supply natural gas ranging in pressure from a minimum of 500 psig to a maximum of 1,440 psig with a maximum flow rate of 6,850 Mscfd. The natural gas provided by PNG will be odorized.

5. The M&R Station will be located east of Shelby Street in Berlin, NH. The structure will be a single piece precast concrete building 12' x 32' x 10' with 2 single doors and a double door will be provided to house the metering and regulating system as well as the Data and Acquisition (DAC) room. The DAC room will be a General Purpose space with climate control and will house the Remote Terminal Unit ("RTU"). The metering and regulating portion of the building will be a Class I, Division 1 rated space with gas and flame detection. A vapor tight wall will separate the two sections of the building. The building will also be equipped with two roof-mounted blast hatches, door alarms and manual louvers for ventilation. Signals from the gas/flame detection and door alarms will be conveyed to the RTU.

6. After entering the M&R Station there is a valve designated as the main shut off valve located after the metering equipment, the pressure and temperature of the natural



gas will be measured and communicated to the M&R Station's RTU. A strainer will be provided at the station inlet and the measurement of the natural gas heating value will be facilitated thru the use of a composite gas sampler. PNG will use this sampler to calculate the heating value of natural gas. The natural gas will then be conveyed to a natural gas pre-heater to increase the temperature of the natural gas prior to pressure reduction. The pre-heater will be sized based on the maximum natural gas flow rate at the maximum M&R Station inlet pressure. Signals from the pre-heater, such as burner status, flame failure, and bath temperature will be communicated to the RTU.

7. Upon entering the M&R Station the natural gas will be metered with a rotary meter. The flow signal will be communicated to the RTU. The composite gas sampler will be installed just upstream of metering and located in the building. PNG will retrieve the gas cylinder on a monthly basis so that they can calculate the heating value of the natural gas. A bypass will be provided around the meter in the event meter maintenance needs to be performed.

8. Immediately downstream of metering, the natural gas will enter one of two regulator runs. Each regulator run will be configured with a Becker Super Monitor, and two Grove regulators in series. The first regulator will be set to reduce the natural gas pressure to approximately 500 psig; the second regulator will be set to further reduce the natural gas pressure to approximately 75 psig. The set pressure of the second stage regulator will be finalized during the design phase.

9. A pressure transmitter between the first and second stage regulators will be installed to monitor the interstage pressure. A pressure transmitter and temperature transmitter will be installed to monitor the final pressure and temperature. All three signals will be communicated to the RTU. Additionally, the pressure signals will be used to control

the Becker Super Monitors. In the event of a first or second stage regulator failure, the Becker Super Monitor valve assembly will shut down flow to the regulator run. Natural gas flow will be automatically diverted to the secondary regulator run to prevent interruption of service. Downstream of the second stage regulators the piping size will increase from 2" to 6", leave the building and proceed underground, transitioning to HDPE pipe. For cathodic protection, insulating flanges and polarization cell replacement kits will be installed as needed where transitions from underground to aboveground steel piping are made.

10. The piping system from the M&R Station inlet through the regulating run will be designed to a pressure/temperature rating of ANSI 600#; the transition to ANSI 150# pressure/temperature rating will be made downstream of each regulator run's block valve. The only exception to the ANSI 600# flange rating is for the natural gas preheater and the two overpressure protection devices (Becker supermonitors). The flanges on these components will be ANSI 900# class because the temperature of the heated gas may exceed the maximum temperature for ANSI 600# flanges at 1440 psig.

11. After leaving the M&R Station the 6" High Density Polyethylene (HDPE) SDR-11 Natural Gas (NG) service pipeline will travel approximately 3,600 feet in length and convey gas to the Gorham Mill at a minimum pressure of 30 psig with a maximum flow rate of 6,850 Mscfd. The pipeline will be joined by heat-fusion butt welds with electrofusion couplings as necessary to facilitate installation and the depth of cover will be 36". At the north end of the Gorham Mill, the HDPE pipeline will transition to steel below grade, rise 2 feet above grade, and end in flanges for connection by others. The pipeline will be foam pigged and pneumatically tested. The locations where the pipeline comes out of the ground will be guarded by fencing.

12. The pipeline route requires the crossing of the Androscoggin River via an existing abandoned railroad bridge approximately 300 foot in length. GPT owns the bridge and it is currently posted "No Trespassing." This is the "point-of-crossing." The abandoned railroad bridge is located in the City of Berlin, slightly upstream from the Berlin Municipal Wastewater Treatment Plant. (See Tab A.)

13. The pipeline mounted on the bridge will be 6" Schedule 40 steel pipe with corrosion protective coating. The pipeline will be mounted on rollers and support guides. Expansion joints with stainless steel bellows will be provided to accommodate thermal expansion and contraction of the steel pipe on the bridge. The pipes will be electrically isolated from the bridge by nonconductive rollers and supports. The pipeline will have non-conductive isolation flanges at each end of the bridge immediately before the pipeline descends to an underground trench condition. The buried steel portions of the pipeline will have sacrificial anode cathodic protection. GPT will contract with PNG to conduct a pressure test of the natural gas pipeline on a regularly scheduled basis. GPT will also complete a quarterly visual inspection of the pipeline over the bridge. The visual inspection will include ascertaining whether the pipe has been tampered with, that pipe brackets are secure and in place, and that the exterior coating is intact.

14. In the event of emergency, such as pipe break, the natural gas pipeline will be immediately isolated via the automatic valve in the M&R Station. The landfill gas pipeline will be manually shut down via a valve located on the upstream side of the bridge. All appropriate emergency agencies will be notified and response actions initiated.

15. In addition to the bridge, GPT owns the parcel of land on the west side of the bridge along the Androscoggin River. The land on the east side of the river is owned by

Great Lakes Hydro America, LLC ("GLHA"). GPT holds easement rights over GLHA's allowing for the construction of the natural gas pipeline pursuant to an Easement Agreement to Confirm and Supplement between Fraser H.H. LLC, the predecessor of the Gorham Mill, and GLHA, dated as of the 27<sup>th</sup> day of September, 2006 and recorded in the Coos County Registry of Deeds in Book 1190, Page 23, as supplemented by an Acknowledgment of Rights and Easements from GLHA dated May 12, 2011, copies of which are attached hereto. (See Tab B.)

16. The proposed crossing will have only minimal and temporary environmental impacts on the Androscoggin River during construction and will not affect the use and enjoyment of the river by the public. The pipeline will cross an existing, privately-owned, railroad bridge that no longer operates as a railway. GPT currently uses the bridge to support a pipe carrying water to the Gorham Mill. GPT contracted with Fisher Engineering, P.C. to review the October 1, 2010 Stephens Associates Report prepared for Northstar Industries, LLC ("Initial Bridge Report"), complete an evaluation of the safety of the bridge, and prepare a design for addressing each of the recommendations in the Initial Bridge Report. (See Tab C.) GPT will complete work necessary to ensure the bridge is structurally sound prior to completion of construction of the pipeline.

17. In the event of decommissioning the pipeline will be left in place following purging with inert gas.

18. Changing the fuel source from No. 6 fuel oil to natural gas as proposed will enable the Gorham Mill's efforts to run profitability. GPT's ability to operate the Gorham Mill and bring it up to full operation and employment levels hinges in large part on its confidence that the Project will be completed by September 26, 2011.

19. GPT and its representatives met with New Hampshire Department of Environmental Services ("DES") officials, including officials from the Air Resources

Division, the Solid Waste Division and the Wetlands Bureau to discuss all applicable environmental requirements. DES officials have informed GPT what DES approvals are necessary to construct and operate the Project. The Androscoggin Valley Refuse Disposal District obtained some of those approvals. GPT is working with DES to transfer or obtain all necessary DES approvals.

20. GPT and its representatives met with the City of Berlin ("City") which confirmed what local approvals are necessary. The City indicated that the Conditional Site Plan approval issued to the District for the pipeline project may be transferred to GPT. GPT also plans to submit a building permit application for the M&R Building.

21. GPT submits that the license petitioned for herein may be exercised without substantially affecting the rights of the public in the public waters of the Androscoggin River. The use and enjoyment by the public of the Androscoggin River will not be diminished in any material respect as a result of the pipeline crossing.

WHEREFORE, GPT respectfully requests that the Commission:

- a. Find that the license petitioned for herein may be exercised without substantially affecting the public rights in the public waters which are the subject of this petition;
- b. Grant GPT a license to construct and maintain a natural gas pipeline over and across the Androscoggin River in Berlin, New Hampshire, as specified in this petition; and
- c. Issue an Order Nisi and orders for its publication.

DATED at Portland, Maine this 10<sup>th</sup> day of June, 2011.

Respectfully submitted,

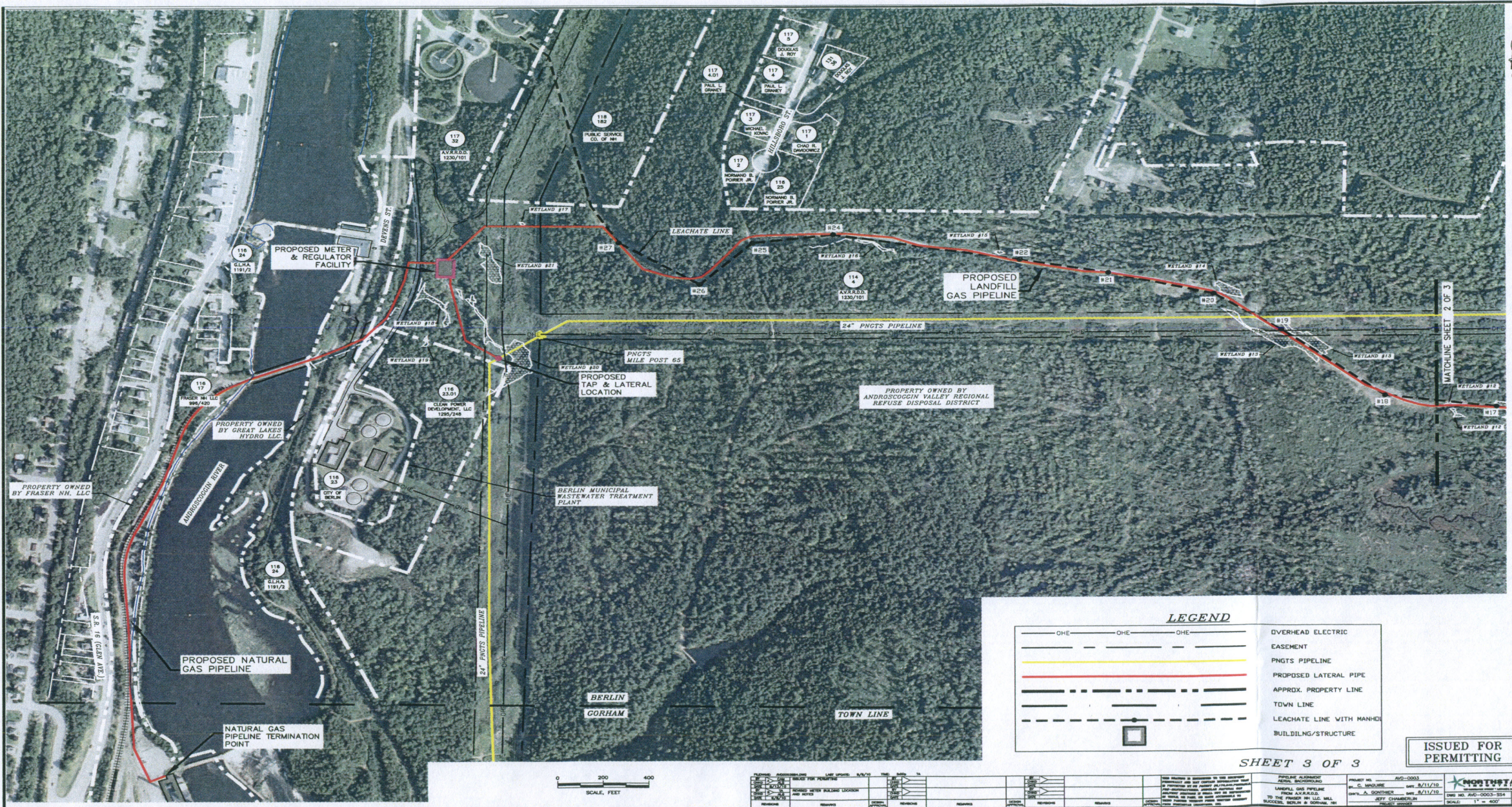
**GORHAM PAPER AND TISSUE, LLC**

By its attorneys,

**DRUMMOND WOODSUM**

Joanna B. Tourangeau, Esq.  
84 Marginal Way, Ste 600  
Portland, ME 04101-2480  
(207) 772-1941  
jbt@dwmlaw.com



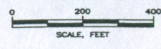


**LEGEND**

	OVERHEAD ELECTRIC EASEMENT
	PNGTS PIPELINE
	PROPOSED LATERAL PIPE
	APPROX. PROPERTY LINE
	TOWN LINE
	LEACHATE LINE WITH MANHOLE
	BUILDING/STRUCTURE

**ISSUED FOR PERMITTING**

SHEET 3 OF 3



DATE: 8/11/10	PROJECT: PIPELINE ALIGNMENT	DRAWN BY: C. MADRINE	DATE: 8/11/10
REVISION: 1	DESCRIPTION: LANDFILL GAS PIPELINE	CHECKED BY: A. SOUTHERN	DATE: 8/11/10
REVISION: 2	DESCRIPTION: TO THE FRASER NH LLC WELLS	PROJECT ENGINEER: JEFF CHAMBERLIN	SCALE: 1" = 400'



\_\_\_\_\_ of \_\_\_\_\_  
**Tax Stamp:** \$ \_\_\_\_\_  
**Recording Fee:** \$ \_\_\_\_\_  
**L-Chip Surcharge:** \$ \_\_\_\_\_

**Return to**  
*Drummond Woodsum & MacMahon*  
*Attn: Richard A. Shinay, Esq.*  
*84 Marginal Way, Suite 600*  
*Portland, Maine 04101-2480*

---

### ACKNOWLEDGEMENT OF RIGHTS AND EASEMENTS

Reference is made to that certain Easement Agreement to Confirm and Supplement, dated as of September 27, 2006 (the "Agreement"), between **GREAT LAKES HYDRO AMERICA, LLC**, a Delaware limited liability company having an address of 972 Main Street, Berlin, New Hampshire 03570, and **FRASER N.H. LLC**, a Delaware limited liability company having an address of 181 Bay Street, Suite 200, Toronto, Ontario, M5J 2T3, Canada, and recorded in the Coos County Registry of Deeds in Book 1190, Page 23, and that certain Deed Without Covenants, dated December 16, 2010, from **FRASER N.H. LLC** to **FP ACQUISITIONS, LLC**, a Delaware limited liability company having an address of 267 Central Avenue, White Plains, New York 10606, recorded in said Registry of Deeds in Book 1317, Page 889. Subject to all of the terms and conditions of the Agreement, **GREAT LAKES HYDRO AMERICA, LLC** hereby acknowledges and agrees that the rights and easements granted to **FRASER N.H. LLC** under the Agreement and related to utilities include the right and easement for the owner of substantially all of the Fraser Property (as defined in the Agreement) to construct, install, maintain, repair, improve and remove gas pipes, gas mains, laterals, manholes and services, and any and all equipment, fixtures and appurtenances relating thereto (collectively, the "Gas Equipment"), over, under and through the land of **GREAT LAKES HYDRO AMERICA, LLC** described in the Agreement, the exact location of the Gas Equipment to be determined by mutual agreement of **GREAT LAKES HYDRO AMERICA, LLC** and the successor to **FRASER PAPER N.H. LLC** in its capacity as the owner of the Fraser Property and the counterparty to the Agreement, as necessary for the transportation and transmission of landfill gas, natural gas, artificial gas or other gas to serve the paper mill located on the Fraser Property, which rights and easements will be exercised in accordance with, and subject to, the terms and conditions of the Agreement. At the request of **GREAT LAKES HYDRO, LLC**, upon the mutual agreement of the location of the Gas Equipment on the GLHA Property (as defined in the Agreement), the parties to the Agreement (whether an original party or a successor or assignee) will execute an amendment to the Agreement detailing the location of the easements for the Gas Equipment.

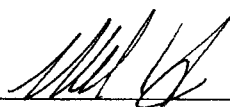


[End of Document. Signature Page Follows.]

Dated as of the 12<sup>th</sup> day of May, 2011.

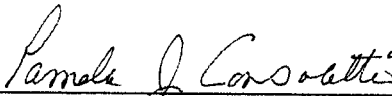
**GREAT LAKES HYDRO AMERICA, LLC**

Lesley A. Russell  
Witness

By:   
**Mel Jiganti**  
**Assistant Secretary and Director**  
Its: **Legal Services, U.S. Operations**  
Duly Authorized

State of MASSACHUSETTS  
County of Middlesex

The foregoing instrument was acknowledged before me this 12<sup>th</sup> day of May, 2011, by Mel Jiganti (name) Asst Sect Dir of Legal Services, U.S. Ops (title) of **GREAT LAKES HYDRO AMERICA, LLC**, a Delaware limited liability company.

  
Justice of the Peace / Notary Public  
My commission expires:  
Seal or Stamp:



**PAMELA J. CONSOLETTI**  
**NOTARY PUBLIC**  
**COMMONWEALTH OF MASSACHUSETTS**  
**MY COMMISSION EXPIRES DECEMBER 27, 2013**

made or brought by any person, any loss, expense, judgment, liability or asserted liability (including strict liability except to the extent caused or contributed to by the negligence or willfull misconduct of the GLHA Indemnified Parties) and including, without limitation, (i) costs and expenses of abatement and remediation of any Release of Hazardous Substances, (ii) liabilities of the GLHA Indemnified Parties to any person (including any Governmental Authority) in respect of bodily injuries, property damage, damage to or impairment of the environment or any other injury or damage, (iii) liabilities of the GLHA Indemnified Parties to any person (including any Governmental Authority) for its foreseeable and unforeseeable consequential damages; and (iv) the liability of any GLHA Indemnified Parties for court costs, expenses of alternative dispute resolution proceedings and fees and disbursements of expert consultants and legal counsel on a solicitor and client basis.

6.6 GLHA Indemnity:

- A. GLHA General Indemnity: GLHA agrees that it shall protect, indemnify and hold harmless Fraser and its respective directors, officers, partners, members, employees, trustees, agents, successors and assigns (collectively, the "Fraser Indemnified Parties") from and against all liabilities, damages, claims, demands, judgments, losses, costs, expenses, suits, actions or proceedings (including reasonable fees and disbursements of counsel) in respect of claims by third parties arising out of the breach of its obligations under this Agreement, negligence, willful misconduct, or failure to act according to Prudent Industry Practice on the part of the GLHA or any of its officials, agents or employees, contractors or subcontractors of any tier in connection with its work pursuant to this Agreement; provided, however, that GLHA shall not be required to reimburse or indemnify any Fraser Indemnified Party for any loss or claim to the extent such a loss or claim is due to the negligence or willful misconduct of that Indemnified Party.
- B. GLHA Environmental Indemnity: Without in any way limiting the generality of the above Section, GLHA shall indemnify the Fraser Indemnified Parties against and hold them harmless from any claims, actions, orders, remediation orders, abatement orders, prevention orders and suits, administrative or other proceedings made or brought by any person, any loss, expense, judgment, liability or asserted liability (including strict liability except to the extent caused or contributed to by the negligence or willfull misconduct of the Fraser Indemnified Parties) and including, without limitation, (i) costs and expenses of abatement and remediation of any Release of Hazardous Substances, (ii) liabilities of the Fraser Indemnified Parties to any person (including any Governmental Authority) in respect of bodily injuries, property damage, damage to or impairment of the environment or any other injury or damage, (iii) liabilities of the Fraser Indemnified Parties to any person (including any Governmental Authority) for its foreseeable and unforeseeable consequential damages; and (iv) the liability of any Fraser Indemnified Parties for court costs, expenses of alternative dispute resolution proceedings and fees and disbursements of expert consultants and legal counsel on a solicitor and client basis.

BK1190 PG0031

6.7 Co-operation Regarding Claims:

- A. If Fraser shall receive notice or have knowledge of any claim, demand, action, suit or proceeding that Fraser may have reason to believe may result in a claim for indemnification pursuant to Section 6.6, Fraser shall be entitled to obtain and file the appropriate pleading, notice or response, and as promptly as possible, shall give GLHA notice thereof. Such notice shall include, to the extent known to Fraser: (i) a reasonably detailed description of the facts and circumstances relating to such claim, demand, action, suit or proceeding, (ii) a complete copy of all related notices, pleadings and other papers and (iii) a description in reasonable detail of the basis for the potential claim for indemnification; provided, however, that failure promptly to give notice or to provide such information and documents shall not relieve GLHA of any obligation of indemnification it may have under Section 6.6.
- B. Fraser shall consult with GLHA regarding, and co-operate in respect of the response to, and the defense of, any claim, demand, action, suit or proceeding. Fraser shall be entitled to assume the defense or to represent the interest of GLHA in respect of such claim, demand, action, suit or proceeding which shall include, without limitation, the right to select legal counsel and other consultants satisfactory to GLHA, appear in proceedings on behalf of GLHA and to propose, accept or reject offers of settlement, all at Fraser's sole cost; provided, however, that if the defendants in any such action include both Fraser and GLHA, GLHA shall have reasonably concluded that there may be legal defenses available to it and/or other indemnified parties which raise a conflict of interest which is not waived, GLHA shall have the right to select separate counsel to defend such action on behalf of GLHA or indemnified parties at the expense of GLHA.
- C. If GLHA shall receive notice or have knowledge of any claim, demand, action, suit or proceeding that GLHA may have reason to believe may result in a claim for indemnification pursuant to Section 6.5, GLHA shall be entitled to obtain and file the appropriate pleading, notice or response, and as promptly as possible, shall give Fraser notice thereof. Such notice shall include, to the extent known to GLHA: (i) a reasonably detailed description of the facts and circumstances relating to such claim, demand, action, suit or proceeding, (ii) a complete copy of all related notices, pleadings and other papers and (iii) a description in reasonable detail of the basis for the potential claim for indemnification; provided, however, that failure promptly to give notice or to provide such information and documents shall not relieve Fraser of any obligation of indemnification it may have under Section 6.5.
- D. GLHA shall consult with Fraser regarding, and co-operate in respect of the response to, and the defense of, any claim, demand, action, suit or proceeding. GLHA shall be entitled to assume the defense or to represent the interest of Fraser in respect of such claim, demand, action, suit or proceeding which shall include, without limitation, the right to select legal counsel and other consultants

BK 190 PG0032

satisfactory to Fraser, appear in proceedings on behalf of Fraser and to propose, accept or reject offers of settlement, all at GLHA's sole cost; provided, however, that if the defendants in any such action include both Fraser and GLHA, Fraser shall have reasonably concluded that there may be legal defenses available to it and/or other indemnified parties which raise a conflict of interest which is not waived, Fraser shall have the right to select separate counsel to defend such action on behalf of Fraser or indemnified parties at the expense of Fraser.

- E. Waiver of Subrogation: Fraser and GLHA hereby waive any and every claim for recovery from the other for any and all loss or damage to each other resulting from the performance of this Agreement, to the extent such loss or damage is recovered under insurance policies described herein.

**6.8 Disputes:**

**A. Discussions among Senior Officers**

- i. Fraser and GLHA shall each provide the other with written notice of its senior authorized officer who, in its name, shall have the right to settle disputes, complaints, and controversies related to the effectiveness, interpretation, performance, infringement or matters otherwise arising out of or related to this Agreement ("Dispute"). If a Dispute cannot be settled on an amicable basis by the Parties through informal discussions, before resorting to the procedure set forth in this Section 6.8 A both Parties must direct the Dispute to the persons appointed in conformity with this Section for further considerations and attempt at resolution within fifteen (15) days (or such greater period of time as has been agreed upon by the Parties) after the Dispute has been addressed to said persons (or such greater period of time as agreed upon by the Parties).
- ii. If the Dispute cannot be settled within fifteen (15) days after it has been referred to the two designated senior officers appointed for such purposes pursuant to Section 7.8 B either Party may give the other written notice declaring the informal dispute resolution process at an end, in which event the Dispute shall be resolved by arbitration as hereinafter provided.
- iii. All conferences and discussions which occur in connection with the informal dispute mechanism set forth in this Section 6.8 A shall be deemed settlement discussions, and nothing said or disclosed, nor any document produced which is not otherwise independently discoverable, shall be offered or received as evidence or used for impeachment or for any other purpose in any current or future arbitration or litigation.

BK 190 PG0033

B. Arbitration

- i. Except as otherwise expressly provided herein, any Dispute not settled in accordance with the procedures set forth in Section 6.8 A shall, at the request of any Party, be settled by arbitration in accordance with the Commercial Arbitration Rules of the American Arbitration Association then in effect (the "Rules"), except as the Rules may be modified in this Section 6.8 B.
- ii. The arbitration shall be held in New Hampshire or at such other location as agreed to by the parties. There shall be three arbitrators, of whom each Party shall select one. The Party-appointed arbitrators shall select the third arbitrator.
- iii. The arbitrators shall decide the matters in dispute in accordance with the laws of New Hampshire, without reference to the conflict of laws rules thereof. The arbitration shall be governed by New Hampshire Civil Procedure.
- iv. The hearing shall be commenced within 90 days and the award shall be rendered no later than 120 days following the appointment of the last of the three arbitrators, unless the Parties agree otherwise or the arbitrators order otherwise. All discovery shall be completed no later than 20 days prior to the commencement of the hearing.
- v. Consistent with the expedited nature of arbitration, each Party will, upon the written request of the other Party, provide the other with copies of documents in its possession, custody or control relevant to the issues raised by any claim or counterclaim. Other discovery may be agreed by the parties or ordered by the arbitrators to the extent the arbitrators deem additional discovery relevant and appropriate, and any dispute regarding discovery, including disputes as to the need therefor or the relevance or scope thereof, shall be determined by the arbitrators, which determination shall be conclusive.
- vi. The Parties and the arbitrators shall treat the proceedings, any related discovery and the decisions of the arbitral tribunal as confidential, except in connection with a judicial challenge to, or enforcement of, an award, and unless otherwise required by law.
- vii. Any claim by either Party shall be time barred unless the asserting Party makes a demand for arbitration with respect to such claim within the applicable statute of limitations except to the extent otherwise provided in this Agreement. Any dispute as to the timeliness of such demand or other statute of limitations issues shall be decided by the arbitrators.

- viii. The award of the arbitrators shall be final and binding and shall be the sole and exclusive remedy between the Parties regarding any claim, counterclaims, issues, or accounting presented to the tribunal. The arbitrators' award shall state the reasons on which the award is based. Any monetary award shall include interest from the date of any breach of or other violation of this Agreement to the date on which the award is paid, at a rate to be determined by the arbitrators. Judgment upon the award rendered by the arbitrators may be entered by any court having jurisdiction thereof. Each of the Parties hereby consents to service of process by registered mail, by receipted Federal Express or other courier delivery, or by personal delivery at its address set forth above and agrees that this submission to jurisdiction and its consent to service of process by mail is made for the express benefit of the other Party.
- ix. This agreement to arbitrate shall be binding upon the successors and assigns and any trustee, receiver, or executor of each Party, provided that nothing contained in this Section 7.8 B shall limit the right of either Party, or any of their respective affiliates, successors, or assigns, at its election, to seek equitable remedies in a court of equity or law in the event of a breach or threatened breach hereof, without first proceeding under this Section 7.8 B.

6.9 Notices:

- A. All notices, demands, requests, reports, approvals, or other communications which may be or are required to be given, served, or sent pursuant to this Agreement shall be to the address and persons listed below:

If to Great Lakes Hydro America, LLC:

Great Lakes Hydro America, LLC  
972 Main Street  
Berlin, New Hampshire, 03570

and copy to  
Great Lakes Hydro America, LLC  
1024 Central Street  
Millinocket, Maine 04462

and copy to:  
Facsimile No.: (207) 723-3948  
Attention: President

BK 1 3 U 2 0 0 0 0

If to Fraser N.H. LLC:

Fraser N.H. LLC  
650 Main Street  
Berlin, New Hampshire, 03570

Fraser Paper, Inc.  
2273 Congress Street  
Portland, ME 04102

- B. Notices shall, unless otherwise specified herein, be in writing and may be delivered by hand delivery, United States mail, overnight courier service or facsimile. Notice by facsimile or hand delivery shall be effective at the close of business on the day actually received, if received during business hours on a business day, and otherwise shall be effective at the close of business on the next business day. Notice by overnight United States mail or courier shall be effective on the next business day after it was sent. A Party may change its addresses by providing notice of same in accordance herewith.

6.10 Definitions: As used in this instrument the following terms shall have the following meanings unless the context dictates otherwise:

- A. "River" shall mean the Androscoggin River, and its tributaries.
- B. "FERC" shall mean Federal Energy Regulatory Commission.
- C. "Sawmill Station" is a certain hydroelectric facility, and the land of GLHA adjacent to said facility, located on the River owned and operated by GLHA and being currently permitted under FERC License # 2422, as said facility has been and is presently used and improved, and as said facility may be further improved, maintained, repaired, modified, and/or replaced. Said Sawmill Dam was formerly sometimes known as the D. C. Station.
- D. "Sawmill Plan" is entitled "ALTA / ACSM Land Title Surveyor, Minor Subdivision of Great Lakes Hydro America, LLC & Fraser NH LLC, Sawmill Dam Parcel, Berlin, New Hampshire, Tax Map 128, Parcels 49.02 and 54" by York Land Services, LLC dated July 18, 2005, and recorded as Plan # 2687.
- E. "Riverside Station" is a certain hydroelectric facility, and the land of GLHA adjacent to said facility, located on the River, owned and operated by GLHA and is currently permitted under the FERC License # 2423, as said facility has been and is presently used and improved, and as said facility may be further improved, maintained, repaired, modified and/or replaced.
- F. "Riverside Plan" is a plan entitled "ALTA/ACSM Land Title Survey and Minor Subdivision of Great Lakes Hydro America, LLC & Fraser NH LLC, Riverside

BR I N U R U U U U



Dam Parcel, Berlin, New Hampshire, Tax Map 128, Parcels 49.02 & 54” by York Land Services, LLC, dated July 18, 2005 and recorded as Plan 2688.

- G. “Cross Station” is a certain hydroelectric facility, and the land of GLHA adjacent to said facility, located on the River owned and operated by GLHA and is currently permitted under FERC License # 2326, as said facility has been and is presently used and improved, and as said facility may be further improved, maintained, repair, modified and/or replaced.
- H. “Cross Plan” is entitled “ ALTA/ACSM Land Title Survey and Minor Subdivision of Great Lakes Hydro America, LLC, Cross Power Dam Parcels, Tax Map 116, Parcels 14 & 24, and Tax Map 118, Parcel 212, Berlin, New Hampshire” by York Land Services, LLC dated July 15, 2005 and recorded as Plan # 2686.
- I. “Cascade Station” is a certain hydroelectric facility, and the land of GLHA adjacent to said facility, located on the River, owned and operated by GLHA and is currently permitted under FERC License #2327, as said facility has been and is presently used and improved, and as said facility may be further improved, maintained, repaired, modified and/or replaced.
- J. “Cascade Plan” is entitled “ALTA/ACSM Land Title Survey and Minor Lot Line Adjustment and Consolidation Plan, of Great Lakes Hydro America, LLC & Fraser NH LLC, Cascade Dam Parcel, Tax Map U-16, Parcels 2A & 4, Gorham, New Hampshire ” by York Land Services, LLC dated May 25, 2006 and recorded as Plan # 2698.
- K. “Gorham Station” is a certain hydroelectric facility, and the land of GLHA adjacent to said facility, located on the River, owned and operated by GLHA and is currently permitted under FERC License # 2311, as said facility has been and is presently used and improved, and as said facility may be further improved, maintained, repaired, modified and/or replaced.
- L. “Gorham Plan” is a certain survey entitled “ALTA/ACSM Land Title Survey and Minor Lot Line Adjustment and Consolidation of Fraser NH LLC and Great Lakes Hydro America, LLC, Tax Map U-11, Parcel 8 and Tax Map U-9, Parcel 13, Gorham, New Hampshire ” by York Land Services, LLC dated May 25, 2006 and recorded as Plan # 2699.
- M. “Shelburne Station” is a certain hydroelectric facility, and the land of GLHA adjacent to said facility, located on the River, owned and operated by GLHA and is currently permitted under FERC License #2300, as said facility has been and is presently used and improved, and as said facility may be further improved, maintained, repaired, modified and/or replaced.
- N. “Shelburne Plan” is a certain survey entitled “ALTA/ACSM Land Title Survey for Great Lakes Hydro America, LLC, Tax Map 7, Parcels 8B, 9, 10A and 10C,

North Road, Shelburne, New Hampshire” prepared by York Land Services, LLC dated June 6, 2006, and recorded as Plan #2773.

- O. “GLHA Plans” are the Sawmill Plan, the Riverside Plan, the Cross Plan, the Cascade Plan, the Gorham Plan and the Shelburne Plan.
- P. “Recorded” shall mean “recorded or of record in the Coos County Registry of Deeds”.
- Q. “Prudent Industry Practice” shall mean (a) with respect to Fraser (1) any of the practices, methods and acts engaged in or approved by a significant portion of the pulp and paper industry or such other industry to the extent activities other than the production of pulp and paper are occurring now or in the future on the Burden Parcels applicable to Fraser or with respect to any matter to which (a)(1) does not apply, any of the practices, methods and acts which in the exercise of reasonable judgment at the time the decision was made could have been expected to accomplish the desired result at a reasonable cost consistent with good business practice, reliability, safety and expedition; (b) with respect to GLHA (i) any of the practices, methods and acts engaged in or approved by a significant portion of the hydro-electric generation industry applicable to GLHA at such time or with respect to any matter to which (b)(1) does not apply, any of the practices, methods and acts which in the exercise of reasonable judgment at the time the decision was made, could have been expected to accomplish the desired result at a reasonable cost consistent with good business practices, reliability, safety and expedition; and (c) in each case with due regard for, among other things, warranties of manufacturers and the requirements of any governmental authorities having jurisdiction over the matters at issue.

- 6.11 Governing Law. This Agreement shall be governed by, and construed in accordance with, the laws of the State of New Hampshire, including all matters of construction, validity and performance, without regard to conflicts of law principles.
- 6.12 Further Assurances. Fraser and GLHA further covenant to cooperate with one another in all reasonable respects necessary to consummate the transactions contemplated by this Agreement, and each will take all reasonable actions within its authority to secure regulatory approvals and cooperation of any necessary third parties.
- 6.13 Relationship of the Parties. GLHA and Fraser shall at all times be deemed independent contractors. GLHA and Fraser shall each be solely responsible for all matters relating to its subordinates, employees, agents, subcontractors and consultants. Neither party shall have authority to make any statements, representations or commitments of any kind or take any action that shall be binding on the other party.
- 6.14 Counterparts: This instrument may be executed in any number of, and by different parties hereto on, separate counterparts, all of which, when so executed, shall be deemed an original, but all such counterparts shall constitute one and the same agreement.

BK 1 9 U R U U U U U

6.15 **No Disturbance:** In addition to the terms as to the construction of this instrument set forth in paragraph 7.1 above, this instrument shall not disturb the rights, easements and agreements made in the following instruments, and both the Fraser Property and the GLHA Property shall remain subject to, and benefitted by, as the case may be:

- A. Covenant Not to Sue in Re: Acquisition of Berlin/Gorham Mills; The Mt. Carberry Landfill; and Certain Hydroelectric Assets recorded at Book 996, Page 331.
- B. Bill of Sale and Assignment (Internal Electric Delivery Assets – Pulp and Paper Mills) of Pulp & Paper of America, LLC, et al, to Fraser, dated as of May 13, 2002, recorded at Book 996, Page 447;
- C. Bill of Sale and Assignment (Internal Electric Delivery Assets – Hydro) of Pulp & Paper of America LLC et al to GNE, LLC executed on May 29, 2002, and recorded at Book 996, Page 457;
- D. Bill of Sale and Assignment (Joint Electric Delivery Assets) of Pulp & Paper of America LLC, et al, to GNE, LLC, et al, executed on May 29, 2002, recorded at Book 996, Page 467;
- E. Bill of Sale and Assignment (Hydro Assets Other Than Internal Electric Delivery Assets) of Pulp & Paper of America LLC to GNE, LLC dated as of May 31, 2002, recorded at Book 996, Page 478;
- F. Bill of Sale and Assignment (Joint Electric Delivery Assets) of Pulp & Paper of America LLC, et al, to Fraser, et al, executed on May 29, 2002, recorded at Book 996, Page 467;
- G. Bill of Sale and Assignment (Assets Other than Hydro, Landfill and Electric Delivery Assets) of Pulp & Paper of America LLC, et al, to Fraser dated as of May 31, 2002, recorded at Book 996, Page 492;
- H. Undivided Ownership, Operation and Maintenance Agreement by and between Fraser and GNE, LLC recorded May 31, 2002 at Book 996, Page 512;
- I. Easement and Cooperation Agreement (as to Cascade Project) by and between Fraser and GLHA dated and recorded of even or near even date herewith; and
- J. Deed of Fraser to GLHA dated and recorded of even or near even date herewith.

6.16 **Authority of Fraser and GLHA to Mortgage Respective Rights:**

A. The rights and easements granted by GLHA to Fraser under this Agreement shall benefit the Fraser Property and run with the Fraser Property, subject to the terms of this Agreement, including the specification of which portion of the Fraser Property is benefitted by a particular easement. In connection with Fraser granting a mortgage and/or security interest in the Fraser Property, Fraser may mortgage and/or grant a security interest in the easement and

DUPLICATE


rights of Fraser under this Agreement, without the consent of GLHA, all subject to the terms of this Agreement. In the event a mortgage holder or purchaser at foreclosure or other proceeding under a mortgage and/or security agreement succeeds to Fraser's interest in the Fraser Property by foreclosure or otherwise, GLHA agrees to recognize such successor to Fraser under this Agreement, subject to the terms of this Agreement. GLHA may require such entity to execute and deliver to GLHA a written assumption agreement in form and substance satisfactory to the GLHA.

B. The rights and easements granted by Fraser to GLHA under this Agreement shall benefit the GLHA Property and run with the GLHA Property, subject to the terms of this Agreement, including the specification of which portion of the GLHA Property is benefited by a particular easement. In connection with GLHA granting a mortgage and/or security interest in the GLHA Property, GLHA may mortgage and/or grant a security interest in the easement and rights of GLHA under this Agreement, without the consent of Fraser all subject to the terms of this Agreement. In the event a mortgage holder or purchaser at foreclosure or other proceeding under a mortgage and/or security agreement succeeds to GLHA's interest in the GLHA Property by foreclosure or otherwise, Fraser agrees to recognize such successor to GLHA under this Agreement, subject to the terms of this Agreement. Fraser may require such entity to execute and deliver to Fraser a written assumption agreement in form and substance satisfactory to Fraser.


Executed as of the day and first above written.

Fraser N.H. LLC

By:   
William Manzer, President  
Duly Authorized

By:   
Donald J. Levesque, Asst. Treasurer  
Duly Authorized

Great Lakes Hydro America, LLC

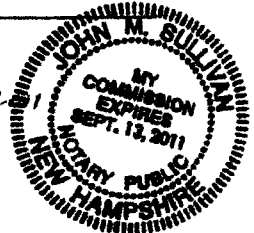
By:   
Michael Cutter, General Manager,  
Brookfield Power New England South  
Duly Authorized

State of New Hampshire  
County of Merrimack

The foregoing instrument was acknowledged before me this 27<sup>th</sup> day of September, 2006, by William Manzer, President of Fraser N.H. LLC, a Delaware limited liability company, on behalf of said company.



Notary Public  
My commission expires:  
Seal or Stamp: Sept 13, 2011

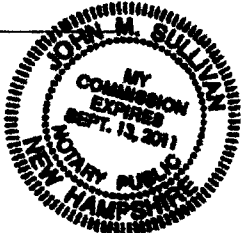


State of New Hampshire  
County of Merrimack

The foregoing instrument was acknowledged before me this 27<sup>th</sup> day of September, 2006, by Donald J. Levesque, Asst. Treasurer, of Fraser N.H. LLC, a Delaware limited liability company, on behalf of said company.

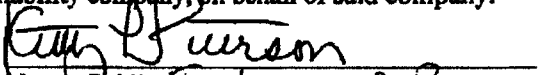


Notary Public  
My commission expires:  
Seal or Stamp: Sept 13, 2011



State of New Hampshire  
County of Merrimack

The foregoing instrument was acknowledged before me this 27<sup>th</sup> day of September, 2006, by Michael Cutter, General Manager, Brookfield Power New England South, of Great Lakes Hydro America, LLC, a Delaware limited liability company, on behalf of said company.



Notary Public Justice of the Peace  
My commission expires:  
Seal or Stamp:

J:\WDOX\DOCS\CLIENTS\14392\70563\W0918950.DOC

Kitty L. Peterson  
Justice of the Peace - New Hampshire  
My Commission Expires February 6, 2007

BK1190 P0041

**Schedule A  
Fraser Insurance Requirements**

**Coverage:** Fraser shall carry or cause to be carried and shall maintain or cause to be maintained at all times during the term of this Agreement the following insurance coverage:

- (a) **Property and Boiler and Machinery:** All risk property and boiler and machinery insurance, covering physical loss or damage to the GLHA Property including the coverage described below:
  - (i) commercial property insurance which at a minimum covers the perils insured under the ISO form commonly referred to as "all-risk" including fire and extended coverage and collapse;
  - (ii) comprehensive boiler and machinery coverage including electrical malfunction, mechanical breakdown and boiler explosion;
  - (iii) extra and expediting expenses coverage;
  - (iv) flood and earthquake coverage to the extent available on commercially reasonable terms;
  - (v) coverage shall be written on a full replacement cost basis;
  - (vi) the insurance shall contain an agreed amount endorsement or equivalent eliminating any co-insurance penalty;
  - (vii) the policy shall be subject to a reasonable deductible which shall be the absolute responsibility of Fraser;
- (b) **Commercial General Liability:** Commercial general liability insurance or its equivalent, and, if necessary, commercial umbrella or excess insurance with a total limit of not less than \$10,000,000 per occurrence. Such coverage shall include premises/operation, broad form contractual, independent contractors, products/completed operations, broad form property damage, advertising injury and personal injury;
- (c) **Workers Compensation and Employers Liability:**
  - (i) Workers Compensation and Employers Liability insurance in compliance with the applicable Laws of the State;
  - (ii) Employers Liability insurance coverage limits of not less than \$1,000,000 each accident for bodily injury or \$1,000,000 each employee for bodily injury by disease;
- (d) **Automobile Liability:** Automobile Liability insurance or its equivalent, and, if necessary, commercial umbrella or excess insurance for any auto including owned

BK 1150 100042

(if any), or non-owned and hired vehicles with combined single limits for bodily injury/property damage not less than \$5,000,000 per occurrence; and

**Independent Contractor Coverages:** When Fraser obtains the services of an independent contractor for any services associated with the GLHA Property, Fraser shall cause such independent contractor to obtain and maintain in full force and effect:

- (a) commercial general liability insurance coverage which includes premises/operation, products/completed operation, broad form property damage, advertising injury and personal injury;
- (b) workers compensation insurance in compliance with the applicable laws of the State and employers liability insurance coverage; and
- (c) automobile insurance for any auto including all owned, non-owned and hired vehicles;

all with limits appropriate for the scope of contract work to be performed.

**General Insurance Requirements for Fraser:**

- (a) all such insurance shall be with insurance companies which are rated "A- VIII" or better by A.M. Best or other insurance companies of recognized responsibility, or equivalent reasonably satisfactory to GLHA;
- (b) All policies shall name GLHA as Additional Insured and/or Loss Payee, as applicable;
- (c) The interest of the Additional Insured(s) and/or Loss Payee(s) in the Shared Facilities shall not be invalidated by any action or inaction of Fraser or any other Person, as applicable;
- (d) All such insurance policies shall provide for the waiver of all rights of subrogation against GLHA, the Additional Insured(s) and/or Loss Payee(s), if any, and their respective officers, employees, agents, successors and assigns, as applicable;
- (e) All such insurance policies shall be primary without right of contribution of any other insurance carried by or on behalf of any of the Additional Insured(s) and/or Loss Payee(s) and each such policy insuring against liability to third parties shall contain a severability of interests or a cross liability provision;
- (f) All such insurance policies shall provide that if cancelled, not renewed, terminated or expiring or if the coverage is reduced or there is any material change in the coverage, such cancellation, nonrenewal, termination, expiration, reduction or material change in coverage shall not be effective as to any of the Additional Insured(s) and/or Loss Payee(s) for 60 days, except for non-payment

FRASER

of premiums, in which case it shall not be effective for 10 days after receipt of a written notice sent by registered mail from such insurer.

BK1130 100077



**Schedule B**  
**GLHA Insurance Requirements**

**Coverage:** GLHA shall carry or cause to be carried and shall maintain or cause to be maintained at all times during the term of this Agreement the following insurance coverage:

- (a) **Property and Boiler and Machinery:** All risk property and boiler and machinery insurance, covering physical loss or damage to the Fraser Property including the coverage described below:
  - (i) commercial property insurance which at a minimum covers the perils insured under the ISO form commonly referred to as "all-risk" including fire and extended coverage and collapse;
  - (ii) comprehensive boiler and machinery coverage including electrical malfunction, mechanical breakdown and boiler explosion;
  - (iii) extra and expediting expenses coverage;
  - (iv) flood and earthquake coverage to the extent available on commercially reasonable terms;
  - (v) coverage shall be written on a full replacement cost basis;
  - (vi) the insurance shall contain an agreed amount endorsement or equivalent eliminating any co-insurance penalty;
  - (vii) the policy shall be subject to a reasonable deductible which shall be the absolute responsibility of GLHA;
  
- (b) **Commercial General Liability;** Commercial general liability insurance or its equivalent, and, if necessary, commercial umbrella or excess insurance with a total limit of not less than \$10,000,000 per occurrence. Such coverage shall include premises/operation, broad form contractual, independent contractors, products/completed operations, broad form property damage, advertising injury and personal injury;
  
- (c) **Workers Compensation and Employers Liability:**
  - (i) Workers Compensation and Employers Liability insurance in compliance with the applicable Laws of the State;
  - (ii) Employers Liability insurance coverage limits of not less than \$1,000,000 each accident for bodily injury or \$1,000,000 each employee for bodily injury by disease;

11202020

- (d) **Automobile Liability:** Automobile Liability insurance or its equivalent, and, if necessary, commercial umbrella or excess insurance for any auto including owned (if any), or non-owned and hired vehicles with combined single limits for bodily injury/property damage not less than \$5,000,000 per occurrence; and

**Independent Contractor Coverages:** When GLHA obtains the services of an independent contractor for any services associated with the Fraser Property, GLHA shall cause such independent contractor to obtain and maintain in full force and effect:

- (a) commercial general liability insurance coverage which includes premises/operation, products/completed operation, broad form property damage, advertising injury and personal injury;
- (b) workers compensation insurance in compliance with the applicable laws of the State and employers liability insurance coverage; and
- (c) automobile insurance for any auto including all owned, non-owned and hired vehicles;

all with limits appropriate for the scope of contract work to be performed.

**General Insurance Requirements for GLHA:**

- (a) all such insurance shall be with insurance companies which are rated "A- VIII" or better by A.M. Best or other insurance companies of recognized responsibility, or equivalent reasonably satisfactory to Fraser;
- (b) All policies shall name Fraser as Additional Insured and/or Loss Payee, as applicable;
- (c) The interest of the Additional Insured(s) and/or Loss Payee(s) in the Fraser Property shall not be invalidated by any action or inaction of GLHA or any other Person, as applicable;
- (d) All such insurance policies shall provide for the waiver of all rights of subrogation against Fraser, the Additional Insured(s) and/or Loss Payee(s), if any, and their respective officers, employees, agents, successors and assigns, as applicable;
- (e) All such insurance policies shall be primary without right of contribution of any other insurance carried by or on behalf of any of the Additional Insured(s) and/or Loss Payee(s) and each such policy insuring against liability to third parties shall contain a severability of interests or a cross liability provision;
- (f) All such insurance policies shall provide that if cancelled, not renewed, terminated or expiring or if the coverage is reduced or there is any material change in the coverage, such cancellation, nonrenewal, termination, expiration, reduction or material change in coverage shall not be effective as to any of the

BK 1 7 U P 5 U 4 U

**Additional Insured(s) and/or Loss Payee(s) for 60 days, except for non-payment of premiums, in which case it shall not be effective for 10 days after receipt of a written notice sent by registered mail from such insurer.**

J:\WDOX\DOCS\CLIENTS\14392\70563\0918950.DOC

14392705630918950

SECTION ENCL.

119023

3 of 6

COOS COUNTY

006929

RECEIVED

2006 SEP 28 AM 8: 29

REGISTER OF DEEDS

Tax Stamp: \$40.00  
Recording Fee: \$ 108 -  
Return to: Account # 182  
Devine, Millimet & Branch - Attn: kp/djc  
111 Amherst Street  
Manchester, NH 03101-9949

*Carole A. Lamirande*  
Carole A. Lamirande, Registrar

STATE OF NEW HAMPSHIRE

DEPARTMENT OF REVENUE ADMINISTRATION



REAL ESTATE TRANSFER TAX

THOUSAND \$	HUNDRED AND 40	DOLLARS
09/28/2006	762240	\$ 444440.00

Property in the Berlin, Gorham, Shelburne, Milan, Dummer, Cambridge and Errol, Coos County, New Hampshire

EASEMENT AGREEMENT  
TO  
CONFIRM AND SUPPLEMENT

This Easement Agreement is made as of the 27<sup>th</sup> day of September, 2006, by and between FRASER N.H. LLC (a Delaware limited liability company) (herein "Fraser") 650 Main Street, Berlin, New Hampshire, 03570, and

GREAT LAKES HYDRO AMERICA, LLC (a Delaware limited liability company) formerly known as GNE, LLC (herein "GLHA") of 972 Main Street, Berlin, New Hampshire, 03570.

RECITALS

I. Fraser is the owner and operator of a pulp mill and a paper mill on certain real property situate in the City of Berlin and Town of Gorham and is the owner of other real property in the City of Berlin, the Town of Gorham, in Coos County, New Hampshire more particularly described in the following instruments (comprising the "Fraser Property"):

- A. Deed (Diesel & Steam) of American Tissue-New Hampshire Electric, Inc. to Fraser executed May 29, 2002, and recorded (defined below) at Book 996, Page 361;
- B. Deed of Pulp of America, LLC to Fraser executed May 29, 2002, and recorded at Book 996, Page 374; as corrected at Book 1018, Page 107;
- C. Deed of Paper of America, LLC to Fraser executed on May 29, 2002, and recorded at Book 996, Page 420;

BK 1190 Pg 0023

- D. Deed of Berlin Mills Railway, Inc. to Fraser executed on May 29, 2002, and recorded at Book 996, Page 432;
- E. Excluding land conveyed by Quitclaim Deed of Fraser to White Mountain Energy, LLC dated December 19, 2003, and recorded at Book 1064, Page 249.

II. GLHA is the owner and operator of six hydroelectric facilities on certain real property with appurtenant rights situate in the City of Berlin, Town of Gorham and the Town of Shelburne, and flowage rights which may include the following communities in Berlin, Gorham, Shelburne, Milan, Dummer, Cambridge and/or Errol, all in Coos County, New Hampshire, more particularly described in the following instruments (comprising the "GLHA Property"):

- A. Deed of American Tissue-New Hampshire Electric, Inc. to GNE, LLC executed on May 29, 2002, and recorded at Book 996, Page 366;
- B. Deed of Fraser to GLHA dated as of even or near even date herewith and recorded of even or near even date herewith.

III. Prior to April 30, 1965, the Brown Company (a Maine corporation) was the owner and operator of the Fraser Property and the GLHA Property;

IV. By Deed of Warranty of the Brown Company to Brown-New Hampshire, Inc. dated April 30, 1965, recorded at Book 490, Page 3, the GLHA Property, which included easements necessary to operate the GLHA Property, was separated in title from the Fraser Property (the "1965 Deed").

V. In 1965 there were no surveys of the GLHA Property and the legal descriptions for the land and easements in the 1965 Deed were, by necessity, broad, general, and lacked specificity.

VI. Both Fraser and GLHA have determined that the boundaries, rights and easements for the GLHA Property need to be more clearly set forth.

VII. GLHA has commissioned a survey of the GLHA Property which surveys are herein the GLHA Plans (defined below) together with GLHA facilities as defined below.

VIII. All capitalized terms contained herein have the meaning of term as defined herein.

NOW, THEREFORE, Fraser and GLHA hereby agree and grant and convey certain rights and easements as following which shall be confirmatory and supplementary to the 1965 Deed:

continued

BK 190 PG0024

**ARTICLE I  
SAWMILL STATION**

- 1.1 For consideration paid, Fraser does hereby grant to GLHA, with Quitclaim Covenants, the following rights and easements for the benefit of the Sawmill Station:
- A. confirms 50' wide access easement over old Cell House Site created in 1965 deed. This access is depicted on the plan dated February 21, 2002 and entitled "Minor Subdivision, Activity & Use Restriction Area Cell House Site, Pulp & Paper of America, LLC, Berlin, New Hampshire" prepared by York Land Services, Inc. and recorded in the Coos County Registry of Deeds at Plan # 1785.
  - B. a general access easement across the Fraser Property located along the easterly side of the Androscoggin River in Berlin, Coos County, New Hampshire over or on existing rights of way or in other locations as mutually agreed to by Fraser and GLHA to provide access for persons, vehicles, machinery and equipment for all purposes associated with the use, ownership and operation of the Sawmill Station.
- 1.2 For consideration paid, GLHA hereby grant to Fraser, with Quitclaim Covenants, for the benefit of the Fraser Property, the right and easement:
- A. to install, maintain, repair, improve, and replace all steam and water lines currently existing at the portion of the GLHA Property associated with the Sawmill Station.
  - B. to access, use, operate, maintain, repair and replace the valve house, valves and appurtenant equipment, the location of which is shown on the Sawmill Station Plan.

**ARTICLE II  
RIVERSIDE STATION**

- 2.1 For consideration paid, Fraser does hereby grant to GLHA, with Quitclaim Covenants, the following rights and easement for the benefit of the Riverside Station:
- A. access over other land of Fraser on the east side of the Androscoggin River over or on existing rights of way or in other locations as mutually agreed to by Fraser and GLHA for the purposes repairing, maintaining, and/or replacing the flash boards and structures on the GLHA property depicted in Detail C on the Riverside Plan.
- 2.2 For consideration paid, GLHA does hereby grant to Fraser, with Quitclaim Covenants, the following rights and easements for the benefit of the Fraser Property:

BK 1190 PG0025

- A. to use, operate, maintain, improve, repair, and replace the existing overhead oil lines and steam pipes as shown in Detail B on the Riverside Plan.
- B. a general access easement across the GLHA Property to access, use, operate, maintain, repair and replace the Bermico fire pump water intake for the pulp mill as located in Detail B of the Riverside Plan.

**ARTICLE III  
CROSS STATION**

- 3.1 For consideration paid, Fraser does hereby grant to GLHA with Quitclaim Covenants, the following rights and easements for the benefit of Cross Station:
  - A. An access easement across the Fraser Land adjacent to the Cross Station over or on existing rights of ways or in other locations as mutually agreed to by Fraser and GLHA by persons, vehicles, machinery, and equipment, as such access easement is depicted on the Cross Plan (defined below).
- 3.2 For consideration paid, GLHA does hereby grant to Fraser, with Quitclaim Covenants, the following rights and easements for the benefit of Fraser Property:
  - A. An easement to install, maintain, repair, improve and or replace the existing stock and water lines as they are currently located and depicted on the Cross Plan.
  - B. An easement for the benefit of the land occupied by the Fraser paper mill (i.e., for the purpose of furnishing steam to the paper mill) to construct, install, maintain, repair, improve and remove an underground steam line running from the easterly side of old railroad bridge which crosses the Androscoggin River southerly of Cross Station as shown on the Cross Plan and extending northerly to the land currently occupied by the Fraser pulp mill, the exact location of such steam line to be determined by mutual agreement of Fraser and GLHA.
  - C. An easement for the benefit of the land occupied by the Fraser paper mill (i.e., for the purpose of furnishing water, power and other utilities to the paper mill) to construct, install, maintain, repair, improve and remove underground water lines, power lines and any other utilities as required, running from the easterly side of old railroad bridge which crosses the Androscoggin River southerly of Cross Station as shown on the Cross Plan and extending northerly to the land currently occupied by the Fraser pulp mill; provided, however, that the installation and location of any such lines or utilities shall be subject to (i) the prior approval of GLHA, such discretion to be exercised by GLHA reasonably based on the present or future needs of GLHA and the absence of interference of such line or utilities with the facilities and operations of GLHA, and (ii) the obligation of Fraser to relocate such lines or utilities at Fraser's cost and expense in the event that such lines or utilities interfere with the future operations or facilities of GLHA. Any disagreement regarding the installation, location, relocation or removal of such lines or utilities shall be resolved in accordance with Section 6.8 hereof. Fraser agrees to indemnify and hold GLHA harmless from any loss, cost, damage or

BK 190 PG 0026

expense incurred or suffered by GLHA on account of the presence of such lines or utilities on GLHA's property.

#### ARTICLE IV TRANSMISSION LINES

4.1 For consideration paid, Fraser does hereby grant to GLHA, with quitclaim covenants, the perpetual right and easement to construct, install, maintain, repair, operate, replace and improve all overhead and underground power and poles and appurtenant equipment for the transmission of electricity and/or communications which are the subject of, and the location of which are depicted on, plans entitled "Power & Transmission Lines for Great Lakes Hydro America, LLC, Berlin, Gorham and Shelburne, New Hampshire prepared by York Land Services, Inc. dated January 26, 2006 and recorded in the Coos County Registry of Deeds as Plan # 2771 & 2772, including but not limited to Segments 2, 4, 6, 9, 12, 14, 16, 22, 23, 25 and any temporary by-pass lines depicted on said plan.

4.2 For consideration paid, GLHA does hereby grant to Fraser, with quitclaim covenants, the perpetual right and easement to maintain, repair, operate, improve and replace the existing transmission lines in their current location either solely owned by Fraser or jointly owned as those rights and interests as described in the Undivided Ownership, Operation and Maintenance Agreement by and between Fraser and GNE, LLC (now known as GLHA) recorded May 31, 2002 at Book 996, Page 572, over the portions of the land of GLHA depicted in the Cross Plan and the Cascade Plan.

4.3 The parties agree that the transmission lines may be relocated as the parties may mutually agree. Any such relocation shall be in writing, executed by the parties, and recorded in the Coos County Registry of Deeds.

#### ARTICLE V GENERAL EASEMENTS

5.1 For consideration paid, Fraser does hereby grant to GLHA with Quitclaim Covenants, the following rights and easements appurtenant to each parcel of the GLHA Property:

- A. The right and easement to enter onto the Fraser Property for access to the GLHA Property for the purposes of maintaining, operating, repairing; and replacing the hydroelectric facilities of GLHA.
- B. The right to use Fraser Property in areas designated by Fraser on a temporary basis to store machinery, equipment and materials for maintenance, repair, improvement, or replacement of any of the hydroelectric facilities operated by GLHA on the GLHA Property.

5.2 For consideration paid, GLHA does hereby grant to Fraser with Quitclaim Covenants, the following rights and easements for the benefit of the Fraser Property:

BK 190 Pg 0027



- A. **The right and easement to enter into the GLHA Properties for the purpose of maintaining, repairing, replacing or improving the Fraser Properties;**
  - B. **A general access easement across and on the GLHA Property to maintain, replace, repair, and operate steam and other utility lines and pipes and appurtenant equipment all as presently located on the GLHA Property, and used in the operation of the Fraser Property.**
- 5.3 **For purposes of this Easement Agreement, Fraser and GLHA agree that a grant of an easement for access or the confirmation or supplement to access of an easement granted or reserved under the 1965 Deed includes:**
- A. **the right to use, maintain, repair, and improve the area of the access easement at the sole cost and expense of the holder of the access easement. The right of access shall be for access by foot or by vehicle on or across existing rights of way or in other locations as mutually agreed to by Fraser and GLHA, for use by the holder of the easement, its employees, contractors, and business invitees for the purposes of access. The holder of the benefited parcel may enter onto land adjoining the area of the access easement to maintain, repair, or replace improvements to the access easement, including paving the area of the access easement provided the burdens of the access easement are not increased.**
  - B. **the owner of the real estate burdened by the access easement shall take no action to prevent use of the access easement for the limited and specified purposes intended by the grant of the easement.**
  - C. **The access easement shall not be relocated without the express prior written approval of the owner of the beneficial parcel and the owner of the burdened parcel.**
- 5.4 **For purposes of this Easement Agreement, Fraser and GLHA agree that the grant of an easement water lines, sewer lines, power lines, or any other utility above, along, or below the ground or the confirmation or supplement of any such easement granted or reserved under the 1965 Deed includes:**
- A. **the right to enter the real estate burdened by such easement to use, maintain, repair, replace or improve such easement and to use property adjacent to such easement area for such purposes. The holder of such easement shall use, maintain repair, replace, and improve such easements at its sole cost and expense. All such work shall not interfere with the operations of the parcel burdened by such easement.**
  - B. **the owner of the real estate burdened by any such easement shall take no action to interfere with the use of such easement.**

BK 190 PG 028

ARTICLE VI  
GENERAL TERMS

- 6.1 **Confirmatory and Supplementary:** This Agreement shall be construed to confirm and supplement the terms of the 1965 Deed, and it shall not be construed that GLHA is releasing any rights and easements under said 1965 Deed unless said (a) release terms are explicit or (b) said rights and easements were previously released by instruments recorded in the Coos County Registry of Deeds. This Agreement shall also not be construed that Fraser is releasing the limitations described with respect to flowage rights held by GLHA. This Agreement shall not be construed to revise the exceptions and reservations made in the 1965 Deed except to the extent explicitly stated herein or as set forth in the deed from Fraser to GLHA in a deed of even date herewith and recorded in the Coos County Registry of Deeds. This instrument shall be recorded in the Coos County Registry of Deeds.

GLHA and Fraser do hereby acknowledge that the so-called Diesel Station, the Kraft Steam Station, the Cascade Steam Station the Central Steam Station (all of which are referenced in the 1965 Deed) are not presently owned by GLHA and have either been dismantled or are presently owned by Fraser.

Fraser hereby confirms and reaffirms by granting to GLHA the flowage rights and easements necessary to operate the six hydroelectric facilities on the GLHA Property insofar as said flowage rights and easements affect any real property of Fraser in Berlin, Gorham, Shelburne, Milan, Dummer, Cambridge and/or Errol, Coos County, New Hampshire.

- 6.2 **Perpetual:** The rights and easements and terms herein are perpetual and shall run with the land and shall bind the parties hereto, their successors and assigns. As used herein "GLHA" shall include, as the context dictates, its successors and assigns, and "Fraser" shall include, as the context dictates, its successors and assigns.
- 6.3 **Insurance of Fraser:** Fraser shall carry and maintain, or cause to be carried and maintained, no less than the insurance coverages listed in Schedule A, applicable to the Fraser Property in the minimum amounts indicated in Schedule A, with insurance companies qualified to do business in the State of New Hampshire. Any cost, fee or expense associated with carrying and maintaining insurance coverages including any deductibles shall be borne by Fraser.
- A. **Certificate of Insurance:** The policies set forth in this Section shall contain a provision that coverages afforded under the policies will not be cancelled, non-renewed or materially modified unless 30 days' prior written notice via Certified United States mail has been delivered to GLHA. The policies shall name GLHA as a beneficiary under the policies as its interests may appear in the case of property insurance, and on an annual basis at each policy anniversary, Fraser shall furnish to GLHA Additional Insured and/or Loss Payee a certification of all required insurance policies in form reasonably satisfactory to GLHA.

BK 190 PG 0029

- B. All policies set forth in this Section shall include waivers of any right of subrogation of the insurers thereunder against Fraser, and any right of the insurers to any setoff or counterclaim or any other deduction whether by attachment or otherwise, in respect of any liability of any such person insured under such policy.

6.4 **Insurance of GLHA:** GLHA shall carry and maintain, or cause to be carried and maintained, no less than the insurance coverages listed in Schedule B, applicable to the GLHA Property in the minimum amounts indicated in Schedule B, with insurance companies qualified to do business in the State of New Hampshire. Any cost, fee or expense associated with carrying and maintaining insurance coverages including any deductibles shall be borne by GLHA.

- A. **Certificate of Insurance:** The policies set forth in this Section shall contain a provision that coverages afforded under the policies will not be cancelled, non-renewed or materially modified unless 30 days' prior written notice via Certified United States mail has been delivered to Fraser. The policies shall name Fraser as a beneficiary under the policies as its interests may appear in the case of property insurance, and on an annual basis at each policy anniversary, GLHA shall furnish to Fraser Additional Insured and/or Loss Payee a certification of all required insurance policies in form reasonably satisfactory to Fraser.

- B. All policies set forth in this Section shall include waivers of any right of subrogation of the insurers thereunder against GLHA, and any right of the insurers to any setoff or counterclaim or any other deduction whether by attachment or otherwise, in respect of any liability of any such person insured under such policy.

6.5 **Fraser Indemnity:**

- A. **Fraser General Indemnity:** Fraser agrees that it shall protect, indemnify and hold harmless GLHA and its respective directors, officers, partners, members, employees, trustees, agents, successors and assigns (collectively, the "GLHA Indemnified Parties") from and against all liabilities, damages, claims, demands, judgments, losses, costs, expenses, suits, actions or proceedings (including reasonable fees and disbursements of counsel) in respect of claims by third parties arising out of the breach of its obligations under this Agreement, negligence, willful misconduct, or failure to act according to Prudent Industry Practice on the part of Fraser or any of its officials, agents or employees, contractors or subcontractors of any tier in connection with its work; provided, however, that Fraser shall not be required to reimburse or indemnify any GLHA Indemnified Party for any loss or claim to the extent such a loss or claim is due to the negligence or willful misconduct of that Indemnified Party.

- B. **Fraser Environmental Indemnity:** Without in any way limiting the generality of the above Section, Fraser shall indemnify the GLHA Indemnified Parties against and hold them harmless from any claims, actions, orders, remediation orders, abatement orders, prevention orders and suits, administrative or other proceedings



Certified W/DBE in MA, ME, NH and VT  
[www.stephensengineers.com](http://www.stephensengineers.com)

60 Northrup Dr  
Brentwood, NH 03833  
Phone: (603) 772-1417  
Fax: (603) 772-1418

668 Main Street, Suite 250  
Wilmington, MA 01887  
Phone: (978) 988-2115  
Fax: (978) 988-2117



**SUMMARY REPORT OF EXISTING RAILROAD  
BRIDGE EVALUATION,  
PHASE 2 BRIDGE ENGINEERING SERVICES  
STRUCTURAL ANALYSIS  
NATURAL GAS PIPELINE FOR FRASER PAPER/AVRRDD  
BERLIN, NEW HAMPSHIRE  
SA Project No. 031-10-013  
October 1, 2010**

Prepared for:

**NORTHSTAR INDUSTRIES, LLC**  
126 Merrimack Street  
Methuen, Massachusetts 01844



Prepared by:

**Stephens Associates Consulting Engineers, LLC**

A handwritten signature in black ink, appearing to read 'Robert S. Stephens'.

Robert S. Stephens, PE  
Principal Engineer

A handwritten signature in black ink, appearing to read 'Bethel A.H. Stephens'.

Bethel A.H. Stephens, PE  
President



**Certified W/DBE in MA, ME, NH and VT**  
[www.stephensengineers.com](http://www.stephensengineers.com)

60 Northrup Dr  
Brentwood, NH 03833  
Phone: (603) 772-1417  
Fax: (603) 772-1418

668 Main Street, Suite 250  
Wilmington, MA 01887  
Phone: (978) 988-2115  
Fax: (978) 988-2117



October 1, 2010

SA Project No. 031-10-013

Northstar Industries, LLC  
126 Merrimack Street  
Methuen, MA 01844  
Attn: André Gonthier

**Re: Summary Report of Existing Railroad Bridge Evaluation –  
Phase 2 Bridge Engineering Services, Structural Analysis  
Natural Gas Pipeline for Fraser Paper/AVRRDD  
Berlin, New Hampshire**

Ladies and Gentlemen:

Stephens Associates Consulting Engineers, LLC (SA, we, our, or us) has prepared this Report under Amendment to our existing Agreement dated August 2, 2010 at the request of Mr. André Gonthier of Northstar Industries, Inc. (Northstar, Client, you, your, etc.), to provide additional bridge engineering services for evaluation of the existing railroad bridge over the Androscoggin River near the Fraser Paper Facility (Bridge or Project). SA performed a visual inspection and prepared a Visual Inspection Report dated August 20, 2010 under Phase 1 of our services. We understand that our services on the Project were done for Northstar on behalf of the Androscoggin Valley Regional Refuse Disposal District (AVRRDD). Our Project understanding and background information are presented below, followed by our scope of services, historical information, analyses approach, results and conclusions, as well as recommendations.

Overall, the bridge appears to have sufficient strength to carry the proposed pipeline, provided that the recommended repairs and maintenance outlined below are completed.

### **Project Understanding and Background**

Most of our understanding of the Project was presented in our August 2, 2010 Agreement and our Visual Inspection Report dated August 20, 2010. Our Project understanding has since been enhanced by our correspondence with Mr. Gonthier by email and telephone.

Figures 1 and 2 show the Site location and proximity. The Site consists of a former railroad bridge crossing the Androscoggin River, located at the southern end of Berlin, NH about 2,700 ft. north of the Fraser Paper facility in the Cascade Flats village of Gorham, NH. The Bridge consists of two spans on the order of 130 ft. each, with a center pier in the Androscoggin River. Photographs and detailed description of the Bridge's current condition can be found in our Visual Inspection Report.

We understand that the Androscoggin Valley Regional Refuse Disposal District (AVRRDD) proposes to construct a natural/mixed gas pipeline over the Androscoggin River by using the existing railroad Bridge. The purpose of the pipeline is to supply the Fraser Paper Company's Cascade Mill on the west riverbank with natural gas from an existing Portland Natural Gas Transmission pipeline on the eastern riverbank, and from a

future connection to a nearby landfill east of the River. We understand that reuse of the existing Bridge (with limited repairs) is a vital component of the overall project and that if the Bridge cannot carry the proposed pipeline for a reasonable lifespan (about 20 years), the overall project will not likely be feasible financially. In our evaluation, SA considered a lifespan of 20 years.

### **Purpose and Scope of Services**

The purpose of SA's services was to evaluate the adequacy of the existing Bridge to carry loads from a proposed natural gas pipeline and temporary pipeline construction/maintenance equipment over a 20-year lifespan.

SA performed its services in two Phases. In Phase 1, we visually inspected the Bridge condition and rendered an opinion as to whether further engineering evaluation was warranted. Our visual inspection indicated that the Bridge condition was adequate enough that we suggested further engineering evaluation to be warranted to judge Bridge adequacy to carry proposed pipeline loads over a 20-year lifespan. SA performed such engineering evaluation for Phase 2 including structural analysis (computer modeling) of the trusses and the existing "repairs" identified in our visual inspection. Our scope of services included:

- Seeking and reviewing readily available historical information on the Bridge for use in our structural evaluation.
- Analyzing the Bridge trusses and repairs for adequacy to carry existing and proposed pipeline loads, excluding seismic loads as explained later.
- Preparing this Report of analysis results indicating our engineering judgment of the adequacy of the existing Bridge for support of the proposed pipeline and recommendations for repairs and modifications to the Bridge to allow its use for pipeline support for a 20-year lifespan. Repairs/modifications will be designed and construction costs estimated in a later phase.
- Reviewing readily available H&H information from the Federal Emergency Management Agency (FEMA Flood Insurance Map) for potential scour issues. SA did not perform a scour analysis as we have no information on foundations.

We believe that seismic analysis would conclude that the Bridge cannot resist seismic loading prescribed in current engineering standards and guidelines. Because of this, and in consideration that the Bridge is not being considered for pedestrian or vehicular traffic, SA neither recommended nor performed a seismic analysis. In lieu of the costs for seismic analysis and retrofit of the Bridge, we strongly recommend engineering precautions for automatic gas shutoff if Bridge/pipeline fails due to seismic or other catastrophic event, bearing in mind that the Bridge would likely be the first (and perhaps only) point of failure if the new pipeline is designed and constructed in accordance with current industry standards.

### **Historical Information**

The railroad Bridge, currently owned by the Fraser Paper Company, was constructed as part of The Berlin Mills Railway, which was built as a spur of the B&M Railroad. The Berlin Mills Railway connected the East Berlin Mill on the east side of the Androscoggin River in Berlin, NH with the Cascade Mill (currently the Fraser Paper Mill) downstream and on the west side of the river in Gorham, NH. We believe that the Bridge has been in its current location since about time the Cascade Mill was constructed in 1903. Correspondence

between New Hampshire bridge engineer, John Storrs, and the Berlin Mills Company in 1917 and 1918 indicates that the Bridge was likely originally constructed as early as 1875 and moved to its current location in 1903. A 2002 New Hampshire Division of Historical Resources (NHDHR) survey of the Berlin Mills Railway states that the original Bridge construction was likely in the 1880's. Copies of the Storrs correspondence and the NHDHR survey are included in the Appendix.

The Bridge structure is a skewed, two-span, pin-connected Whipple through truss, also known as a double-intersection Pratt truss or Murphy-Whipple truss. Whipple trusses constructed of wrought iron with Phoenix columns for compression members, as the subject Bridge, are also known as Linville trusses.

The Bridge is one of two known remaining Whipple truss bridges in New Hampshire, and thus is considered to be historically significant. Whipple trusses were commonly used for railway bridges in the United States between 1860 and 1890. The truss vertical members and top chord are comprised of "Phoenix columns," built-up members consisting of four quarter-round flanged sections riveted together to form a pipe column. These elements strongly suggest that the Bridge was originally built by the Clarke, Reeves & Company of wrought iron members fabricated at their Phoenixville Bridge Works in Pennsylvania, or by its successor, the Phoenix Bridge Company. These companies built many Whipple truss railroad bridges in the northeast during the late 19<sup>th</sup> century and Phoenix columns were their standard during that time.

SA did not take samples or perform chemical analysis of the Bridge material, but based on the estimated date of construction and many of the construction details, we believe the Bridge is constructed of wrought iron or possibly a combination of wrought iron and cast iron. Cast iron is strong in compression, but is brittle and weak in tension, and was most commonly used for compression members such as vertical posts and top chords. Wrought iron is equally strong in compression and tension and is much more ductile than cast iron. Historically, wrought iron was first used for tension members, and later for other Bridge structural members. By about 1900, steel, which is stronger and more ductile than wrought iron, became the most common material for truss bridges.

The John Storrs correspondence (referenced above) stated that the Bridge was probably designed for Cooper E22 loading, but that the Bridge would not go beyond the elastic limit of iron under loading with Cooper E40. Current steel railroad bridges are designed for Cooper E80, a much heavier loading.

The Brown Company owned the Cascade Mill through the first half of the 20<sup>th</sup> century. Brown Company photographs archived by Plymouth State University (PSU) and available on the PSU website show the Bridge undergoing repairs/strengthening in the mid-1940's. The Bridge was probably strengthened to accommodate newer engines and corresponding heavier loads. It is possible that Bridge has been repaired or modified since then, but the owner indicated to us that they do not have records of such repairs/modifications.

Based on our visual inspection and the archived PSU photographs, repairs/modifications (likely done in the 1940's) included:

- Phoenix column end posts (angled members at the ends of the trusses) strengthened by welding curved steel plates over the length of each side of each Phoenix column section;
- Side plates added to top chord members;
- Bars added to bottom chord members;
- Diagonal members modified with additional sistered bars and/or turnbuckle splices;



- A vertical Phoenix column replaced with an 8-inch wide-flange column; and
- End portal lattice beams replaced with wide-flange steel beams.

We do not know if the existing floorbeams, stringers and U-Bolt connections are original to the Bridge.

Steel angle frames have been added to the north and south sides of the structure to support pipelines. These support frames are typically welded to the vertical truss members, but some are also attached to bottom chord members.

There is evidence that the Bridge was used for rail traffic as recently as 2001. The tracks have been removed since then and the Bridge is posted as closed to the public. The Bridge currently supports two active and two inactive water/waste pipelines.

### **Scour**

SA considered bridge scour based on readily available published information and our observations on-site, and without the benefit of information on existing foundations.

The 1982 Federal emergency Management Agency (FEMA) flood insurance rate map (FIRM) for Berlin, NH shows 100-year water surface elevations between 905 and 906 ft. NGVD 1929 in the vicinity of the railroad bridge. The map shows the railroad bridge and the limits of the 100-year at the normal river bank, suggesting that the flood is confined to the bridge abutments. At the first dam upstream of the bridge, the water surface elevation is shown as 925 ft. upstream of the dam and 906 downstream. SA considered the FEMA FIRM as well as the presence of the nearby upstream dam, the historic regulation of flooding by dam operators on the Androscoggin Watershed upstream of the Bridge, and historic performance of the Bridge having been in place for more than 100 years, and the measurements and observation made by SA during our visual inspection in evaluation of the risk of scour.

We believe risk of bridge scour resulting in Bridge failure from the 100-year flood or lesser floods is small. Given the lack of information on the bridge foundations, however, we recommend design of failsafe engineering controls to stop gas flow in the event of pipeline rupture at or near the bridge from bridge failure due to seismicity (e.g., earthquakes), scour, or other mechanism.

### **Structural Analysis**

In our analyses, SA used a combination of standards and specifications, as well as engineering judgment to assign appropriate loads, load cases, material properties and allowable stresses for the historic structure. We judged that the standard design specifications for bridges used by AASHTO or the railways (AREMA) do not directly apply to this structure since the Bridge will not support train or highway traffic, nor would current building codes necessarily apply since the structure is an existing bridge. Standards considered in our evaluation included ASCE 7-05, *Minimum Design Loads for Buildings and Other Structures*, American Railway and Maintenance-of-Way Association (AREMA) Manual, and AISC *Steel Construction Manual*, as well as various historical resources (see list in “References” section of this report.)



SA created a three-dimensional model of the structure in Visual Analysis finite element software using section properties measured calculated from our field measurements and historical material properties selected based on review of several sources and engineering judgment. SA modeled one span since both the west and east spans have substantially similar structural configuration and loading. Refer to Figures 3 through 5 for schematic bridge elevation, section and floor bracing plan and for member numbering conventions.

The loads used for our analysis included dead load, snow load, wind load and construction live loads. Applied dead loads consisted of existing structure and existing pipeline weights plus the weight of the proposed 8-inch diameter steel pipeline filled with natural gas. Applied snow loads were calculated to be 85 psf using USACE ERDC/CRREL TR-02-6 "Ground Snow Loads for New Hampshire" Feb 2002. We applied wind loads of 45 psf, based on AREMA recommendations for railway bridges, to the projected vertical area of the Bridge. Construction live loads up to 10,000 lbs were also added to the model, both as a single point load and as a combination of smaller point loads. SA did not perform a seismic analysis as the Bridge would likely not pass a seismic evaluation and the intent is to engineer pipeline fail safes to stop the gas flow in the event of rupture from bridge failure by earthquake, scour or other mechanism, as recommended above.

SA computed maximum member stresses in the model using ASCE 7-05 allowable stress design load combinations and then compared the maximum stresses to current and historical allowable stresses. We used the allowable stresses for wrought iron that were standard at its time of construction. Where historical documents provided different 'standard' values for allowable stress, we typically used the more conservative value. See Table 1 for a summary by Bridge member type of the maximum stresses under the modeled loading and corresponding allowable stresses.

During our field visual inspection SA observed several Bridge members with some section loss due to corrosion. SA calculated section properties and member capacities for these members based on the measured reduced sections. See Table 2 for summary of maximum expected stresses in members with reduced sections.

#### *Tension Members*

Computed tension stresses in the diagonal and bottom chord members of the trusses were within the assumed allowable stress. With the exception of one floor bracing diagonal, the structural members where we observed some section loss due to corrosion or broken welds, have adequate capacity to carry the proposed loads. At the west abutment, the floor-bracing rod that connects L1 of the south truss to the west abutment has lost more than half its diameter due to corrosion and is overstressed under assumed wind loads.

Although other members with some corrosion (e.g. the bottom chord where it wraps around the end post) currently have adequate section properties for the expected loads, we believe these and potentially others will continue to corrode at a rate that will possibly reduce their capacity below allowable in less than 20 years. In other words, the structural member repairs noted in our Visual Inspection Report previously submitted will likely need to be done in less than 20 years, and the repair to the west abutment L1 floor bracing diagonal will need to be made immediately.

### *Compression Members*

Historical formulas for allowable compression stress (e.g. in vertical members, end posts and top chord of the truss) vary considerably, potentially giving a wide range of allowable loads. Our analyses used several methods, with each of these methods, except one, resulting in computed allowable loads greater than estimated applied loads. The one formula that results in an allowable load less than the computed column force was for a Phoenix column with two pin ends and an assumed factor of safety of 6. Two other formulas based on actual tests of Phoenix columns, with a factor of safety of 5, resulted in allowable loads 50% to 65% higher than the maximum computed column forces. Safety factors were calculated based on historic formulas for wrought iron columns that included a variable for height to diameter ratio. Compression member forces were also well below allowable forces calculated from another general 1888 formula for pin-ended wrought iron hollow columns.

When strengths are computed using current AISC equations with wrought iron material properties, the compression members are adequate as well. The wide-flange section that replaced a vertical Phoenix column on the west span, north truss and the modified end posts also have adequate capacity.

Considering the relatively high factors of safety used and the historic performance of the compression members under train loading, it is our opinion that the compression members have adequate strength for the proposed use in support of the new pipeline.

### *Floor System and Deck*

The wood ties comprising the deck are significantly deteriorated. The existing planks (perpendicular to the ties) should be removed and replaced with new planks strong enough to distribute any construction load among several ties. Point loads on the existing railroad ties comprising the decking should be limited to 2,000 lbs, and should be strictly for construction and maintenance (not for river crossing traffic).

The analysis results indicate that the stringers and floorbeams have adequate capacity to support expected loads plus up to 10,000 lbs of live load. The floorbeam that was previously repaired with welded plates also appears to be adequate based on visual observations and the expected stresses in the beam.

### *Connections*

The U-bolts with section loss at the bottom flange of the floorbeams have been repaired with steel plates welded to the bolts and the web of the floorbeam. Our analysis indicated this repair is adequate to carry the proposed loads. One U-bolt in the south truss, east span also has section loss at the top, above the repair. The amount of bolt remaining currently has adequate capacity for proposed loads, however, since the rate of future corrosion is unknown, the U-bolt should be repaired/strengthened now. The diagonal member U1 to L2 at the south truss, east span has been welded to the top of this U-bolt just above the area of U-bolt corrosion, likely complicating repair.

The pin connections of the main truss members are not visible since they are concealed by the members they are connecting. While SA did not note any reason for concern during our visual observations, non-destructive

testing would be required to confirm the soundness of the pins, and would be strongly recommended if the bridge were to be opened to public or vehicular use.

Many previously repaired connections are unusual construction and would not be considered standard practice today, nor meet the requirements of current codes. However, since they were constructed as part of a strengthening alteration to the Bridge for train loads considerably greater than loads that will be experienced under the proposed use, and since SA did not observe significant deterioration of these modifications, we do not believe they should preclude the Bridge from carrying the proposed pipeline.

### *Utility Frame*

With some minor repairs, the utility frame will have adequate strength to support the proposed 8-inch diameter pipeline. The weld between the frame and the endpost at the west abutment has fractured and needs to be repaired. Also, many of the welds beneath existing steel bracket plates mounted to the top of the south side of the frame appear to be fractured, possibly due to rust bloom below the brackets. The brackets should be removed, the areas of rust cleaned, and the welds repaired. Some short sections of horizontal angle between the vertical truss members and the longitudinal angle of the utility support have been previously removed. These will need to be replaced or otherwise repaired if the frame is to be reused. Other necessary modifications to the utility frame will depend on the attachment details of this specific pipeline, which are still to be determined.

### **Recommendations**

In general, based on the results of our structural analysis, the Bridge appears to have sufficient strength to carry the proposed pipeline. The structural member repairs noted in our Visual Inspection Report previously submitted will likely need to be done in less than 20 years, and the repair to the west abutment L1 floor bracing diagonal will need to be made immediately. In order to achieve the desired useful life as a pipeline crossing, we strongly recommend the following repairs and/or maintenance:

- Replace existing wood ties and planking if light vehicle access (i.e. 10,000 lbs or less total weight) is desired for construction/maintenance purposes. Otherwise (e.g. for pedestrian and light equipment access during construction), remove existing hazardous spikes/nails and remnants of wood plank wearing surface and add new wood planking.
- Repair or replace corroded U-bolt at L2 of east span of south truss.
- Repair concrete at east abutment.
- Repair missing rivets at vertical members.
- Repair welds, remove existing brackets, clean and treat areas of corrosion and replace missing sections of utility frame to be reused.

Our evaluation assumed that the Bridge will only be used for the current pipelines plus the proposed 8-inch natural/mixed gas pipeline. Any other use, especially one involving public access or any type of cyclical loads, will require additional evaluation and repairs.

We reiterate the recommendations of our Visual Inspection Report previously submitted with emphasis on visual inspection every 2 years to check for additional/new section loss, etc. Though we did not recommend

painting and other maintenance that would be costly, such painting and maintenance would slow the rate of deterioration, reduce future deterioration and possibly extend the useful service life.

### **Limitations**

This Section presents the limitations regarding evaluation, conclusions and recommendations presented in this Report. Stephens Associates Consulting Engineers, LLC (SA) has prepared this Report based on the information available to us at this time, including information furnished through the Client, their client, the Owner and their representatives for the proposed Project. SA's services were performed using data generated by others (e.g. FEMA, historic resources, etc.). SA relied on these data for cost savings to Client and Owner in lieu of generating these data ourselves at higher cost. If any of the noted information is incorrect or has changed (e.g., revisions to the scope or approach of Project, etc.), SA should be notified and retained to review the corrections and changes and amend this Report. If SA is not retained for these purposes, we cannot be responsible for the impact of those conditions on the performance of the Project

SA's scope of services did not include an environmental assessment of any kind, including but not limited to assessments for the presence or absence of wetlands or hazardous or toxic materials or organisms (e.g., fungi, flora, fauna, bacteria, viruses, etc.) in the soil, surface water, groundwater, or air, on or below or around this Site. Any observations of odors, colors, or unusual or suspicious items or conditions noted by SA were incidental to our services, and any statements regarding such observations are strictly for the information of the Client. We recommend that the Project Owner engage a qualified environmental professional to provide environmental services for this Project.

We recommend that Client retain SA for design and construction including analysis and engineering of design options, assistance with shop drawing/submittal review and engineering observation of construction. These services will assist the Owner with quality assurance through observation of compliance with design concepts, specifications and recommendations and will allow for the implementation of design changes where necessary due to conditions that differ from those anticipated.

This Report has been prepared by SA for the exclusive use of the Client and for the specific application to the subject Project, as conceived at this time. The Report is for preliminary evaluation only, and by itself is not sufficient to prepare an accurate construction cost estimate or construction "bid." Subject to the limitations inherent in the agreed scope of services as to the degree of care, amount of time and expenses to be incurred, and subject to any other limitations contained in this Report and the Agreement for SA's services, SA has performed its services with the degree of care and skill ordinarily exercised by other professional engineers under similar circumstances at the time the services were performed, without warranty, express or implied.

### **References**

"Structures Inspection Field Report, Routine Visual Inspection, Existing Railroad Bridge Evaluation, Natural Gas Pipeline for Fraser Paper/AVRRDD, Berlin, New Hampshire" by Stephens Associates Consulting Engineers, LLC, August 20, 2010.

Email correspondence with James L. Garvin, State Architectural Historian, New Hampshire Division of Historical Resources, September 1 to September 14, 2010.

Determination of Eligibility (DOE) report of the Berlin Mills Railway, commissioned by NHDOT, July 19, 2002.

Correspondence between John Storrs, New Hampshire Bridge Engineer, and the Berlin Mills Company, September 1917 to March 1918.

<http://beyondbrownpaper.plymouth.edu>

*A Context for Common Historic Bridge Types*, NCHRP Project 25-25, Task 15, Transportation Research Council, October 2005.

Bovey, Henry T., M.A., D.C.L., F.R.S.C., *Theory of Structures and Strength of Materials*, John Wiley & Sons, 1893.

Album of designs of the Phoenix Bridge Company : successors to Clarke, Reeves & Co., Phoenixville Bridge Works (1885)

Album of designs of the Phoenixville Bridge-Works / by Clarke, Reeves & Co. (1873)

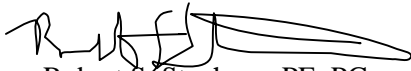
Rabun, J. Stanley, *Structural Analysis of Buildings*, John Wiley & Sons, Inc., 2000.

Friedman, Donald, *Historical Building Construction*, W.W. Norton & Company, 1995.

Kidder, Frank E. & Parker, Harry, *Kidder-Parker Architects' and Builders' Handbook*, 18<sup>th</sup> ed., John Wiley & Sons, Inc., 1954.

Sincerely,

**Stephens Associates Consulting Engineers, LLC**



Robert S. Stephens, PE, PG  
Principal Engineer



Bethel A.H. Stephens, PE  
President

RSS/BAHS:tgbg

Attachments: Figure 1 – Site Location Map  
Figure 2 – Site Aerial  
Figure 3 – Typical Truss Elevation Schematic and Member Identification Convention  
Figure 4 – Typical Truss Section  
Figure 5 – Typical Truss Floor Bracing Schematic  
Table 1 – Maximum Structural Member Stresses  
Table 2 – Reduced Capacity Member Stresses  
Appendix – Historical Documents: NHDHR Survey; John Storrs Correspondence; Clarke Reeves & Co.

## FIGURES

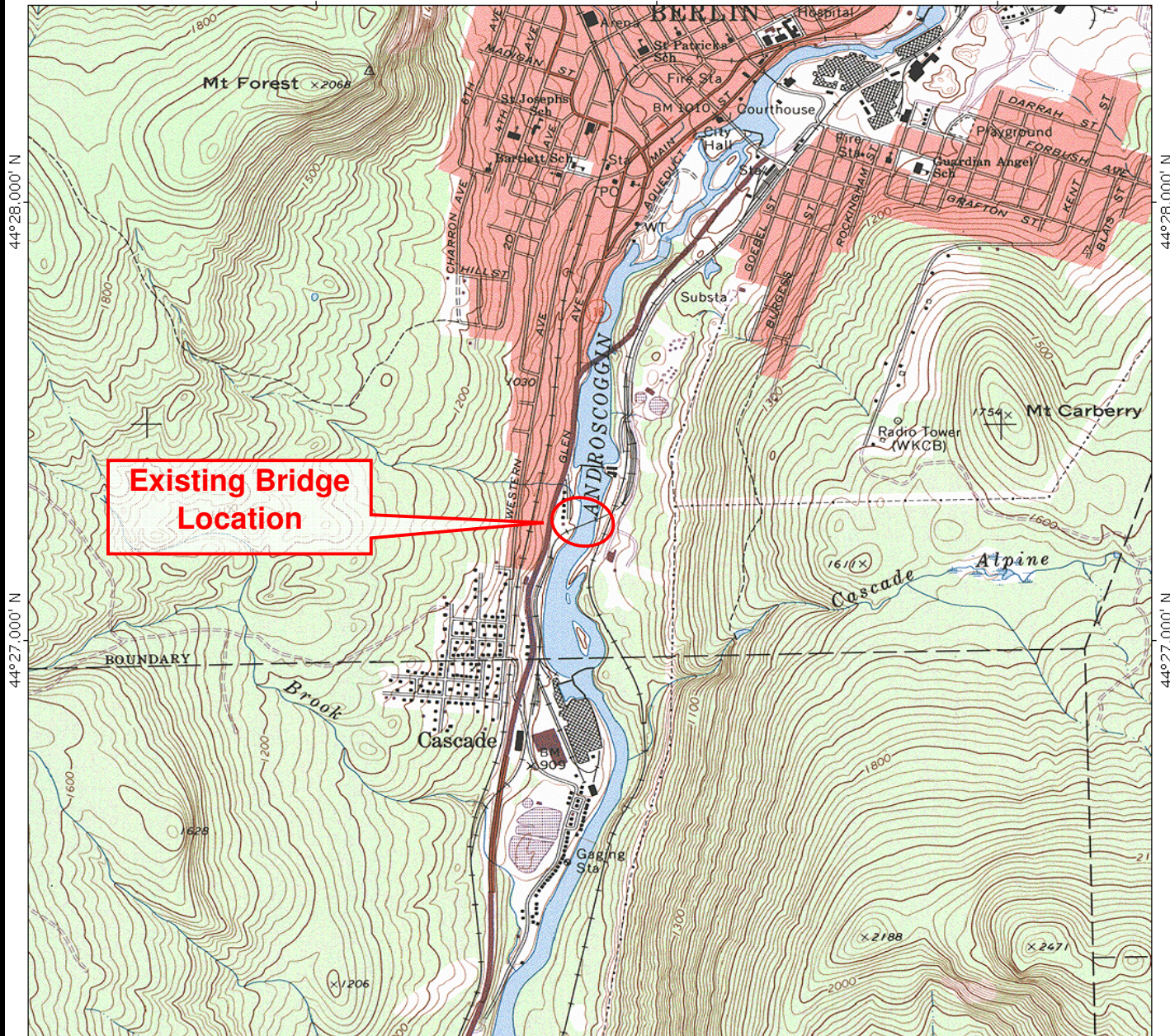


Original Work:

By: R. Stephens Date: August 20, 2010 Subject:

Checked By: JET Date: August 20, 2010

TOPO! map printed on 07/30/10 from "WHITEMTN.TPO" and "Untitled.tpg"  
71°12.000' W 71°11.000' W NAD27 71°10.000' W



Map created with TOPO! © 2001 National Geographic (www.nationalgeographic.com/topo)

Copyright © 2010 Stephens Associates Consulting Engineers, LLC

Revisions:

By: \_\_\_\_\_ Date: \_\_\_\_\_

By: \_\_\_\_\_ Date: \_\_\_\_\_

SACE 00-1 (v. 1) 1/00







Copyright © 2010 Stephens Associates Consulting Engineers, LLC

Revisions:

By: \_\_\_\_\_ Date: \_\_\_\_\_

By: \_\_\_\_\_ Date: \_\_\_\_\_

SACE 00-1 (v. 1) 1/00



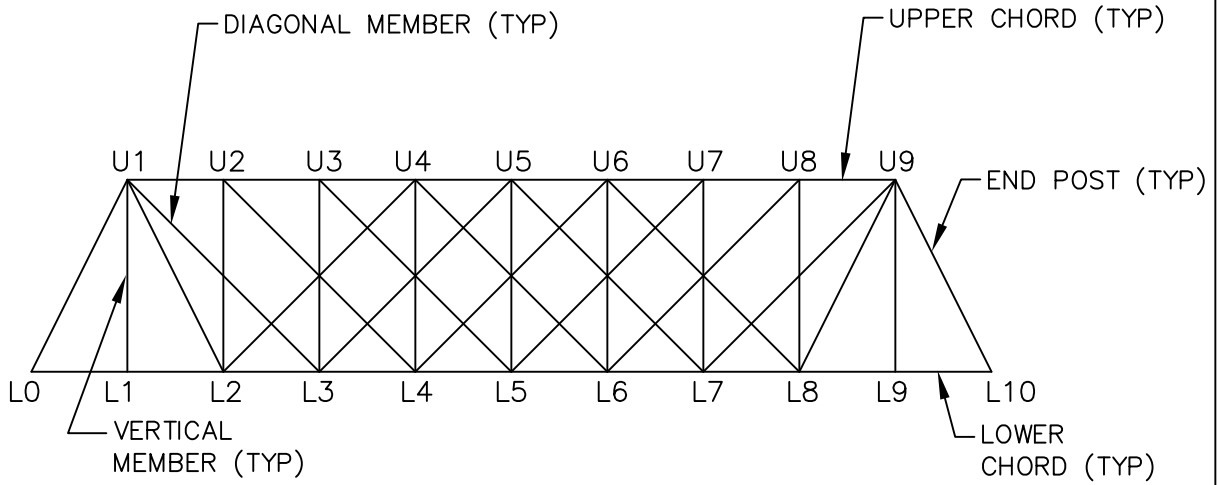
Original Work:

By: NAO Date: 10/1/10

Subject: Figure 3 - Typical Truss Elevation Schematic

Checked By: BAHS Date: 10/1/10

and Member Identification Convention



ELEVATION VIEW LOOKING NORTH (UPSTREAM)  
EACH LINE REPRESENTS ONE MEMBER

<-- WEST

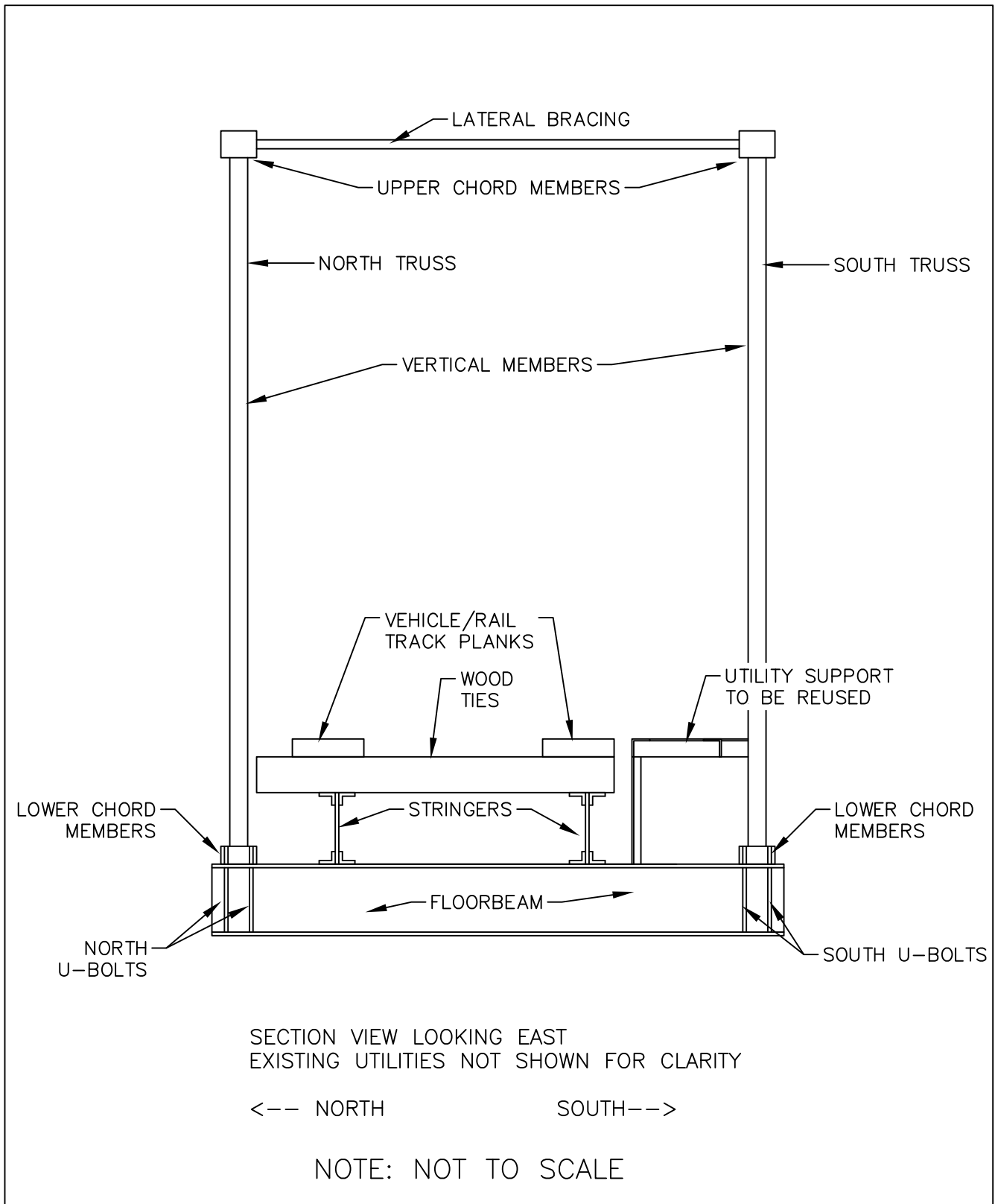
EAST-->

NOTE: NOT TO SCALE

Revisions:

By: \_\_\_\_\_ Date: \_\_\_\_\_

By: \_\_\_\_\_ Date: \_\_\_\_\_



Copyright © 2010 Stephens Associates Consulting Engineers, LLC



Revisions:  
 By: \_\_\_\_\_ Date: \_\_\_\_\_  
 By: \_\_\_\_\_ Date: \_\_\_\_\_

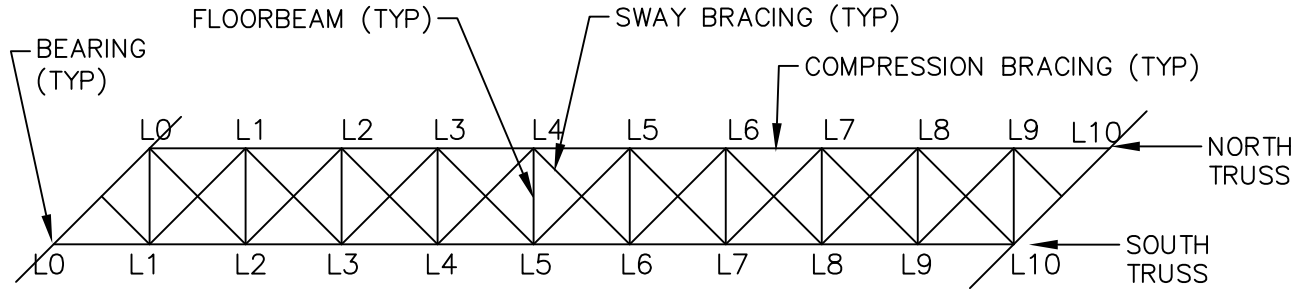
Original Work:

By: NAO Date: 10/1/10

Subject: Figure 5 - Typical Truss Floor

Checked By: BAHS Date: 10/1/10

Bracing Schematic



PLAN VIEW  
EACH LINE REPRESENTS ONE MEMBER

<-- WEST

EAST-->

NOTE: NOT TO SCALE

Revisions:

By: \_\_\_\_\_ Date: \_\_\_\_\_

By: \_\_\_\_\_ Date: \_\_\_\_\_

## TABLES

Original Work:

By: B. Stephens Date: 10/01/10

Subject: Table 1

Checked By: Date:

Maximum Structural Member Stresses

Member Type	Type of Stress	Member with Max Stress	Maximum Computed Stress (ksi)	Maximum Allowable Stress (ksi)	Ratio Computed to Allowable
Bottom Chord	tension	L4-L5	6.3	12.5	0.50
Top Chord	compression	U3-U7	7.4	7.1 to 12.5 9.1 avg.	0.81
Diagonal	tension	U2-L4 L6-U8	7.8	12.5	0.62
Vertical	compression	U2-L2 U8-L8	4.4	2.7 to 9.1 5.8 avg.	0.76
End Post	compression	typ.	4.7	12	0.39
Portal Beam	bending	typ.	11.3	18	0.63
	shear		0.5	12	0.04
Stringers	bending	typ.	9	12.0	0.75
	shear		4	9.0	0.44
Floorbeams	bending	typ.	3.9	12.0	0.33
	shear		1.9	9.0	0.21

Notes:

- Maximum computed stress is maximum stress resulting from ASCE 7-05 load combinations. Assumed live load is 10,000 pounds.
- Allowable stresses are most conservative historical values, except for compression which are average of range of historical values.

Revisions:

By: \_\_\_\_\_ Date: \_\_\_\_\_

By: \_\_\_\_\_ Date: \_\_\_\_\_



Original Work:

By: B. Stephens Date: 10/01/10

Checked By: Date:

Member	Computed Stress with full section	Percent section loss	Computed Stress Reduced Section	Maximum Allowable Stress	Ratio Computed to Allowable
Wood Ties	546 psi bending	25% to 50%	546 psi	725 psi	0.75
	25 psi shear		60 psi	155 psi	0.39
Bottom Chord at NW end post	5.2 ksi tension	20%	6.5 ksi	12.5 ksi	0.52
Diagonal U1-L2 with broken weld near L2	4.8 ksi tension	25%	6.4 ksi	12.5 ksi	0.51
Floor bracing diagonal at west abutment	1.9 ksi tension	85%	12.7 ksi	12.5 ksi	1.01
U-Bolt with corrosion above repair	2.9 ksi tension	43%	5.1 ksi	12 ksi	0.42

Notes:

- Wood tie stresses computed on reduced section with 2000 lb. live point load.
- If a type of section loss was typical to several locations, worst case member is included in table.

Revisions:

By: \_\_\_\_\_ Date: \_\_\_\_\_  
 By: \_\_\_\_\_ Date: \_\_\_\_\_

## APPENDIX

**Determination of Eligibility (DOE)**

Date received: 7/19/02 Inventory #:-  
 Date of group review: 8/14/02 Area: Berlin Mills Railway  
 DHR staff: Linda Wilson Town/City: Gorham, Berlin  
 Property name: -- County: Coos  
 Address: 2.6 miles of rail line (see form for maps showing route)  
 Reviewed for: R&C PTI NR SR Survey Other  
 NHDOT/FHWA Berlin STP-X-5045(009), 12958

Individual Properties		Districts	
NR	SR	NR	SR
<input type="checkbox"/>	<input type="checkbox"/> Eligible	<input checked="" type="checkbox"/>	<input type="checkbox"/> Eligible
<input type="checkbox"/>	<input type="checkbox"/> Eligible, also in district	<input type="checkbox"/>	<input type="checkbox"/> Not eligible
<input type="checkbox"/>	<input type="checkbox"/> Eligible, in district	<input type="checkbox"/>	<input type="checkbox"/> More information needed
<input type="checkbox"/>	<input type="checkbox"/> Not eligible	<input type="checkbox"/>	<input type="checkbox"/> Not evaluated @ district
<input type="checkbox"/>	<input type="checkbox"/> More information needed		
<input checked="" type="checkbox"/>	<input type="checkbox"/> Not evaluated for individual eligibility		

Integrity: Location Design Setting Materials  
Workmanship Feeling Association

Criteria: A. Event B. Person C. Architecture/Engineering  
D. Archaeology E. Exception

Level: Local State National

**STATEMENT OF SIGNIFICANCE:**

Concur with consultant that the Berlin Mills Railway is eligible for the National Register of Historic Places because it "was instrumental in the establishment and development of the Berlin and Cascade Mills, and as such, New Hampshire's paper and pulp industry. The line provided the necessary rail connection between the mills and the Boston and Maine Railroad and the Atlantic and St. Lawrence Railroad....Under Criterion C, the BMR's three [metal truss] bridges are representative of railroad engineering and architecture from the late 19<sup>th</sup> and early 20<sup>th</sup> centuries. The pin-connected iron bridges are noteworthy in that they are rare surviving examples of their type, and that they may represent the practice of smaller private company railroads purchasing used bridges unsuitable for main line locomotive weights but sufficient for the loads imposed by cars and yard engines." The two Whipple trusses may also be the oldest remaining high metal truss bridges in New Hampshire.

Because it was an active line that served the Berlin paper mills until 2001, the railroad's period of significance would be from its construction in 1903 to the National Register's fifty year cut-off, currently 1952. The Berlin Mills Railway resources were originally included with the inventory for the Atlantic & St. Lawrence Railroad, which was determined to be eligible for the National Register of Historic Places on December 17, 2001. The A&SLRR evaluation form requested a separate inventory form for the Berlin Mills Railway, a different line with separate ownership. As the consultant notes, "no primary sources were located and secondary sources are contradictory" for the history of the BMR. Whatever the antecedents, its modern identity appears to have begun in 1903 with construction of a branch line from the B&M tracks to the new Cascade mills. The Berlin Mills Railway linked existing yard tracks and sidings in the mill complexes, along with the late 19<sup>th</sup> century Whipple truss and the "192--" Pratt truss in the Berlin mill yard, with the Cascade Mills Whipple truss (erected in 1903, perhaps as a relocated used bridge) and a 1903 through plate girder bridge at Cascade. The inventory form describes the four bridges as the "primary resources" of the rail line, summarizing their characteristics in a "List of Resources." The photographs are especially fine, capturing key details and contextual information about the metal truss bridges. If this area form were to be updated in the future, the "List of Resources" should be expanded to include ALL of the surviving resources (including small structures, signals, etc.) associated with the Berlin Mills line. A larger-scale map delineating and differentiating the tracks, sidings, and appurtenances of the Berlin Mills Railway, Boston & Maine Railroad, and Atlantic & St. Lawrence Railroad where they are proximate in the millyards and in the Berlin-Gorham area should also be prepared and, if necessary, the boundary descriptions for the BMR and A&SLRR should be revised.

ENTERED INTO DATABASE

ACREAGE: 31.5 acres  
 PERIOD OF SIGNIFICANCE: 1903 to 1952 (representing the NR's fifty year cut-off)  
 AREA OF SIGNIFICANCE: Industry and engineering  
 BOUNDARY: Boundary of RR right of way (approximately 50 feet to each side of the centerline of the railroad tracks, "as estimated from field observations and mapping."  
 SURVEYOR: Richard M. Casella, Louis Berger & Assoc., May 2002  
 FOLLOW-UP: Notify surveyor, NHDOT and FHWA of eligibility.

Final DOE approved by:

*EJL Muzey 9/13/02*



**NEW HAMPSHIRE DIVISION OF HISTORICAL  
RESOURCES - AREA FORM**

**NHDHR Area letter  
CODE**

**Name of Area** Berlin Mills Railway

**Town/City** Gorham, Berlin

**County** Coos

**Project Area**

**Historic District**

**Inventory form numbers in this Area:** none

**Use(s):** Present railroad

Original railroad

**Period of Significance:** 1903-1952

**General Condition:** good

**Setting:** city, river valley

**Acreage:** approximately 31.5 acres

**UTM Ref. Zone:**

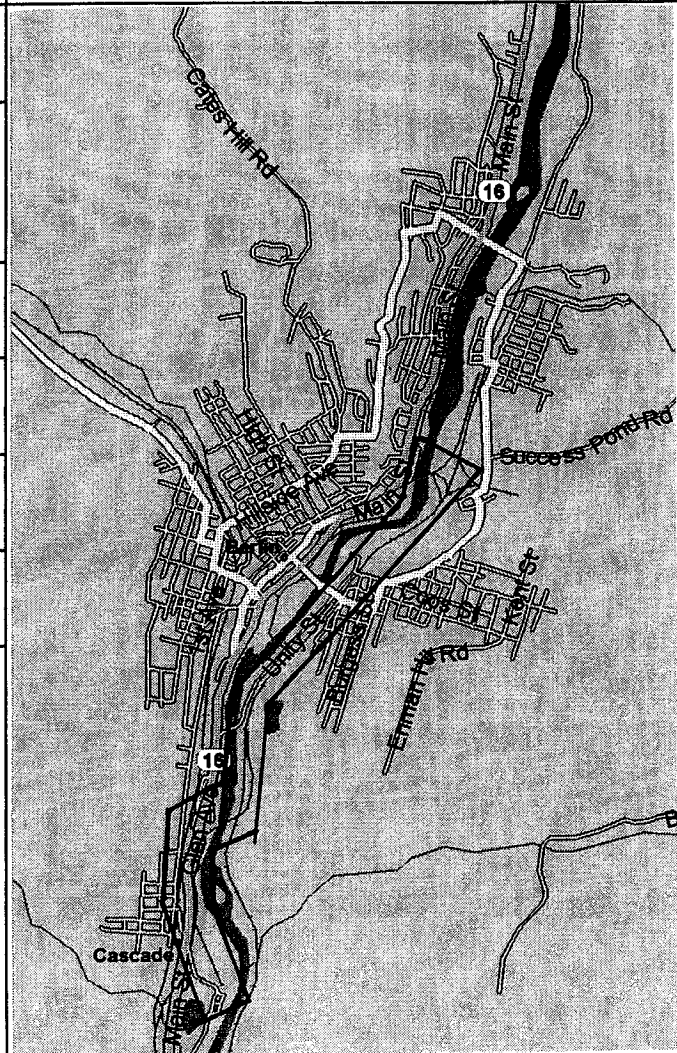
**USGS Quadrangle:**

**Scale:**

**Surveyor:** Richard M. Casella

**Recorded by:** Richard M. Casella

**Date of field survey:** May 2002



**SKETCH MAP:** ---Indicate North with arrow

**Photographer facing:**

**Photograph date:**

**Roll# Frame# Negative stored at:**

*Draw a general map of the area showing all structures and buildings (old and new) within it. Each structure or building should be identified with an open box, and every building documented on an individual inventory form should be numbered with its corresponding NHDHR inventory number. For historic district area forms, all contributing buildings should be identified with shaded boxes while the boxes for non-contributing properties should remain unshaded. Label streets including route numbers, if any. Attach a separate sheet if this space is not sufficient.*

JUL 19 2002

JUL 19 2002 11 19 2002

**SURVEY METHODOLOGY:**

See continuation sheets

**ARCHITECTURAL DESCRIPTION AND COMPARATIVE EVALUATION:**

See continuation sheets

**HISTORICAL BACKGROUND and role in Town's/City's development:**

See continuation sheets

**STATEMENT OF INTEGRITY:**

See continuation sheets

**NATIONAL REGISTER CRITERIA STATEMENT OF SIGNIFICANCE:**

See continuation sheets

**PERIOD OF SIGNIFICANCE:**

1903 to 1952

**BIBLIOGRAPHY and/or REFERENCES:**

See continuation sheets

**APPLICABLE HISTORIC CONTEXTS (s) with code:**

16 Large-scale lumbering and paper manufacturing in the North Country, 1870-present

52 The Railroads Of New Hampshire, 1842-1960

**NEW HAMPSHIRE DIVISION OF HISTORICAL  
RESOURCES -- CONTINUATION FORM**

**NHDHR Inventory #**  
**NHDHR Area Letter**  
**Town/City** Berlin, Gorham  
**County** Coos

**Area Form:** Berlin Mills Railway

Sheet 3 of 19

**SURVEY METHODOLOGY:**

In May 2002 a historic architectural resources survey was conducted to record and document historic properties (those over 50 years of age) of the former Berlin Mills Railway in Berlin, Coos County, New Hampshire. Existing historic buildings (none) and structures (three bridges and tracks) now or formerly owned by the Berlin Mills Railway were inspected and photographed along the 2.6 mile route of the line between the mill at Berlin (Berlin Mills) and the company's later mill built at Cascade, just over the line into the town of Gorham. A fourth bridge, carrying the former Boston and Maine Railroad tracks (abandoned) over the Berlin Mills Railway was also documented since its construction was a direct result of the construction of the Berlin Mills line to the Cascade Mills. Historical research was conducted at the New Hampshire State Library, the University of New Hampshire, and the Berlin Library.

**ARCHITECTURAL DESCRIPTION AND COMPARATIVE EVALUATION:**

Historic resources of the Berlin Mills Railway (BMR) consist of yard tracks and sidings within the Berlin Mills complexes at East Berlin and Cascade; a switch and siding on the west side of the Androscoggin River in Berlin that makes connection with the Berlin extension of the Atlantic & St. Lawrence Railroad; a switch and siding in East Berlin that makes connection with the former Boston and Maine Railroad (B&MRR) tracks; a switch and branch line that breaks from the B&MRR tracks in East Berlin and extends over the Androscoggin River into the Cascade Mills; three metal truss bridges spanning the Androscoggin River and an overhead plate girder bridge. Originally it appears that the BMR operated over a short section of the B&MRR tracks in East Berlin in order to reach Cascade; presumably when the section of the B&MRR north of Gorham was abandoned, the BMR took it over, although this has not been confirmed. The ownership of the overhead plate girder bridge which carries the former B&MRR tracks over the BMR branch line to Cascade was also not determined.

The primary resources are the bridges, the most significant being the two pin-connected Whipple-type iron trusses crossing the Androscoggin River in Berlin and Gorham. One of the Whipple trusses is located beside a riveted steel Pratt truss built to replace it: both span the Androscoggin between the former Berlin Mills complex just above the mill dam and a switchyard on the west bank where the line meets the Berlin extension of the Atlantic & St. Lawrence Railroad (now named the St. Lawrence and Atlantic Railroad). The other Whipple truss crosses the Androscoggin River 2 miles to the south of Berlin Mills to connect with the factory at Cascade. A plate girder bridge presumably originally owned by the former Boston and Maine line spans the BMR on the east side of Androscoggin River.

**Berlin Mills Railway Whipple Truss:** This bridge is a single-span, pin-connected wrought iron and cast iron thru Whipple truss. The Whipple truss, also called a double-intersecting Pratt truss, is characterized by diagonals which extend across two posts. The bridge has cast iron posts and top chords of the segmental "Phoenix column" type, indicating it was built by the Phoenix Bridge Company of Phoenixville, Pennsylvania. The vertical end posts suggest that this is an early Phoenix bridge, possibly dating from the early 1860s, but more likely from the 1870's or 1880s. It may have been a used bridge bought from another railroad and moved to the

JUL 19 2002

NEW HAMPSHIRE DIVISION OF HISTORICAL  
RESOURCES -- CONTINUATION FORM

NHDHR Inventory #  
NHDHR Area Letter  
Town/City Berlin, Gorham  
County Coos

Area Form: Berlin Mills Railway

Sheet 4 of 19

location. The bridge consists of thirteen panels 12' wide for a total length of approximately 156'. The bridge is 16' wide from the centers of the end posts. The bridge survives due to its conversion to a pipe (carrying) bridge sometime after its replacement by the adjoining truss, described next.

Berlin Mills Railway Pratt Truss: This truss is located immediately beside (south of) the previously described Whipple truss and was apparently built to replace the aging, lower capacity, iron truss. A broken name plate reads "Built 192-" (the last digit missing) at the top of the plaque; "Berlin ..." at the middle of the plaque (the remainder of the builder's name missing); and "Berlin" at the bottom of the plaque. It may have read "Berlin Mills Railway" as the builder. The bridge is a single-span, riveted steel thru Pratt truss on concrete abutments, roughly 156' in length.

Berlin Mills Railway Cascade Mills Whipple Truss: This bridge was also built by the Phoenix Bridge Company and has undergone extensive strengthening (member replacement and sistering) to provide continuing service until fairly recently - perhaps less than 5 years ago based on plant growth on the approach tracks. The bridge is a skewed, two-span, pin-connected, wrought iron and cast iron, thru Whipple truss. The bridge has cast iron posts and top chords of the segmental "Phoenix column" type, indicating it was built by the Phoenix Bridge Company of Phoenixville, Pennsylvania. The angled end posts suggest that this is not quite as early as the Berlin Mills Whipple truss, probably dating from the between 1880's. Since the bridge was erected in 1903 on concrete abutments and a concrete center pier, it was most likely purchased used and moved to the site.

Plate Girder Bridge carrying the Boston and Maine Railroad over Berlin Mills Railway Cascade Mills branch line: This bridge is a 20' long, single-span, skewed, thru plate girder spanning the Berlin Mills Railway line to the Cascade Mills on the east side of the Androscoggin River. The bridge was built in 1903 by the Baltimore Bridge Company, Baltimore, Maryland as evidenced by the extant builder's plate. The bridge was probably financed by the BMR but owned by the B&MRR. With the abandonment of the B&MRR ownership may have reverted to the BMR.

### **HISTORICAL BACKGROUND and role in Town's/City's development:**

The precise history of the Berlin Mills Railway (BMR) was not ascertained by the limited research conducted with this study. No primary historical sources were located and secondary sources are contradictory. Robert Lindsell, in *The Rail Lines of Northern New England* states that the BMR originated as the Success Pond Railroad, which began in 1893 as a logging railroad (Lindsell (2000:372). C. Francis Belcher, in *Logging Railroads of the White Mountains*, gives a fairly in-depth history of the Success Pond Railroad, known initially as the Blanchard and Twitchell Railroad, and does not mention any relationship with the Berlin Mills Company or Berlin Mills Railway, other than as a supplier of logs to the Berlin Mills (Belcher 1980:40-48). Historic mapping coincides with Belcher's account: the Success Pond made connection with the Concord and Montreal Division of the Boston and Maine just north of Berlin Mills (see maps provided). Bailey K. Davis in *Traditions and Recollections of Berlin*, also does not mention any relationship between Berlin Mills Railway and the Success Pond Railroad (Davis 1897:107-108).

JUL 19 2002

**NEW HAMPSHIRE DIVISION OF HISTORICAL  
RESOURCES -- CONTINUATION FORM**

**NHDHR Inventory #**  
**NHDHR Area Letter**  
**Town/City** Berlin, Gorham  
**County** Coos

**Area Form:** Berlin Mills Railway

Sheet 5 of 19

In 1852, the H. Wilson & Company saw mills were established at Berlin Falls by a group of wealthy Portland investors. On July 15, 1854 the New Hampshire legislature granted the Atlantic and St. Lawrence Railroad (A&SLRR) – under lease to the Grand Trunk Railway of Canada - the right to extend a branch line from the Berlin station to the mills which was completed in 1856. The company was later known as Berlin Mills, and then Brown Company, and grew by 1890 into the largest lumber mill east of the Mississippi (Grand Trunk Railway 1916; Holt 1986:65,69).

The Berlin Mills undoubtedly constructed railroad tracks through the mill yard to load lumber and wood products. Initially they would have simply had sidings on the west side of the Androscoggin River and leased the cars from the Grand Trunk. At some point, presumably well before the turn of the century, perhaps in the 1880s or earlier, the Berlin Mills erected the Whipple truss bridge across the Androscoggin and brought the tracks into the mill complex in east Berlin.

In 1892 the Concord and Montreal Railroad extended a line up the east side of the Androscoggin River to connect with the Berlin Mills. Plans to extend the line to Montreal were never completed and line was leased to the Boston and Maine Railroad in 1895. The construction of the Concord and Montreal inspired two lumbermen from nearby Milan, George W. Blanchard and Cassius M. C. Twitchell, to buy up vast timber lands comprising nearly the entire town of Success, NH, and to construct a logging railroad to bring out the trees. The line was started as the Blanchard and Twitchell Company Railroad and ran roughly 14 miles from Success Pond down to the wye connection with the Concord and Montreal, just east of the Berlin Mills off present-day Hutchins Street. By 1897 the Blanchard and Twitchell Company employed 400 to 500 men and had erected several buildings including an engine house and a log car building and repair shop near the railroad wye at Berlin (Belcher 1980:43).

Exactly when and if the Blanchard and Twitchell Company Railroad became officially known as the Success Pond Railroad is unclear. It is labeled the Success Railroad on the 1893 Gorham topographic quadrangle map. In 1904 Twitchell sold his interest in the railroad to Blanchard and the line became the property of the George W. Blanchard and Son Company. By 1907 the railroad ceased operations and in 1909 the Boston and Maine Railroad cancelled their contract with the Blanchard Company, and seized control of 1600' of connection tract at the wye (Belcher 1980:47). None of the buildings or track of the Success Pond Railroad exist today and the route of the track bed is now the unimproved and seasonal Success Pond Road still in use by logging trucks.

In 1904, the Brown Company, owner of Berlin Mills, opened a new paper plant on the Androscoggin River at Cascade in the town of Gorham. In 1903 a branch line was built off the Boston and Maine tracks to serve the new mills at Cascade. The Cascade mills branch passed under the B&M (the existing plate girder bridge is dated 1903) and crossed the Androscoggin River on a two-span Whipple truss bridge one-half mile north of the plant. This probably marked the beginning of the Berlin Mills Railway proper. Perhaps it acquired some or all of the equipment of the Success Railroad but that is not reported in the literature cited. Neither the Berlin Mills Railway, nor the various names of the Blanchard and Twitchell Railroad are listed in the annual NH Railroad Commissioners Reports (New Hampshire Railroad Commissioners).

JUL 19 2002

**NEW HAMPSHIRE DIVISION OF HISTORICAL  
RESOURCES -- CONTINUATION FORM**

**NHDHR Inventory #**  
**NHDHR Area Letter**  
**Town/City** Berlin, Gorham  
**County** Coos

**Area Form:** Berlin Mills Railway

Sheet 6 of 19

**STATEMENT OF INTEGRITY:**

As a whole, the Berlin Mills Railway in Berlin and Gorham, New Hampshire possesses a level of integrity sufficient to support National Register eligibility. The line follows its original route and retains its three bridges dating from the late 19<sup>th</sup> and early 20<sup>th</sup> century. The two pin-connected iron truss bridges, although somewhat altered and in disrepair, are rare surviving examples of their type and retain sufficient integrity to qualify for listing on the National Register. The riveted steel truss bridge retains a high level of integrity of materials and design.

**NATIONAL REGISTER CRITERIA STATEMENT OF SIGNIFICANCE:**

The Berlin Mills Railway (BMR) is potentially eligible for the National Register of Historic Places as a historic district under Criteria A and C. Under Criterion A, the BMR made significant contributions to the history of Berlin and to the State of New Hampshire. The line was instrumental in the establishment and development of the Berlin and Cascade Mills, and as such, New Hampshire's paper and pulp industry. The line provided the necessary rail connection between the mills and the Boston and Maine Railroad and the Atlantic and St. Lawrence Railroad. The BMR has apparently operated continuously in New Hampshire since 1903 to approximately 2001.

Under Criterion C, the BMR's three bridges are representative of railroad engineering and architecture from the late 19<sup>th</sup> and early 20<sup>th</sup> centuries. The pin-connected iron bridges are noteworthy in that they are rare surviving examples of their type, and that they may represent the practice of smaller private company railroads purchasing used bridges unsuitable for main line locomotive weights but sufficient for the loads imposed by cars and yard engines.

**DESCRIPTION AND JUSTIFICATION OF RESOURCE BOUNDARIES:**

The boundary of the National Register eligible resource corresponds to the boundary of the railroad right-of way as estimated from field observations and mapping. The boundaries are generally described as follows: beginning at the property line of the Berlin Mills Extension branch track of the St. Lawrence and Atlantic Railroad, Berlin, Coos County, New Hampshire (a point approximately 200' northwest of the west abutment of the Berlin Mills Trusses located in the Berlin Mills), and extending 50' to each side of the centerline of the railroad tracks (100' wide right-of-way) continuing along the centerline of the railroad tracks approximately 13,728 feet (2.6 miles) to the center of the mill yard at Cascade Mills in Gorham, Coos County, New Hampshire, comprising a total area of approximately 31.5 acres.

The boundaries of the district include the right-of-way historically associated with the line.

JUL 19 2002

NEW HAMPSHIRE DIVISION OF HISTORICAL  
RESOURCES -- CONTINUATION FORM

Area Form: Berlin Mills Railway

NHDHR Inventory #  
NHDHR Area Letter  
Town/City Berlin, Gorham  
County Coos

Sheet 7 of 19

**BIBLIOGRAPHY and/or REFERENCES:**

- JUL 19 2002
- Belcher, C. Francis  
1983 *Logging Railroads of the White Mountains*. Appalachian Mountain Club, Boston, Massachusetts.
- Canadian National Railway Company  
1917 *Right of Way and Track Map, Canadian National Railway Company*. Office of the Valuation Engineer, Toronto. On file at the New Hampshire Department of Transportation, Concord.
- Davis, Bailey K.  
1897 *Traditions and Recollections of Berlin*. Reprinted 1989 by Berlin Public Library, Berlin, New Hampshire.
- Grand Trunk Railway Company of Canada  
1916 *Right of Way and Track Map, Atlantic and St. Lawrence Railroad*. Office of the Chief Engineer, Montreal. On file at the New Hampshire Department of Transportation, Concord.
- Holt, Jeff  
1986 *The Grand Trunk in New England*. Railfare Enterprises, Ltd., Toronto.
- Lindsell, Robert M.  
2000 *The Rail Lines of Northern New England*. Branch Line Press, Pepperell, Massachusetts.
- Merrill, Georgia Drew  
1888 *History of Coos County, New Hampshire*. W. A. Fergusson & Co. Syracuse, New York.
- New Hampshire Railroad Commissioners.  
1857-19 *Annual Reports of the Railroad Commissioners of the State of New Hampshire*. Amos Hadley, State Printer, Concord. Located at Dimond Library, University of New Hampshire, Durham.
- Wallace, R. Stuart and Mausolf, Lisa B.  
2001 *New Hampshire Railroads: Historic Context Statement*. Report prepared for the New Hampshire Department of Transportation, Concord

**NEW HAMPSHIRE DIVISION OF HISTORICAL  
RESOURCES - CONTINUATION FORM**

**NHDHR Inventory #**  
**NHDHR Area Letter**  
**Town/City** Berlin, Gorham

**Area Form:** Berlin Mills Railway

**County** Coos

**LIST OF RESOURCES**

Sheet 8 of 19

JUL 19 2002

TOWN	LOCATION MILE POST	RESOURCE NAME	PHOTO NOS.	DATE	ELIGIBLE STATUS
Berlin	0.1	Berlin Mills Railway Whipple Truss bridge over Androscoggin River	1 - 12	ca. 1870's	Contributing
Berlin	0.1	Berlin Mills Railway Pratt Truss bridge over Androscoggin River	1 - 5	ca. 1925	Contributing
Gorham	2.2	Berlin Mills Railway Cascade Mills Whipple Truss bridge over Androscoggin River	13 - 18, 20	Erected 1903, possibly earlier bridge moved to site	Contributing
Gorham	2.1	Plate girder bridge carrying Boston and Maine Railroad over Berlin Mills Railway Cascade branch line	19, 20	1903	Contributing



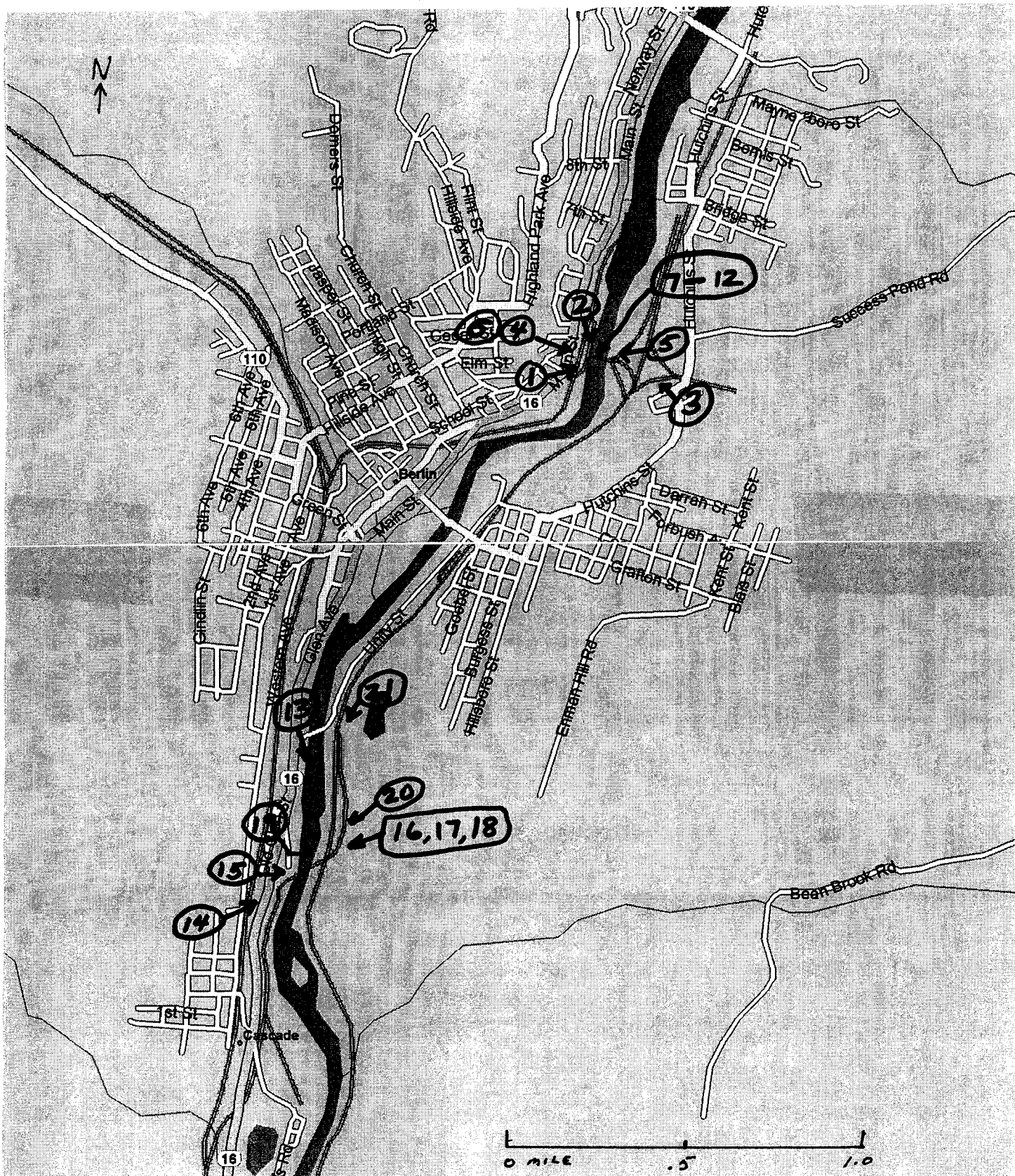
NEW HAMPSHIRE DIVISION OF HISTORICAL  
RESOURCES - CONTINUATION FORM

NHDHR Inventory #  
NHDHR Area Letter  
Town/City Berlin, Gorham  
County Coos

Area Form: Berlin Mills Railway

GRAPHIC MATERIAL: Map of Resources and Key to Photos

Sheet 9 OF 19



JUL 19 2002

NEW HAMPSHIRE DIVISION OF HISTORICAL  
RESOURCES - CONTINUATION FORM

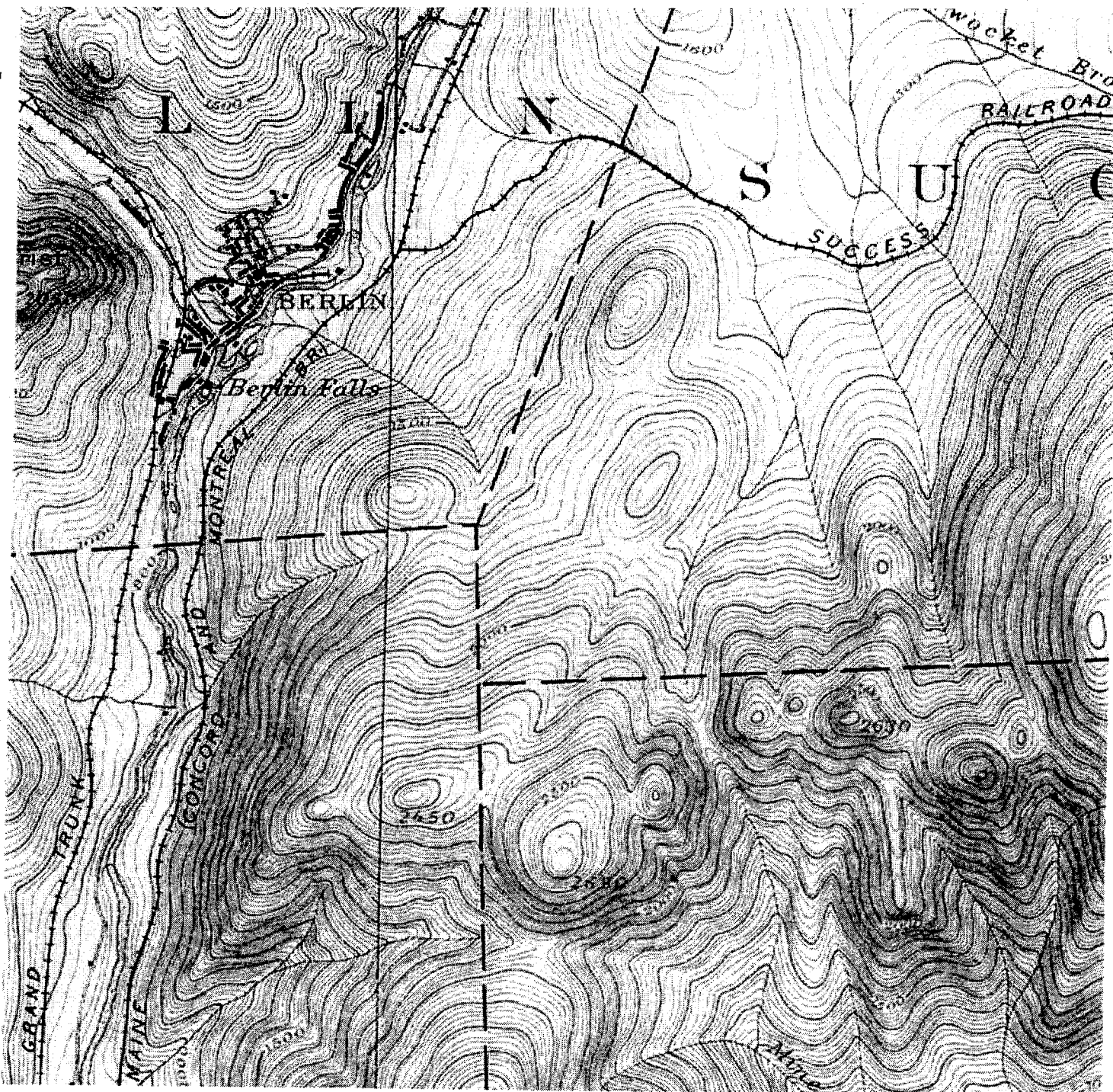
NHDHR Inventory #  
NHDHR Area Letter  
Town/City Berlin, Gorham  
County Coos

Area Form: Berlin Mills Railway

GRAPHIC MATERIAL: Success Railroad (predecessor)  
source: USGS Topo Gorham, New Hampshire, 1893.

Sheet 10 of 19

JUL 19 2002





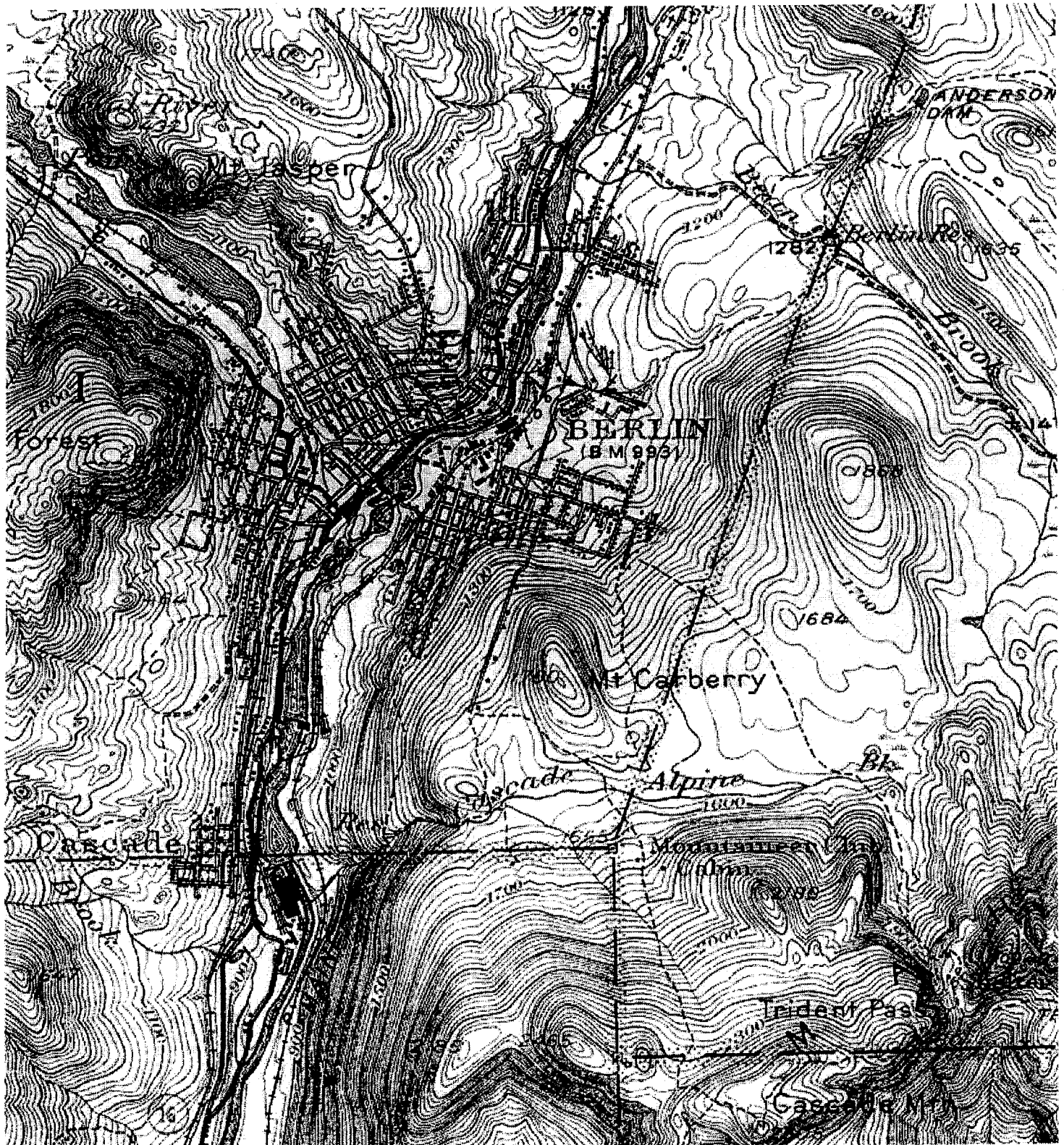
NEW HAMPSHIRE DIVISION OF HISTORICAL  
RESOURCES - CONTINUATION FORM

NHDHR Inventory #  
NHDHR Area Letter  
Town/City Berlin, Gorham  
County Coos

Area Form: Berlin Mills Railway

GRAPHIC MATERIAL: Map, 1942  
source: USGS Topo Gorham, New Hampshire, 1942.

Sheet 11 of 19



2007 R 1 707

NEW HAMPSHIRE DIVISION OF HISTORICAL  
RESOURCES - CONTINUATION FORM

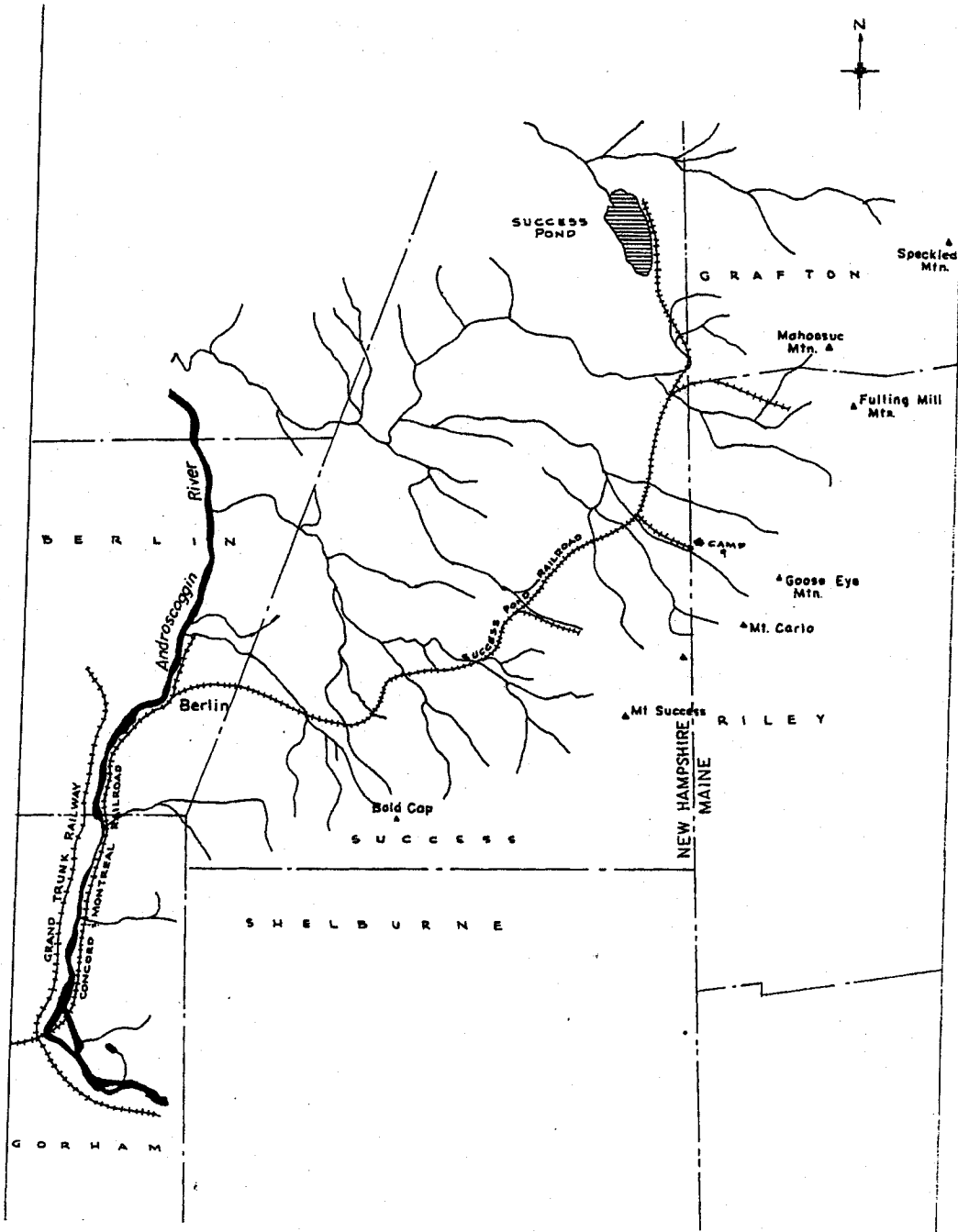
NHDHR Inventory #  
NHDHR Area Letter  
Town/City Berlin, Gorham  
County Coos

Area Form: Berlin Mills Railway

GRAPHIC MATERIAL: Success Railroad  
source: Belcher 1980:41

Sheet 12 of 19

JUL 19 2002



**NEW HAMPSHIRE DIVISION OF  
HISTORICAL RESOURCES  
PHOTO SHEET**

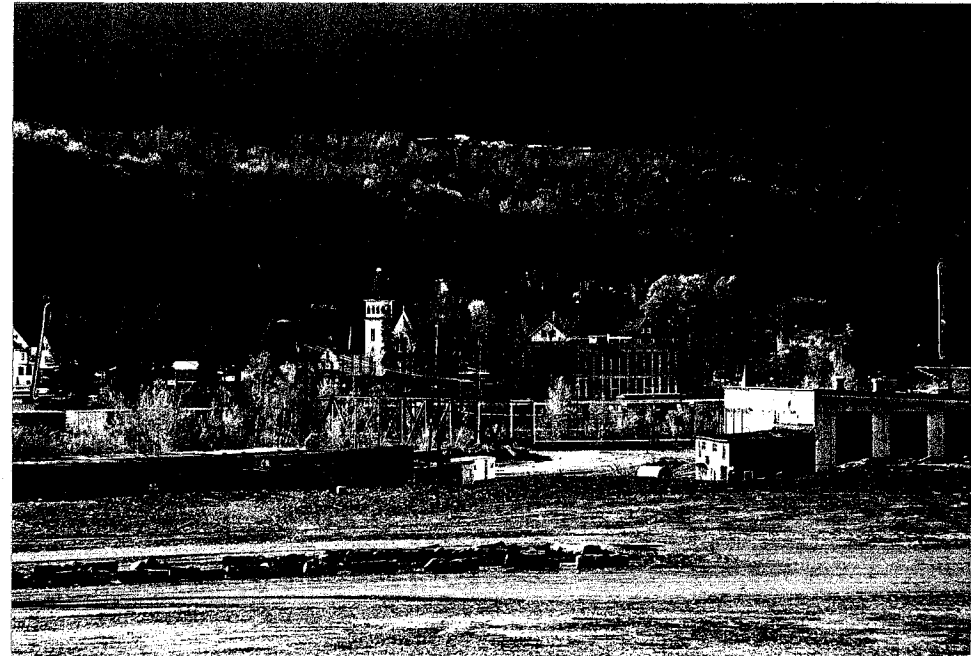
**Inventory #**  
**Area:** Berlin Mills Railway  
**Town:** Berlin , Gorham  
**County:** Coos  
**Sheet** 13 of 19

**Date of Photographs:** 05/2002  
**Negatives stored at:** NHDOT

**PHOTO # 1**  
**Subject:** Whipple & Pratt Truss Bridges  
Berlin Mills Railway, BERLIN  
**Photographer facing:** NE  
**Roll #** 1 **Frame #** 4



**PHOTO # 2**  
**Subject:** Whipple & Pratt Truss Bridges  
Berlin Mills Railway, BERLIN  
**Photographer facing:** SE  
**Roll #** 3 **Frame #** 16



**PHOTO # 3**  
**Subject:** Whipple & Pratt Truss Bridges  
Berlin Mills Railway, BERLIN  
**Photographer facing:** NW  
**Roll #** 1 **Frame #** 1

JUL 1 2002

**NEW HAMPSHIRE DIVISION OF  
HISTORICAL RESOURCES  
PHOTO SHEET**

**Inventory #**

**Area:** Berlin Mills Railway

**Town:** Berlin , Gorham

**County:** Coos

**Sheet** 14 of 19

**Date of Photographs:** 05/2002

**Negatives stored at:** NHDOT

**PHOTO # 4**

**Subject:** Whipple & Pratt Truss Bridges  
Berlin Mills Railway, BERLIN  
West Portals

**Photographer facing:** E

**Roll #** 3 **Frame #** 12



JUL 19 2002

**PHOTO # 5**

**Subject:** Whipple & Pratt Truss Bridges  
Berlin Mills Railway, BERLIN  
East Portals

**Photographer facing:** W

**Roll #** 2 **Frame #** 12



**PHOTO # 6**

**Subject:** Whipple Truss Bridge  
Berlin Mills Railway, BERLIN

**Photographer facing:** E

**Roll #** 2 **Frame #** 7

**NEW HAMPSHIRE DIVISION OF  
HISTORICAL RESOURCES  
PHOTO SHEET**

**Inventory #**  
**Area:** Berlin Mills Railway  
**Town:** Berlin , Gorham  
**County:** Coos  
**Sheet** 15 of 19

**Date of Photographs:** 05/2002  
**Negatives stored at:** NHDOT

**PHOTO # 7**  
**Subject:** Whipple Truss Bridge  
Berlin Mills Railway, BERLIN  
Detail of post and bottom chords  
**Photographer facing:** E  
**Roll # 2**      **Frame # 4**



JUL 19 2002

**PHOTO # 8**  
**Subject:** Whipple Truss Bridge  
Berlin Mills Railway, BERLIN  
Detail of floor beam/post/chord  
pin connection  
**Photographer facing:** NE  
**Roll # 2**      **Frame # 6**



**PHOTO # 9**  
**Subject:** Whipple & Pratt Truss Bridges  
Berlin Mills Railway, BERLIN  
Detail of upper chord connections  
**Photographer facing:** N  
**Roll # 2**      **Frame # 10**



**NEW HAMPSHIRE DIVISION OF  
HISTORICAL RESOURCES  
PHOTO SHEET**

**Inventory #**

**Area:** Berlin Mills Railway

**Town:** Berlin, Gorham

**County:** Coos

**Sheet** /6 of 19

**Date of Photographs:** 05/2002

**Negatives stored at:** NHDOT

**PHOTO # 10**

**Subject:** Whipple Truss Bridge

Berlin Mills Railway, BERLIN

Detail of post and upper chord

**Photographer facing:** NW

**Roll # 2      Frame # 9**

JUL 19 2002

**PHOTO # 11**

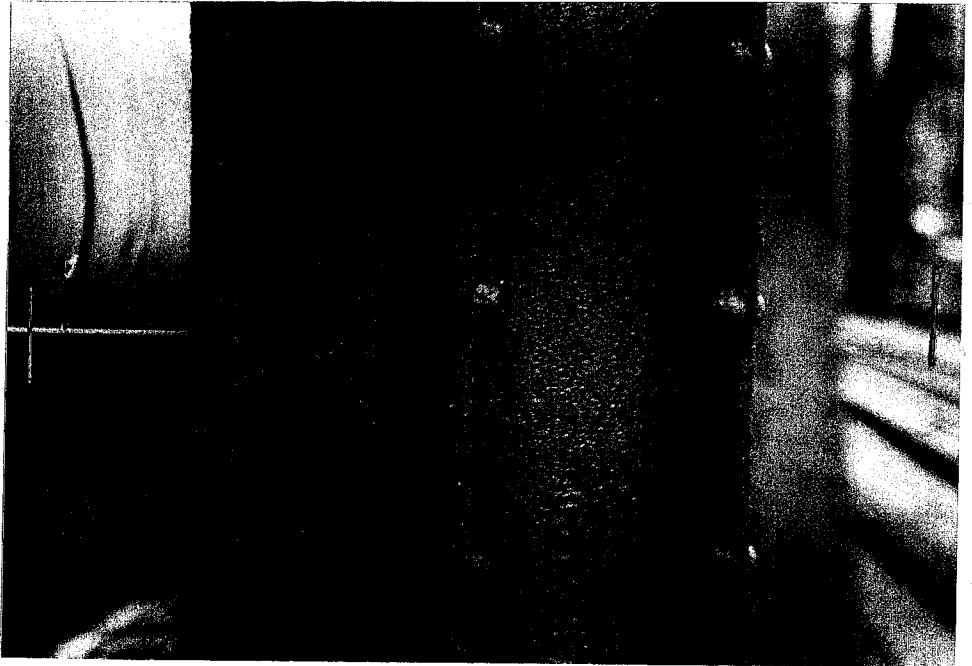
**Subject:** Whipple Truss Bridge

Berlin Mills Railway, BERLIN

Detail of Phoenix column

**Photographer facing:** E

**Roll # 2      Frame # 3**



**PHOTO # 12**

**Subject:** Whipple Truss Bridge

Berlin Mills Railway, BERLIN

Detail of lower pin connection

**Photographer facing:** NE

**Roll # 2      Frame # 16**

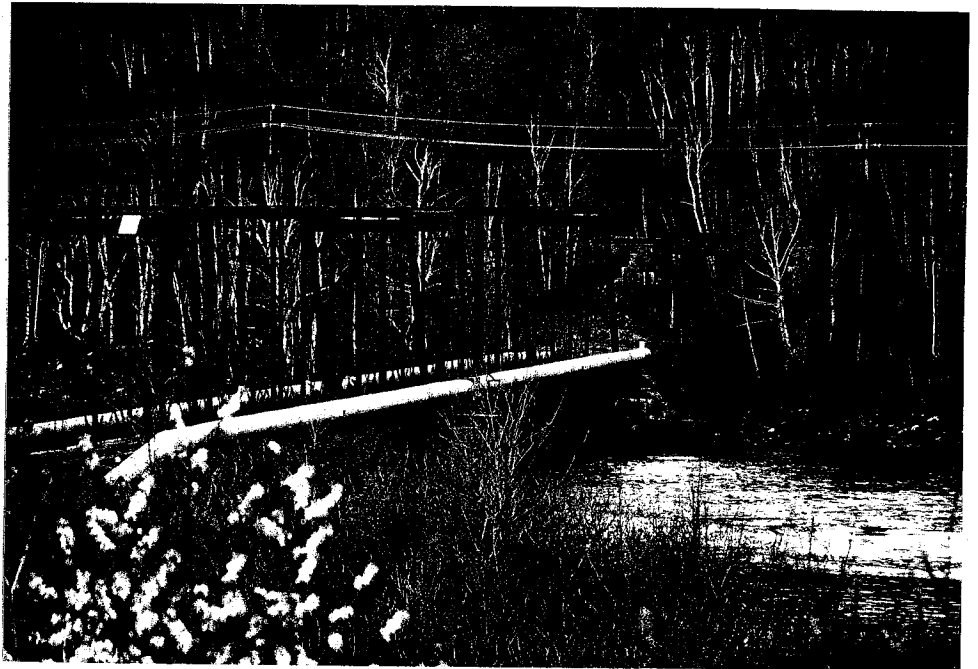
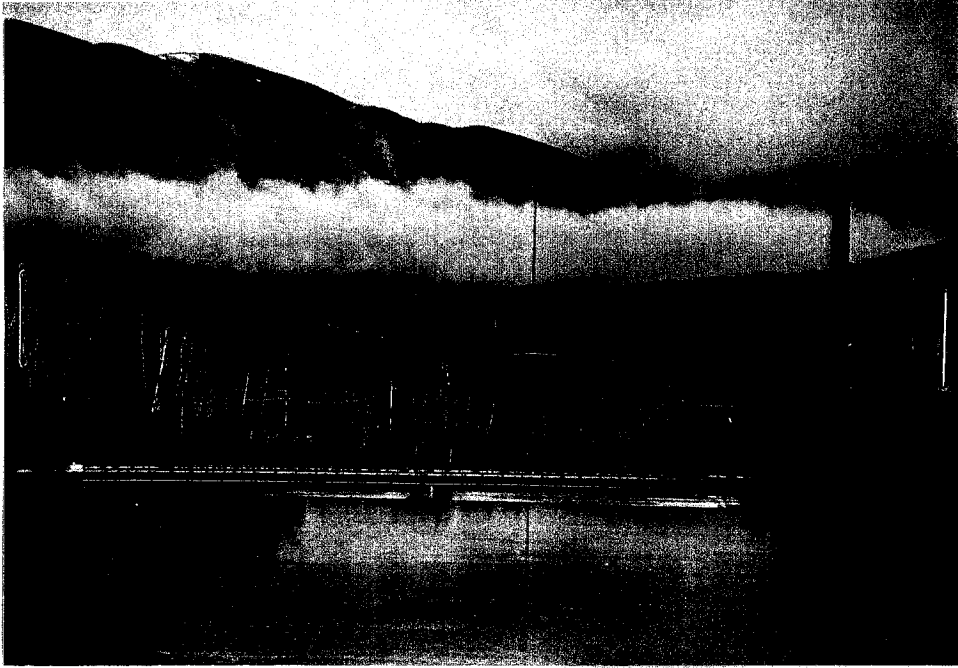


**NEW HAMPSHIRE DIVISION OF  
HISTORICAL RESOURCES  
PHOTO SHEET**

**Inventory #**  
**Area:** Berlin Mills Railway  
**Town:** Berlin , Gorham  
**County:** Coos  
**Sheet** 17 of 19

**Date of Photographs:** 05/2002  
**Negatives stored at:** NHDOT

**PHOTO # 13**  
**Subject:** Whipple Truss Bridge – Cascade  
Berlin Mills Railway, GORHAM  
**Photographer facing:** SE  
**Roll #** 1 **Frame #** 13



**PHOTO # 14**  
**Subject:** Whipple Truss Bridge - Cascade  
Berlin Mills Railway, GORHAM  
**Photographer facing:** NE  
**Roll #** 1 **Frame #** 15

**PHOTO # 15**  
**Subject:** Whipple Truss Bridge - Cascade  
Berlin Mills Railway, GORHAM  
West Portal  
**Photographer facing:** NE  
**Roll #** 1 **Frame #** 23



JUL 19 2002

**NEW HAMPSHIRE DIVISION OF  
HISTORICAL RESOURCES  
PHOTO SHEET**

**Inventory #**

**Area:** Berlin Mills Railway  
**Town:** Berlin, Gorham  
**County:** Coos  
**Sheet** 18 of 19

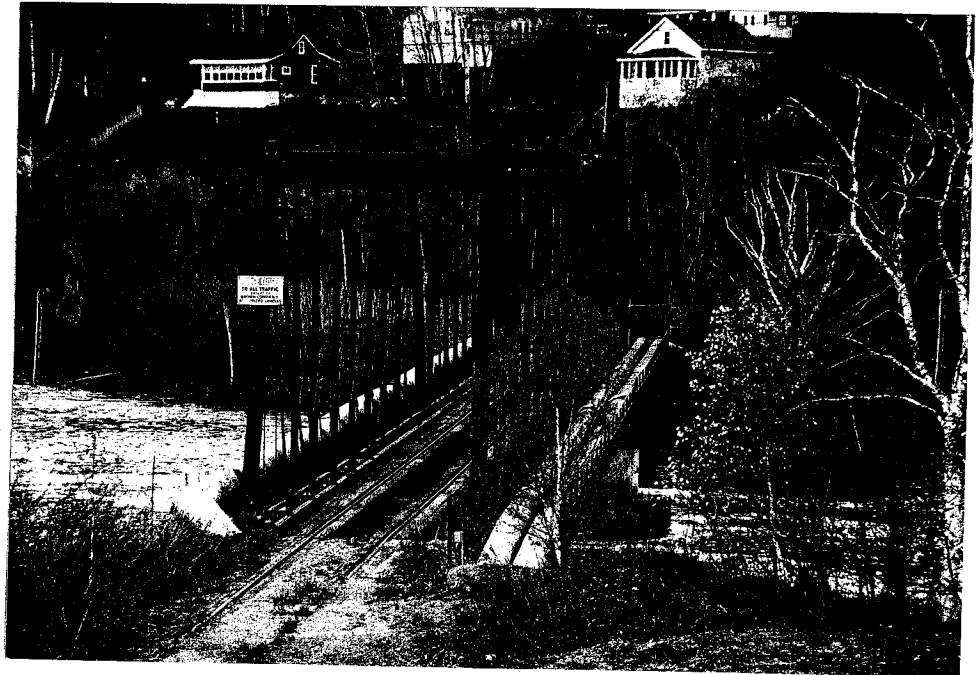
**Date of Photographs:** 05/2002  
**Negatives stored at:** NHDOT

**PHOTO # 16**

**Subject:** Whipple Truss Bridge – Cascade  
Berlin Mills Railway, GORHAM  
East Portal

**Photographer facing:** SW

**Roll # 1      Frame # 28**



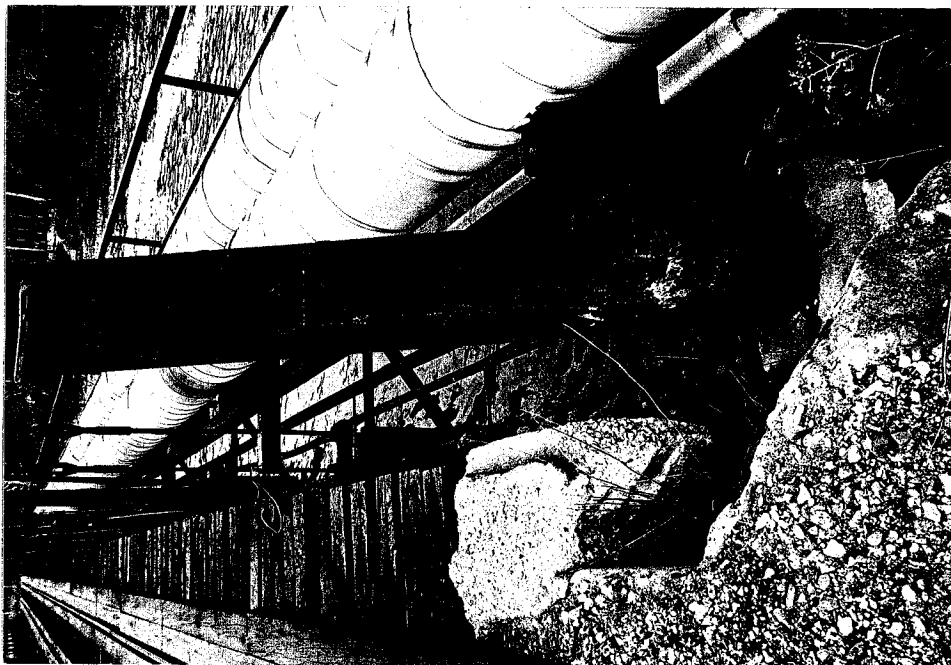
**PHOTO # 17**

**Subject:** Whipple Truss Bridge - Cascade  
Berlin Mills Railway, GORHAM

**Photographer facing:** W

**Roll # 1      Frame # 29**

JUL 19 2002



**PHOTO # 18**

**Subject:** Whipple Truss Bridge - Cascade  
Berlin Mills Railway, GORHAM  
Detail of end post

**Photographer facing:** W

**Roll # 1      Frame # 22**



**NEW HAMPSHIRE DIVISION OF  
HISTORICAL RESOURCES  
PHOTO SHEET**

**Inventory #**

**Area:** Berlin Mills Railway

**Town:** Berlin, Gorham

**County:** Coos

**Sheet 19 of 19**

**Date of Photographs:** 05/2002

**Negatives stored at:** NHDOT

**PHOTO # 19**

**Subject:** Plate Girder Bridge – Cascade  
Berlin Mills Railway, GORHAM  
B&MRR over Berlin Mills Railway

**Photographer facing:** NE

**Roll # 1      Frame # 18**

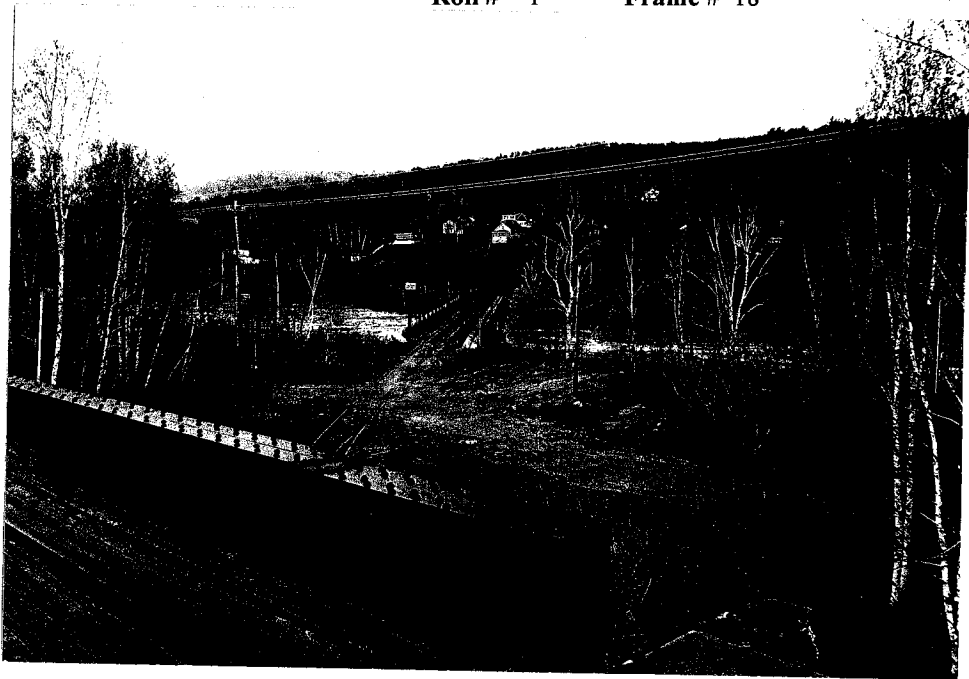
JUL 19 2002

**PHOTO # 20**

**Subject:** Whipple Truss Bridge - Cascade  
Berlin Mills Railway, GORHAM  
from plate girder bridge

**Photographer facing:** SW

**Roll # 1      Frame # 30**



**PHOTO # 21**

**Subject:** BMR tracks

Berlin Mills Railway, GORHAM  
switch and branch off B&MRR to  
Cascade

**Photographer facing:** N

**Roll # 1      Frame # 31**