

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

PETITION OF PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE FOR  
LICENSES TO CONSTRUCT AND MAINTAIN ELECTRIC LINES AND FIBER  
OPTIC CABLE OVER AND ACROSS THE ASHUELOT RIVER IN THE CITY OF  
KEENE AND THE TOWN OF SWANZEY, NEW HAMPSHIRE

TO THE PUBLIC UTILITIES COMMISSION:

Public Service Company of New Hampshire (“PSNH”), a public utility engaged in the generation, transmission, distribution and sale of electricity in the State of New Hampshire, hereby petitions the Public Utilities Commission (“Commission”), pursuant to RSA 371:17, for licenses to construct and maintain electric lines and fiber optic cable at three locations over and across the public waters of the Ashuelot River in Keene and Swanzey, New Hampshire, and in support of its petition states as follows:

1. In order to meet the reasonable requirements of service to the public, PSNH has previously constructed and currently operates and maintains a 115 kV transmission line, designated as line A-152 (formerly designated as line N-186). The A-152 line runs between PSNH’s Emerald Street Substation in Keene, New Hampshire, and PSNH’s Swanzey Substation, in Swanzey, New Hampshire, and is an integral part of the PSNH transmission system and the overall New England transmission grid. The A-152 line, as presently constructed, crosses the Ashuelot River at three locations. One crossing is in the City of Keene and two are in the Town of Swanzey, New Hampshire. One of the two overhead crossings of the A-152 line in Swanzey, between structures 54 and 55, has been previously licensed by the Commission in Docket DE 76-22, Order No. 12,219.<sup>1</sup>

2. In order to improve and enhance the reliability and capacity of the communications system used in its electric system operations, PSNH has also previously installed and currently uses and maintains an underbuilt all-dielectric self-supporting fiber optic cable, known as ADSS cable, on the existing A-152 structures, which crosses the Ashuelot River at the same three locations as the A-152 crossings. The overhead ADSS cable crossing on the A-152 line structures has been previously licensed by the Commission in Swanzey, again between structures 54 and 55, in Docket DE 98-100, Order No. 22,973.<sup>2</sup>

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<sup>1</sup> The other A-152 line crossings of the Ashuelot River, between structures 2 and 3 (in Keene) and between structures 22 and 23 (in Swanzey), were apparently not previously licensed due to either oversight or to the application of navigability or other crossing license criteria at the time of original construction. The rebuild of the A-152 crossings of the Ashuelot River at these locations will be licensed under this Petition.

<sup>2</sup> As with the A-152 line crossings, the rebuild of the fiber optic cable crossings at all unlicensed crossing locations will be licensed under this Petition.

3. In order to continue to meet the reasonable requirements of service to the public, PSNH has determined it is necessary to upgrade the A-152 line conductors to increase the power transfer capability of the line. This need is a result of load growth in the central part of New Hampshire. The entire length of the A-152 line between Keene and Swanzey is constructed of 477 ACSR. The remainder of this line, between the Swanzey substation and Vermont Yankee generating plant in Vermont, is 795 ACSR. This project will remove all of the 477 ACSR and replace it with 1590 ACSR between the Emerald Street and Swanzey Substations. Upgrading this portion of the A-152 line will allow PSNH to continue to provide reliable electric service to its customers in this area of the State.

4. The necessary conductor upgrade of the A-152 line will require that the line and its associated water crossings be rebuilt within the right-of-way corridor that it presently occupies. The existing A-152 line pole structures, most of which are of H-Frame type construction, will be replaced with new structures designed to handle the increased loads of the larger conductor. The existing 477 ACSR 18/1 phase wires will be replaced with 1590 ACSR 45/7. The existing underbuilt ADSS cable used in PSNH's electric system communications system will be replaced with optical ground wire containing fiber optic cable, known as OPGW cable. A majority of the line will be rebuilt utilizing single pole structures with davit arms. In these locations, the two existing static wires will be replaced with only one OPGW cable. Where the existing H-Frame type structures are being replaced with new H-Frame type structures or deadend structures, one 7#8 Alumoweld static wire and one OPGW cable will be installed.

5. Rebuilding the A-152 line will require construction of three new overhead crossings of the Ashuelot River. The location map, design and proposed construction plan and profile drawing, and required clearance calculations for each of the new crossings are attached to this Petition as Appendices A, B and C.

6. The required technical information provided in this Petition is based on the 2007 National Electrical Safety Code (NESC) C2-2007.

7. All river crossing locations will be spanned using laminated wood structures. These structures will all be single pole tangent structures (Type WT-1). A detail design specification for this structure type is attached to this Petition as FIGURE 1. As shown on FIGURE 1, the top and middle phase wires have an approximate separation at the structure of 7' vertically and 12' horizontally, while the middle and bottom phase wires are 8' vertically and 13' horizontally. The static wire is carried on the structure by a support bracket approximately 6" down from the top of the structure.

8. Flood water elevations for the crossings were based on information contained in flood insurance rate maps obtained from FEMA. Table 232-1, note 18 of the NESC states that the minimum clearance over a water body must be based on a 10-yr flood elevation. For the purpose of the design, the 100-yr flood elevation was used. It

should be noted that the 100-year elevations would be well above the 10-year flood elevation.

9. Based on Table 232-1.7 of the NESC, for open supply conductors 750 V to 22 kV to ground, the minimum clearance to the water surface during normal flood level (100-yr flood for the purpose of this Petition) is 20.5' (for waters less than 20 acres), 28.5' (for waters 20-200 acres), and 34.5' (for waters 200-2000 acres). NESC Rule 232.C.1.a states that an additional clearance of 1.6-ft or  $[(69.7 \text{ kV} - 22 \text{ kV}) \times 0.4]$  is needed for 115 kV, which brings the total required minimum clearance to 22.1', 30.1', and 36.1', respectively. For overhead shield/surge protection wires that meet NESC Rule 230.E.1, the minimum clearance to the water surface at the normal flood level is 17.5', 25.5', and 31.5' respectively for those water bodies. As the static wires are located above the phase wires at all crossings, this NESC minimum clearance requirement will always be met. Based on Table 232-1.2 of the NESC, for open supply conductors 750 V to 22 kV to ground, the minimum clearance to roads subject to truck traffic is 18.5'. With the additional 1.6' of clearance required for 115 kV, the total required clearance is 20.1'. In consideration of the special wind corridor that the A-152 line transmission right-of-way traverses, all structures and wire clearances have been reviewed and determined by PSNH to have been designed to meet this special wind zone.

10. A total of three phase wires and one OPGW cable will span each water crossing. All three 1590 ACSR 45/7 phase conductors and the OPGW cable shield wire will be sagged using the NESC Heavy Loading (0 degrees F., 4 pounds per square foot wind loading, 1/2-inch radial ice) sag charts upon installation in the field. The 1590 ACSR conductors will be sagged using a maximum tension of 10,000 pounds (unless stated otherwise in the Appendices to this Petition) and the shield wire will be sagged using a maximum tension of 4,500 pounds (unless stated otherwise in the Appendices to this Petition). The sags and clearances to the water surface for each of the proposed crossings are provided in the attached Appendices.

11. Three of the four new crossing structures in Swanzey will be set within jurisdictional wetlands or other areas that require New Hampshire Department of Environmental Services (NHDES) permitting. The appropriate NHDES wetlands permits have been applied for and obtained by PSNH including access through wetland areas to install these structures. A copy of the wetlands permit covering both of the crossings in Swanzey is attached to this Petition. The installation of the two new crossing structures in Keene will not involve any wetlands impact and do not require a wetlands permit.

12. The proposed crossings have been designed and will be constructed, maintained and operated by PSNH in accordance with the applicable requirements of the NESC.

13. With the exception of the north side of the Ashuelot River crossing in Keene, which is on land owned by PSNH in fee, PSNH owns permanent easements for its lines and facilities on both sides of the Ashuelot River at each of the proposed crossing

locations. Each of the crossings at these locations will be constructed within the limits of those easements.

14. PSNH submits that the licenses petitioned for herein may be exercised without substantially affecting the rights of the public in the public waters of the Ashuelot River. Minimum safe line clearances above all water surfaces and affected shorelines will be maintained at all times. The use and enjoyment by the public of the Ashuelot River will not be diminished in any material respect as a result of the overhead line and fiber optic cable crossings.

WHEREFORE, PSNH respectfully requests that the Commission:

- a. Find that the licenses 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 PSNH licenses to construct and maintain electric lines and fiber optic cable over and across the public waters of the Ashuelot River in Keene and Swanzey, New Hampshire, as specified in the Petition; and
- c. Issue an Order Nisi and orders for its publication.

Dated at Manchester this 7<sup>th</sup> day of August, 2008.

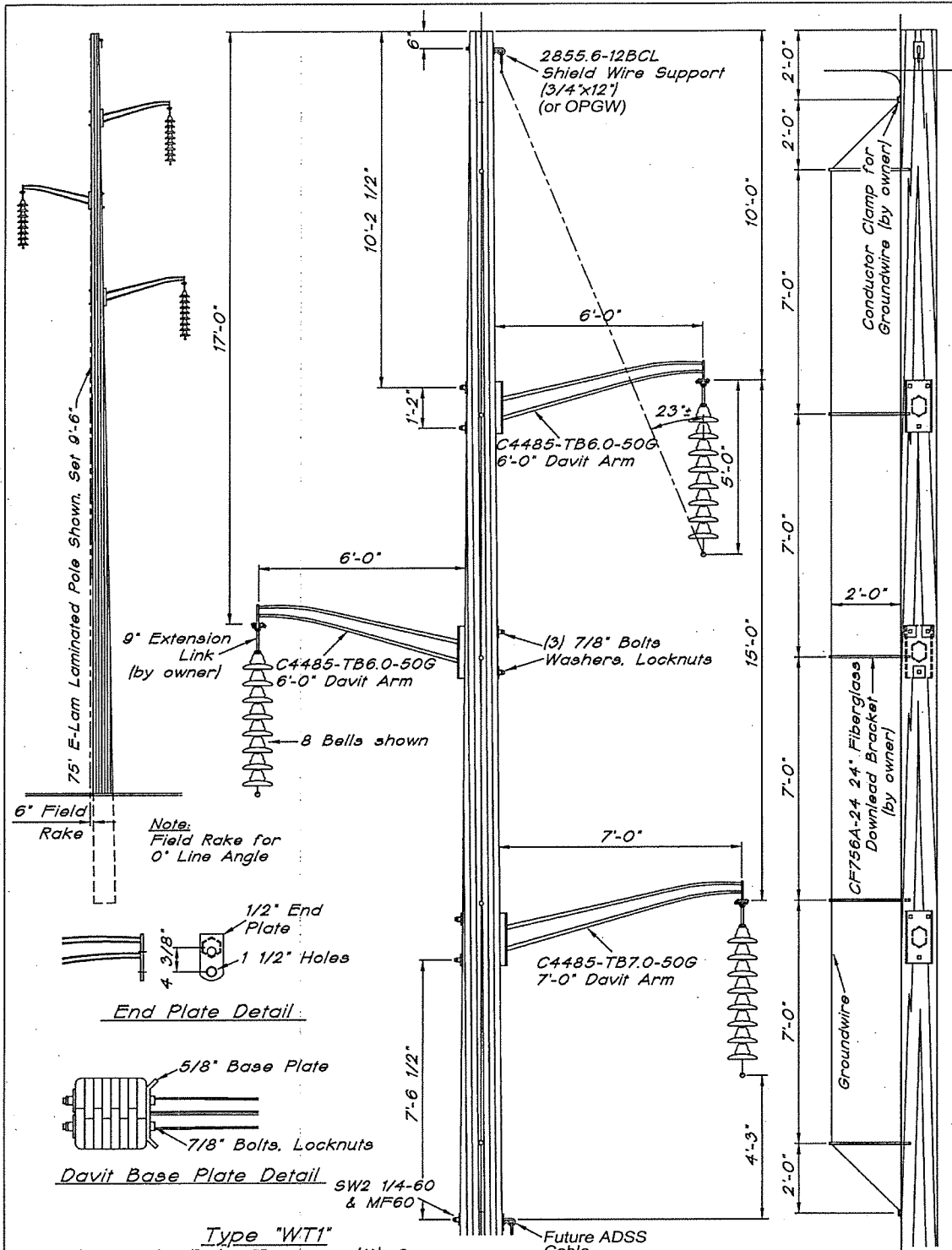
Respectfully submitted,

PUBLIC SERVICE COMPANY OF NEW  
HAMPSHIRE

By Its Attorney



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Senior Counsel, Legal Department  
PSNH Energy Park  
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Manchester, NH 03101  
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**Type "WT1"**  
**115kV Single Pole Tangent (1') Structure**  
 Line A152  
 Northeast Utilities Service Company  
 Public Service Company of New Hampshire  
 Manchester, New Hampshire

**FIGURE 1**

				Laminated Wood Systems, Inc.		
				<b>E-LAM</b>		
				P.O. BOX 386, SEWARD, NE 68434		1-800-949-ELAM
NO.	REVISION	DATE	CK.	DRAWN	DATE	DWG. NO.
				D. Policky	7-25-06	NESC-0054.01A1
ACAD DWG. FILE: NESC5401A1						



The State of New Hampshire  
**DEPARTMENT OF ENVIRONMENTAL SERVICES**



Thomas S. Burack, Commissioner

**WETLANDS AND NON-SITE SPECIFIC PERMIT 2008-00219**

Permittee: Public Service of NH, 780 North Commercial St., Manchester, NH 03101  
 Project Location: PSNH ROW, Swanzey  
 Swanzey Tax Map/Lot No. 38 / 46  
 Waterbody: Unnamed Wetland

Page 1 of 3 **NOTE--  
 CONDITIONS**

APPROVAL DATE: 04/03/2008      EXPIRATION DATE: 04/03/2013

Based upon review of the above referenced application, in accordance with RSA 482-A and RSA 485-A:17, a Wetlands Permit and Non-Site Specific Permit was issued. This permit shall not be considered valid unless signed as specified below.

**PERMIT DESCRIPTION:** Temporarily impact 31,700 square feet and permanently impact 491 square feet of palustrine emergent/scrub-shrub wetlands and intermittent stream in a utility right-of-way easement for the replacement of the 4.9 mile A-152 electrical transmission line in Keene and Swanzey.

**THIS APPROVAL IS SUBJECT TO THE FOLLOWING PROJECT SPECIFIC CONDITIONS:**

1. All work shall be in accordance with plans by Public Services of New Hampshire (PSNH) dated December 21, 2007, as received by the DES Wetlands Bureau on February 13, 2008.
2. The Department has determined that this project is in the vicinity of an impaired waterbody. Therefore stormwater runoff treatment for this project shall be designed and constructed so that the stormwater pollutant loads from the completed project are no greater than the stormwater pollutant loads that existed prior to the project for all pollutants causing impairment which are likely to be in stormwater discharged from the completed project.
3. All activity shall be in accordance with the current Comprehensive Shoreland Protection Act.
4. Work shall be completed in frozen or dry conditions or with the use of swamp mats or temporary construction bridges.
5. Prior to the installation; swamp mats shall be inspected for and removed of all vegetative matter.
6. Equipment used shall be designed to have low ground contact pressure or placed on temporary swamp mats so as to minimize rutting of the soils. Swamp mats shall be removed immediately upon completion of work in a particular area so as not to result in permanent impacts.
7. Prior to installation, new wood-pole structures; and upon removal, old wood-pole structures and appurtenances shall be placed outside of the jurisdiction of the DES Wetlands Bureau.
8. The contractor shall remove the stumps of the old wood-pole structures in wetlands. If removal of the stump(s) will result in increased wetlands impacts, due to increased soil disturbance, the pole(s) shall be cut off at ground level.
9. Discharge from dewatering of work areas shall be to sediment basins that are: **a)** located in uplands; **b)** lined with hay bales or other acceptable sediment trapping liners; **c)** set back as far as possible from wetlands and surface waters, in all cases with a minimum of 20 feet of undisturbed vegetated buffer.
10. Dredged material shall be placed outside of the jurisdiction of the DES Wetlands Bureau.
11. Appropriate siltation/erosion/turbidity controls shall be in place prior to construction, shall be maintained during construction, and remain until the area is stabilized.
12. Silt fence(s) must be removed once the area is stabilized.
13. Within three days of final grading or temporary suspension of work in an area that is in or adjacent to wetlands or surface waters, all exposed soil areas shall be stabilized by seeding and mulching during the growing season, or if not within the growing season, by mulching with tack or netting and pinning on slopes steeper than 3:1.
14. Where construction activities have been temporarily suspended within the growing season, all exposed soil areas shall be stabilized within 14 days by seeding and mulching.
15. Where construction activities have been temporarily suspended outside the growing season, all exposed areas shall be stabilized within 14 days by mulching and tack. Slopes steeper than 3:1 shall be stabilized by matting and pinning.

16. Construction shall be inspected by a qualified wetland scientist, erosion control specialist, or professional engineer to ensure that appropriate protective measures are properly implemented, including those outlined in the plans and documents supporting this permit application and the conditions of this authorization.
17. Any clearing required in utility line rights-of-way shall be in accordance with the "Best Management Practices for Erosion Control on Timber Harvesting Operations in New Hampshire." Timber, slash and/or chips shall be removed from wetland areas and shall not be buried in wetlands.
18. There shall be no excavation or operation of construction equipment in flowing water.
19. Construction equipment shall be inspected daily for leaking fuel, oil and hydraulic fluid prior to entering wetlands.
20. Faulty equipment shall be repaired prior to entering wetlands.
21. The contractor shall have appropriate oil spill kits on site and readily accessible at all times during construction and each operator shall be trained in its use.
22. All refueling of equipment shall occur 100 feet away from surface waters or wetlands during construction.
23. The qualified professional shall submit weekly monitoring reports including the status of the project and the work conducted each week, the status of the erosion control measures, restoration areas and color photographs of work areas and areas recently restored. These reports shall be submitted via e-mail to [kpulkkinen@des.state.nh.us](mailto:kpulkkinen@des.state.nh.us).
24. Wetland topsoil shall be stripped and segregated from subsoil and stockpiled separately from subsoil during construction. Soils shall be properly backfilled and restored to pre-existing grades.
25. All temporary impact to wetland shall be regraded to original contours and stabilized within 72 hours following the completion of work and 30 days of the start of work.
26. All temporary impacts to wetlands shall be restored to natural grade, stabilized, and replanted with native vegetation where necessary.
27. Wetlands shall be restored to their pre-construction conditions within the right-of-way, including restoration of original grades, within 5 days of backfill.
28. Mulch within the restoration areas shall be straw or seedless hay.
29. Seed mix within the restoration areas shall be a wetland seed mix appropriate to the area and shall be applied in accordance with manufacturer's specifications.
30. Wetland restoration areas shall be properly constructed, landscaped, monitored and remedial actions taken that may be necessary to create functioning wetland areas similar to those of the wetlands destroyed by the project. Remedial measures may include replanting, relocating plantings, removal of invasive species, changing soil composition and depth, changing the elevation of the wetland surface, and changing the hydrologic regime.
31. Wetland restoration shall not be considered successful if sites are newly invaded by nuisance species such as common reed or purple loosestrife during the first full growing season following project completion. The applicant shall work with the DES Wetlands Bureau to attempt to eradicate nuisance species newly found along the right-of-way during this same period.
32. Wetland restoration areas shall have at least 75% successful establishment of wetlands vegetation after two (2) growing seasons, or shall be replanted and re-established until a functional wetland is replicated in a manner satisfactory to the DES Wetlands Bureau.
33. Stream restoration shall be properly constructed, landscaped, monitored and remedial actions taken that may be necessary to create a healthy riverine system that is replicated in a manner satisfactory to the DES Wetlands Bureau. Remedial measures may include replanting, relocating plantings, removal of invasive species, changing stream sinuosity, changing the slope of the stream, and changing the hydrologic regime.
34. Recreated stream channel beds must maintain the natural stream bed elevation.
35. Stream banks shall be restored to their original grades and to a stable condition within 5 days of completion of construction.
36. The right-of-way shall be monitored and a written report documenting its condition shall be submitted to the DES Wetlands Bureau by July 15 of the year following project completion. The report shall include photographic documentation. The DES Wetlands Bureau shall require subsequent monitoring and may require corrective measures if the right-of-way is not adequately stabilized and restored.

**GENERAL CONDITIONS THAT APPLY TO ALL DES WETLANDS PERMITS:**

1. A copy of this permit shall be posted on site during construction in a prominent location visible to inspecting personnel;
2. This permit does not convey a property right, nor authorize any injury to property of others, nor invasion of rights of others;
3. The Wetlands Bureau shall be notified upon completion of work;
4. This permit does not relieve the applicant from the obligation to obtain other local, state or federal permits that may be required (see attached form for status of federal wetlands permit);
5. Transfer of this permit to a new owner shall require notification to and approval by the Department;
6. This permit shall not be extended beyond the current expiration date.
7. This project has been screened for potential impacts to **known** occurrences of rare species and exemplary natural communities in the immediate area. Since many areas have never been surveyed, or have received only cursory inventories, unidentified sensitive species or communities may be present. This permit does not absolve the permittee from due diligence in regard to state, local or federal laws regarding such communities or species.
8. The permittee shall coordinate with the NH Division of Historic Resources to assess and mitigate the project's effect on historic resources.

APPROVED: \_\_\_\_\_

Kirsten Pulkkinen

DES Wetlands Bureau

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**BY SIGNING BELOW I HEREBY CERTIFY THAT I HAVE FULLY READ THIS PERMIT AND AGREE TO ABIDE BY ALL PERMIT CONDITIONS.**

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OWNER'S SIGNATURE (required)

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CONTRACTOR'S SIGNATURE (required)