

STATE OF NEW HAMPSHIRE

Inter-Department Communication

DATE: November 19, 2015

AT (OFFICE): NHPUC

FROM: Randy Knepper
Director – Safety Division



SUBJECT: Docket No. DE 15-285 PSNH d/b/a Eversource Energy
Petition for a License to Construct and Maintain Electric Lines Over
State Lands in three locations in Londonderry, NH
Staff Recommendation

TO: Debra Howland, Executive Director
Thomas Frantz, Director, Electric Division
Leszek Stachow, Assistant Director, Electric Division
Rorie Patterson, Staff Attorney

The Safety Division's review of the above petition consisted of the following elements:

- Petition contents and history;
- Applicable State statute(s);
- Review of any existing crossing(s) already licensed by the PUC;
- Review of land ownership of existing pole structures;
- Review of NESC code requirements as described in Puc 300;
- Review of public need and public impact, including applicability of other State regulations; and
- Conclusions and Recommendations.

1. Petition contents and history

The Merrimack Valley Reliability Project

On July 21, 2015, PSNH d/b/a Eversource Energy (PSNH), filed a petition pursuant to RSA 371:17 for a license to construct and maintain electric lines over and across public lands in the Town of Londonderry, New Hampshire. The proposed new crossings are three small segments associated with PSNH's portion of a newly proposed installation of a 345 kV electric transmission line that is part of the "Merrimack Valley Reliability Project". The project is jointly owned by PSNH and New England Power Company d/b/a National Grid (NEP) and connects PSNH's Scobie Pond 345kV Substation in Londonderry with NEP's 22A Substation in Tewksbury, MA. The 345 kV Merrimack Valley Reliability Project will measure 17.9 miles from the Massachusetts border to the Scobie Pond Substation in Londonderry [traversing Pelham, Windham,

Hudson and Londonderry] plus 6.5 miles in Massachusetts through Dracut, Andover and Tewksbury.¹

The 3124 Line

The Londonderry segments of the proposed electric Merrimack Valley Reliability Project 345 kV circuit (phase to phase), are identified as part of the “3124 line.” PSNH proposes to locate the 3124 line within an existing 535-foot wide permanent easement that allows for multiple circuits to be placed including pole structures and conductors. The 3124 line will be built comprised of three pairs of 1590 kcmil ACSR (aluminum conductor steel reinforced) horizontally spaced single phase conductor wires of a 54/19 configuration. Each of the conductors will be approximately 1.545 inch diameter with a weight of 2.042 pound per foot. Each of the OPGWs is stated to have 48 fiber cables with 0.650 inch diameter and 0.407 pound per foot unit weight.

The total span of this segment of the 3124 line, between the supporting structures #277 and #278, is 548 feet. The 3124 line segment requiring a license or Occupancy Agreement is composed of proposed Crossing #1 (approx. 58 ft.), a Highway ROW (457ft),² and proposed Crossing # 2 (472ft.)³.

An additional segment will span the Granite State Rail Trail (82.5 ft) and is referenced in this memo as Crossing#3.

The conductors transmitting electrical power at 345 kV will be 1590 ACSR “Falcon” cable with 54/19 stranding. The condition representing the least clearance to road or grade condition is when conductors will be sagged using 285 Degrees Fahrenheit thermal maximum operating condition. PSNH did not provide the maximum tension amount applied. In its petition, PSNH provides sufficient detail to show how all required clearances from phase wires to the surface of the road will be maintained.

The position, tensioning and type of the OPGW (static) wire is consistent with the NESC heavy loading rule 250B but does not factor into the clearances because it is located above the poles by approximately 24 additional feet.

Crossing #1, West I 93 Crossing

- The location of Crossing #1 is at the approximate 13.8 mile mark of Interstate 93. PSNH seeks a license for a small approximate 58 feet segment over a parcel of land located westerly of Interstate 93 and owned by the NH DOT but

¹ NH Site Evaluation Committee Application July 2015 Section C page 6. NEP will own 14.6 miles: 8.1 miles in Pelham, Windham, and Hudson; and 6.5 miles in the Massachusetts communities of Dracut, Andover and Tewksbury. PSNH will own 9.8 miles in Londonderry and Hudson, NH.

² The Highway ROW includes both northbound and southbound travel lanes, medians and right of way extensions. PSNH is not seeking a license from the Commission to cross the Highway ROW; this will be done separately through an Occupancy and Use Agreement with the NH DOT.

³ Crossing # 3 has a total amount of 479 ft consists of partial span of 21 ft and 458 ft of a separate full span length.

outside of the Highway Right of Way. The parcel of land is identified on Exhibit 2 of the petition as Department of Public Works and Highways Map 13 block 14, and the Town of Londonderry identifies the parcel as 0130140. Appendix A Figure 1 shows the parcel of state land being crossed. Crossing #1 will consist of a Support Structure #277 and will only have 3 pairs of energized conductors; twin bundled per phase, and 2 Overhead Power Ground Wires (OPGW) fiber optic cables, that will serve as both a ground wire and a communication carrier. Appendix A Figure 4 shows the 58 ft segment in yellow to west of Interstate 93.

- Structure #277 will support the conductors on the west side of Interstate 93 at mile marker 13.8. It is not located on the public parcel being crossed but adjacent to it, on the westerly side, on a parcel owned by PSNH. Structure #277 will be 101.5 ft above ground level and will consist of octagonal tubular steel pole configured in an H Frame tangential configuration. The height of Structure #277 is 115 ft and will be embedded approximately 13.5 ft.
- The road clearance for Crossing #1, taken from the highest elevation of the northbound and southbound lanes for Interstate 93, is shown as 54 ft. The NESC requirement is 24.7 ft clearance. The Safety Division recognizes that PSNH was conservative with the clearances found and there is an additional safety factor not depicted because the lowest point of the sag is not within the 580ft and 21ft sections of the crossings.

Crossing #2, East I 93 Crossing

- The location of this crossing is also at the approximate 13.8 mile mark of Interstate 93. PSNH seeks a license for a small 21 feet segment over a parcel of land located easterly of Interstate 93 and owned by the NH DOT but outside of the Highway Right of Way. PSNH also seeks the same license for an adjacent 458 feet segment over the same parcel.⁴ The parcel of land is identified on Exhibit 2 of the petition as Department of Public Works and Highways Map 13 block 57 and the Town of Londonderry identifies the parcel as 0130570. Appendix A Figure 2 shows the parcel of state land being crossed. Crossing #2 will consist of a partial span between Support Structure #277 and #278 and a partial span between Support Structure #278 and #279. Each span has 3 pairs of energized conductors; twin bundled per phase and 2 Overhead Power Ground Wires (OPGW), fiber optic cables, that serves as both a ground wire and a communication carrier. Appendix A Figure 4 indicates in yellow the Crossing #2
- Structure #278 will support the conductors on the east side of Interstate 93 at mile marker 13.8. It is located on the public parcel being crossed (owned by

⁴ Crossing #2 in aggregate consists of 21 ft in addition to 458 ft minus 7 ft from the property line to the pole for a total length of 472 ft.

NH DOT) approximately 198 ft easterly of the northbound Interstate 93 travel lane. Structure #2 will be 101.5 ft above ground level and will consist of octagonal tubular steel pole configured in an H Frame tangential configuration. The height of the Structure #2 is 115 ft and will be embedded approximately 13.5 ft.

- The road clearance for Crossing #2, taken from the highest elevation of the northbound and southbound lanes for Interstate 93, is shown as 57.5 ft. The NESC requirement is 24.7 ft clearance. The Safety Division recognizes that PSNH was conservative with the clearances found and there is an additional safety factor not depicted because the lowest point of the sag is not within the 21ft section of the crossings.

Crossing #3, Granite State Rail Trail

- The former Manchester Lawrence Branch of the Guilford Rail is now a segment of the Granite State Rail Trail.
- The location of this crossing is just east of Rockingham Road also known as New Hampshire State Route 28, north of Seasons Land and west of the Scobie Pond Substation in Londonderry. PSNH seeks a license for a small 82.5 feet segment over the former rail corridor that is now owned by NH DOT. The parcel of land is identified on Exhibit 5 of the petition as Dept of Transportation - Granite State Rail Trail, and the Town of Londonderry identifies the parcel as 0131430. Appendix A Figure 3 shows the parcel of state land being crossed.
- Crossing #3 will be an aerial crossing that occurs between two octagonal support structures, #285 and #286, with a span length of approximately 719 feet. The 719 span is composed of a 208 ft span west of Granite State Rail Trail, the 82.5 ft width of the Granite State Rail trail, and a 418 ft span east of the Granite State Rail Trail. PSNH is also separately seeking permission to cross the Granite State Rail Trail, and this will be done separately through a Rail Crossing Agreement and Temporary Use Agreement with the NH DOT⁵.
- Structure #285 has 3 pairs of energized conductors; twin bundled per phase and 2 Overhead Power Ground Wires (OPGW), fiber optic cables, that serves as both a ground wire and a communication carrier. Structure #285 will support the conductors on the west side of the Granite State Rail Trail. It is located on an adjacent parcel being crossed (owned by PSNH) approximately 208 ft westerly of the western edge of the Granite State Rail Trail parcel. Structure #285 will be 92.5 ft above ground level and will consist of octagonal tubular steel pole configured in a two pole H Frame tangential configuration.

⁵ SEC 15-05 Appendix P NHDOT Aerial Utility Permit and Rail Crossing Agreement and Temporary Use Agreement

The height of Structure #285 is 105 ft and will be embedded approximately 12.5 ft.

- Structure #286 will support the conductors on the east side of the Granite State Rail Trail. It is located on an adjacent parcel being crossed (owned by PSNH) approximately 418 ft easterly of the eastern edge of the Granite State Rail Trail parcel. Structure #286 will be 79 ft above ground level and will consist of octagonal tubular steel pole configured in a three pole H Frame tangential configuration. The height of Structure #286 is 90 ft and will be embedded approximately 11 ft.
- For Crossing #3 the NESC clearance requirement is 32.7ft⁶, and PSNH represents the minimum clearance provided is 39.9 ft. This sag is greater because of the elevation change of nearly 20 ft between structure #285 and #286 which makes the clearance closer to that which is required. Nonetheless, there is sufficient clearance by nearly 7.2 ft.

2. New Hampshire statute referenced in petition

371:17 Licenses for New Poles. – Whenever it is necessary, in order to meet the reasonable requirements of service to the public, that any public utility should construct a pipeline, cable, or conduit, or a line of poles or towers and wires and fixtures thereon, over, under or across any of the public waters of this state, or over, under or across any of the land owned by this state, it shall petition the commission for a license to construct and maintain the same. For the purposes of this section, "public waters" are defined to be all ponds of more than 10 acres, tidewater bodies, and such streams or portions thereof as the commission may prescribe. Every corporation and individual desiring to cross any public water or land for any purpose herein defined shall petition the commission for a license in the same manner prescribed for a public utility.

Source. 1921, 82:1. PL 244:8. RL 294:16. 1951, 203:48 par. 17. 1953, 52:1, eff. March 30, 1953. 2013, 82:1, eff. June 19, 2013.

3. Review of existing license(s) and permissions previously granted by the PUC for this location along the DOT owned parcels.

The proposed crossings are new and, consequently, have not been previously licensed by the Commission as the 3124 line. There are two other 345 kV circuits and three 115 kV circuits within the right of way but no research was done to confirm that those licenses were granted since they are not part of the petition.

⁶ NESC Table 232-1 requires $(26.5 \text{ ft} + 1.05 * 345 \text{ kV} / \sqrt{3} - 22 \text{ kV} \times 0.04)$ = 32.7 ft for rail trail corridor that potentially be used for track rails in future. See 232 C – 1 a.

PSNH asserts in the petition that the proposed construction of this crossing will be exercised without substantially affecting the rights of the public for use of public lands. Minimum safe line clearances above the road and grounds surface will be maintained at all times. The use of the parcels by the public will not be diminished in any material respect as a result of the overhead line crossing. The New Hampshire DOT has the right to require relocation of structures if the ROW is negatively affected. *See RSA 231:161 (c)*.

4. Review of land ownership of proposed pole structures

In its petition, PSNH specifies that the construction of this crossing will span the affected parcels at the same location as other existing crossings within the same PSNH easement. New Structure #277 will be located within existing property owned in fee by PSNH. New Structure #278 will be located in a parcel outside of the Highway ROW but owned by the NH DOT. PSNH also states Structure #279 will be located within existing property owned in fee by PSNH.

In Crossing #3 two structures will be installed are #285 and #286. Both will be located within existing property owned in fee by PSNH.

Electronic copies of both easements referenced above were provided to the SEC 15-05 filing in Appendix P.

5. Review of NESC code requirements as described in Puc 300

N.H. Code of Administrative Rules Puc 306 requires:

- (a) each utility shall construct, install, operate and maintain its plant, structures and equipment and lines, as follows:
 - (1) In accordance with good utility practice;
 - (2) After weighing all factors, including potential delay, cost and safety issues, in such a manner to best accommodate the public; and
 - (3) To prevent interference with other underground and above ground facilities, including facilities furnishing communications, gas, water, sewer or steam service.
- (b) For purposes of this section, “good utility practice” means in accordance with the standards established by:
 - (1) The National Electrical Safety Code C2-2012....

PSNH states that it used the 2012 National Electrical Safety Code C2-2012 compliance.

Safety Division Staff reviewed the specifications related to the design and construction of this crossing project as provided in the petition, exhibits 1-5, attachments, and all supplemental support documents, and found them to be in conformance with the applicable sections of NESC code C2-2012 and Puc 300.

6. Review of public need and public impact.

In order to meet the reasonable requirements of electric service to the public, PSNH has previously constructed, and currently operates and maintains, other three-phase 345 kV transmission lines within the same easement in the Town of Londonderry, New Hampshire. The 3124 Line is an integral part of the regional ISO New England Grid. Alternative transmission routes were evaluated but were ultimately not selected by ISO New England. The proposed 3124 Line will use the same easements and cross the same public lands as other existing electric lines.

PSNH asserts in the petition that the proposed construction of this crossing will be exercised without substantially affecting the rights of the public of the public lands at all three crossings. Minimum safe line clearances above the road and ground surfaces will be maintained at all times. The use and enjoyment of the rail trail by the public will not be diminished in any material respect as a result of the overhead line crossing.

Safety Division Staff concludes the impact to the public will be *de minimis* and not measurable. The proposed crossing does not appear to materially affect the rights of the public at each of the three locations because minimum safe line clearances above the road and ground surfaces will be easily be far above the amounts required by the NESC.

Safety Division Staff Recommendations:

Based on the results of its review of the petition, its attachments, and all other supporting documents filed to this docket, the Safety Division Staff recommends that the Commission:

- 1) Find that the license PSNH requests in this docket may be exercised without substantially affecting the public rights in the public lands which are the subject of the petition;
- 2) Licenses shall be for an approximate 58 ft section, a 472 ft section (21 ft section combined with 451 ft) and an 82.5 ft section of separate public lands all within the Town of Londonderry.
- 3) Grant PSNH a license to construct and maintain electric lines, including communication wires across the public lands of the near mile marker 13.8 of Interstate 93 and the Granite State Rail Trail in Londonderry, New Hampshire, as specified in the petition.

- 4) Issue an Order Nisi and orders for its publication; and
- 5) Require PSNH to forward the Order after 30 days of publication notice to Site Evaluation Committee for consideration in SEC proceeding 15-05.

Attachment

Appendix A

FIGURE 1:



Figure 1: 345kV, designated as the 3124 Line, a span of approximately 548 feet, Londonderry, NH. The yellow highlighted parcel is the public land owned by NH DOT that the petition seeks to cross. This is outside of the Highway ROW thus RSA 231:161 does not apply. RSA 371:17 does apply. The structure on the west side of the Interstate 93 at mile marker 13.8 is new structure 277 and will be located on PSNH property. Structure 277 is a 115 ft tall steel tubular 2 pole H Frame tangential structure with horizontal spacing of the conductors. Note this crossing is referenced as Crossing #1 in this Staff Memorandum and is for approximately 70 feet.

Appendix A

FIGURE 2:



Figure 2: 345kV, designated as the 3124 Line, a span of approximately 548 feet and another of 458 ft, Londonderry, NH. The yellow highlighted parcel is the public land owned by NH DOT that the petition seeks to cross. This is outside of the Highway ROW thus RSA 231:161 does not apply. RSA 371:17 is applicable. The structure on the east side of the Interstate 93 at mile marker 13.8 is new structure 278 and will be located within the Parcel. Structure 278 is a 115 ft tall steel tubular 2 pole H Frame tangential structure with horizontal spacing of the conductors. Structure 279 is identical to Structure 278 except it is located on PSNH property. Note this crossing is referenced as Crossing #2 in this Staff Memorandum and consists of one partial span and one full span is for approximately 21 feet and 451 feet respectively.

Appendix A

FIGURE 3:



Figure 3: 345kV, designated as the 3124 Line, a span of approximately 719 feet, Londonderry, NH. The yellow highlighted parcel is the public land owned by NH DOT that serves as a rail trail that the petition seeks to cross. The structure on the west side of the rail trail is new structure 285 and will be located on PSNH property. Structure 285 is a 105 ft tall steel tubular 2 pole H Frame tangential structure with horizontal spacing of the conductors. The Structure on the east side of the rail trail is Structure 286 and is a 90 ft tall steel tubular 3 pole H Frame tangential structure with horizontal spacing of the conductors. Note this crossing is referenced as Crossing #3 in this Staff Memorandum and is for approximately 82.5 feet.

Appendix A

FIGURE 4:

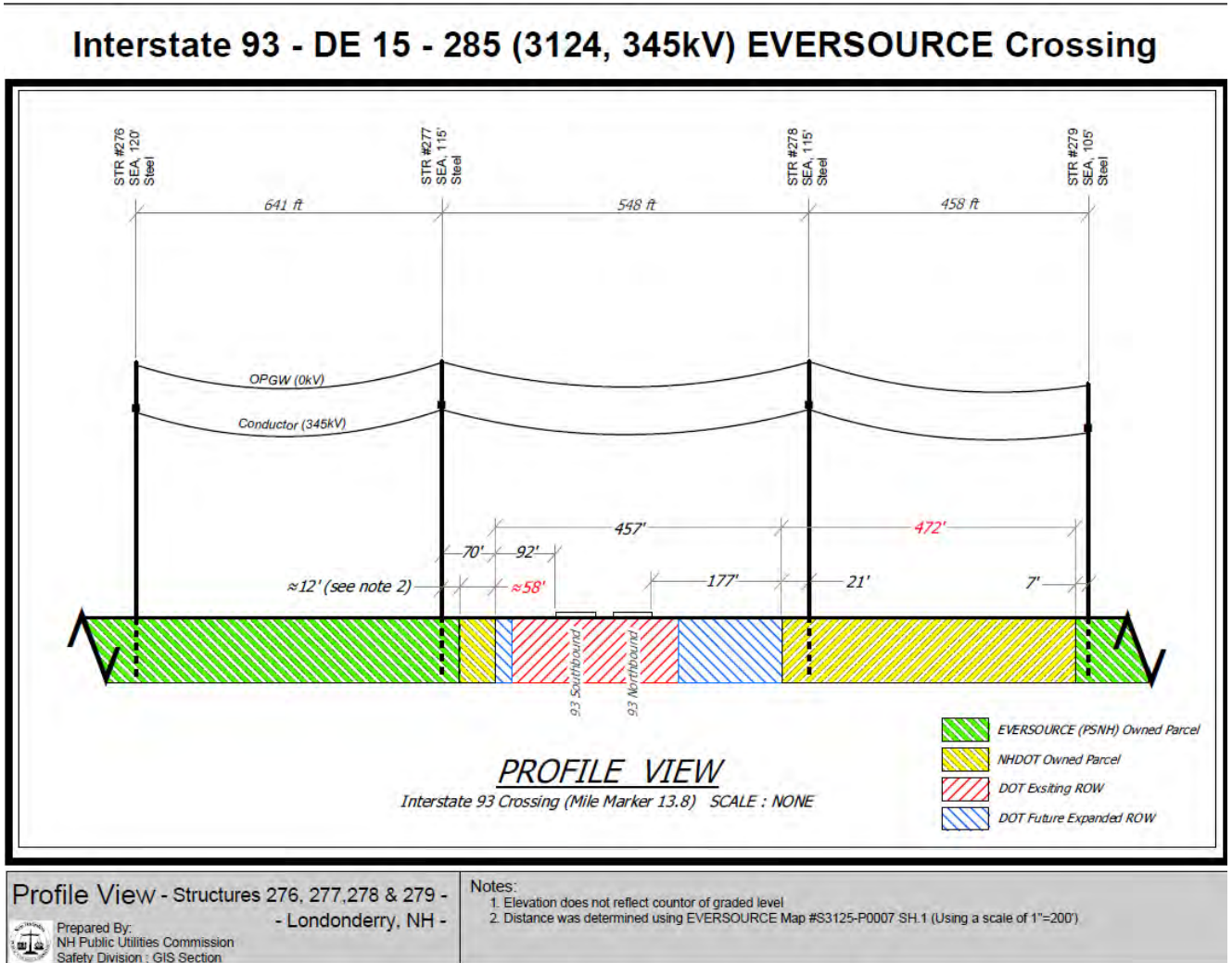


Figure 4: 345kV, designated as the 3124 Line, at mile marker 13.8 of I 93, Londonderry, NH. The yellow highlighted parcel is the public land owned by NH DOT that is outside of the Highway ROW. The yellow highlighted area is Crossing #1 (approximately 58 ft) and is located west of I93. The second yellow highlighted area is Crossing #2 (approximately 472 ft) and is located east of I93. Note that partial spans make up both Crossings.

SERVICE LIST - EMAIL ADDRESSES - DOCKET RELATED

Pursuant to N.H. Admin Rule Puc 203.11 (a) (1): Serve an electronic copy on each person identified on the service list.

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FILING INSTRUCTIONS:

- a) Pursuant to N.H. Admin Rule Puc 203.02 (a), with the exception of Discovery, file 7 copies, as well as an electronic copy, of all documents including cover letter with:
- DEBRA A HOWLAND
EXECUTIVE DIRECTOR
NHPUC
21 S. FRUIT ST, SUITE 10
CONCORD NH 03301-2429
- b) Serve an electronic copy with each person identified on the Commission's service list and with the Office of Consumer Advocate.
- c) Serve a written copy on each person on the service list not able to receive electronic mail.