

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

PETITION OF PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE FOR  
LICENSE TO CONSTRUCT AND MAINTAIN ELECTRIC LINES OVER AND  
ACROSS THE SAGAMORE CREEK IN THE CITY OF PORTSMOUTH, 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 a license to construct and maintain electric lines over and across the public waters of the Sagamore Creek in the City of Portsmouth, 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 three-phase 12.47 kV distribution line, designated as the 2W4 circuit, in Portsmouth, New Hampshire, which is an integral part of PSNH’s electric distribution system in the area. This distribution line, as currently constructed, crosses over the Sagamore Creek at a location approximately six feet east of the Route 1A (Sagamore Avenue) bridge.

2. The New Hampshire Department of Transportation (NHDOT) is replacing the existing bridge in this location with a new, wider bridge structure. In order to accommodate the NHDOT’s new bridge, it is necessary for PSNH to relocate the 2W4 distribution line by shifting it slightly further east (approximately six feet) of the current crossing location. There is no known Commission license for the existing 2W4 line crossing; however, the relocation of the 2W4 line crossing will be newly licensed under this petition.

3. The location of this proposed new crossing of Sagamore Creek is shown on the attached location map, marked as Exhibit 1.

4. The design and proposed construction of the crossing is shown on the attached PSNH Distribution Business Plan and Profile Drawing entitled “2W4 CIRCUIT BETWEEN STRUCTURES 136/46 & 136/49, SAGAMORE CREEK WATER CROSSING, PLAN & PROFILE”, marked as Exhibit 2.

5. The required technical information provided in this petition is based on the 2007 National Electrical Safety Code (NESC) C2-2007 and the crossing, as designed, will also be in conformance with the requirements of the 2002 NESC C2-2002.

6. The proposed crossing will occur between two new wood structures to be set with a span length of approximately 463 feet. The new structure on the north side of the Creek, number 136/46, is a dead end structure, constructed with a single class H2, 65' tall pole. The new structure on the south side of the Creek, number 136/49, is also a dead end structure, constructed with a single class H2, 65' tall pole. The construction detail for dead end structures applicable to both new poles is attached as Exhibit 3. The existing conductor wires (336 ACSR with 18/1 stranding) will be reused. The existing neutral will be replaced with 4/0 ACSR, 6/1 stranding. The conductors will be sagged using NESC Heavy Loading conditions (0° F, 4 pounds psf wind loading, ½" radial ice) at a maximum tension of 2,500 pounds. The neutral will be sagged using NESC Heavy Loading conditions at a maximum tension of 2,000 lbs.

7. Flood water elevations for the Sagamore Creek in this area are identified on Flood Insurance Rate Map, Rockingham County, New Hampshire, Panel 286 of 681, Map Number 33015C0286E, effective date May 17, 2005 issued by the Federal Emergency Management Agency (FEMA). The 100-year flood elevation for the Creek in this location is approximately 11 feet. This elevation is based on the National Geodetic Vertical Datum of 1929 (NGVD 29). The 100-year flood elevation is higher than the 10-year flood elevation required by NESC and provides a more conservative design.

8. The area of the Sagamore Creek at design flood level as defined by NESC (note 19 to Table 232-1) is 176± acres.

9. Using the above design criteria, the maximum sags of the phase and neutral wires and minimum clearances for the crossing have been determined and designed as follows (due to the proximity of the structure, the centerline elevation of the bridge was assumed as the reference point for clearances to land; this is more conservative than measuring to actual ground):

- A. NESC Heavy, Phase Wire – For the sag on the phase wires under this condition, the minimum clearance to land is 33.8'; the minimum clearance to the 100 year flood level is 48.3'.
- B. Minus 20° F, Phase Wire – For the sag on the phase wires under this condition, the minimum clearance to land is 36.1'. The minimum clearance to the 100 year flood level is 50.6'.
- C. 212° F, Phase Wire – For the sag on the phase wires under this condition, the minimum clearance to land is 30.0'. The minimum clearance to the 100 year flood level is 44.5'.
- D. NESC Heavy, Neutral Wire – For the sag on the neutral wire under this condition, the minimum clearance to land is 25.5'. The minimum clearance to the 100 year flood level is 40.0'.

- E. Minus 20° F, Neutral Wire – For the sag on the neutral wire under this condition, the minimum clearance to land is 27.6'. The minimum clearance to the 100 year flood level is 42.1'.
- F. 90° F, Neutral Wire - For the sag on the neutral wire under this condition, the minimum clearance to land is 25.0'. The minimum clearance to the 100 year flood level is 39.5'.
- G. Minimum Clearance, Phase Wire – The 212°F operating conditions (item C above), results in the minimum clearance for phase conductors. The minimum clearances expected under those conditions are 30.0' to land and 44.5' to the 100 year flood level. The required minimum clearance from the phase wires to land based on NESC Table 232-1.2 is 18.5'. The required minimum clearance from phase wire to the water surface based on NESC Table 232-1.7.b, is 28.5'. The crossing design as proposed exceeds the NESC requirements.
- H. Minimum Clearance, Neutral Wire – The 90° F operating conditions (item D above), results in the minimum clearance for the neutral wire. The minimum clearances expected under that condition is 25.0' to land and 39.5' to the 100 year flood level. The required minimum clearance from the neutral to land based on NESC Table 232-1.2 is 15.5'. The required minimum clearance from the neutral wire to the water surface based on NESC Table 232-1.7.b, is 25.5'. The crossing design as proposed exceeds the NESC requirements.
- I. Minimum Phase to Neutral Clearance –The conditions which would result in the minimum clearance between these lines is a winter condition with the phase wires at NESC Heavy Loading (item A above) and the neutral at - 20° F (item E above). This could occur after an ice storm if the neutral shed ice before the conductors. Under those conditions the phase to neutral clearance would be 2.4'. Based on NESC Table 235-6 section 2a, the minimum clearance should be 13.8 inches (1.15 feet).
- J. Bridge Clearance – The nearest proposed conductor will be located approximately one foot east of the bridge. As a conservative measure for evaluating clearances, the conductor was evaluated as if it were directly over the bridge. The required minimum clearance from the conductors to a bridge based on NESC table 234-2.1.b. is 12.0'. The actual clearance to the conductor wire operating at 212°F conditions would be 26'±. This was calculated as

the nearest distance to the bridge with an assumed railing height of 48". The crossing design as proposed exceeds the NESC requirements.

10. There are no NHDES or NHDOT permits necessary specifically for the construction of this crossing.

11. The proposed crossing has been designed and will be constructed, maintained and operated by PSNH in accordance with the NESC.

12. The new poles associated with this crossing are to be located within the street right of way for Route 1A (Sagamore Avenue) which is administered by the City of Portsmouth. A pole license application for the pole locations has been submitted to the City and is pending issuance.

13. PSNH submits that the license petitioned for herein may be exercised without substantially affecting the rights of the public in the public waters of Sagamore Creek. Minimum safe line clearances above the Creek surface and affected shorelines will be maintained at all times. The use and enjoyment by the public of the Creek will not be diminished in any material respect as a result of the overhead line crossing.

WHEREFORE, PSNH respectfully requests that the Commission:

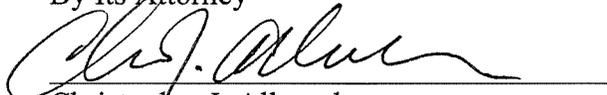
- a. Find that the license petitioned for herein may be exercised without substantially affecting the public rights in the public waters which are the subject of this petition;
- b. Grant PSNH a license to construct and maintain electric lines over and across the public waters of Sagamore Creek in Portsmouth, New Hampshire, as specified in the petition; and
- c. Issue an Order Nisi and orders for its publication.

Dated at Manchester this 24<sup>th</sup> day of March, 2011.

Respectfully submitted,

PUBLIC SERVICE COMPANY OF NEW  
HAMPSHIRE

By Its Attorney



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