

STATE OF NEW HAMPSHIRE

Inter-Department Communication

DATE: February 27, 2017
AT (OFFICE): NHPUC

FROM: Randy Knepper
 Director – Safety Division

SUBJECT: Docket No. DE 15-460, DE 15-461, DE 15-462 and DE 15-463
 Northern Pass Transmission Project
 Northern Pass Transmission, LLC (NPT) and
 Public Service Company of New Hampshire d/b/a Eversource Energy (ESE)
**Staff Recommendation #3 regarding
 17 Licenses to Cross Public Waters and Lands**

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

cc: Robert Wyatt, Assistant Director, Safety Division

Public waters and lands crossings included in this recommendation

Table 1 Zone 3 - List of NPT and ESE Crossings

Staff Zone-Map #	Water/Land Name	DE 15-460 NPT Water Crossing/License	DE 15-461 NPT Land Crossing/License	DE 15-462 ESE Water Crossing/License	DE 15-463 ESE Land Crossing/License	Totals
3-13	Pemigewasset River	Bridgewater	--	--	--	1
3-14	Squam River	Ashland	--	--	--	1
3-15	NHDOT	--	New Hampton	--	New Hampton	2
3-15	Pemigewasset River	New Hampton	--	New Hampton	--	2
3-16	Pemigewasset River	Bristol	--	Bristol	--	2
3-17	Pemigewasset River	New Hampton	--	New Hampton	--	2
3-18	W.H. Thomas Forest	--	Hill	--	--	1
3-19	Northern Rail Trail	--	Franklin	--	Franklin(2)	3
3-19	Chance Pond	Franklin	--	Franklin (2)	--	3
Zone 3	Total Licenses	6 NPT Water	3NPT Land	5 ESE Water	3 ESE Land	17

Staff Recommendation #3 for Zone 3 crossings

NPT filed petitions pursuant to RSA 371:17 in docket no. DE 15-460, DE 15-461, DE 15-462 and DE 15-463, for licenses to construct and maintain electric lines over, under and across public waters, lands and rails at 17 locations along the proposed path between Bridgewater and Franklin, New Hampshire (Zone 1). The proposed 320kV direct current high-voltage electric transmission line is referenced in the petitions as the DC Line. Other existing Eversource circuits along the project path that will require licenses to cross public waters or lands are identified by their assigned circuit numbers and operate at alternating current (AC).

The methodology used by Staff to determine how the analysis was performed is presented in the Overall Recommendation memorandum.

This Recommendation #3 is to provide the details examined that apply to Zone 3.

Within Zone 3 there are no underground proposed installations. All 17 remaining crossings are overhead for land, public waters, and rails. The 17 crossings are sequentially labeled from, north to south. All mapping and data collection tables are presented in and follow the same sequence.

Table 2 gives pertinent information tables provided in this Staff Recommendation regarding overhead crossing information that has been reviewed or otherwise analyzed as appropriate.

TABLE 2 ZONE 3 AERIAL CROSSINGS												
Staff	Water/Land Name	Town	Type Crossing	Voltage/Type	NPT/ESE	Circuit	Staff Calculated Clearance SAG 10	Clearance Shown on Petition Profile	Calculated Difference	Required Clearance NESC	Span ft	Verification
Zone-Map			Land									
#			Rail									
			Water									
3-13	Pemigewasset River	Bridgewater	Water	320kV/DC	NPT	3270 3271	45	41	4	35.7	926.83	Good
3-14	Squam River	Ashland	Water	320kV/DC	NPT	3270 3271	47	47	0	35.7	644.42	Excellent
3-15	NHDOT	New Hampton	Land	320kV/DC	NPT	3270 3271	69	65	4	21.7	601.98	Good
3-15	NHDOT	New Hampton	Land	115kV/AC	ESE	E115	51	46	5	16.1	692.46	Good
3-15	Pemigewasset River	New Hampton	Water	320kV/DC	NPT	3270 3271	81	81	0	35.7	612.44	Excellent
3-15	Pemigewasset River	New Hampton	Water	115kV/AC	ESE	E115	76	77	-1	30.1	594.21	Excellent
3-16	Pemigewasset River	Bristol	Water	320kV/DC	NPT	3270 3271	67	66	1	35.7	1447.42	Excellent
3-16	Pemigewasset River	Bristol	Water	115kV/AC	ESE	E115	47	43	4	30.1	1397.38	Good
3-17	Pemigewasset River	New Hampton	Water	320kV/DC	NPT	3270 3271	108	107	1	35.7	1112.90	Excellent
3-17	Pemigewasset River	New Hampton	Water	115kV/AC	ESE	A111	50	65	-15	30.1	728.06	Adequate
3-18	W.H. Thomas Forest	Hill	Land	320kV/DC	NPT	3270 3271	36	32	4	21.7	776.80	Good
3-19	Northern Rail Trail	Franklin	Rail	320kV/DC	NPT	3270 3271		55		21.7	248.68	Not Verified
3-19	Northern Rail Trail	Franklin	Rail	115kV/AC	ESE	M127		41		16.1	180.92	Not Verified
3-19	Northern Rail Trail	Franklin	Rail	115kV/AC	ESE	F139		61		16.1	175.35	Not Verified
3-19	Chance Pond	Franklin	Water	320kV/DC	NPT	3270 3271	81	79	2	35.7	597.17	Excellent
3-19	Chance Pond	Franklin	Water	115kV/AC	ESE	M127	57	55	2	30.1	524.86	Excellent
3-19	Chance Pond	Franklin	Water	115kV/AC	ESE	F139	63	60	3	30.1	550.31	Excellent

Refer to 7 detailed PUC generated single-page maps using its GIS mapping software specific to each crossing location. Each detailed map depicted all circuits, (proposed and existing including those that

will be relocated and those that will remain in place). Support structures, Support structure identifications, support structure heights, ROW widths, proper orientation of circuits, dimensions of spans, parcel information known as line lists (which emanated from NPT and ESE's petitions) are all depicted. Typical elevation views within the Right of Way are shown including cross sections within the ROW are taken from Forward NH Plans located at www.northernpass.us/towns.htm. In addition to the above geographical information was also depicted such as roads, buildings, rivers, trees, neighborhoods, bridges, and town lines.

Refer to Appendix A for single-page tables of information specific to each crossing, with a comments, conclusions, conditions and recommendations. Staff designated Zone 3 has identified 17 public waters, rails, and lands crossings that will require licenses. Specific technical and information relevant to the crossing are identified in each Appendix A table.

Existing license(s) and permissions previously granted by the PUC for these locations

See Attachments A1, A2 or A3 of the Overall Recommendation for licenses previously granted. NPT and ESE petitions were for the new DC transmission line and only for relocated ESE transmission lines. ESE did not include licenses for those existing transmission lines that were not being altered.

Existing Circuits where ESE does not have a license.

In examining the eight locations Staff found 2 locations where existing licenses were never issued:

1. Pemigewasset River, Bridgewater - E115 Circuit 115kV - PUC detailed map 13
2. Squam River, Ashland - E115 Circuit 115kV- PUC detailed map 14

Staff recommends ESE be required to submit petitions for granting of these licenses.

Safety Division Specific Recommendations with any applicable conditions:

See individual crossing details listed within Tables A.3.13.1, A.3.14.1, A.3.15a.1, A.3.15a.2, A.3.15b.1, A.3.15b.2, A.3.16.1, A.3.16.2, A.3.17.1, A.3.17.2, A.3.18.1, A.3.19a.1, A.3.19a.2, A.3.19a.2b, A.3.19b.1, A.3.19b.2a, A.3.19b.2b located in Appendix A of Recommendation #3.

Public Water/Land Crossing Name: Pemigewasset River, Bridgewater, NH for NPT

General Information		Technical Information	
PUC Docket Number	DE 15-460	Voltage	320 kV, DC
PUC Zone	3	Circuit	3720/3731
PUC Map Number	13	Conductor Type	AAAC
Petitioner (NPT, ESE)	NPT	Code Name	None
Petitioner Line List # (for Parcels traversed)	5813.01	Conductor Size	2933 kcmil
Crossing Circuit Configuration	Overhead	Stranding	91
Public Crossing Type (Water/Land)	Water	Conductor Horizontal Separation	28
Previous Public Crossing License Issued by PUC (Yes/No)	No	Conductor Vertical Separation	NA
Relocated ESE Crossing (Yes/No/NA)	Yes	Cable Weight (Lbs/Ft)	2.769
Right of Way Width	225	Back Pole Number	DC-1100
Number of Circuits within ROW	1 new (DC), 1 existing	Back Structure Height	110
Foreign Utilities within ROW	None	Back Ground Elevation (Ft)	474.2
Total Structures/Poles/Manholes this circuit crossing	2	Back Conductor Height	85.5
First Structure Identification	DC-1099	Back Conductor Elev. at Pole	559.7
State Listed Public Waters (Yes/No/Not Applicable)	Yes	Forward Pole Number	DC-1101
Last Structure Identification	DC-1101	Forward Structure Height	95
PUC Approximate Length of crossing for License (Land only) [Does Not apply to Water or Rail]	Not Applicable	Forward Ground Elevation	483.91
		Forward Conductor Height	70.5
		Forward Conductor Elev. at Pole	554.41
		Span (Feet)	926.83
		Max Tension NESC Heavy lbs.	20,000
		Max Operating Temp (°F)	130
		Calc'd Horiz.Tension@MaxTemp	
		Calc'd. Clearance (SAG 10)	45
		Clearance Shown on Profile	41
		Req'd Clearance (NESC)	35.7
Crossing Comments, Conclusions, Conditions, and Staff Recommendation			
Comments	This section of the Pemigewasset River is used recreationally for boating, canoe and kayaking, fishing and swimming.		
	In order to determine the minimum NESC clearance above the water, the engineering design incorporates flood water elevations that are based on information contained in flood insurance rate maps provided by FEMA. The design uses the 100-year flood elevation for this portion of the river.		
	The design incorporates NESC minimum required clearance above the water for these open supply conductors, using 100-year flood data (28.5 feet) plus the additional NESC Rule 232.C.1 requirement (7.19 feet) brings the minimum clearance to 35.7 feet.		
Conclusions	The proposed public water crossing will not substantially affect the public rights in these waters, nor will the proposed crossing substantially affect the functional use and safety in these public waters.		
	The the proposed design for this overhead crossing across public waters meets or exceeds NESC requirements for the expected recreational use by the public.		
Staff Recommendation	That the Commission grant the license to construct, maintain and operate the electric and communication lines over and across the public waters identified in the petition.		
Staff Recommended Conditions applied to License	The license for this public water crossing is contingent upon the Northern Pass Project receiving a Certificate of Site and Facility from the SEC.		

Public Water/Land Crossing Name: Squam River, Ashland, NH for NPT

General Information		Technical Information	
PUC Docket Number	DE 15-460	Voltage	320 kV, DC
PUC Zone	3	Circuit	3720/3731
PUC Map Number	13	Conductor Type	AAAC
Petitioner (NPT, ESE)	NPT	Code Name	None
Petitioner Line List # (for Parcels traversed)	5538, 5542	Conductor Size	2933 kcmil
Crossing Circuit Configuration	Overhead	Stranding	91
Public Crossing Type (Water/Land)	Water	Conductor Horizontal Separation	28
Previous Public Crossing License Issued by PUC (Yes/No)	No	Conductor Vertical Separation	NA
Relocated ESE Crossing (Yes/No/NA)	No	Cable Weight (Lbs/Ft)	2.769
Right of Way Width	225	Back Pole Number	DC-1113
Number of Circuits within ROW	1 new (DC), 1 existing	Back Structure Height	80
Foreign Utilities within ROW	None	Back Ground Elevation (Ft)	477.23
Total Structures/Poles/Manholes this circuit crossing	2	Back Conductor Height	55.5
First Structure Identification	DC-1113	Back Conductor Elev. at Pole	532.73
State Listed Public Waters (Yes/No/Not Applicable)	Yes	Forward Pole Number	DC-1114
Last Structure Identification	DC-1114	Forward Structure Height	80
PUC Approximate Length of crossing for License (Land only) [Does Not apply to Water or Rail]	Not Applicable	Forward Ground Elevation	494.98
		Forward Conductor Height	55.5
		Forward Conductor Elev. at Pole	550.48
		Span (Feet)	644.42
		Max Tension NESC Heavy lbs.	20,000
		Max Operating Temp (°F)	130
		Calc'd Horiz.Tension@MaxTemp	
		Calc'd. Clearance (SAG 10)	47
		Clearance Shown on Profile	47
		Req'd Clearance (NESC)	35.7
Crossing Comments, Conclusions, Conditions, and Staff Recommendation			
Comments	This section of the Squam River is used recreationally for boating, canoe and kayaking, fishing and swimming.		
	In order to determine the minimum NESC clearance above the water, the engineering design incorporates flood water elevations that are based on information contained in flood insurance rate maps provided by FEMA. The design uses the 100-year flood elevation for this portion of the river.		
	The design incorporates NESC minimum required clearance above the water for these open supply conductors, using 100-year flood data (28.5 feet) plus the additional NESC Rule 232.C.1 requirement (7.19 feet) brings the minimum clearance to 35.7 feet.		
Conclusions	The proposed public water crossing will not substantially affect the public rights in these waters, nor will the proposed crossing substantially affect the functional use and safety in these public waters.		
	The the proposed design for this overhead crossing across public waters meets or exceeds NESC requirements for the expected recreational use by the public.		
Staff Recommendation	That the Commission grant the license to construct, maintain and operate the electric lines and communication cables over across the public waters identified in the petition.		
Staff Recommended Conditions applied to License	The license for this public water crossing is contingent upon the Northern Pass Project receiving a Certificate of Site and Facility from the SEC.		

Public Water/Land Crossing Name: NH DOT ROW, New Hampton, NH for NPT

General Information		Technical Information	
PUC Docket Number	DE 15-461	Voltage	320 kV, DC
PUC Zone	3	Circuit	3720/3731
PUC Map Number	15	Conductor Type	AAAC
Petitioner (NPT, ESE)	NPT	Code Name	None
Petitioner Line List # (for Parcels traversed)	6145	Conductor Size	2933 kcmil
Crossing Circuit Configuration	Overhead	Stranding	91
Public Crossing Type (Water/Land)	Land	Conductor Horizontal Separation	28
Previous Public Crossing License Issued by PUC (Yes/No)	No	Conductor Vertical Separation	NA
Relocated ESE Crossing (Yes/No/NA)	Yes	Cable Weight (Lbs/Ft)	2.769
Right of Way Width	150	Back Pole Number	DC-1142
Number of Circuits within ROW	1 new (DC), 1 existing	Back Structure Height	110
Foreign Utilities within ROW	None	Back Ground Elevation (Ft)	521.02
Total Structures/Poles/Manholes this circuit crossing	2	Back Conductor Height	86
First Structure Identification	DC-1141	Back Conductor Elev. at Pole	607.02
State Listed Public Waters (Yes/No/Not Applicable)	NA	Forward Pole Number	DC-1143
Last Structure Identification	DC-1143	Forward Structure Height	105
PUC Approximate Length of crossing for License (Land only) [Does Not apply to Water or Rail]	~ 2,062 feet	Forward Ground Elevation	480.2
		Forward Conductor Height	80.5
		Forward Conductor Elev. at Pole	560.7
		Span (Feet)	601.98
		Max Tension NESC Heavy lbs.	20,000
		Max Operating Temp (°F)	130
		Calc'd Horiz.Tension@MaxTemp	7,865
		Calc'd. Clearance (SAG 10)	69
		Clearance Shown on Profile	65
		Req'd Clearance (NESC)	21.7
Crossing Comments, Conclusions, Conditions, and Staff Recommendation			
Comments	This State-owned land is managed by the NH Department of Transportation. This crossing uses NH DOT ROW over a State highway and a NH State Police firing range.		
	Staff received no comments from NH DOT related to the project's impact on this parcel.		
	Staff notes the the proposed design for this overhead crossing across this ROW meets or exceeds NESC requirements for the type of use.		
Conclusions	The proposed public land crossing will not substantially affect the public rights in these lands, nor will the proposed crossing substantially affect the functional use and safety in these public lands.		
	Staff notes the the proposed design for this overhead crossing across public lands meets or exceeds NESC requirements for expected use by the public.		
Staff Recommendation	That the Commission grant the license to construct, maintain and operate the electric and communication lines over and across the public lands identified in the petition.		
Staff Recommended Conditions applied to License	The license for this public land crossing is contingent upon the Northern Pass Project receiving a Certificate of Site and Facility from the SEC.		

Public Water/Land Crossing Name: NH DOT ROW, New Hampton, NH for ESE

General Information		Technical Information	
PUC Docket Number	DE 15-463	Voltage	115 kV, AC
PUC Zone	3	Circuit	E115
PUC Map Number	15	Conductor Type	ACSR
Petitioner (NPT, ESE)	ESE	Code Name	Drake
Petitioner Line List # (for Parcels traversed)	6145	Conductor Size	795 kcmil
Crossing Circuit Configuration	Overhead	Stranding	26/7
Public Crossing Type (Water/Land)	Land	Conductor Horizontal Separation	NA
Previous Public Crossing License Issued by PUC (Yes/No)	No	Conductor Vertical Separation	
Relocated ESE Crossing (Yes/No/NA)	Yes	Cable Weight (Lbs/Ft)	1.094
Right of Way Width	150	Back Pole Number	E115-170
Number of Circuits within ROW	1 new (DC), 1 existing	Back Structure Height	115
Foreign Utilities within ROW	None	Back Ground Elevation (Ft)	523.12
Total Structures/Poles/Manholes this circuit crossing	2	Back Conductor Height	77.57
First Structure Identification	E115-171	Back Conductor Elev. at Pole	600.69
State Listed Public Waters (Yes/No/Not Applicable)	NA	Forward Pole Number	E115-169
Last Structure Identification	E115-169	Forward Structure Height	100
PUC Approximate Length of crossing for License (Land only) [Does Not apply to Water or Rail]	~ 515 feet	Forward Ground Elevation	494.28
		Forward Conductor Height	62.5
		Forward Conductor Elev. at Pole	556.78
		Span (Feet)	692.46
		Max Tension NESC Heavy lbs.	9,000
		Max Operating Temp (°F)	285
		Calc'd Horiz.Tension@MaxTemp	2,772
		Calc'd. Clearance (SAG 10)	51
		Clearance Shown on Profile	46
		Req'd Clearance (NESC)	16.1
Crossing Comments, Conclusions, Conditions, and Staff Recommendation			
Comments	This State-owned land is managed by the NH Department of Transportation. This crossing uses NH DOT ROW over a State highway and a NH State Police firing range.		
	Staff received no comments from NH DOT related to the project's impact on this parcel.		
	Staff notes the the proposed design for this overhead crossing across this ROW meets or exceeds NESC requirements for the type of use.		
Conclusions	The proposed public land crossing will not substantially affect the public rights in these lands, nor will the proposed crossing substantially affect the functional use and safety in these public lands.		
	Staff notes the the proposed design for this overhead crossing across public lands meets or exceeds NESC requirements for expected use by the public.		
Staff Recommendation	That the Commission grant the license to construct, maintain and operate the electric and communication lines over, under or across the public lands identified in the petition.		
Staff Recommended Conditions applied to License	The license for this public land crossing is contingent upon the Northern Pass Project receiving a Certificate of Site and Facility from the SEC.		

Public Water/Land Crossing Name: Pemigewasset River, New Hampton, NH for NPT

General Information		Technical Information	
PUC Docket Number	DE 15-460	Voltage	320 kV, DC
PUC Zone	3	Circuit	3720/3731
PUC Map Number	15	Conductor Type	AAAC
Petitioner (NPT, ESE)	NPT	Code Name	None
Petitioner Line List # (for Parcels traversed)	6145.03	Conductor Size	2933 kcmil
Crossing Circuit Configuration	Overhead	Stranding	91
Public Crossing Type (Water/Land)	Water	Conductor Horizontal Separation	28
Previous Public Crossing License Issued by PUC (Yes/No)	No	Conductor Vertical Separation	NA
Relocated ESE Crossing (Yes/No/NA)	Yes	Cable Weight (Lbs/Ft)	2.769
Right of Way Width	150	Back Pole Number	DC-1144
Number of Circuits within ROW	1 new (DC), 1 existing	Back Structure Height	110
Foreign Utilities within ROW	None	Back Ground Elevation (Ft)	473.9
Total Structures/Poles/Manholes this circuit crossing	2	Back Conductor Height	85.5
First Structure Identification	DC-1144	Back Conductor Elev. at Pole	559.4
State Listed Public Waters (Yes/No/Not Applicable)	Yes	Forward Pole Number	DC-1145
Last Structure Identification	DC-1145	Forward Structure Height	65
PUC Approximate Length of crossing for License (Land only) [Does Not apply to Water or Rail]	Not Applicable	Forward Ground Elevation	535.95
		Forward Conductor Height	40.5
		Forward Conductor Elev. at Pole	576.45
		Span (Feet)	612.44
		Max Tension NESC Heavy lbs.	20,000
		Max Operating Temp (°F)	130
		Calc'd Horiz.Tension@MaxTemp	
		Calc'd Clearance (SAG 10)	81
		Clearance Shown on Profile	81
		Req'd Clearance (NESC)	35.7
Crossing Comments, Conclusions, Conditions, and Staff Recommendation			
Comments	This section of the Pemigewasset River is used recreationally for boating, canoe and kayaking, fishing and swimming.		
	In order to determine the minimum NESC clearance above the water, the engineering design incorporates flood water elevations that are based on information contained in flood insurance rate maps provided by FEMA. The design uses the 100-year flood elevation for this portion of the river.		
	The design incorporates NESC minimum required clearance above the water for these open supply conductors, using 100-year flood data (28.5 feet) plus the additional NESC Rule 232.C.1 requirement (7.19 feet) brings the minimum clearance to 35.7 feet.		
Conclusions	The proposed public water crossing will not substantially affect the public rights in these waters, nor will the proposed crossing substantially affect the functional use and safety in these public waters.		
	The the proposed design for this overhead crossing across public waters meets or exceeds NESC requirements for the expected recreational use by the public.		
Staff Recommendation	That the Commission grant the license to construct, maintain and operate the electric and communications lines over, under or across the public waters identified in the petition.		
Staff Recommended Conditions applied to License	The license for this public water crossing is contingent upon the Northern Pass Project receiving a Certificate of Site and Facility from the SEC.		

Public Water/Land Crossing Name: Pemigewasset River, New Hampton, NH for ESE

General Information		Technical Information	
PUC Docket Number	DE 15-462	Voltage	115 kV, AC
PUC Zone	3	Circuit	E115
PUC Map Number	15	Conductor Type	ACSR
Petitioner (NPT, ESE)	ESE	Code Name	Drake
Petitioner Line List # (for Parcels traversed)	6145.03	Conductor Size	795 kcmil
Crossing Circuit Configuration	Overhead	Stranding	26/7
Public Crossing Type (Water/Land)	Water	Conductor Horizontal Separation	12
Previous Public Crossing License Issued by PUC	No	Conductor Vertical Separation	NA
Relocated ESE Crossing (Yes/No/NA)	Yes	Cable Weight (Lbs/Ft)	1.094
Right of Way Width	150	Back Pole Number	E115-168
Number of Circuits within ROW	1 new (DC), 1 existing	Back Structure Height	125
Foreign Utilities within ROW	None	Back Ground Elevation (Ft)	467.8
Total Structures/Poles/Manholes this circuit crossing	2	Back Conductor Height	87.5
First Structure Identification	E115-168	Back Conductor Elev. at Pole	555.3
State Listed Public Waters (Yes/No/Not Applicable)	Yes	Forward Pole Number	E115-167
Last Structure Identification	E115-167	Forward Structure Height	75
PUC Approximate Length of crossing for License (Land only) [Does Not apply to Water or Rail]	Not Applicable	Forward Ground Elevation	536.88
		Forward Conductor Height	37.5
		Forward Conductor Elev. at Pole	574.38
		Span (Feet)	594.21
		Max Tension NESC Heavy lbs.	20,000
		Max Operating Temp (°F)	130
		Calc'd Horiz.Tension@MaxTemp	2,587
		Calc'd Clearance (SAG 10)	76
		Clearance Shown on Profile	77
		Req'd Clearance (NESC)	30.1
Crossing Comments, Conclusions, Conditions, and Staff Recommendation			
<p>Comments</p> <p>This section of the Pemigewasset River is used recreationally for boating, canoe and kayaking, fishing and swimming.</p> <p>In order to determine the minimum NESC clearance above the water, the engineering design incorporates flood water elevations that are based on information contained in flood insurance rate maps provided by FEMA. The design uses the 100-year flood elevation for this portion of the river.</p> <p>The design incorporates NESC minimum required clearance above the water for these open supply conductors, using 100-year flood data (28.5 feet) plus the additional NESC Rule 232.C.1 requirement (1.59 feet) brings the minimum clearance to 30.1 feet.</p>			
<p>Conclusions</p> <p>The proposed public water crossing will not substantially affect the public rights in these waters, nor will the proposed crossing substantially affect the functional use and safety in these public waters.</p> <p>The the proposed design for this overhead crossing across public waters meets or exceeds NESC requirements for the expected recreational use by the public.</p>			
<p>Staff Recommendation</p> <p>That the Commission grant the license to construct, maintain and operate the electric and communication lines over and across the public waters identified in the petition.</p>			
<p>Staff Recommended Conditions applied to License</p> <p>The license for this public water crossing is contingent upon the Northern Pass Project receiving a Certificate of Site and Facility from the SEC.</p>			

Public Water/Land Crossing Name: Pemigewasset River, Bristol, NH for NPT

General Information		Technical Information	
PUC Docket Number	DE 15-460	Voltage	320 kV, DC
PUC Zone	3	Circuit	3720/3731
PUC Map Number	16	Conductor Type	AAAC
Petitioner (NPT, ESE)	NPT	Code Name	None
Petitioner Line List # (for Parcels traversed)	6441	Conductor Size	2933 kcmil
Crossing Circuit Configuration	Overhead	Stranding	91
Public Crossing Type (Water/Land)	Water	Conductor Horizontal Separation	36
Previous Public Crossing License Issued by PUC (Yes/No)	NA	Conductor Vertical Separation	NA
Relocated ESE Crossing (Yes/No/NA)	Yes	Cable Weight (Lbs/Ft)	2.769
Right of Way Width	225	Back Pole Number	DC-1174
Number of Circuits within ROW	1 new (DC), 1 existing	Back Structure Height	100
Foreign Utilities within ROW	None	Back Ground Elevation (Ft)	530.1
Total Structures/Poles/Manholes this circuit crossing	2	Back Conductor Height	75.5
First Structure Identification	DC-1174	Back Conductor Elev. at Pole	605.6
State Listed Public Waters (Yes/No/Not Applicable)	Yes	Forward Pole Number	DC-1175
Last Structure Identification	DC-1175	Forward Structure Height	125
PUC Approximate Length of crossing for License (Land only) [Does Not apply to Water or Rail]	Not Applicable	Forward Ground Elevation	474.95
		Forward Conductor Height	100.5
		Forward Conductor Elev. at Pole	575.45
		Span (Feet)	1447.42
		Max Tension NESC Heavy lbs.	20,000
		Max Operating Temp (°F)	130
		Calc'd Horiz.Tension@MaxTemp	10,494
		Calc'd Clearance (SAG 10)	67
		Clearance Shown on Profile	66
		Req'd Clearance (NESC)	35.7
Crossing Comments, Conclusions, Conditions, and Staff Recommendation			
Comments	This section of the Pemigewasset River is used recreationally for boating, canoe and kayaking, fishing and swimming.		
	In order to determine the minimum NESC clearance above the water, the engineering design incorporates flood water elevations that are based on information contained in flood insurance rate maps provided by FEMA. The design uses the 100-year flood elevation for this portion of the river.		
	The design incorporates NESC minimum required clearance above the water for these open supply conductors, using 100-year flood data (28.5 feet) plus the additional NESC Rule 232.C.1 requirement (7.19 feet) brings the minimum clearance to 35.7 feet.		
Conclusions	The proposed public water crossing will not substantially affect the public rights in these waters, nor will the proposed crossing substantially affect the functional use and safety in these public waters.		
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Staff Recommendation	That the Commission grant the license to construct, maintain and operate the electric and communication lines over and across the public waters identified in the petition.		
Staff Recommended Conditions applied to License	The license for this public water crossing is contingent upon the Northern Pass Project receiving a Certificate of Site and Facility from the SEC.		

Public Water/Land Crossing Name: Pemigewasset River, Bristol, NH for ESE

General Information		Technical Information	
PUC Docket Number	DE 15-462	Voltage	115 kV, AC
PUC Zone	3	Circuit	E115
PUC Map Number	16	Conductor Type	ACSR
Petitioner (NPT, ESE)	ESE	Code Name	Drake
Petitioner Line List # (for Parcels traversed)	6441	Conductor Size	795 kcmil
Crossing Circuit Configuration	Overhead	Stranding	26/7
Public Crossing Type (Water/Land)	Water	Conductor Horizontal Separation	0
Previous Public Crossing License Issued by PUC (Yes/No)	Yes	Conductor Vertical Separation	12
Relocated ESE Crossing (Yes/No/NA)	Yes	Cable Weight (Lbs/Ft)	1.094
Right of Way Width	225	Back Pole Number	E115-123
Number of Circuits within ROW	1 new (DC), 1 existing	Back Structure Height	120
Foreign Utilities within ROW	None	Back Ground Elevation (Ft)	521.08
Total Structures/Poles/Manholes this circuit crossing	2	Back Conductor Height	82.5
First Structure Identification	E115-123	Back Conductor Elev. at Pole	603.58
State Listed Public Waters (Yes/No/Not Applicable)	Yes	Forward Pole Number	E115-122
Last Structure Identification	E115-122	Forward Structure Height	120
PUC Approximate Length of crossing for License (Land only) [Does Not apply to Water or Rail]	Not Applicable	Forward Ground Elevation	472.85
		Forward Conductor Height	82.5
		Forward Conductor Elev. at Pole	555.35
		Span (Feet)	1397.38
		Max Tension NESC Heavy lbs.	9,000
		Max Operating Temp (°F)	285
		Calc'd Horiz.Tension@MaxTemp	3,443
		Calc'd. Clearance (SAG 10)	47
		Clearance Shown on Profile	43
		Req'd Clearance (NESC)	30.1
Crossing Comments, Conclusions, Conditions, and Staff Recommendation			
Comments	This section of the Pemigewasset River is used recreationally for boating, canoe and kayaking, fishing and swimming.		
	In order to determine the minimum NESC clearance above the water, the engineering design incorporates flood water elevations that are based on information contained in flood insurance rate maps provided by FEMA. The design uses the 100-year flood elevation for this portion of the river.		
	The design incorporates NESC minimum required clearance above the water for these open supply conductors, using 100-year flood data (28.5 feet) plus the additional NESC Rule 232.C.1 requirement (1.59 feet) brings the minimum clearance to 30.1 feet.		
Conclusions	The proposed public water crossing will not substantially affect the public rights in these waters, nor will the proposed crossing substantially affect the functional use and safety in these public waters.		
	The the proposed design for this overhead crossing across public waters meets or exceeds NESC requirements for the expected recreational use by the public.		
Staff Recommendation	That the Commission grant the license to construct, maintain and operate the electric and communication lines over and across the public waters identified in the petition.		
Staff Recommended Conditions applied to License	The license for this public water crossing is contingent upon the Northern Pass Project receiving a Certificate of Site and Facility from the SEC.		

Public Water/Land Crossing Name: Pemigewasset River, New Hampton, NH for NPT

General Information		Technical Information	
PUC Docket Number	DE 15-460	Voltage	320 kV, DC
PUC Zone	3	Circuit	3720/3731
PUC Map Number	17	Conductor Type	AAAC
Petitioner (NPT, ESE)	NPT	Code Name	None
Petitioner Line List # (for Parcels traversed)	6182	Conductor Size	2933 kcmil
Crossing Circuit Configuration	Overhead	Stranding	91
Public Crossing Type (Water/Land)	Water	Conductor Horizontal Separation	36
Previous Public Crossing License Issued by PUC (Yes/No)	No	Conductor Vertical Separation	NA
Relocated ESE Crossing (Yes/No/NA)	Yes	Cable Weight (Lbs/Ft)	2.769
Right of Way Width	225	Back Pole Number	DC-1205
Number of Circuits within ROW	1 new (DC), 1 existing	Back Structure Height	95
Foreign Utilities within ROW	None	Back Ground Elevation (Ft)	399.63
Total Structures/Poles/Manholes this circuit crossing	2	Back Conductor Height	70.5
First Structure Identification	DC-1205	Back Conductor Elev. at Pole	470.13
State Listed Public Waters (Yes/No/Not Applicable)	Yes	Forward Pole Number	DC-1206
Last Structure Identification	DC-1206	Forward Structure Height	95
PUC Approximate Length of crossing for License (Land only) [Does Not apply to Water or Rail]	Not Applicable	Forward Ground Elevation	415.37
		Forward Conductor Height	70.5
		Forward Conductor Elev. at Pole	485.87
		Span (Feet)	1112.9
		Max Tension NESC Heavy lbs.	20,000
		Max Operating Temp (°F)	130
		Calc'd Horiz.Tension@MaxTemp	9,912
		Calc'd Clearance (SAG 10)	108
		Clearance Shown on Profile	107
		Req'd Clearance (NESC)	35.7
Crossing Comments, Conclusions, Conditions, and Staff Recommendation			
Comments	This section of the Pemigewasset River is used recreationally for boating, canoe and kayaking, fishing and swimming.		
	In order to determine the minimum NESC clearance above the water, the engineering design incorporates flood water elevations that are based on information contained in flood insurance rate maps provided by FEMA. The design uses the 100-year flood elevation for this portion of the river.		
	The design incorporates NESC minimum required clearance above the water for these open supply conductors, using 100-year flood data (28.5 feet) plus the additional NESC Rule 232.C.1 requirement (7.19 feet) brings the minimum clearance to 35.7 feet.		
Conclusions	The proposed public water crossing will not substantially affect the public rights in these waters, nor will the proposed crossing substantially affect the functional use and safety in these public waters.		
	The the proposed design for this overhead crossing across public waters meets or exceeds NESC requirements for the expected recreational use by the public.		
Staff Recommendation	That the Commission grant the license to construct, maintain and operate the electric and communication lines over and across the public waters identified in the petition.		
Staff Recommended Conditions applied to License	The license for this public water crossing is contingent upon the Northern Pass Project receiving a Certificate of Site and Facility from the SEC.		

Public Water/Land Crossing Name: Pemigewasset River, New Hampton, NH for ESE

General Information		Technical Information	
PUC Docket Number	DE 15-462	Voltage	115 kV, AC
PUC Zone	3	Circuit	A111
PUC Map Number	17	Conductor Type	ACSR
Petitioner (NPT, ESE)	ESE	Code Name	Linnet
Petitioner Line List # (for Parcels traversed)	6182	Conductor Size	336 kcmil
Crossing Circuit Configuration	Overhead	Stranding	26/7
Public Crossing Type (Water/Land)	Water	Conductor Horizontal Separation	14
Previous Public Crossing License Issued by PUC (Yes/No)	Yes	Conductor Vertical Separation	0
Relocated ESE Crossing (Yes/No/NA)	Yes	Cable Weight (Lbs/Ft)	0.462
Right of Way Width	225	Back Pole Number	A111-80A
Number of Circuits within ROW	1 new (DC), 1 existing	Back Structure Height	65.5
Foreign Utilities within ROW	None	Back Ground Elevation (Ft)	378.06
Total Structures/Poles/Manholes this circuit crossing	2	Back Conductor Height	59.53
First Structure Identification	A111-80A	Back Conductor Elev. at Pole	437.59
State Listed Public Waters (Yes/No/Not Applicable)	Yes	Forward Pole Number	A111-80
Last Structure Identification	A111-80	Forward Structure Height	74.5
PUC Approximate Length of crossing for License (Land only) [Does Not apply to Water or Rail]	Not Applicable	Forward Ground Elevation	325.19
		Forward Conductor Height	68.53
		Forward Conductor Elev. at Pole	393.72
		Span (Feet)	728.06
		Max Tension NESC Heavy lbs.	3,500
		Max Operating Temp (°F)	285
		Calc'd Horiz.Tension@MaxTemp	847
		Calc'd Clearance (SAG 10)	50
		Clearance Shown on Profile	65
		Req'd Clearance (NESC)	30.1
Crossing Comments, Conclusions, Conditions, and Staff Recommendation			
Comments	This section of the Pemigewasset River is used recreationally for boating, canoe and kayaking, fishing and swimming.		
	In order to determine the minimum NESC clearance above the water, the engineering design incorporates flood water elevations that are based on information contained in flood insurance rate maps provided by FEMA. The design uses the 100-year flood elevation for this portion of the river.		
	The design incorporates NESC minimum required clearance above the water for these open supply conductors, using 100-year flood data (28.5 feet) plus the additional NESC Rule 232.C.1 requirement (1.59 feet) brings the minimum clearance to 30.1 feet.		
Conclusions	The proposed public water crossing will not substantially affect the public rights in these waters, nor will the proposed crossing substantially affect the functional use and safety in these public waters.		
	The the proposed design for this overhead crossing across public waters meets or exceeds NESC requirements for the expected recreational use by the public.		
Staff Recommendation	That the Commission grant the license to construct, maintain and operate the electric and communication lines over and across the public waters identified in the petition.		
Staff Recommended Conditions applied to License	The license for this public water crossing is contingent upon the Northern Pass Project receiving a Certificate of Site and Facility from the SEC.		

Public Water/Land Crossing Name: William H. Thomas State Forest, Hill, NH for NPT

General Information		Technical Information	
PUC Docket Number	DE 15-461	Voltage	320 kV, DC
PUC Zone	3	Circuit	3720/3731
PUC Map Number	18	Conductor Type	AAAC
Petitioner (NPT, ESE)	NPT	Code Name	None
Petitioner Line List # (for Parcels traversed)	6703, 6704, 6705	Conductor Size	2933 kcmil
Crossing Circuit Configuration	Overhead	Stranding	91
Public Crossing Type (Water/Land)	Land	Conductor Horizontal Separation	28
Previous Public Crossing Licensed Issued by PUC	NA	Conductor Vertical Separation	NA
Relocated ESE Crossing (Yes/No/NA)	NA	Cable Weight (Lbs/Ft)	2.769
Right of Way Width	225	Back Pole Number	DC-1209
Number of Circuits within ROW	1 new (DC)	Back Structure Height	85
Foreign Utilities within ROW	None	Back Ground Elevation (Ft)	464.02
Total Structures/Poles/Manholes this circuit crossing	5	Back Conductor Height	61
First Structure Identification	DC-1209	Back Conductor Elev. at Pole	525.02
State Listed Public Waters (Yes/No/Not Applicable)	NA	Forward Pole Number	DC-1210
Last Structure Identification	DC-1213	Forward Structure Height	85
PUC Approximate Length of crossing for License (Land only) [Does Not apply to Water or Rail]	~ 4,142 feet	Forward Ground Elevation	456.49
		Forward Conductor Height	61
		Forward Conductor Elev. at Pole	517.49
		Span (Feet)	776.8
		Max Tension NESC Heavy lbs.	20,000
		Max Operating Temp (°F)	130
		Calc'd Horiz.Tension@MaxTemp	8,812
		Calc'd Clearance (SAG 10)	36
		Clearance Shown on Profile	32
		Req'd Clearance (NESC)	21.7
Crossing Comments, Conclusions, Conditions, and Staff Recommendation			
Comments	The William H. Thomas State Forrest consists of three parcels of land that are used recreationally for hiking, picnicing, hunting and fishing.		
	This State-owned public land parcel is managed by DRED. DRED did not provide any information or concerns of negative impacts on the public use and enjoyment of this public land as a result of this proposed project.		
	The utility ROW passing through the three parcels spans approximately 4,000 feet.		
Conclusions	The proposed public land crossing will not substantially affect the public rights in these lands, nor will the proposed crossing substantially affect the functional use and safety in these public lands.		
	The the proposed design for this overhead crossing of public lands meets or exceeds NESC requirements for the expected recreational use by the public.		
Staff Recommendation	That the Commission grant the license to construct, maintain and operate the electric and communications lines over and across the public lands identified in the petition.		
Staff Recommended Conditions applied to License	The license for this public land crossing is contingent upon the Northern Pass Project receiving a Certificate of Site and Facility from the SEC.		

Public Water/Land Crossing Name: Northern Rail Trail, NH Bureau of Rail and Transit, Franklin, NH for NPT

General Information		Technical Information	
PUC Docket Number	DE 15-461	Voltage	320 kV, DC
PUC Zone	3	Circuit	3720/3731
PUC Map Number	19	Conductor Type	AAAC
Petitioner (NPT, ESE)	NPT	Code Name	None
Petitioner Line List # (for Parcels traversed)	7317.01	Conductor Size	2933 kcmil
Crossing Circuit Configuration	Overhead	Stranding	91
Public Crossing Type (Water/Land)	Land	Conductor Horizontal Separation	28
Previous Public Crossing Licensed Issued by PUC (Yes/No)	No	Conductor Vertical Separation	NA
Relocated ESE Crossing (Yes/No/NA)	Yes	Cable Weight (Lbs/Ft)	2.769
Right of Way Width	up to 375 feet	Back Pole Number	DC-1270
Number of Circuits within ROW	1 new (DC), 1 existing	Back Structure Height	100
Foreign Utilities within ROW	None	Back Ground Elevation (Ft)	429.82
Total Structures/Poles/Manholes this circuit crossing	2	Back Conductor Height	55 EST.
First Structure Identification	DC-1270	Back Conductor Elev. at Pole	71 EST.
State Listed Public Waters (Yes/No/Not Applicable)	NA	Forward Pole Number	DC-1271
Last Structure Identification	DC-1271	Forward Structure Height	90
PUC Approximate Length of crossing for License (Land only) [Does Not apply to Water or Rail]	181 feet	Forward Ground Elevation	429.78
		Forward Conductor Height	55 EST.
		Forward Conductor Elev. at Pole	62 EST.
		Span (Feet)	248.68
		Max Tension NESC Heavy lbs.	20,000
		Max Operating Temp (°F)	130
		Calc'd Horiz.Tension@MaxTemp	
		Calc'd. Clearance (SAG 10)	DID NOT CALC
		Clearance Shown on Profile	55
		Req'd Clearance (NESC)	21.7
Crossing Comments, Conclusions, Conditions, and Staff Recommendation			
Comments	This NPT crossing traverses State-owned land in this section of Franklin, NH. The land is managed by the NH DOT, Bureau of Rail and Transit. In response to a NH PUC Staff inquiry, the NH DOT provided comments that noted the NH DRED has managed the rail trail through this area for more than ten years.		
	The Northern Rail Trail follows the rail corridor through these parcels and is used for a variety of recreation activities including snowmobiling, cross country skiing, walking, hiking, biking, etc..		
	NESC requires a 21.7 minimum clearance between the conductor and the terrain surface for this proposed circuit specifications. The NPT profile view displays a 30-foot reference line tracking above the surface terrain with the conductor tracking at approximately 25 feet above the 30 foot reference line. Staff did not verify the clearance.		
Conclusions	The proposed public land crossing will not substantially affect the public rights on this land, nor will the proposed crossing substantially affect the functional use and safety in these public lands.		
	The the proposed design for this overhead crossing of public lands meets or exceeds NESC requirements for the expected recreational use by the public.		
Staff Recommendation	That the Commission grant the license to construct, maintain and operate the electric and communication lines over and across the public lands identified in the petition.		
	The license for this public land crossing is based on NPT representing a 55 foot clearance which is more than double the requirement.		
Staff Recommended Conditions applied to License	The license for this public land crossing is contingent upon the Northern Pass Project receiving a Certificate of Site and Facility from the SEC.		

Public Water/Land Crossing Name: Northern Rail Trail, NH Bureau of Rail and Transit, Franklin, NH for ESE

General Information		Technical Information	
PUC Docket Number	DE 15-463	Voltage	115 kV, AC
PUC Zone	3	Circuit	M127
PUC Map Number	19	Conductor Type	ACSR
Petitioner (NPT, ESE)	ESE	Code Name	Drake
Petitioner Line List # (for Parcels traversed)	7317.01	Conductor Size	795 kcmil
Crossing Circuit Configuration	Overhead	Stranding	26/7
Public Crossing Type (Water/Land)	Land	Conductor Horizontal Separation	
Previous Public Crossing Licensed Issued by PUC (Yes/No)	No	Conductor Vertical Separation	
Relocated ESE Crossing (Yes/No/NA)	Yes	Cable Weight (Lbs/Ft)	1.094
Right of Way Width	up to 375 feet	Back Pole Number	M127-1a
Number of Circuits within ROW	1 new (DC), 3 existing	Back Structure Height	74.5
Foreign Utilities within ROW	None	Back Ground Elevation (Ft)	429.76
Total Structures/Poles/Manholes this circuit crossing	2	Back Conductor Height	>= 41
First Structure Identification	M127-1	Back Conductor Elev. at Pole	60 Est.
State Listed Public Waters (Yes/No/Not Applicable)	NA	Forward Pole Number	M127-1
Last Structure Identification	M127-1A	Forward Structure Height	50.5
PUC Approximate Length of crossing for License (Land only) [Does Not apply to Water or Rail]	181 feet	Forward Ground Elevation	429.76
		Forward Conductor Height	>= 41
		Forward Conductor Elev. at Pole	42 Est.
		Span (Feet)	180.92
		Max Tension NESC Heavy lbs.	9,000
		Max Operating Temp (°F)	285
		Calc'd Horiz.Tension@MaxTemp	
		Calc'd. Clearance (SAG 10)	
		Clearance Shown on Profile	41
		Req'd Clearance (NESC)	16.1
Crossing Comments, Conclusions, Conditions, and Staff Recommendation			
Comments	This relocated ESE crossing traverses State-owned land in this section of Franklin, NH. The land is managed by the NH DOT, Bureau of Rail and Transit. In response to a NH PUC Staff inquiry, the NH DOT provided comments that noted the NH DRED has managed the rail trail through this area for more than ten years.		
	The Northern Rail Trail follows the rail corridor through these parcels and is used for a variety of recreation activities including snowmobiling, cross country skiing, walking, hiking, biking, etc..		
	NESC requires a 16.1 foot minimum clearance between the closest conductor and the terrain surface for this proposed circuit specifications. The ESE profile view displays a 24-foot reference line tracking above the surface terrain with the conductor tracking at approximately 20 feet above the 24 foot reference line at the closest point. Staff did not verify the clearance.		
Conclusions	The proposed public land crossing will not substantially affect the public rights on this land, nor will the proposed crossing substantially affect the functional use and safety in these public lands.		
	The the proposed design for this overhead crossing of public lands meets or exceeds NESC requirements for the expected recreational use by the public.		
Staff Recommendation	That the Commission grant the license to construct, maintain and operate the electric and communication lines over and across the public lands identified in the petition.		
	The license for this public land crossing is based on ESE representing a 41 foot clearance which is more than double the requirement.		
Staff Recommended Conditions applied to License	The license for this public land crossing is contingent upon the Northern Pass Project receiving a Certificate of Site and Facility from the SEC.		

Public Water/Land Crossing Name: Northern Rail Trail, NH Bureau of Rail and Transit, Franklin, NH for ESE

General Information		Technical Information	
PUC Docket Number	DE 15-463	Voltage	115 kV, AC
PUC Zone	3	Circuit	F139
PUC Map Number	19	Conductor Type	ACSR
Petitioner (NPT, ESE)	ESE	Code Name	Drake
Petitioner Line List # (for Parcels traversed)	7317.01	Conductor Size	795 kcmil
Crossing Circuit Configuration	Overhead	Stranding	26/7
Public Crossing Type (Water/Land)	Land	Conductor Horizontal Separation	
Previous Public Crossing Licensed Issued by PUC	Yes	Conductor Vertical Separation	
Relocated ESE Crossing (Yes/No/NA)	Yes	Cable Weight (Lbs/Ft)	1.094
Right of Way Width	up to 375 feet	Back Pole Number	F139-343
Number of Circuits within ROW	1 new (DC), 3 existing	Back Structure Height	70
Foreign Utilities within ROW	None	Back Ground Elevation (Ft)	435.1
Total Structures/Poles/Manholes this circuit crossing	2	Back Conductor Height	>= 61
First Structure Identification	F139-343	Back Conductor Elev. at Pole	60 Est.
State Listed Public Waters (Yes/No/Not Applicable)	NA	Forward Pole Number	F139-342
Last Structure Identification	F139-342	Forward Structure Height	92.5
PUC Approximate Length of crossing for License (Land only) [Does Not apply to Water or Rail]	181 feet	Forward Ground Elevation	427.83
		Forward Conductor Height	>= 61
		Forward Conductor Elev. at Pole	65 Est.
		Span (Feet)	175.35
		Max Tension NESC Heavy lbs.	9,000
		Max Operating Temp (°F)	285
		Calc'd Horiz.Tension@MaxTemp	
		Calc'd Clearance (SAG 10)	
		Clearance Shown on Profile	61
		Req'd Clearance (NESC)	16.1
Crossing Comments, Conclusions, Conditions, and Staff Recommendation			
Comments	This relocated ESE crossing traverses State-owned land in this section of Franklin, NH. The land is managed by the NH DOT, Bureau of Rail and Transit. In response to a NH PUC Staff inquiry, the NH DOT provided comments that noted the NH DRED has managed the rail trail through this area for more than ten years.		
	The Northern Rail Trail follows the rail corridor through these parcels and is used for a variety of recreation activities including snowmobiling, cross country skiing, walking, hiking, biking, etc..		
	NESC requires a 16.1 foot minimum clearance between the closest conductor and the terrain surface for this proposed circuit specifications. The ESE profile view displays a 24-foot reference line tracking above the surface terrain with the conductor tracking at approximately 37 feet above the 24 foot reference line at the closest point. Staff did not verify the clearance.		
Conclusions	The proposed public land crossing will not substantially affect the public rights on this land, nor will the proposed crossing substantially affect the functional use and safety in these public lands.		
	The the proposed design for this overhead crossing of public lands meets or exceeds NESC requirements for the expected recreational use by the public.		
Staff Recommendation	That the Commission grant the license to construct, maintain and operate the electric and communication lines over and across the public lands identified in the petition. The license for this public land crossing is based on ESE representing a 61 foot clearance which is more than triple the requirement.		
Staff Recommended Conditions applied to License	The license for this public land crossing is contingent upon the Northern Pass Project receiving a Certificate of Site and Facility from the SEC.		

Public Water/Land Crossing Name: Chance Pond, Franklin, NH for NPT

General Information		Technical Information	
PUC Docket Number	DE 15-460	Voltage	320 kV, DC
PUC Zone	3	Circuit	3720/3731
PUC Map Number	19	Conductor Type	AAAC
Petitioner (NPT, ESE)	NPT	Code Name	None
Petitioner Line List # (for Parcels traversed)	7315	Conductor Size	2933 kcmil
Crossing Circuit Configuration	Overhead	Stranding	91
Public Crossing Type (Water/Land)	Water	Conductor Horizontal Separation	28
Previous Public Crossing Licensed Issued by PUC	Yes	Conductor Vertical Separation	NA
Relocated ESE Crossing (Yes/No/NA)	Yes	Cable Weight (Lbs/Ft)	2.769
Right of Way Width	up to 375 feet	Back Pole Number	DC-1271
Number of Circuits within ROW	1 new (DC), 3 existing	Back Structure Height	90
Foreign Utilities within ROW	None	Back Ground Elevation (Ft)	429.78
Total Structures/Poles/Manholes this circuit crossing	2	Back Conductor Height	65.5
First Structure Identification	DC-1271	Back Conductor Elev. at Pole	495.28
State Listed Public Waters (Yes/No/Not Applicable)	No	Forward Pole Number	DC-1272
Last Structure Identification	DC-1272	Forward Structure Height	110
PUC Approximate Length of crossing for License (Land only) [Does Not apply to Water or Rail]	Not Applicable	Forward Ground Elevation	412.82
		Forward Conductor Height	85.5
		Forward Conductor Elev. at Pole	498.32
		Span (Feet)	597.17
		Max Tension NESC Heavy lbs.	20,000
		Max Operating Temp (°F)	130
		Calc'd Horiz.Tension@MaxTemp	7,833
		Calc'd Clearance (SAG 10)	81
		Clearance Shown on Profile	79
		Req'd Clearance (NESC)	35.7
Crossing Comments, Conclusions, Conditions, and Staff Recommendation			
Comments	This section of the Chance Pond is used recreationally for boating, canoe and kayaking and fishing. Chance Pond has not been listed as designated public waters by NH DES but Staff recommends issuing a license because three existing ESE crossings have been previously licensed by the NH PUC. Chance Pond has all the characteristics of a public water body although DES does not consider it because it is man made. Two existing circuits are being relocated as part of the NPT project.		
	In order to determine the minimum NESC clearance above the water, the engineering design incorporates flood water elevations that are based on information contained in flood insurance rate maps provided by FEMA. The design uses the 100 year flood elevation for this portion of the river.		
	The design incorporates NESC minimum required clearance above the water for these open supply conductors, using 100-year flood data (28.5 feet) plus the additional NESC Rule 232.C.1 requirement (7.19 feet) brings the minimum clearance to 35.7 feet.		
Conclusions	The proposed public water crossing will not substantially affect the public rights in these waters, nor will the proposed crossing substantially affect the functional use and safety in these public waters.		
	The the proposed design for this overhead crossing across public waters meets or exceeds NESC requirements for the expected recreational use by the public.		
Staff Recommendation	That the Commission grant the license to construct, maintain and operate the electric and communication lines over and across the public waters identified in the petition.		
Staff Recommended Conditions applied to License	The license for this public water crossing is contingent upon the Northern Pass Project receiving a Certificate of Site and Facility from the SEC.		

Public Water/Land Crossing Name: Chance Pond, Franklin, NH for ESE

General Information		Technical Information	
PUC Docket Number	DE 15-462	Voltage	115 kV, AC
PUC Zone	3	Circuit	M127
PUC Map Number	19	Conductor Type	ACSR
Petitioner (NPT, ESE)	ESE	Code Name	Drake
Petitioner Line List # (for Parcels traversed)	7315	Conductor Size	795 kcmil
Crossing Circuit Configuration	Overhead	Stranding	26/7
Public Crossing Type (Water/Land)	Water	Conductor Horizontal Separation	14 ft (1), 20 ft (2)
Previous Public Crossing Licensed Issued by PUC	Yes	Conductor Vertical Separation	0 ft (1), 12 ft (2)
Relocated ESE Crossing (Yes/No/NA)	Yes	Cable Weight (Lbs/Ft)	1.094
Right of Way Width	up to 375 feet	Back Pole Number	M127-1
Number of Circuits within ROW	1 new (DC), 3 existing	Back Structure Height	50.5
Foreign Utilities within ROW	None	Back Ground Elevation (Ft)	430.06
Total Structures/Poles/Manholes this circuit crossing	2	Back Conductor Height	44.5
First Structure Identification	M127-1	Back Conductor Elev. at Pole	474.56
State Listed Public Waters (Yes/No/Not Applicable)	No	Forward Pole Number	M127-2
Last Structure Identification	M127-2	Forward Structure Height	83.5
PUC Approximate Length of crossing for License (Land only) [Does Not apply to Water or Rail]	Not Applicable	Forward Ground Elevation	414.57
		Forward Conductor Height	56
		Forward Conductor Elev. at Pole	470.57
		Span (Feet)	524.86
		Max Tension NESC Heavy lbs.	9,000
		Max Operating Temp (°F)	285
		Calc'd Horiz.Tension@MaxTemp	2,434
		Calc'd. Clearance (SAG 10)	57
		Clearance Shown on Profile	55
		Req'd Clearance (NESC)	30.1
Crossing Comments, Conclusions, Conditions, and Staff Recommendation			
Comments	This section of the Chance Pond is used recreationally for boating, canoe and kayaking and fishing. Chance Pond has not been listed as designated public waters by NH DES but Staff recommends issuing a license because three existing ESE crossings have been previously licensed by the NH PUC. Chance Pond has all the characteristics of a public water body although DES does not consider it because it is man made. Two existing circuits are being relocated as part of the NPT project.		
	In order to determine the minimum NESC clearance above the water, the engineering design incorporates flood water elevations that are based on information contained in flood insurance rate maps provided by FEMA. The design uses the 100-year flood elevation for this portion of the river.		
	The design incorporates NESC minimum required clearance above the water for these open supply conductors, using 100-year flood data (28.5 feet) plus the additional NESC Rule 232.C.1 requirement (1.59 feet) brings the minimum clearance to 30.1 feet.		
Conclusions	The proposed public water crossing will not substantially affect the public rights in these waters, nor will the proposed crossing substantially affect the functional use and safety in these public waters.		
	The the proposed design for this overhead crossing across public waters meets or exceeds NESC requirements for the expected recreational use by the public.		
Staff Recommendation	That the Commission grant the license to construct, maintain and operate the electric and communication lines over and across the public waters identified in the petition.		
Staff Recommended Conditions applied to License	The license for this public water crossing is contingent upon the Northern Pass Project receiving a Certificate of Site and Facility from the SEC.		

Public Water/Land Crossing Name: Chance Pond, Franklin, NH for ESE

General Information		Technical Information	
PUC Docket Number	DE 15-462	Voltage	115 kV, AC
PUC Zone	3	Circuit	F139
PUC Map Number	19	Conductor Type	ACSR
Petitioner (NPT, ESE)	ESE	Code Name	Drake
Petitioner Line List # (for Parcels traversed)	7315	Conductor Size	795 kcmil
Crossing Circuit Configuration	Overhead	Stranding	26/7
Public Crossing Type (Water/Land)	Water	Conductor Horizontal Separation	20
Previous Public Crossing Licensed Issued by PUC	Yes	Conductor Vertical Separation	12
Relocated ESE Crossing (Yes/No/NA)	Yes	Cable Weight (Lbs/Ft)	1.094
Right of Way Width	up to 375 feet	Back Pole Number	F139-342
Number of Circuits within ROW	1 new (DC), 3 existing	Back Structure Height	92.5
Foreign Utilities within ROW	None	Back Ground Elevation (Ft)	427.83
Total Structures/Poles/Manholes this circuit crossing	2	Back Conductor Height	65
First Structure Identification	F139-342	Back Conductor Elev. at Pole	492.83
State Listed Public Waters (Yes/No/Not Applicable)	No	Forward Pole Number	F139-341
Last Structure Identification	F139-341	Forward Structure Height	83.5
PUC Approximate Length of crossing for License (Land only) [Does Not apply to Water or Rail]	Not Applicable	Forward Ground Elevation	414.71
		Forward Conductor Height	56
		Forward Conductor Elev. at Pole	470.71
		Span (Feet)	550.31
		Max Tension NESC Heavy lbs.	9,000
		Max Operating Temp (°F)	285
		Calc'd Horiz.Tension@MaxTemp	2,492
		Calc'd. Clearance (SAG 10)	63
		Clearance Shown on Profile	60
		Req'd Clearance (NESC)	30.1
Crossing Comments, Conclusions, Conditions, and Staff Recommendation			
Comments	<p>This section of the Chance Pond is used recreationally for boating, canoe and kayaking and fishing. Chance Pond has not been listed as designated public waters by NH DES but Staff recommends issuing a license because three existing ESE crossings have been previously licensed by the NH PUC. Chance Pond has all the characteristics of a public water body although DES does not consider it because it is man made. Two existing circuits are being relocated as part of the NPT project.</p> <p>In order to determine the minimum NESC clearance above the water, the engineering design incorporates flood water elevations that are based on information contained in flood insurance rate maps provided by FEMA. The design uses the 100 year flood elevation for this portion of the river.</p> <p>The design incorporates NESC minimum required clearance above the water for these open supply conductors, using 100-year flood data (28.5 feet) plus the additional NESC Rule 232.C.1 requirement (1.59 feet) brings the minimum clearance to 30.1 feet.</p>		
Conclusions	<p>The proposed public water crossing will not substantially affect the public rights in these waters, nor will the proposed crossing substantially affect the functional use and safety in these public waters.</p> <p>The the proposed design for this overhead crossing across public waters meets or exceeds NESC requirements for the expected recreational use by the public.</p>		
Staff Recommendation	<p>That the Commission grant the license to construct, maintain and operate the electric and communication lines over and across the public waters identified in the petition.</p>		
Staff Recommended Conditions applied to License	<p>The license for this public water crossing is contingent upon the Northern Pass Project receiving a Certificate of Site and Facility from the SEC.</p>		