STATE OF NEW HAMPSHIRE
SITE EVALUATION COMMITTEE

DOCKET NO. 2015-06

JOINT APPLICATION OF NORTHERN PASS TRANSMISSION, LLC AND PUBLIC SERVICE COMPANY OF NEW HAMPSHIRE D/B/A EVERSOURCE ENERGY FOR A CERTIFICATE OF SITE AND FACILITY

PREFILED DIRECT TESTIMONY OF

ADAM ZYSK, PE

ON BEHALF OF
COUNSEL FOR THE PUBLIC

December 30, 2016

Qualifications and Purpose of Testimony

Q. Please state your name, position and your employer.

A. My name is Adam Zysk. I am a Senior Site/Civil Engineer with Dewberry, which is a multi-disciplinary engineering firm with offices in 18 states and headquartered in Fairfax, Virginia.

Q. Please summarize your education background and work experience.

A. I have a Bachelor of Science degree in Civil Engineering from the University of Rhode Island. I am a Registered Professional Engineer) in Massachusetts, Connecticut and Rhode Island.

I have 31 years of diverse experience on projects located throughout New England, from interstate highway and interchange designs to site plans for telecom installations. My project responsibilities have included project management, transportation and civil/site design, traffic engineering, construction phasing and traffic management design, drainage, water and wastewater system design and pre-construction and construction inspections. See my resume attached as Exhibit A.

Q. Have you testified previously before the New Hampshire Site Evaluation Committee or other regulatory bodies?

A. No.

Q. What is the purpose of your testimony?

A. My testimony here discusses the short-term and long-term impacts on New Hampshire's communities and natural resources from the construction and maintenance of the underground portion of the proposed Northern Pass transmission line project (the "Project").

Impacts from Construction of the Underground Line

Q. Please describe the types of impacts that construction of the underground portion of the Project will have on communities and natural resources?

A. The construction of the underground portion of the Project will have several impacts. Construction of the transmission line will (1) result in increased traffic on public and private roads from many different types of heavy construction vehicles; (2) will cause increased dust/dirt on roads along the route of the Project; (3) will potentially damage roads, particularly local roads that are not designed for high numbers of heavy construction vehicles; (4) will result in lane closures, and in some places road closures, which will cause traffic delays (5) will increase the level of noise, particularly in rural and lightly developed areas; (6) will cause disruption and hardship by road closures and detours in certain areas, lane closures and the loss of parking spaces in business districts; (7) will potentially cause sediment erosion, particularly on unpaved roads; (8) will cause visual impacts from temporary asphalt road patching; (9) will potentially cause impacts to wetlands and water bodies; and (10) along narrow, local roads and along some sections of state highways, the removal of roadside vegetation and trees will alter the look and character of these roads and their surrounding landscapes. See Exhibits B through E attached to the Pre-Filed Direct Testimony of David L. Taylor, Jr.

Underground Construction

Q. Please describe the areas of underground construction.

A. There are three areas where the transmission line will be buried: (1) a 0.70-mile segment from Pittsburg to Clarksville; (2) a 7.5-mile segment from Clarksville to Stewartstown; and (3) a 52.3-mile segment from Bethlehem to Bridgewater.

Q. Please describe each of these segments.

A. The 0.70-mile segment is on private property and within the unpaved shoulder along US Route 3 and Beecher Falls Road, and will pass under the Connecticut River. This section will have one (1) Horizontal Directionally Drilled ("HDD") drilling site and one splice vault installed.

The 7.5-mile segment runs along Route 145 for a short distance, then runs underneath or adjacent to three local roads: Old County Road, North Hill Road and Bear Rock Road. This section will have seven (7) HDD and one (1) "jack and bore" ("JB") trenchless drilling sites and twenty (20) splice vaults installed.

The 52.3-mile segment will run adjacent to and underneath state highways: Route 302, Route 18, Route 116, Route 112 and Route 3. This section will have forty-two (42) HDD trenchless drilling sites, one (1) micro tunnel site and 130 splice vaults.

<u>Open Trench and Trenchless Construction</u>

Q. Please describe generally the construction of the underground transmission line by the use of open trench construction.

A. Construction of the underground segments by open trench and trenchless construction will involve the following activities:

1. establish maintenance of traffic controls;
2. stake limits of disturbance;
3. establish erosion and sediment control measures;
4. vegetation clearing and grubbing;
5. stake route alignment, splice vault locations, HDD areas, etc.
6. excavate splice vault locations, perform any blasting of rock or ledge, remove excavation spoils and shore and brace the vault hole;
7. install splice vaults;
8. backfill around splice vaults;
9. excavate open trenches, perform any blasting of rock or ledge, remove excavation spoils and shore and brace the trench;
10. install duct work in open trenches;
11. backfill open trenches;
12. proof the ducts;
13. pull cable through the ducts and into the vaults;
14. splice cable within the underground vaults;
15. temporary road repair;
16. demobilize; and
17. final road repair.

Q. Please describe generally the use of HDD and JB for trenchless construction of the underground transmission line.

A. The Project will primarily use HDD to construct the transmission line under roads and bodies of water. HDD consists of a drilling machine located at one end of the area through which the drill will pass and an exit location at the other end of the drilling area. A drilling machine is used to drill a tunnel underneath the obstacle and then to place the cable and conduit through the tunnel. The Project also will use JB installation for one area where the length of the tunnel is shorter, and it will use a micro-tunnel in Franconia.

Q. How many areas for the Project will require trenchless construction operations?

A. Across all three underground segments there will be fifty (50) drilling operations. There will be forty-eight (48) HDD operations, one (1) JB operations, and one (1) micro-tunnel.

Q. What is the size of the work area of construction for these trenchless operations on the Project?

A. For the Project, the work area for HDD and JB operations vary between 200 feet and 1,650 feet in length. The area for entry pits varies between 21 and 35 feet wide and 300 to 400 feet long, and the area for exit pits ranges between 26 and 44 feet wide and 585 to 1,770 feet long. The depths of the trenchless drilling operations also vary between 27 and 75 feet deep, with many drilling bores passing through bedrock.

Q. What are the work area requirements for open trench construction of the underground sections?

A. For open trench construction, typically two traffic lanes wide are used to excavate and load excavation spoils into a dump truck, and to backfill the trench after the cable is installed. One-lane wide is possible if construction staging is done "end-to-end," typically for short distances.

Q. What types of equipment is used for open trench construction?

A. The typical open trench construction involves a backhoe or track excavator; dump trucks to haul away excavation spoils and deliver backfill material; concrete trucks to deliver fluidized thermal backfill; flatbed trucks to deliver splice vaults; a crane to install splice vaults; trench boxes to shore up the trench and splice vault holes; soil compactors; steel plates; jackhammers; asphalt rollers; and other equipment.

Q. What additional equipment is used for HDD or JB drilling?

A. A drill rig for HDD or jacking equipment for JB; driller control room; racks of section of drill stem; a crane or excavator; mud cleaning unit; mud mixing tanks; mud pump; frac tanks; dump trucks; flatbed trucks; trench boxes; sheeting and shoring materials; and other equipment.

Q. What is the rate of underground construction for the transmission line?

A. The rate of construction can vary, depending upon the depth of the open trench or the length of the trenchless crossing, the existing soil conditions, the presence of rock or ledge, and the presence of other underground utilities. For open trench construction each crew can install 20 to 100 feet per day. An HDD crossing can take three to eight weeks. A JB can be 10 to 100 feet per day once mobilized.

Specific Constraints and Challenges

Q. Are there any areas along the 0.70-mile segment where the underground construction will be constrained or challenging?

A. Yes. In the 0.70-mile segment, existing vegetation along the road will be removed and the banked-slope area along the road must be regraded. This will require single-lane road closures on Route 3 and Beecher Falls Road. Also, the HDD drilling under the Connecticut River will be a long distance, which will require large work areas for the entry and exit pits. This will require closing the intersection at Route 3 and Beecher Falls Road, as well as single-lane road closures on both sides of the Connecticut River.

Q. What about constraints or challenges along the 7.5-mile segment of underground construction?

A. The local roads in this area are narrow with limited to no shoulder in many places. This section will require seven (7) HDD trenchless drilling operations, one (1) JB operations and the installation of twenty (20) splice vaults. The Applicants plan a rolling work zone up to 1,600 feet in length. There will be lane closures and full road closures along most of this section, with detours around Old County Road, North Hill Road, and Bear Rock Road when those roads are closed.

Q. What about constraints or challenges along the 52.3-mile segment of underground construction?

A. Along the 52.3-mile segment there are several areas where the narrow useable portion of right-of-way, rock and ledge outcrops and numerous HDD drilling locations will cause lane closures, including along Route 18 and Route 116 in Franconia, along Route 116 and Route 112 in Easton, along Route 112 and Route 3 in Woodstock, along Route 3 in Thornton and along Route 3 in Plymouth. In addition, in North Plymouth there are two (2) long HDD drilling operations, one underneath Route 3A (Tenney Mountain Highway) and the other under the Baker River, in an area that has significant vehicle traffic which will likely result in a lengthy construction time, causing impacts.

Also, construction through downtown Plymouth and south of downtown Plymouth will be complicated, slow and cause significant disruption, including the loss of parking and lane closures for an extended period of time, and the detour of traffic around the downtown area of Plymouth.

Impacts on Traffic

Q. Will construction of the underground sections impact traffic?

A. Yes. There will be traffic delays throughout the three underground sections due to road closures and traffic detours, lane closures and the increased traffic from construction related vehicles. For instance, there will be an estimated minimum 19,653 concrete and dump truck deliveries for the open trench construction, with additional concrete truck and dump truck trips for deep trench areas and the 50 trenchless operations. The other construction related vehicles, including flatbed trucks delivering splice vaults, drilling equipment, trench boxes, and other equipment and material; backhoes and excavators; and vehicles for workers will result in increased traffic all along the underground route.

Impact on Roads

Q. In addition to traffic delays, will construction of the underground sections have an impact on the roads?

A. Yes. The construction activity will increase the amount of dirt and dust on roads. It also may cause damage to roads, particularly local roads that are not designed for high volumes of heavy construction related vehicles over many months.

Visual Impacts

Q. Will construction of the underground sections have any visual impacts?

A. Yes. The removal of existing vegetation and trees, particularly along the 7.5-mile section of underground construction, will alter the character of the road and the surrounding landscape. Also, the temporary asphalt road patching will visually impact the appearance of the road. Where existing roads have an older pavement structure, there will be a need for a well-consolidated, permanent patch. Where existing roads have been recently rehabilitated, the roads should be repaved by mill and overlaid methods at a minimum for at least half the road or in some places the entire road or the finished road will not be left in as good a condition as before construction.

<u>Other Impacts</u>

Q. Will construction of the underground sections potentially have other impacts?

A. Yes. The construction activities and construction vehicle traffic will increase the noise level along the route, particularly in rural areas. Also, construction of the underground sections could cause sediment erosion, particularly on unpaved roads, and it could adversely impact wetlands and water bodies if best management practices are not instituted at the beginning of construction and monitored throughout construction for compliance.

Q. Where there aspects of the underground construction that you were not able to assess?

A. Yes. The Applicants' submission did not include sufficient information on the following items for us to assess their impact associated with construction of the underground segments:

1. the location and size of additional laydown areas and staging areas that will be required;
2. the location for the placement of excavation spoils;
3. the location of concrete batch plants;
4. the need for temporary easements;
5. utility designating and test pit data, particularly for the more urban and commercial areas;
6. geotechnical boring along the entire underground route;
7. the protection of cultural resources identified in Easton;
8. detailed traffic control plans with construction sequencing; and
9. detailed erosion and sedimentation control plans with sequencing.

Q. Does this conclude your testimony?

A. Yes.

<u>Exhibits</u>

A. Resume of Adam Zysk, PE

EDUCATION:

BS, Civil Engineering, University of Rhode Island, 1985

REGISTRATIONS:

Professional Engineer - Civil: MA, CT, RI

YEARS OF EXPERIENCE:

Dewberry: 8

Prior: 23

AFFILIATIONS:

American Society of Civil Engineers

Boston Society of Civil Engineers

Adam Zysk PE

Senior Site/Civil Engineer

Mr. Zysk has over 31 years of diverse experience on projects located throughout the New England states. These projects have covered the spectrum from interstate highway and interchange designs to site plans for telecom installations. Throughout his careeer he has completed projects for federal and state agencies, multiple municipalities and private clients. His project responsibilities have included project management, transportation and civil/site design, traffic engineering, construction phasing and traffic management design, drainage, water and wastewater system design and pre-construction and construction inspections. In addition, he has led and/or participated in the public information process in many of the projects he has been involved with through presentations to clients and outside groups and the development of informational materials.

SELECTED EXPERIENCE

Route 1A (Rantoul Street and Cabot Street) Reconstruction, City of Beverly, MA, Project Manager. Responsible for leading the design process and presenting the proposed design concepts to the local business organization, City officials and the general public as the design progressed. Detailed traffic management plans were required to maintain access to numerous abutters and existing traffic volumes throughout construction. Project right of way requirements included preparing plans and legal descriptions for nearly 200 temporary and 70 permanent easements and 3 takings. This $20-million reconstruction project included rehabilitation of deteriorated roadway and pedestrian sidewalks, traffic signal upgrades, ADA accessibility, permitting and extensive improvements to the existing storm drainage system. The design requires that traffic be maintained throughout construction with minimal detouring allowed.

Neponset River Bridge Rehabilitation, Boston and Quincy MA. Civil Engineer for the $54 million rehabilitation of this 23 span viaduct which included complete reconstruction of deteriorated hammerhead pier caps; seismic retrofit with isolation bearings; complete roadway deck reconstruction; widening the sidewalks and adding pedestrian ramps; installation of new lighting and railings; minor realignment and grading of surface streets; modifications to the surface drainage system and optimization of traffic signals. The two-phase project integrated a workable traffic management scheme to maintain daily traffic on this major arterial roadway connecting Quincy and Boston.

Replacement of Needham Street Bridge over Great Ditch Bridge, MassDOT, Dedham, MA, Roadway Project Manager for this Accelerated Bridge Project assignment that includes preliminary through final design and construction phase services for the replacement of the Needham Street over Great Ditch bridge in Dedham. Drainage improvements included the design of two new level spreaders to mitigate stormwater runoff to adjacent resource areas. Temporary easements were identified as required for construction access and placement of erosion and sedimentation control elements. Detailed construction phasing plans and traffic management details were required for the new bridge.

Section 4 Webster Avenue Evaluation, MWRA, Somerville, MA, Civil Engineer. Responsible for providing assessment of necessary traffic restrictions/ management to allow the project to be constructed for replacement and rehabilitation alternatives analysis for a 48" water main on a utility bridge over the MBTA railroad. Details included ADA compliant wheelchair ramps and detailed traffic management plans and details. Final design of the bridge replacement included analysis and impact to local roadway access restrictions, crane access requirements, foundation impact to adjacent structures, etc.

Telecom Sites, New England. Project Engineer for the design of access roads for numerous telecommunication sites in each of the New England states. Project requirements included geometric design and grading, drainage design, and development of erosion and sediment control and other site specific details. At a number of locations, infiltration systems were designed to maintain a zero net increase in site stormwater runoff in accordance with local regulations. Sites located on private property required the delineation of permanent easements for site access and occasionally supplemental temporary easements for construction.

Northern Intermediate High Short Term Improvements, MWRA, Civil/Traffic Engineer for design of 2,500 linear feet of 36" water main connecting the Towns of Stoneham and Reading. Dewberry was responsible for survey, wetland delineation, hazardous materials assessment, subsurface investigation, permitting, design, bidding, resident inspection and construction administration services. Mr. Zysk oversaw the designs for traffic management including detours, construction zone safety plan (CZSP), intersection phasing and incorporating blasting requirements. He was also responsible for presenting the proposed traffic management schemes to the officials and police forces of both municipalities and coordinating their respective requirements to gain acceptance of the work.

Callahan Tunnel Roadway Rehabilitation, MassDOT, Boston, MA. Civil Engineer for design of the $30 million rehabilitation of the Callahan Tunnel, which carries two lanes of traffic of Route 1A NB under Boston Harbor and serves as a major highway transportation link between downtown Boston to Logan Airport and points north. The project featured concrete reconstruction of the roadway deck, curb reconstruction, and new bituminous concrete pavement. The work involved closing one of the primary access points to Logan Airport. Extensive traffic management plans were required that varied from local detour plans and site access details to regional notification signs and electronic messaging. To assist travelers unfamiliar with Boston, interactive maps were created for posting to the project website.