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December 19, 2014

Mr. Michael Adams
U.S. Army Corps of Engineers, New England District, Vermont Project Office
8 Carmichael Street, Suite 205
Essex Junction, Vermont 05452

**Subject: New England Clean Power Link Project**
**Supplement to Section 404 / Section 10 Permit Application**

Dear Mr. Adams:

Champlain VT, LLC, d/b/a TDI-New England (the Applicant or TDI-NE) is proposing to construct, operate and maintain the New England Clean Power Link Project (Project) to bring renewable sources of power generation in Canada to Vermont and ISO-NE via underwater and underground high-voltage direct current (HVDC) transmission cables. On November 7, 2014, an application to obtain construction permits pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899 was submitted to your office.

The Applicant is providing supplemental information to further support your office's review. This material includes information related to impacts to waters of the United States (including wetlands), construction typicals and updated route mapping. In many cases, this document references materials that were part of the Applicant's December 8, 2014 petition to the Vermont Public Service Board for a Certificate of Public Good, which has been sent to your office and is available on-line. We will send additional hard copies of any of the enclosed material upon your request.

We look forward to speaking with you in January about this application. Please feel free to contact me at any time if you have any questions about the materials presented.

Regards,

Sean Murphy
Project Manager

Enclosure
cc: Beth Alafat, USFWS
Maria Tur, USEPA
Billy Coster, VT ANR
Brian Mills, DOE
Don Jessome, TDI-NE
Josh Bagnato, TDI-NE

# SUPPLEMENT TO
# SECTION 404/10 PERMIT APPLICATION

# FOR THE

# NEW ENGLAND CLEAN POWER LINK PROJECT

**Submitted by:**
**CHAMPLAIN VT, LLC**
**P.O. Box 155**
**Charlotte, VT 05445**

**DECEMBER 2014**

# 1.0 INTRODUCTION

Champlain VT, LLC, d/b/a TDI-New England (the Applicant or TDI-NE) is proposing to construct, operate and maintain the New England Clean Power Link Project (Project) to bring renewable sources of power generated in Canada to Vermont and ISO-NE via underwater and underground high-voltage direct current (HVDC) transmission cables. On November 7, 2014, an application was submitted to obtain construction permits pursuant to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899 (Application) for the Project. The intent of this submission is to supplement the information provided in the Application, so as to provide sufficient information to the U.S. Army Corps of Engineers (USACE) to evaluate the Project.

In the Application, TDI-NE proposed that, for the purpose of facilitating an understanding of the various aspects of the NECPL Project, the transmission line route be described as two geographically logical segments:

- Lake Champlain Segment; and
- Overland Segment

The two segments are identified on Figures 1-1 through 1-2, respectively. The Lake Champlain Segment corresponds to the portion of the route located for approximately 0.5 miles overland in Alburgh, Vermont and approximately 97.6 miles in Lake Champlain. The Overland Segment represents the approximately 56 miles that would be located within existing roadway and railroad rights-of-way (ROWs).

The discussion below relies upon materials that were included as part of the Applicant's petition to the Vermont Public Service Board for a Certificate of Public Good (Petition), dated December 8, 2014, a copy of which has been provided to the USACE. In order to reduce the need for multiple printings of these documents, the applicable Petition exhibit identifier has been provided as well as a link to its location on the Applicant's Regulatory Documents website (http://necplink.com/regulatory-documents.php). The Applicant has also provided digital copies of each of the documents referenced below in an attached CD ROM and can provide hard copies upon request.

**FIGURE 1-1**
**LAKE CHAMPLAIN SEGMENT**

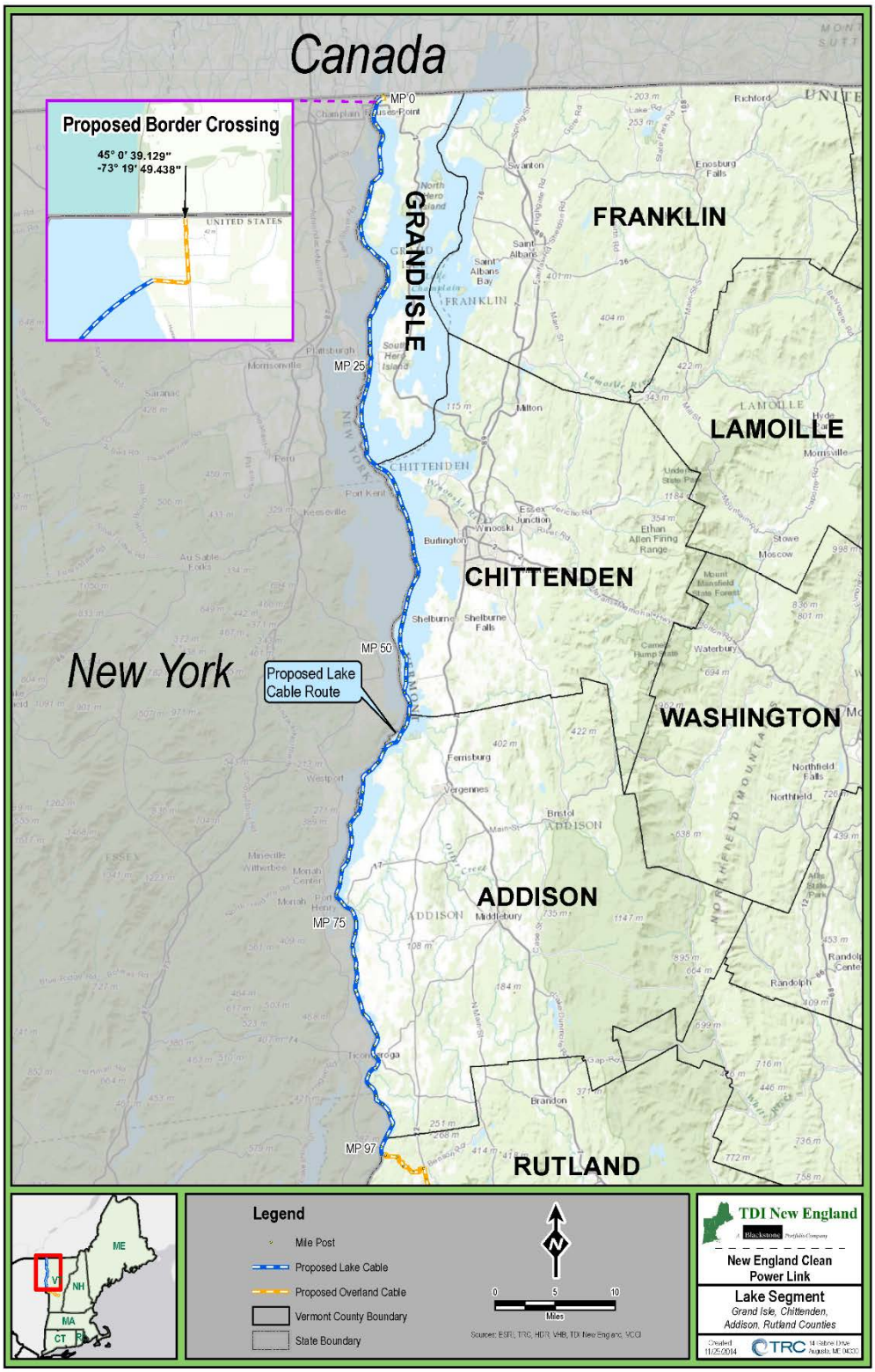
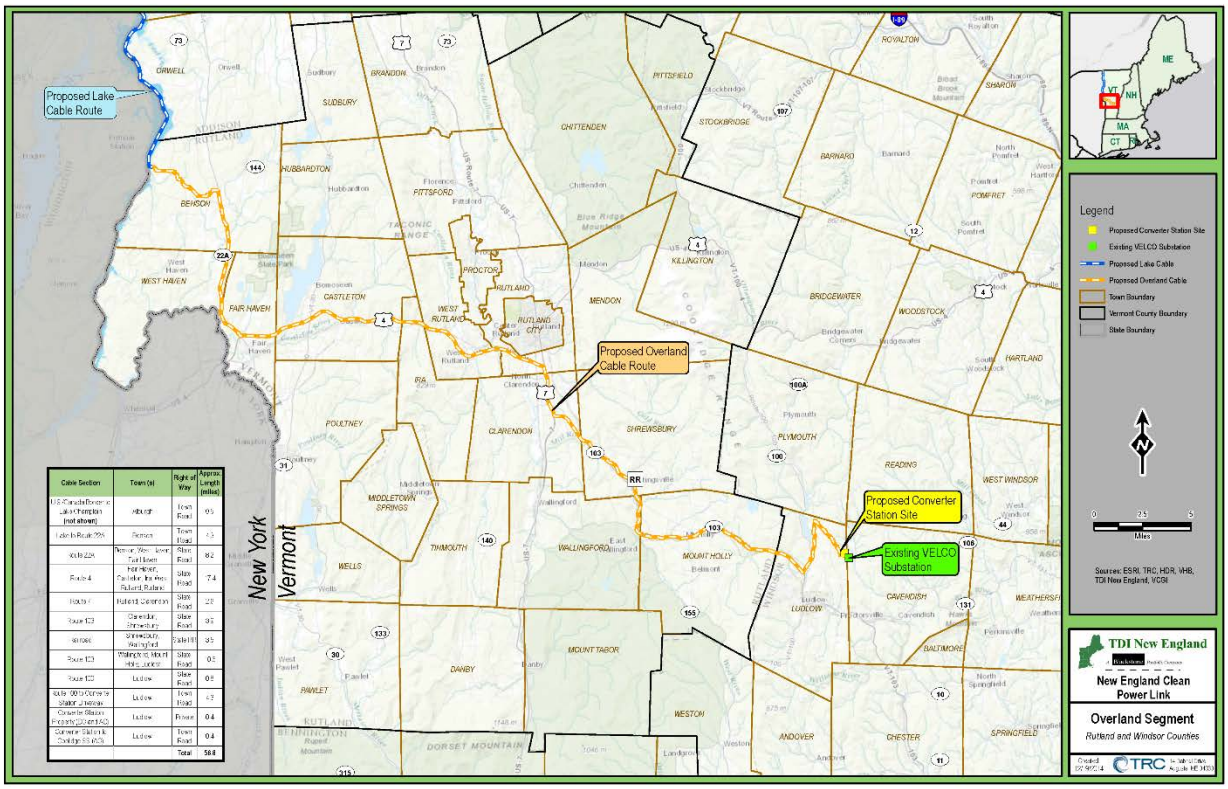


**FIGURE 1-2**
**OVERLAND SEGMENT**




| Cable Section | Town (s) | Right of Way | Approx. Length (miles) |
|---|---|---|---|
| U.S./Canada Border to Lake Champlain (not shown) | Alburgh | Town Road | 0.5 |
| Lake to Route 78A | Swanton | Town Road | 4.3 |
| Route 22A | Swanton, West Haven, Fair Haven | State Road | 8.2 |
| Route 4 | Fair Haven, Castleton, Rutland, Rutland City | State Road | 7.4 |
| Route 7 | Rutland, Clarendon | State Road | 2.8 |
| Route 103 | Clarendon, Shrewsbury | State Road | 9.7 |
| Route 103 | Shrewsbury, Mount Holly, Ludlow | State Road | 9.5 |
| Route 103 | Ludlow | State Road | 0.5 |
| Route 103 to Converter Station 2 Access | Ludlow | Town Road | 4.7 |
| Converter Station Property (22 acres) | Ludlow | Private | 0.4 |
| Converter Station to Coolidge 83 (VCS) | Ludlow | Town Road | 0.4 |
| | | Total | 58.6 |

## 2.0 OVERLAND AND LAKE ROUTING

The November 7, 2014 Application provided a description of the routing of the Project, both in-water and overland, and mapping showing the general location of the cable system. Since that submission, TDI-NE has made minor adjustments to the route, which generally involve very minor realignments and additional use of horizontal directional drilling (HDD) to avoid certain natural resource and engineering constraints. Design drawings have been provided for the Lake Segment as Petition Exhibit TDI-JMB-4 (on-line: NECPL Route Plans - Lake). The Overland Segment design drawings have been provided as Petition Exhibit TDI-AW-2 and due to its size has been divided into 18 documents under the testimony of Al Wironen at the NECPL Regulatory Documents website. A revised listing of the geographic coordinates for each mile point is provided as Attachment A.

## 3.0 CONSTRUCTION TYPICALS

The November 7, 2014 Application provided a general description of the construction methods that would be utilized during the installation of the Project. Detailed construction typicals have been provided for the Lake Segment as Petition Exhibit TDI-JMB-5 (on-line: Lake Construction Typicals) and for the Overland Segment as Petition Exhibit TDI-AW-3 (on-line: Overland CM Details and Overland TD Details).

## 4.0 PUBLIC NOTICE NOTIFICATIONS

In order to facilitate the Public Notice process, the Applicant proposes to provide an electronic spreadsheet to your office with the following names and addresses:

- All property owners abutting wetlands and streams impacted along the Overland Segment
- Town offices of all municipalities crossed by the Project
- The following Regional Planning Commissions: Northwest, Chittenden, Addison, Rutland and Southern Windsor

This listing would be provided at least one month prior to your office's planned date to issue the Public Notice, pending your office's confirmation that the above approach is sufficient and complete.

# 5.0 IMPACTS TO WATERS OF THE UNITED STATES

## 5.1. Lake Segment

After crossing the U.S./Canadian border and being installed for approximately 0.5 miles underground within the Town of Alburgh, Vermont, the HVDC transmission line will enter Lake Champlain via HDD. The two cables will be bundled together and installed beneath (or, in deeper waters, be laid on) the bed of Lake Champlain for approximately 97.6 miles entirely within the jurisdictional waters of the State of Vermont before exiting the lake in the Town of Benson, Vermont via HDD.

With respect to installation in the lake, there are four types of installation which will be employed. From MP 0.5 to MP 1 the cable will be installed via HDD to avoid impacts to the shoreline.[1] From MP 1 to 2, it is anticipated that the transmission cables will be installed by divers, due to the shallowness of the waters and the presence of the submerged Rouses Point Train Trestle (a potential archaeological site located south of the Route 2 Bridge). From MP 2 to MP 22, where waters are generally less than 150 feet in depth, the jet plow installation method will be employed. In waters greater than 150 feet, which generally extend from MP 22 to 66, the cables will be laid on the lake bottom to allow for self-burial where the cables are not crossing utilities or bedrock. Jet plow installation will be initiated again from MP 66 to MP 74, at which point the shear plow installation will occur until MP 98. Jet plow and shear plow installation is described in the Application. From the lake to the landfall in Benson, HDD will again be utilized. Typicals for HDD installation using a guide shaft and cofferdam or receiver casings are provided in Petition Exhibit TDI-JMB-5 (on-line: Lake Construction Typicals)

A series of studies have been conducted to characterize lake conditions and assess the Project's potential impacts on aquatic resources in the lake during construction and operation phases. Water quality modeling was completed by HDR Engineering Inc. (HDR) to analyze the Project's potential impact on water quality during installation. This analysis consisted of detailed water quality modeling to estimate the potential dispersion of sediment and other constituents during the cable installation process for jet plow and shear plow installation. For the deeper waters (anything greater than 150 feet deep), the water quality model assumed installation via a jet plow in order to present a conservative scenario for water quality impacts, but it should be noted that the present plan for those deep water areas is to simply lay the cables on the bottom and allow for self-burial. The modeling results indicate that Project-related activities will be in compliance with relevant criteria in the Vermont Water Quality Standards (VWQS).

[1] TDI-NE is pursuing an alternative to this HDD which would utilize a State-owned fishing area adjacent to the Route 2 Bridge as the launching point for HDDs. If use of this area is allowed by the State and this alternative was pursued, the HDD would exit the lake bottom at approximately MP 1.5 instead of MP 0.5.

The modeling report and its results have been provided as Petition Exhibit TDI-AT-2 and is on-line at: Lake Champlain Water Quality Modeling Report.

The Applicant also evaluated potential impacts on rare, threatened, and endangered species in Lake Champlain. There are no federally listed aquatic species in the lake. In terms of state-listed species, based on the recommendation of Mark Ferguson of the Vermont Fish and Wildlife Department (VT FWD) HDR completed surveys for five RTE freshwater mussel species suspected to occur in the northern section of the Project route. In July and August, 2014, diver surveys were conducted every one-half mile along the northern cable route until water depths increased to greater than 30 feet. No live Vermont RTE mussel species were observed, and the live common mussels found at only three of the 24 sites surveyed were sufficiently covered in zebra mussels that field staff did not believe that they would survive the year. The full results are included in a report that has been provided as Petition Exhibit TDI-SM-4 and is on-line at: Lake Champlain Freshwater Mussel Survey Report. Based on these results, the VT FWD concurred in September of 2014 that these species are not likely to be persisting within the Project area and that no further work was required.

The Applicant engaged the Lake Champlain Maritime Museum (LCMM) to advise on cultural resources in Lake Champlain. This work included reviewing the NECPL routing through Lake Champlain to suggest alternatives that avoided known cultural resources to the extent practical. The LCMM also completed a Phase I Archaeological Resource Assessment for the fifty foot Area of Potential Effects corridor within the lake that is proposed for the installation. This report identified three historic resources for which there was a potential for impacts, although LCMM noted that impacts to these three resources could be avoided or minimized with additional field work. The public version of the Phase 1A report has been provided as Petition Exhibit TDI- CRS-2 and is on-line at: NECPL Phase 1 Archeological Report - Lake Route. The non-public version of the Phase 1A report which depicts the location of sensitive archaeological information can be provided upon request.

In terms of the operation of the transmission system, the primary operational impacts would be the magnetic and thermal fields associated with the operation of the transmission system. Exponent Inc. (Exponent) completed detailed modeling to characterize the temperature gradients around the NECPL cables and analyzed the potential effects on water quality, mercury methylation rates, and macroinvertebrates in Lake Champlain during operation. Exponent also modeled the expected change to the earth's geomagnetic field around the cables associated with the magnetic field created by the flow of DC electricity in the cables and assessed the potential implications for compass deviations, human health and fish species. These reports conclude that the Project's operation is not expected to have an undue impact on human health, compasses, water quality or aquatic species. The thermal report has been provided as Petition Exhibit TDI-WHB-2 (on-line: Temperature Gradients in the Vicinity of NECPL Cables and Potential Effects on Water Quality, Bioavailability of Mercury, and Macroinvertebrates) and the lake magnetic field report has been

provided as Petition Exhibit TDI- WHB-3 (on-line: Submarine Cable DC Magnetic Field in Lake Champlain and Marine Assessment).

### 5.2. Overland Segment

In general, the buried transmission line will be routed underground beginning at the U.S. - Canada border into Alburgh, Vermont before entering Lake Champlain, and then upon exiting Lake Champlain from Benson, Vermont to the proposed converter station location in the Town of Ludlow, with a buried AC line continuing on to the existing VELCO Coolidge substation in Cavendish, Vermont. The installation of the underground transmission line will primarily be completed via trenching techniques along this portion of the route, with HDD installation being utilized in over 20 areas totaling approximately five linear miles to avoid certain resource impacts. This section discusses studies related to the overall environmental setting along the Overland Segment and for the portion of the Lake Segment located in Alburgh. It also provides specific information on potential impacts to waters of the United States.

#### 5.2.1. Overall Environmental Setting

For the Overland Segment, and the portion of the Lake Segment located in Alburgh, Vermont, Vanasse Hangen Brustlin, Inc. (VHB), TRC Environmental (TRC), Arrowwood Environmental and Gillman & Briggs Environmental performed detailed natural resource surveys during the 2014 growing season, including investigation of corridor widths of up to 400 feet along the proposed terrestrial cable alignment, resulting in approximately 1200-acres of area directly studied. The Project area, generally defined as the temporary construction area, is comprised of a corridor approximately 50 feet wide, with a resultant area of approximately 350 acres. The permanent maintenance area above the cable within the Project area will be approximately 12 feet wide and will require ongoing vegetation maintenance to prevent the establishment of deep rooted trees. The results of the field work are summarized in a Natural Resources Report and a Rare, Threatened, and Endangered Species, Necessary Wildlife Habitat, and Natural Communities Report. Table 5-1 provides the Petition Exhibit references and the on-line locations for these reports.

The Rare, Threatened, and Endangered Species, Necessary Wildlife Habitat, and Natural Communities Report provides a description of the desktop and field work completed for this Project rated to sensitive species. With the implementation of the Indiana bat avoidance measures proposed in that document, no federally listed or endangered animal species will be adversely impacted by the Project. No federally listed threatened or endangered plant species were encountered.

**Table 5-1 Overland Natural Resources Study Reports**

| Report Name | Exhibit Number | Location on NECPL Project Document Library |
|---|---|---|
| Natural Resources Report and maps | TDI-JAN-2, -3 | Natural Resources Report<br><br>Natural Resources Report Maps |
| Rare, Threatened, and Endangered Species, Necessary Wildlife Habitat, and Natural Communities Report | GGM-2,-3,-4, 5a, 5b, 6 and 7 | Survey Results Report<br><br>Attachment: Overland and Lake Summary Tables<br><br>Attachment: RTE Report<br><br>Attachment: Survey Memos for Converter Station and Railroad<br><br>Attachment: Survey memo for Temporary Off-ROW Work Areas<br><br>Attachment: Indiana Bat Report<br><br>Attachment: Non-Native Invasive Species Report |

Similar to the cultural study completed for the Lake Segment, a Phase 1A archaeological reconnaissance survey was completed for the Overland Segment by Public Archaeology Laboratory, Inc. (PAL). The survey methods consisted of background research, including the development of a preliminary "desktop" archaeological sensitivity model, and field investigations consisting of a walkover assessment. The Phase IA survey recommended that a Phase IB archaeological survey be completed for those locations within the recommended Project Area of Potential Effects which were assessed as having a moderately–high archaeological sensitivity and potentially subject to Project-related impacts. The public version of the Phase IA survey has been provided as Petition Exhibit TDI- KBH-2 and is on-line at: Phase 1A Archeological Report.

PAL also completed a historic architectural reconnaissance survey and effects assessment. This survey was designed to identify historic architectural properties, including districts, buildings, structures, objects, and sites within the Project study area that are listed or potentially eligible for listing in the National and/or State Register of Historic Places (National Register). Of the 57 properties that potentially met the criteria for inclusion in National Register, three properties are listed in the National Register, 16 are listed in the State Register and four were evaluated by PAL

as potentially eligible for listing in the State/National Registers. Thirty-four properties were evaluated as ineligible for listing in the State/National Registers. The report concluded that the construction of the proposed transmission line and the converter station will have no adverse direct or indirect effect on any of the historic architectural resources. The historic architectural reconnaissance survey has been provided as Petition Exhibit TDI- SOA-2 (on-line: NECPL Architecture Technical Report) and TDI-SOA-3 (on-line at: NECPL Architecture Report Survey Maps).

### 5.2.2. Wetlands

VHB/TRC field staff conducted wetland and stream delineation work within the proposed Project alignment and known temporary work zones, from May to November 2014. Wetland delineations were made pursuant to the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region Routine Determination Method* (USACE 2011). Wetlands were also classified in accordance with the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin, et al. 1979). Wetland functions criteria were qualitatively evaluated based on the field notes and observations according to the Vermont Wetland Rules (VWR) Section 5 (Functional Criteria for Evaluating a Wetland's Significance) (NRB 2010). In addition, representative photographs of wetlands and streams were taken and provided as Petition Exhibit TDI-JAN-6b (online: Representative Photos - Wetlands) and Petition Exhibit TDI-JAN-6a (online: Representative Photos: Stream), respectively.

In conducting the field investigations along the terrestrial alignment, two distinct areas were defined. The "Study Area" was comprised generally of the lands within the roadway/railroad ROWs within which Project activities (during both the construction and operational phases) will occur. In addition, a supplemental area generally 50-feet wide outside of the road or railroad ROW areas was added in order to approximate the boundaries of potential wetlands and/or wetland buffers; this area is referred to as the "Approximate Study Area." The intent of adding this supplemental area is to provide information on additional wetlands in the context of the Project corridor, as well as to identify potential buffer zones of nearby wetlands that could extend into the Project corridor.

In the Application submitted on November 7, 2014, a technical memorandum describing the wetland and waters delineation study methods and results was provided as Attachment C. Since the submission of that document, there have been minor changes to the Natural Resources maps and the summary of delineated wetlands and streams as a result of minor alignment shifts in the design. Table 5-2 provides the location of these revised documents in the Petition submission as well as their location on-line. There have been no changes to the wetland data sheets. A copy of

the revised technical memorandum is provided in the CD ROM accompanying this submission and a hard copy will be provided on request.

**Table 5-2 Revised Technical Memorandum Documents**

| | Petition Exhibit | On-line location |
|---|---|---|
| Attachment 1 – Natural Resource Maps | TDI-JAN-3 | Natural Resources Report Maps |
| Attachment 2 - Summary of Delineated Streams | TDI-JAN-5 | Stream Summary Table |
| Attachment 3 - Summary of Delineated Wetlands | TDI-JAN-4 | Wetland Summary Table |

A total of 508 wetland features were identified within the Study Area or Approximate Study Area. The wetland investigation and delineation included assessments for the presence of all Class I, Class II and Class III wetlands within the study areas, based on the definitions provided in the 2010 Vermont Wetland Rules. Utilizing the results of the wetland studies, TDI-NE undertook measures during planning, design, and federal/state agency outreach to avoid (where possible), and then minimize, impacts to jurisdictional wetlands (see Section 6 below for further information).

Using the assumptions of a 12 foot permanent corridor over the transmission system and a construction zone up to 50 feet wide, Table 5-3 below presents a conservative estimate of the impacts to federal jurisdictional wetlands. It is important to note that none of the proposed Project activities include the placement of fill material within wetlands that would be considered a permanent fill impact. Flowable fill and/or cable armoring may be required for cable thermal resistivity backfill or protection within the sub-grade of the trench, but the surface contour and condition will be restored with the replacement of native topsoils and as such would not be considered a permanent fill impact. By also employing avoidance and minimization measures, there would be no permanent fill impacts as a result of construction.

**Table 5-3 Estimated Wetland Impacts**

| Project Area Type | Wetlands (Acres) | | Total (Acres) |
|---|---|---|---|
| | Forested | Non-forested | |
| Project Corridor | 0.68 | 0.97 | 1.65 |
| Temporary Construction Corridor | 1.72 | 1.92 | 3.64 |
| *Total Wetland Impacts* | *2.40* | *2.89* | *5.29* |

Within the permanent Project corridor, vegetative management activities will be conducted to prevent the establishment of deep-rooted plants/trees in order to protect the cables. Approximately 0.68 acres of forested wetlands are located within the permanent corridor and will be converted to scrub-shrub wetlands. For non-forested wetlands within the permanent corridor (0.97 acres), the majority of these are within maintained roadway ROWs, so that the existing non-forested wetlands are subject to regular mowing and the potential application of herbicide. As the vegetative maintenance planned by the Applicant will be consistent if not identical to vegetative control measures already in place, no loss of existing wetland functions or values is expected and therefore there would be no permanent impact. Where impacts cannot be avoided, the Applicant proposes to make a payment to the Vermont In-Lieu Fee Program for the Richelieu service area in lieu of providing traditional mitigation (such as wetland creation or restoration). The number of credits needed will be determined in consultation with the USACE.

A construction zone will be established which will include the area needed for excavation of the trench, installation of erosion and sediment control measures, and stockpiling of excavated material. Typical construction configurations are provided in Petition Exhibit TDI-AW-3 (on-line: Overland CM Details and Overland TD Details). During construction, it is expected that temporary impacts to wetlands will occur within the construction corridor. However, original surface hydrology in disturbed wetland areas will be re-established by backfilling the trench and grading the surface to pre-construction contours to the extent practical. Trenches in wetlands will be backfilled with native wetland soils to the extent practicable and a layer of native topsoil will be installed. The Applicant will seed the construction corridor to establish temporary cover and stabilize soils, at which point wetlands will then be allowed to revegetate naturally. Emergent wetland vegetation is expected to return quickly following construction (approximately 1 to 2 years). The woody species within the 1.72 acres of forested wetlands in the construction corridor would be expected to return more slowly under natural conditions, so the Applicant will propose tree plantings with an expected planting density of 400-600 stems per acre if required. Tree species

would be selected in consultation with a professional wetlands ecologist based on the dominant wetland tree species in the area prior to construction and commercial availability.

In May 2014, VHB/TRC Environmental Scientists also conducted a survey for vernal pool sites according to the definitions of and criteria for vernal pools provided by the USACE (2007) and Thompson and Sorenson (2005). There were no egg masses from the known indicator species found that would indicate vernal pools, or any other evidence of vernal pool characteristics present. Portions of the Project Study Area completed after May 2014 were assessed and there were no vernal pools or potential vernal pools identified. This finding was further corroborated by surveys for Special Aquatic Sites completed in summer 2014 and reported separately by Arrowwood Environmental.

### 5.2.3. Streams

VHB/TRC environmental scientists conducted field delineation and assessment of stream features from May 2014 to November 2014. Streams were identified according to federal delineation procedures (USACE 2005), including flow regime designation and ordinary high water (OHW) width. During field work, flow regimes are preliminarily classified as perennial, intermittent or ephemeral and are determined based on qualitative observations of instream hydrology indicators at the time of observation and existing geomorphic characteristics. The limits of open waters, such as those associated with Lake Champlain and Lake Bomoseen, are delineated along the field-determined OHW levels. A Technical Memorandum on Wetland and Waters Delineation describing the study methods was provided in Attachment C of the Application submitted in November of 2014. As discussed above, the stream summary table was slightly modified since the November 7th submission and submitted as Petition Exhibit TDI-JAN-5 (online: Stream Summary Table). The Applicant also submitted a Stream Alteration Review report, whose components are listed in Table 5-4 below.

**Table 5-4 Stream Alternation Report Documents**

| Report Name | Exhibit Number | Location on NECPL Project Document Library |
|---|---|---|
| Section 248 Stream Alteration Review Report | TDI-JAN-8, -9a, -9b | Stream Alteration Report<br><br>Appendix 1 - Index Map<br><br>Appendix 2 - Table of Crossings |

Based on the field investigations performed, the proposed Project alignment would cross 51 perennial streams, 78 intermittent streams, and 38 ephemeral streams. Eleven named streams would be crossed by the proposed Project alignment, namely the Hubbardton River, Mud Brook,

North Brenton Brook, Castleton River, Clarendon River, Otter Creek, Cold River, Freeman Brook, Branch Brook (crossed twice), Coleman Brook, and Black River. The Project would also cross an additional 39 unnamed tributaries that were identified and delineated in the field as perennial streams. A summary of the proposed perennial stream crossings is as follows:

- Ten of the stream crossings are located at sites with contributing drainage areas greater than ten square miles.
- Ten of the stream crossings are located at sites with contributing drainage areas between one and ten square miles.
- Eight of the stream crossings are located at sites with contributing drainage areas between 0.5 and one square miles.
- 23 of the stream crossings are located at sites with contributing drainage areas less than 0.5 square mile.

Of the perennial stream crossings, construction at 43 of the 51 crossings, including all of the named features, would occur in a manner that would avoid disturbance of the bed or banks of the streams. This would be accomplished through installation beneath or above existing culverts, use of HDD, or attachment of the cables to bridge structures. For the remaining crossings, open trench excavation would be used with proper Erosion Prevention and Sediment Control (EPSC) practices in place, such as streamflow diversion.

# 6.0 AVOIDANCE AND MINIMIZATION MEASURES

## 6.1. General Measures

Since the outset of the Project, TDI-NE has focused on site selection, Project design, routing, construction techniques, and equipment selection, so as to avoid, minimize and/or mitigate potential impacts to environmental resources. A broad overview of these measures is provided in Petition Exhibit TDI-JMB-14 (online: NECPL Mitigation Summary) and include the following:

Lake Segment

- Shorelines - Using horizontal directional drilling (HDD) for land/water transitions in Alburgh and Benson entirely to avoid impacts to the Lake Champlain shoreline, nearshore environments, and shallow water habitats.
- Commitment to restore an existing degraded shoreline on TDI-NE controlled parcel in Benson.
- Utilizing installation techniques in the lake to minimize resuspension of sediments and to avoid specific aquatic archaeological sites.

- Timing the installation to avoid sensitive periods of fish life cycles.
- Fisheries – In consultation with state regulators, certain known fisheries habitats have been avoided.
- Invasive plants - Developing an Aquatic Invasive Species Management Plan to prevent the introduction and spread of invasive species.
- Turbidity - Real-time monitoring of turbidity during construction, and utilizing controls such as changing the rate of installation in order to reduce suspension of sediments if appropriate.
- Utilizing environmental inspectors on the installation vessels to monitor compliance with lake-related regulatory requirements.
- Siting the cable route in conjunction with the Lake Champlain Maritime Museum (LCMM) to avoid archaeological resources wherever possible, and committing to LCMM best management practices.

Overland Segment

- Locating the overland cable route almost exclusively within existing public rights-of-way (ROW) (other than TDI-NE's property). The ROWs are heavily used, easily accessible during construction, are generally cleared of trees, undergo regular vegetation management and contain existing utilities.
- Selection of lake entry/exit points on relatively flat parcels of land that are currently cleared and developed, in order to reduce the need for tree removal, vegetation clearing and soil disturbance.
- Tree clearing - Reducing and minimizing tree clearing within the ROW during project design.
- Routing the project away from or under RTE species and potential significant natural communities to the extent practical to avoid undue adverse impacts. Any tree removal in potentially significant communities will be limited to areas immediately adjacent to the ROW and promptly restored and re-vegetated to preconstruction conditions to the extent practical.
- Identifying potential Indiana Bat roosting trees and designing the route to avoid them.
- A long-term Vegetative Management Plan will be implemented to address the introduction of invasive species and mitigate impacts to RTE plants.
- Due to the project design and the nature of trench construction, permanent fill to wetlands will be avoided.

- TDI-NE has, and will continue to, coordinate with VTrans and VTANR to ensure that crossing culverted streams will not interfere with potential future culvert replacement or stream enhancements. In addition, certain Town and/or State culverts could be replaced and hydrology would be improved during project construction.
- Riparian buffers have been identified in accordance with ANR Buffer Guidelines, and ground contours will be restored following construction to avoid any permanent alterations to waterways, flood elevations, or the ability of land to hold water.
- In certain areas, the cable is proposed in roadside stormwater ditches. These ditches will likely be improved as part of construction.
- Development of an operational-phase stormwater management concept for the Converter Station site to ensure proper management of stormwater runoff volumes and water quality treatment.

### 6.2. Wetlands

The Project design has carefully considered protection of wetlands and buffers. This began with the delineation of all wetlands/buffers within the Project corridor, as described above. The design then sought to include construction practices that would avoid and minimize impacts through specific design criteria, such as shown in the Typical Construction Methods and Designs – Overland Route (see Section 3). Specific measures include:

- Complete avoidance of any permanent wetland fill impacts;
- Locating the NECPL within existing disturbed/managed rights-of-way to minimize impacts to previously undisturbed wetlands;
- Identifying and avoiding impacts to riparian buffers in accordance with the ANR Buffer Guidance and VWR;
- Implementing stringent EPSC measures to protect water quality during construction as will be specified in final EPSC plans;
- Implementing topsoil segregation procedures during construction to ensure rapid revegetation of areas of temporary wetland impact;
- Implementing prompt restoration and revegetation at all wetland crossings during construction;
- Stabilizing disturbed soils with seed, including a native wetland seed mix for wetland areas, and providing temporary stabilization in the form of seedless straw; and

- Developing a specific long-term vegetation management protocol for implementation within wetlands and buffer areas that will be crossed by the Project.

### 6.3. Streams

As with wetlands, the Project design has included measures for the protection of streams within the NECPL corridor, including riparian buffers. The Applicant has adopted construction practices that would avoid and minimize impacts through specific design criteria, as shown in the Typical Construction Methods and Designs – Overland Route (Petition Exhibit AW-3). Specific to streams, the following avoidance and minimization measures have been implemented:

- Complete avoidance of any permanent stream channel impacts;
- Minimization of the number of buried crossings of streams;
- Co-location of the Project with existing culverted crossings of streams to avoid new temporary stream channel impacts;
- Providing stream dewatering/bypass structures to complete open trench excavations in a dry bed;
- Identification of riparian buffers in accordance with the ANR Buffer Guidance;
- Use of HDD in multiple locations to avoid direct impacts to stream channels;
- Implementation of stringent EPSC measures to protect water quality during construction;
- Implementation of prompt restoration and revegetation at all stream crossings; and
- Development of a specific long-term vegetation management protocol for implementation within riparian buffer areas that will be crossed by the Project.

In addition, the Project may provide opportunities for improvement to certain existing culverted stream crossings during construction, subject to review and approval by involved agencies and/or Towns.

## 7.0 REFERENCES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**ATTACHMENT A**

**REVISED MILE POINT COORDINATE POINTS**

# Coordinates for Mile Markers (Projection: WGS84)

| Mile-post | Latitude | Longitude |
|---|---|---|
| 0 | 45.010844 | -73.33031 |
| 1 | 45.001405 | -73.341418 |
| 2 | 44.987404 | -73.346576 |
| 3 | 44.974057 | -73.341693 |
| 4 | 44.961569 | -73.332046 |
| 5 | 44.947932 | -73.338172 |
| 6 | 44.933485 | -73.337957 |
| 7 | 44.91905 | -73.336675 |
| 8 | 44.907899 | -73.348643 |
| 9 | 44.894837 | -73.355251 |
| 10 | 44.880903 | -73.360626 |
| 11 | 44.867008 | -73.366307 |
| 12 | 44.853566 | -73.373117 |
| 13 | 44.839282 | -73.37025 |
| 14 | 44.826852 | -73.360654 |
| 15 | 44.816849 | -73.34606 |
| 16 | 44.806959 | -73.331357 |
| 17 | 44.792955 | -73.328054 |
| 18 | 44.779081 | -73.33223 |
| 19 | 44.767045 | -73.343528 |
| 20 | 44.753977 | -73.35203 |
| 21 | 44.740933 | -73.360564 |
| 22 | 44.726529 | -73.361318 |
| 23 | 44.712048 | -73.36115 |
| 24 | 44.69764 | -73.360604 |
| 25 | 44.683356 | -73.361595 |
| 26 | 44.669043 | -73.364679 |
| 27 | 44.655028 | -73.369617 |
| 28 | 44.641181 | -73.375551 |
| 29 | 44.626906 | -73.378449 |
| 30 | 44.612489 | -73.376856 |
| 31 | 44.598407 | -73.372411 |
| 32 | 44.584105 | -73.370216 |
| 33 | 44.570932 | -73.365126 |
| 34 | 44.561414 | -73.349942 |
| 35 | 44.553305 | -73.333434 |
| 36 | 44.540591 | -73.323983 |
| 37 | 44.526858 | -73.317581 |
| 38 | 44.51307 | -73.311497 |
| 39 | 44.499594 | -73.304202 |
| 40 | 44.485541 | -73.299319 |
| 41 | 44.471248 | -73.296195 |
| 42 | 44.456861 | -73.293928 |
| 43 | 44.442809 | -73.289202 |
| 44 | 44.428876 | -73.289933 |
| 45 | 44.416317 | -73.29992 |
| 46 | 44.402665 | -73.306545 |
| 47 | 44.388583 | -73.311258 |
| 48 | 44.374539 | -73.316183 |
| 49 | 44.360371 | -73.320205 |
| 50 | 44.345954 | -73.320334 |
| 51 | 44.332945 | -73.31192 |
| 52 | 44.318627 | -73.311402 |
| 53 | 44.304188 | -73.312715 |
| 54 | 44.289947 | -73.315063 |
| 55 | 44.27698 | -73.306727 |
| 56 | 44.262893 | -73.308809 |
| 57 | 44.249068 | -73.314422 |
| 58 | 44.236985 | -73.325401 |
| 59 | 44.228386 | -73.339546 |
| 60 | 44.21833 | -73.352958 |
| 61 | 44.20579 | -73.362569 |
| 62 | 44.195892 | -73.377105 |
| 63 | 44.184902 | -73.387612 |
| 64 | 44.17049 | -73.389287 |
| 65 | 44.15618 | -73.392384 |
| 66 | 44.143262 | -73.399977 |
| 67 | 44.131238 | -73.410435 |
| 68 | 44.116843 | -73.408744 |
| 69 | 44.102687 | -73.411219 |
| 70 | 44.088703 | -73.415657 |
| 71 | 44.076825 | -73.425914 |
| 72 | 44.062579 | -73.429508 |
| 73 | 44.048977 | -73.436015 |
| 74 | 44.037391 | -73.425779 |
| 75 | 44.028667 | -73.41069 |
| 76 | 44.015186 | -73.404145 |
| 77 | 44.000774 | -73.405439 |
| 78 | 43.986811 | -73.410468 |
| 79 | 43.972687 | -73.407304 |
| 80 | 43.958424 | -73.405687 |
| 81 | 43.94413 | -73.404993 |
| 82 | 43.929981 | -73.405792 |
| 83 | 43.916362 | -73.398979 |
| 84 | 43.902715 | -73.393193 |
| 85 | 43.891143 | -73.381711 |
| 86 | 43.878183 | -73.37282 |
| 87 | 43.864682 | -73.377058 |
| 88 | 43.851507 | -73.376297 |
| 89 | 43.839163 | -73.374944 |
| 90 | 43.829331 | -73.388362 |
| 91 | 43.816504 | -73.386185 |
| 92 | 43.804594 | -73.376494 |
| 93 | 43.794118 | -73.366198 |
| 94 | 43.782689 | -73.354846 |
| 95 | 43.769135 | -73.349792 |
| 96 | 43.756376 | -73.359249 |
| 97 | 43.74339 | -73.368083 |
| 98 | 43.732337 | -73.362421 |
| 99 | 43.730077 | -73.343374 |
| 100 | 43.719057 | -73.332561 |
| 101 | 43.711543 | -73.316892 |
| 102 | 43.715478 | -73.299972 |
| 103 | 43.70219 | -73.295375 |
| 104 | 43.68864 | -73.290061 |
| 105 | 43.6744 | -73.288934 |
| 106 | 43.660033 | -73.291438 |
| 107 | 43.646173 | -73.29722 |
| 108 | 43.631995 | -73.296925 |
| 109 | 43.618208 | -73.295429 |
| 110 | 43.608791 | -73.280961 |
| 111 | 43.606084 | -73.263636 |
| 112 | 43.606696 | -73.244102 |
| 113 | 43.612831 | -73.226556 |
| 114 | 43.61733 | -73.207791 |
| 115 | 43.623367 | -73.190164 |
| 116 | 43.616644 | -73.172765 |
| 117 | 43.616132 | -73.153611 |
| 118 | 43.616738 | -73.13434 |
| 119 | 43.614644 | -73.115857 |
| 120 | 43.613526 | -73.096224 |
| 121 | 43.607828 | -73.078621 |
| 122 | 43.602596 | -73.062661 |
| 123 | 43.590937 | -73.051557 |
| 124 | 43.589451 | -73.033813 |
| 125 | 43.592601 | -73.014435 |
| 126 | 43.586829 | -72.996603 |
| 127 | 43.581724 | -72.978014 |
| 128 | 43.572447 | -72.965551 |
| 129 | 43.558372 | -72.964344 |
| 130 | 43.544736 | -72.959044 |
| 131 | 43.538219 | -72.943561 |
| 132 | 43.525973 | -72.932933 |
| 133 | 43.516466 | -72.919183 |
| 134 | 43.506954 | -72.904284 |
| 135 | 43.496679 | -72.891702 |
| 136 | 43.487623 | -72.877347 |
| 137 | 43.474087 | -72.871396 |
| 138 | 43.46046 | -72.873899 |
| 139 | 43.449984 | -72.867262 |

| Mile-post | Latitude | Longitude |
|---|---|---|
| 140 | 43.448269 | -72.848038 |
| 141 | 43.447552 | -72.82855 |
| 142 | 43.451893 | -72.810221 |
| 143 | 43.45538 | -72.792175 |
| 144 | 43.447393 | -72.775767 |
| 145 | 43.438277 | -72.760445 |
| 146 | 43.436697 | -72.74079 |
| 147 | 43.431986 | -72.722231 |
| 148 | 43.421293 | -72.708914 |
| 149 | 43.429287 | -72.697749 |
| 150 | 43.443018 | -72.694426 |
| 151 | 43.456732 | -72.693198 |
| 152 | 43.448081 | -72.681086 |
| 153 | 43.436404 | -72.670021 |
| 154 | 43.430204 | -72.662362 |