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GT GreenbergTraurig

William A. Hurst
Tel: (518) 689-1407
Fax (518) 935-9513
hurstw@gtlaw.com

January 15, 2014

VIA ELECTRONIC MAIL and
UPS OVERNIGHT DELIVERY

United States Corps of Engineers
New York District
Jacob K. Javits Federal Building
New York, New York 10278-0090
ATTN: Regulatory Branch
Public Notice No.: NAN-2009-01089-EYA
(jun.yan@usace.army.mil)

Mr. Brian Mills
Office of Electricity Delivery and Energy Reliability (OE-20)
U.S. Department of Energy
1000 Independence Avenue SW
Washington, D.C. 20585
(Brian.Mills@hq.doe.gov)

Re: U.S. Army Corps of Engineers Application No. 2009-01089-EYA
United States Department of Energy, Office of Electricity Delivery and Energy Reliability -- Presidential Permit Application No. PP 362

Draft Champlain Hudson Power Express Transmission Line Project
Environmental Impact Statement (issued September 2013)

Dear Sir/Madam:

We write on behalf of Entergy Nuclear Indian Point 2, LLC, Entergy Nuclear Indian Point 3, LLC, and Entergy Nuclear Operations, Inc. (collectively, for the purpose of this filing, "Entergy-IP") to provide comments regarding the sufficiency of (i) the above-referenced permit application submitted by Champlain Hudson Power Express, Inc. and CHPE Properties, Inc. (collectively, "CHPE") to the U.S. Army Corp of Engineers ("USACE") for authorization to construct and operate portions of a 336-mile high-voltage, direct-current ("HVDC") transmission line and affiliated facilities in the waters of the United States (collectively, "Proposed Project"), and (ii) the associated Draft Environmental Impact Statement ("DEIS"), dated September 2013, prepared by the U.S. Department of Energy, Office of Electricity Delivery and Energy Reliability ("DOE"), as lead agency under the National Environmental Protection Act ("NEPA"), 42 U.S.C. §§ 4321, *et seq*. The DOE is considering whether to issue a Presidential Permit authorizing the Proposed Project to interconnect with yet unidentified electric generation sources located across the international border in Quebec, Canada.

As discussed below, CHPE's permit application pending before USACE should be denied for failure to comply with the Rivers and Harbors Appropriation Act of 1899 ("RHAA"), and based on the Proposed Project's inability to satisfy the stringent requirements of Clean Water Act ("CWA") § 404(b), 33 U.S.C. § 1344. Moreover, the DOE should withhold the Presidential Permit because the DEIS fails to take the requisite "hard look" at all environmental impacts associated with, and reasonable alternatives to, the Proposed Project, largely due to the DEIS's reliance on outdated and/or inapposite studies and findings generated during the related CHPE siting proceeding conducted under Article VII of the N.Y. Public Service Law ("PSL").[1] For all of these reasons, no permits or authorizations should be granted for the Proposed Project until the administrative record is supplemented in the manner discussed below, and in the accompanying Expert Report titled, *Technical Review of Environmental Impact Assessments of the Hudson River Segment of the Champlain Hudson Power Express* (Normandeau Associates, 2013), which Entergy-IP hereby submits for the record.[2]

Background

A. Entergy-IP's Interest in the Proceedings

Affiliates of Entergy-IP own and operate three of the six operating nuclear-electric generating units located in New York: Indian Point Units 2 and 3 (together, "Indian Point"), located on the Hudson River in Westchester County, and the James A. FitzPatrick Station ("FitzPatrick;" collectively, the "Stations"), located on Lake Ontario. The three units have a cumulative capacity of approximately three thousand (3,000) megawatts ("MW"), and collectively produce approximately 16% of New York's electricity. On a day-in, day-out basis, Indian Point alone provides a substantial percentage of metropolitan New York City's electricity, and therefore anchors the base load supply that advances the electric-system reliability and affordability goals that underpin the New York economy. The operation of Indian Point furthers federal and State goals of reducing emissions of criteria pollutants in New York State, especially in the non-attainment area of downstate New York, as well as advancing New York's Climate Change goals.

Entergy Corporation ("Entergy") and its affiliates, including Entergy-IP, are committed to environmental stewardship, as evidenced by the recognition it has received for its environmental performance and work to promote sustainability. On the strength of its industry-leading environmental performance, Entergy was named to the 2013/2014 Dow Jones Sustainability World and North America Indices. Entergy is the only U.S. company in the electric utility sector named to the World Index for 2013/2014. This is the 12th consecutive year the Dow Jones Sustainability Index, which measures the sustainable value companies provide to stakeholders, has included Entergy. Entergy also was named to the CDP S&P 500 Climate Performance Leadership Index. CDP, formerly known as the Carbon Disclosure Project, is an international, not-for-profit organization providing the only global system for companies and

[1] See NYPSC Case No. 10-T-0139, *Application of Champlain Hudson Power Express, Inc. and CHPE Properties, Inc. for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the PSL for the Construction, Operation and Maintenance of a High Voltage Direct Current Circuit from the Canadian Border to New York City*, "Order Granting Certificate of Environmental Compatibility and Public Need" (issued April 18, 2013).

[2] A true and correct copy of the Normandeau technical report is annexed hereto as Exhibit 1.

cities to measure, disclose, manage and share vital environmental information. Entergy is the only utility added to the performance index during the year just ended. Entergy was also named to the CDP S&P 500 Climate Disclosure Leadership Index. The disclosure index highlights companies with a strong approach to providing information on climate change. Only the top 10 percent of companies assessed are included on the index, with 53 companies making the list for 2013. These diverse awards underscore the Entergy companies' commitment to sustainability and the environment.

As related to the above referenced proceedings, Entergy-IP is particularly concerned about ensuring that any excavation and/or construction activities associated with the Proposed Project, to the extent conducted in the Hudson River adjacent to Indian Point, are undertaken with the utmost care and concern for public safety and the environment. Entergy-IP's operations are potentially affected during the CHPE project's construction phase, when dredging and cable-laying activities, with associated cable and support vessels, will occur just beyond the federally designated Safety and Security Zone at Indian Point. During the CHPE Project's operational phase, moreover, water temperature changes caused by the emanation of heat from the HVDC cables could alter the riverine environment in front of Indian Point in such a way as to directly impact critical operations at Indian Point. In other words, Entergy-IP's operations, which occur directly adjacent to an underwater portion of the Proposed Project, may be directly and adversely affected by the activities that would be authorized by CWA § 404(b) and other approvals CHPE seeks in these proceedings.

B. Description of Proposed Project

The Proposed Project includes: (i) an approximately 336-mile, HVDC transmission line that would run from the New York State border with Quebec to a new converter station in Astoria, Queens, largely via an underwater route; and (ii) an approximately five mile, underground alternating-current ("AC") line running from the Astoria converter station site to the existing Rainey Substation. *See* USACE, Public Notice, dated Oct. 2, 2013 ("October Notice"), Attachments 1, 3-4. In addition to being buried in or laid on the beds of Lake Champlain and the upper Hudson River, the HVDC Line would pass through multiple towns and cities along the 336-mile route, and be buried within two State-owned parks in Rockland County, prior to reentering and passing under the Hudson River, then the Harlem and East Rivers, and making landfall in Astoria, Queens. Upon making landfall, the HVDC Line would terminate at a converter station where the Direct-Current ("DC") power transmitted over the line from Canada would be converted into AC power for distribution to New York City customers. *See* DEIS, § 2.4.1.

The HVDC Line would be installed along the following route: From the Quebec border, the HVDC Line would enter into, and run under (or be laid on the bed of), Lake Champlain for approximately 101 miles, and would occupy the Federally-maintained navigation channel for part of that length. *See* October Notice, Attachment ("Att.") 2; Att. 3, Sheets 2-26. The HVDC Line would exit at the southern terminus of Lake Champlain in the Town of Dresden, Washington County, via Horizontal Directional Drilling ("HDD") – the practice of boring a hole with drilling equipment directionally into the ground to acceptable levels, and then gradually orienting the drill bit to run parallel to the surface of the earth. October Notice, p. 6. From there, the HVDC Line would be buried underground, first for approximately 11 miles within the Route

22 right-of-way through several towns in Washington County, and then for 65 miles along a railroad right-of-way owned by Canadian Pacific Railway, and running through the Town of Whitehall and several towns in Saratoga and Schenectady Counties until it would reach the City of Schenectady. October Notice, Att. 4, Sheets 1-194.

From the City of Schenectady, the HVDC Line would pass underground southwest through various private properties and rights-of-way until it would reach the City of Rotterdam, from which it would run through a railroad right-of-way owned by CSX that travels through the Towns of Bethlehem and Coeymans in Albany County, and then through the Village of Athens and the Town of Catskill in Greene County. October Notice, Att. 4, Sheets 195 *et al.* At that point, the HVDC Line would enter the Hudson River via a tunnel excavated by means of HDD. The HVDC Line would then travel 67 miles under (or be laid on the bed of) the Hudson River, until it would reach a point north of Haverstraw Bay. *Id.*, Att. 3, Sheets 29-46. The HVDC Line would bypass Haverstraw Bay for approximately 7.66 miles, via a combination of trenching and no less than three additional excavations by HDD that would enable the line to run under the Stony Point State Historic Park and the Rockland State Park. *Id.*, Att.3, Sheets 46-47.

The HVDC Line would then re-enter the Hudson River via further HDD and run approximately 21 miles to the Spuyten Duyvil Creek, and then into the Harlem River for 6.6 miles, where it would again occupy the Federally-maintained navigation channel. October Notice, Att. 2; Att. 3, Sheets 47-54. After leaving the Harlem River, the line would run along a 1.1 mile right-of-way until it enters and crosses under the East River, and then onto land in Astoria, Queens. *Id.*, Att. 3, Sheet 53. The submarine portions of the HVDC Line would collectively span almost 200 miles in length, making it the longest submarine transmission line in the United States.[3]

In July 2010, the Federal Energy Regulatory Commission ("FERC") granted CHPE's request for market-based rate authority, and authorized CHPE to pre-subscribe as much as 75% of the HVDC Line's transmission capacity to one or more "anchor tenants."[4] HQ Energy Services (US) Inc. ("HQUS"), the power-marketing subsidiary of Hydro-Quebec (a Canadian, state-owned utility), has identified itself as the most likely purchaser of those pre-subscription rights, and is actively seeking changes to New York's Renewable Energy Portfolio Standard ("RPS") eligibility criteria to obtain State subsidy of that purchase.[5] Because the HVDC Line

[3] The Proposed Project also includes the "Astoria-Rainey Cable" – an approximately five mile long, underground AC transmission line, which would connect the Astoria Substation to the Consolidated Edison Company of New York, Inc.'s existing Rainey Substation.

[4] *See* FERC Docket No. ER10-1175, "Order Authorizing Proposal and Granting Waivers" (issued July 1, 2010). Additionally, as noted below, Transmission Developers Inc. ("TDI") – an affiliate of CHPE – and Hydro-Quebec each submitted responses in another State proceeding noting Hydro-Quebec's proposal to become the anchor tenant for the CHPE project.

[5] NYSPC Case 13-M-0412, *et al.*, *Petition of New York State Energy Research Development Authority to Provide Initial Capitalization for the New York Green Bank*, "Comments of HQ Energy Services (US) Inc." (filed October 28, 2013) at p. 3 ("In addition to the direct economic and environmental benefits intrinsic to hydropower, incentives for hydropower could enhance the prospects for successful completion of the proposed Champlain Hudson Power Express ('CHPE') transmission facilities as well as future AC transmission investments currently being pursued to relieve upstate congestion by promoting increased hydropower deliveries over these facilities.").

has no intermediate access points in New York – *i.e.*, "on ramps" – it is designed and intended to inject Canadian power directly into the New York City load pocket.[6]

C. Construction Methodology

The aspects of the Proposed Project requiring underwater cable installation activities would be undertaken 24-hours per day/7-days per week in most areas, with nighttime shutdowns occurring only in select sensitive receptor areas. The continual construction schedule would thus result in the operation of heavy machinery and equipment (*e.g.*, generators, water pumps, and vessel engines) during all hours of the day and night. *See* Supplement to Dec. 10, 2010 Application & Responses to Additional Information Request for the CHPE Project ("Supplemental Application"), Appendix ("App.") A-3, pp. 9-10, 15.[7] The primary method for laying and burial of the underwater HVDC cable would be by jet plowing – a process that can simultaneously trench, lay and embed the cable with one device. This process is used in areas where the sediments are sufficiently soft, without significant rocky material. *Id.*, pp. 16-18. For sections where jet plowing is not possible, "plowing" and "dredging" of the lake and/or river bed would be necessary. *Id.*, p. 19. The decision regarding the type of equipment necessary to lay and bury the cables underwater would depend on precise field conditions that are unknown at this time. *Id.*, p. 15.

The application shows that installation of the submarine portions of the HVDC Line would cumulatively affect as much as 347 acres of USACE jurisdictional waters of the United States. October Notice, p. 6. Additionally, in areas of hard substrate on lake and river bed, and in instances where the HVDC Line would cross over existing underwater utility infrastructure, the record shows that work crews would lay the cable on the bed underlying the applicable water body and cover it with concrete mats. Supplemental Application, p. 21. CHPE only recently acknowledged the precise locations of these concrete mats and the fact that such matting would cover approximately 4.45 miles of the HVDC Line.[8] Moreover, while the October Notice specifies that the Proposed Project would permanently affect 10.5 acres of forested and non-forested wetlands and temporarily affect 67.4 acres of such wetlands, October Notice, pp. 7-8, the application shows that the impact would be much greater. Indeed, as explained in the

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[6] After the conclusion of the Proposed Project's State level Article VII proceeding, the New York Public Service Commission ("NYPSC") initiated a new proceeding, the purpose of which is to examine AC upgrades to New York's Bulk Transmission System that would relieve existing transmission constraints affecting electric transfers between New York's "Central East" and "UPNY-SENY" electrical interfaces. The relief of such constraints is intended to increase the flow of electricity from upstate and western New York into the New York City load pocket. NYPSC Case 12-T-0502, *Proceeding on Motion of the Commission to Examine Alternating Current Transmission Upgrades*, "Order Instituting Proceeding" (issued November 30, 2013). Numerous overland AC alternatives have since been filed and are under active consideration in that proceeding. *See generally*, NYPSC Case 13-E-0488, *In the Matter of AC Transmission Upgrades – Comparative Proceeding*. In essence, those newly proposed AC projects serve exactly the same function, from a transmission system perspective, as the Proposed Project.

[7] Although the Supplement is not dated, it appears that it was provided to USACE via a letter from HDR Engineering, Inc., dated February 29, 2011. Based on the information in the Supplement, however, the date specified on the letter must be incorrect; it should be dated 2012, not 2011. Of note, USACE has not posted any of CHPE's application documents on its website, or provided an appropriate website link to the application documents. In its October Notice, USACE provided a link to DOE's website but that website does *not* provide any information related to the application with USACE.

[8] *See* Supplemental Application, App. A-3, Table 5-1.4.

annexed Expert Report, the application appears to show that approximately 25.4 acres would be permanently impacted and 168 acres temporarily impacted in the Hudson, Harlem and East Rivers. *See* Expert Report, Table 1. The record needs to be clarified for a better understanding of the extent to which wetlands would be impacted by the Proposed Project. However, given the discrepancy in impacts to wetlands, the compensatory mitigation identified in the October Notice appears to be far too minimal and needs to be supplemented.

I. The Proposed Route for the HVDC Line Does not Comply with the Rivers and Harbors Appropriation Act of 1899

Section 10 of the RHAA prohibits "the creation of any obstruction not affirmatively authorized by Congress, to the navigable capacity of any of the waters of the United States." 33 U.S.C. § 403. Section 10 also provides that it shall be unlawful to (i) "build or commence the building of . . . structures . . . in any . . . navigable river, or other water of the United States," or (ii) "excavate or fill . . . the channel of any navigable water of the United states, unless the work has been recommended by the Chief of Engineers and authorized by the Secretary of War prior to beginning same." *Id.* Three aspects of the submarine routing of the HVDC Line included in CHPE's application are prohibited under in this provision: (a) 9-miles of cable that would run coincident with federal navigation channels in Lake Champlain and the Harlem River; (b) a 4.45-mile portion of the cable that would be anchored to the Hudson River sediment by concrete matting; and (c) all aspects of the transmission cable to be routed under Lake Champlain to the extent (i) the HVDC Line is to be surfaced laid with no covering at depths of greater than 150'; and (ii) the burial depth is less than four feet elsewhere in Lake Champlain.[9]

A. Aspects of the Proposed Project Route That Coincide with Federal Navigation Channels Are Prohibited Under RHAA § 10

Attachment 3 of the October 2013 Notice provides a detailed map-set of the underwater aspects of the CHPE's proposed cable route. The map-set shows that the proposed cable would be located directly within Federal navigation channels or their side slopes in the following areas: (i) mile markers 98 through 101 – in Lake Champlain near the Town of Dresden; and (ii) mile markers 324-30 – which correspond to the entire Harlem River. Attachment 2 of the October 2013 Notice provides a proposed cable route description table, which also indicates that the aspects of the cable route identified in (i) and (ii) above would be located within Federal navigation channel or side slopes.

Stacey M. Jensen, USACE Section Chief of the Eastern Permits Section, provided a letter to CHPE, dated July 5, 2011 ("July 2011 Letter"), in which she explained that construction of permanent structures, such as a transmission cable, linearly within a federal navigation channel is prohibited under RHAA § 10:

> The Corps of Engineers does not permit permanent structures with the length of the right of way, including side slopes, of a Federal navigation

[9] An affiliate of Entergy's raised the legality of these aspects of the Proposed Project in the proceedings held before the NYPSC. The NYPSC specifically deferred to USACE. *See* NYPSC Case 10-T-0139, *supra*, "Order Granting Certificate of Environmental Compatibility and Public Need," at p. 72 ("It is simply premature to guess the outcome of USACE's review.").

> channel (perpendicular crossings are permitted). . . . For this project to be deemed acceptable from a navigation perspective, the cable alignment must remain outside the Federal right of way. Minimal utility crossings perpendicular to the Federal navigation channel will be evaluated on a case by case basis in consultation with the regional harbor operations committees for navigation impacts when such crossings are unavoidable.

See Exhibit B, p. 1.[10] After identifying the portions of the proposed route located within federal navigation channels, including along mile markers 98-101 and mile markers 324-30, the letter requested that CHPE "[p]lease correct" the deficiency. Id., p. 5.[11]

In its Supplemental Application (at p. 3), CHPE acknowledged "propos[ing] to align the cables within close proximity to the Federal navigation channels located in the narrows of Lake Champlain . . . and the Harlem river." Rather than amending the proposed cable route to fully avoid the noted federal navigation channels, however, CHPE "request[ed] a meeting with USACE engineering staff to review this proposed configuration." *Id.* The record provides no evidence of whether such a meeting was scheduled and, if so, the matters discussed at the meeting, or its outcome. It would be inappropriate for the USACE to base its determination on private agreements reached at a non-public meeting, particularly since the basis and justification for any such agreements appear nowhere in the written record of this proceeding and thus cannot be subjected to public scrutiny. Nevertheless, whether or not such a meeting occurred, the final application documents conclusively show that the proposed route would coincide with the length of two federal navigation channels in clear violation of RHAA § 10.

B. Use of Concrete Matting to Anchor Transmission Cables to the Bed of the Hudson River is Prohibited

In its original application, dated December 6, 2010, CHPE explained that protective covering, such as concrete matting, would be mounted on top of the transmission cables in certain areas where the cable is surface laid because submarine burial is not feasible:

> In limited areas along the Project route, surficial geology may not permit adequate cable burial depths to ensure adequate cable protection. In these areas, the cables will be laid on the lake/riverbed with protective coverings, such as rip-rap, articulated concrete mats, grout/stone filled mattresses, or within a protective duct. Areas where these methods may occur are at existing pipeline or cable crossings, small unavoidable bedrock areas, and potentially in areas of highly contaminated sediments.

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[10] This requirement is consistent with Nationwide Permit No. 52 (Water-Based Renewable Energy Generation Pilot Projects), which provides that "[s]tructures may not be placed in established danger zones or restricted areas as designated in 33 CFR part 334, Federal navigation channels, shipping safety fairways or traffic separation schemes established by the U.S. Coast Guard (see 33 CFR part 322.5(l)(1)), or EPA or Corps designated open water dredged material disposal areas."

[11] The July 2011 Letter also insists that CHPE take measures to avoid Haverstraw Bay – which also corresponds with a federal navigation channel. CHPE has since modified the route to avoid Haverstraw Bay, although it still affects other Significant Coastal Fish and Wildlife Habitats ("SCFWHs").

See Application, dated December 6, 2010, § 4.2.4. In response to this aspect of CHPE's application, USACE notified CHPE in the July 2011 Letter (at p. 2) that the use of concrete matting for this purpose is prohibited: "Laying cables in lake/river bed in limited areas with protective coverings would not be acceptable. All cables must be buried."[12]

Nevertheless, as noted above, it appears that CHPE's final application includes requests to (1) surface lay the cable in Lake Champlain at depths of greater than 150' with no protective covering (other than the cable sheath); and (2) place approximately 4.45 miles of concrete matting over the HVDC Line in the Hudson River. Although CHPE's Supplemental Application (at p. 4) directly quotes USACE's notification that "protective coverings would not be acceptable," it provides a response that fails to address the matting question, noting only that certain parties in the completed proceeding before the NYPSC have "agreed that non-burial within Lake Champlain would be acceptable provided a report prepared by a recognized authoritative technical consultant demonstrated and concluded that public health and safety can be appropriately protected without such burial, and that the proposed installation method was approved by the Commission."

CHPE also included with its Supplemental Application an appendix – Appendix K – that purports to identify instances where surface laying transmission cable within Lake Champlain may be appropriate; however, nothing in the appendix addresses the appropriateness of using concrete matting to anchor transmission lines on the bed the Hudson River. Rather than providing any further written information in response to USACE's notification, CHPE again "requested a meeting with USACE staff to discuss this issue." Supplemental Application, p. 4. As previously stated, it would be inappropriate for the USACE to base its determination on private agreements reached at a meeting with CHPE that was not the subject of a public notice.

C. The Portions of Transmission Cable to Be Buried under Lake Champlain to a Depth of Less than Four Feet are Prohibited

Finally, with respect to the aspect of the HVDC Line to be situated within Lake Champlain, CHPE requested in its Supplemental Application (at p. 4) that USACE waive the requirement that the cable be covered at depths of greater than 150', and waive the requirement that, in all other cases in Lake Champlain, the cable be buried to a depth of no less than four feet. *See also id.,* App. A-3., p. 15 (the underwater transmission cables will be manufactured with armoring and buried primarily . . . from zero to four feet within Lake Champlain north of Crown Point, and three to four feet deep within Lake Champlain south of Crown Point").[13] USACE rejected this request in the October Notice (at p. 4), which specifies that "[t]he proposed burial

[12] The prohibition against the use of protective covering is consistent with Condition (b)(2)(iii) of the New York District's Nationwide General Permit No. 12 (Utility Line Activities), which requires instead that all transmission cable must be buried and to a certain depth: "In cases where the channel's existing bottom is already deeper than the authorized project depth, the utility line shall be located a minimum of 4 feet below the existing bottom in sediment . . ."

[13] CHPE had also requested a meeting with USACE staff to discuss this issue. The results of that meeting, if any, have not been made public.

would be 4 feet below the bottom of Lake Champlain . . ."[14] Should USACE decide to waive this requirement, Entergy-IP requests that the record be reopened so that such a waiver may be properly evaluated and subjected to public comment.

II. The Application Fails to Meet the Minimum Requirements Specified under Section 404(b) of the Clean Water Act

A. Applicable Legal Standard

Section 404 of the CWA requires a permit for the discharge of "dredged or fill materials" into "waters of the United States." 33 U.S.C. § 1344(a). To issue a Section 404 permit, the USACE must ensure that the Proposed Project complies with the Guidelines established by the U.S. Environmental Protection Agency ("EPA") under 40 C.F.R. Part 230. The critical provision of the Guidelines is the requirement that "no discharge of dredged or fill material shall be permitted if there is a practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem." 40 C.F.R. § 230.10(a). USACE must deny a permit application under Section 404 if the application does not contain "sufficient information" for the agency "to make a reasonable judgment as to whether" the proposed project constitutes the least environmentally damaging practicable alternative ("LEDPA"). *Id.*, § 230.12(a)(3)(iv).

The purpose of LEDPA is to *avoid* environmental impacts; *i.e.*, mitigation is required only after a showing that environmental impacts could not be avoided. *See* 75 Fed. Reg. 85,336, 85,340 (Dec. 24, 1980) ("if destruction of an area of water of the United States may be avoided, it should be avoided"). Under the terms of § 230.10(a), the ultimate project alternative approved by USACE must be *both* (i) the least environmentally damaging and (ii) practicable. The burden of demonstrating that no such alternative exists "is the sole responsibility of the applicant." *See* USACE, "HQUSACE Review & Findings: Old Cutler Bay Permit 404(q) Elevation" ("*Old Cutler*"), dated Sept. 13, 1990, p. 5.

In addition to the LEDPA test, Section 230.10(a)(3) establishes a rebuttable presumption with respect to a *non-water dependent activity* undertaken within a *special aquatic site*:

> [w]here the activity associated with a discharge which is proposed for a *special aquatic site* . . . does not require access or proximity to or siting within the special aquatic site in question to fulfill its basic purpose (*i.e.*, *is not 'water dependent'*), practicable alternatives that do not involve special aquatic sites are presumed to be available . . ."

Id. (emphasis added). Under §§ 230.3(q)(1), and 230.40-.43, the term "special aquatic site" is defined to include all wetlands, mudflats, vegetated shallows, and all sanctuaries and refuges designated under State and federal laws or local ordinances to be managed principally for the preservation and use of fish and wildlife resources. In this respect, the October Notice estimates – albeit inaccurately (see Part C below) – that 10.5 acres of wetlands would be permanently impacted and 67.4 acres of wetlands would be temporarily impacted because of the Proposed

[14] USACE informed CHPE in its July 2011 Letter (at p. 4) that "[o]utside of channel areas, the burial depth requirement is four feet." This requirement is also consistent with Condition (b)(2)(iii) of New York District's Nationwide General Permit No. 12 (Utility Line Activities).

Project. To obtain approval for the Proposed Project, CHPE must show by "clear and convincing evidence" that there are no practicable alternatives that would not cause a discharge of dredge and fill material into those wetlands. *See* USACE, In re: Plantation Landing Resort, Inc. ("*Plantation Landing*"), p. 12;[15] *see also* 40 C.F.R. § 230.10(a)(3) (practicable alternatives to non-water dependent activities are presumed to be available "unless clearly demonstrated otherwise"); 45 Fed. Reg. 85,336, 85,339 (Dec. 24, 1980) ("where an applicant proposes to discharge in a special aquatic site it is his responsibility to persuade the permitting authority that . . . these presumptions have clearly been rebutted").

Notably, the rebuttable presumption under the existing version of § 230.10(a)(3) replaced a "special, irrebutable presumption" that existed in the original 1975 regulation. *See* 45 Fed. Reg. at 85,339/col. 2. EPA made this change based upon its "experience" that (i) it was "not always the case" that "alternatives to wetlands were always less damaging to the aquatic ecosystem," and (ii) "there could be substantial impacts on other elements of the environment and only minor impacts on wetlands." *Id.* In other words, EPA replaced the "irrebuttable presumption" with a "rebuttable presumption" in recognition of the fact that a proposed non-water dependent project to be located within a special aquatic site may not always be the most environmentally damaging alternative. Accordingly, this aspect of the regulation was changed to acknowledge that, with respect to a non-water dependent project to be located within a special aquatic site, one water-based alternative may be preferable to other water-based alternatives. The change was not intended to make a water-based alternative preferable to land-based alternatives.

Here, USACE appropriately determined in its July 7, 2010 letter to CHPE (at p. 2) that "[t]he proposed power line project is not a water dependent use." It appears that USACE based this determination on the commonsense finding that transmission power lines, by their very nature, are not water dependent. This fact is further evidenced by the submissions in the NYPSC's ongoing AC Transmission proceeding (NYPSC Case 12-T-0502; Case 13-E-0488, *supra*), in which all but one of the proposals to relieve congestion on New York's bulk transmission system would occupy existing, overland rights of way.[16] Accordingly, the rebuttable presumption under Section 230.10(a)(3) is applicable to *all* aspects of the Proposed Project that affect a "special aquatic site," and cannot be overcome in this instance.

CHPE has also failed to consider that the aspects of the Hudson River through which the Proposed Project would be routed also constitute a "special aquatic site." Specifically, the State of New York enacted the Hudson River Estuary Management Act ("Act"), which establishes a "Hudson River estuarine district" that includes "the tidal waters of its tributaries and wetlands from the federal lock and dam at Troy to the Verrazano-Narrows." *See* N.Y. Envtl. Conserv.

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[15] As noted in the *Plantation Landing* decision, the presumption under Section 230.10(a)(3) is intended to "increase the burden on an applicant for a non-water dependent activity to demonstrate that no practicable alternative exists to his proposed discharge in a special aquatic site." *Id.*, p. 3; *see also Old Cutler*, p. 5 ("presumption should have the effect of forcing a hard look at the feasibility of using environmentally preferable sites to discourage avoidable discharges in special aquatic sites") (internal quotes omitted); "USACE, HQUSACE Findings: Hartz Mountain Development Corp.," August 17, 1989, at 3 ("if a 404 discharge may reasonably be avoided, it should be avoided") (internal quotes omitted);

[16] A diagram of the competing proposals in the NYPSC AC Transmission proceeding, drawn from the record of that proceeding, is annexed hereto as Exhibit 2.

Law ("ECL") § 11-0306(1). The purpose of the Act is to "protect, preserve and, where possible, restore and enhance the Hudson River estuarine district," *id.* § 11-0306(2). Since enactment of the Act, five sites have been designated as part of the Hudson River National Estuarine Research Reserve. Additionally, included within the Hudson River are numerous areas that have been formally designated as SCFWHs, several of which would be adversely affected by the HVDC Line. CHPE's failure to appropriately consider the Hudson River as a "special aquatic site" in its permit application is grounds to deny the application. Moreover, as shown below, CHPE has failed to show why practicable measures are not available to *avoid* both the wetlands that would be impacted by the Proposed Project, as well as the Hudson River.

B. CHPE's Application Fails to Show That The Proposed Project is the Least Environmentally Harmful Practicable Alternative

1. The Proposed Project Constitutes the Most Environmentally Harmful Alternative

CHPE has selected the *most* environmentally harmful alternative from among the range of alternatives. Deeming alternatives that avoid the Hudson River Estuary as "not practical" eliminates them from further consideration in the alternatives analysis. Thus, according to CHPE, the only remaining practicable alternative was the submarine route through the Hudson River Estuary. The environmental impacts of reasonable alternatives are therefore not considered as part of CHPE's alternatives analysis in making this selection, and a full environmental cost benefit analysis was not performed as it would be for a water dependent use project to monetize the value of the aquatic resources affected as both direct use and non-use benefits (and costs). By default, the submarine alternative appears to be the "least environmentally damaging" merely because it is the *only remaining* alternative. However, the 404(b)(1) guidelines stipulate that the project proponent must demonstrate there is no "practicable alternative . . . which would have less adverse impact on the aquatic ecosystem" and "*does not have other significant adverse environmental consequences*." 40 C.F.R. § 230.10(a) (emphasis added).

There is simply no way for CHPE to meet this standard. CHPE's application advances the claim that no other reasonable, non-water dependent alternatives to the Proposed Project exist, when in fact numerous examples of such alternatives are currently under active consideration by the NYPSC in the AC Transmission proceeding (NYPSC Case 12-T-0502, Case 13-E-0488, *supra*). At the least, CHPE's Section 404(b) application, and the DEIS, must be supplemented to include a meaningful consideration of these alternative means of meeting the overall DOE goal of relieving congestion in the New York State bulk transmission system.

2. CHPE Has Failed to Make the Requisite Showing that Each of the Alternatives it Rejected is Impracticable

An alternative is practicable where "it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes." 40 C.F.R. § 230.10(a)(2). Here, CHPE has essentially acknowledged that each of the overland alternatives it evaluated is feasible. *See* "Updated Least Environmentally Damaging Practicable Alternative Evaluation," dated July 3, 2013, attached as Att. I to Application (hereinafter,

"LEDPA Evaluation"), § 3. Moreover, none of the identified logistical challenges associated with routing the HVDC Line overland are insurmountable as evidenced by the fact that *virtually all transmission lines in New York have historically been routed overland.* Indeed, the notion that no practicable overland alternative routes for the HVDC Line exist is belied by the history of New York's bulk transmission system as it has developed over the last 100-plus years. Virtually all bulk transmission lines operating at 230 kilovolts and above in New York are routed overland. *See* N.Y.S. Energy Planning Bd., "Transmission & Distribution Reliability Study & Report" dated Aug. 2012, at p. 11, Figure 2.[17]

This point is reinforced by the pending submissions in the NYPSC's AC Transmission proceeding, in which a group of electric distribution utility companies calling itself the "New York Transmission Owners" ("NYTOs") has filed for permission to construct two new transmission projects, both of which would be routed overland: (i) Second Ramapo to Rock Tavern 345 kV Line; and (ii) Second Oakdale to Fraser 345 kV Line. Several merchant transmission companies, including NextEra Energy Transmission, LLC, Boundless Energy NE, LLC, and North America Transmission, LLC, have each submitted overland transmission alternatives to what the NYTOs' submitted, including a proposal to construct a Marcy to New Scotland 345 kV Line. Thus, irrespective of CHPE's evaluation, it is just not credible to conclude that overland routes are impracticable.[18]

Nor is it credible, as CHPE suggests, to find that overland alternatives are too costly – another of the elements of impracticability. LEDPA Evaluation, pp. 3-3 to 3-5. The standard to be applied when examining the cost of an alternative under Section 230.10(a) is whether the alternative is "unreasonably expensive" (45 Fed. Reg. at 85,343), which, in turn, is based on "whether the projected cost is substantially greater than the costs normally associated with the particular type of project." *See* EPA, "Memorandum: Appropriate Level of Analysis Required for Evaluating Compliance with the Section 404(b)(1) Guidelines Alternatives Requirements."[19] Again, given that *only* overland alternatives are being examined in the context of the NYPSC's AC Transmission Proceeding, the suggestion that overland alternatives are *unreasonably* expensive when compared to the Project is groundless.

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[17] The Report can be found at http://www.nysenergyplan.com/Reliability-Study-and-Report/reliabilitystudy.aspx. There are two submarine transmission lines that provide electricity to Long Island (the Neptune and Cross-Sound lines) and one that provides electricity to New York City (the Bayonne line). About two-thirds of the 65 mile long Neptune line – or 44 miles – extends under New York's waters. *See* Map of Project at http://neptunerts.com/ the-project/. About half of the 24-mile Cross-Sound line – or 12-miles – is located in New York's waters. *See* http://www.crosssoundcable.com/. The Bayonne line extends approximately 2.5 miles under New York waters. *See* http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId= {8BF803F7-E587-439E-AB32-83C01BB41401}. By contrast, there are currently 4,000 miles of bulk transmission lines operating at 230 kilovolts and above in New York. Report, p. 10. Thus, submarine transmission lines represent about 1.5% of the bulk transmission system in New York.

[18] CHPE also refers to the discontinued proceedings related to the New York Regional Interconnection ("NYRI") project, apparently to imply that construction of overland bulk transmission cables is logistically problematic. *See* LEDPA Evaluation, pp. 1-3 to 1-5. The NYRI project, however, is irrelevant to a determination of logistics here, given that the route that would have been traversed by the NYRI project is entirely different from any of the overland alternative routes considered by CHPE. Furthermore, consideration of the difficulty in obtaining political support for overland transmission projects would set a bad precedent in that it would create an incentive for future transmission projects to be routed through New York's waterways.

[19] The Memorandum can be found at http://water.epa.gov/lawsregs/guidance/wetlands/flexible.cfm.

In any event, to address the cost issue, CHPE also makes an inapposite comparison of the HVDC Line to four other submarine transmission lines constructed in the United States. For example, CHPE points to the Juan de Fuca Project, which connects power sources on View Royal, British Columbia, to Port Angeles in the State of Washington. LEDPA Evaluation, p. 3-4. However, that line had to be routed under the Strait of Juan de Fuca for the simple reason that View Royal is located on an island.[20] Additionally, the submarine route selected in the context of the Juan de Fuca Project constituted the shortest distance between View Royal and Port Angles, and the line was routed across the Strait, rather than along the length of a lake and river, which would be the case here. Each of the other projects identified by CHPE similarly was routed across, rather than along the length of, the applicable water body, and vastly shortened the distance between power source and end point. *Id.* Here, by contrast, CHPE went out of its way to ensure that the HVDC Line would be routed through the length of waterways.

Moreover, CHPE makes an inapt comparison between the costs per MW of the Proposed HVDC Line versus the cost per MW of the submarine transmission lines installed in the context of the four referenced projects. The appropriate comparison should be cost per mile, not cost per MW, for the simple reason that there is nothing that requires the HVDC Line to be connected to a power source in Canada. The fact is that CHPE has proposed to construct a transmission line that is close to two times the length of the Northern Pass line (the longest one on the list). Again, as the submissions in the NYPSC AC Transmission proceeding show, the HVDC Line is not the only solution to congestion relief. The incredibly long span of the HVDC Line serves to prove only that the project itself is impracticable. A more appropriate cost per mile comparison shows that the CHPE project is by far the *least* expensive of the projects evaluated.

	CHPE Project	Neptune	Port Angeles-Juan de Fuca	Trans Bay	Northern Pass
Overall Cost	~$ 2.0 billion	$600 million	$750 million	$505 million	$1.1 billion
Distance	336 miles	65 miles	31 miles	57 miles	180 miles
Cost per Mile	$5.95 million	$9.2 million	$24.2 million	$8.9 million	$ 6.1 million

CHPE is proposing to build the longest submarine HVDC transmission line in the country's history. Unlike the projects CHPE evaluates for comparison purposes, there is simply no compelling reason why the Proposed Project needs to be routed through New York's waters to the extent proposed. As evidenced by the lengthy discussion in the LEDPA Evaluation regarding the NYRI proceeding, CHPE intended from the beginning to route the HVDC line through State waterways specifically because of perceived political – not environmental or feasibility – problems related to routing transmission lines overland. LEDPA Evaluation, pp. 1-3 to 1-5. That simply cannot form the basis of a project that the USACE acknowledges does not qualify as a water dependent use. The waterways of New York should not be used as a mechanism to make an impracticable project less expensive.

[20] A map of the project can be found at http://jdfcable.com/maps.shtml.

C. The Proposed Compensatory Mitigation Recommended by USACE is Far Too Minimal as a Matter of Law

EPA's CWA § 404(b) Guidelines also require compensatory mitigation associated with the loss of any aquatic resources, including wetlands. *See* 40 C.F.R. Subpart J. Specifically, pursuant to 40 C.F.R. § 230.93(a)(1), the required compensatory mitigation "must be commensurate with *the amount* and type of impact that is associated with a particular [] permit." (Emphasis added). Again, as explained in the annexed Expert Report (Table 1), information from CHPE's application shows that approximately 25.4 acres would be permanently impacted in the Hudson, Harlem and East Rivers – much greater than the 10.5 *total* acres identified in the October Notice. Thus, because CHPE's proposed compensative mitigation is based on an incorrect amount of wetlands impacted, it must be rejected. At minimum, USACE must require additional compensatory mitigation, and another opportunity for public comment to ensure that the mitigation is appropriate.

III. The DEIS Fails To Take the Requisite "Hard Look" At the CHPE Project's Environmental Impacts

NEPA "is our basic national charter for protection of the environment." 40 C.F.R. § 1500.1(a). It is a procedural statute that requires federal agencies to assess the environmental consequences of their actions before those actions are undertaken. In *Marsh v. Oregon Natural Resources Council*, 490 U.S. 360 (1989), the United State Supreme Court noted that "NEPA promotes its sweeping commitment to prevent or eliminate damage to the environment and biosphere by focusing Government and public attention on the environmental effects of proposed agency action" so that the "agency will not act on incomplete information, only to regret its decision after it is too late to correct." *Id.* at 371 (internal quotation marks and citations omitted).

"At the heart of NEPA is a requirement" that for every "major Federal action[] significantly affecting the quality of the human environment," the agency involved must prepare a "detailed statement" regarding, among other things, (i) "the environmental impact of the proposed action," (ii) "any adverse environmental effects which cannot be avoided should the proposal be implemented," and (iii) "alternatives to the proposed action." *Dep't of Transp. v. Pub Citizen*, 541 U.S. 752, 763 (2004) (quoting 42 U.S.C. § 4332(2)(C)). In *Winter v. Natural Resources Defense Council, Inc.*, 55 U.S. 7 (2008), the Supreme Court reiterated that "[p]art of the harm NEPA attempts to prevent in requiring an EIS is that, without one, there may be little if any information about prospective environmental harms and potential mitigating measures." *See also Monsanto v. Geertson Seed Farms*, 130 S. Ct. 2743 (2010) (Stevens, J., dissenting) (noting that an EIS is especially important where, as here, the environmental threat is novel). Ultimately, federal agencies must take a "hard look" at the potential environmental consequences of their actions. *Kleppe v. Sierra Club*, 427 U.S. 390, 410 n.21 (1976). Conclusory presentation of data and "general statements about possible effects and some risk" do not satisfy the "hard look" standard. *Ocean Advocates v. U.S. Army Corps of Engineers*, 361 F.3d 1108, 1118 (9th Cir. 2004).

As explained more fully in the accompanying Expert Report of Normandeau Associates, Inc., titled, *Technical Review of Environmental Impact Assessments of the Hudson River Segment of the Champlain Hudson Power Express*, the DEIS is inadequate when measured

against NEPA's exacting standards.[21] The CHPE project is of unprecedented scale in New York, and proposes to convert more than 80 miles of the Hudson River – a critical natural resource – into a transmission cable right of way approximately 30 feet wide. Whether viewed in the context of impacts to fish (including ESA-listed sturgeon), and/or their habitat from cable construction, which will be significant and long-lasting, or the impacts to recreational and commercial use of the Hudson River caused by a new, 88-mile long "no anchor" zone that will render 320 acres of river bottom unavailable for anchorage,[22] the CHPE project requires the utmost in environmental scrutiny, not a rehash of insufficient and outdated studies generated for a State-level siting proceeding, which is all the DEIS contains. *See Klamath-Siskiyou Wildlands Center v. Bureau of Land Management*, 387 F.3d 989, 998 (9th Cir. 2004) ("A non-NEPA document – let alone one prepared and adopted by a state government – cannot satisfy a federal agency's obligations under NEPA.").

A. The DEIS Fails to Take a Hard Look at the Proposed Project's Potential Environmental Impacts

The tidal Hudson River possesses regionally and globally rare communities in one of the largest freshwater tidal river systems in the northeastern United States. The Hudson River Estuary contains about 130 species of fish, and supports nearly 100 species of special emphasis, including federally and state-listed endangered or threatened species of fish, birds, and plants. It provides habitat for spawning and nursery of commercially and ecologically important fish and shellfish species such as Striped Bass, American Shad, Alewife, Blueback Herring, and Blue Crab. In addition, it hosts two federally listed endangered fish species, the Atlantic Sturgeon and Shortnose Sturgeon, and an expanding population of nesting bald eagles.

Within the Hudson River Estuary are several SCFWHs designated under the federal Coastal Zone Management Act and New York Coastal Management Program, and an additional five sites constituting the Hudson River National Estuarine Research Reserve.[23] The proposed CHPE Project route within the 88-mile Hudson River Segment will directly intrude upon several of these SCFWHs, yet the direct and indirect impacts of selecting the submerged route through

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[21] See Normandeau Associates, Inc., Technical Review of Environmental Impact Assessments of the Hudson River Segment of the Champlain-Hudson Power Express (dated January 15, 2014), Exhibit 1 hereto.

[22] The DEIS indicates that "[v]essel anchorage would be prohibited in the transmission line ROW," which is further described as being "approximately 30 feet (9 meters) in width in most underwater areas." *See* DEIS, p. S-34, 2-31. Thus, the acreage amount is based upon a simple conversion of area to acreage: 88 miles x 5280 feet/mile x 30 feet x 1 acre/43,560 feet^2. Additionally, the DEIS (at S-34) recognizes that "local authorities" would be relied upon "to prevent the possibility of anchor damage" to the HVDC Line. It seems entirely inappropriate and unreasonable for a safety issue of this dimension to be based upon local enforcement shared between the numerous municipalities having jurisdiction along the 88-mile Hudson River route.

[23] In a combined Article 78/declaratory judgment action currently pending in the New York State courts, affiliates of Entergy have challenged the designation of the four-mile stretch of the Hudson Highlands SCFWH adjacent to Indian Point as a Habitat. That challenge, which does not pertain to the entire Hudson Highlands SCFWH, was denied by a trial court judge on November 20, 2013. The appeal of that decision was filed on December 26, 2013, raising multiple grounds why the New York Appellate Division should reverse or vacate the decision of the trial court, and nothing in this letter or the annexed Expert Report should be deemed a waiver of the position taken in that proceeding. Importantly, even if the particular portion of the Hudson Highlands SCFWH challenged in that proceeding should be dedesignated, the points made above in text remain in force with respect to the balance of the Hudson Highlands SCFWH and the other Habitats mentioned.

the sanctuary and these SCFWHs is inadequately addressed in the DEIS and CWA § 404(b) Application. For example, the CHPE Project route intentionally selected an overland route to avoid the Haverstraw Bay SCFWH, but failed to afford the same protections for other SCFWHs (Catskill Creek, Esopus Estuary, the Kingston-Poughkeepsie Reach, the Hudson Highlands, and the Lower Hudson River Reach). Because reasonable alternate overland routes along existing utility and transportation corridors are both available and obvious, prudent management practices warrant avoiding the uncertainties of an underwater route to protect all SCFWHs within the Hudson River Estuary.

The DEIS does not adequately address the cumulative environmental impacts associated with the Hudson River Segment of the CHPE Project, when combined with other, reasonably foreseeable construction projects affecting the Lake Champlain and Hudson River environments. Other projects proposed coincident with the CHPE Project include the West Point Transmission Project (77.6 miles of underwater buried cable) and the TDI New England Clean Power Link Project (100 miles in Lake Champlain, apparently on the same route as CHPE), yet the cumulative impact of these projects when combined with the CHPE have not been adequately addressed in the DEIS.[24] This can be demonstrated by comparison to another massive construction project, the Tappan Zee Bridge Construction Project, the impacts of which will overlap with those of the CHPE. The impacts from the CHPE Project are spatially extensive and of a similar magnitude of disturbance (185 acres) compared to the spatially and temporally restricted Tappan Zee Project (246 acres), yet the Tappan Zee project has undergone, and will undergo, far more detailed environmental study, analysis and mitigation than is offered in the DEIS. Further, new information arising from studies of endangered species and their habitat use required by the Tappan Zee Project must be considered in the DEIS here to adequately assess the incremental and cumulative impacts of the CHPE Project, when added to the Tappan Zee Bridge Project.

There is also a convergence of existing and proposed projects in the Hudson River near Indian Point that warrant a more thorough cumulative impact analysis than is found in the DEIS. The Hudson River near Indian Point is an area of a high level of anthropogenic use, including the existing Spectra gas pipeline and proposed expansion, and the proposed underwater West Point transmission cable that would exit the river at Con Edison's Buchanan North Substation, located adjacent to the Indian Point Energy Center. These existing and proposed uses are all within the recently (August 2012) expanded lower reach of the Hudson Highlands SCFWH, which extended the former Hudson Highlands SCFWH from Hudson River miles (HRM) 44-56 by four miles downstream to Stony Point and by an additional four miles upstream to Denning Point to now encompass HRM 40-60.[25] The CHPE Project will bisect this newly designated SCFWH for several river miles.

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[24] As reported on the website established by TDI New England, the company proposes to construct a 1,000 MW HVDC transmission to Vermont and the New England marketplace by, in part, routing the line under Lake Champlain. *See* http://necplink.com/docs/New_England_Clean_Power_Link_Map.pdf. Upon information and belief, TDI New England is a sister-company to CHPE's parent, TDI.

[25] As noted in footnote 23, nothing in this letter or the annexed Expert Report should be deemed a waiver of the position taken in the court proceeding related to the designation of the four-mile stretch of the Hudson Highlands SCFWH adjacent to Indian Point as a Habitat.

The organic fraction of the sediments that will be redistributed by dredging will likely be transported even further than the inorganic fraction, potentially exacerbating the spread of anoxic or low oxygen concentration waters that are in violation of numeric and narrative water quality standards for waters of the Hudson River Estuary. Blasting, HDD activities, and the use of drilling fluids have the potential to increase turbidity and contaminants in nearby groundwater wells due to bedrock fracturing and an increase in pore volume. Due to a slow rate of groundwater exchange, these alterations to groundwater quality are rarely "temporary" as described in the DEIS and CWA § 404(b) Application. Furthermore, the Spill Prevention, Controls, and Countermeasures ("SPCC") and/or an Environmental Management and Construction Plan ("EM&CP") proposed in the DEIS rely on subjective visual and operational management, and not on quantitative best management practices like volume or pressure metrics, and thus are inadequate for a project of this magnitude and potential impacts. While the DEIS provides rudimentary information on the heat dispersion properties of the HVDC cable at depth and in varying types of sediments, there is insufficient information to determine whether this thermal input to the Hudson River will have no significant individual or cumulative impact on the Hudson River Estuary or on the permitted existing permitted uses.

The annexed Expert Report also demonstrates how the DEIS's evaluation of magnetic fields and induced electrical fields is incomplete, particularly regarding the potential effects on two federally-listed endangered fish species, Atlantic Sturgeon and Shortnose Sturgeon. These are both bottom oriented fish species that spawn over the soft substrates, use the near bottom areas as nursery habitat for their larvae and juveniles, forage for benthic invertebrates, and in general spend nearly all of their estuarine life within 3 feet of the Hudson River substrate and therefore in close proximity to the CHPE transmission cable whether buried or covered by rip rap mats. Studies of other sturgeon species suggest that these two endangered species may be sensitive to both magnetic and induced electrical fields and avoid contact with these fields. Recent (2012-2013) Hudson River Biological Monitoring Program trawl catch data from 2012-2013 demonstrate relatively high abundance of juvenile Atlantic Sturgeon and Shortnose Sturgeon caught directly on the proposed cable route in the upper portion of the Hudson Highlands CHPE. As noted in the Report, a concentration of Atlantic and shortnose sturgeon overwintering in the expanded northern portion of the Hudson Highlands SCFWH was recently revealed through analysis of fisheries monitoring data from August 29, 2012 through August 29, 2013 and reported to the National Marine Fisheries Service. Displacement of sturgeon from this habitat was not addressed in the DEIS or CWA § 404(b) Application, and must be adequately addressed to determine the impacts of the proposed CHPE cable route for these two endangered species. Furthermore, the evaluation of fish exposure to magnetic fields generated by the AC cable and to induced electrical fields, although superficially addressed in the DEIS for electrosensitive species, is incomplete because it does not consider species other than those with documented electrosensitivity.

B. The DEIS Fails to Take a Hard Look at All Reasonable Alternatives

As previously stated, an EIS must assess, *inter alia*, "alternatives to the proposed action." 42 U.S.C. § 4332(2)(C). An agency's assessment of alternatives "sharply defin[es] the issues and provid[es] a clear basis for choice among options by the decisionmaker and the public." 40 C.F.R. § 1502.14. Agencies must "[r]igorously explore and objectively evaluate all reasonable alternatives." *Id.*, § 1502.14(a). Although agencies have discretion to identify the

range of "reasonable" alternatives, they must "include the alternative of no action." *Id.*, § 1502.14(c)-(d). As DOE noted in the DEIS (at p. S-3), "[i]n determining whether a proposed action or a reasonable alternative is in the public interest, DOE considers the potential impacts of the proposed action and any reasonable alternatives on the environment pursuant to NEPA, the Proposed Action's impact on the reliability of the U.S. electric power supply system, and any other factors that DOE considers relevant." The ostensible justification for the Proposed Project is to by-pass existing system congestion problems and inject presumably lower-cost Canadian power directly into the constrained New York City load pocket. *Id.* A fundamental flaw in the DEIS's alternatives analysis, however, is its sole focus on alternative means of sourcing *Canadian* power to achieve that purpose. As evidenced, again, by the NYPSC's ongoing AC Transmission proceeding (NYPSC Case Nos. 12-T-0502 and 13-E-0488), there are numerous other more local and potentially less environmentally harmful means of relieving those system constraints and increasing the deliverability of power to the New York City load pocket, yet the DEIS impermissibly fails to consider them as alternatives to the Proposed Project. It also fails to consider those projects as part of the "no action" alternative, *i.e.*, the likelihood that, should the Proposed Project not be authorized, congestion relief could still be accomplished through the AC transmission projects. In other words, the Proposed Project may be unnecessary and redundant of other projects.

C. The Proposed Project Does Not Serve the Public Interest

"Applications for Presidential Permits are evaluated based on the potential impacts that a proposed project could have on the environment, the operating reliability of the U.S. electric power supply, and any other factors relevant to the public interest." DEIS, at p. S-3. With a project of this magnitude, the possibility that New York consumers will be forced to subsidize the Proposed Project's costs, directly or indirectly, is a matter directly "relevant to the public interest." Here, although denominated a "merchant" transmission project (DEIS, at p. S-3), *i.e.*, one in which the project's investors assume all financial risk, it is now quite clear that CHPE's business model will impose at least some of the Proposed Project's costs on New York consumers.

On May 30, 2012, CHPE (by and through their affiliate TDI) and Hydro-Quebec separately submitted their respective responses to Governor Andrew Cuomo's "Energy Highway Initiative" ("Energy Highway") Request for Information ("RFI").[26] The first proposal contained in Hydro-Quebec's EHI submission is titled "Hydro-Quebec participation in Champlain Hudson Power Express." The accompanying text states, *inter alia*, "[Hydro-Quebec] proposes to become the 'anchor tenant' for the [TDI] project by committing up to a 40-year purchase of 75% of the transmission rights, effectively paying for the construction of the line."[27] TDI's companion EHI submission states, "TDI will enter into a 35-40 year Transmission Service Agreement with [Hydro-Quebec] or other entity for 750 MW of transmission capacity."[28]

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[26] A true and correct copy of CHPE's and Hydro-Quebec's Energy Highway submissions are annexed hereto as Exhibit 2.

[27] Id., Hydro-Quebec EHI submission at 3 of 13 (footnote omitted).

[28] Id., TDI EHI submission at 11 of 26.

Read together, as they are intended to be, TDI's and Hydro-Quebec's RFI submissions reveal a business model under which Hydro-Quebec may finance the Project, in whole or in part, "effectively paying for the construction of the line," in return for the right to 75% of the Project's transmission capacity for a term of years. As evidenced by, *inter alia*, Hydro-Quebec's recent entreaty to the NYPSC to amend the qualifying criteria of the RPS program to include hydropower imports, Hydro-Quebec would likely only be willing to undertake such an obligation if the costs could be offset by some extra-market mechanism that would allow recoupment of the price paid to secure long-term transmission rights on the HVDC Line. Under the RPS program, and/or through an out-of-market contract with a New York load serving entity, that offset would come through payments made by New York consumers, not the Proposed Project's investors. If that were to occur, the Proposed Project would actually harm, not advance, the public interest.

CONCLUSION

Entergy-IP is seeking to ensure through submission of this comment letter, as well as the annexed Expert Report, that all entities that have filed permit applications to undertake energy-related activities in New York are held to an appropriate-level of scrutiny. However, for the reasons specified above, given the high standard of environmental review to which USACE and DOE are held under applicable law, the permit applications submitted by CHPE to the two agencies should be denied.

Respectfully submitted,

GREENBERG TRAURIG, LLP

William A. Hurst

Robert M. Rosenthal

WAH/rsb
Enclosure
ALB 1746671v1

EXHIBIT 1

NORMANDEAU
environmental consultants

Technical Review of Environmental Impact Assessments of the Hudson River Segment of the Champlain-Hudson Power Express

Prepared For:
Entergy Indian Point 2, LLC,
Entergy Indian Point 3, LLC and
Entergy Nuclear Operations, Inc.

Submitted On:
15 January 2014

Prepared By:
Normandeau Associates, Inc.
30 International Drive; Suite 6
Portsmouth, NH 03801

www.normandeau.com

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Executive Summary

A technical review was performed of the September 2013 Draft Environmental Impact Statement (DEIS) and the Clean Water Act Section 404 Permit Application Alternatives Analysis Report (404 Application) for the Champlain Hudson Power Express, Inc. (CHPE) proposal to construct, operate and maintain an approximately 336-mile long 1000 MW high-voltage, direct-current (HVDC) transmission line and related facilities from Quebec to New York City (CHPE Project). The objective of this technical review was to assess the selection of an 88-mile long Hudson River Segment of the CHPE Project as the Least Environmentally Damaging Practicable Alternative (LEDPA) based on the temporary, permanent, and cumulative impacts to the natural environment identified and described in the DEIS.

The Hudson River Estuary is classified as the length of river from the Verrazano Narrows – the tidal strait separating Staten Island and Brooklyn, to the Troy Dam just north of Albany, is a variable habitat that represents the overlap between southern and northern ecological zones, traverses saline, brackish and fresh waters, and includes many important natural resources, including a substantial recreational fishery and nursery areas for many important commercial species. The Hudson River drainage has more than 200 species of fish, with 129 of those being found in the tidal portion of the estuary (Daniels et al. 2005). In addition, the Hudson River Estuary supports nearly 100 species of special emphasis, including federally and state-listed endangered or threatened species of fish, birds, and plants.

Within the Hudson River Estuary are many Significant Coastal Fish and Wildlife Habitats (SCFWHs) designated by the New York State Coastal Zone Management Act, and an additional five sites constituting the Hudson River National Estuarine Research Reserve. While the proposed CHPE Project route within the 88 mile Hudson River Segment avoids direct contact with all but five SCFWHs, the direct and indirect impacts of selecting the submerged route through this area and these five SCFWHs are problematic in that they are inadequately addressed in the DEIS and 404 Application. It appears the CHPE Project route intentionally selected an overland route to avoid the Haverstraw Bay SCFWH, but did not afford the same protections for five other SCFWHs (Catskill Creek, Esopus Estuary, the Kingston-Poughkeepsie Reach, the Hudson Highlands, and the Lower Hudson River Reach). Prudent management practices warrant avoiding the uncertainties of an underwater route for the CHPE Project to protect all SCFWHs within the Hudson River Estuary when overland routes along existing corridors are both available and obvious, low-environmental impact alternatives.

The 88 miles of CHPE Project transmission cable proposed for installation within the Hudson River Segment would either be installed over the hard bottom substrate or be buried in a shallow trench beneath the soft bottom habitat of the Hudson River Estuary through a mechanism known as a jet or hydraulic plowing. Jet plowing uses a pressurized water jet to displace the bottom sediment from the trench in which the cable is placed, allowing the suspended sediment to re-settle on top of the cable. Although use of jet plowing was included in the Best Management Practices (BMP) guiding this project, detailed model input parameters were not provided, sediment dispersion was not modeled, and assumptions may have been overstated. For these reasons it is unclear if the specific displacement of sediments within the five SCFWHs of the Hudson River Estuary by jet plowing represents a temporary disturbance, or if the suspended material could have

substantial long-term detrimental impacts on biota in the water column. Key potential impacts for a project of the scale addressed here include de-oxygenation of potentially large areas of the water column by re-suspended organic materials, turbidity above known tolerances for certain species, and smothering. Sufficient overland routes along existing transportation or transmission corridors exist to make the selection of 88 miles within the Hudson River Estuary the most environmentally damaging alternative, particularly since the CHPE Project is not a water-dependent use.

The DEIS and 404 Application have not adequately demonstrated that the submerged CHPE Project route within the Hudson River Estuary is significantly less costly than overland routes. The DEIS and 404 Application have not adequately demonstrated that an overland route is logistically impracticable compared to the 88 miles of submerged cable within the Hudson River Estuary. To the contrary, the potential for significant adverse effects of the Hudson River Segment of the CHPE Project to "waters of the United States" clearly demonstrate that it fails to be the LEDPA.

The DEIS and 404 Application also have not adequately addressed cumulative impacts or imposed sufficient mitigation measures associated with the Hudson River Segment of the CHPE Project. By comparison, the level of study and mitigation (both in-kind and out-of-kind) required for the Tappan Zee Bridge Construction Project far exceeds that related to the proposed CHPE Project. The impacts from the CHPE Project within the Hudson River Segment are spatially extensive along 88 miles of river bottom and greater in magnitude (168 acres of temporary disturbance and 25 acres of permanent change estimated by the DEIS) compared to the spatially constrained Tappan Zee Project (139 acres total disturbed and 107 acres permanently changed). New information arising from studies of endangered sturgeon species and their habitat use required by the Tappan Zee Project should be considered to adequately assess the incremental and cumulative impacts of the CHPE Project. Other projects proposed coincident with the CHPE Project include the West Point Transmission Project (77.6 miles of underwater buried cable) and the TDI New England Clean Power Link Project (100 miles in Lake Champlain), and these cumulative impacts have not been adequately addressed in the DEIS or 404 Application.

In addition, the area of Hudson River permanent impact based on Table 5.1-4 "Locations of non-burial cable installation and associated area of impact and volume of permanent fill" in the CHPE Project Description and Purpose Attachment A, Part 3 is much greater (25.4 acres) than the value given in the Public Notice table "Obstacles encountered: impacts from non-cable burial along the submarine route" (8.8 acres). Regarding in-water cable burial (temporary) impacts as illustrated in the public notice, some of these values could not be reproduced based on the information contained within the table, and therefore one or more of the source documents are believed to contain errors which should be reconciled to validate the final estimated areas and volumes of impact.

Surface and groundwater quality considerations should be included in the permit applications as they are filed. Water quality aspects of the CHPE Project were not sufficiently modeled in the DEIS or 404 Application to provide reasonable certainty regarding the magnitude of impacts from sediment disturbance, redistribution of sediments, sediment contamination including PCBs, biological oxygen demand, groundwater quality, hazardous wastes, and electrical and magnetic fields. The process specified for burying the CHPE Project cable in the soft sediment portions of the Hudson River Estuary would not

include containment of sediments and thus would result in re-suspension of up to 242,257 cubic yards (6.5 million cubic feet) of bottom material for some unknown distance from the trench (assumed to be at least 15 feet laterally). The potential re-suspension of sediments remains unquantified by the modeling as described in the available documents at the level of detail required for a project of this magnitude. Presumably natural currents, bed load transport, and wave action will return a portion (up to 70% or 80%) of the displaced material to fill back into the trench. However CHPE's calculation of the amount of original material that would be returned to the trench and the rate of filling is largely speculative and should be thoroughly delineated to best quantify the habitat disturbance and whether that disturbance is temporary or permanent for each component of the aquatic community. For example, the organic fraction of the sediments redistributed by dredging would likely be transported even further than the inorganic fraction, potentially exacerbating the spread of anoxic or low oxygen concentration waters that may violate numeric and narrative water quality standards for waters of the Hudson River Estuary.

Likewise, blasting, shear plowing, conventional dredging, horizontal directional drilling activities, and the use of drilling fluids associated with transition zones between overland and underwater segments of the CHPE Project have the potential to increase turbidity and contaminants in nearby groundwater wells due to bedrock fracturing and an increase in pore volume. Due to a slow rate of groundwater exchange, these alterations to groundwater quality are rarely "temporary" as described in the DEIS and 404 Application. Furthermore, although the DEIS specifies that either a Spill Prevention, Controls, and Countermeasures (SPCC) Plan and/or an Environmental Management and Construction (EM&C) Plan would be prepared in the future to address potential discharges of hazardous materials related to the Project, the DEIS also makes clear that whatever plan is chosen would rely on subjective visual and operational management, and not on quantitative BMPs like volume or pressure metrics. Implementation of such subjective measures is wholly inadequate for a project of this magnitude and potential impacts.

Further, the evaluation of magnetic fields and induced electrical fields in the record is incomplete, particularly regarding the potential effects on two federally-listed endangered fish species, Atlantic Sturgeon and Shortnose Sturgeon. These are both bottom oriented fish species that spawn over the soft substrates, use the near bottom areas as nursery habitat for their larvae and juveniles, forage for benthic invertebrates, and in general spend nearly all of their estuarine life within three feet of the Hudson River substrate and therefore in close proximity to where the CHPE Project transmission cable would be buried or covered by rip rap mats. Studies of other sturgeon species suggest that these two endangered species may be sensitive to both magnetic and induced electrical fields and avoid contact with these fields. The most recent Hudson River Biological Monitoring Program trawl catch data reported from 2012-2013 also demonstrate high abundance of juvenile Atlantic Sturgeon and Shortnose Sturgeon caught on the river bottom directly along the proposed cable route in the upper portion of the Hudson Highlands SCFWH. The sturgeon use of this expanded portion of the Hudson Highlands SCFWH and the expansion of the State's SCFWHs are both recent phenomena. Neither phenomenon was taken into account in the State level Article VII proceeding, the record of which closed long before the discovery of this new habitat use and the designation of additional SCFWH habitat. Nor are these new

developments addressed in the DEIS or 404 Application, as they must be to determine the impacts of the proposed CHPE Project cable route on these two endangered species.

1.0 Introduction

Normandeau Associates, Inc. (Normandeau) undertook a technical review of the September 2013 Draft Environmental Impact Statement (DEIS) and the Clean Water Act Section 404 Permit Application Alternatives Analysis Report (404 Application) for the Champlain Hudson Power Express, Inc. (CHPE) plan to construct a 330-mile long 1000 MW high voltage direct current (HVDC) transmission line and related facilities from Quebec directly to New York City. The objective of this technical review was to assess the selection of an 88-mile long Hudson River Segment of the CHPE Project as the Least Environmentally Damaging Practicable Alternative (LEDPA) based on the temporary, permanent, and cumulative impacts to the natural environment identified and described in the DEIS.

Many of the references to the available biological information related to the Hudson River Estuary are associated with specific locations measured along the centerline of the Hudson River from New York City to Albany. These locations within the Hudson River Estuary are labeled by Hudson River Miles (HRMs), which denote one-mile long segments of the river between successive mile marks measured along the river's centerline progressing upstream from Battery Park at the southern tip of Manhattan Island in New York City to the Troy Dam near Albany. Each HRM segment is named according to the mile mark at the boundary furthest from Battery Park, so there is no HRM 0. For example, HRM 1 in the Battery region of the Hudson River is from mile mark 0 at Battery Park to mile mark 1, HRM 2 is from mile mark 1 to mile mark 2, etc. The Troy Dam forms the upstream boundary of HRM 152 and the upper boundary of the Hudson River Estuary. This document will refer to HRM and distinguish these segments of the Hudson River Estuary from the mile points designated by the CHPE (CHPE MP) that were measured south from the CHPE MP 0 at the Canadian-New York border along the proposed HVDC cable route.

With respect to the DEIS, this review evaluates if the route selected for the Hudson River Segment of the CHPE Project is adequately supported by findings of no, low, or temporary impacts; i.e. if the selected route is indeed the LEDPA. With respect to the 404 Application, this review considers if the LEDPA recommendation for the Hudson River Segment in the DEIS adequately avoided or minimized impacts, and proposes sufficient mitigation for those impacts not avoided. This review relies on Normandeau's areas of expertise in water quality certification (Section 401), wetlands, dredge and fill regulations (Section 404) of the Clean Water Act, and aquatic ecology, based on the unparalleled technical information derived from approximately 40 years of performing annual environmental monitoring in the Hudson River Estuary for both the Hudson River power generators (including Entergy Nuclear Operations, Inc., "Entergy") and on behalf of the New York State Department of Environmental Conservation (NYSDEC).

The specific documents reviewed include:

- Department of Energy Draft Environmental Impact Statement (DOE 2013)
- United States Army Corps of Engineers (USACE) 404 Permit Application, as supplemented in February, 2012 (CHPE 2012b), and relevant Appendices

- New York State Public Service Commission 401 Water Quality Certificate Conditions (PSC 2013a)
- New York State Certificate of Environmental Compatibility and Public Need Conditions (PSC 2013b)
- New York State Department of State Conditional Coastal Zone Consistency Determination (DOS 2011)
- Army Corps of Engineers Public Notice (USACE 2013).

2.0 Water Quality and Hazardous Materials

2.1 Water Quality

As acknowledged in all documents reviewed, submarine cable installation in the beds of all water bodies will result in "increased turbidity and downstream sedimentation and re-suspension of contaminated sediments in surface water." The specific form of cable embedment via jet plow proposed for the CHPE Project presents particular habitat and aquatics concerns. Sufficient quantities of displaced material can have substantial detrimental impacts on biota in the water column from increased turbidity and downstream displacement of sediments, as well as the biota buried by jet plowing within the trench. Key potential impacts for a project of the scale addressed here include de-oxygenation of potentially large areas of the water column, turbidity above known tolerances for certain aquatic species, and smothering. Key questions include whether this technology is appropriate for work of the scale of the CHPE Project, why other routes that result in far lower impacts are not considered and preferred, the implications of sediment loading on aquatic organisms, particularly for species of heightened susceptibility. None of these topics are adequately addressed at a sufficient level of detail in the CHPE application documents for a project of this magnitude.

Disturbance of the top layer of sediments for a project of this magnitude will mobilize a considerable organic fraction into the overlying water. This mobilization would increase the biological activity within the water column for extended periods during the resettlement time, and can cause or contribute to a locally significant increase in biological oxygen demand. Because organic material would likely be transported greater distances than inorganic material due to its lower density, the area of potential reduced dissolved oxygen could extend to far beyond the 15 feet lateral zone centered on the HVDC cable path that is assumed to be the zone of impact, and therefore the zone of sediment redistribution (CHPE 2012d). Newly decaying biological loads may serve as substrate for benthic bacteria and algal growth which could increase the benthic metabolism and associated oxygen demands, creating blooms that further exacerbate the spread of hypoxic or anoxic zones. These conditions would in turn jeopardize survival of benthic invertebrates, shellfish and fish within the affected zone, particularly some of the less mobile forms like bivalve and some gastropod mollusks. It is unclear whether the temporal and spatial extent of the impact on dissolved oxygen was investigated through the modeling activities or through any other investigation conducted by the applicant.

Cable embedment via jet plow is considered in the DEIS and in the 404 Application to cause no violation of water quality standards for any regulated water quality parameters. It is not clear, however, where those predictions were made along the 88 miles of Hudson River Segment, and at what level of spatial resolution. Furthermore, the complete set of input parameter and results of the DHI MIKE3 model were not disclosed in any of the review documents.

Without a detailed review of the input data, only generalized assessments can be made. We note that there was no attempt to model sediment dispersion during cable installation. But there was reference in the DEIS to sediment re-deposition not being significantly distant from the point of disturbance under average Hudson River water velocity of less than three (3) miles per hour. However, a peer-reviewed publication by Neff and Geyer (1996) indicates velocities of approximately 2 meters per second (or 4.4 miles per hour) within the Hudson River under normal flow conditions. Thus, the analysis is incomplete, even in terms of normative Hudson River conditions.

Theories of hydraulic flow assume a no-slip condition at the interface of the water and conduit merely for mathematical simplicity. By assuming that the disturbance of material is occurring below the interface, velocities that may be influential in disturbing sediments are minimized to potentially unrealistically low magnitudes, hence further under-estimating the potential for sediment transport. Additionally, despite the use of a three-dimensional model, there is no indication that cross-directional flow, confluences, or empirically-determined turbulence caused by the highly uncharacterized bathymetry of the water bodies were included, which may have led to an incorrect conclusion that 70% to 80% of the sediments would "settle back into the trench".

There is no indication of the particle size and density distribution used to predict the sediment disturbance. Estuarine and deep-riverine sediments may be much smaller than anticipated. Moreover, the return of sediments disturbed by jet plowing to their initial position in the water column can take several hours to days, as shown through the utilization of laboratory Imhoff cone experiments conducted in introductory level water quality courses.

The proposed dredging activities will mobilize up to 242,257 cubic yards (6.5 million cubic feet) along the entire 88 miles of Hudson River Segment (including the Hudson, Harlem and East Rivers; USACE 2013). Exacerbated disturbance of this volume of material with water velocities reaching a known normal velocity of 4.4 miles per hour (and the potential for considerably greater velocities) could result in turbidity that exceeds the water quality standard, specifying that "there is to be no increase that will cause a substantial visible contrast to natural" for the water quality classifications of the surface waters found along the Hudson River Segment of the CHPE Project (Class SB, Class B, Class A; http://www.dec.ny.gov/ chemical/23853.html). Even with 70% to 80% of the sediments returned to the trench through gravity settling, as claimed in the DEIS, there is the potential for the remaining 1.3 to 2.0 million cubic feet of bottom sediments and its associated contaminant load to be displaced from the trench and dispersed widely over previously undisturbed portions of the Hudson River. The above concerns are exacerbated where known contamination or species of particular susceptibility to those contaminants exists, as discussed below.

2.1.1 Modeling of Expected Contaminant Concentrations

As acknowledged in all documents, submarine cable installation in the beds of all water bodies will result in "increased turbidity and downstream sedimentation and re-suspension of contaminated sediments in surface water", with the contaminants cited including "mercury, PCBs [polychlorinated biphenyls], and other toxins that could include dioxins/furan, PAHs [polycyclic aromatic hydrocarbons], pesticides, and other heavy metals". The jet plow may disturb contaminants attached electromagnetically or through molecular forces to sediments. This disturbance could , in turn, cause a contaminant plume that may be transported to areas much farther than estimated as the temporary impact zone in the DEIS, and at potentially higher concentrations.

2.1.2 PCBs and Metals

While the Project Applicant has taken steps to mitigate impacts to areas impacted by polychlorinated biphenyls (PCBs), the DEIS acknowledges that concentrations of PCBs exist at varying levels throughout the Hudson River Estuary outside of remediation areas (Levinton and Waldman 2006). Furthermore, the DEIS acknowledges that there remain concentrations of cadmium in some sediments above remedial action levels. There appears to be no specific plan for interaction and potential mobilization of this metal, which leaves an unacceptable exposure risk unaddressed.

2.1.3 Turbidity

Localized increased turbidity in the Hudson River Estuary is an expected impact from jet plowing and shear plowing. The DEIS concedes that increased turbidity "could include smothering, reduction of filtering rates, toxicity from exposure to anaerobic sediments, reduced light intensity, and physical abrasion," including mortalities (DOE 2013). However the review of these potential impacts to all life stages of fish, macroinvertebrates, and plankton is incomplete and no attempt at quantifying these impacts, including potential mortality, has been attempted. Fish are particularly sensitive to increased turbidity (Kemp et al. 2011), and many species will avoid using habitat disturbed by increased turbidity, while some benthic macroinvertebrates (e.g., attached clams and mussels) are not capable of moving and will become embedded or buried, where they smother and die. Presumably, natural currents, bed load transport, and wave action will return a portion (up to 70% or 80%) of the displaced material to fill back into the trench; however the amount of original material returned to the trench, the amount of material redistributed away from the trench, and the rate of settling and filling are largely speculative and should be thoroughly delineated in the DEIS to best quantify the amount of habitat disturbance and whether that disturbance is temporary or permanent for each component of the aquatic community.

2.2 Electrical and Magnetic Fields

The presence of an electrical field may pose a small increase to the immediate water temperature as calculated by the applicant; however, within the sediments surrounding the cable and in areas where the transmission line will remain exposed (where covering is not possible due to impenetrable surfaces at the bottom of the water bodies), this temperature increase will be perpetual and potentially significant. Based on the material presented in the

DEIS, there has been no investigation as to the long-term temperature impacts of the perpetual addition of heat. Increased temperatures can cause modifications to the character of deposited metals and volatile organic compounds, potentially creating spontaneous mobilization and unanticipated chemical reactions.

The introduction of a non-dissipating magnetic field via HVDC cable to environments that are potentially contaminated with a myriad of metals could cause spontaneous mobilization of these metals, attraction to and agglomeration on the transmission cable, and the potential and unexpected corrosion and/or deterioration of the protective surface of the transmission line. The magnetic field may also cause an electrostatic agglomeration of sediments and contaminants, increasing localized concentrations that may result in exceedances of state and federal water quality criteria.

In Section 5.1.4 of the DEIS, the proponent cites two documents (Fisher and Slater 2010; Cada et al. 2011) as evidence that high magnetic field strengths did not elicit "effects" on several aquatic species. First, Fisher and Slater (2010) is a synthesis report, so it would have been appropriate to examine the primary literature so that experimental design could have been considered. Cada et al. (2011) was reporting on a toxicological experiment designed to evaluate mortality, not to examine subtle nonlethal effects. In addition, the magnetic field was generated by a magnet, not a current, and so did not reflect conditions that would occur in the vicinity of an energized underwater cable.

Also in Section 5.1.4 of the DEIS, discussion of potential effects on Atlantic Sturgeon (*Acipenser oxyrinchus oxyrinchus*) and Shortnose Sturgeon (*Acipenser brevirostrum*) was based on studies of exposure to magnetic fields generated by AC cables. Given that the physics of AC current are different from DC current in that AC currents reverse roughly 60 times per second whereas DC current flow continuously in one direction, the ability of organisms to sense the resultant magnetic fields differs as well (Normandeau, et al. 2011). The use of studies designed to examine mortality during exposure to AC magnetic fields do not provide sufficient evidence needed to conclude that exposure to DC magnetic fields would have no impact on these two federally-listed endangered species.

The DEIS discussion on induced electric fields is incomplete. First, any movement through a magnetic field, whether it be a water current, a particle, or large object (e.g., fish or vessel), induces a secondary electric field. It is not restricted to electrosensitive organisms as suggested in the DEIS. Although Section 5.3.4 directs the reader to Section 5.3.5 for discussion on the effects of induced electric fields on sturgeon, in fact, there is no discussion in the latter section other than a dismissal of the issue and a referral back to Section 5.1.5. In turn, Section 5.1.5 provides no substantive additional information and concludes that "the current state of knowledge about the magnetic fields emitted by aquatic transmission lines and induced electric fields is sometimes considered too variable and inconclusive to make an informed assessment of the effects on these species (Cada et al. 2011)."

The DEIS does not make a strong enough case to dismiss exposure to EMF as a source of impact to the two species of sturgeon that use the Hudson River segment for critical stages in their life cycle. By incorporating information on AC currents without clearly acknowledging how they differ from the DC currents that would flow through the CHPE aquatic cable, the DEIS clouds the issue.

2.3 Groundwater Quality

The DEIS acknowledges (1) the possible necessity to use blasting to penetrate bedrock, and (2) that "(b)edrock blasting has the potential to increase bedrock fracturing near the blasting zone". The associated conclusion that "(b)lasting could result in changes in local hydrology and temporarily increased levels of turbidity in nearby groundwater wells" greatly under-estimates the potential adverse impact of blasting. For example, the inclusion of the statement that "short-term impacts on groundwater quality could occur if blasting of bedrock is required" should be adequate recognition that such activities should not be permitted. The DEIS further acknowledges that "drilling fluid would be used and has the potential to percolate to groundwater", which is an indication that blasting of bedrock may cause an immediate threat to human health. Moreover, the DEIS acknowledges that "the bentonite clay particles would become trapped, through absorption, by the soil and would aggregate within soil pore spaces" but then offers no explanation of the long-term impact of such an occurrence. Indeed, it is highly likely that soil permeability will be reduced and diminished groundwater recharge capacity will occur, resulting in adverse impacts to groundwater resources that may extend in perpetuity.

2.4 Hazardous Waste

In addition to the potential mobilization of hazardous substance discussed above, the use of horizontal directional drilling (HDD) at the entry and exit points to the river utilizes hazardous materials, as acknowledged by the DEIS. The US EPA and many state environmental agencies have issued guidance documents regarding how to manage inadvertent discharges from HDD, illustrating the real potential for such an unauthorized discharge. These agencies recommend that use of HDD in wetlands and sensitive ecological systems should be avoided due to the potential for irreparable impacts. As indicated in the DEIS, several wetlands and other sensitive ecological systems will be encountered during the installation, operation, and maintenance of the transmission line, suggesting that there could be unauthorized discharge of hazardous materials in these sensitive areas.

The DEIS indicates that the applicant will be issuing a Spill Prevention, Controls, and Countermeasures (SPCC) Plan and/or an Environmental Management and Construction (EM&C) Plan prior to commencing installation of the transmission line. The DEIS states that "visual and operational monitoring" will be associated with the program, which indicates that subjective and fallible human observation will be the stop-gap measure employed by the contractors to detect "excessive loss of volume or pressure", which is not a "Best Management Practice (BMP)". The contractor will use judgment - not specified volume or pressure metrics - to determine whether a response would be triggered.

The cofferdams to be constructed around the HDD exit areas will be designed to contain certain fluids, including "hazardous materials and petroleum products such as gasoline, diesel, oils, hydraulic fluids, and cleaners", meaning that the applicant has an expectation that drilling fluids will be discharged to the environment. However, there are no pre-defined clean-up activities associated with these anticipated discharges, which suggests that the discharges will be addressed *ad-hoc*, and, despite the presence of a barge to collect fluids, there is no explanation of how the contractor will determine scientifically that discharged fluids have been collected, which does not constitute a "Best Management Practice".

Despite the inclusion of the information on activities proposed by the applicant (in Appendix G of the DEIS, DOS 2013), there is no ability to assess if those measures will be adequate to completely mitigate the potential for increased risk or remediate any unauthorized release. As each SPCC (or EM&CP) is site-specific, each should be prepared and submitted based on scientifically measurable parameters for the installation, operation, and maintenance of the transmission line prior to the issuance of a permit for construction. Moreover, since the activities will be conducted upon public lands, these documents should be made available for public review.

3.0 Aquatic Ecosystem

This section examines the 88 miles of the CHPE Project referred to as the Hudson River Segment that is located on or under the substrate in the Hudson River Estuary between Catskill and New York City. Mile Points (CHPE MPs) designated along the CHPE Project route are measured from the New York-Canadian Border at CHPE MP 0 to New York City at CHPE MP 336. The submerged or aquatic section of the CHPE Project route enters the Hudson River Segment at CHPE MP 228 and continues along the bottom of the Hudson River Estuary downstream (south) for 67 miles to Stony Point (CHPE MP 295) where it exits the river on the west side. The CHPE Project runs overland to avoid the Haverstraw Bay SCFWH, re- enters the Hudson River Estuary at CHPE MP 303, and continues south along the bottom of the Hudson River for another 21 miles until it reaches the end of the Hudson River Segment at Spuyten Duyvil Creek (CHPE MP 324). From there it enters into the Harlem River for 6.58 miles, goes overland in the Bronx (CHPE MP 330) and finally enters the East River briefly before exiting at the terminal Luyster Creek Converter Station (CHPE MP 332).

3.1 Hudson River Estuary Background

The Hudson River Estuary consists of the tidal waters s from the Federal Dam at Troy, NY to the Verrazano Narrows in New York City. The tidal Hudson River possesses regionally and globally rare communities in one of the largest freshwater tidal river systems in the northeastern United States. The estuary supports nearly 100 species of special emphasis, including federally and state-listed endangered or threatened species of fish, birds, and plants. It is a spawning and nursery ground for commercially and ecologically important fish and shellfish species such as Striped Bass (*Morone saxatilis*), American Shad (*Alosa sapidissima*), Alewife (*Alosa pseudoharengus*), and Blueback Herring *(Alosa aestivalis)* (Alewife and Blueback Herring are referred to collectively as "river herring"), and Blue Crab (*Callinectes sapidus*). In addition, it hosts two endangered fish species, the Atlantic Sturgeon and Shortnose Sturgeon, and nesting bald eagles (*Haliaeetus leucocephalus).*

The Hudson River Estuary is highly diverse, and more than 200 species of fish have been recorded within the estuary and is tributaries (Daniels et al. 2005; Levinton and Waldman 2006). The only freshwater tidal wetlands in the state of New York occur in the Hudson River Estuary. It is a unique and valuable state and local resource, and has been recognized as such by the NYSDEC New York Natural Heritage Program, which identified numerous sites with rare plant and animal species and exemplary ecological communities. Recognizing the river's wealth scientifically, the Hudson River National Estuarine Research

Reserve was established to "[i]mprove the health and vitality of the Hudson River Estuary by protecting estuarine habitats through integrated education, training, stewardship, restoration, and research programs." Nearly 5,000 acres of tidal wetlands and upland buffer represent the diverse plant and animal communities of the Hudson River National Estuary Research Reserve, which is headquartered at Norrie Point within the Mills-Norrie State Park, and include the Stockport Flats in Columbia County, Tivoli Bays in Dutchess County, Piermont Marsh and Iona Island in Rockland County. In addition, the New York Department of State (NYDOS) has designated numerous SCFWHs in areas that provide living and feeding areas for organisms in the estuary (see Section 3.2).

The wealth of knowledge and resources provided by the Hudson River Estuary makes it both important and unique. While the impacts as summarized in the DEIS are largely considered to be temporary, the CHPE Project is of a substantial magnitude. Further explanation of environmental reasoning behind the rejected overland alternatives is needed to justify such a large-scale impact to the Hudson River Estuary.

3.2 Significant Coastal Fish and Wildlife Habitats

The NYDOS Office of Communities and Waterfronts has identified several SCFWHs along the length of the Hudson River. NYSDEC also identified certain "exclusion zones" in the Hudson River during the N.Y. *Public Service Law* Article VII review process conducted at the State level.

The CHPE Project footprint and dredging plan illustrate how the project will encounter each SCFWH in the Hudson River from Catskill to Manhattan. A total of five different SCFWHs are directly transgressed by the CHPE Project. They are, from north to south, Catskill Creek, Esopus Estuary, Kingston-Poughkeepsie Deepwater Habitat, Hudson Highlands, and Lower Hudson Reach. Based on plan view maps provided in Attachment 3 of the USACE public notice, approximately 36 miles of SCFWH will be directly impacted, which is 40 percent of the total length of the project's Hudson River reach including the Harlem and East Rivers (88 miles, Table 1).

Table 1. DEIS and Army Corps In-Water Impacts to Significant Coastal Fish and Wildlife Habitats (SCFWH) Identified Within the Entire Hudson River Segment of the CHPE.

SCFWH Name	Approx. Location (CHPE MP)	Approx. Location (HRM)	Approx. Length (Mi)	Length of Impact (Ft)	Temporary Impact[3]		Permanent Impact	
					(Sq. Ft)	(Acres)	(Sq. Ft)	(Acres)
Catskill Creek[1]	221.4	112	0.06	317	4,755	0.1	-	-
Esopus Estuary	232.5-236	99-103	3.5[2]	18,480	277,200	6.4	-	-
Kingston-Poughkeepsie	244-270	65-92	6.0[2]	31,680	475,200	10.9	307,977	7.1
Hudson Highlands	276-295.7	40-60	19.7[2]	104,016	1,560,240	35.8	239,277	5.5
Lower Hudson Reach	317-324	0-22	7.0[2]	39,960	554,400	12.7	13,117	0.3
Total SCFWH[5]	-	-	**36.3**	**191,453**	**2,311,424**	**53.1**	**560,371**	**12.9**
Total Hudson River Reach (including Harlem and East Rivers)	-	-	**88.5**	**467,280**	**7,357,860[6]**	**168[6]**	**1,107,668[4]**	**25.4[4]**

1 Source: CHPE 2012e. Revised Wetland Delineation Report, Table 4-2.

2 Source: CHPE 2012f. Length of CHPE Project cable through SCFWH measured from "Plan View Maps – Submarine Route."

3 Assumed jet plow impact zone width of 15 feet as used by CHPE in impact calculations (DOE 2013).

4 Source: CHPE 2012c. Tables 5.1-3 and 5.1-4. The values in these tables differ from what is presented in the Public Notice (USACE 2013) and we were unable to determine how the 8.8 acres of permanent impact was derived. The area of Hudson River impact based on Table 5.1-4 "Locations of non-burial cable installation and associated area of impact and volume of permanent fill" is much greater (25.4 acres) than the value given in the Public Notice table "Obstacles encountered: impacts from non-cable burial along the submarine route."

5 Square foot and acre values do not sum within this table because permanent impacts were estimated by subtraction from total impacts in each SCFWH.

6 The values for total Hudson River (including Harlem and East Rivers) temporary impacts were taken from the tables labeled "Impacts from In-Water Cable Burial" from the CHPE Project Description and Purpose (CHPE 2012d) and Public Notice (USACE 2013). Some of these values could not be reproduced here based on the information contained within the table, and therefore the source documents are believed to contain errors which should be reconciled before the Project moves forward.

Coastal Fish and Wildlife assessment documents created for each SCFWH assess criteria including ecosystem rarity, species vulnerability, human use, population level, and replaceability. Each of these five SCFWHs was declared unique and valuable for protection, and the NYDOS has routinely advised that SCFWHs should be avoided during construction. Where avoidance of SCFWHs is impracticable, DOS requests siting of any new disturbance within areas that are previously disturbed including dredged navigation or other channels. The proposed CHPE Project cable line does not appear to have been routed through previously disturbed areas except at roughly CHPE MP 239 near the town of Ulster, NY.

The CHPE Project includes both temporary disturbance of and long-term permanent impact on these important areas described above. The criteria used to determine practicability and the results of the required habitat impairment tests presented in the DEIS are ambiguous and do little to quantify the net ecological impacts on the affected SCFWH compared to the rejected overland alternatives. The areas impacted as stated in these comments were calculated based on information found in the DEIS and supporting documents, but nowhere

in the available public record are these values made clear. A more thorough quantification and assessment of the impacts on SCFWH in the Hudson River by the CHPE Project is needed. Each of these five SCFWHs is discussed below in more detail to illustrate their features and ecological factors that were either overlooked or deemphasized in the DEIS and 404 Application.

3.2.1 Catskill Creek SCFWH

The Catskill Creek SCFWH is located in the town of Catskill, on the west side of the Hudson River. An important feature of the riverine habitat is 1.2 kilometers (0.75 mile) of Kaaterskill Creek to the first impassable fish barrier, which provides spawning habitat for Alewife, Blueback Herring, White Perch (*Morone americana*), and resident Smallmouth Bass (*Micropterus dolomieu*) and Largemouth Bass (*Micropterus salmoides*), because it is more accessible than other streams in the area. These species and others including Sea Lamprey (*Petromyzon marinus*), American Shad and Striped Bass can also be found spawning throughout other areas of the Catskill Creek SCFWH in April-August. There are also several beds of submerged aquatic vegetation (SAV) in this habitat that provide food and shelter for fish and invertebrates, and a number of threatened and endangered plant species can be found in its wetlands. At least ten reptile and amphibian species are found in the Catskill Creek area. Freshwater recreational fisheries, birdwatching and nature studies are listed as human benefits.

The NYDOS SCFWH assessment for Catskill Creek warns against any activities that would substantially degrade water quality, increase turbidity or sedimentation, or alter flows, temperature or water depths. Based on the DEIS and 404 Application, the CHPE Project will temporarily impact 0.11 of the 156 acres of the Catskill Creek SCFWH (Table 1). Some of these impacts may include degradation of water quality, increased turbidity or sedimentation, and an altered temperature or water depth due to cable construction and operation. While the area impacted in Catskill Creek SCFWH is small, these impacts will occur in strict opposition to the protection of SCFWH as required by the NYDOS.

3.2.2 Esopus Estuary SCFWH

The Esopus Estuary SCFWH is located at the mouth of the Esopus Creek, a major tributary to the upper Hudson River estuary. It is a tidal wetland complex encompassing the lower two (2) kilometers (1.3 miles) of Esopus Creek to the first barrier, and extensive unique wetlands habitats. These habitats are important spawning, nursery, and feeding areas for anadromous fish including White Perch, American Shad, Alewife, Blueback Herring, and Rainbow Smelt (*Osmerus mordax*). They also provide habitat for resident and coastal migratory species like Smallmouth and Largemouth Bass, Striped Bass and American Eel (*Anguilla rostrata*). Deepwater areas near the mouth of Esopus Creek provide important post-spawning and overwintering habitat for Shortnose Sturgeon, and both sturgeon species (Atlantic and Shortnose) use the area as a thruway for their migrations.

Estuarine-dependent and marine species are also found in the Esopus Creek SCFWH, including Atlantic Silverside (*Menidia menidia*), Bay Anchovy (*Anchoa mitchilli*), Bluefish (*Pomatomus saltatrix*), Weakfish (*Cynoscion regalis*), and Hogchoker (*Trinectes maculatus*). This stretch of the river contains several sites that appear to be important for overwintering Shortnose Sturgeon. The deepwater habitat extends right up to the shorelines in this

SCFWH, railroads run along both shorelines, and there are only small areas of marsh and flat habitat behind the railroad. The only sizable marsh is found behind the railroad tracks on the east side of the river at Crum Elbow.

The tidal freshwater wetlands surrounding Esopus Creek provide important feeding and resting habitat for migrating waterfowl and osprey. Submerged aquatic vegetation beds provide food and habitat for fish, invertebrates, amphibians, and birds. The wetlands contain several rare plant species including heart-leaf plantain (*Plantago cordata*), kidneyleaf mud-plantain (*Heteranthera reniformis*), and spongy arrowhead (*Sagittaria montevidensis* var. *spongiosa*). Human value from Esopus Creek SCFWH comes from recreational fishing, waterfowl hunting, and birdwatching opportunities.

The NYDOS SCFWH assessment for Esopus Creek warns against any activities that would substantially degrade water quality, increase turbidity or sedimentation, or alter flows, temperature or water depths. Based on the DEIS and 404 Application, the CHPE Project will temporarily impact 6.4 of the 970 acres of the Esopus Creek SCFWH (Table 1). Some of these impacts may include degradation of water quality, increased turbidity or sedimentation, and an altered temperature or water depth due to cable construction and operation. While the area impacted in Esopus Creek SCFWH is small, it is still proposed in strict opposition to the protection of SCFWH as required by the NYDOS.

3.2.3 Kingston-Poughkeepsie Deepwater SCFWH

The Kingston-Poughkeepsie Deepwater habitat (sometimes referred to as two separate habitats, Kingston and Poughkeepsie) is a 40.2-kilometer (25-mile) stretch of the river from Kingston Point to Rhinecliff. It is the northernmost section of deepwater habitat in the Hudson River Estuary and contains a nearly continuous deepwater section, with depths ranging from 9 meters (30 feet) to as much as 30 meters (100 feet). Dense saline bottom waters abundant here are important to the federally listed endangered Atlantic and Shortnose Sturgeon as overwintering habitat. The area represents the upper limits of the saltwater reach of the estuarine Hudson River, and a host of estuarine-dependent and marine species are found in this area, including Atlantic Silverside, Bay Anchovy, Bluefish, Weakfish, and Hogchoker. Many of these species are commercially important and this area is believed to contribute directly to production of in-river and ocean populations of food, game, and forage fish species. In addition, many other freshwater and brackish fish species are found here, along with Blue Crab and migratory waterfowl.

The NYDOS SCFWH assessment for the Kingston-Poughkeepsie Deepwater habitat warns against any activities that would substantially degrade water quality, increase turbidity or sedimentation, or alter flows, temperature or water depths. Based on the DEIS and the 404 Application, the CHPE Project will temporarily impact 10.9 of the 6,350 acres of the Kingston-Poughkeepsie Deepwater SCFWH, and in addition, this habitat would experience permanent impacts totaling 7.1 acres (Table 1). Some of these impacts may include degradation of water quality, change in bottom substrate, increased turbidity or sedimentation, and an altered temperature or water depth due to cable construction and operation. While the area impacted in the Kingston-Poughkeepsie Deepwater SCFWH is relatively small, it is still proposed in strict opposition to the protection of SCFWH as required by the NYDOS.

3.2.4 Hudson Highlands SCFWH

The Hudson Highlands SCFWH is a swift, narrow, and deep portion of the Hudson River estuary that was recently (August 2012) expanded from encompassing HRM 44 (Jones Point) through HRM 56 (Storm King Mountain) to now include the reach of the river running from Denning's Point (HRM 60) on the north down to Stony Point (HRM 40). [As noted in the Comments to which this Report attached, Entergy is currently challenging in court the designation of the four-mile stretch of the Hudson River Estuary adjacent to Indian Point as an extended part of the Hudson Highlands SCFWH, and nothing in this Report should be deemed a waiver of its position in that proceeding.] The physical attributes of the Hudson Highlands SCFWH contribute to a rocky bottom substrate, which in turn provides highly favorable conditions for Striped Bass spawning each spring. This is also an important part of the migratory route for Atlantic and Shortnose Sturgeon, and provides habitat for freshwater, brackish, and marine species depending on the location of the salt front. In addition, a large overwintering population of bald eagles is found in this reach of the river. The Hudson Highlands SCFWH contributes directly to the populations of commercially and recreationally important fish species, and recreational fishing is a popular activity here.

The NYDOS SCFWH assessment for Hudson Highlands habitat warns against any activities that would substantially degrade water quality, increase turbidity or sedimentation, or alter flows, temperature or water depths. Based on the DEIS and the 404 Application, the CHPE Project will temporarily impact 35.8 acres of the 6,350 acres of the Hudson Highlands SCFWH, and another 5.5 acres will be permanently impacted (Table 1). Some of these impacts may include degradation of water quality, change in bottom substrate, increased turbidity or sedimentation, and an altered temperature or water depth due to cable construction and operation.

New information reveals that the upper reaches of this SCFWH (approximately HRM 53-59) are also a critical overwintering habitat for juvenile sturgeon of both species, but particularly for juvenile Atlantic Sturgeon. This new information is found in a report submitted to the National Marine Fisheries Service (NMFS) on behalf of Entergy to describe the "take" of Atlantic and Shortnose Sturgeon while performing the Hudson River Biological Monitoring Program (HRBMP) during the period 29 August 2012 through 28 August 2013 (Normandeau 2013a).

The HRBMP is a continuing and extensive annual biological monitoring program that has been performed for more than four decades to assess potential impacts of cooling water withdrawals from electric power generating stations (including Indian Point) on the Hudson River ecology. The present HRBMP consists of four discrete fisheries sampling programs that have been developed under the oversight, and with the input, of regulators including the NYSDEC. Conducting the HRBMP is an annual requirement of the current State Pollutant Discharge Elimination System ("SPDES") water withdrawal and discharge permit for Indian Point. The four fisheries sampling programs comprising the current HRBMP are the Long River Ichthyoplankton Survey, Fall Juvenile Survey, Beach Seine Survey, and Striped Bass/Atlantic Tomcod Mark/Recapture Survey. Fisheries sampling is scheduled in each month of the year by one or more of these four programs in the Hudson

River Estuary from the Battery in Lower Manhattan (HRM 0) to the Troy Dam near Albany (HRM 152).

Shortnose Sturgeon and Atlantic Sturgeon are occasionally collected while performing the HRBMP. The incidental collection and handling of these two sturgeon species during performance of the current HRBMP is permitted under the provisions of NMFS Permit to Take Protected Species for Scientific Purposes No. 17095-01 and NYSDEC Permit No. 313. One program in particular, the Fall Juvenile Fish Survey, has been independently verified to provide a valuable index of the abundance and distribution of juvenile sturgeon in the Hudson River Estuary (Woodland and Secor 2007). The primary objective of the Fall Juvenile Survey is to determine the seasonal occurrence, abundance, and distribution of juvenile (young of the year, or "YOY") fish in the 152 mile portion of the Hudson River estuary between Battery Park at the southern tip of Manhattan and the Troy Dam above Albany. Sampling is performed during 8 to 12 alternate weeks spread between early July and late October of each year. About 200 samples per week are collected at randomly selected tow paths allocated among 13 geographic regions and three depth strata. The present Fall Juvenile Fish Survey is a massive biological monitoring program that is unprecedented in the combined within-year temporal, spatial and geographic extent for the number of consecutive years of sampling. Annually, the Fall Juvenile Fish Survey collects about 2,050 samples per year, and identifies and enumerates all fish caught, with more than 66,000 samples collected and analyzed during the 1979-2013 period.

The 2012-2013 HRBMP collected a total of 121 Atlantic Sturgeon and 57 Shortnose Sturgeon during the one-year period from 29 August 2012 through 28 August 2013, and these sturgeon were caught primarily in 3-m beam trawl samples deployed to collect fish living directly (i.e., within 0.7 meters or 2 feet) in association with the river bottom substrate at randomly selected locations throughout the Hudson River Estuary. When the GPS locations of trawl samples catching sturgeon are overlaid on the maps of the CHPE Hudson River Segment transmission line route (Figure 1), it is apparent that more than half (65 fish or 54%) of the total catch of 121 Atlantic Sturgeon came from the upper portion of the Hudson Highlands SCFWH located between Denning's Point and Constitution Island (HRMs 53-59; CHPE MPs 277-283). More importantly, nearly all of these juvenile Atlantic Sturgeon (52 fish out of 65 fish or 80%) came from just one mile of the Hudson Highlands SCFWH (HRM 55; CHPE MPs 280-281) adjacent to Storm King Mountain that is directly in contact with the substrate along the proposed route of the CHPE transmission line (Figure 1). Nearly all of the juvenile Atlantic Sturgeon caught during 2012-2013 from the Hudson Highlands SCFWH near Storm King Mountain were caught during the late summer and fall, indicating that this area is an important and previously undiscovered overwintering habitat for juvenile Atlantic Sturgeon. Thus, any cable embedment activities should avoid this location and sensitive time period to protect the sturgeon. Shortnose Sturgeon also inhabit the same upstream portion of the Hudson Highlands SCFWH as evident by their catch in the 2012-2103 HRBMP (Figure 1). Based on these new observations, in conjunction with the uncertainties about operational EMF and construction impacts on these two federally-listed endangered sturgeon species (Section 2.2 above), and the exact spatial juxtaposition of both overwintering juvenile Atlantic Sturgeon and the CHPE Project transmission corridor, we conclude that at least the upper portion of the Hudson Highlands SCFWH should be avoided by an overland route to protect the sturgeon.

3.2.5 Lower Hudson Reach SCFWH

The Lower Hudson Reach extends from Battery Park to Yonkers, and is considered one of the New York City SCFWHs. The shoreline in this area has been extensively altered, but its status as one of only a few large tidal river mouth systems in the northeastern US makes it unique and important habitat. The Lower Hudson Reach is characterized by a wide range of salinities and by the seasonal influx of large volumes of freshwater flowing from the Hudson River, especially from fall through spring. The area is a very important feeding and overwintering area for juvenile Striped Bass, which feed on abundant zooplankton near the salt front. Other important fish species including Summer Flounder (*Paralichthys dentatus*), White Perch, Atlantic Tomcod (*Microgadus tomcod*), Atlantic Silverside, Bay Anchovy, Hogchoker and American Eel use this area of the estuary, as well as Shortnose and Atlantic Sturgeon. This habitat also plays an important role for Blue Crabs and waterfowl. Based on information in both the DEIS and the 404 Application, the CHPE Project would have a temporary impact of 12.7 acres in the Lower Hudson Reach SCFWH, with approximately 0.3 acres of permanent impact (Table 1). Some of these impacts may include degradation of water quality, increased turbidity or sedimentation, change of bottom substrate, and an altered temperature or water depth due to cable construction and operation. While the area impacted in Lower Hudson Reach SCFWH is relatively small, it is still proposed in strict opposition to the protection of SCFWH as required by the NYDOS.

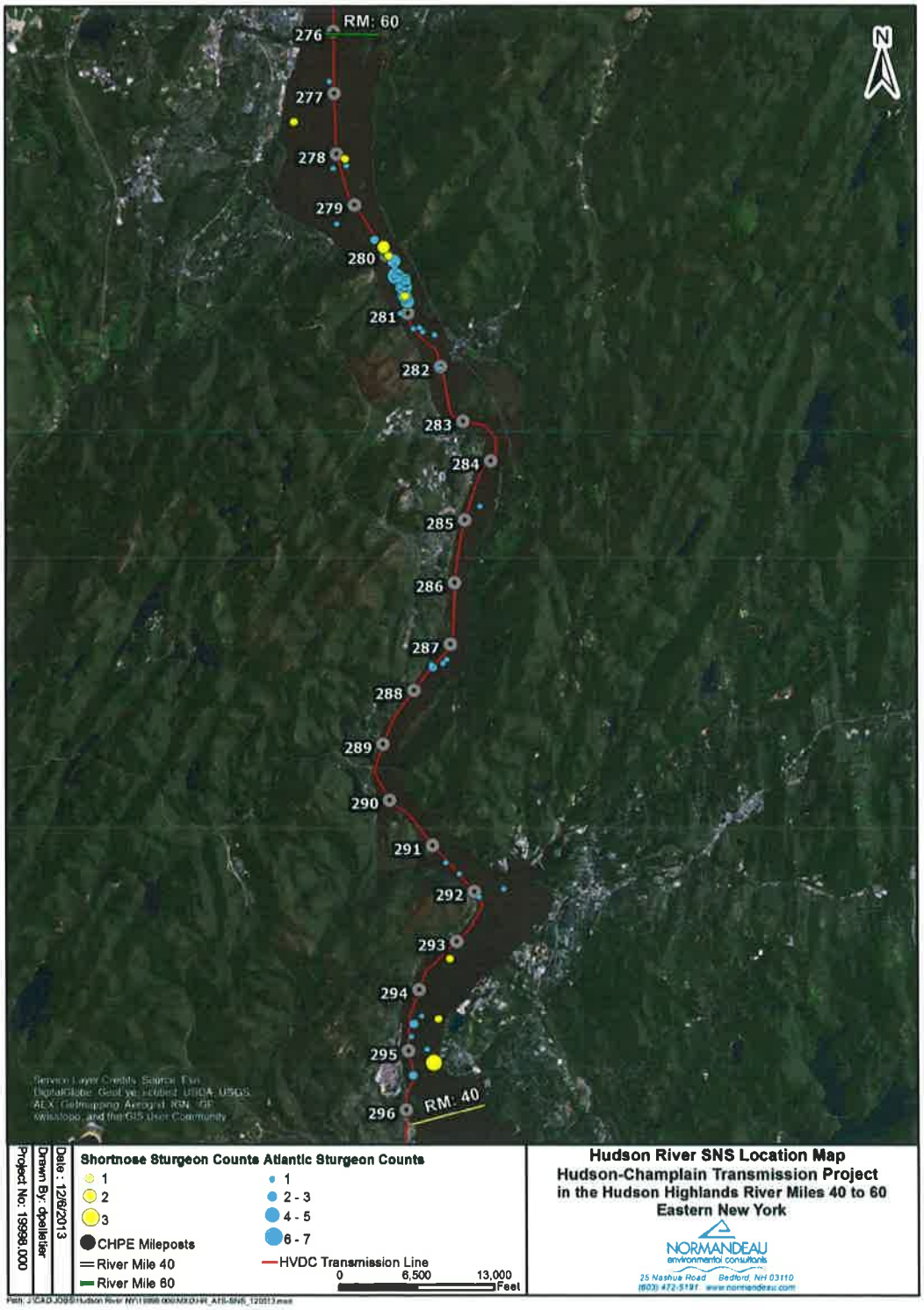

Figure 1. Trawl sampling locations from random locations within the Hudson Highlands SCFWH of the Hudson River Estuary where juvenile Atlantic Sturgeon and Shortnose Sturgeon were caught by the HRBMP during 29 August 2012 through 28 August 2013 in relation to the proposed CHPE Project transmission cable route.

3.3 Construction Impacts

3.3.1 Jet Plow Entrainment

Both the CHPE Project DEIS and USACE Public Notice (NAN-2009-01089-EYA) state that "the proposed method for laying and burial of a majority of the underwater HVDC cable is the plow/water jetting embedment process." In-water cable burial impacts will include 185.8 miles of installation in Lake Champlain, the Hudson River, the Harlem River, and the East River. The DEIS indicates that installation of HVDC cable in an aquatic environment proceeds at approximately one to three (1-3) miles per day. Assuming this rate of cable embedment is correct, aquatic installation of the HVDC cable within the 88 miles of the Hudson River Segment will encompass anywhere between 29 and 88 days of habitat disturbance due to jet plowing activities in the benthic substrates. Although these trenches are considered a temporary impact and part of the BMP, jet plowing activities have direct impacts on fish spawning and foraging activities, planktonic eggs and larvae (ichthyoplankton), and zooplankton found in the water column as a function of increased turbidity, and benthic macroinvertebrates, as a function of direct disturbance, burying, or sedimentation in adjacent substrates. While these impacts may be negligible for certain embedment activities, the magnitude of the CHPE Project suggest otherwise.

Effective use of the jet plow ("water jet," "hydraulic plow") construction technique is dependent upon the requisite information being available to understand potential aquatic impacts. However, there is too much uncertainty in the application to establish that the process is or can be properly used for the CHPE Project to minimize impacts. For instance, it is unclear where in the water column the inlet siphon for the jet plow would withdraw water, whether it will entrain demersal or pelagic fish eggs or both, and whether the time period for in-river construction will avoid all stages of ichthyoplankton. The jet plow method is not likely to significantly impact adult or juvenile fish on a long-term basis because they will likely avoid the suction current during construction and therefore not be subject to impingement or entrainment by the jet plow water withdrawal currents.

The Long River Survey ("LRS") is part of the HRBMP that was initiated in 1974 and annually monitors the seasonal abundance and distribution of ichthyoplankton weekly or biweekly during the months of March through November at randomly-selected stations throughout the entire Hudson River Estuary. Results of each annual survey are presented to NYSDEC and other agencies in a document referred to as a "Year Class Report". In the most recent year available (the 2011 Year Class Report), fish eggs and larvae from at least seven important fish species identified from the SCFWH designations were present and often abundant within the Hudson River Estuary from July to November (ASA 2013; AKRF 2013; Normandeau 2013b; Table 2), which overlaps with the proposed in-water construction periods for the Hudson, Harlem, and East River portions of the Hudson River Segment of the CHPE Project (Table 2-2 of DEIS).

Although considered environmentally sensitive, the DEIS and 404 Application do not quantify the impacts from the use of ambient river water for jet plowing due to entrainment of river organisms including ichthyoplankton (i.e., fish eggs and larvae) and zooplankton (Reine and Clarke 1998). Entrainment is defined as the direct uptake of aquatic organisms by a suction field, and may result in injury or mortality due to mechanical damage when drawn into, and passed through the water jet. While the DEIS claims that the project

operations have been scheduled to minimize interaction with aquatic organisms in the water column, plankton are nearly ubiquitous within the aquatic project construction zone during all portions of the construction window for the CHPE Project (Cole and Caraco 2006), and recent (2011) data shows that ichthyoplankton are present in the Hudson River throughout the range of underwater construction windows (Table 2). Therefore, jet plow cable embedment will inevitably entrain and kill an unspecified number of ichthyoplankton.

Table 2. Range and peak seasonal occurrence of Hudson River ichthyoplankton species and life stages, 1974-2011[1].

	Eggs		YSL		PYSL	
Species	Range	Peak	Range	Peak	Range	Peak
Striped bass	July-Aug	end July	July-Aug	end July	July-Sep	mid Aug
White perch	July-Sep	end July	July-Sep	end July	July-Sep	mid Aug
Atlantic tomcod	Dec-Jan	January	Feb-Apr	March	Apr-May	April
Bay anchovy	July-Oct	mid Sep	July-Nov	late Aug	Aug-Nov	mid Sep
American shad	July-Aug	mid July	July-Aug	end July	July-Sep	early Aug
Alosa spp	July-Aug	end July	July-Aug	end July	July-Sep	early Aug
Rainbow smelt	July	mid July	July	mid July	July-Aug	end July

[1]Adapted from ASA 2013, AKRF 2013, and Normandeau 2013b.

The expected impact from the loss of these organisms must be quantified in the DEIS and 404 Application and placed in perspective with other known sources of entrainment losses to fully assess cumulative impacts. A model using the volume of Hudson River water pumped per hour in hydraulic plowing and the expected hours of hydraulic plow use during construction should be developed. Such a model can be used in conjunction with available data on seasonal abundance to determine the expected losses if an overland route is not selected. Information about where in the water column (at what depth) water is suctioned for the jet plow and dimensions of the intake should also be provided and compared with the seasonal and vertical distribution of all planktonic organisms to determine the size and magnitude of organisms entrained during jet plowing activities. Entrainment of ichthyoplankton from a moving plow apparatus is particularly worrisome as many of the SCFWH the CHPE Project traverses are important nursery areas and the path may effectively siphon up large concentrations of fish eggs and larvae.

Losses of phytoplankton, macroinvertebrates such as comb-jellies (*Ctenophora spp.*), and zooplankton from the water column have the potential to directly impact populations of these species themselves, but also have indirect impacts to the local food web including commercially and ecologically sensitive species that rely on them as prey during different stages of their life history. Unlike a fixed location intake, the water entrained during jet plowing will come from a variety of diverse and sensitive habitats that are known to be important spawning and nursery areas, including SCFWHs), throughout the 88 miles of the Hudson River Segment. Because of these potential losses, this jet plow entrainment analysis should be included in both the DEIS and 404 application impact summary to determine no significant impact to Hudson River Estuary aquatic communities.

3.3.2 Recreational Fishing Data

The DEIS concludes that there will be no impact on recreational angling in the Hudson River "because vessels could either transit around the work site or use a different area of the Hudson River." This is obviously a vast oversimplification of the issue. Sedimentation will effect species, as noted above, in a manner unaddressed in the DEIS. Further, the DEIS fails to consider that the CHPE Project will require a "no anchor" corridor for its full extent in the Hudson River (88 miles by 30 feet wide), for which the responsibility of enforcement will fall on local and State law enforcement officials.

The affected environment section gives one short paragraph on Hudson River recreational fisheries, with a citation for surveys conducted in the mid-1990s. However, creel surveys conducted in 2001-2002 and 2005 for NYSDEC provide detailed information on fishing effort, catch, and characteristics of the fishery that is considerably more up to date and inclusive than what was considered in the DEIS and 404 Application (Normandeau 2007). Impacts on fisheries in the Hudson River cannot be adequately measured in the DEIS without use of more recent and complete data.

3.3.3 Riprap Mats

The DEIS and 404 Application both indicate that there will be sections of the submarine cable that cannot be buried to full depth due to obstacles such as existing infrastructure (utility lines, etc.) or surface bedrock. At these areas the project proposes to place the cable on the riverbed or at a shallower buried depth (less than four feet below the riverbed). Protective covering such as articulated concrete or riprap mats would be used to protect the cable.

Based on information from the Army Corps of Engineers Public Notice NAN-2009-01089-EYA, the use of protective coverings for the HVDC cable where underwater obstacles are encountered will result in a permanent impact to approximately 25.4 acres of habitat in the Hudson River. This value is not stated in the DEIS, nor is there provided any indication of where these areas of habitat alteration are likely to occur and their relation to SCFWH. [We approximated the value by converting the "Footprint area (sq ft)" in Table 5.1-4 of CHPE 2012d to acreage.] Some of the areas may include subsurface bedrock that prevents burial at the desired depth, which would cause loss of soft bottom habitat and replacement with protective riprap covering, resulting in a net loss of foraging habitat for Atlantic and Shortnose Sturgeon.

The use of riprap mats also has the potential to act as suitable habitat for invasive Zebra Mussels (*Dreissena polymorpha*), a mussel species introduced in 1992 that has caused significant declines in phytoplankton and zooplankton biomass due to their filter feeding activities, and has changed the foraging habits of some important fish species (e.g., Blueback Herring juveniles; Pace et al. 1998, Strayer et al. 2004). The short-term and long-term consequences of the proposed habitat alterations due to CHPE Project construction activities have not been adequately investigated for Zebra Mussels and for other, more recent invasive species, like the Asiatic clam (*Corbicula fluminea*), the Chinese Mitten Crab (*Eriocheir sinensis*) and the Asian Shore Crab (*Hemigrapsus sanguineus*). Altering the benthic habitat due to addition of rip-rap mats could encourage the establishment and expansion of these invasive species in portions of the Hudson River Estuary that are currently unsuitable because the established benthic communities are capable of repelling these invasive species.

3.4 Cumulative Impacts

3.4.1 Tappan Zee Bridge Project

The NYSDEC issued a permit to the New York State Thruway Authority authorizing construction of a new bridge to replace the existing Tappan Zee ("TZ") Bridge on 25 March 2013 ("the Permit"). The TZ Bridge is located within the mile-long segment of the Hudson River referred to as HRM 27. The Permit provides authorizations for the TZ Bridge construction activities beginning 25 March 2013 and continuing through 24 March 2019 under Tidal Wetlands – ECL Article 25, Section 401 Water Quality Certification – ECL Article 15, and Endangered/Threatened Species (Incidental Take) – ECL Article 11.

The Permit requires, among other things, implementation of an Endangered and Threatened Species Mitigation Plan ("ET Mitigation Plan") for the TZ Bridge Construction Project ("the TZ Bridge Project"), consisting of the following seven (7) activities to insure the project will proceed with a Net Conservation Benefit to the Shortnose and Atlantic Sturgeon within the Hudson River Estuary:

1. Mapping of benthic habitat that could be used by both sturgeon species for 152 miles of the Hudson River from NY Harbor to Troy.
2. Study of the foraging habits of each life stage of both species of sturgeon so that their diet can be linked to use of the benthic habitats mapped for foraging within the entire Hudson River Estuary.
3. Tagging of Shortnose and Atlantic Sturgeon and tracking their movements so habitat use can be determined within the entire Hudson River Estuary.
4. Collection of immature and adult Shortnose Sturgeon and immature Atlantic Sturgeon during the winter months to identify important overwintering habitat throughout the entire Hudson River Estuary.
5. Collection and tagging of both sturgeon species with ultrasonic tags and passive integrated transponder tags that are compatible other research activities, and searching for tags administered by all researchers to better understand sturgeon movements and habitat use within the entire Hudson River Estuary.
6. Tracking acoustic tagged sturgeon of both species in the vicinity of the TZ Bridge Project and elsewhere to obtain knowledge of species distribution and habitat use as affected by construction activities.
7. Develop an outreach program to the commercial fishing industry with the goal of reducing the commercial by-catch of Atlantic Sturgeon in the near-shore Atlantic Ocean coastal waters.

The Permit also requires implementation of a Compensatory Mitigation Plan to mitigate impacts from the construction of the new TZ Bridge, including:

1. Re-establishment of 13 acres of hard bottom/shell oyster habitat nearby from material removed from the TZ Bridge Project.
2. Secondary Channel Restoration at Gay's Point (HRM 122).
3. Wetland Enhancement at Piermont Marsh (HRM 24, west).

4. Supplemental Habitat Replacement or Enhancement elsewhere within the Hudson River Estuary.

The new information obtained from the ET Mitigation Plan Studies represent important advances in the scientific knowledge of sturgeon habitat use within the Hudson River Estuary that must be considered before sound scientific conclusions can be reached about the nature and magnitude of impacts from the CHPE Project. It is clear that the CHPE Project DEIS and 404 Application did not consider the important new information that will be obtained by the ET Mitigation Plan for the TZ Bridge Project because these studies just began in 2013 and will conclude in 2019. However, given the coincidence of the CHPE Project and TZ Bridge Projects in time and space, the importance of the Hudson River Estuary as a special aquatic site designated by the Hudson River Estuary Management Act, and the voracity of the scientific information required by the ET Mitigation Plan for the TZ Bridge Project, conclusions of no or temporary impacts stated in the DEIS for the CHPE Project on federally listed Shortnose Sturgeon and on the Gulf of Maine Distinct Population Segment ("DPS"), New York Bight DPS and the Chesapeake Bay DPS of Atlantic Sturgeon are premature.

Both in-kind and out of-kind mitigation for endangered sturgeon species affected or potentially affected by the CHPE Project must be commensurate with the magnitude of impacts quantified. The intersection of benthic habitat disturbance along the path of the CHPE Project in the Hudson River Segment and the foraging, overwintering, spawning, nursery, and resting habitat use by each life stage (egg, larvae, juvenile, adult) of the two sturgeon species in space and time must be reconciled before scientifically valid conclusions can be reached about the magnitude of impacts. It is not scientifically credible to reach LEDPA conclusions in the DEIS or 404 Application for the CHPE Project based the "best available information" with the knowledge that significant new information was required and is forthcoming from the studies required by the ET Mitigation Plan for the TZ Bridge Project.

While the outcome of studies required by the ET Mitigation Plan of the TZ Bridge Project is not yet known, the available information suggests the scale of the CHPE Project is of a comparable relative magnitude or larger than the TZ Bridge Project with respect to the potential to impact Shortnose and Atlantic Sturgeon in the Hudson River Estuary. The TZ Bridge Project impacts are spatially constrained to a relatively short mile-long segment of the Hudson River Estuary and temporally restricted to a construction period of 6 years. Impacts are further constrained to construction periods within each year to avoid use of the habitat near the TZ Bridge Project by migrating sturgeon. Adult sturgeon, particularly the anadromous Atlantic Sturgeon, must traverse the TZ Bridge Project both when entering the Hudson River Estuary from the sea to migrate upstream and spawn in the freshwater portion, and when returning to the sea after spawning. The CHPE Project is spatially extensive within the Hudson River Segment over approximately the same construction period, and therefore has a greater potential to interact with all life stages of sturgeon than the TZ Bridge Project. Specifically, the TZ Bridge Project will disturb 139 acres of Hudson River Estuary benthic habitat due to dredging, and 107 acres of this dredged habitat will be covered with sand and stone and permanently altered during and following construction. None of the habitat temporarily or permanently disturbed by dredging for the TZ Bridge

Project is within a designated SCFWH. The Hudson River Segment of the CHPE Project will extend along 88 miles of benthic habitat in the Hudson River Estuary, 36 miles of which are located among five SCFWHs, temporarily disturbing an estimated total of 168 acres of aquatic benthic habitat during entrenchment by jet plowing, and permanently disturbing another 25 acres of habitat by installation of rip-rap mats (Table 1). However, this review suggests that the amount of habitat temporarily or permanently altered may both be underestimated in the DEIS when the additional impacts identified in this report are considered. Therefore, based on available quantitative estimates of the areas affected by construction and installation activities, the CHPE Project is at least comparable to the TZ Bridge construction Project, but has the potential to affect a wide variety of habitats and five SCFWHs along 88 miles of the Hudson River Estuary and should require at least comparable mitigation.

3.4.2 West Point Transmission Project

West Point Partners, LLC submitted an application to the United States Army Corps of Engineers ("USACE") dated 31 July 2013 for a Department of the Army Individual Permit for the West Point Transmission Project ("West Point Project"). This project falls under jurisdiction of the New York State Public Service Commission rather than the New York State Department of Environmental Conservation. The permit is being sought to install a buried cable system for delivery of high voltage electricity between the existing National Grid Leeds Substation (Leeds Substation) in the Town of Athens, Greene County, NY and the existing Consolidated Edison Company of New York, Inc. (Con Edison), Buchanan North Substation (Buchanan Substation) located adjacent to the Indian Point Energy Center in the Village of Buchanan, Town of Cortlandt, Westchester County, NY. For approximately 77 miles of its length, the Project will be buried under the bed of the Hudson River Estuary.

The proposed In-River Cable Route runs from the Transition Vault located in the vicinity of the Northern Landfall near HRM 118 on the west side of the Hudson River to the Transition Vault located in the vicinity of the Southern Landfall near HRM 42 on the east side of the Hudson River. The total length of the In-River Cable between these two locations will be approximately 77.6 miles. The large majority of this cable will be embedded into the river bottom by hydraulic jetting.

The permit requests authorization for the West Point Project construction activities beginning June 2014 and continuing through May 2016, with cable installation work beginning in 2015. While the permit has not yet been granted, the permit will likely require completion of agency consultations, modeling of benthic impacts, essential fish habitat assessment, and several other impacts. Some of these have already been completed and others are in process or will be scheduled as the permitting process continues.

The new information obtained from the these studies represents important advances in the scientific knowledge of the Hudson River Estuary that must be considered before sound scientific conclusions can be reached about the nature and magnitude of impacts from the CHPE Project. It is clear that the CHPE Project DEIS and 404 Application did not consider the important new information that will be obtained by the permitting and impact analysis of the West Point Project because these studies just began in 2013 and will conclude in 2016. However, given the coincidence of the CHPE Project and West Point Projects in time and space, the importance of the Hudson River Estuary as a special aquatic site designated by

the Hudson River Estuary Management Act, and the wealth of the scientific information required by the permitting process of the West Point Project, conclusions of no or temporary impacts stated in the DEIS for the CHPE Project on federally listed Shortnose Sturgeon and on the Gulf of Maine Distinct Population Segment ("DPS"), New York Bight DPS and the Chesapeake Bay DPS of Atlantic Sturgeon are premature.

The proposed West Point Project is planned for a subset of the same stretch of the river where CHPE intends to install HVDC cables. Because this overlap is not detailed in either permit application at this time (CHPE or West Point Partners), it is unclear whether the installation would occur simultaneously or staggered, or where the two cables would be laid in relation to each other. The disturbance of the same area of river bottom twice in a short period of time has the potential to disrupt communities attempting recovery from the first installation, and could cause the long-term degradation of habitat. The area in which the West Point Project is planned also includes SCFWHs deemed to be unique and valuable living and feeding grounds for animals. The impacts of construction, operation (including electro-magnetic fields), and maintenance of the West Point Project will add significant pressure to an area and aquatic community already disturbed by the CHPE Project and may increase the duration and severity of impacts.

It is essential that the cumulative effects section of the CHPE Project DEIS be expanded to include updated facts about the placement and timing of the West Point Project in relation to the installation of HVDC by CHPE. Without this information, the conclusion of no significant negative impact is made using incomplete analysis.

3.4.3 TDI New England Clean Power Link Lake Champlain

TDI New England has proposed a 1,000 MW HVDC underwater and underground transmission line from the Canadian border to New England via Vermont, to be installed by 2019. Approximately 100 miles of this HVDC cable would run through Lake Champlain. The impacts of this project should be considered in Cumulative Impacts under Present and Reasonably Foreseeable Transmission Projects.

4.0 Least Environmentally Damaging Practicable Alternative

The CHPE Project Alternatives Analysis presented in the DEIS followed the Clean Water Act 404(b)(1) Guidelines for Selecting the Least Environmentally Practicable Alternative (LEDPA). The project proponent must demonstrate there is "no practicable alternative that would have less adverse impact" and "which does not have other significant adverse environmental impacts to waters of the United States". An alternative is considered practicable "if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purpose".

CHPE conducted and refined several alternatives analyses, including for the New York State Siting and Permitting Process (CHPE 2010a, 2010b), the DEIS (DOE 2013, Appendix B), an updated Alternatives Analysis dated January 18, 2011 in the Coastal Zone Consistency Determination (CHPE 2011), a supplemental Alternatives Analysis (CHPE 2012c) and the Alternatives Analysis Report included in the CWA 404 permit application (CHPE 2013). According to the USACE 2013 permit application and attachments (CHPE 2013d), several design and routing changes were adopted that avoid the in-water route "to the extent

practical and feasible" as part of the NYS siting and permitting process, specifically Article VII of the New York State Public Service Law (CHPE 2010a, 2010b) and NY DOS Coastal Zone Consistency determination (CHPE 2011). The applicant claims that these routing changes included portions of the Hudson River Western Rail Line Route and Harlem River Rail Line route.

According to the 404 Alternatives Analysis report (CHPE 2013), adopting these elements would result in the applicant incurring additional "significant" costs. The alternatives analysis then evaluated the practicability of three alternatives that avoid Hudson River impacts: the Hudson River Western Rail Line Route, use of existing ROWs east of the Hudson River including rail and roads; and an alternative entirely over land (either with overhead or buried transmission lines) using a new power line route. These alternatives were deemed not practicable based on logistics and costs.

One of the alternatives located the CHPE Project with other utilities or roadways. The proponents state that co-location of utility and transportation corridors expose infrastructure to increased risk from terrorism, necessitating a single corridor for each utility to minimize risk. In addition, the applicant states that submarine routes are inherently more secure because of the lack of visible markers. First, the vast majority of high-voltage transmission lines in the United States are above-ground. Second, the submarine location through the Hudson River Estuary, even though not visible, is no less vulnerable than an overland route and could still be easily located by simple reference to navigation charts (due to the "no anchor" zone), and would therefore not offer substantially increased protection from terrorism or attack, even assuming such a threat realistically exists (none has been documented in the record).

Elimination of alternatives as impracticable based on cost raises the question of what is an acceptable cost. Under the 404(b)(1) guidelines that determine what is an unreasonable expense, the applicant should be required to consider whether the projected cost is substantially greater than the cost normally associated with this type of project. In this respect, the applicant compares construction costs for the CHPE Project to costs for other cable installation projects; specifically the Neptune, Port Angeles-Juan de Fuca, Transbay and Northern Pass (the sole overland project) projects (Table 3-2 in Appendix B, CHPE 2013). The applicant claims that the costs per MW are significantly higher by 47% compared to the next most expensive project (Port Angeles). The "comparable" projects are much shorter than CHPE, and thus do not capture the economies of scale that would occur in a project of the length of CHPE. The cost per mile of CHPE (approximately $6.0 million) is less than the cost per mile for the other submarine projects and compares favorably with the overland Northern Pass ($6.1 million per mile). Cost per mile is also more appropriate comparison than cost per megawatt. The applicants estimate that an overland project would increase costs by 35% to 79% over what is defined as baseline costs. This increase would still make the costs per mile similar to "reasonable" costs of comparable overland projects.

Table 3. Transmission line construction cost comparison.

	CHPE	Neptune	Port Angeles-Juan de Fuca	Transbay	Northern Pass
Overall cost	$1,999 800,000	$600,000,000	$750,000,000	$505,000,000	$1,100,000,000
MW	1,000	660	550	400	1,200
Miles	332.8	65	31	57	180
Cost per Mile	$6.0m[1]	$9.2m	$24m	$8.9m	$6.1m

[1]million

Deeming alternatives that avoid the Hudson River Estuary as "not practical" eliminates them from further consideration in the alternatives analysis. The only remaining practicable alternative under this analysis is the submarine route through the Hudson River Estuary. Thus, the applicant failed to examine the environmental impacts or perform a full environmental cost benefit analysis with respect to each of the alternative routes as it would have done for a water dependent use project. By default, the submarine alternative is deemed the "least environmentally damaging" because it is the only remaining alternative. However the 404(b)(1) guidelines stipulate that the project proponent must demonstrate there is no "practicable alternative ...which would have less adverse impact on the aquatic ecosystem" and "does not have other significant adverse environmental consequences".

The project proponent considered only freshwater and tidal wetlands in its wetland impact assessment. Impacts to the Hudson River Estuary bottom should be considered both a regulated tidal wetlands and a special aquatic site based on consideration of the portions that are SCFWH. Approximately 7,357,860 square feet (168 acres) of river bottom would be disturbed during burial of the HDVC cable (USACE 2013). This would be considered a temporary impact as well as a temporal impact, as there would be a loss of wetland functions and values during habitat recovery. An additional 1,107,700 square feet (25 acres; based on Table 5.1-4 of CHPE 2012d) of permanent impact would result from fill from concrete mats placed over cable crossings over bedrock and existing utilities. These impacts were not considered in the assessment of wetland impacts. The proposed wetland mitigation did not include compensation for these impacts. We would argue that these impacts to the Hudson River, along with impacts to freshwater wetlands would constitute 'a significant adverse impact to waters of the United States'.

Compliance with the 404 (b)(1) Guidelines includes special consideration of discharges proposed for special aquatic sites. Defined in Subpart E, these include sanctuaries and refuges, wetlands, mudflats, and vegetated shallows. The Hudson River Estuary is defined as a special aquatic site. If the activity associated with the discharge does not require access or proximity to, or siting within, a special aquatic site (also known as "water dependent use") to fulfill its basic purpose, practical alternatives that do not include special aquatic sites are presumed to be available unless clearly demonstrated otherwise. The applicant states that "while the project does not itself constitute a 'water-dependent' use, several conditions ensure that the transmission cables will be sited and installed in a manner that facilitates water-dependent economic uses and avoids interference with other important water-dependent uses such as navigation and fishing". These conditions include installation using a single-trench jet plow at the "maximum achievable depth", at least six feet below the sediment-water interface and 15 feet in Federal Navigation channels (NYDOS Coastal Zone Consistency Determination, CHPE 2011). The proposed project does not require access or proximity to, or siting within, a special aquatic site to fulfill its project purpose nor do the

special conditions assure that water dependent uses of this project are maintained. Therefore, when fully valued, it appears that indeed at least one practicable overland alternative exists that is not within the Hudson River Estuary and therefore does not traverse five SCFWHs. The land-based alternatives may indeed be the LEDPA when the scientific uncertainties identified in this review are fully addressed and compared to the significant adverse impact to the Hudson River Estuary by the CHPE Project in a revised alternatives analysis.

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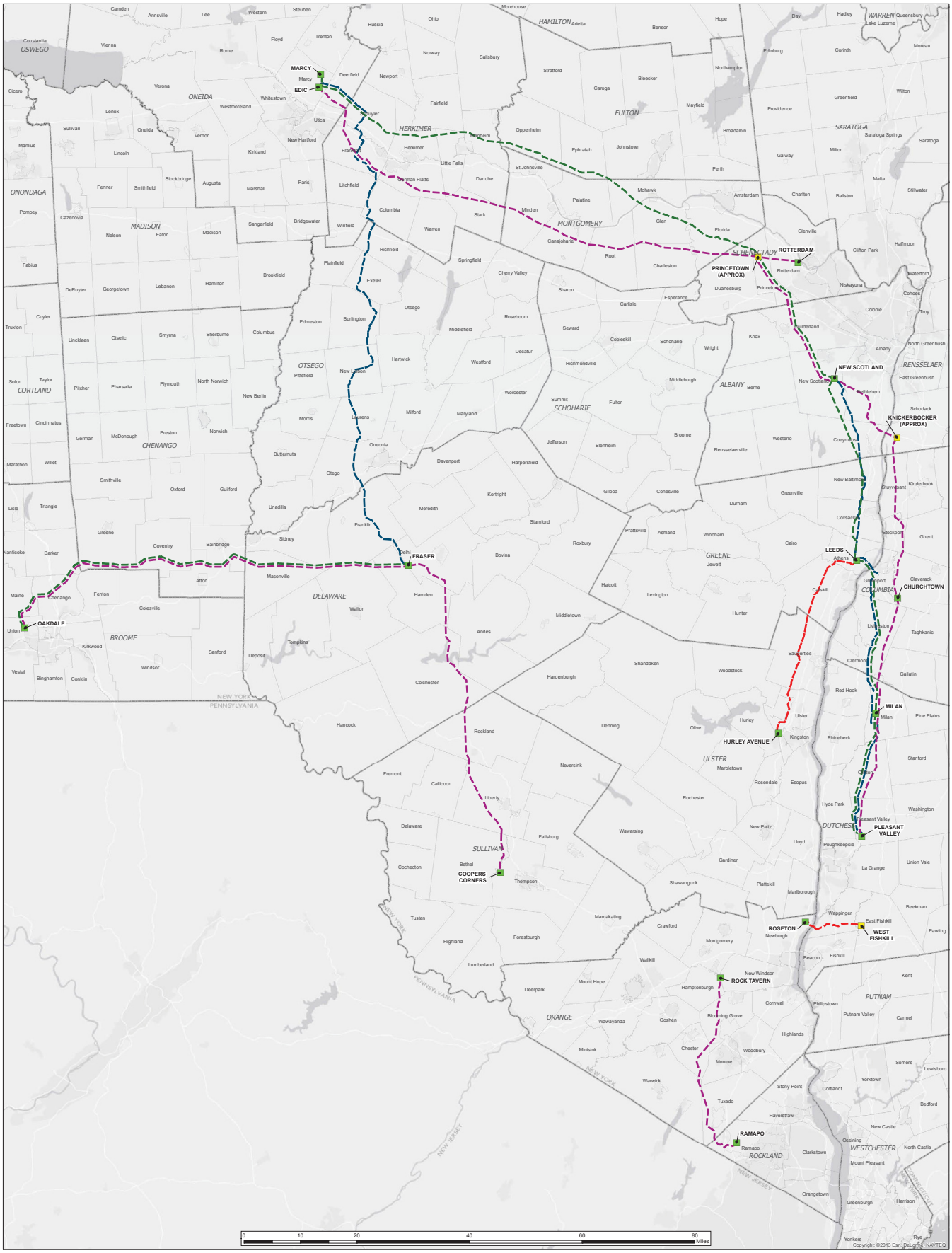
EXHIBIT 2



Boundless Energy (Case 13-T-0461)

- Roseton to West Fishkill
- Leeds to Hurley Avenue

NEETNY (Case 13-T-0455 and 13-T-0456)

- Marcy to Pleasant Valley Route (13-T-0455)
- Oakdale to Fraser (13-T-0456)

North American Transmission (Case 13-T-0454)

- Edic to Fraser
- New Scotland to Leeds to Pleasant Valley

NYTO (Case 13-M-0457)

- Edic to Pleasant Valley
- Oakdale to Fraser
- Fraser to Coopers Corners
- Ramapo to Rock Tavern

Project Substations

- Proposed
- Existing

AC Transmission Upgrades Proceeding
Case 13-E-0488

(Proposed Transmission Lines)

New York State Public Service Commission
Ensuring Safe, Reliable Service and Just, Reasonable Rates since 1907

EXHIBIT 3

Champlain Hudson Power Express, Inc.
Case 10-T-0139

Request No.:	IPPNY-44 Supplement	Date of Request:	June 1, 2012
Requested By:	Independent Power Producers of New York, Inc.	Reply Date:	June 18, 2012
Subject:	New York Energy Highway Request for Information	Witness:	

REQUEST:

a. Did Applicants or their affiliates submit any proposals in response to the Energy Highway Task Force's New York Energy Highway Request for Information?

b. If yes, please provide the proposals.

RESPONSE:

Applicants object to this request on the grounds that the materials requested are not relevant to any issue in this proceeding, and on the further ground that the information contained in the materials requested is not publicly available at this time.

Without waiving the foregoing objections, Applicants state as follows:

a. A response to the Energy Highway Task Force's New York Energy Highway Request for Information was submitted by TDI-USA Holdings Corp. on May 30, 2012. Hydro-Québec Production ("HQP") has informed Applicants that it also submitted a response to the New York Energy Highway Request for Information referencing the Champlain Hudson project on or about May 30, 2012.

b. Notwithstanding the fact that the Energy Highway Task Force has established that it will produce a summary of all submissions but copies of this information will not otherwise be made available absent the submission of a Freedom of Information Law request, Applicants elect in this instance to attach to this response copies of the May 30, 2012 submissions to the Energy Highway Task Force of both TDI and HQP.

The New York Energy Highway

Response to

Request for Information (RFI)

Submitted by:

TDI-USA Holdings Corp.

May 30, 2012

Transmission Developers Inc.

Respondent Information

Respondent's Name: TDI-USA Holdings Corp.
Pieter Schuyler Building
600 Broadway
Albany, New York 12207

Primary Contact: William Helmer
Senior Vice President and General Counsel
Pieter Schuyler Building
600 Broadway
Albany, New York 12207
518.465.0710
bill.helmer@transmissiondevelopers.com

TDI-USA Holdings Corp. ("TDI") is a Delaware corporation formed by Transmission Developers Inc. in 2008 for the purpose of developing merchant energy transmission projects throughout North America. Energy transmission has been identified by the utility industry and the United States Department of Energy ("DOE") as one of the primary vehicles by which costs to electricity consumers may be reduced and newer and cleaner generation resources may enter the marketplace.[1] Since wholesale energy markets were opened to competition by the Federal Energy Regulatory Commission ("FERC") nearly two decades ago, transmission development of new transmission facilities has lagged for a number of reasons. Two reasons in particular stand out: (a) community opposition to overhead transmission lines; and (b) the complexity and controversy arising out of determining who benefits from and who pays for the service under a traditional cost-of-service model. Given these realities, TDI has developed a simple strategy:

1. Develop projects on a merchant (entrepreneurial) business model;
2. Use best in class technology; and
3. Develop projects in the most environmentally responsible manner and pay utmost respect to community values and concerns.

In order to achieve these strategic objectives, TDI adopted the FERC merchant transmission model, whereby TDI must find its own customers to pay for the transmission service, selected high voltage direct current ("HVdc") technology, and determined to bury the transmission system in existing, well-established corridors of maritime, railway, and road transportation and other upland rights-of-way ("ROWs"). Given the fact that buried cable technology can be three to five times more expensive to install than traditional overhead transmission, TDI concluded

[1] National Electric Transmission Congestion Study, August 2006; http://nietc.anl.gov/documents/docs/Congestion_Study_2006-9MB.pdf; *See also*, Power Trends State of the Grid 2012: http://www.nyiso.com/public/webdocs/newsroom/power_trends/power_trends_2012_final.pdf

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that it should focus its efforts on projects that presented the best combination of need, available ROWs, and environmental merit.

TDI began by assembling a core team of exceptionally experienced senior managers, beginning with Donald Jessome, Anthony Turner, and William Helmer. The biographies of these managers are appended to this response to the New York Energy Highway Request For Information ("RFI") and attest to their extensive experience in the energy area. Less than a year after the Champlain Hudson Power Express Project ("CHPE Project") was publicly announced in February of 2009, TDI was acquired by the Blackstone Group, L.P. ("Blackstone"), the largest private equity fund in the world, and was added to Blackstone's portfolio of energy companies. Shortly after the acquisition, TDI added Thomas O'Flynn and Todd Singer to its senior manager roster, and their biographies, also appended to this RFI response, confirm the exceptional talents they bring to TDI and the CHPE Project. The biographies of TDI's senior managers are appended to this RFI as Appendix A.

Project Description[2]

Project Name:	Champlain Hudson Power Express
Type of Proposed Project:	Transmission
Size of Proposed Project:	1,000 MW (expected annual energy delivery up to 8.3 TWh, expected capacity rights of between 600-1,000 MW)
Proposed Project Location:	U.S.-Canada Border to Zone J, Astoria-Queens, NYC (Project Map is Appendix B to this RFI)[3]
Fuel Source:	Anticipated to be predominantly hydroelectric power[4]
Commercial Operations Date:	Q4-2017
Project Technology:	HVdc Voltage Source Converter similar to the attached information provided below at "Project Justification" #2.

[2] In the Article VII proceeding now pending before the New York State Public Service Commission, TDI has also proposed to construct a 345 kV cable circuit connecting NYPA's Astoria Annex to the Rainey Substation owned and operated by the Consolidated Edison Company of New York, Inc. (the "Astoria-Rainey Cable"). The Astoria-Rainey Cable will be constructed to increase the amount of electric energy that can flow from the Astoria Annex into Con Edison's transmission system without violating applicable reliability requirements and is not included in the definition of the "CHPE Project" for purposes of this RFI Response.

[3] From north to south, the CHPE Project traverses Lake Champlain; Washington, Saratoga, Schenectady, Albany and Greene Counties; the upper Hudson River; Rockland County; the lower Hudson and Harlem Rivers; Bronx County; the East River; and Queens County.

[4] Hydro resources currently represent nearly ninety-eight percent (98%) of the power generation in the Hydro-Québec control area. Hydro-Québec, Annual Report 2011, pg. 5.
http://www.hydroquebec.com/publications/en/annual_report/pdf/annual-report-2011.pdf

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Project Justification

The following discussion explains how the CHPE Project will address the objectives and goals outlined in the RFI.

1. **Reduce constraints on the flow of electricity to, and within, the downstate area; and expand the diversity of power generation sources supplying downstate.**

   The downstate area of New York has increasingly relied on natural gas power generation sources as coal and oil generation has declined. Once in operation, the CHPE Project will bring clean and reliable hydroelectric energy from the Quebec control area to consumers in and around New York City and will enhance fuel diversity in the downstate mix of generation.[5] Furthermore, the major constraints on bringing this new generation source to downstate through the existing, congested grid will be averted by the CHPE Project, and resulting savings to consumers have been estimated by the New York State Public Service Commission ("PSC") staff to be as high as $720 million in 2018 from energy benefits alone.[6] These consumer savings are generated through reductions in congestion costs on the existing transmission system assuming operation of the most efficient in-state generation resources along with the energy supplied by the CHPE Project. In addition, PSC staff has estimated that the environmental benefits of the CHPE Project would reach 838 tons of SO_2, 1,432 tons of NOx, and 2.2 million tons of CO_2 in its 2018 test year analysis. Environmental benefits are forecasted at similar levels in subsequent years.[7]

2. **Assure the long-term reliability of the electric system is maintained in the face of major system uncertainties.**

   The CHPE Project will both add new clean and reliable energy resources to New York's electric system and help reinforce the grid by using state-of-the-art HVdc technology with its inert cables installed in existing ROWs. The CHPE Project is expected to be in-service for at least 40 years and will use HVdc voltage source converter technology to deliver the energy and capacity into New York's electric system. The CHPE Project will be a ± 320 kV, 1,000 MW HVdc cable circuit, comprised of two polymer ("XLPE") cables for both the land and marine portions of the cable route. The system design uses HVdc voltage-sourced converters ("VSC"), which allows for fully independent control of both the active and the reactive power flow over its operating range. An overview of two manufacturers' Voltage Source Converter technology (which is typical of VSC technology in general) can be found at:

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[5] NYISO, *Power Trends 2012, State of the Grid* at pg. 19.

[6] Champlain Hudson Power Express, Inc. Joint Proposal for Settlement. Submitted to the New York State Public Service Commission on February 24, 2012. On-line at: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={C5F63E41-5ED5-46A2-99A5-F1C5FC522D36} ; See pg. 58. ¶ 137.

[7] *See*, Joint Proposal filed February 24, 2012, ¶ 141.

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https://netfiles.uiuc.edu/ysharon2/www/enrgysym/talks/larsson_talk.pdf and http://www.ieee.org.br/t-dlamerica2010/T_D_2010_Brasil_paineis_PDF/on%2010_11/morning/IEEE%20HVDC_PLUS%20Technology_Overview.pdf

This technology not only offers unprecedented flow control to the New York Independent System Operator ("NYISO") as it works to balance the system, it also incorporates world-class "smart grid" technologies such as phasor measurement units at each end of the converter station. As the CHPE Project will be in service for a long period of time, it will not only help to address the near-term uncertainties of the state's aging transmission system, potential generation retirements, and energy-demand growth, it will also add a clean and reliable long-term source of secure supply into the New York market.

3. **Encourage development of utility-scale renewable generation resources throughout the State.**

The CHPE Project has the ability to increase access to its facilities by adding additional intermediate converter stations in the future, if and when economic conditions supporting such a capital investment arise. Most critically, the hydroelectric power resources that will flow from the Québec control area have extremely responsive operational characteristics both in terms of fine scale load-following and frequency control along with the longer term energy balancing of the operational spectrum. Energy balancing allows system operators to maximize the integration of utility-scale renewable generation resources, which tend to be intermittent in nature. Thus, the CHPE Project can help to facilitate the development of wind generation by providing the NYISO with an important means of balancing the transmission system on a real-time basis.

4. **Increase efficiency of power generation, particularly in densely populated urban areas.**

The CHPE Project will lower power costs to consumers in the downstate region through the introduction of reliable, lower cost energy and capacity resources. Power prices in the NYISO Zone J market will therefore trend lower for existing generators, which should have the effect of inducing them to make investments in re-powering. In general, the effect of lower power costs will be to incent improvements to efficiency.

5. **Create jobs and opportunities for New Yorkers.**

The CHPE Project on average will save consumers an estimated $650 million per year, year after year, through the introduction of lower cost, clean, and reliable hydroelectric power. A study performed by London Economics International ("LEI") and Regional Economics Modeling, Inc. ("REMI") estimates that the consumer savings will create approximately 2,400 indirect and induced jobs across a wide spectrum of the New York State economy. In addition, during the 3.5 year construction period, the study projects that, on average, 300

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construction jobs will be created by the CHPE Project (with a peak employment of 600), and an additional 1,200 indirect and induced jobs will be created during this period.

6. Contribute to an environmentally sustainable future for New York State.

Given the clean and reliable sources of power that are anticipated to utilize the CHPE Project, substantial and sustained environmental benefits will accrue to New York State. As noted above, PSC staff has estimated that the CHPE Project will lead to reductions of 838 tons of SO_2, 1,432 tons of NOx, and 2.2 million tons of CO_2 in the test year 2018.[8] Annual environmental benefits in subsequent years will be on a similar scale. The CHPE Project converter station is planned to be situated in what may be characterized as the Astoria energy campus in northern Queens. Traditionally, the Astoria campus has housed conventional fossil-fuel generation. For many years, the people of Queens have struggled with high electricity prices while hosting a disproportionate number of fossil-fuel generating facilities. A buried 1,000 MW transmission project that will displace higher-cost fossil generation with clean power, save hundreds of millions of dollars through reduced consumer costs, and increase the reliability of the grid will be a very positive event for the people of Queens. Furthermore, if approved, the Hudson River and Lake Champlain Habitat Enhancement, Restoration, and Research/Habitat Improvement Project Trust (the "Trust"), discussed in detail below, will establish a lasting legacy of stewardship that will benefit New York State's environment for decades to come.

7. Apply advanced technologies that benefit system performance and operations.

The CHPE Project will utilize best-in-class HVdc voltage source converter station technology, along with inert XLPE transmission cable. An HVdc transmission system integrated into the existing HVac transmission network allows grid operators enhanced control over both voltage and frequency, the most significant reliability metrics of the transmission grid, and also improves grid system operation.[9] The innovative technology chosen by TDI will also include many "smart grid" technologies, including phasor measurement units at each end of the converter station. This technology will give real time synchronized data regarding the operations of the CHPE Project to the NYISO, a critically important advantage in the management of the modern power system. In addition to the advantages of the HVdc technology, the hydroelectric power resources that will flow easily on the line from the Québec control area will allow for much needed fast responding regulation and frequency control, along with the capability to balance the existing and new intermittent resources being integrated into the transmission system.

[8] *See*, Joint Proposal filed February 24, 2012, ¶ 141.

[9] D.E. Martin, W.K. Wong, D.L. Dickmander, R.L. Lee and D.J. Melvold, *Increasing WSCC Power System Performance with Modulation Controls on the Intermountain Power Project HVDC System*. 1992.

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8. Maximize New York State electric ratepayer value in the operation of the electric grid.

The CHPE Project employs a privately-financed, user-pay transmission model that will not impose the cost of service on the ratepayers of New York State. Notably, the CHPE Project will significantly reduce the cost of service borne by utility customers in the downstate region without increasing costs in other parts of the state. As noted above, consumer benefits from the CHPE Project have been estimated by PSC staff to be as high as $720 million in 2018 from energy benefits alone. These consumer savings are generated by reducing congestion costs on the existing transmission system by incenting reliance on the most efficient in-state generation resources, along with the energy supplied by the CHPE Project. In addition to the estimated energy benefits, the introduction of up to 1,000 MW of capacity in the Zone J market will help dampen capacity prices well into the future. In addition, as discussed above, environmental benefits were estimated by PSC staff to be as high as 838 tons of SO_2, 1,432 tons of NOx, and 2.2 million tons of CO_2 in 2018. Environmental benefits are forecasted at similar levels in subsequent years.

9. Adhere to market rules and procedures and make recommendations for improvements as appropriate.

The CHPE Project has been involved in the NYISO interconnection process since 2008, occupying queue position 305. The CHPE Project has completed its System Reliability Impact Study ("SRIS") and is currently participating in the 2012 Class Year Facilities Study.

Financial

As noted above, TDI was purchased by Blackstone in January of 2010. Blackstone is a leading global investment and advisory firm that has a remarkable track record in terms of its energy portfolio. Since the acquisition of TDI in January 2010, Blackstone has invested approximately $30 million in the CHPE Project, and Blackstone is fully committed to investing the approximately $500 million of equity required to build the CHPE Project. In addition, TDI is securing the debt required for the CHPE Project through a combination of shipper's access to capital markets, sovereign banks associated with the potential equipment suppliers, and other traditional project financiers. TDI has committed in its Article VII Certificate application now pending before the PSC to develop the CHPE Project as a privately-financed, shipper-pay merchant transmission line with no requirement for ratepayer or governmental support. In response to the RFI's inquiry with respect to public-private partnerships, TDI remains open to such a structure if it increases the CHPE Project's benefits to all parties and is consistent with the commitments made in the "Joint Proposal of Settlement," discussed below.

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Permit/Approval Process

In order to develop, construct, and operate the CHPE Project, TDI is seeking or has obtained a number of state and federal permits. It may be noted that, on June 8, 2011, the New York State Department of State ("DOS") completed its review of the CHPE Project by issuing its concurrence pursuant to the Federal Coastal Zone Management Act ("CZMA"), and, on July 1, 2010, FERC approved a negotiated rate and open season process for this merchant transmission project. The key permits and approvals still to come are as follows:

1. *PSC (Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the Public Service Law).* TDI submitted its initial application to the PSC on March 30, 2010. Since that initial application was filed, extensive public and intervener consultation has been carried out, and this effort culminated with the filing of a Joint Proposal of Settlement ("Joint Proposal") on February 24, 2012 supported, in whole or in part, by 14 state agencies, municipalities, environmental groups, and an electric utility.[10] The Joint Proposal is currently under review by the PSC Administrative Law Judges supervising Case 10-T-0139. TDI anticipates that the PSC will make its final ruling granting a Certificate of Environmental Compatibility and Public Need (the "Article VII Certificate") before the end of 2012.

2. *Other New York State Approvals.* The PSC will issue a Water Quality Certificate pursuant to section 401 of the federal Clean Water Act ("CWA") contemporaneously with the Article VII Certificate. In addition, TDI will apply to the PSC for a number of ancillary approvals, such as a regime of "lightened regulation," late in 2012. Finally, TDI will apply to the New York State Office of General Services ("OGS") for an interim construction permit (and draft grant of lands under water pursuant to the New York State Public Lands Law) in mid-2012.

3. *DOE (Presidential Permit).* TDI submitted is initial application to the DOE on January 27, 2010. DOE is preparing an Environmental Impact Statement ("EIS") to evaluate potential environmental impacts associated with the CHPE Project in accordance with the National Environmental Policy Act of 1969 ("NEPA"). The EIS will only address potential impacts in the United States; NEPA does not require an analysis of environmental impacts that occur within Canada. The EIS, however, will evaluate all relevant environmental impacts within the United States related to or caused by project-related activities in Canada. The original application to DOE was amended on August 5, 2010, updated on July 7, 2011 to reflect the DOS CZMA consistency determination, and further amended on February 28, 2012 to reflect revisions to the application arising out of the Joint Proposal. The draft EIS is expected later this year, with a final determination regarding the Presidential Permit application expected in the first half of 2013.

[10] See Footnote No. 5 above and references below.

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4. *Other Federal approvals.* TDI has applied to the United States Army Corps of Engineers ("ACOE") for permits pursuant to section 404 of the CWA and section 10 of the 1899 Rivers and Harbors Act, and this permitting process is proceeding on a parallel track with the DOE permitting and NEPA processes. A final determination regarding these applications is expected in early 2013.

5. *NYISO approval of interconnection agreement.* As noted above, the CHPE Project is participating in the 2012 Class Year Facilities Study, and conclusion of this study and final approval of the CHPE Project interconnection agreement is expected by mid-2013.[11]

Other Considerations

1. *Anchor Supply Background.* It bears repeating that the source of supply for the CHPE Project is of utmost importance in terms of its overall benefits. Hydro-Québec, which will most likely be the anchor tenant for the CHPE Project, as well as its predecessor companies, have sold power to New York State for decades in the wake of the construction of the Cedars-Dennison intertie in the late 1910's and more recently, the Châteauguay-Massena intertie in the early 1980's. It is the opinion of Hydro-Québec and TDI that the addition of the CHPE Project will significantly contribute to fostering already deep and long-standing electricity relationships between New York State and the Province of Québec by adding 1,000 MW of intertie capacity to the existing 1,700 MW. Hydro-Québec currently owns or controls approximately 37,000 MW of generation capacity, as of the end of 2011, producing approximately 195 TWh of energy every year, nearly 98% of which flows from hydroelectric power stations. Hydro-Quebec continues to add resources in its generation fleet in Quebec as well as capacity improvements to its existing generation stations. Since 2005, nearly 1,600 MW of hydroelectric generation capacity have been commissioned (including the Eastmain-1, Péribonka, and Toulnustouc powerhouses) and 918 MW of new capacity will be commissioned in 2012 after the completion of the Eastmain-1A/Sarcelle/Rupert project. In addition, the four-station, 1,550 MW Romaine hydro complex, currently under construction, will be put in service incrementally starting in 2015.

[11] Additional NYISO approvals may also be required for the Astoria-Rainey Cable proposed in the Joint Proposal in the Article VII proceeding.

2. *Ancillary Benefits.* If the HVac transmission and distribution system suffers a shut-down, or "blackout," conventional generators must have an energized HVac system to connect to before they can begin to restore power. This can take considerable time in conventional generation systems. There is need to be able to start-up the system from the blackout, and this is known as "Blackstart" capability. The VSC technology used in the CHPE transmission system has an inherent Blackstart capability, which means that it can provide up to 1,000 MW of power into a completely blacked-out system as required by the system operator.

Property

For a project of its scale and scope, the CHPE Project is fortunate in having a very limited number of "landlords." Well over 90% of the route will occupy ROWs owned by the State of New York (the beds of Lake Champlain, the beds of the Hudson, Harlem and East Rivers, and state highways 9W and 22) and two large and established railroad corporations (CSX Transportation and the Canadian Pacific Railway). Incidental landlords or providers of real property rights will include some upland municipalities and, potentially, a limited number of commercial landowners. A detailed description of the CHPE Project routing can be found in Exhibit B to the Joint Proposal. The CHPE Project converter station will be located in the Astoria neighborhood of the Borough of Queens in an area that has been dedicated to industrial and commercial use for many years.

Projected In-Service Date and Project Schedule

A Gantt chart of the currently anticipated CHPE Project schedule is appended to this RFI response as Appendix C.

Interconnection

The CHPE Project point of interconnection will be the Astoria Annex 345 kV substation in Astoria, which is owned by the New York Power Authority ("NYPA") and is located on land owned by the Consolidated Edison Company of New York, Inc. ("Con Edison"). The Astoria Annex interconnects with the Con Edison system through two cables that connect to its East 13th Street substation. In addition, Con Edison is in the process of constructing an additional interconnection between the Astoria Annex and its Astoria East 138 kV Substation. An interconnection diagram is appended to this RFI response as Appendix D. The Astoria interconnection point was selected for a number of different reasons including voltage level, breaker positions, and proximity to land for the converter station, as well as consideration of deliverability and reliability. TDI has agreed to upgrade facilities at the Astoria Annex so that the energy deliverability to the Con Edison system will be at least 1,550 MW, thus ensuring that both the CHPE Project and Astoria II Project can deliver low-cost energy supplies to the market. As noted above, the CHPE Project is currently participating in the 2012 Class Year Facilities Study, and conclusion of this study and final approval of the CHPE Project interconnection agreement is expected by mid-2013.

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Technical

The CHPE Project is expected to be in service for at least 40 years. TDI is requesting that the construction contractor ultimately selected to provide engineering, construction, and procurement services (the "EPC Contractor") provide a three-year equipment guarantee, and it is anticipated that the EPC Contractor will also be responsible for the ongoing maintenance and emergency repairs to the CHPE Project.

Construction

TDI is currently conducting an EPC Contractor selection process. It is expected that the construction teams will be companies based in the United States, with the equipment manufacturers being suppliers with some on-shore based manufacturing capability. Labor to construct the project will be primarily local and drawn from the communities in which the cables will be installed and from the New York City area. Cable manufacturing capability will be in the critical path for the construction of the CHPE Project, as there is limited manufacturing capability and high demand in the European and Asian markets. It may be necessary to form a cable manufacturing consortium in order to manufacture the cable on the timeline required by TDI. The HVdc voltage source converter technology, as well as the submarine and terrestrial HVdc cables, are commercially available and are used throughout the world.[12] The CHPE Project is expected to be in service for at least 40 years, and historical experience with the cable and converter station technologies has demonstrated that properly-maintained equipment can be in service much longer. If the technology becomes uneconomic or inoperable, the least environmentally disruptive option would be to leave the inert cables *in situ*.

Operational

The CHPE Project has en expected life span of 40 or more years. During this period, it is estimated that the transmission system will maintain an availability of 95%, which translates to a capability of delivering up to 8,322 GWh of clean, reliable energy year after year. The HVdc voltage source converter technology uses best in class real time fault detection equipment to clear any fault in 50 milliseconds (0.05 seconds), making the risk of damage to human health and the environment *de minimis*. In addition, the cables are buried to depths that minimize the risk of potential external mechanical damage from ship anchors or fishing equipment. Finally, the transmission cables will both be shielded and buried, so the magnitudes of the electric field levels will be inconsequential. The CHPE Project will meet applicable regulatory standards with respect to magnetic fields and the impacts to potential receptors, if any, are projected to be insignificant.

[12] See, http://www.abb.com/industries/us/9AAF400197.aspx ;and http://www.transbaycable.com/

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Socio-Economic

As noted above, LEI and REMI prepared a study detailing the socio-economic benefits of the CHPE Project. Inasmuch as the CHPE Project will be primarily installed in ROWs, the impacts to the affected communities will be limited to the construction periods. For those communities in which the CHPE Project will be buried along railroad ROWs or streets and highways, an estimated $20 million of property taxes will be paid annually. Once the CHPE Project is *in situ*, there will be little or no burden on the communities. Property values in the communities are also expected to be unaffected by the CHPE Project as the project is almost wholly invisible once buried. It may also be noted that the CHPE Project will receive a grant of land underwater from OGS, and this will generate tens of millions of dollars towards the State's general fund. As previously stated in this RFI response, the introduction of a low-cost, clean, reliable energy source in Astoria will be a very positive event due to the introduction of zero emissions energy in their community. During the three to four year construction period, an estimated 300 unionized construction jobs will be created in a number of trades and crafts. At the peak of construction, there will be 600 workers employed by the CHPE Project. The LEI/REMI study also has determined that 1,200 indirect and induced jobs will be created from this construction activity. Once the CHPE Project is operational and the estimated $650 million of annual energy cost savings flows into the economy, the LEI/REMI study has determined that approximately 2,400 sustainable jobs will result from the energy cost savings. Finally, the CHPE Project will be the largest and longest HVdc transmission project in North America. As such, New York State will be able to showcase the implementation of the technology, bringing further prominence to the emerging high tech revolution that is occurring in the Capital District region of New York State and once again restoring New York State to the forefront of the electric power industry.

Financial

The CHPE Project is a privately-financed merchant transmission project. The CHPE Project will be financed as follows:

1. *Customer Commitments.*

    a. TDI will enter into a 35-40 year Transmission Service Agreement with Hydro-Québec Production or other entity for 750 MW of transmission capacity;

    b. TDI will offer the remaining 250 MW in an open season process. Such process will be administered by the third party evaluator Boston Pacific in accordance with FERC order ER10-1175-000 issued July 1, 2010; and

    c. Qualifying parties will need to offer, at a minimum, investment grade credit.

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2. *Sources of Project Finance.*

    a. Hydro-Québec may supply all debt for the CHPE Project;

    b. Sovereign Export banks can and may supply between 25-50% of the debt financing for those suppliers selected to manufacture the cables and converter stations;

    c. Traditional project finance may be utilized; and

    d. TDI continues to be a participant in DOE's "Section 1703" Loan Guarantee Program established pursuant to the Energy Policy Act of 2005.

3. *Source of Equity.* Blackstone will provide all equity for the CHPE Project. Current estimates are that equity will represent 25% of the required capital.

4. *Customer Revenues.* TDI will not assume ownership of the energy and capacity that will be sold into the NYISO administered markets, but rather will transport these valuable products to the market. The expected markets that Hydro-Québec and other shippers are expected to access include the energy (Zone J Locational Marginal Price), New York In-City capacity markets, and, potentially, the ancillary services markets administered by the NYISO.

5. *Risk in Price Changes.* TDI is currently in the process of selecting an EPC Contractor for the CHPE Project through a request for proposal process. The risks associated with commodity prices (e.g. copper, lead, etc.) will be borne by the EPC Contractor after issuance of the "notice to proceed" with the work identified by the contract. Risks associated with geotechnical and environmental conditions will be apportioned between the EPC Contractor and TDI in accordance with determinations regarding which of the parties can best manage a particular risk. Risks associated with the NYISO markets will be borne by the shippers using the CHPE Project and will be managed in accordance with the shippers risk management strategies.

6. *Public Service Commission.* The CHPE Project is a merchant, privately-financed, user-pay transmission project and is therefore not involved in any PSC rate-making proceedings. The CHPE Project is, as noted above in this RFI response, the subject of the PSC Article VII siting proceeding, Case No. 10-T-1039.

7. *Power Purchase Agreement.* The CHPE Project will be a merchant, privately-financed, user-pay transmission project and TDI is not seeking a Power Purchase Agreement with any utility or state authority. If in the future an authority or utility in New York undertakes a power purchase request for proposal process, it is anticipated the shippers using the CHPE Project may participate, offering their long-term, clean, and reliable energy supply to the New York market on a competitive basis.

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Environmental

TDI has completed a thorough review of the environmental aspects of the development, construction, and operation of the CHPE Project in the context of the PSC Article VII process. On February 24, 2012, the Joint Proposal was filed on behalf of the following parties:

1. The Applicants (TDI subsidiaries Champlain Hudson Power Express, Inc. and CHPE Properties, Inc.);
2. PSC Staff;
3. New York State Department of Environmental Conservation ("NYSDEC");
4. New York State Department of State ("DOS");
5. New York State Department of Transportation ("NYSDOT");
6. New York State Department of Agriculture and Markets ("Ag & Mkts");
7. Adirondack Park Agency ("APA");
8. Riverkeeper, Inc. ("Riverkeeper");
9. Scenic Hudson, Inc. ("Scenic Hudson");
10. New York State Council of Trout Unlimited ("Trout Unlimited");
11. City of Yonkers;
12. City of New York ("CNY");
13. New York State Office of Parks, Recreation and Historic Preservation ("OPRHP");
14. Palisades Interstate Park Commission; and
15. Vermont Electric Power Company – Only with respect to those sections associated with co-located infrastructure.

As part of the Joint Proposal, a comprehensive review was conducted regarding all aspects of the CHPE Project. The application, testimony, and exhibits designated for inclusion in the evidentiary record describe the nature of the probable environmental impacts of the CHPE Project and are briefly summarized below. The environmental impacts associated with the CHPE Project are expected to be avoided, minimized or mitigated, provided that the Best Management Practices ("BMPs") and Guidelines for the preparation of the Environmental Management and Construction Plan ("EM&CP Guidelines") agreed to by the signatory parties are adhered to in the preparation of the Environmental Management and Construction Plan ("EM&CP") and provided that the EM&CP and the proposed Certificate Conditions agreed to by the signatory parties are strictly complied with during CHPE Project construction, operation, and maintenance. The signatory parties have agreed in the Joint Proposal that the CHPE Project, located and configured as provided therein, represents the minimum adverse environmental impact considering the state of available technology and the nature and economics of the various alternatives and other pertinent considerations. The route of the CHPE Project is preferred

because it would avoid and/or minimize the disturbance of natural habitat and would primarily use existing and previously disturbed ROWs.

The Joint Proposal further details the environmental aspects of the CHPE Project in the following sections:

Environmental Impact: Sections 24-98

a. Topography, Geology, Soils: Section 26
b. Aquatic Physical Characteristics: Sections 27-34
c. Aquatic Sediment and Water Quality: Sections 35-39
d. Benthic Resources: Sections 40-45
e. Finfish: Sections 46-50
f. Lacustrine and Aquatic Protected Species: Sections 51-58
g. Freshwater and Tidal Wetlands and Water Resources: Sections 59-62
h. Terrestrial Wildlife and Plants and Protected Species: Section 63-68
i. Land Use: Sections 69-74
j. Agricultural: Sections 75-76
k. Visibility from Areas of Public View: Sections 77-80
l. Cultural and Historic Resources: Sections 81-82
m. Transportation: Sections 83-88
n. Noise: Section 89
o. Communications: Sections 90-91
p. Electric and Magnetic Fields: Sections 92-98

Environmental Benefits: Section 141

Studies in the Joint Proposal also indicated that the CHPE Project would result in environmental benefits by reducing the emissions of SO_2, NO_X, and CO_2 due to the displacement of electric power that would have otherwise been generated by burning fuel in power plants as outlined below in Table #1.

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Table 1

Emissions Reductions	**SO_2 (tons)**	**NO_X (tons)**	**CO_2 (tons)**
PSC Staff estimate	499 - 828	748 - 1,432	1.5-2.2 million
LEI Updated emissions reduction benefit with CHPE @ 75%- 90%	454 – 571	952-1,114	2.5-2.9 million

The signatory parties have agreed upon the establishment a $117 million Trust, as detailed at proposed Certificate Condition 165 in Appendix C of the Joint Proposal, to be used exclusively for in-water mitigation studies and projects that have a direct nexus to the construction and operation of the CHPE Project. The signatory parties have participated in extensive discussions to develop and implement a variety of studies and projects that will minimize, mitigate, study, and/or compensate for the short-term adverse aquatic impacts and potential long-term aquatic impacts and risks to these water bodies from construction and operation of the CHPE Project.

Project Contract/Request for Proposal ("RFP") Status

The CHPE Project is a privately-financed merchant transmission project and has therefore not been submitted to a New York agency or authority in response to a Request for Proposals.

Public Outreach and Stakeholder Engagement

TDI has pursued an extensive public outreach program as documented below:

1. Public Announcement February 23, 2010

2. TDI Public Meetings:
    a. Albany, New York: March 10,2010
    b. Plattsburgh, New York: April 13,2010
    c. Kingston, New York: April 20, 2010

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d. Scotia, New York: May 4, 2010
e. Yonkers, New York: May 12, 2010

3. DOE Public Scoping Meetings
   a. New York City: July 9, 2010
   b. Yonkers, New York: July 12, 2010
   c. Kingston, New York: July 13, 2010
   d. Albany, New York: July 14, 2010
   e. Glens Falls, New York: July 15, 2010
   f. Plattsburgh, New York: July 16, 2010

4. PSC Public Statement Hearings on Article VII Completed Application
   a. Yonkers, New York: Oct 24, 2010
   b. Kingston, New York: Oct 28, 2010
   c. Schenectady, New York: November 4, 2010
   d. Whitehall, New York: November 8, 2010
   e. Plattsburg, New York: November 9, 2010

5. PSC Public Statement Hearings on Filed Joint Proposal
   a. Whitehall, New York: April 3, 2012
   b. Catskill, New York: April 4, 2012
   c. Ravena, New York: April 5, 2012
   d. Schenectady, New York: April 10, 2012
   e. Haverstraw, New York: April 12, 2012
   f. Astoria, Queens, New York: April 24, 2012

In addition to the public meetings, there have been two forty-five (45) day public comment periods noticed on the Federal Register by the DOE, the first on June 18, 2010 and the second on April 30, 2012. Members of the public can also express their opinion regarding the CHPE Project through the PSC Article VII process on an ongoing basis. Finally, to ensure that the public is well informed with respect to the CHPE Project, there are several websites that the public can access to obtain all public information available. The sites can be found at:

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TDI Website: www.chpexpress.com

DOE EIS Website: http://chpexpresseis.org

PSC Article VII Website: http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=10-T-0139

It should be noted that the following additional parties have expressed support for the Joint Proposal and/or the CHPE Project generally:

- Twenty members of New York's Congressional Delegation[13]
- New York League of Conservation Voters
- New York City Councilman Peter Vallone, Jr.
- Hydro-Québec
- Long Island Association
- Plattsburgh-North Country Chamber of Commerce
- New York State Energy Consumers Council
- International Union of Operating Engineers
- Laborers' International Union of North America
- New York State Laborers' Union
- Empire State Development Corporation
- New York City Economic Development Corporation
- Coalition Helping Organize a Kleaner Environment ("CHOKE")
- Middletown Times Herald Record
- Watertown Daily Times

[13] The Honorable Tom Reed, Paul Tonko, Tim Bishop, Peter King, Steve Israel, Carolyn McCarthy, Gary Ackerman, Gregory Meeks, Jerry Nadler, Ed Towns, Yvette Clarke, Mike Grimm, Carolyn Maloney, Charlie Rangel, Richard Hanna, Eliot Engel, Ann Marie Buerkle, Bill Owens, Nita Lowey and Louise Slaughter.

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APPENDIX A

Donald Jessome
President and CEO

Mr. Jessome is President and CEO of Transmission Developers Inc, and a co-founder of the Company. He earned his undergraduate degree in Electrical Engineering from the Technical University of Nova Scotia (currently referred to as Dalhousie University) in 1987 and his Masters of Business Administration, with Distinction, from Saint Mary's University in 1999.

Mr. Jessome spent his entire career in the energy field starting with 22 years at Emera Inc., a publicly traded company in Canada with $5.3 Billion in energy infrastructure assets centered on power and natural gas. Mr. Jessome has worked in a broad range of areas while at Emera including Transmission & Distribution Operations and Construction, Integrated System Planning, System Operations, Generation Operations and Fuel Procurement, Marketing and Sales, and most recently Director of Asset Optimization and Power Trading for Emera Energy Inc. a wholly owned non-regulated trading and asset Optimization Company of Emera Inc. During this tenure, Mr. Jessome has sat on numerous advisory boards including his membership as one of the inaugural members of the NBSO Market Advisory Committee and a founding member of the CEA Power Marketing Committee. Mr. Jessome has extensive knowledge of the power markets in the North East including ISO-NE, NYISO, IESO, TransÉnergie, NBSO, and PJM through his extensive marketing and trading experience with both the regulated and non-regulated business at Emera.

Prior to co-founding Transmission Developers Inc, Mr. Jessome joined Riverbank Power in 2008 as the Vice-President of Marketing and Trading to assist Riverbank Power in developing its commercialization strategy for its 1,000 MW underground pump-storage technology referred to as Aquabank™. This commercialization strategy included the development of economic models and programs for the sale of energy, capacity and renewable attributes for both the regulated and market based energy markets that Aquabank™ is currently developing sites. In addition, Mr. Jessome was responsible, along with the CEO, in raising equity financing for Riverbank's development plans. Mr. Jessome is a board member to Riverbank Power.

Mr. Jessome serves as a Director for Transmission Developers.

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Tom O'Flynn
Chief Operating and Finance Officer

Mr. O'Flynn is a seasoned energy executive. From 2001-2009, he served as the Chief Financial Officer of PSEG, a New Jersey based power and utility company with approximately 2.4 million utility customers, 16,000 megawatts of unregulated generation, and operator of a large transmission system in the PJM system. Mr. O'Flynn was responsible for all PSEG corporate and operating financial and strategic functions from 2007 – 2009.

Mr. O'Flynn also served as President of PSEG Energy Holdings, a subsidiary that owned major electric distribution businesses in Chile and Peru and has approximately 2,600 megawatts of generation, primarily in the United States.

From 1986 to 2001, Mr. O'Flynn was in the Global Power and Utility Group in the Investment Banking Division of Morgan Stanley, based in New York City. He served as a Managing Director for his last five years and as Head of the North American Power Group in 2000 - 2001. He was responsible for senior client relationships and led a number of large merger, financing, restructuring and advisory transactions.

Mr. O'Flynn graduated from Northwestern University in 1982 with a B.A., Economics and from the University of Chicago in 1986 with an MBA, Finance. Mr. O'Flynn served as a member of the Board of Directors of Nuclear Electric Insurance Limited from 2003 - 2009, serving as Chairman of the Finance Committee from 2007 - 2009. He is on the Boards of the New Jersey Performing Arts Center and the Newark Museum.

Transmission Developers Inc.

Bill Helmer
Senior Vice President, General Counsel, and Secretary

Bill Helmer has practiced energy, environmental, contract, and real estate law during a career spanning over a quarter century. He has occupied senior positions in New York State government, litigated groundbreaking cases before federal courts and the highest court in New York State, and handled the legal issues associated with the development and financing of many large and complicated power projects.

Bill is a graduate of Hamilton College, and he earned a Master of Arts degree at Columbia University in New York City. He graduated with honors from the Law School of the State University of New York at Buffalo in 1982. After a judicial clerkship, Bill practiced law privately in Albany, New York for a dozen years until he was placed in charge of the Environmental Protection Bureau in the State Attorney General's office.

The Bureau serves as the litigation counsel for all environmental cases involving state bodies such as the Departments of Environmental Conservation and State, the Adirondack Park Agency, and many others. During his tenure as Bureau Chief, Bill managed a staff that included over thirty attorneys, six scientists, and dozens of other employees in offices located in Buffalo, Albany, and New York City.

From 1999 until 2007, Bill served as Special Counsel in the New York Power Authority's Law Department. At the Authority, Bill oversaw all legal matters associated with the Authority's nuclear fleet until the plants were sold to Entergy Corporation late in 2000. Shortly before the sale, Bill also assumed responsibility for the Authority's hydroelectric relicensing portfolio. By early 2007, new 50-year federal licenses had been issued for the Authority’s projects on the St. Lawrence and Niagara Rivers.

Bill is a sought-after writer and lecturer. He has served as an adjunct faculty member at Union College, where he designed and taught "The Land and the Law" Environmental Studies course, and he frequently appears in programs sponsored by the New York State Bar Association. At the Bar Association, Bill sits on the Executive Committees of the Environmental and General Practice Sections. He is also a past Chairman of the latter section and a past member of the Public Utility Law Committee.

Bill’s published works include scores of articles and sixteen entries in the official Encyclopedia of New York State. He has served as a quarterfinals judge for the National Environmental Law Moot Court competition held annually at Pace Law School. He is also the co-host of the "Capital Green Scene" weekly radio program on WVCR-FM 88.3, which made its debut on Earth Day, 2008.

Transmission Developers Inc.

Todd Singer
Vice President of Finance and Treasurer

Mr. Singer is the Vice President of Finance and Treasurer for Transmission Developers. He is a senior finance and business development executive with over 17 years of diverse corporate and investment banking experience. He has significant expertise in the alternative energy and power/utility industries. During his investment banking career, Mr. Singer was responsible for originating and executing over $97 billion in capital markets transactions and $3.6 billion in M&A transactions. He was formerly a Consultant and Head of Strategy and Corporate Development for Energy Storage and Power LLC, a wind energy storage company that is a portfolio company of PSEG. He was also a Consultant with the Natural Resources Defense Council in its Center for Market Innovation where he was focused on energy efficiency finance.

Mr. Singer worked for over eight years as an investment banker at Morgan Stanley where he was an Executive Director. Following business school, Todd was also a Consultant at Price Waterhouse Coopers and an investment banker at Bank of America. He also worked in advertising finance at Time Warner's Time Inc. subsidiary.

Mr. Singer received his MBA from Columbia Business School in 1996 and his BSBA in Management with a Minor in Art History from Bucknell University in 1991. Mr. Singer is currently the Co-Chair of the Bucknell Professional Networks, a 2,500-member network of alumni covering a broad range of industries and disciplines. He was also the founding Co-Chairman of the Bucknell Finance Network, a worldwide network of all Bucknell alumni working in Finance. He is also a former Chairman of the Reunion Gift Committee and has been a guest lecturer at Bucknell. Mr. Singer is also on the Board of Directors for Green Allowance, a non-profit focused on making homes more energy efficient.

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Anthony Turner
Vice-President of Engineering

As VP of Engineering, Mr. Turner has more than 40 years' experience in electrical engineering, including a variety of aspects relating to high voltage direct current and alternating transmission systems. This experience includes HVdc manufacturing, research, lecturing and consultancy, high voltage cable systems, power systems studies, energy management systems, renewable energy and railway electrification and restructuring of electrical utilities. This has included major projects in Canada, the Gulf States, the United States, China, Central America, Europe, Africa, India, Brazil and Panama.

The experience in HVdc Transmission systems has included Contractor's responsibility for the design and commissioning of the Master Controls and HVdc Line Protection systems of the Nelson River Bipole 1 HVdc Project, and as Owner's Engineer for the supervision of the factory testing and commissioning of the Leyte-Luzon and the Chandrapur Padghe HVdc transmission systems.

Mr. Turner's HV Cable systems experience includes responsibility, again as the Owner's Engineer, for supervision of all aspects of the installation of the cable systems for the Leyte-Luzon 350 kV HVdc project (Philippines), the designs and tender evaluation of the 345 kV AC cable crossing between Newark and New Jersey (USA) and the 400 kV land and cable system between Bahrain and Saudi Arabia. In the early 1980's, Mr. Turner was responsible for the HVdc Cable component for the detailed studies of the Strait of Belle Isle crossing, the HVdc cable crossing of the Cabot Strait and the HVdc crossing between Québec and Iles de la Madeleine.

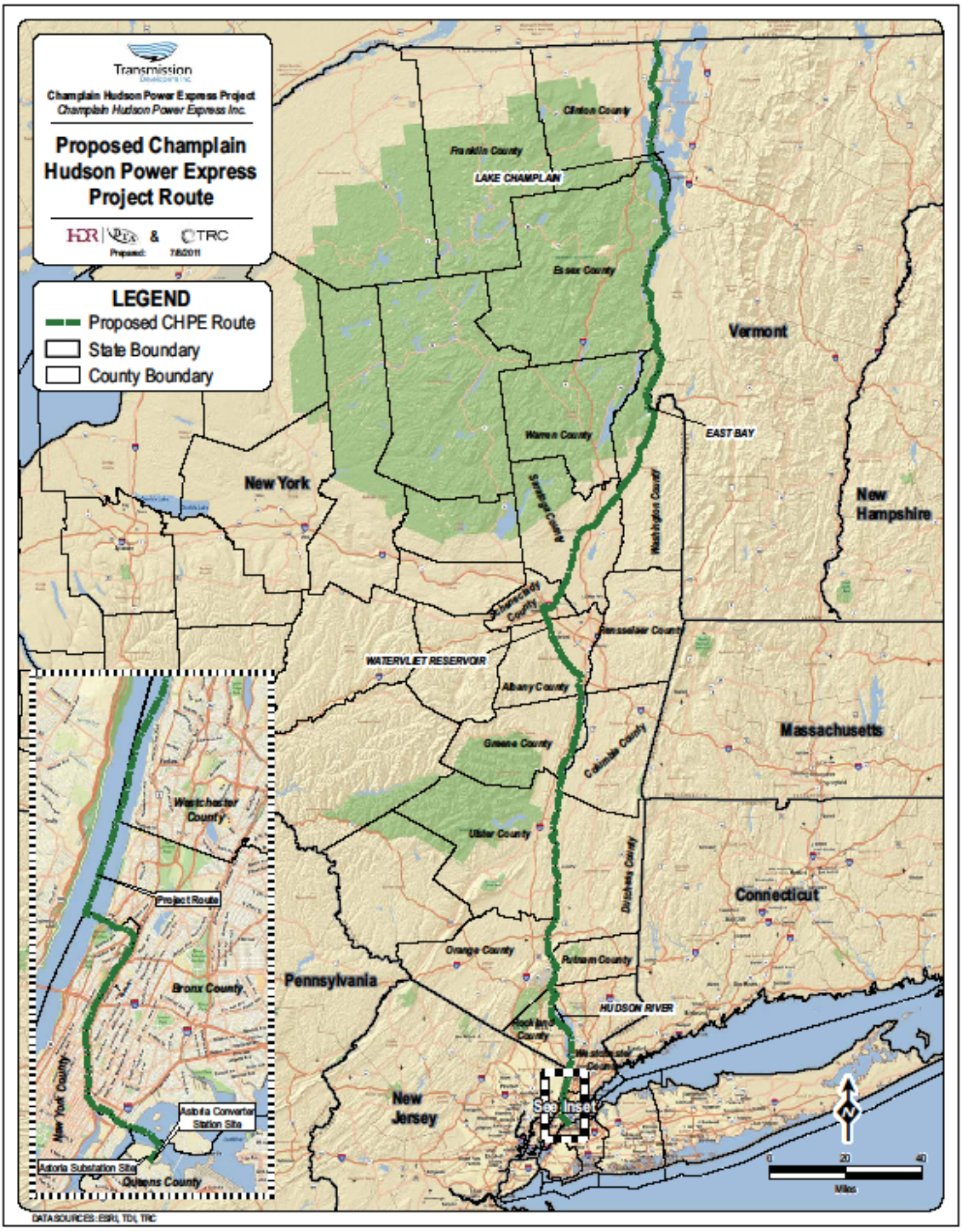
Mr. Turner has carried out numerous power system studies for integrated generation/transmission/distribution systems and for production facilities such as smelter plants, and has been Project Manager for a number of HVac and HVdc transmission projects in Canada, the Philippines, Panama and India.

He has authored papers on HVdc systems, submarine cable crossings, energy management, renewable energy resources and the electrification of railway systems, and has been a member of a number of CIGRE, CEA, IEEE and other committees and panels.

Mr. Turner holds a B.Tech. (Honours), Electrical Engineering, University of Technology, Loughborough, England 1967, Technical Teacher Certificate, England 1973 and a Masters in Engineering., Power Systems, McGill University, Montreal, Québec, Canada 1978.

Transmission Developers Inc.

APPENDIX B



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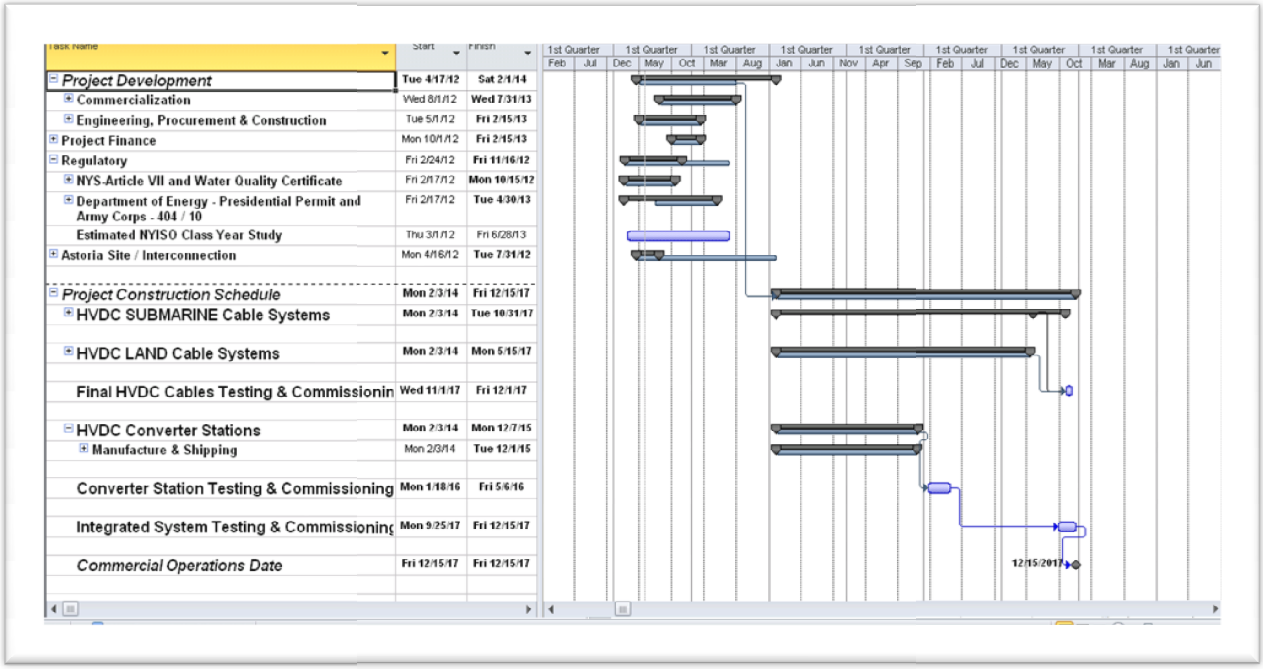
APPENDIX C

PROJECT SCHEDULE

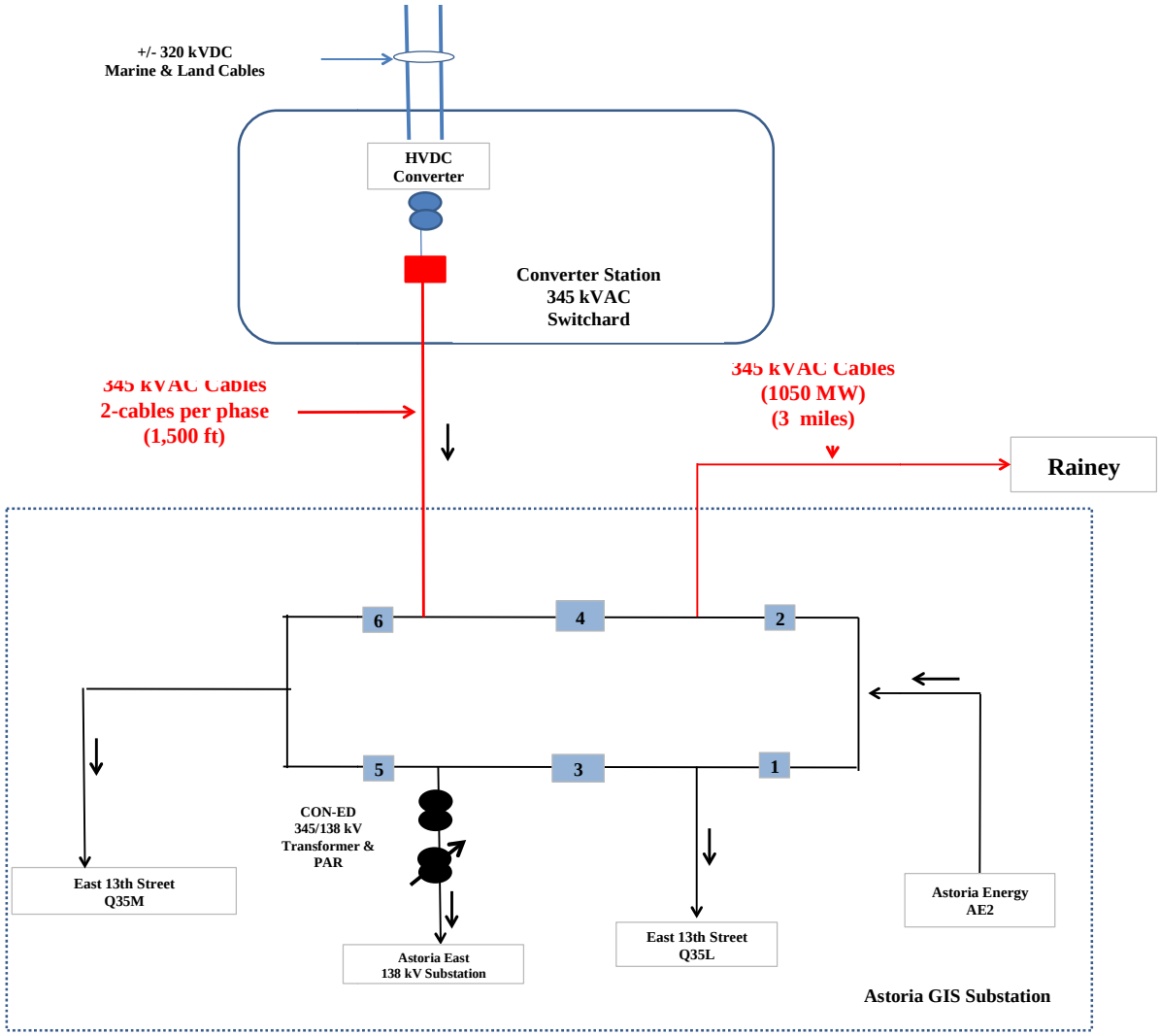


Task Name	Start	Finish
Project Development	Tue 4/17/12	Sat 2/1/14
Commercialization	Wed 8/1/12	Wed 7/31/13
Engineering, Procurement & Construction	Tue 5/1/12	Fri 2/15/13
Project Finance	Mon 10/1/12	Fri 2/15/13
Regulatory	Fri 2/24/12	Fri 11/16/12
NYS-Article VII and Water Quality Certificate	Fri 2/17/12	Mon 10/15/12
Department of Energy - Presidential Permit and Army Corps - 404 / 10	Fri 2/17/12	Tue 4/30/13
Estimated NYISO Class Year Study	Thu 3/1/12	Fri 6/28/13
Astoria Site / Interconnection	Mon 4/16/12	Tue 7/31/12
Project Construction Schedule	Mon 2/3/14	Fri 12/15/17
HVDC SUBMARINE Cable Systems	Mon 2/3/14	Tue 10/31/17
HVDC LAND Cable Systems	Mon 2/3/14	Mon 5/15/17
Final HVDC Cables Testing & Commissionin	Wed 11/1/17	Fri 12/1/17
HVDC Converter Stations	Mon 2/3/14	Mon 12/7/15
Manufacture & Shipping	Mon 2/3/14	Tue 12/1/15
Converter Station Testing & Commissioning	Mon 1/18/16	Fri 5/6/16
Integrated System Testing & Commissionin	Mon 9/25/17	Fri 12/15/17
Commercial Operations Date	Fri 12/15/17	Fri 12/15/17

Transmission Developers Inc.

APPENDIX D

INTERCONNECTION DIAGRAM



Hydro-Québec
Response to
The New York Energy Highway
Request for Information
May 30, 2012

Respondent Information

Respondent's Name: Hydro-Québec Production
75 Rene Levesque Blvd, 18th Floor
Montreal, Québec H2Z 1A4

Primary Contact: Stephen Molodetz
Vice President – Business Development
H. Q. Energy Services Inc. ("HQUS")
A wholly owned subsidiary of Hydro-Québec
225 Asylum Street, 27th Floor
Hartford, CT 06103
(860) 241-4021
Molodetz.Stephen@Hydro.Qc.Ca

Respondent Background

For over 50 years Hydro-Québec, a Crown corporation wholly owned by the province of Québec, has been successfully developing and operating Québec's vast hydropower resources. Hydro-Québec generates, transmits and distributes electricity and is made up of four divisions: Hydro-Québec Production, its power generation division; Hydro-Québec TransÉnergie, its transmission division; Hydro-Québec Distribution; and, Hydro-Québec Equipment and Services, its construction division. At the end of 2011, the company operated a fleet of nearly 37,000 Megawatts ("MW") of installed capacity with hydropower accounting for 98% of its output. Since 2005, approximately 2,500 MW of new hydropower capacity has been commissioned. An additional 1,550 MW is currently under construction, and will be put in service progressively starting in 2015[1].

In developing these resources, Hydro-Québec applies the principles of sustainable development from the planning phase all the way through to construction and operation. Hydro-Québec does not undertake a project unless it is profitable under market conditions, environmentally acceptable and favorably received by local communities. As a result, Hydro-Québec is able to provide a renewable, low-carbon, reliable and affordable supply of electricity for both its domestic and export markets.

As Canada's environmental regulations are among the most stringent in the world, all of Hydro-Québec's hydropower projects undergo rigorous and extensive environmental and ecological impact assessment[2]. For example, the environmental impact assessment for the Romaine hydropower project evaluated all the potential environmental and social effects of the project. Based on the results, mitigation and compensation measures have been designed to reduce the environmental impacts and enable land users to continue their traditional activities. The extent of the studies, mitigation measures and environmental monitoring is estimated at nearly $320 million for this project alone.

[1] This represents new capacity from the Romaine project.
[2] http://www.hydroforthefuture.com/approche/6/the-hydropower-development-process

In addition to our environmental stewardship, Hydro-Québec works in close concert with all of the host communities for its projects, Aboriginal and non-Aboriginal. Québec recognizes 11 Aboriginal nations in 55 communities throughout the province and endeavors to develop mutually beneficial partnerships with all of these communities. Host communities are consulted at the very start of a project, and when possible, participate in all phases of a project – from conducting environmental impact studies, through construction, to the on-going environmental monitoring that follows every project. Since 1975, Hydro-Québec has signed more than 30 agreements with Aboriginal communities to promote their long-term development well after its hydropower projects are completed. Furthermore, every effort is undertaken to ensure that the host communities benefit from the economic spin-offs of a project, usually through comprehensive agreements in the case of Aboriginal communities.

H. Q. Energy Services Inc. ("HQUS") is the U.S. energy marketing and business development subsidiary of Hydro-Québec and has been an active participant in the New York electricity market since the inception of the New York Independent System Operator ("NYISO") in 1999. Prior to establishing HQUS, Hydro-Québec and its predecessor companies sold power to New York State for decades following the construction of the Cedars-Dennison intertie in the late 1910s, and more recently following the construction of the Chateauguay-Massena intertie in the early 1980's. Since this time, Hydro-Québec has provided New York with large quantities of energy and displaced a considerable quantity of greenhouse gas ("GHG") emissions[3]. Today, Hydro-Québec is committed to annually providing 900 MW of capacity into New York State through 2030.

Submission Description

Hydro-Québec is pleased to make this submittal to the Request for Information for the New York Energy Highway Initiative. This submission is comprised of two distinct projects that offer the potential for significant improvements to the reliability, efficiency and environmental performance of the New York State power system.

Project 1 consists of Hydro-Québec's participation in the proposed new Champlain Hudson Power Express ("CHPE") HVDC transmission line[4], combined with a renewable, low-carbon supply of electricity into the downstate area.

Project 2 outlines Hydro-Québec's commitment to work closely with the state to evaluate opportunities that enable increased power flows from Québec into and throughout the State of New York.

[3] Hydro-Québec estimates that in 2011 alone, up to 12 million tonnes of CO2 emissions were avoided as a result of the export of energy from the Hydro-Québec system into neighboring systems.

[4] Project 1 should be considered in combination with the submission from TDI-USA Holdings, which is developing the transmission infrastructure for the US portion of the CHPE project.

Hydro-Québec requests that the two projects be evaluated individually since they are not mutually exclusive and could therefore both be pursued, although they would likely advance and be implemented on significantly different time horizons.

Project 1: Hydro-Québec participation in the Champlain Hudson Power Express

Project Description

The CHPE is a 1,000 MW high-voltage merchant transmission line being proposed to interconnect the province of Québec with the State of New York in the New York City area. The CHPE project would provide a wide range of benefits to the state because it consists of both an HVDC transmission line, and a renewable, low-carbon supply of electricity. Hydro-Québec proposes to become the "anchor tenant" for the project by committing to up to a 40-year purchase of 75% of the transmission rights, effectively paying for the construction of the line[5].

Project Justification

The CHPE project would simultaneously address several of the primary objectives of the New York Energy Highway Initiative including to promote long-term power system reliability, environmental sustainability, power supply diversity in the downstate area and ratepayer value in the operation of the grid. Additional information about how the project meets each of the objectives contained in the Request for Information is provided below.

1. **Reduce constraints on the flow of electricity to, and within, the downstate area; and expand the diversity of power generation sources supplying downstate.**

   CHPE would provide the State of New York with access to another fuel and delivery source for electricity. In particular its potential to deliver significant quantities of hydropower and alter the resource mix in the downstate area is unique for a single project. Today the downstate area relies primarily on natural gas generation, with a limited ability to switch to oil under certain conditions. The recent New York State Transmission Assessment and Reliability Study ("STARS") report indicates the expectation that the downstate area will continue to rely heavily on natural gas for power generation through 2030. In addition, the City of New York is promoting the replacement of its inefficient oil generators. Inevitably, the addition of new gas capacity to meet growing demand, or replace retiring capacity, will advance the need for additional investment in upgrades to the natural gas transmission system and could create electric system reliability issues during peak periods. The addition of a significant energy and capacity source that is independent from natural gas supply needs and pipeline delivery systems to the area will significantly improve fuel diversity and reliability and mitigate the need for new gas system infrastructure. Additionally, the CHPE

[5] Hydro-Québec will also invest in new transmission necessary in Québec to support the full 1,000 MW capacity of the new interconnection.

provides significant quantities of renewable electricity to the state without exacerbating the constraints that currently exist for the delivery of upstate resources.

2. Assure the long-term reliability of the electric system is maintained in the face of major system uncertainties.

While capacity levels in New York are reported by the NYISO and others to be adequate today, the state's traditional capacity resources face an uncertain future in the coming years due to the combination of pending federal environmental regulations, market conditions and public concern for continued operation of certain facilities. The CHPE would provide a highly reliable source of capacity to make up for a loss of capacity that could result from these uncertainties. To the extent that capacity losses occur in supply constrained areas, the CHPE would be particularly valuable since the area is limited in its ability to transfer power from other areas of the state, and generally, to develop large infrastructure projects.

Over the long-term, CHPE would provide the New York power system with an additional interconnection to Hydro-Québec's vast resource base of close to 37,000 MW that could be accessed under a variety of system operating conditions. All interties between Québec and New York are fully controllable, either with HVDC technology or with generation radially connected to the New York system. As a result, the Hydro-Québec system operates independent of system operating conditions in New York. In turn, disturbances in either area do not affect one another and system reliability is enhanced in both. For example, Hydro-Québec assisted New York during the 2003 blackout and continues to be available to provide support during abnormal and emergency power system events. CHPE would enhance Hydro-Québec's ability to provide this type of support into the future.

3. Encourage development of utility-scale renewable generation resources throughout the State.

Hydro-Québec's hydropower facilities are extremely valuable as dispatchable sources of energy. In other words, Hydro-Québec's hydropower resources can be ramped up or down to balance the output of intermittent resources such as wind and solar facilities. The CHPE project would support the integration of greater quantities of utility-scale renewable generation in New York because of the dispatchability and size of the resource base in Québec. Hydro-Québec's ability to provide this type of balancing service for intermittent renewable resources would be further enhanced by adding the CHPE project as an additional interconnection point into the New York control area. In addition, the HVDC transmission technology being used to construct CHPE is highly controllable, further enhancing its ability to provide balancing support for intermittent resources. Although it has been employed between Québec and its neighboring markets for decades, HVDC transmission technology has become increasingly

attractive to deregulated energy markets in recent years due to its operating characteristics in comparison with AC transmission. In contrast to AC transmission lines where the power flows freely, an HVDC line's flow is completely controllable allowing the system operator to precisely adjust the flow at the delivery point to the amount needed. An approach that combines utility-scale renewables balanced with Québec hydropower presents a unique opportunity for the state to contribute to its renewable and carbon reduction goals.

4. **Increase efficiency of power generation, particularly in densely populated urban areas.**

   CHPE has the potential to improve the efficiency of existing power generators serving the New York City area indirectly. Because New York relies on competition among suppliers to serve the electric needs of consumers and CHPE would be an additional supplier, existing power generators will be motivated to improve the efficiency and performance of their resources to continue to compete in the market. In fact, it is these market dynamics that have made New York's wholesale electric markets successful and beneficial for consumers by promoting investment in existing and new resources.

5. **Create jobs and opportunities for New Yorkers.**

   Large incremental supplies of competitively priced energy and capacity will result in significant downward pressure on wholesale market prices in congested areas, enabling access to reliable and affordable energy; a critical driver for economic development. While the construction and operation of the CHPE project will create direct jobs and opportunities for New Yorkers, equally important are the indirect jobs that will be created through the access to competitively priced, renewable and low-carbon energy that the project will bring to New York State and the downstate region.

6. **Contribute to an environmentally sustainable future for New York State.**

   CHPE would have the capability to deliver up to 1,000 MW of additional renewable, low-carbon power into New York. Using a life-cycle analysis approach, Québec hydropower emissions are similar to those from wind power, a quarter of those from photovoltaic solar facilities, and 40 times less than those from a natural gas plant. Therefore, when coupled with supply from Hydro-Québec, CHPE would assist the state in making significant progress towards reducing carbon emissions as well as reduce other effluents such as SO2, NOx, heavy metals, and particulate matter. This will be particularly beneficial for air quality in New York City during peak summer and winter periods when the existence of the project could displace the use of higher-emitting resources on the power system. Additionally, as state and federal energy policies evolve and policymakers and stakeholders consider broader approaches to the use of

renewable technologies, CHPE would assist New York in meeting, and potentially increasing, its commitments to renewable energy supplies.

7. Apply advanced technologies that benefit system performance and operations.

Please see the submission from TDI-USA Holdings.

8. Maximize New York State electric ratepayer value in the operation of the electric grid.

CHPE would enhance value to New York ratepayers in several ways. First, significant new quantities of competitively priced energy and capacity will be delivered directly to the higher-priced areas of the state. This will lower wholesale prices and save money for New York consumers[6]. Moreover, the project allows wholesale prices to remain low in the upstate region because it will not cause prices throughout the state to converge[7]. In fact, a recent analysis conducted by the staff of the New York Public Service Commission estimates hundreds of millions of dollars in wholesale market savings that will flow to ratepayers[8].

Secondly, the addition of the CHPE line will increase competition in the downstate area by increasing the number of suppliers able to serve New York City electric demand. This is important since the downstate area currently relies on a limited number of suppliers. As a result these suppliers will be motivated to enhance the efficiency and performance of existing facilities that operate in the area. Additionally, competition from a lower-cost, highly available resource such as hydropower will minimize price spikes that add to the cost of electricity.

Finally, the project requires significant transmission infrastructure investment in New York, and to a lesser extent Québec, that would be funded by Hydro-Québec's long-term transmission reservation on the line and therefore would not affect transmission rates in New York. Current investment projections estimate that the U.S. portion of the project will cost approximately $2.2 billion. With this project, New York ratepayers stand to benefit from a significant energy infrastructure addition at no cost.

9. Adhere to market rules and procedures and make recommendations for improvements as appropriate.

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[6] Lower wholesale prices will result in lower retail rates based on the retail ratemaking structure in the state.

[7] Price convergence is common in wholesale markets as a result of transmission investment that increases the deliverability of low priced resources to higher priced areas.

[8] NY PSC comments in support of TDI-USA Holding's CHPE project filed in article VII Case 10-T-0139 on March 16 and March 30, 2012. In the March 16, 2012 filing, page 25: "Staff estimated the long-term production cost savings of the Facility as the cost of the Facility plus the cost of the hydropower (dams), less the cost of the combined cycle plant and the present value of the plant's fuel and other operating and maintenance costs. Over a 35-year period, the savings (net present value) ranged from approximately $1.2 billion to $3.2 billion in 2015".

Hydro-Québec has a long history of involvement in New York's wholesale electricity markets as a committed participant in the stakeholder process for market design and long-term power system planning. In this regard, Hydro-Québec experts actively engage in the various process steps with the staff of the NYISO, representatives of the various state agencies and stakeholders to appropriately design transmission facilities as well as market rules and transact in the market for the delivery of energy and capacity. Hydro-Québec suggests that clarity of the capacity market mitigation rules for merchant entry in the New York City area is very important for projects such as CHPE to be successful and to maximize the value of the facility for New York. This includes how the state may value the entry of supply that will contribute to New York State's public policy objectives.

Financial

Prospects for an Energy Partnership

CHPE will assist New York in resolving traditional power system challenges such as maintaining reliability, security and adequacy, as well as address many of the newer challenges in the marketplace such as the need to increase the use of renewable power sources, lower carbon emissions and ensure appropriate levels of fuel diversity to achieve balanced market outcomes for New York consumers.

Hydro-Québec expects the CHPE project to be economic despite significant market uncertainties that currently exist. However, Hydro-Québec also recognizes that the characteristics of the energy to be delivered have significant value for New York and are likely to have increasing value into the future.

Hydro-Québec proposes to work creatively with New York State to explore options for ensuring that as the value of the energy becomes increasingly important to New York in meeting its evolving policy goals for clean, affordable and renewable energy that there will be opportunities to consider how the various energy benefits enabled by CHPE may be utilized by the state. In addition, to the extent that the state desires to take a continued leadership role in the development of renewables and reduction of carbon emissions, CHPE offers such an opportunity. In this regard, Hydro-Québec proposes that the state of New York consider a stakeholder process that would consider innovative ways in which policy and regulation might prioritize and promote incremental hydropower deliveries.

General Financial Structure

The CHPE project uses a Federal Energy Regulatory Commission ("FERC") approved[9] merchant transmission funding structure, which allows the developer to subscribe up to 75% of the transmission rights to an anchor tenant, and subscribe the remaining transmission rights through an open season solicitation. Transmission development costs

[9] 132 FERC ¶ 61,006 (2010)

in New York will be funded by Hydro-Québec's long-term transmission reservation on the line and therefore would not affect transmission rates in New York.

Permit/Approval Process

Please see the submission from TDI-USA Holdings.

Other Considerations

CHPE is consistent with Governor Cuomo's vision that New York's power system be comprised of a broad range of projects because it uses technology that can operate efficiently and reliably within an integrated system of diverse supply and demand resources. Commercialization of CHPE is also consistent with the state's goal of maintaining the benefits of wholesale markets that are open to all resources and provide incentives for performance and new investment.

CHPE would provide significant quantities of renewable electricity to New York without exacerbating the constraints that currently exist for the delivery of upstate renewable resources. Similarly, CHPE will add a new source of energy and capacity to the downstate area without adding to the infrastructure needs of the gas transmission system that may increase overtime with continued reliance on natural gas for reliable system operations.

Additional Information

For all additional information related to the development of the CHPE please see the submission from TDI-USA Holdings. For any other information, please contact Hydro-Québec.

Project 2: Increasing Hydro-Québec Power Flows into New York

Project Description

In addition to Hydro-Québec's proposed participation as the anchor tenant for the CHPE project, Hydro-Québec proposes to work in conjunction with the New York State transmission owners to optimize and expand the existing upstate New York – Québec transmission interconnections and relieve key New York congestion points.

In addition to transmission upgrades in Québec, substantially increasing power flows from Hydro-Québec would likely also require transmission upgrades in New York to remove existing deliverability constraints. Increasing the transfer capability over existing interfaces would increase deliverability of upstate generation into downstate areas, including new in-state renewable generation. As identified in the STARS report, the benefits from this type of new transmission investment can be maximized with increased imports from Hydro-Québec[10].

[10] http://www.nyiso.com/public/webdocs/services/planning/stars/Phase_2_Final_Report_4_30_2012.pdf

Hydro-Québec proposes a coordinated transmission development approach to increase transfer capability between Québec and New York, while resolving internal constraints within the New York control area. We envision Project 2 encompassing a joint study to first identify the most economic and beneficial upgrades, changes to operating practices, etc; followed by a joint development agreement to ensure optimal coordination and implementation of the resulting recommendations.

As with Hydro-Québec's participation in the CHPE project (Project 1), this project would increase New York State's interconnection capability with the Québec control area and Hydro-Québec's vast portfolio of hydro resources, providing the state with increased access to competitively priced, renewable and low-carbon energy.

Project Justification

1. **Reduce constraints on the flow of electricity to, and within, the downstate area; and expand the diversity of power generation sources supplying downstate.**

   A coordinated initiative to increase imports to New York and relieve constraints within the New York system would directly address both congestion and fuel diversity concerns in the downstate area. Enabling power flows across the New York grid will allow diverse resources such as in-state wind and hydro to access natural gas reliant regions in constrained areas, increasing reliability and reducing wholesale energy costs throughout New York.

2. **Assure the long-term reliability of the electric system is maintained in the face of major system uncertainties.**

   Accessing incremental energy and capacity sources is critical in assuring the future reliability and efficiency of the grid. In addition, reducing constraints throughout the system will increase reliability by enabling power to flow freely and efficiently from generators to consumers. Constrained interfaces impede these flows, requiring the dispatch of less economic resources in order to maintain reliability requirements. Power supplies from Hydro-Québec can be available very quickly in the event of an emergency or contingency that may occur, helping further bolster reliability on the New York energy system. All interties between Québec and New York are fully controllable, either with HVDC technology or with generation radially connected to the New York system. As a result, the Hydro-Québec system operates independent of system operating conditions in New York. In turn, disturbances in either area do not affect one another and system reliability is enhanced in both. For example, Hydro-Québec assisted New York during the 2003 blackout and continues to be available to provide support during abnormal and emergency power system events. An increased ability to flow energy into New York would enhance Hydro-Québec's ability to provide this type of support into the future.

3. **Encourage development of utility-scale renewable generation resources throughout the State.**

   Hydro-Québec's hydropower facilities are extremely valuable as dispatchable sources of energy. Therefore, Hydro-Québec's hydropower resources can be ramped up or down to balance the output of intermittent resources such as wind and solar facilities. Increased power flows from Hydro-Québec would support the integration of greater quantities of utility-scale renewable generation in New York because of the dispatchability and size of the resource base in Québec. An approach that combines utility-scale renewables balanced with Québec hydropower presents a unique opportunity for the state to contribute to its renewable and carbon reduction goals.

   In addition, optimizing the transmission system and eliminating bottlenecks will enable in-state utility-scale renewable generation projects in remote and oversupplied areas to access higher-priced load centers, which will both aid in the continued development of these projects, as well as increase reliability and lower costs and price volatility.

4. **Increase efficiency of power generation, particularly in densely populated urban areas.**

   Reducing bottlenecks within the state will eliminate the need to dispatch less economic resources in order to meet reliability standards in constrained areas. This will result in a more efficient and economic energy grid, allowing companies to make more informed and predictable investment decisions, allowing newer and more efficient generation and generation technologies to be integrated into the grid.

5. **Create jobs and opportunities for New Yorkers.**

   Large incremental supplies of competitively priced energy and capacity will result in significant downward pressure on wholesale market prices in congested areas, enabling access to predictable and affordable energy; a critical driver for economic development. Equally important are the indirect jobs that will be created through the increased access to competitively priced renewable, low-carbon energy that is made available to New York State.

6. **Contribute to an environmentally sustainable future for New York State.**

   Increased import/export capacity with Québec will allow incremental renewable, low-carbon power to flow into New York, which can be dispatched to aid in the integration of new intermittent renewable resources.

   Using a life-cycle analysis approach, Québec hydropower emissions are similar to those from wind power, a quarter of those from photovoltaic solar facilities, and

40 times less than those from a natural gas plant. Therefore, increased deliveries would assist the state in making significant progress towards reducing carbon emissions as well as other effluents such as SO2, NOx, heavy metals, and particulate matter

7. Apply advanced technologies that benefit system performance and operations.

If identified as a preferred opportunity, new transmission development will utilize the most up to date technology, which will increase efficiency and assure compatibility with the latest innovations in generation, transmission and smart grid technologies.

8. Maximize New York State electric ratepayer value in the operation of the electric grid.

Optimizing the power flow capability between Québec and New York will ensure the most effective and efficient use of the energy system, resulting in increased reliability and predictable and competitive wholesale energy costs for New York ratepayers. As recognized in the STARS report, increasing energy flows from Québec would increase the economic benefits of upgrades developed within New York.

9. Adhere to market rules and procedures and make recommendations for improvements as appropriate.

As outlined in the recent STARS[11] report, due to current NYISO operating practices regarding the treatment of a single external source, the import limit from Hydro-Québec's Chateauguay station into New York is nearly 1,000 MW below the facility's approved limit. A review of the relevant NYISO operating practices could lead to low-cost economic solutions for increasing power flows from Hydro-Québec.

Financial

Prospects for an Energy Partnership

Hydro-Québec proposes an iterative partnership with New York and applicable transmission owners, and in conjunction with NYISO's long-term planning process, to assess the various operating practices and transmission infrastructure options that would enhance deliverability into and throughout the state. This would include

[11] The export limit from Hydro-Québec's Chateauguay station to New York is approved at 2,370 MW with all equipment in service, which includes four 765/120 kV transformers. The New York Control Area ("NYCA") import limit from the Québec Chateauguay-Massena single 765 kV interconnection is, however, limited to 1,380 MW per current NYISO operating criteria, which prevents a single external NYCA source from exceeding the largest internal contingency, in this case Nine Mile Point Station #2 at a projected capacity of 1,380 MW. If there is a desire, from a public policy perspective, to increase the import capability of hydro generation from Québec, additional analysis would be needed to determine how to best address the loss of single source contingency.

collaboration on the scope, design and assumptions for the necessary studies as well as transmission funding mechanisms and agreements for treatment of new capacity.

In order to facilitate increased power flow capabilities between New York and Québec, partnership opportunities would need to be evaluated to ensure equitable long-term value for both Hydro-Québec and New York. One way to achieve this is to build on the current partnership with the State of New York, which commits long-term capacity sales from Hydro-Québec into the state. However, Hydro-Québec is open to all ideas and concepts.

General Financial Structure

Hydro-Québec is open to traditional and innovative funding structures, including structures in which the cost of the initial study is shared equally between Hydro-Québec and the New York transmission owners. Actual upgrade costs could be borne by Hydro-Québec for the upgrades needed in Québec and the appropriate transmission owners for the upgrades required in New York.

Permit/Approval Process

N/A at this time

Other Considerations

N/A at this time

Additional Information

Please contact Hydro-Québec for questions regarding additional information.