DOE/EIS-0447

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Champlain Hudson Power Express Transmission Line Project Environmental Impact Statement

Volume II: Appendices

U.S. Department of Energy
Office of Electricity Delivery and Energy Reliability
Washington, DC

September 2013

DRAFT

CHAMPLAIN HUDSON POWER EXPRESS TRANSMISSION LINE PROJECT ENVIRONMENTAL IMPACT STATEMENT

Volume II: Appendices

U.S. DEPARTMENT OF ENERGY
OFFICE OF ELECTRICITY DELIVERY
AND ENERGY RELIABILITY

COOPERATING AGENCIES

U.S. ENVIRONMENTAL PROTECTION AGENCY
U.S. ARMY CORPS OF ENGINEERS
U.S. FISH AND WILDLIFE SERVICE
U.S. COAST GUARD
NEW YORK STATE DEPARTMENT OF PUBLIC SERVICE
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SEPTEMBER 2013

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CHAMPLAIN HUDSON POWER EXPRESS TRANSMISSION LINE PROJECT ENVIRONMENTAL IMPACT STATEMENT

VOLUME II: APPENDICES

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APPENDIX A

Proposed CHPE Project Transmission System Detailed Map Atlas

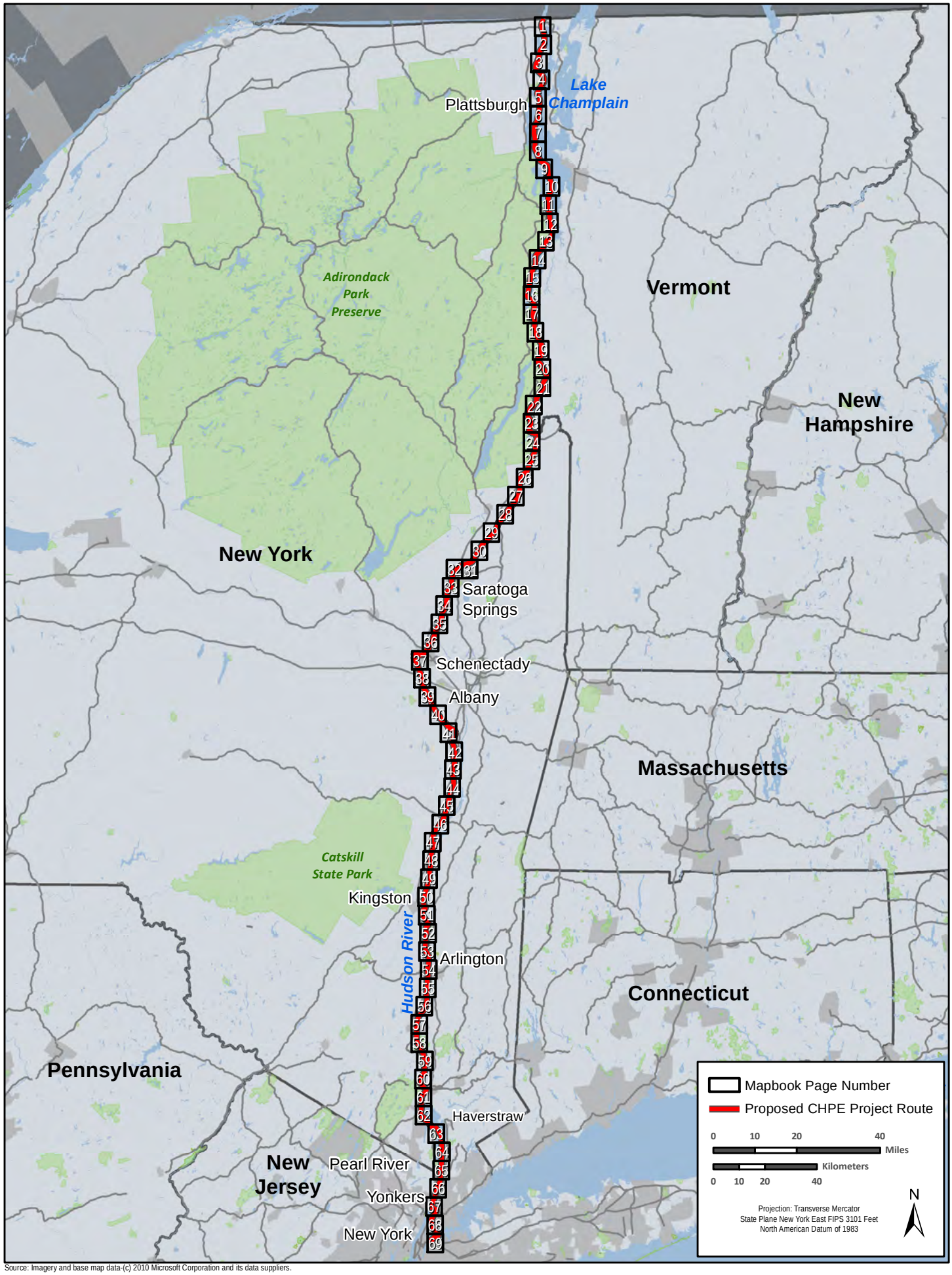
Appendix A
Proposed CHPE Project Transmission System Detailed Map Atlas

This appendix provides detailed maps of the entire proposed Champlain Hudson Power Express (CHPE) Project route. The sources of the base maps used for the figures are U.S. Geological Survey (USGS) 1:24,000-scale topographic quadrangle maps. **Table A-1** lists each of the maps presented in the appendix. The maps are presented in an order that geographically is from north to south.

Table A-1. Map Guide

Map Number	Mileposts	Segment	Key Geographic Feature
1	0–4	Lake Champlain	Rouses Point, NY
2	5–9	Lake Champlain	Point au Fer
3	9–13	Lake Champlain	Trembleau Point
4	14–18	Lake Champlain	Beekmantown, NY
5	19–23	Lake Champlain	Cumberland, NY
6	23–27	Lake Champlain	Sawyer Island
7	28–31	Lake Champlain	Providence Island
8	32–36	Lake Champlain	Port Kent, NY
9	37–41	Lake Champlain	Schuyler Island
10	42–46	Lake Champlain	Four Brothers Islands
11	46–50	Lake Champlain	Jones Point
12	51–55	Lake Champlain	Essex, NY
13	55–60	Lake Champlain	Split Rock Mountain
14	61–65	Lake Champlain	North West Bay
15	66–70	Lake Champlain	Beaver Brook
16	70–75	Lake Champlain	Crown Point State Park
17	75–79	Lake Champlain	Indian Ridge
18	80–84	Lake Champlain	Spar Mill Bay
19	85–89	Lake Champlain	Fort Ticonderoga, NY
20	90–94	Lake Champlain	Huckleberry Mountain
21	95–99	Lake Champlain	Mill Bay
22	100–105	Lake Champlain, Overland	Dresden, NY
23	105–110	Overland	Pine Lake Brook
24	110–115	Overland	Whitehall, NY
25	116–120	Overland	Great Meadows State Prison
26	120–125	Overland	Fort Ann, NY
27	126–130	Overland	Kingsbury, NY
28	131–135	Overland	Hudson Falls NY
29	136–141	Overland	Moreau, NY
30	142–146	Overland	Ballard Corners, NY

Map Number	Mileposts	Segment	Key Geographic Feature
31	147–149	Overland	Wilton, NY
32	150–153	Overland	Saratoga Springs, NY
33	154–158	Overland	Saratoga Spa State Park
34	159–163	Overland	Ballston Spa, NY
35	164–168	Overland	Burnt Hills, NY
36	168–173	Overland	Mohawk River
37	174–180	Overland	Rotterdam, NY
38	181–185	Overland	Watervliet Reservoir
39	186–190	Overland	Voorheesville, NY
40	191–195	Overland	Unionville, NY
41	196–201	Overland	South Bethlehem, NY
42	202–206	Overland	Ravena, NY
43	207–210	Overland	New Baltimore, NY
44	211–215	Overland	Coxsackie, NY
45	216–219	Overland	Athens, NY
46	220–225	Overland	Catskill, NY
47	225–230	Overland, Hudson River	Germantown, NY
48	231–235	Hudson River	Saugerties, NY
49	235–239	Hudson River	Tivoli Bay State Unique Area
50	240–244	Hudson River	Ulster, NY
51	245–249	Hudson River	Port Ewen, NY
52	249–253	Hudson River	Norrie State Park
53	254–258	Hudson River	Hyde Park, NY
54	258–262	Hudson River	Poughkeepsie, NY
55	263–267	Hudson River	Poughkeepsie, NY
56	267–271	Hudson River	Newburgh, NY
57	272–276	Hudson River	Beacon, NY
58	277–281	Hudson River	Cornwall, NY
59	282–286	Hudson River	West Point, NY
60	287–291	Hudson River	Highlands, NY
61	292–296	Hudson River	Stony Point, NY
62	297–301	Hudson River	Haverstraw, NY
63	302–307	Hudson River	Rockland Lake State Park
64	308–311	Hudson River	Tarrytown, NY
65	312–316	Hudson River	Greenburgh, NY
66	317–321	Hudson River	Yonkers, NY
67	321–326	Hudson River, New York City Metropolitan Area	Spuyten Duyvil, NY
68	327–332	New York City Metropolitan Area	Bronx, NY
69	333–336	New York City Metropolitan Area	Queens, NY



Source: Imagery and base map data-(c) 2010 Microsoft Corporation and its data suppliers.

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0 0.25 0.5 1 Kilometers

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Projection: Transverse Mercator
State Plane New York East FIPS 3101 Feet
North American Datum of 1983

- Proposed CHPE Project Route Mileposts
- Proposed CHPE Project Route
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- Pipe Bridge Installation
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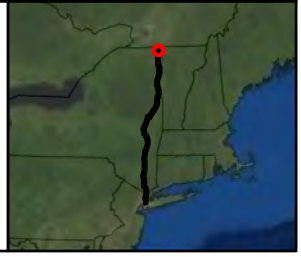

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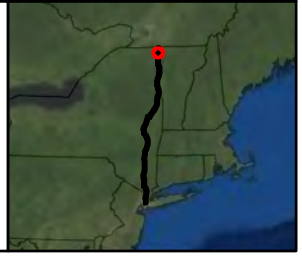

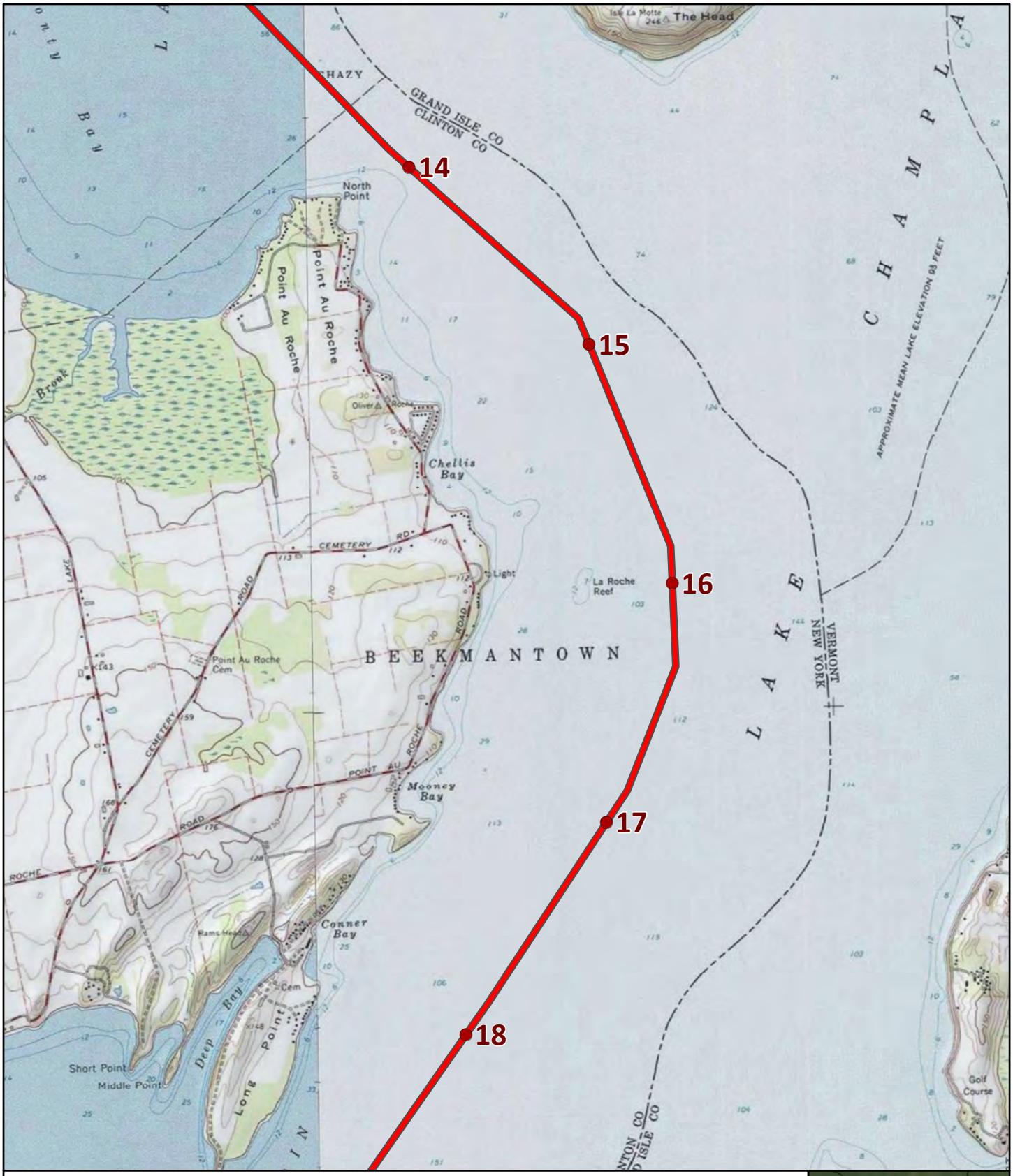

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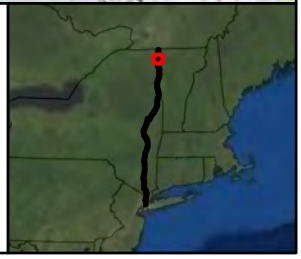

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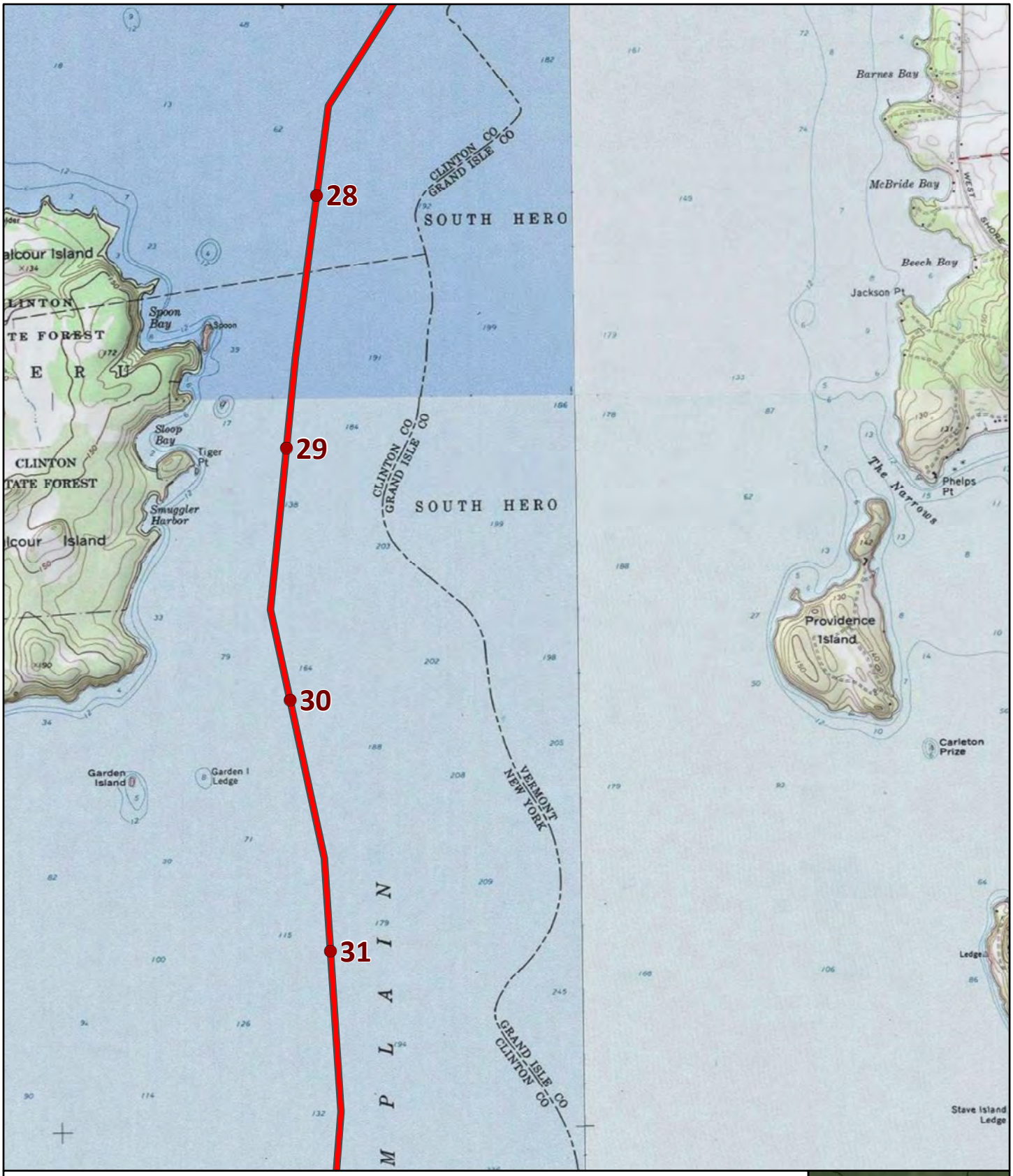

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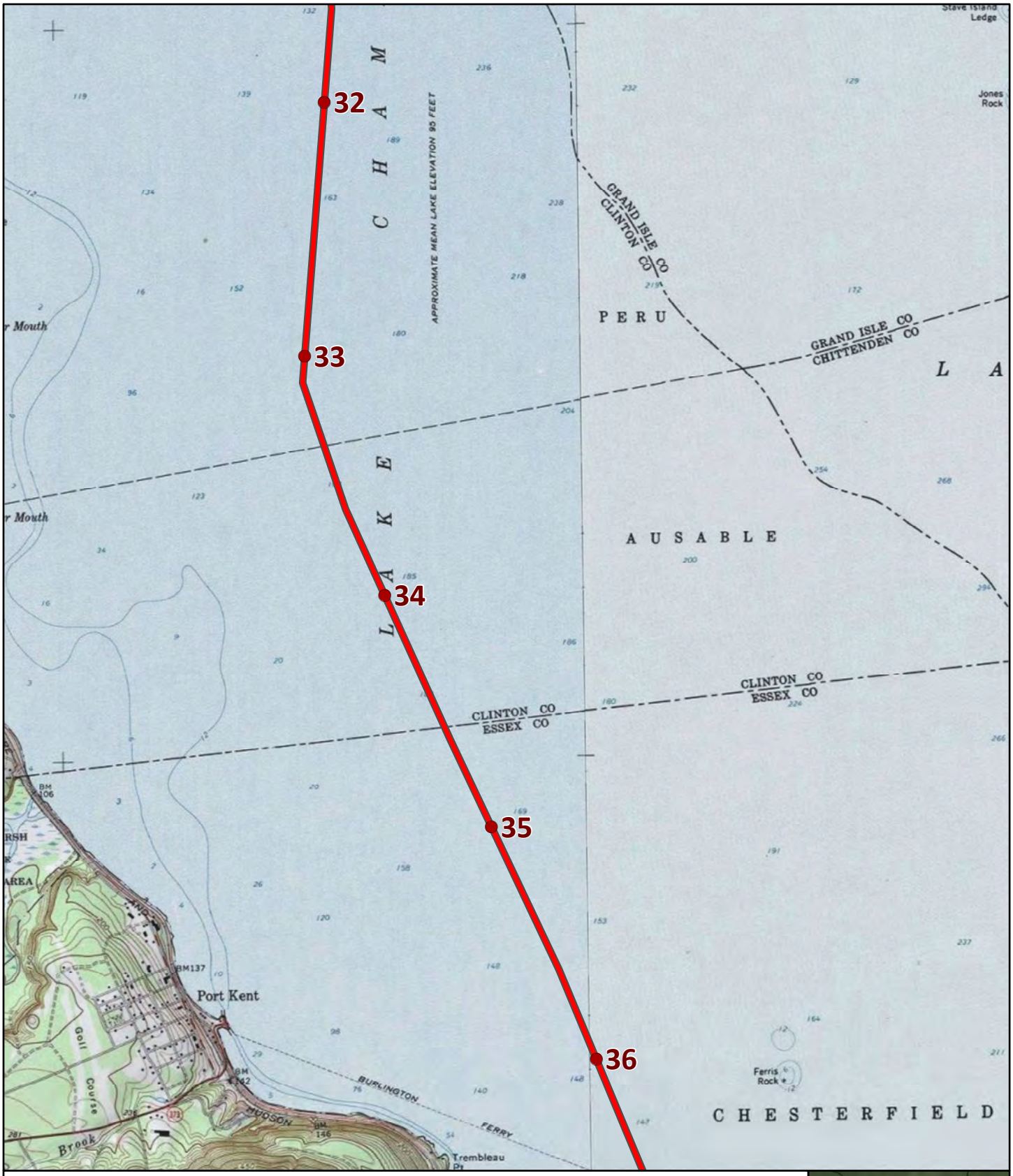

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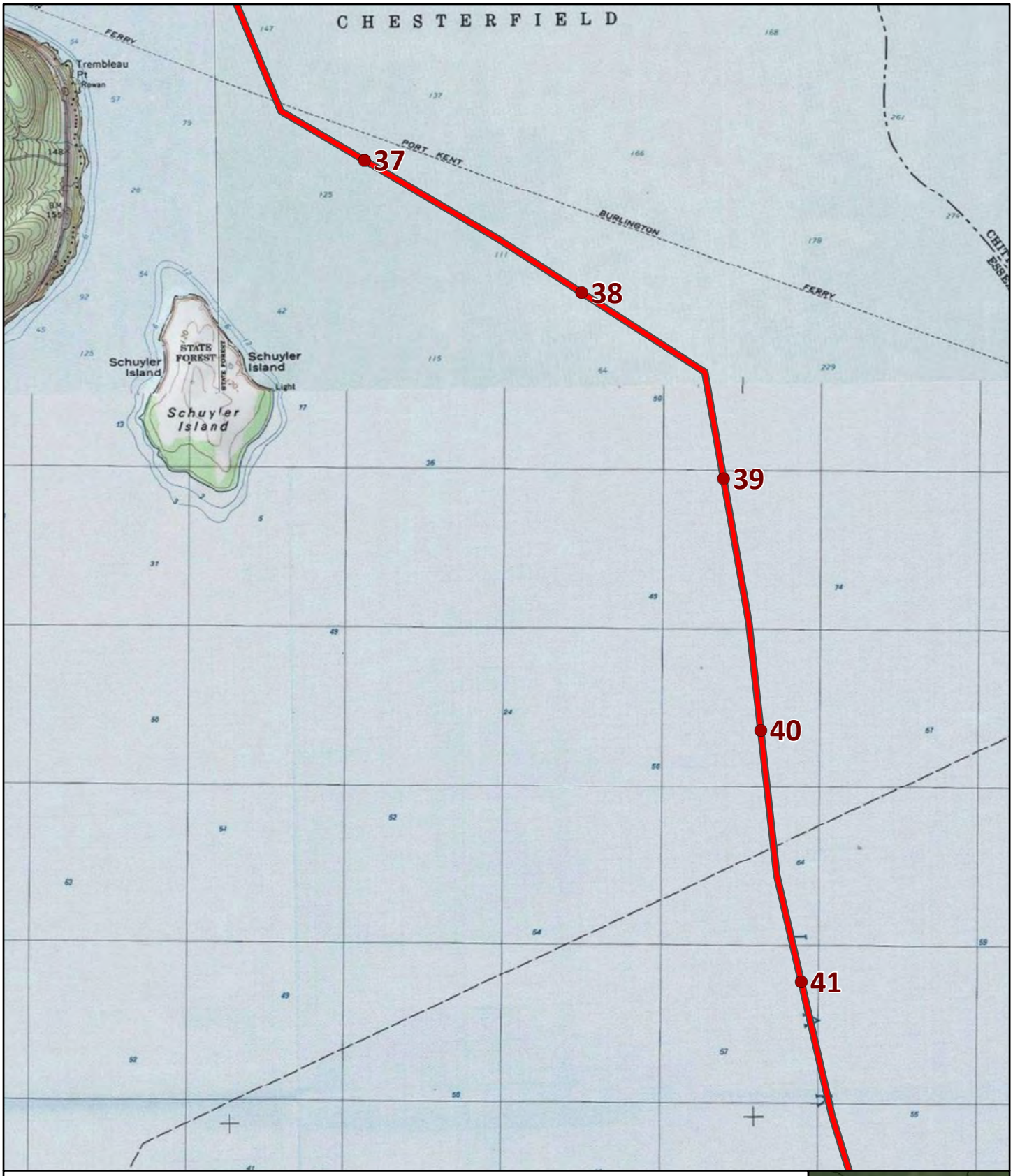

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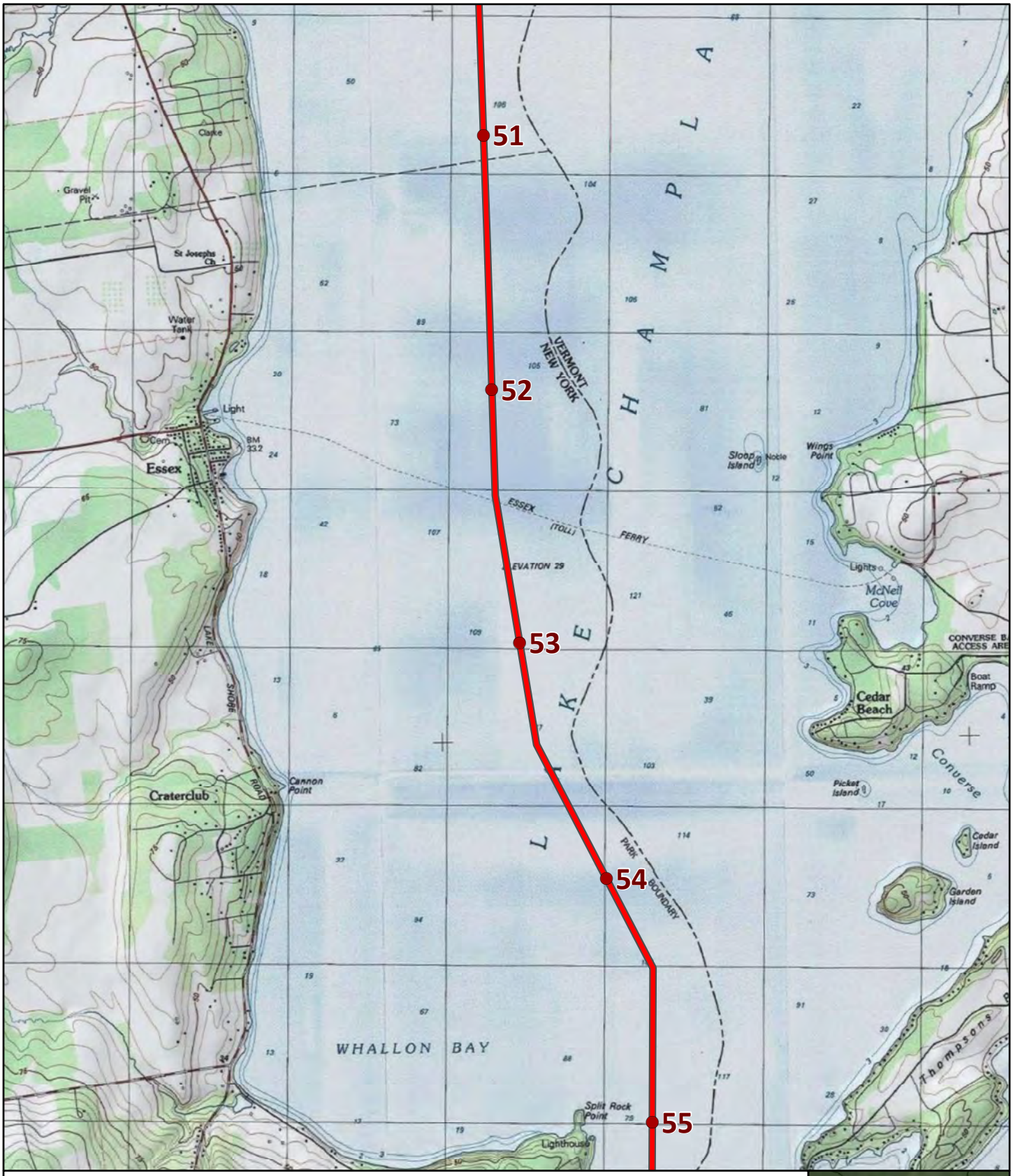

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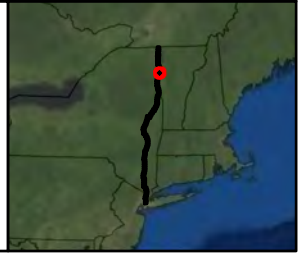

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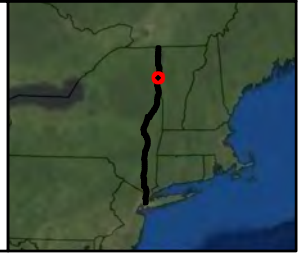

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0 0.25 0.5 1 Miles

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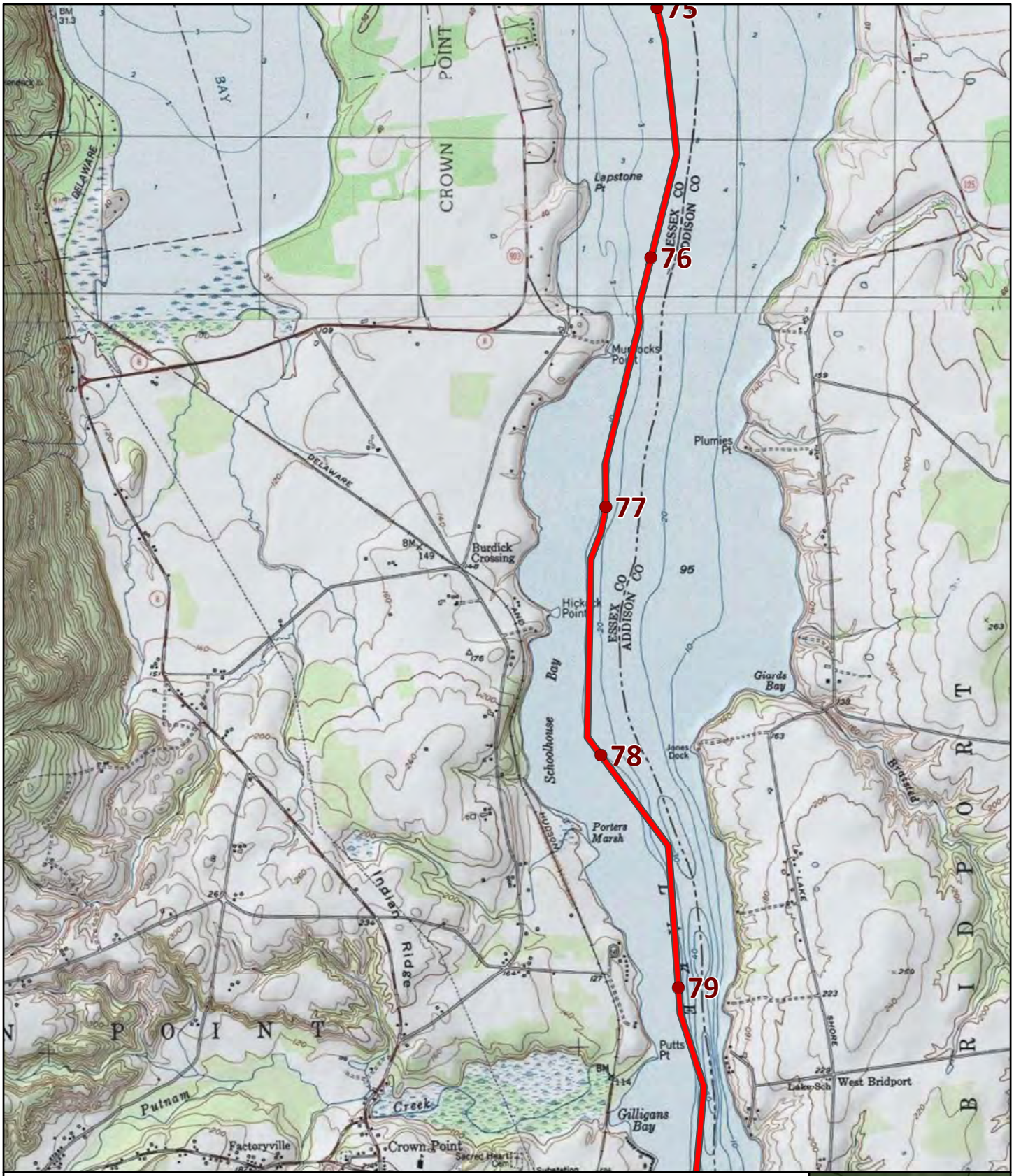
Source: Imagery -(c) 2010 Microsoft Corporation and its data suppliers.



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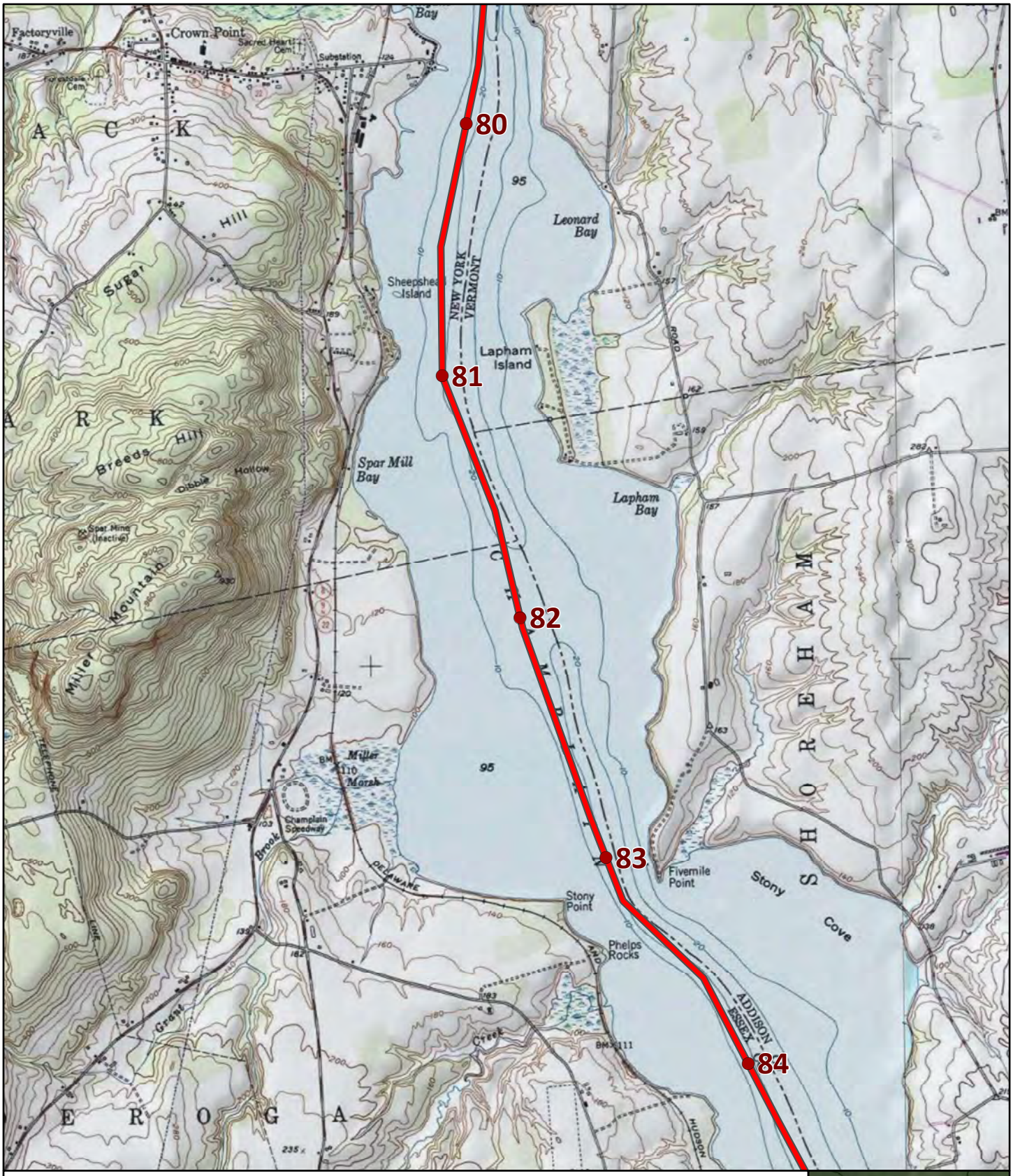

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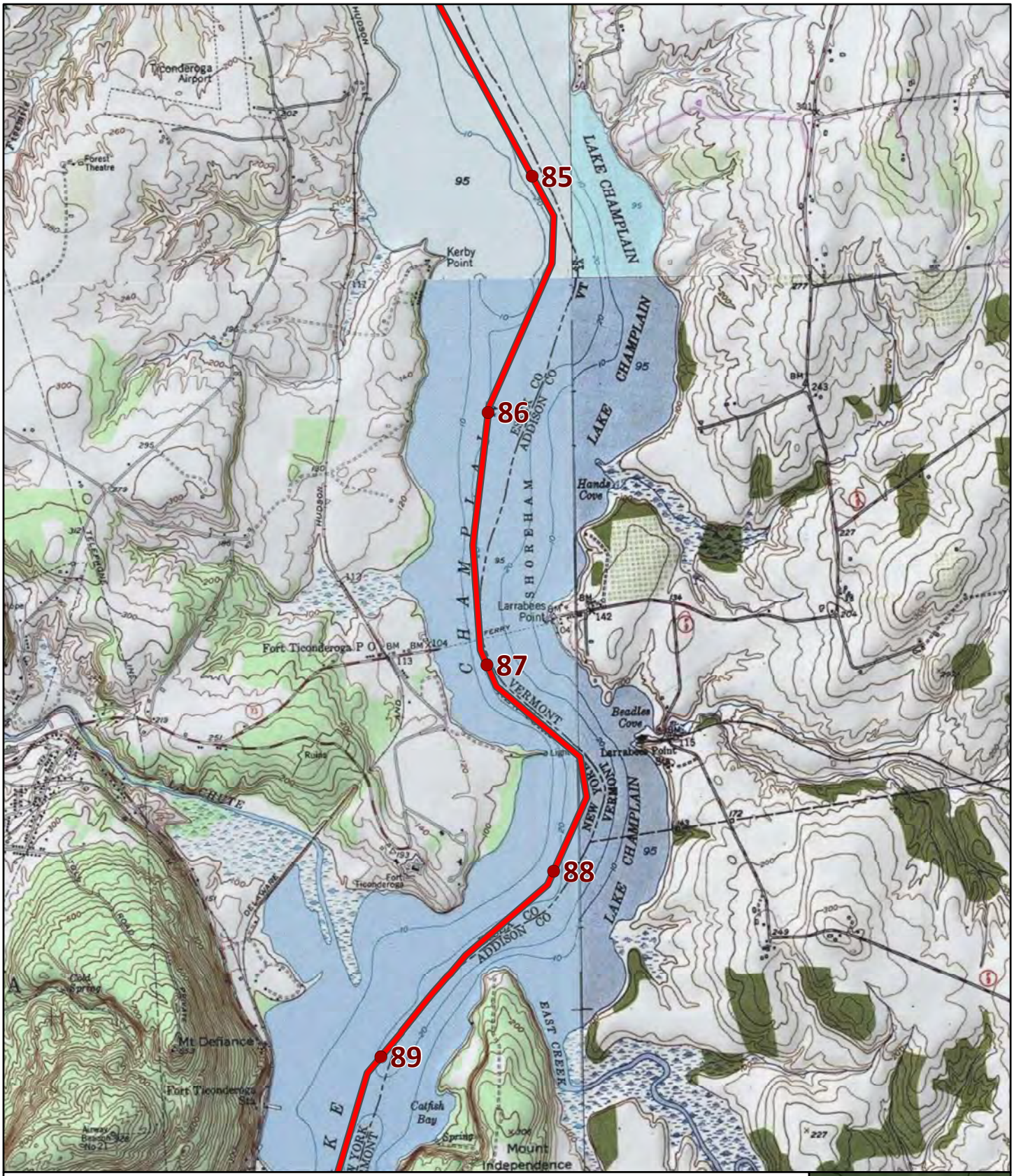

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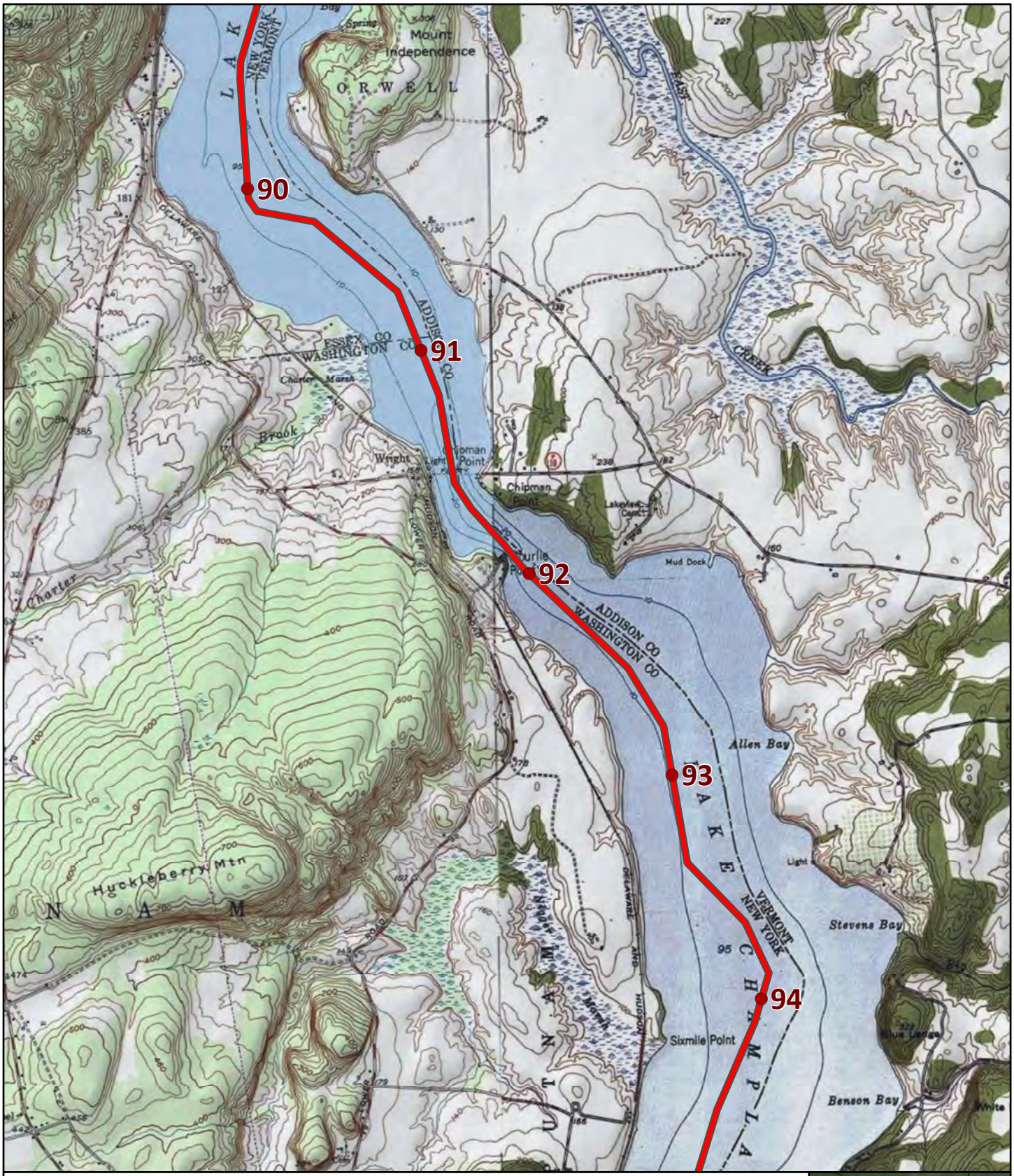

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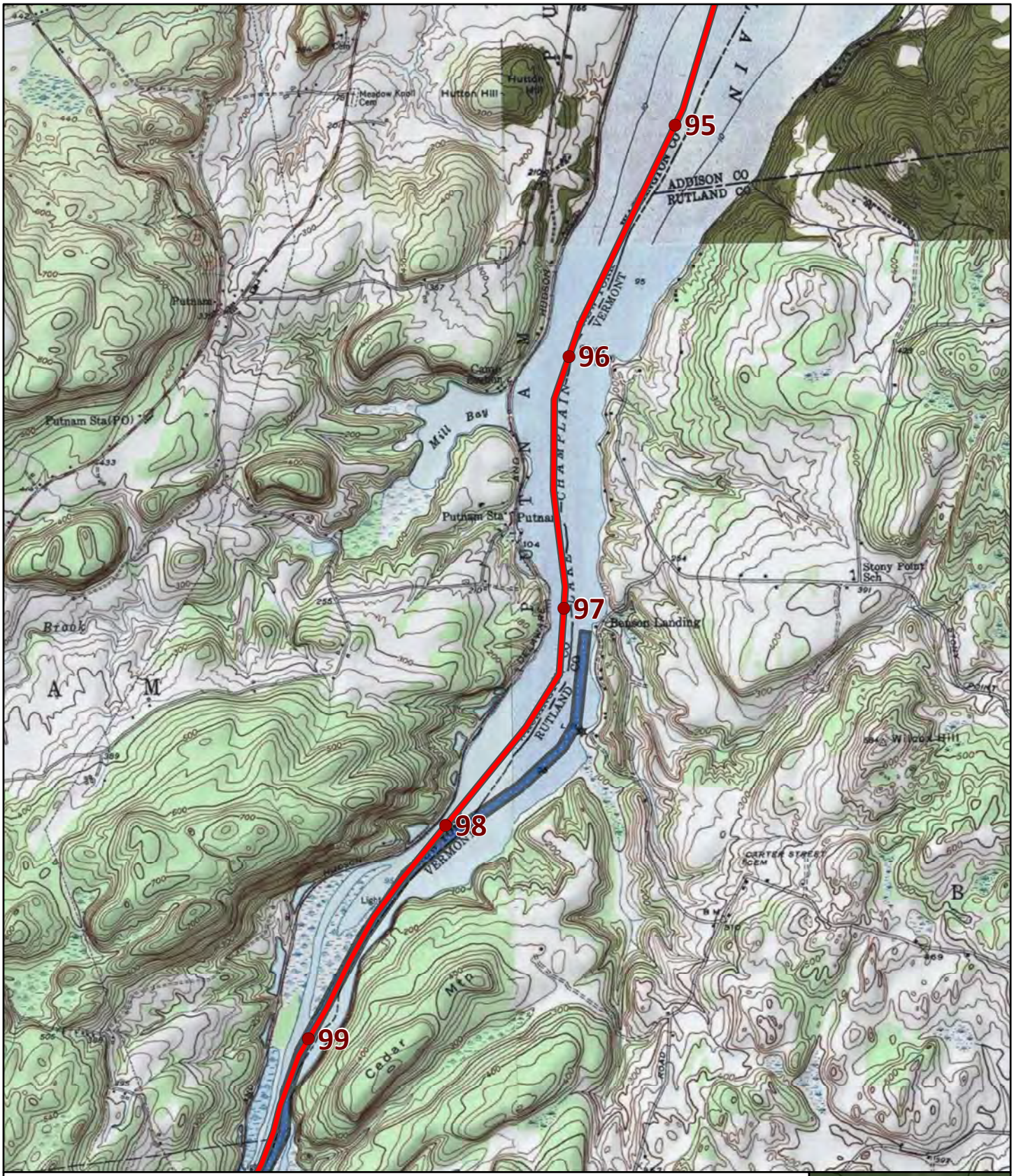

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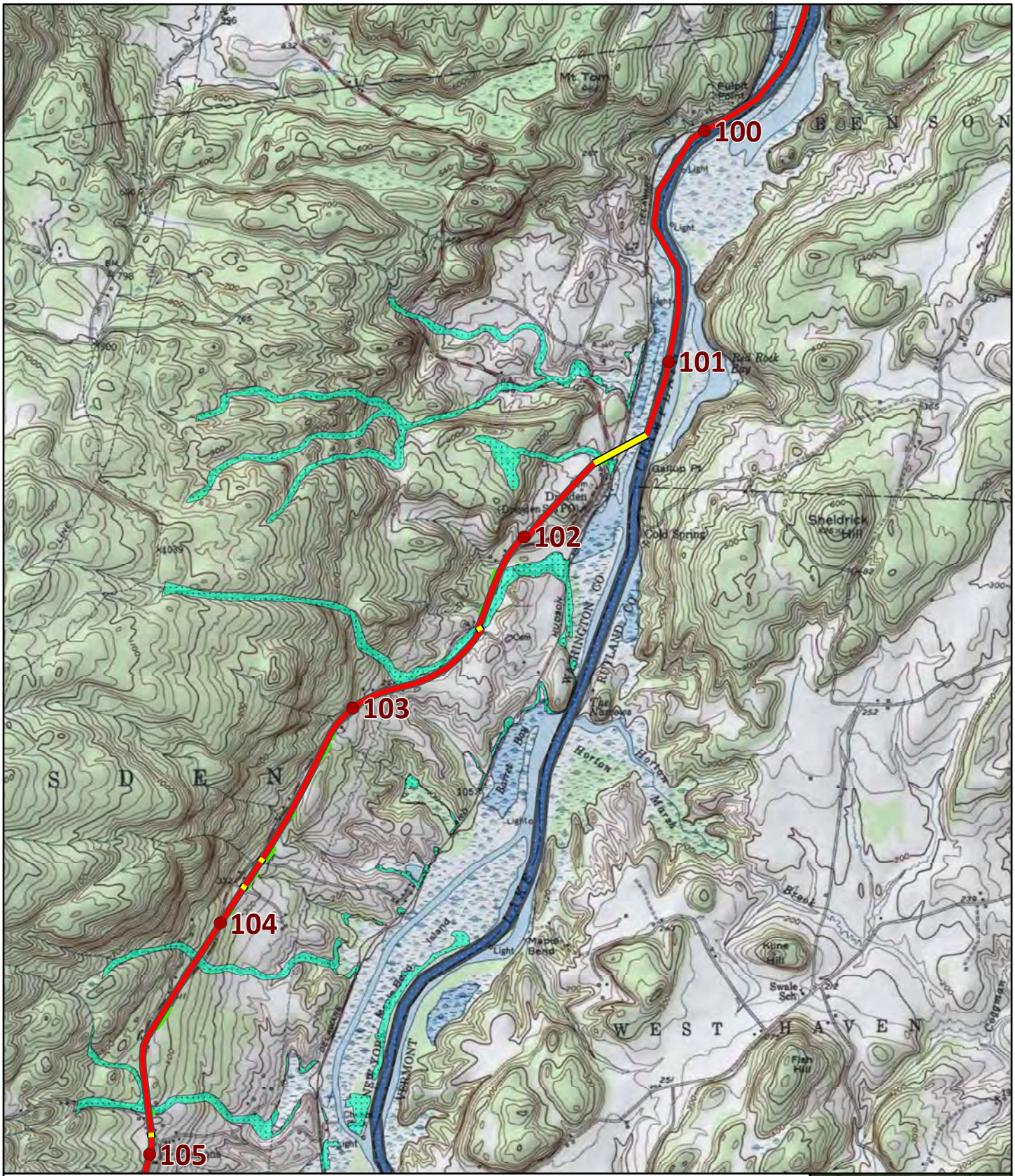

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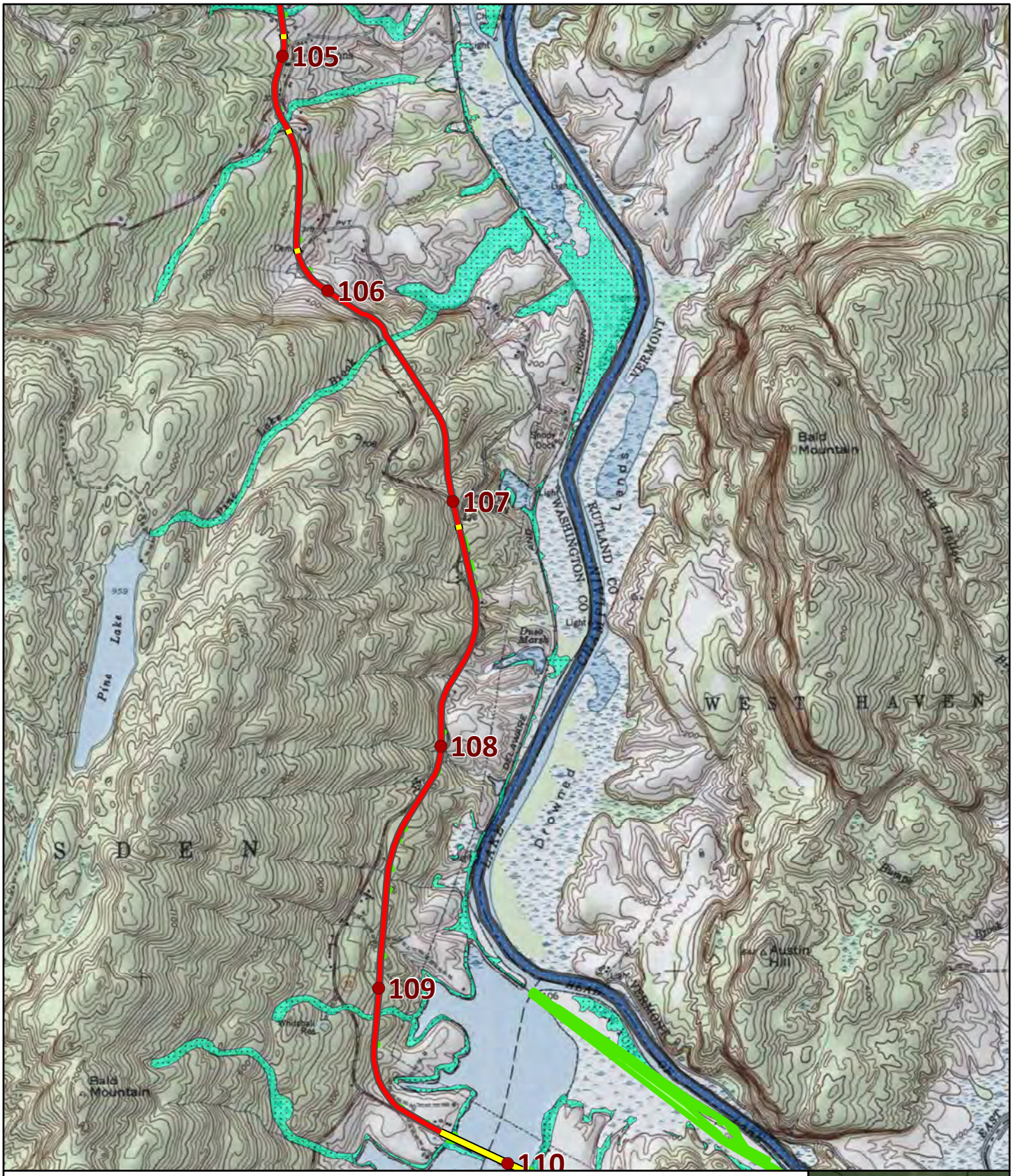

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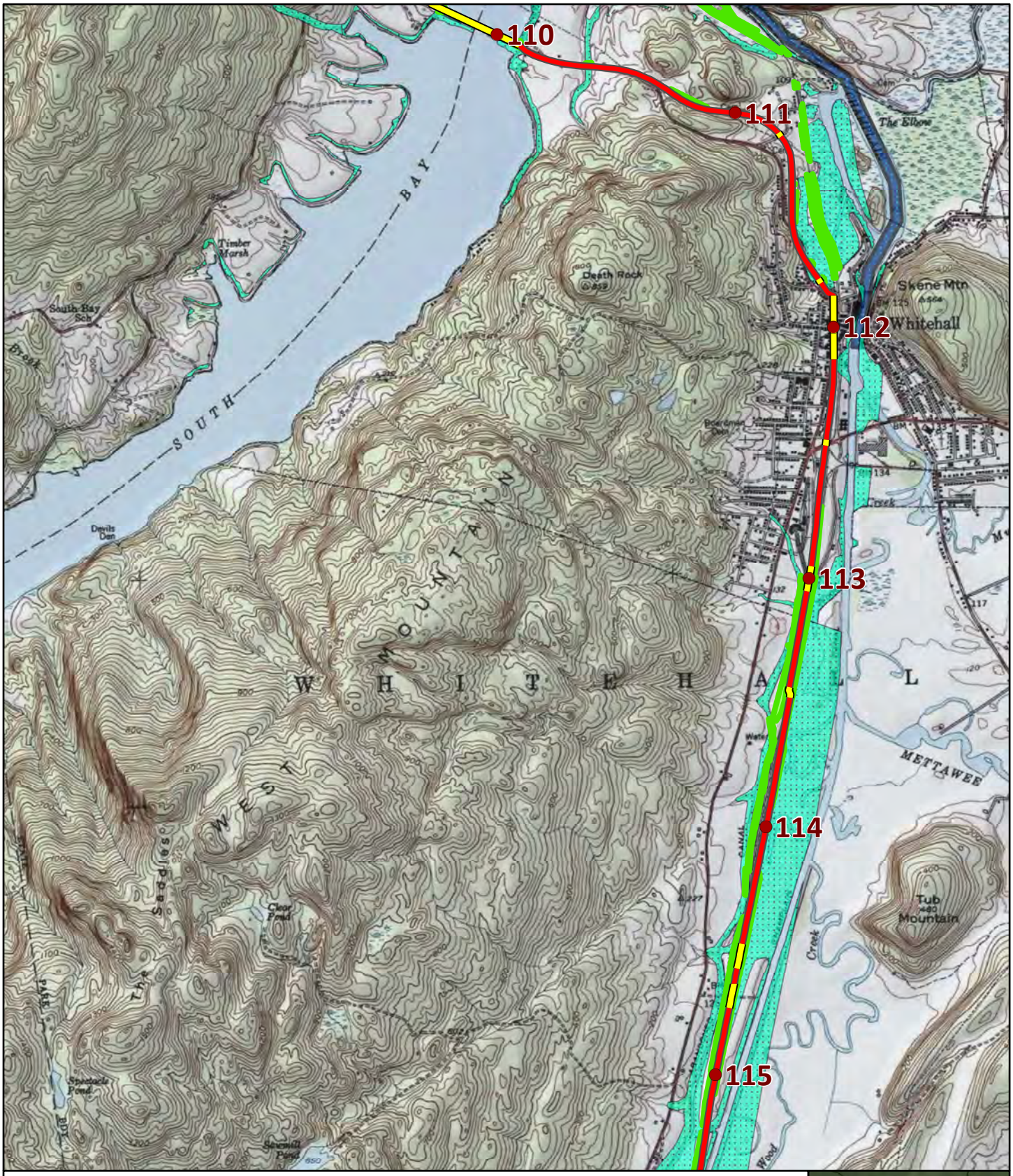

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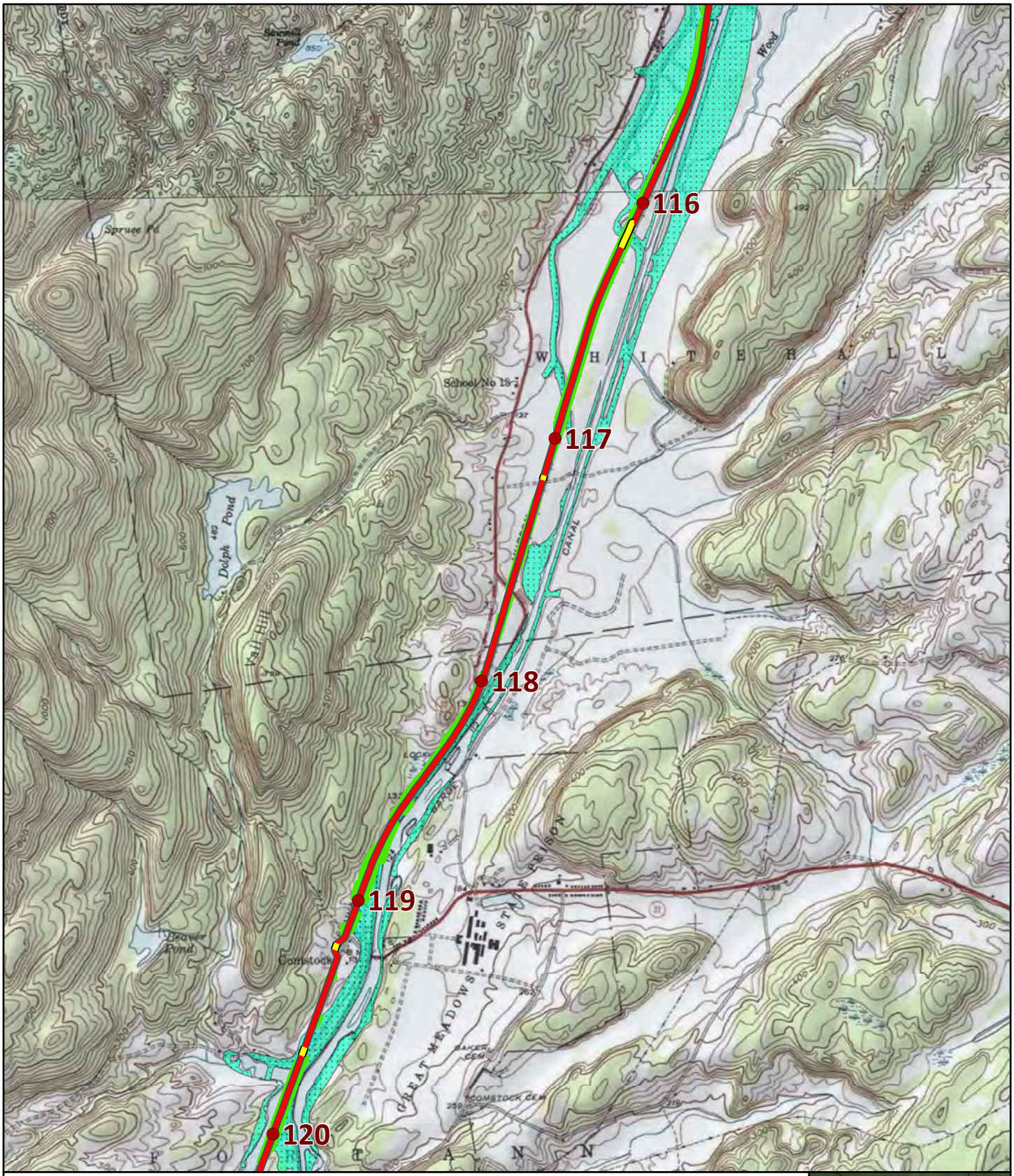

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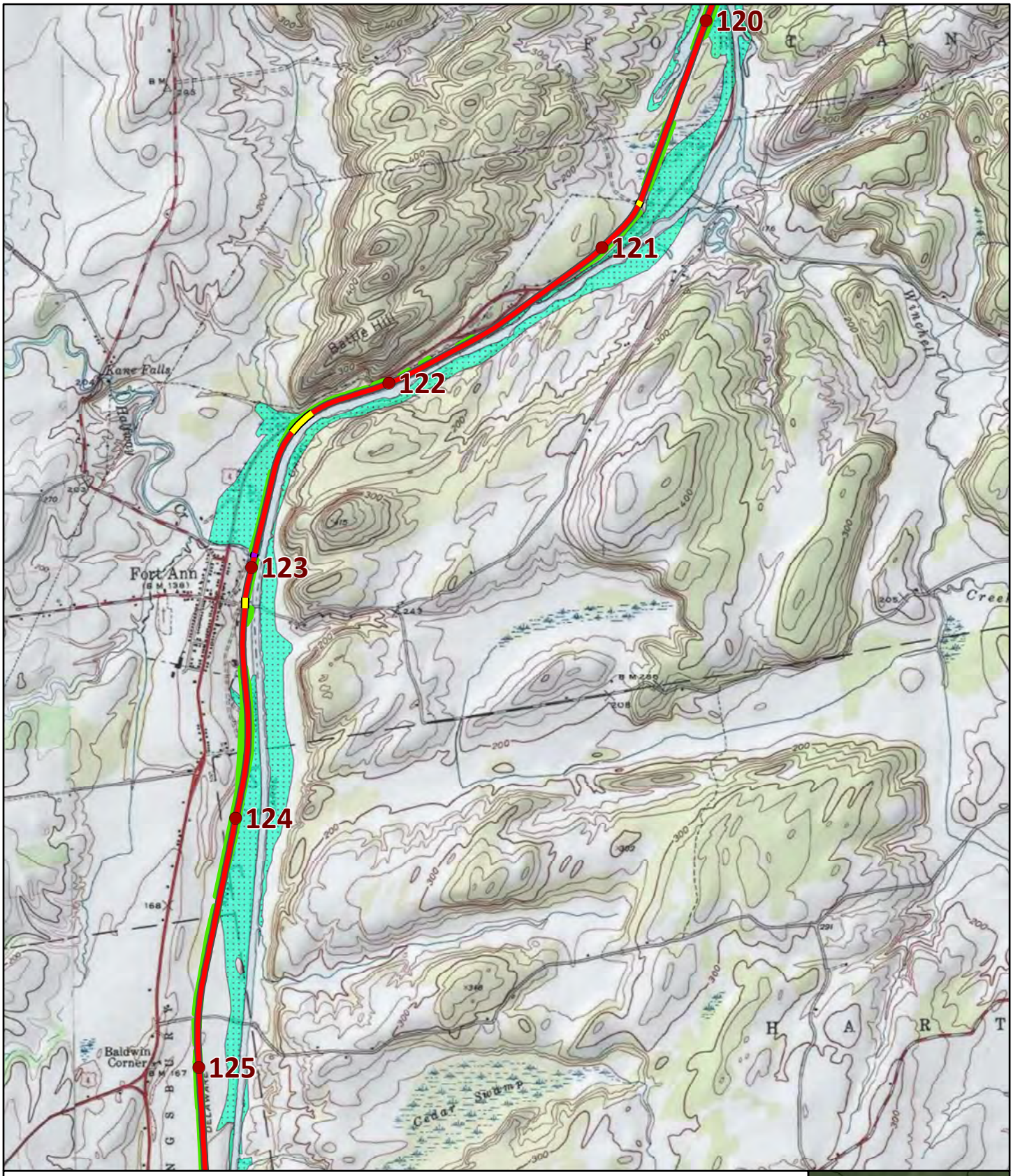

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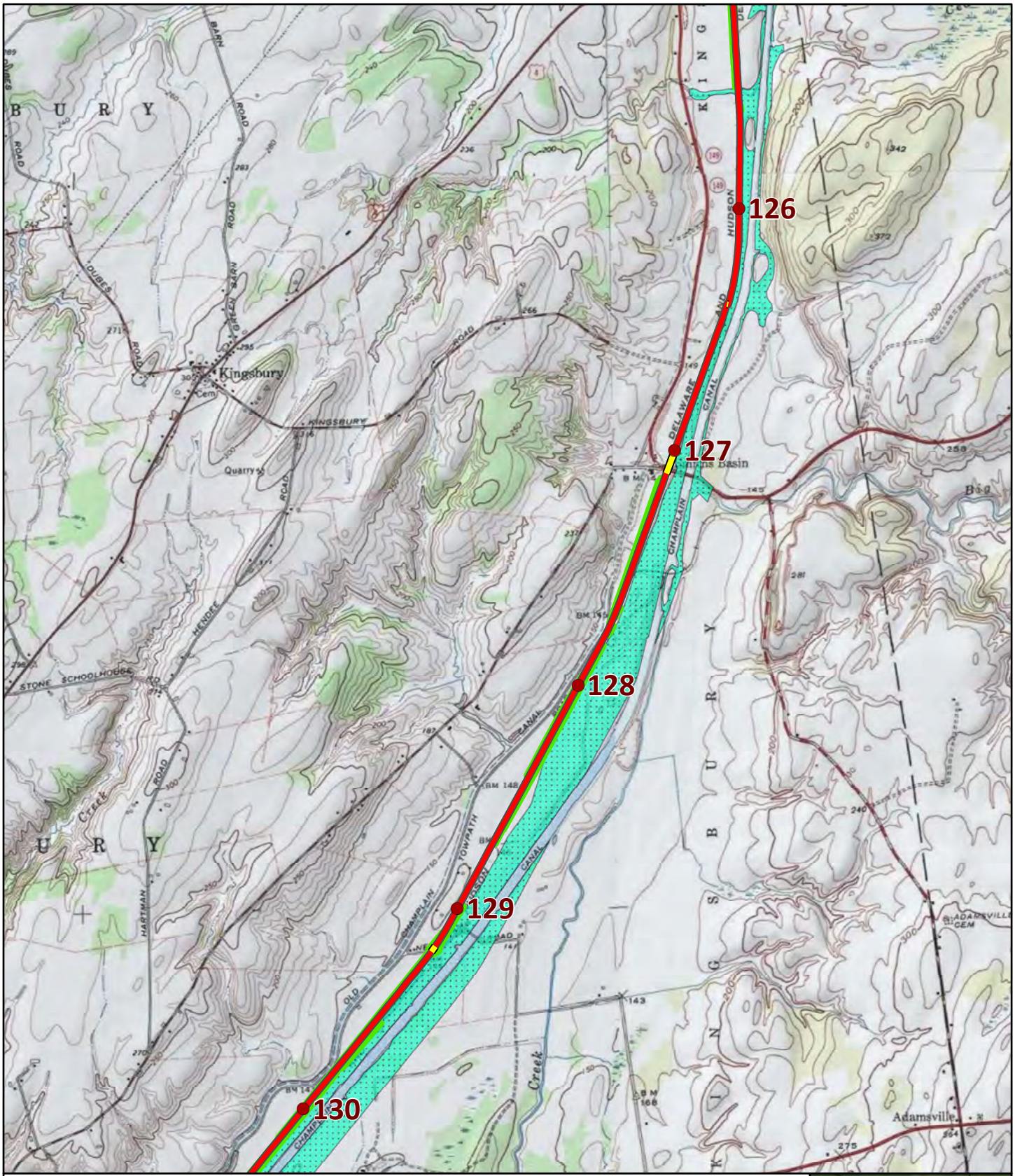

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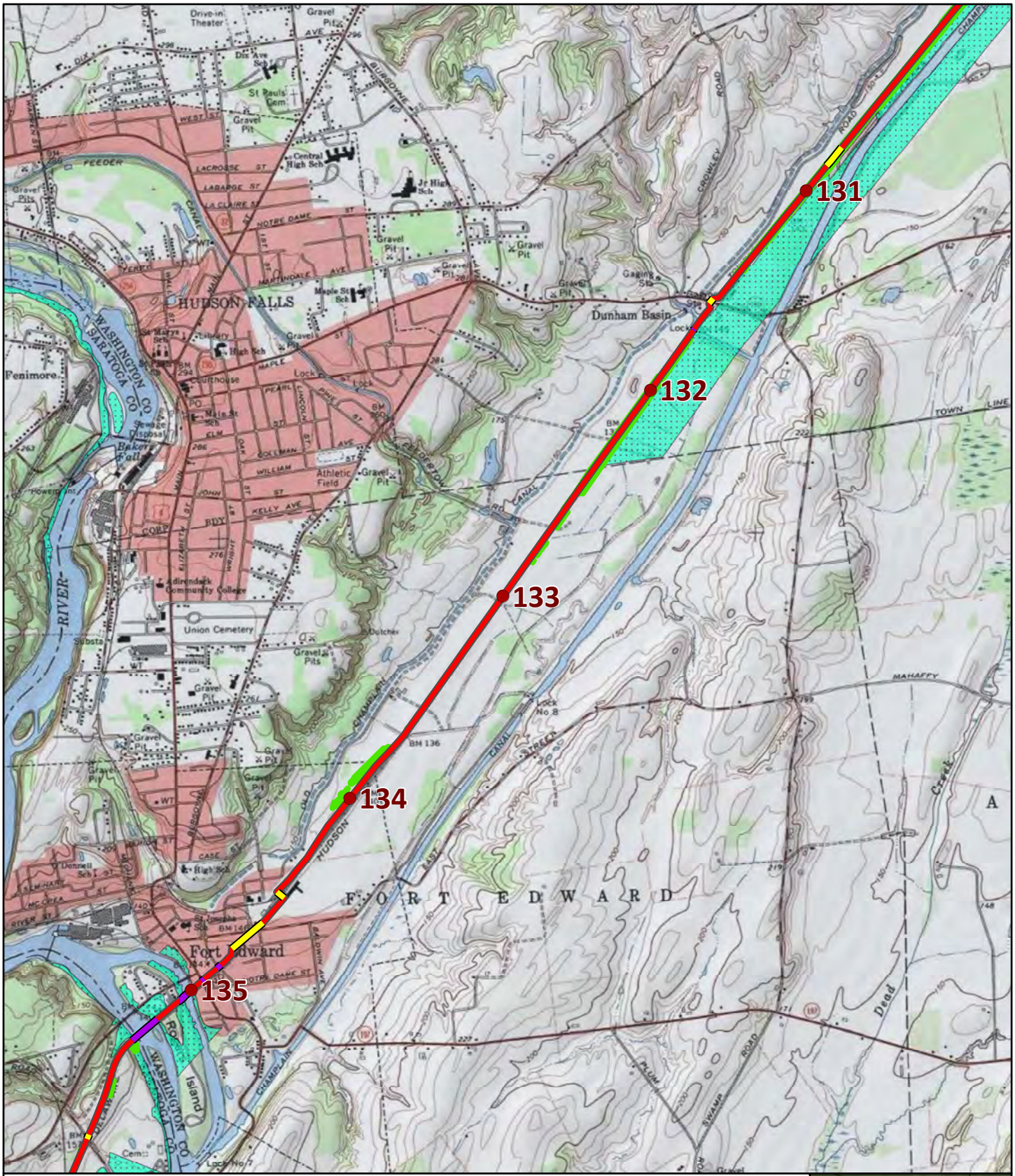

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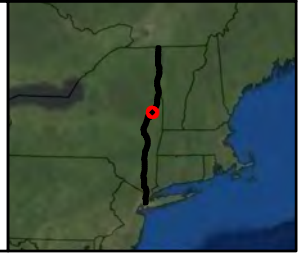

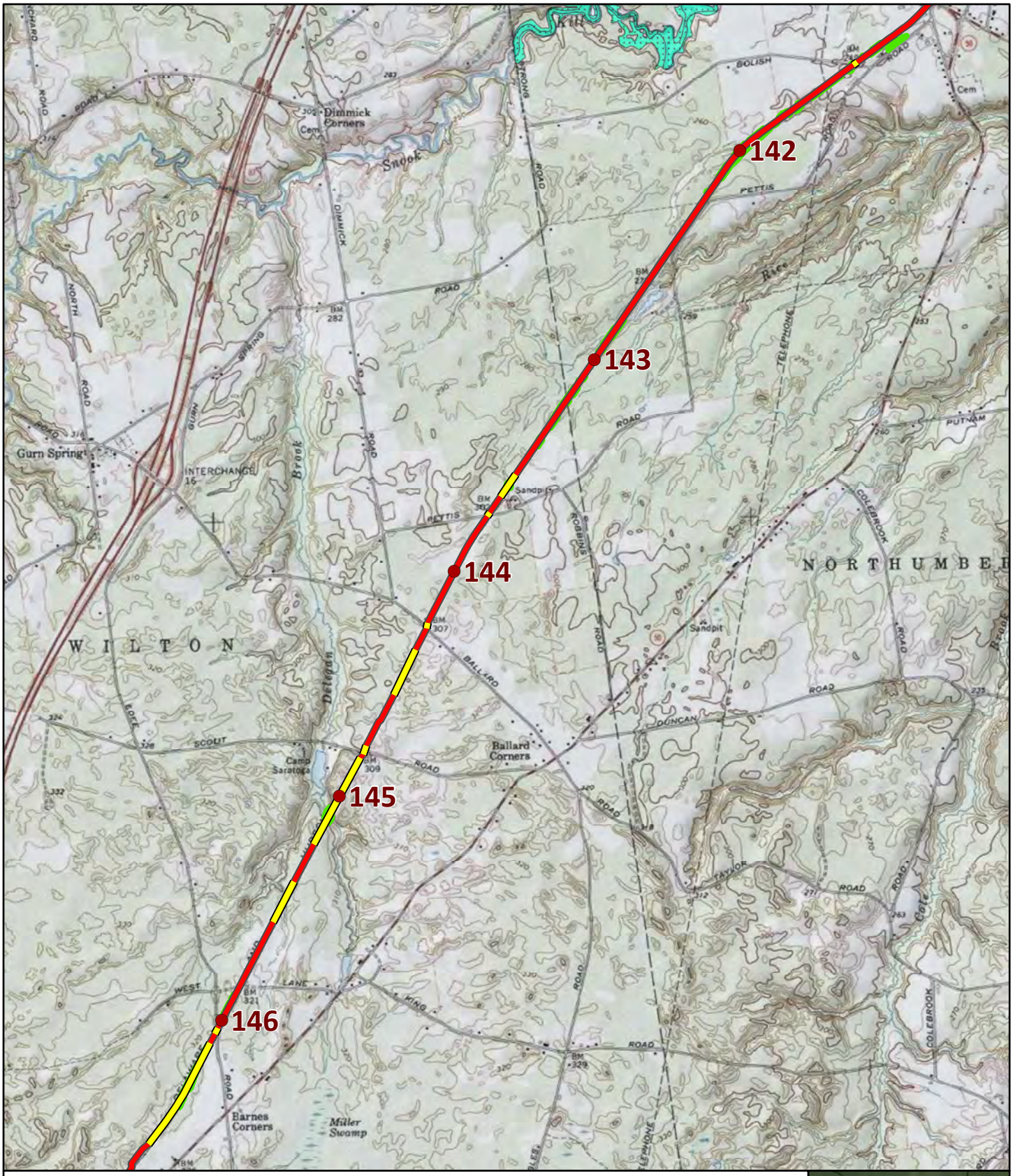

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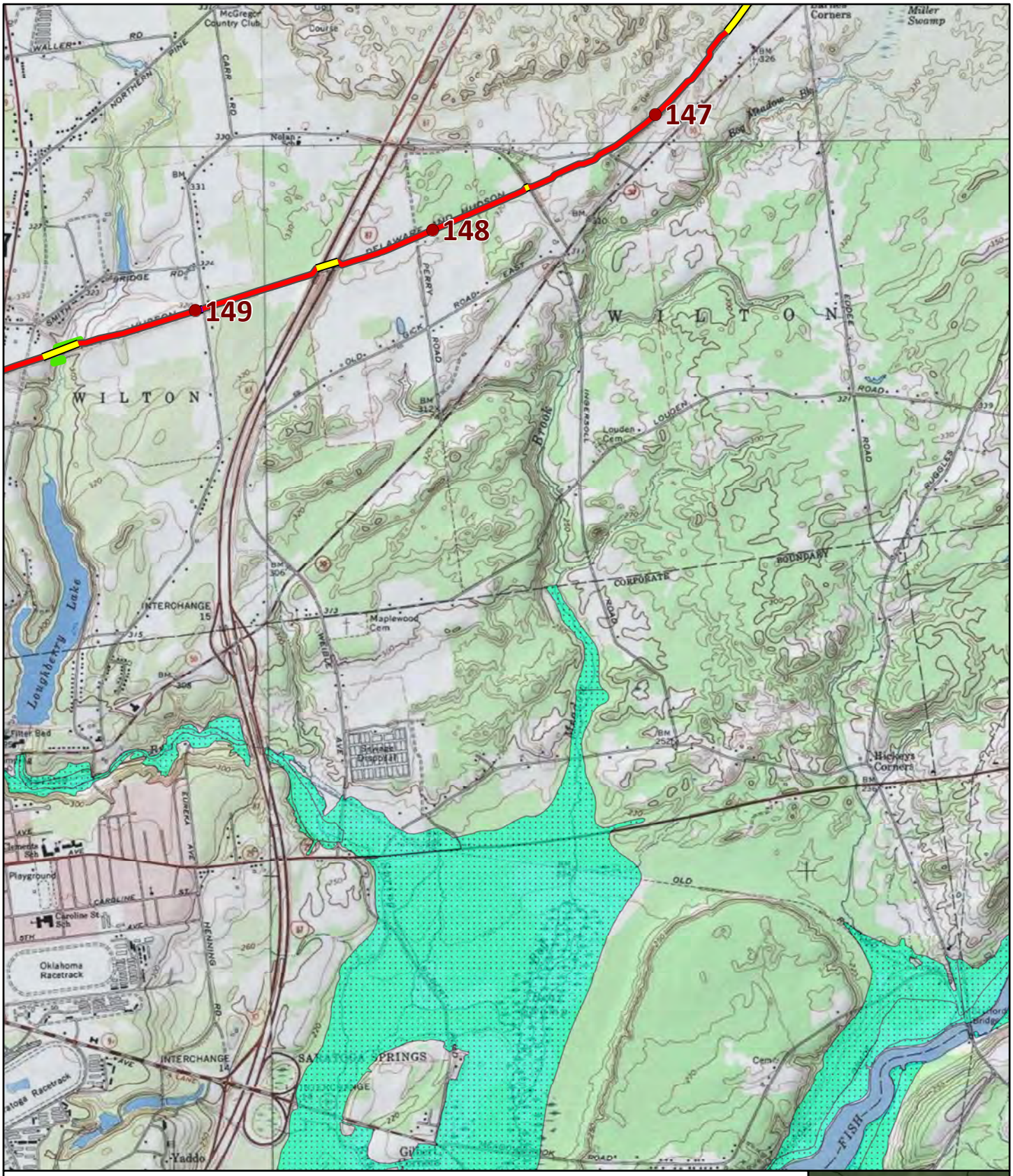

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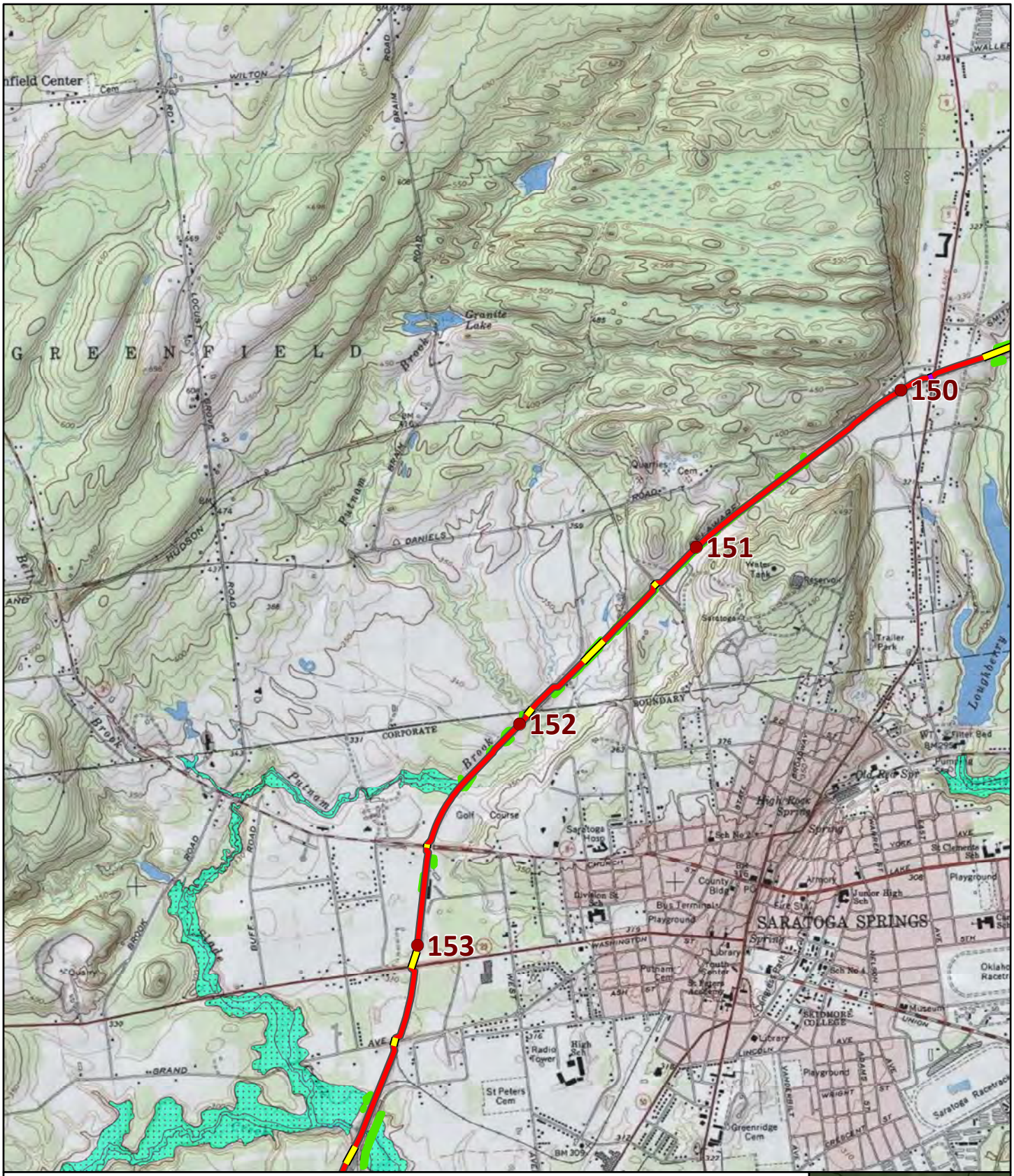

Map 32 of 69

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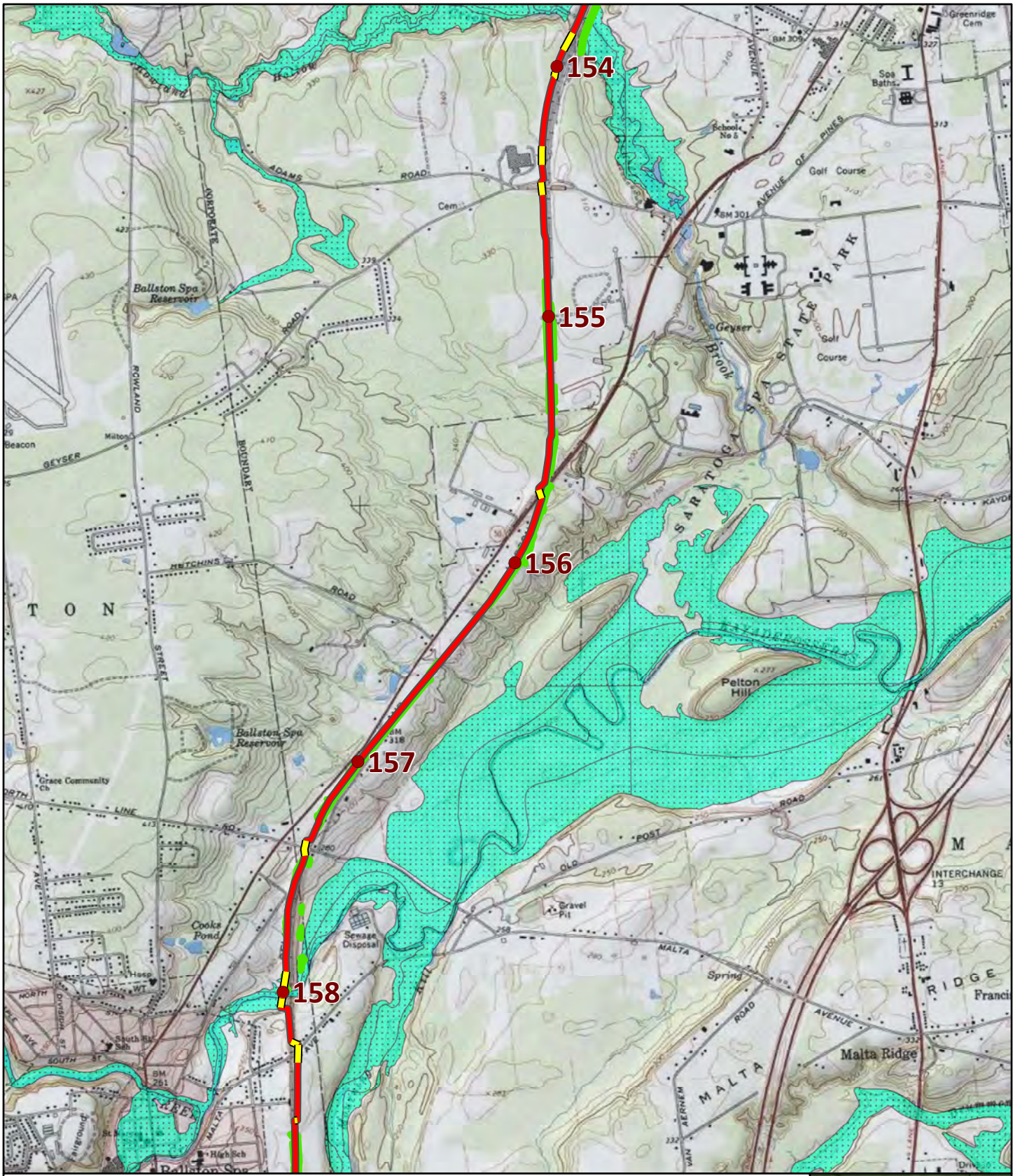

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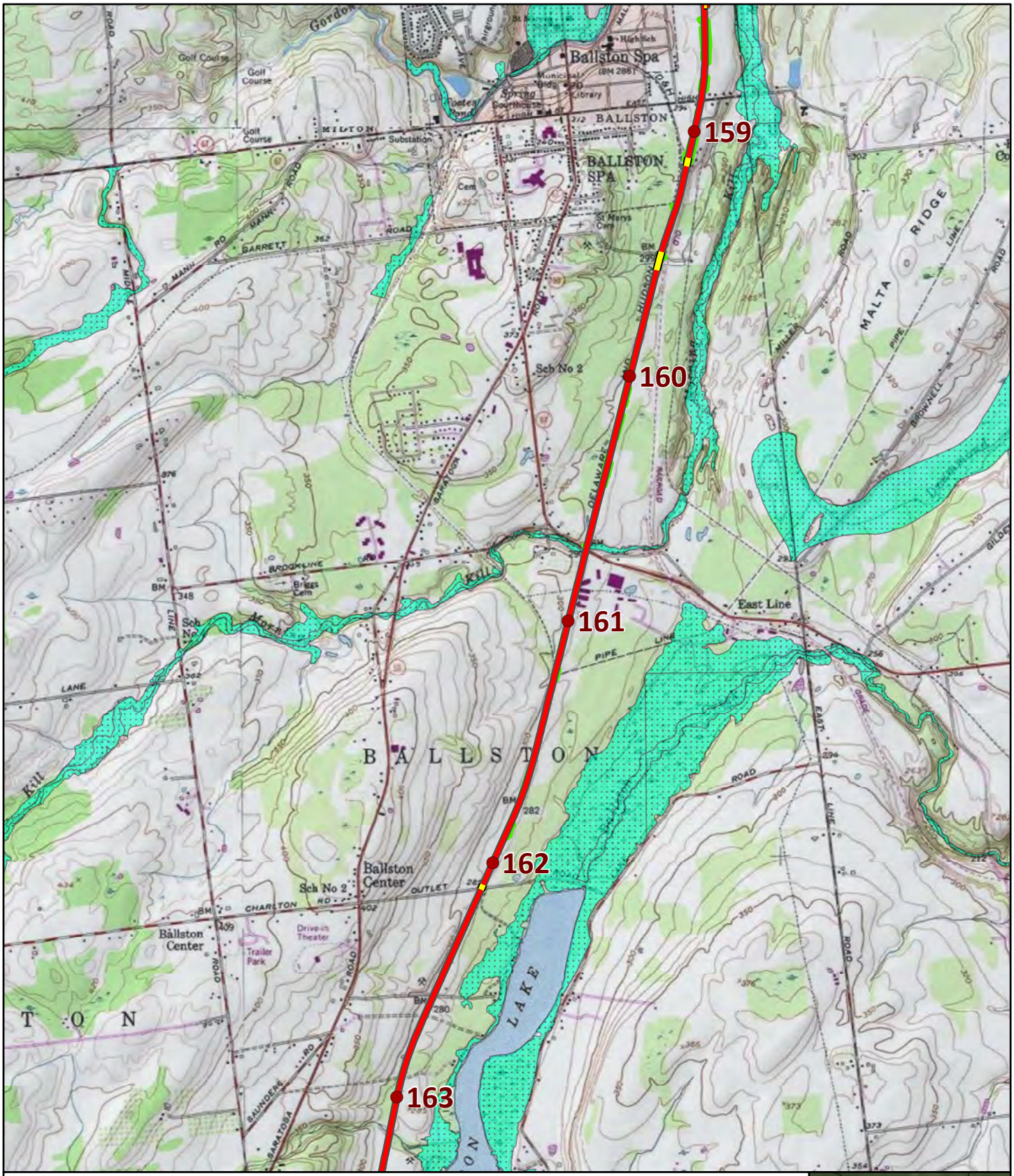

Projection: Transverse Mercator
State Plane New York East FIPS 3101 Feet
North American Datum of 1983

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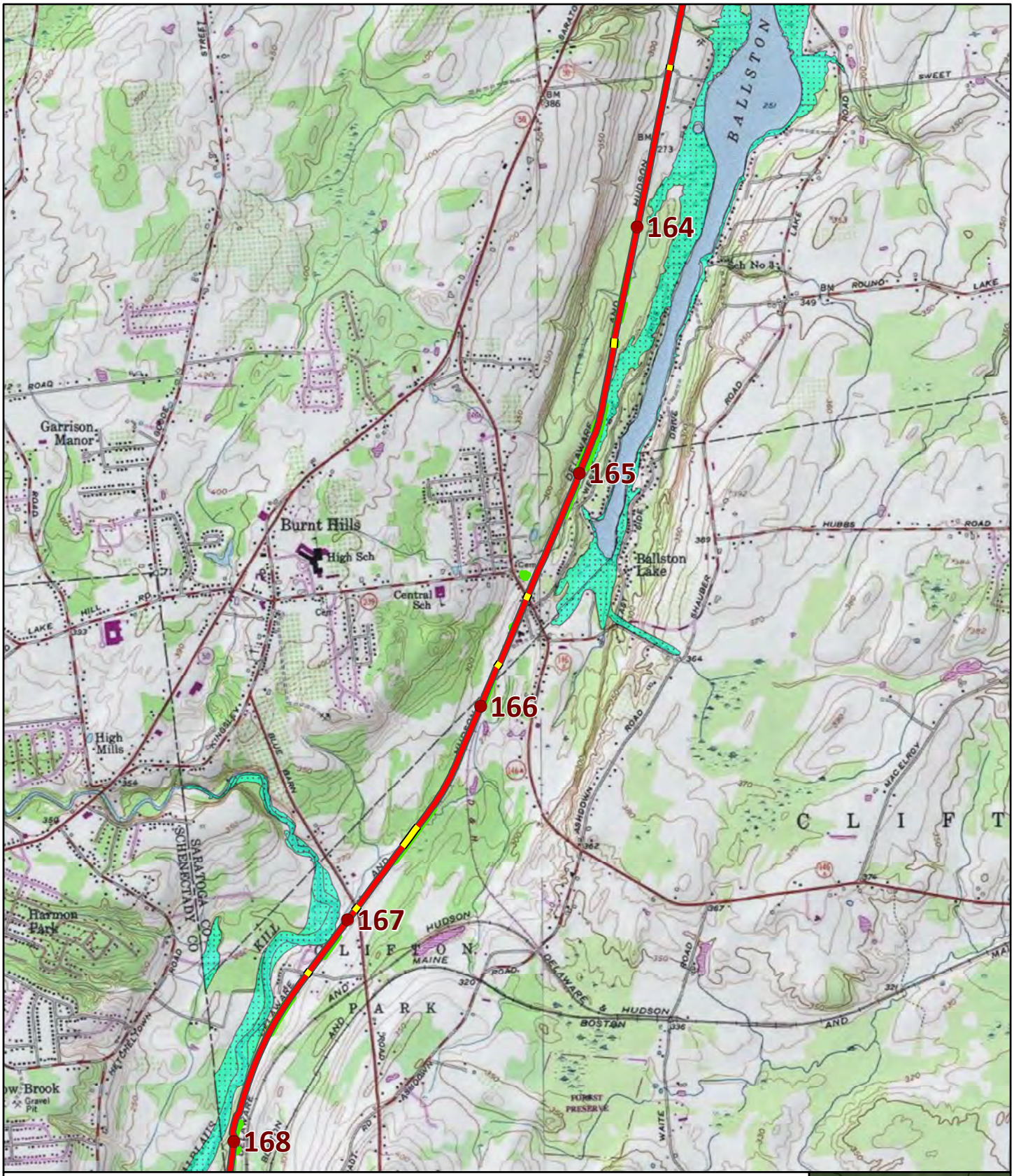

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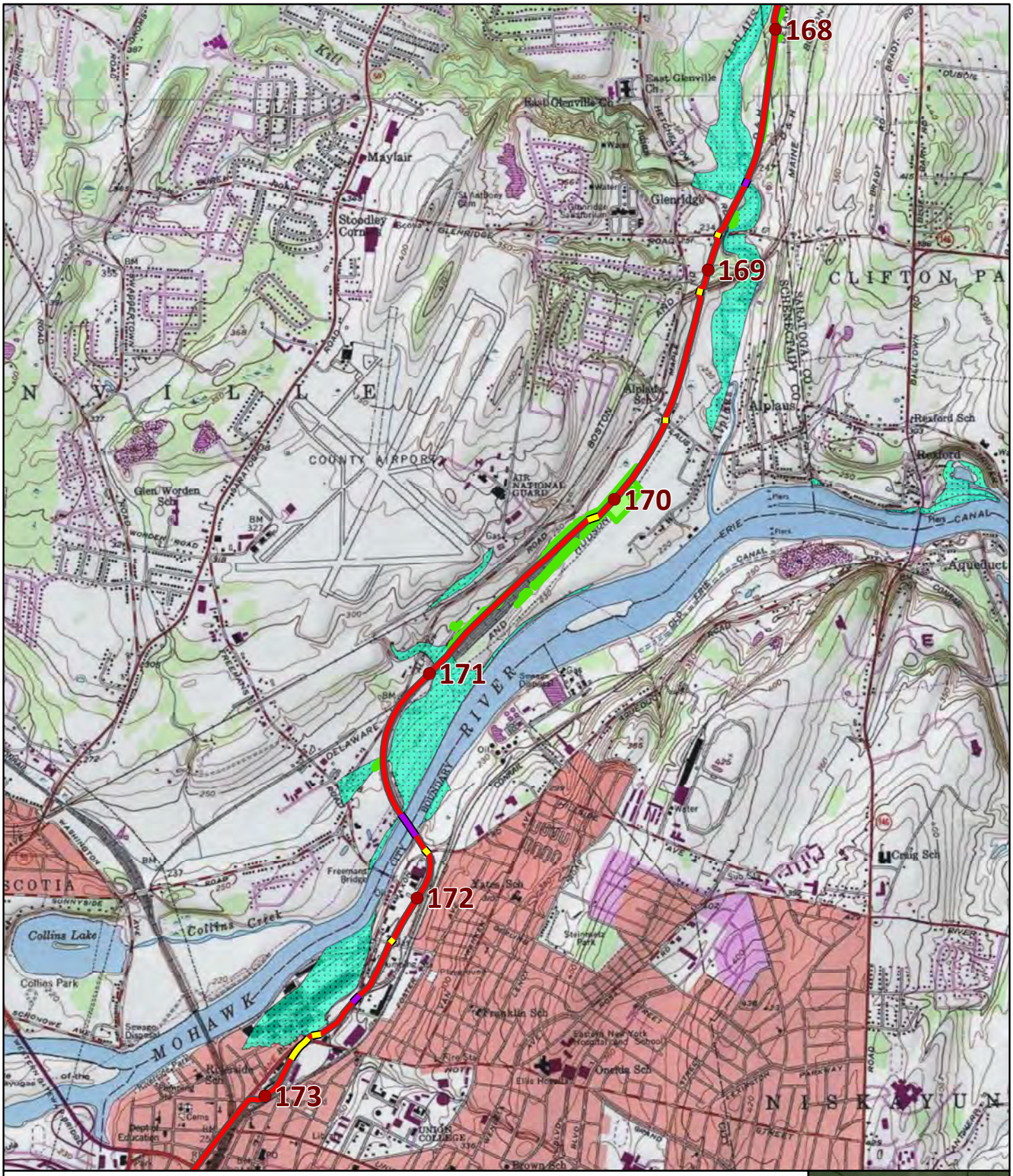

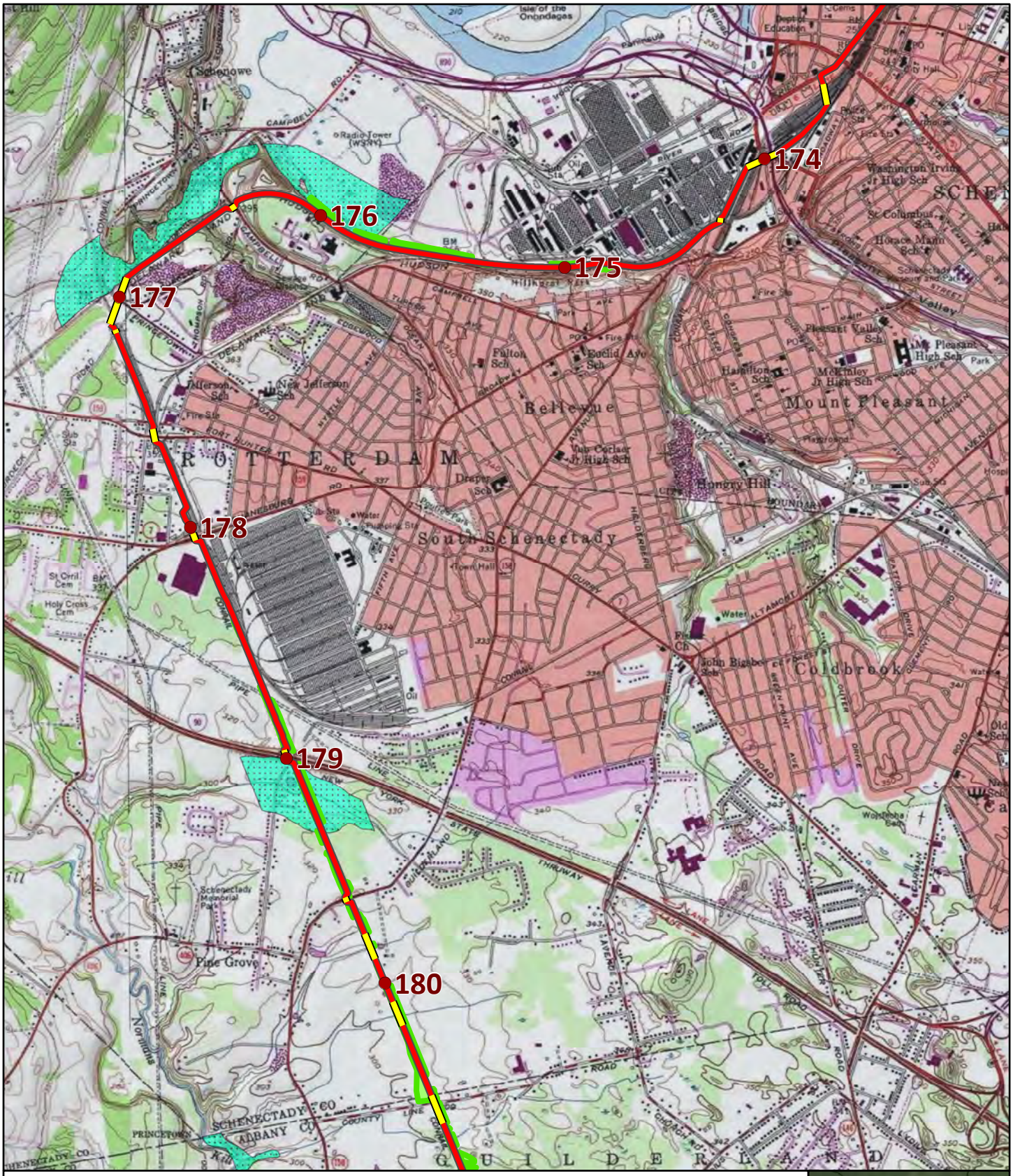

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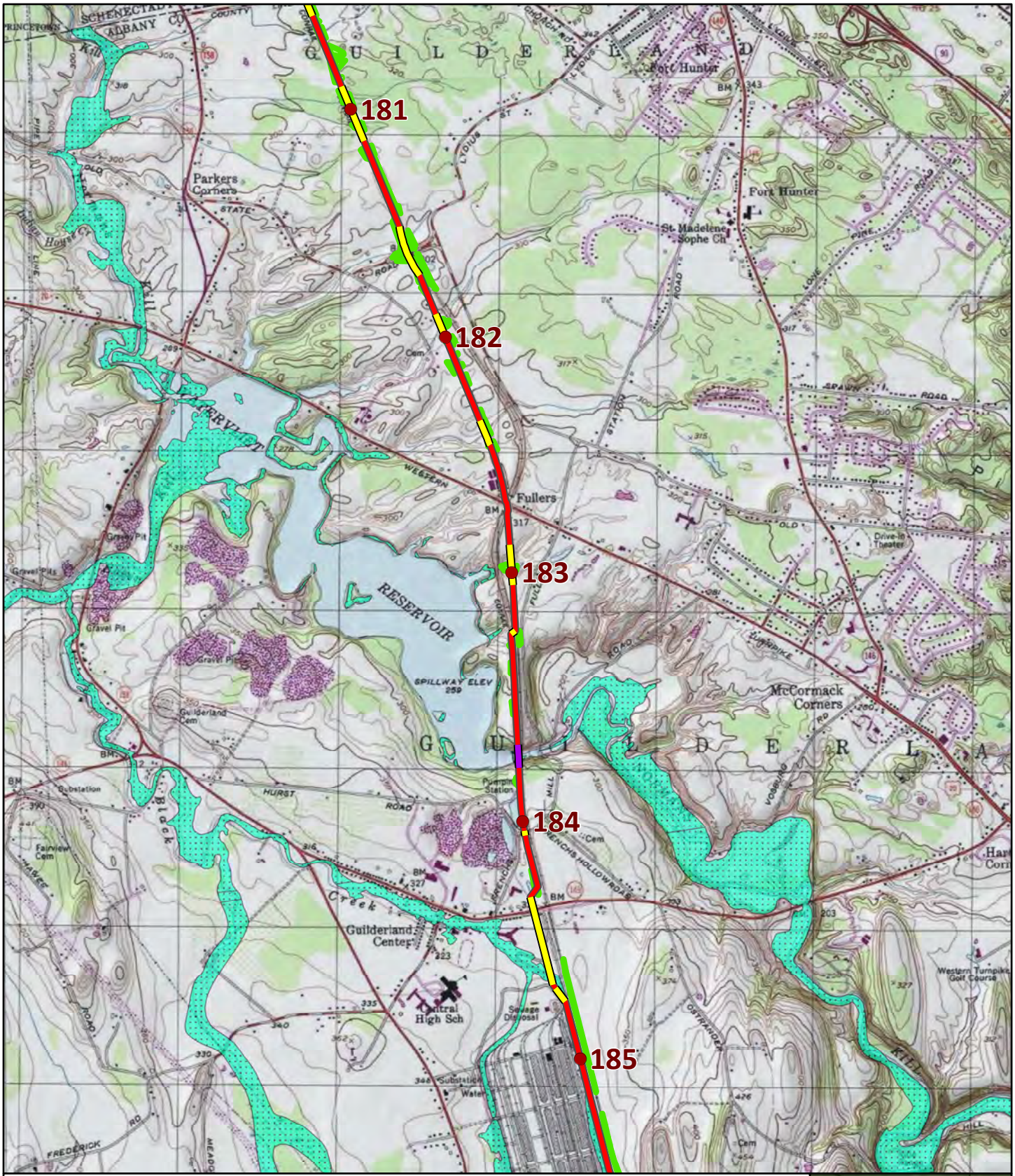

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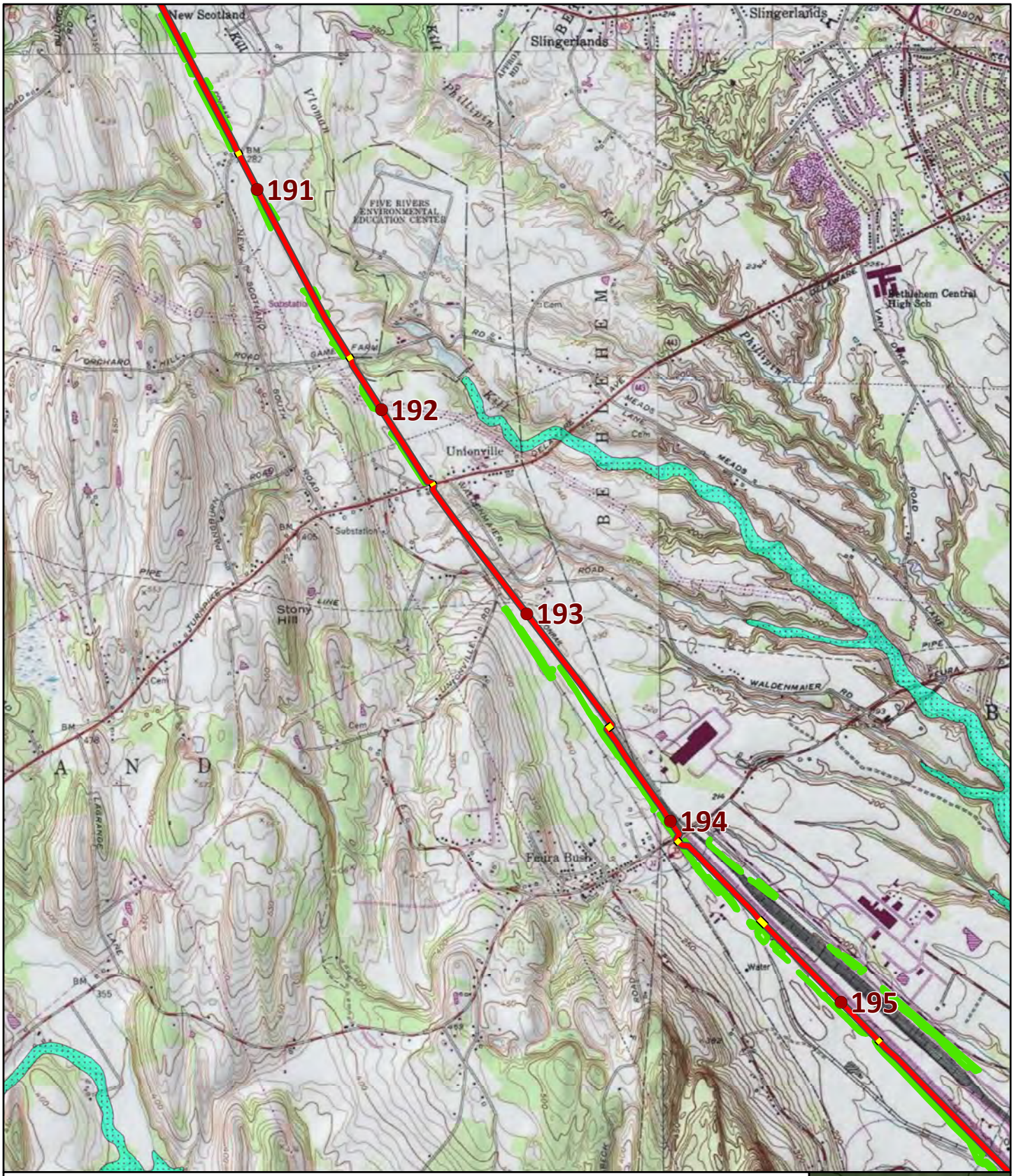

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Projection: Transverse Mercator
State Plane New York East FIPS 3101 Feet
North American Datum of 1983

N

- Proposed CHPE Project Route Mileposts
- Proposed CHPE Project Route
- HDD Installation
- Pipe Bridge Installation
- Federal Navigation Channel
- FEMA 100-Year Flood Zone
- Delineated Wetlands

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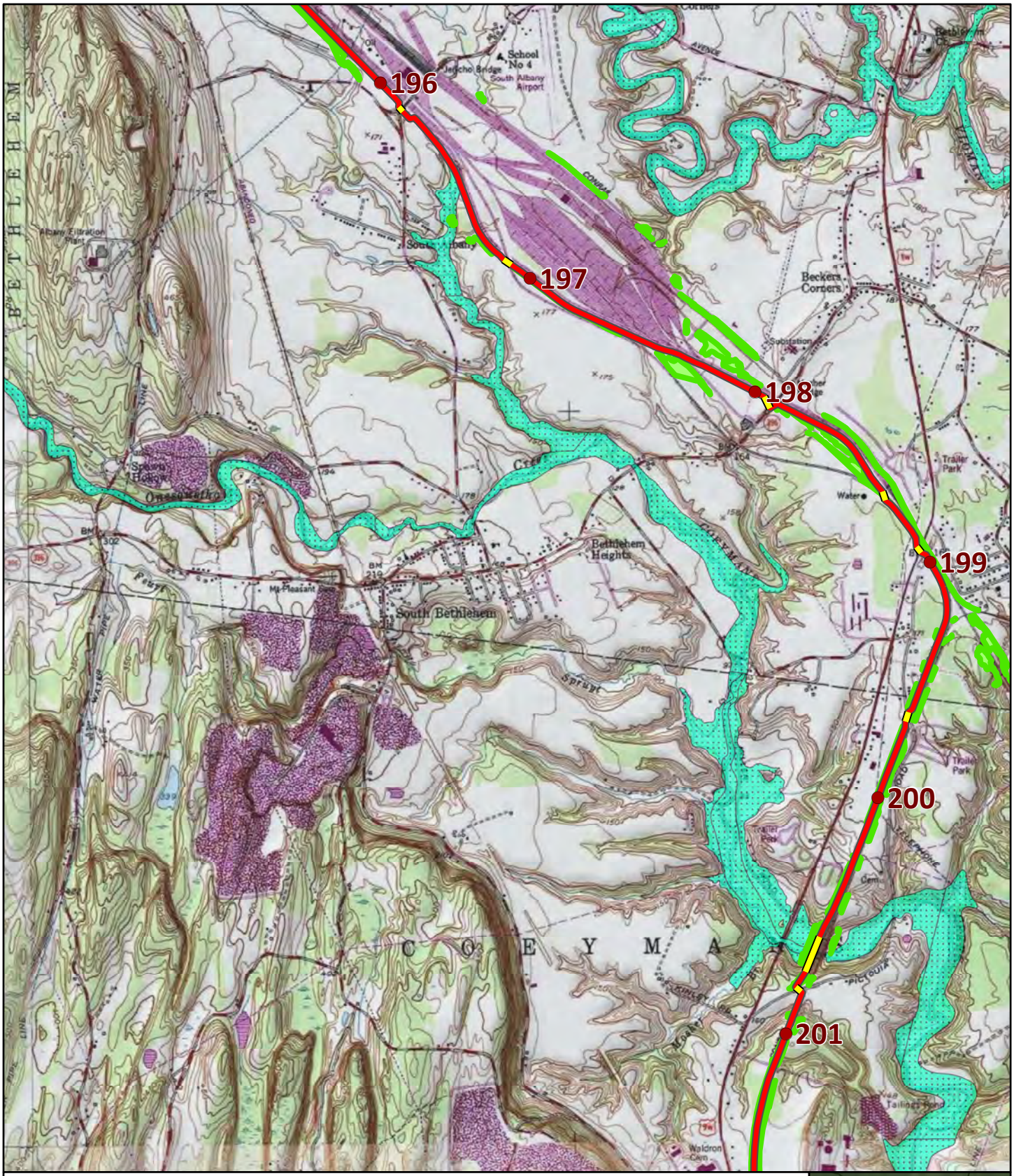

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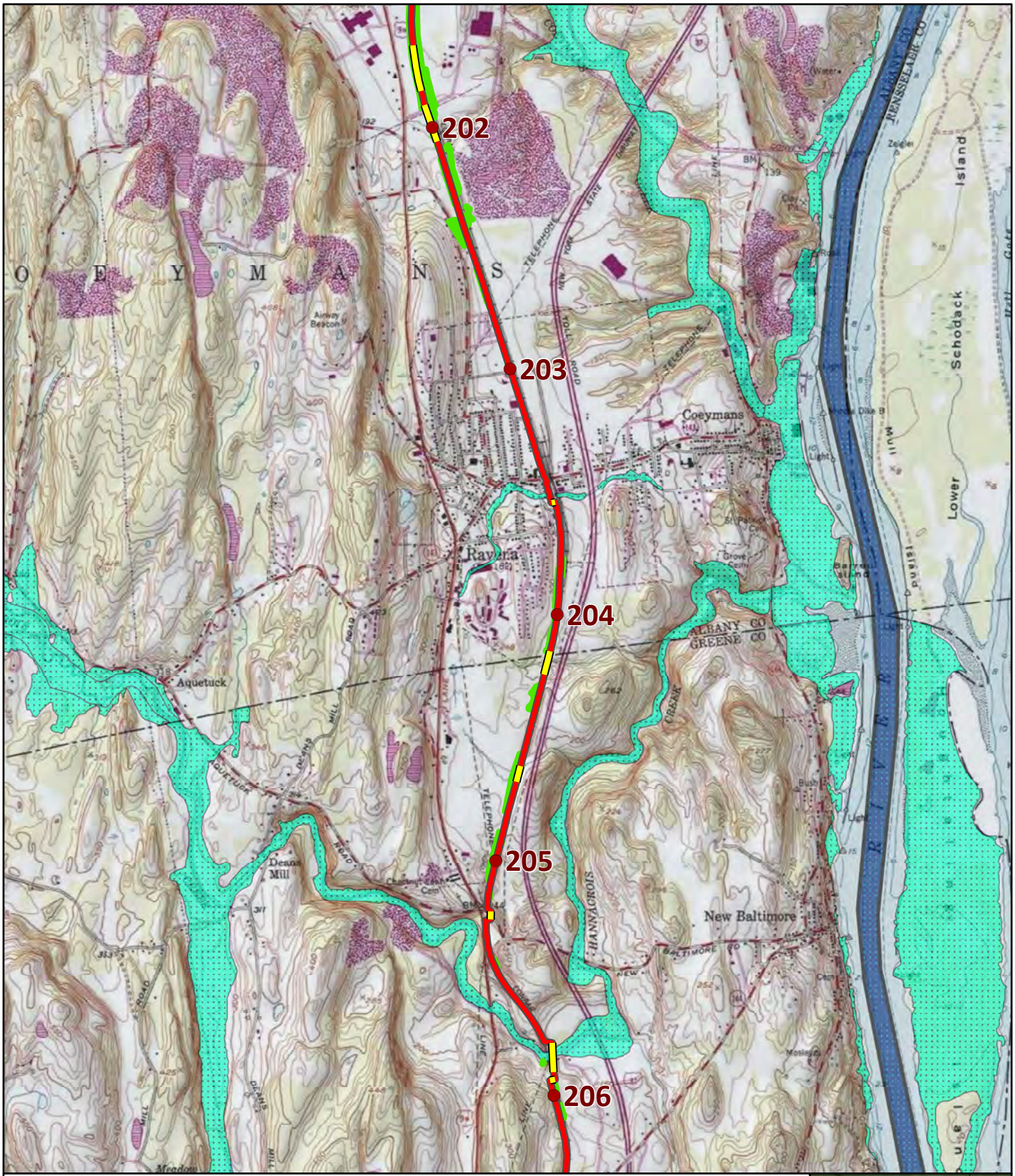

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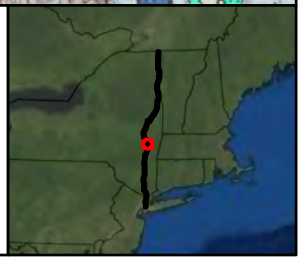

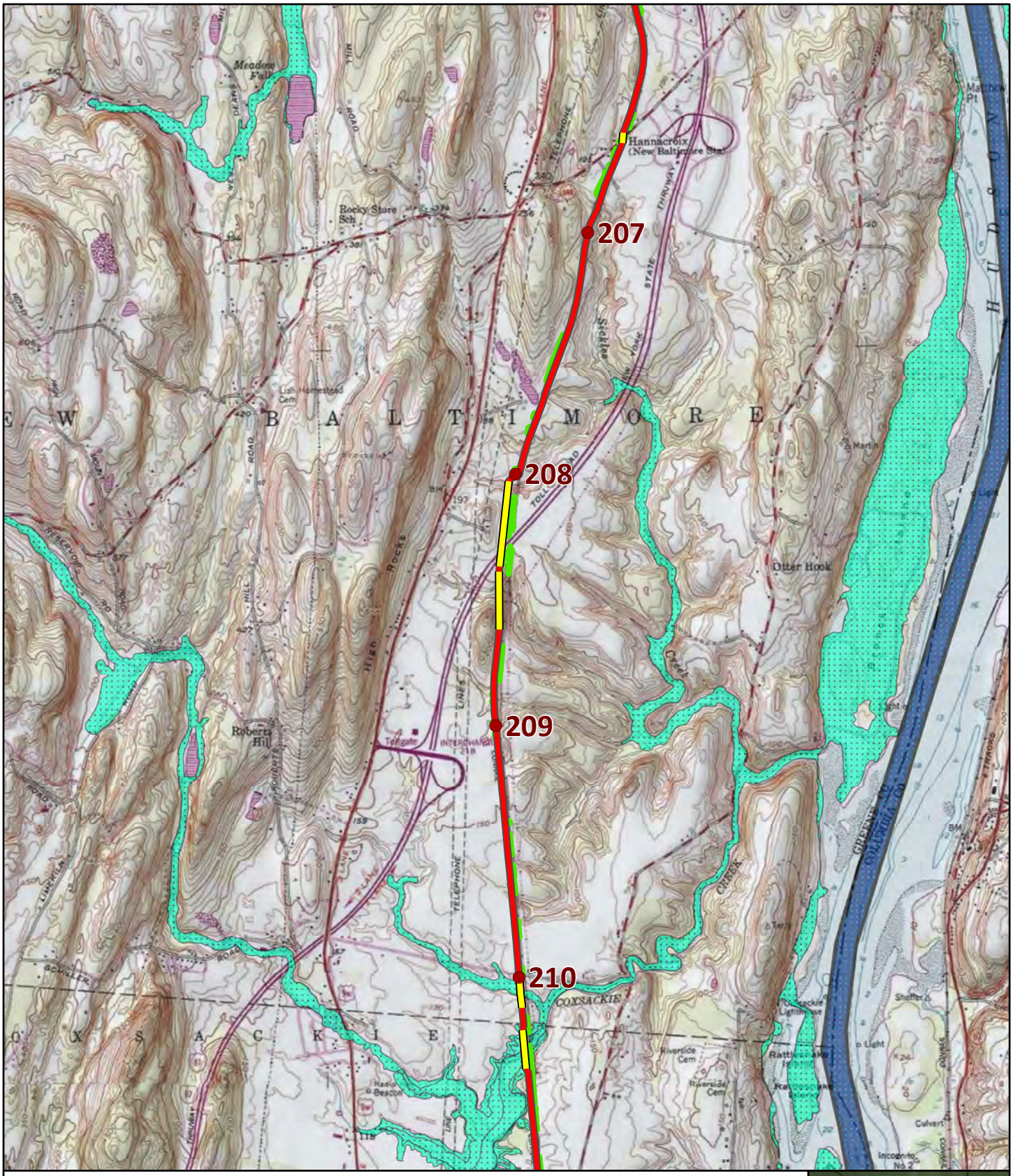

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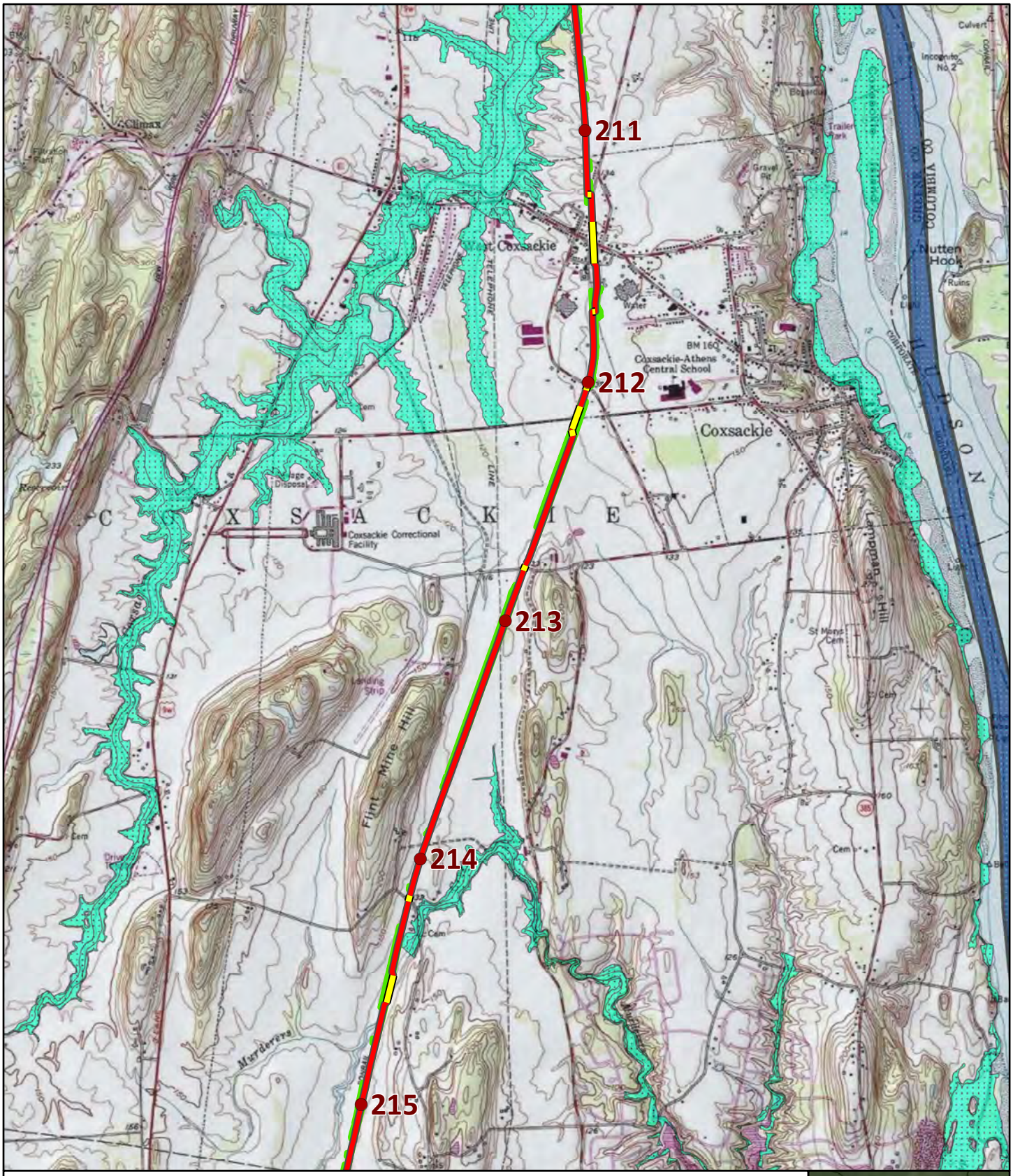

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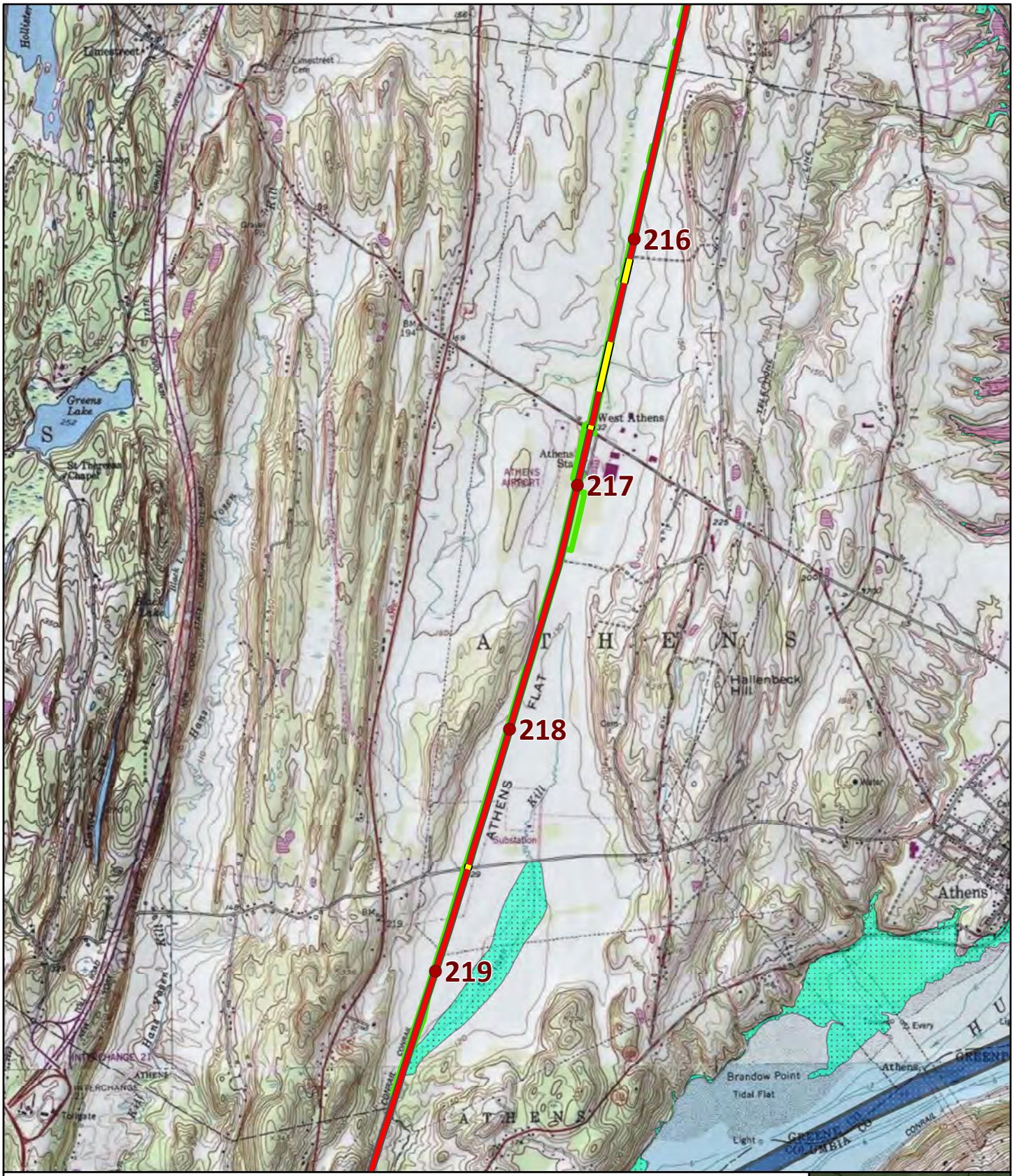

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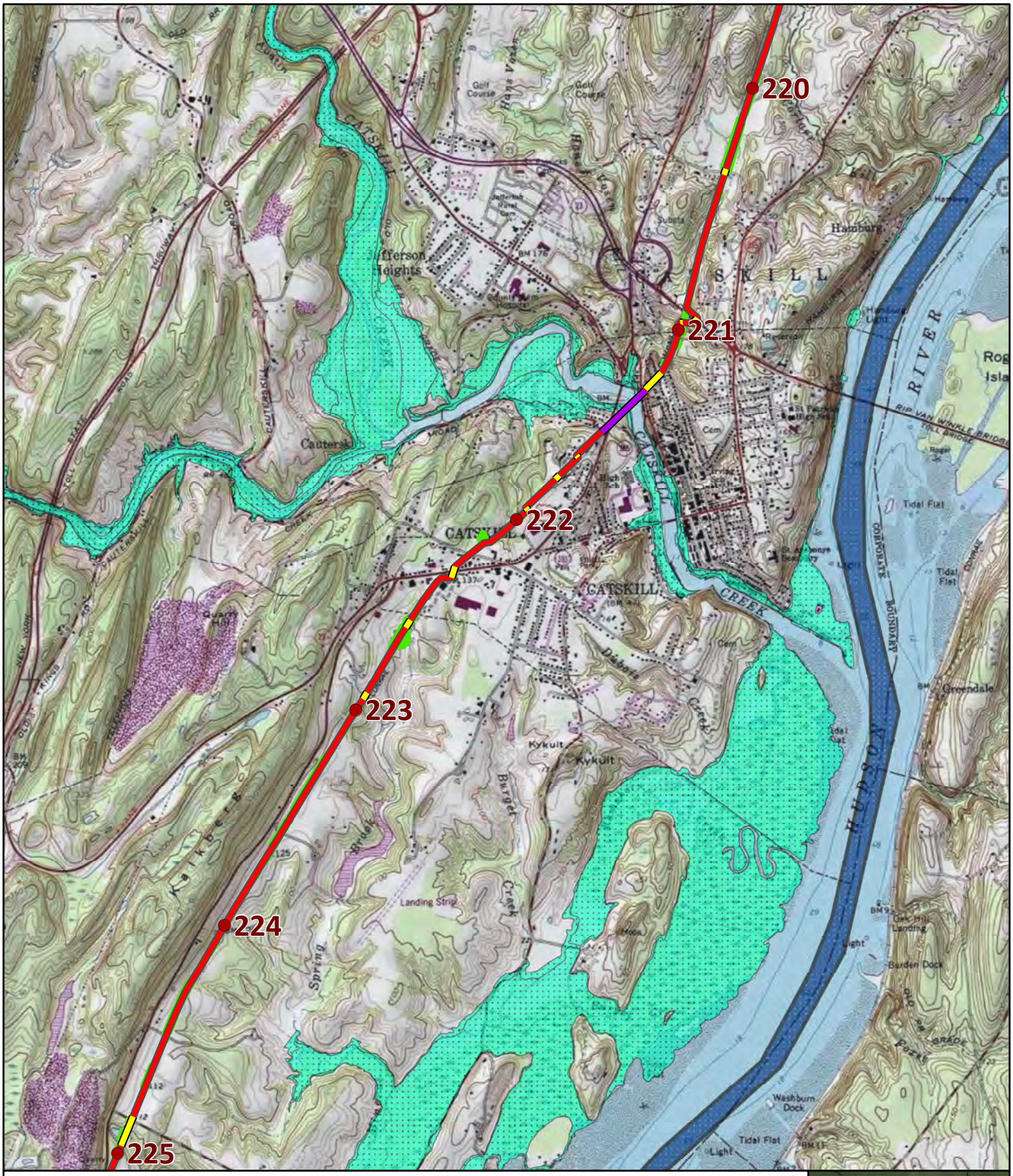

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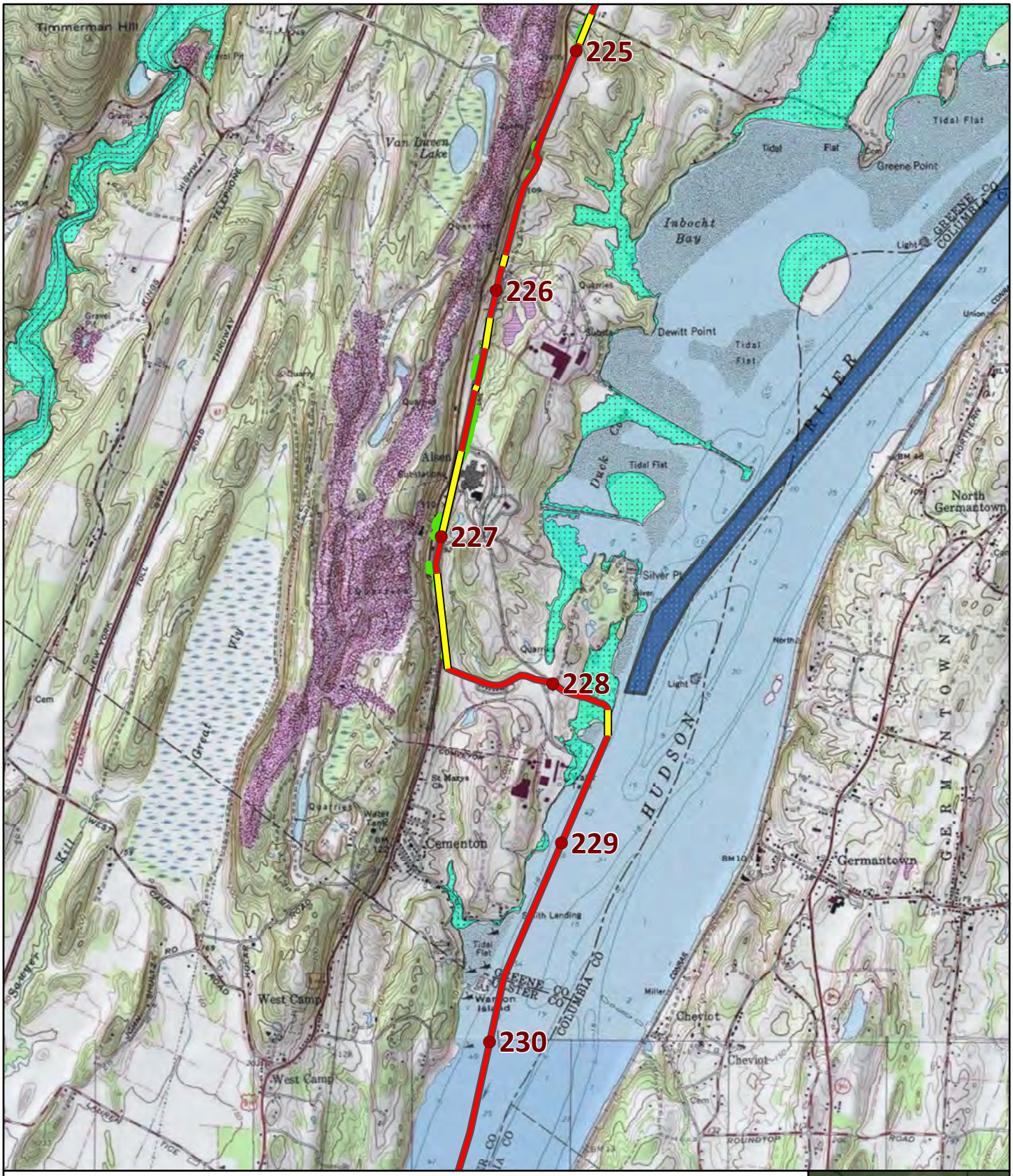

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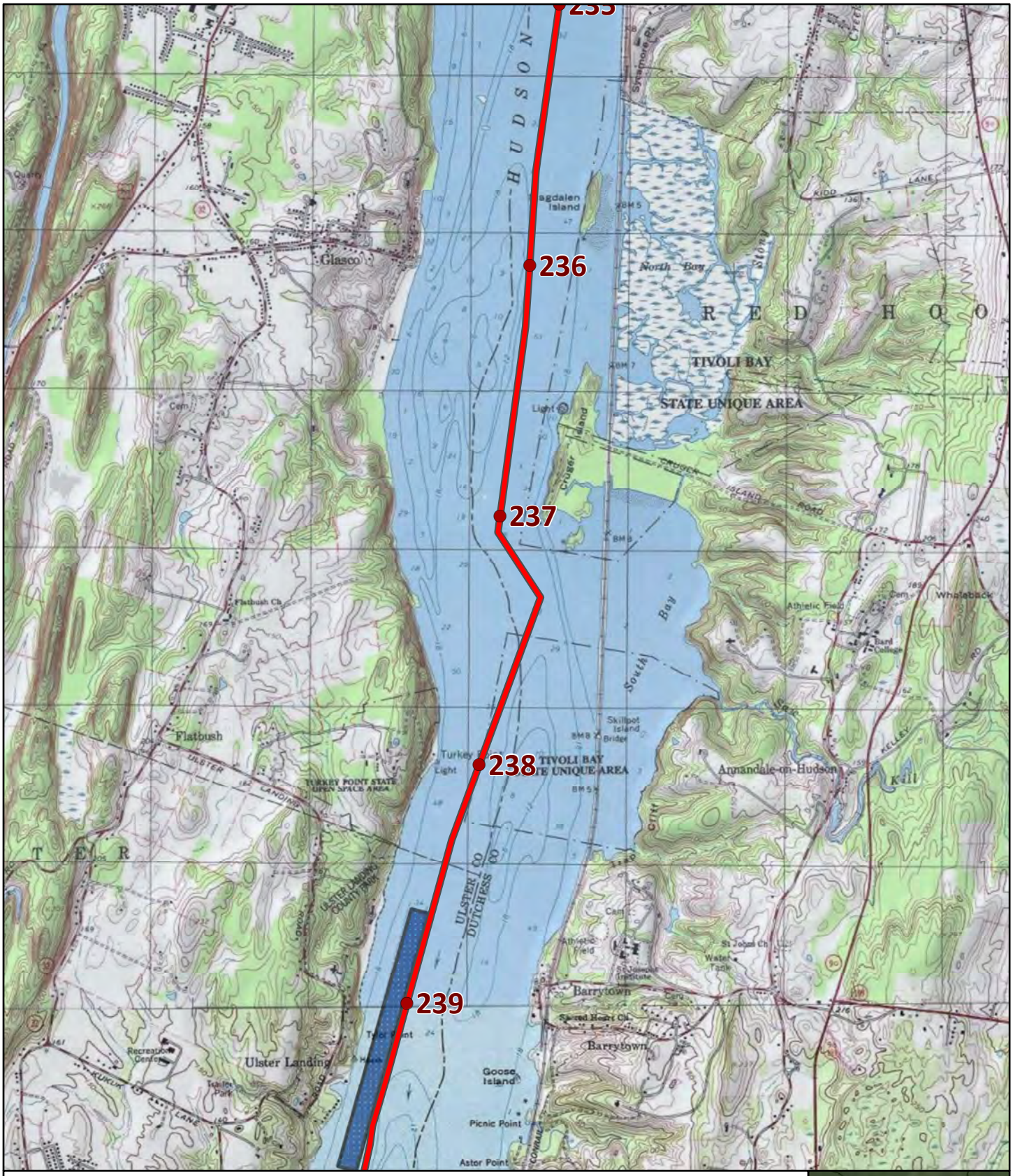

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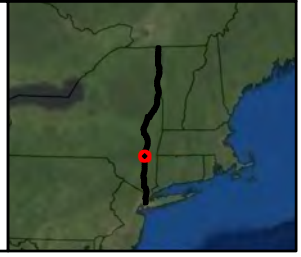

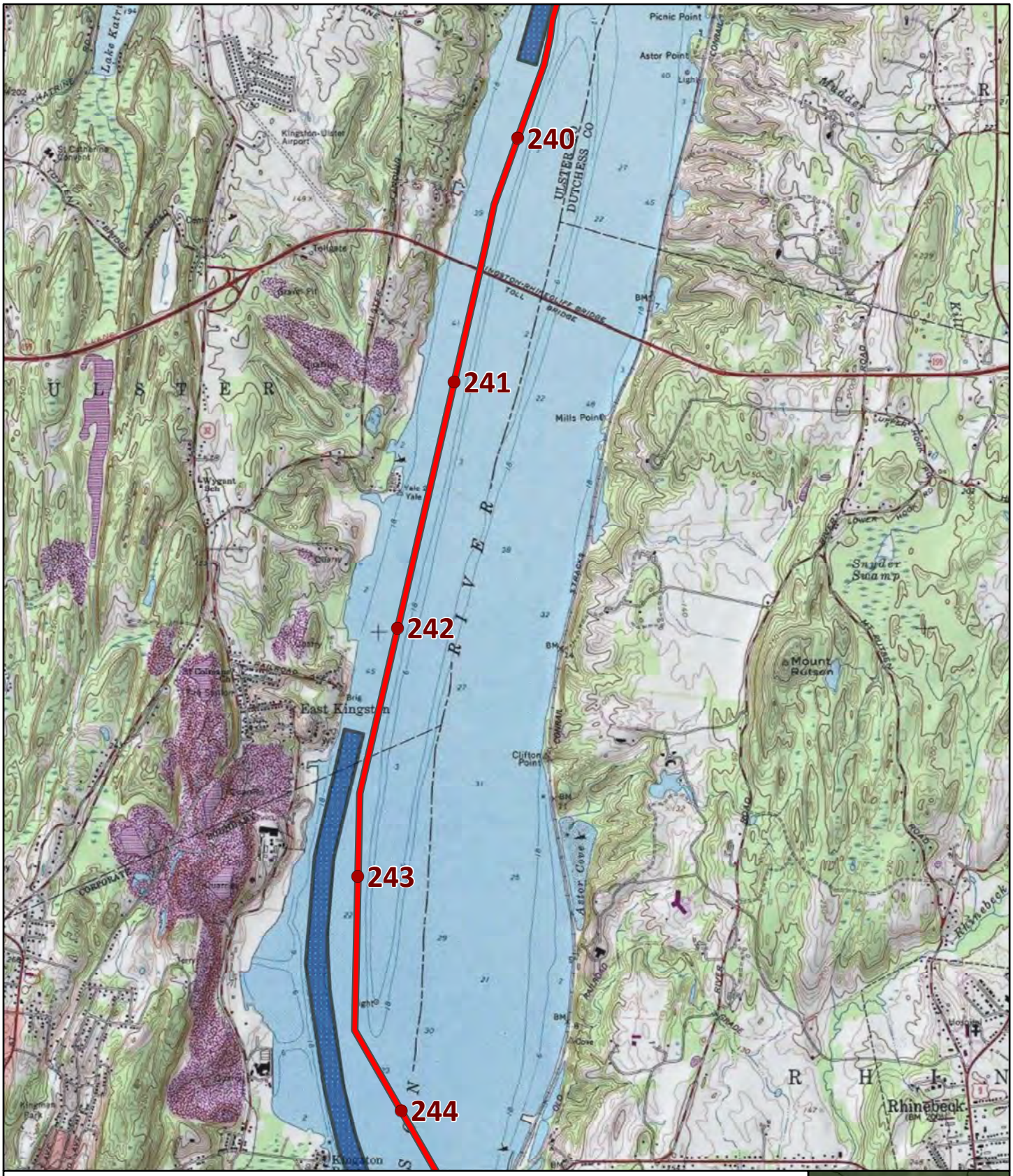

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Projection: Transverse Mercator
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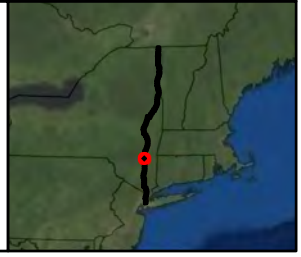

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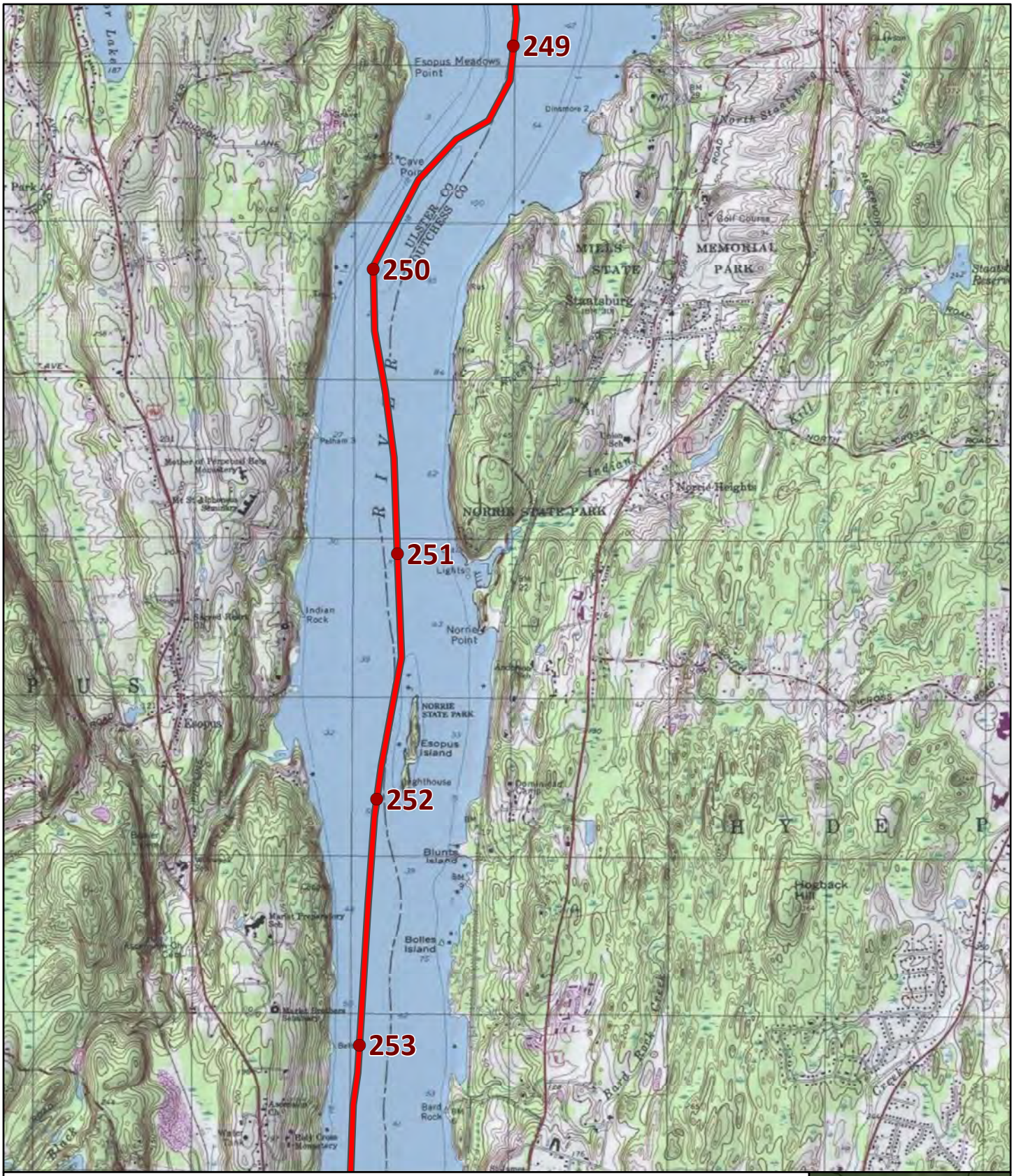

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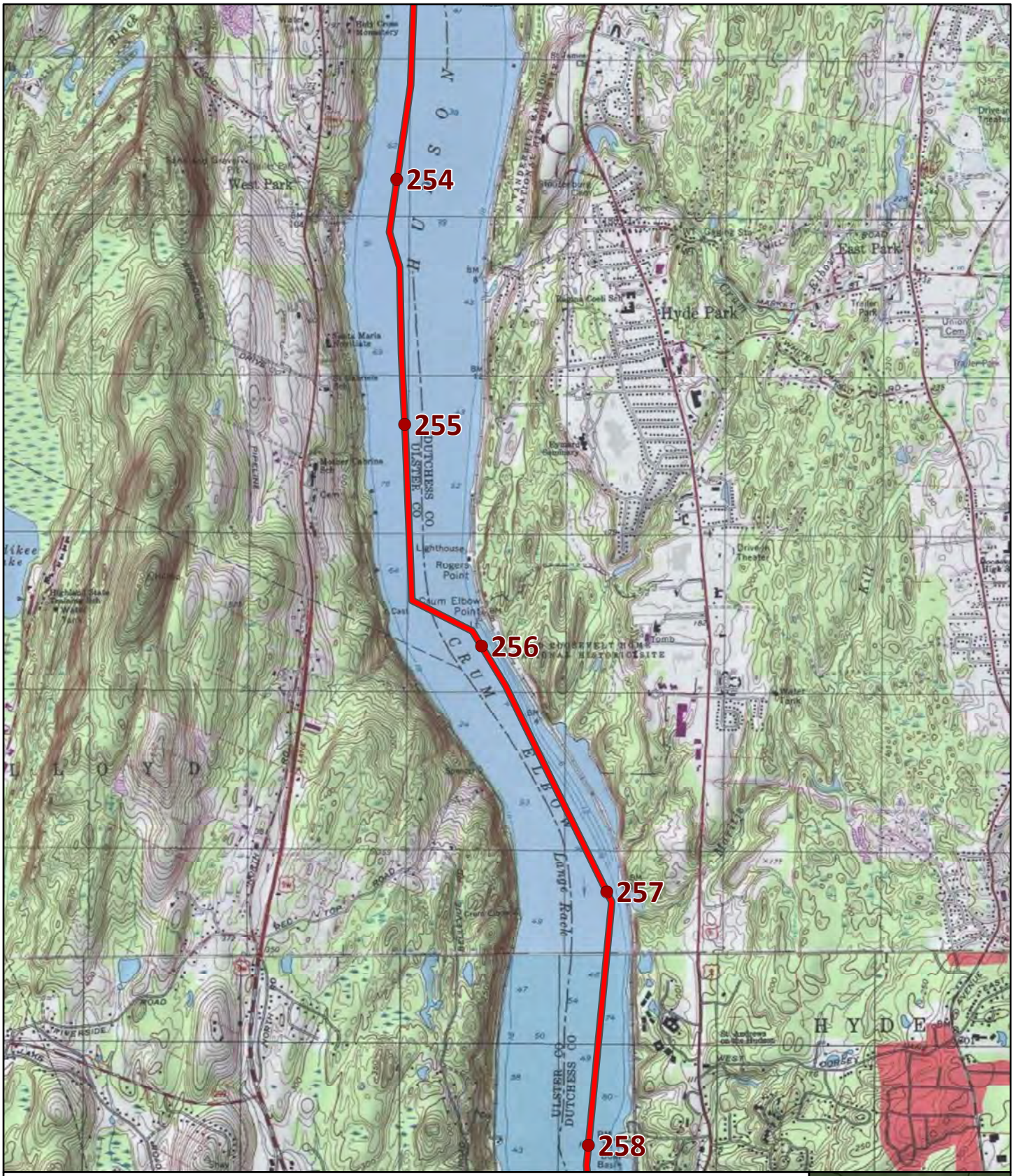

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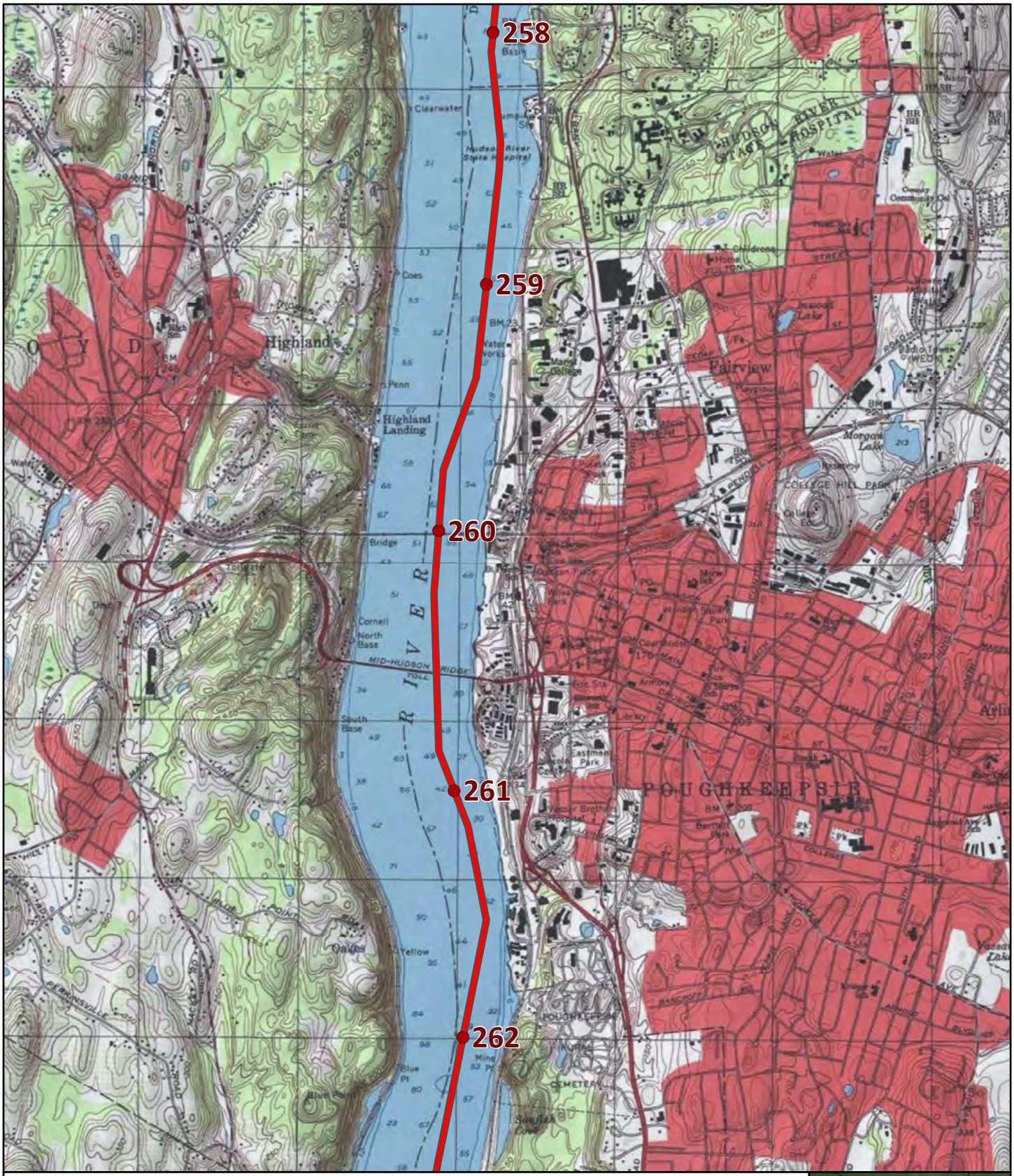

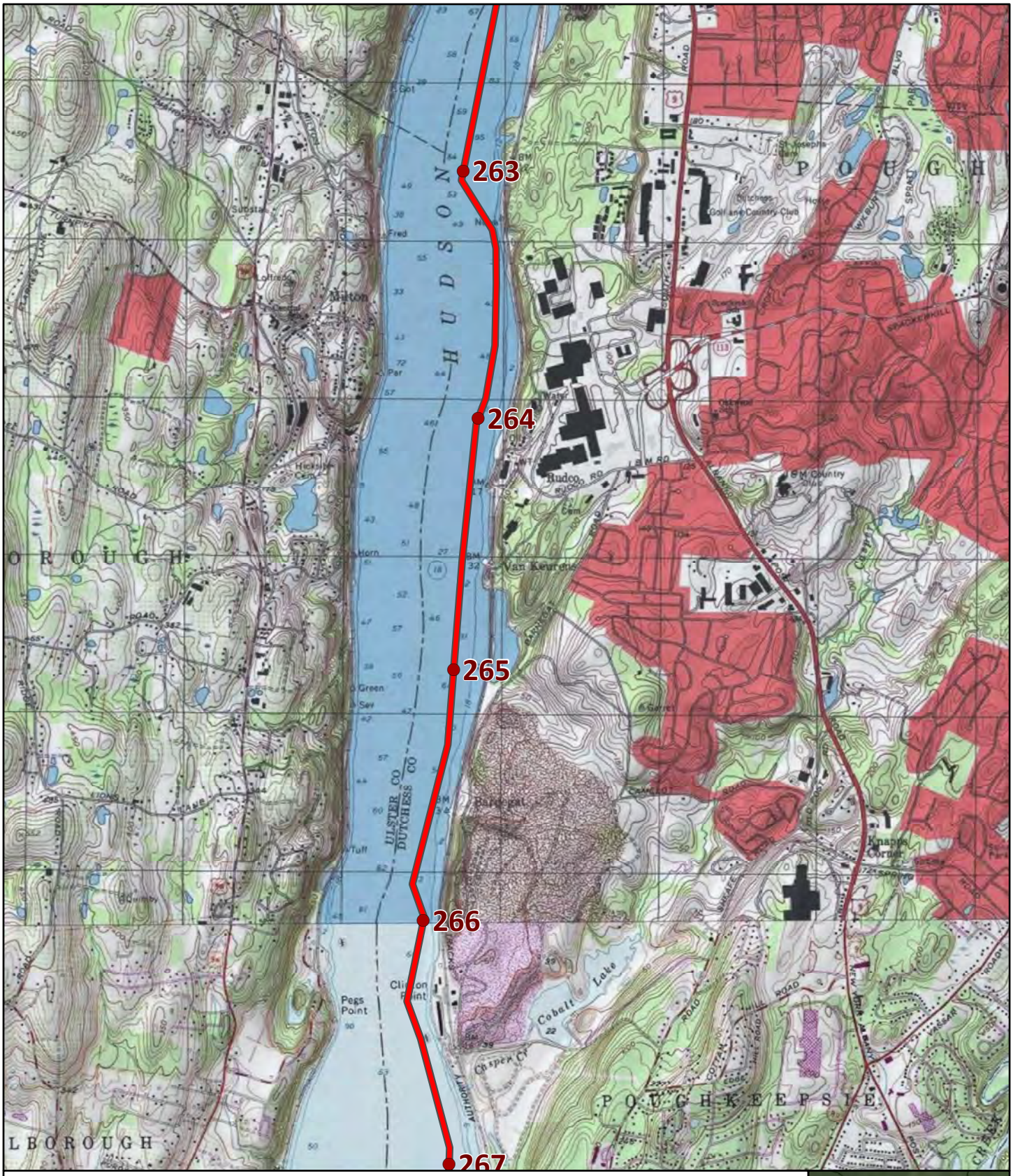

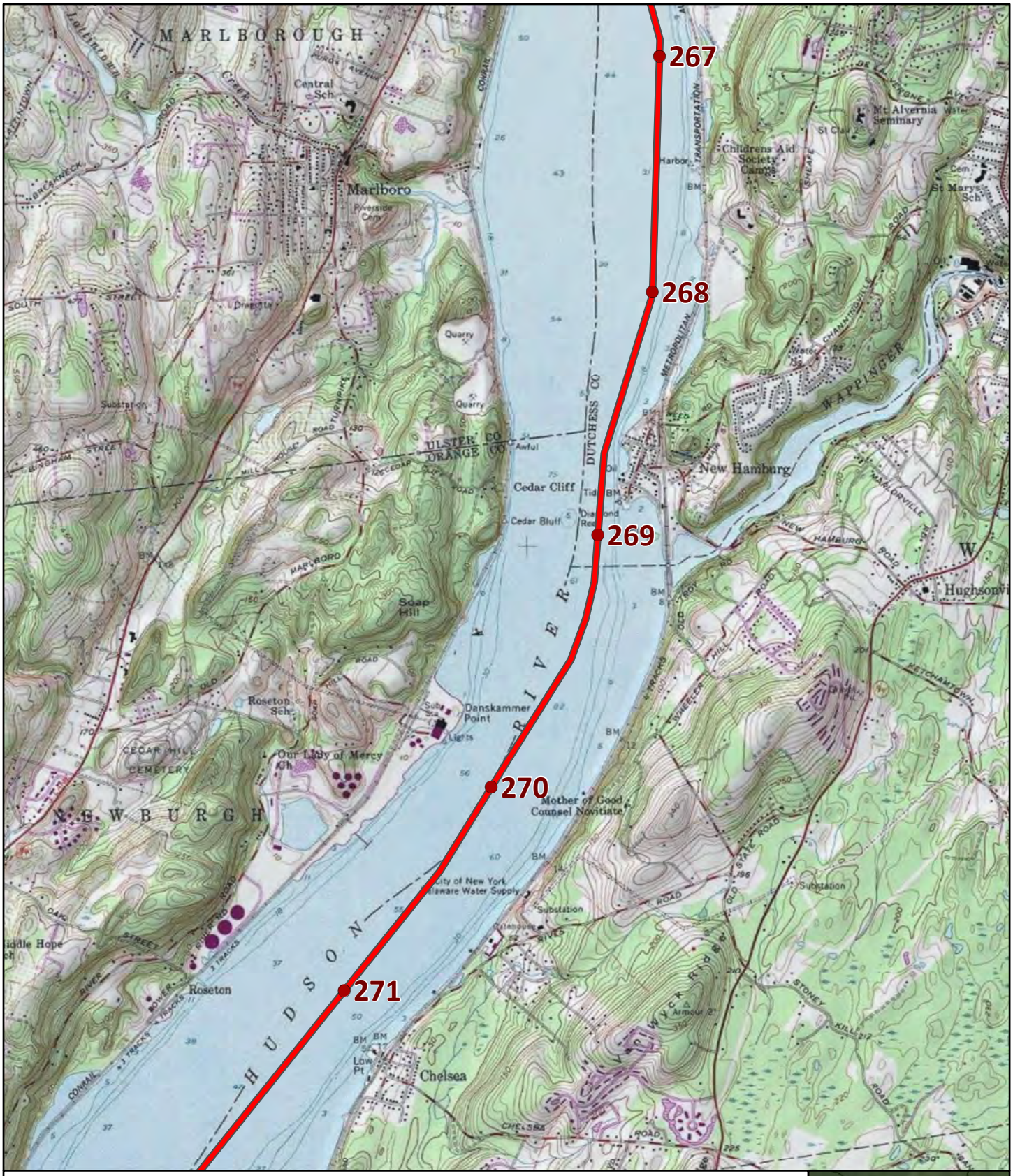

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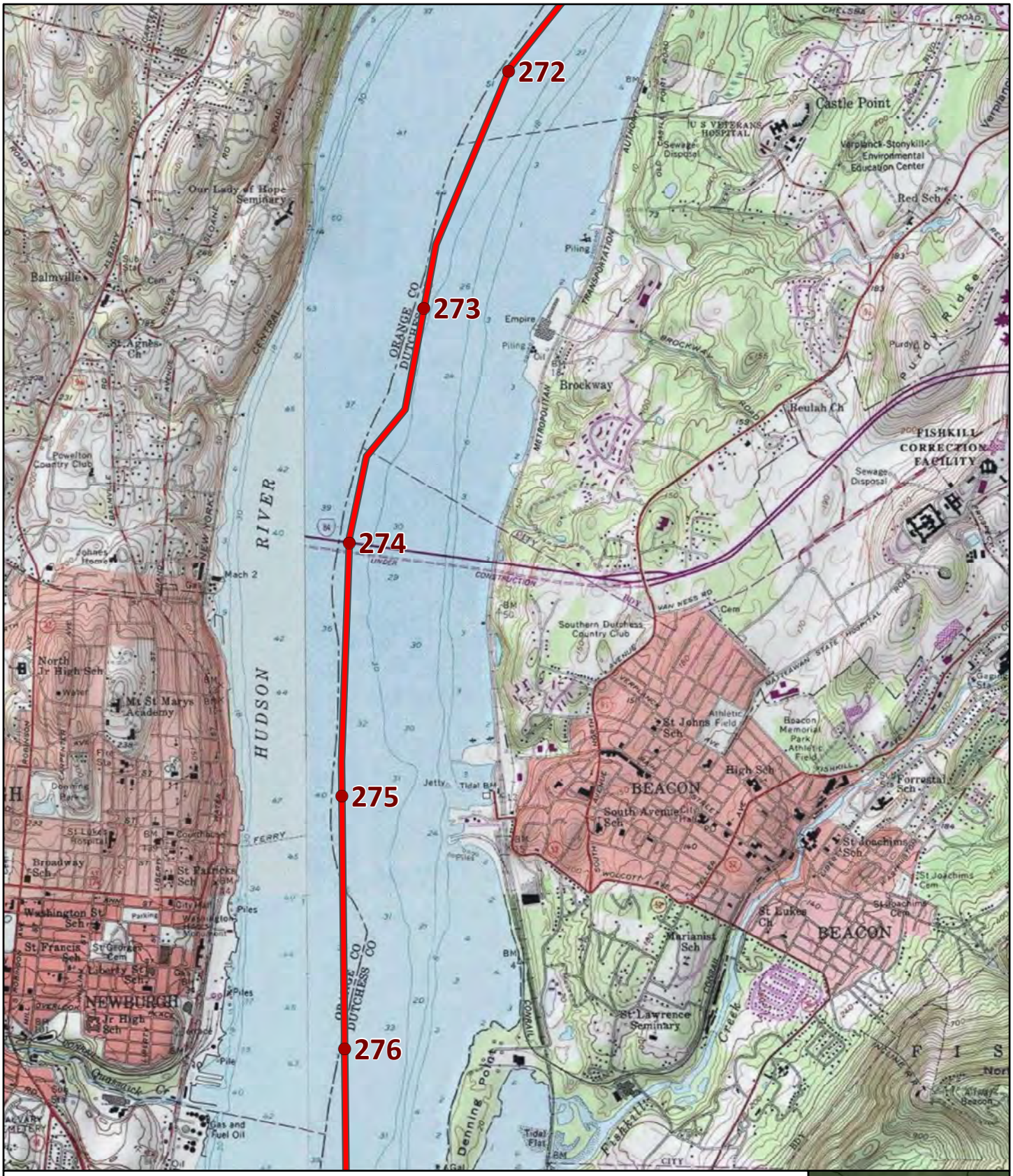

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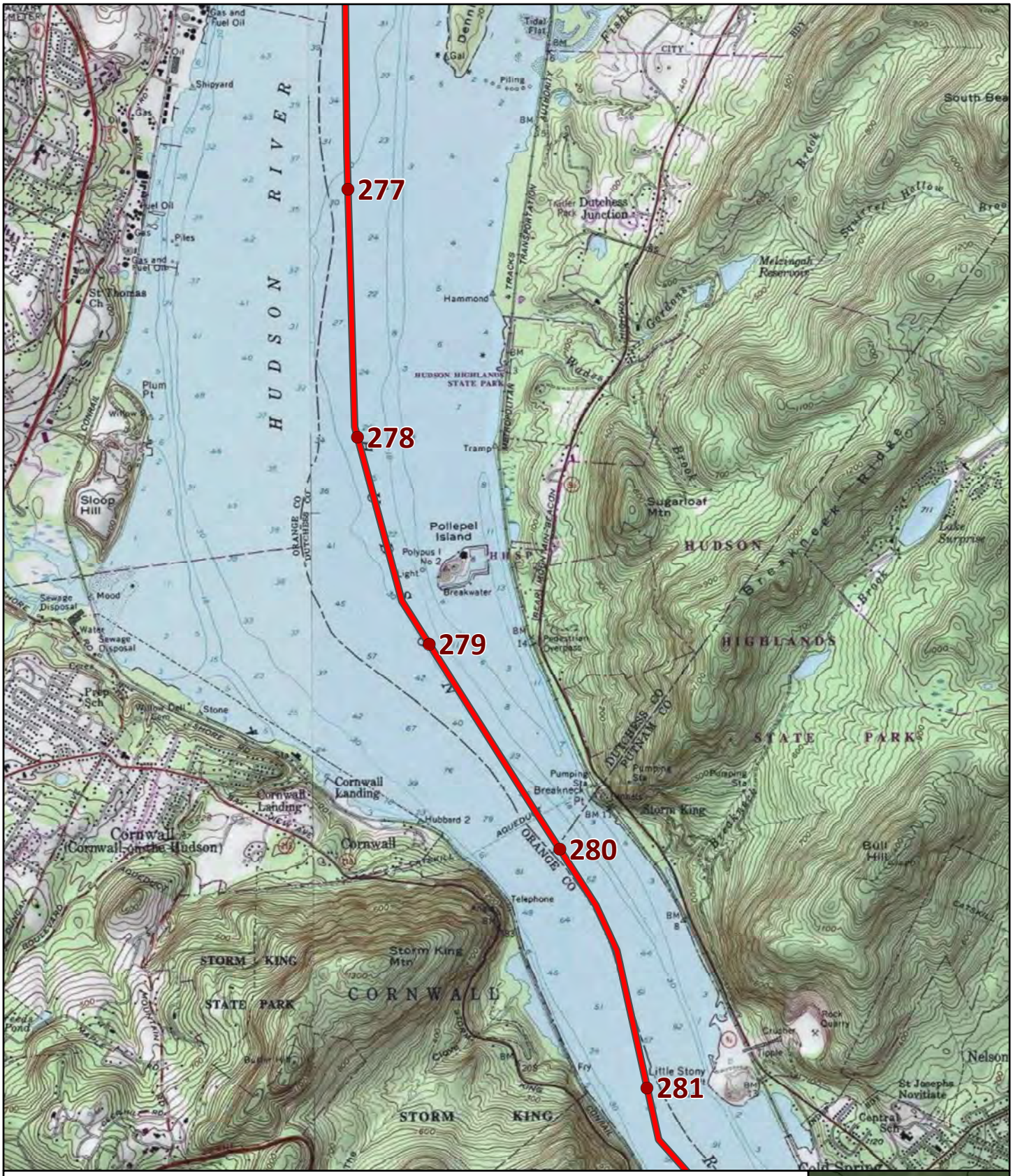

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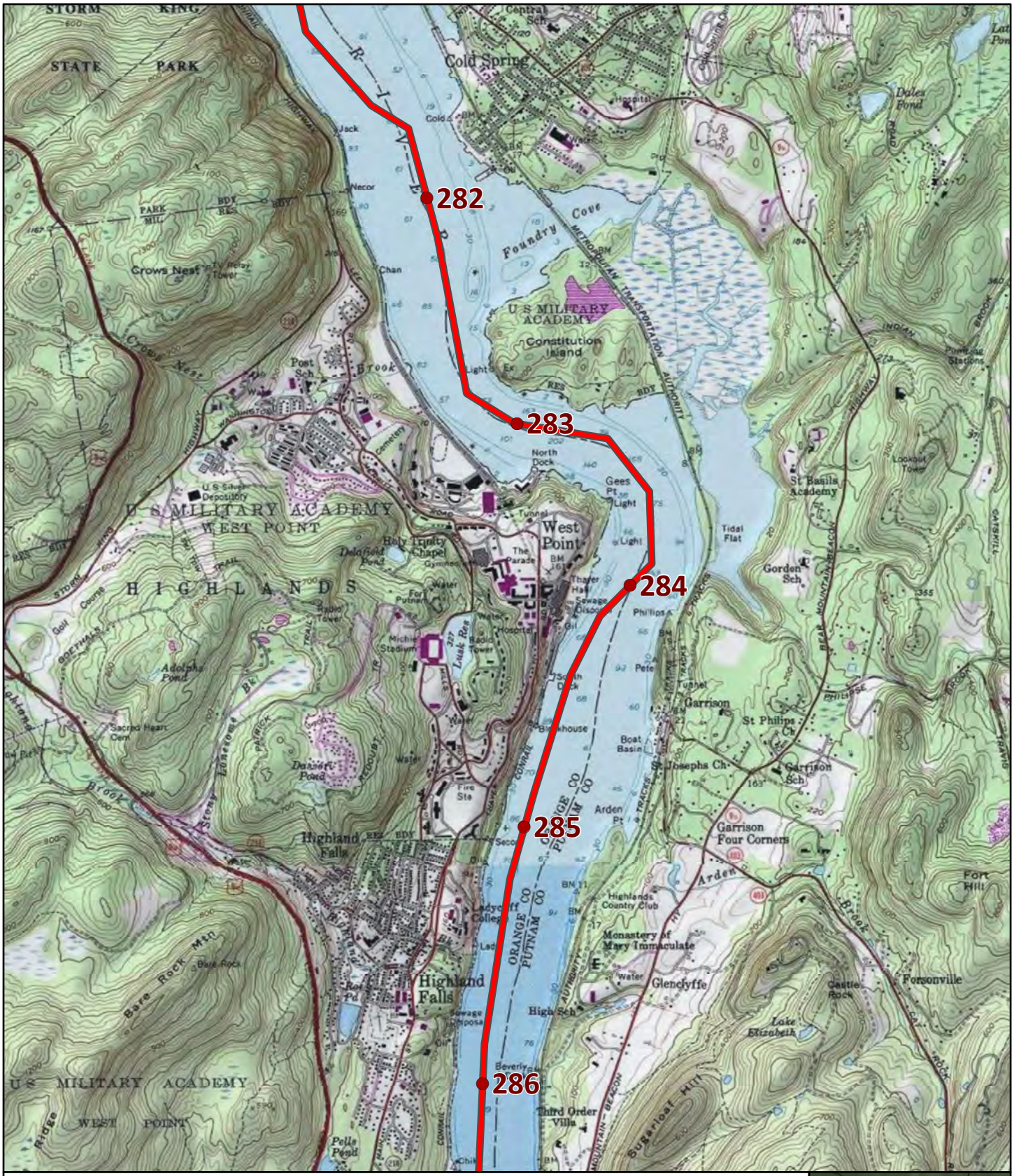

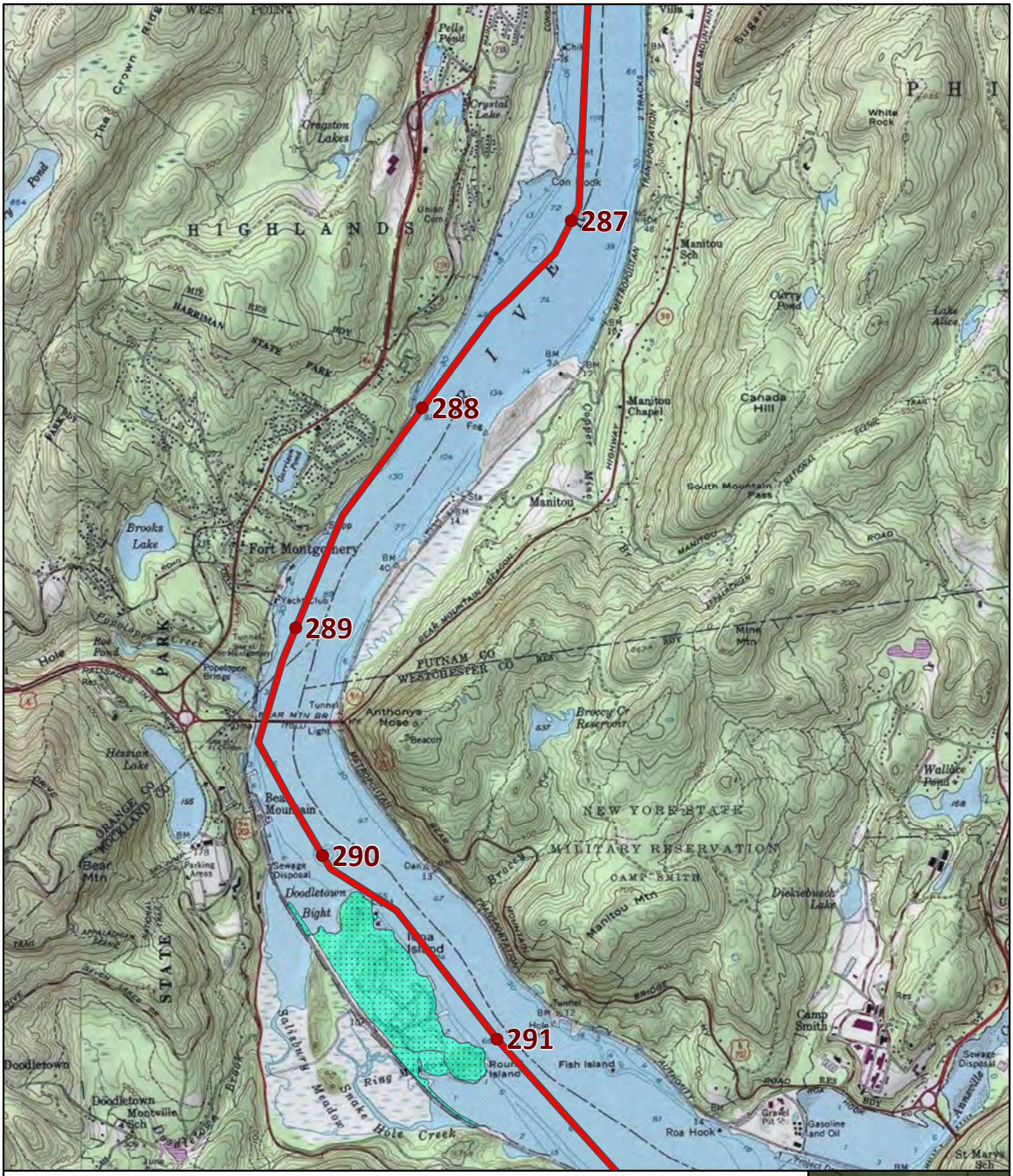

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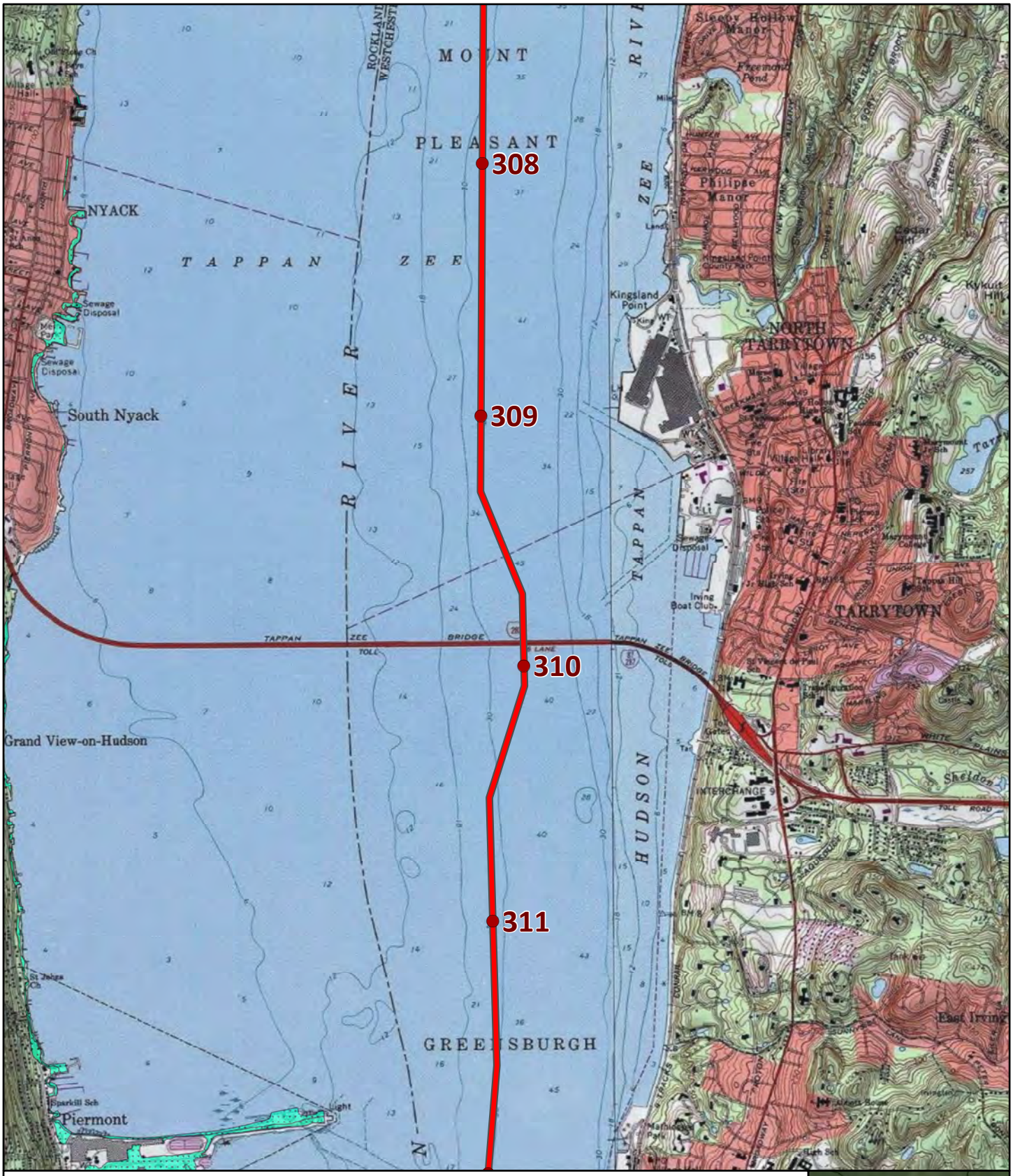

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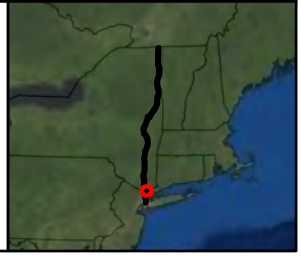

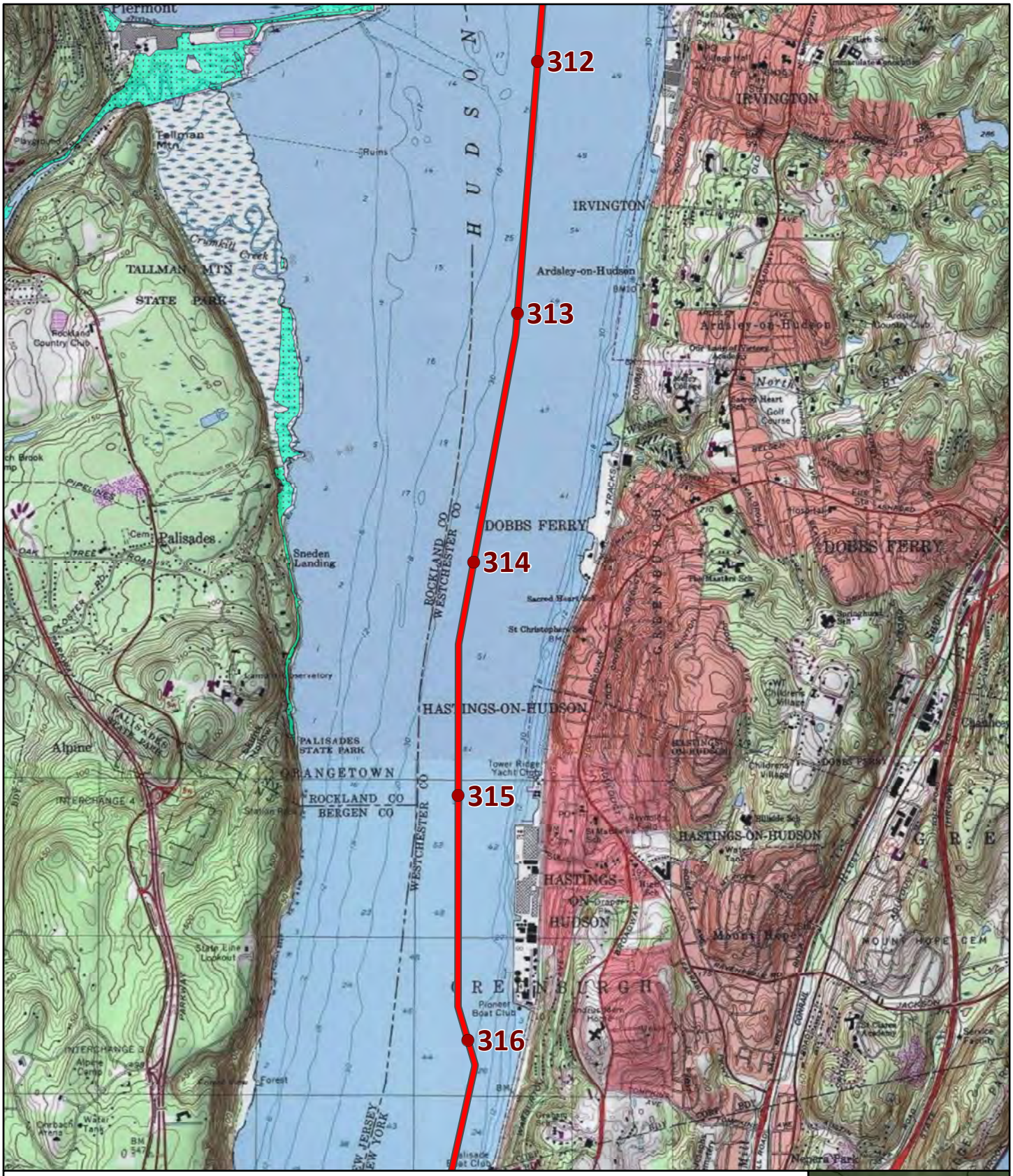

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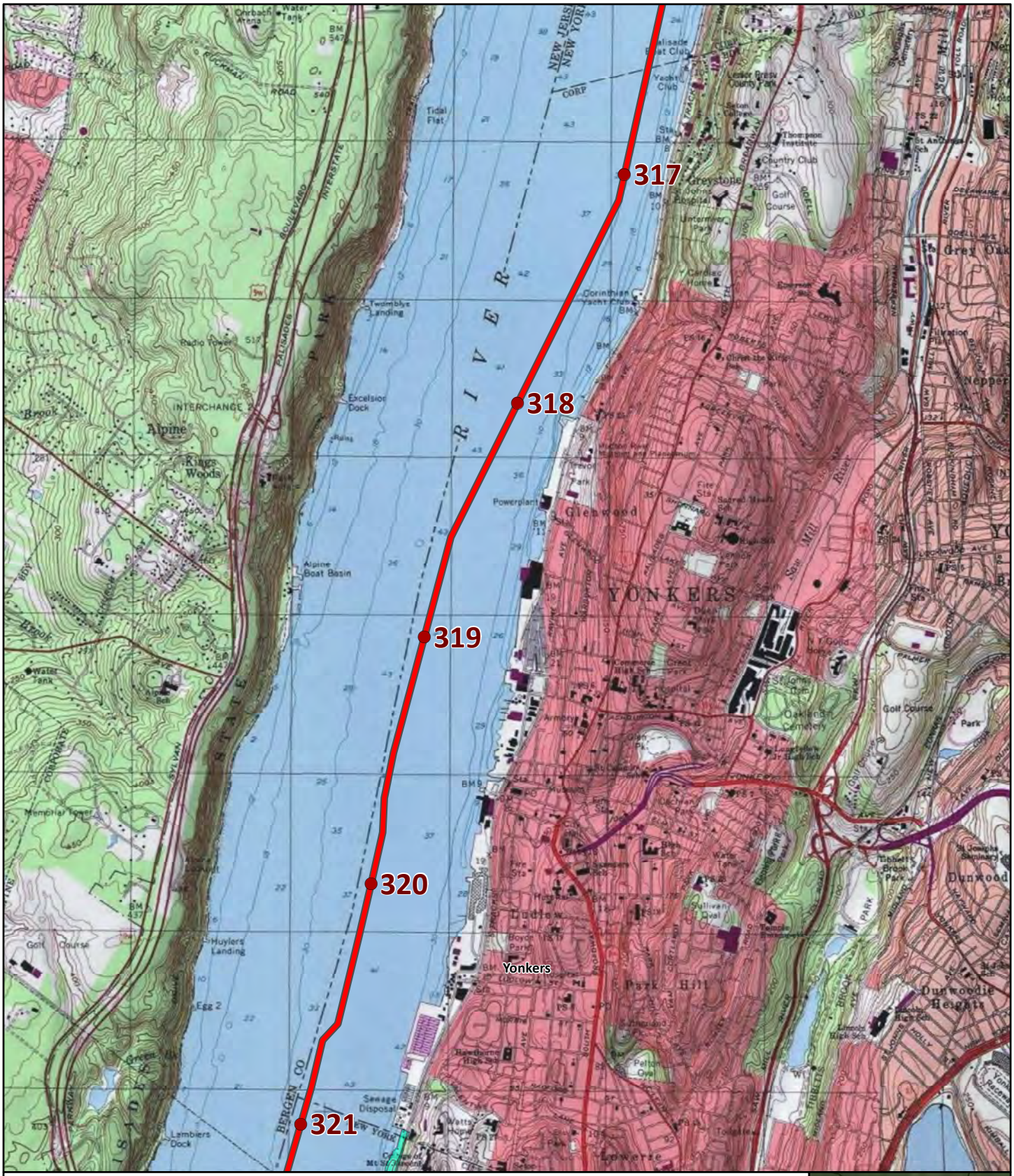

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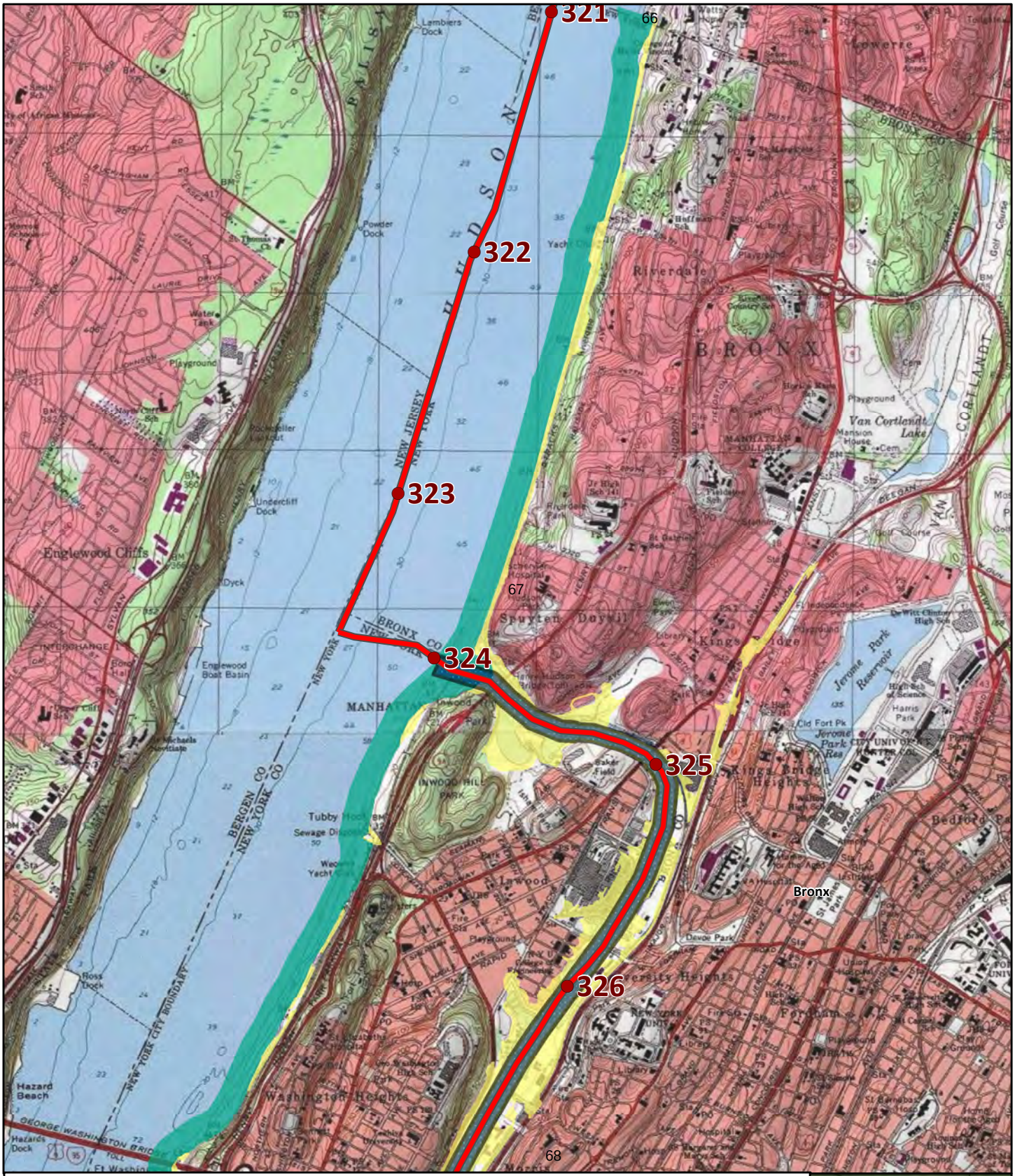

0 0.25 0.5 1 Miles

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State Plane New York East FIPS 3101 Feet
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Proposed CHPE Project Route Mileposts

Proposed CHPE Project Route

FEMA Preliminary Draft Work Map Data

Zone AE - High flood risk subject to inundation by the 1% annual-chance flood event. Base Flood Elevations (BFEs) have been determined.

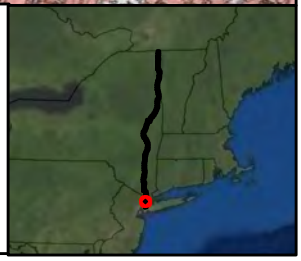
Zone VE - High flood risk subject to inundation by the 1% annual-chance flood event and storm-induced velocity wave action (a 3-foot or higher breaking wave).

HDD Installation

Pipe Bridge Installation

Delineated Wetlands

Federal Navigation Channel



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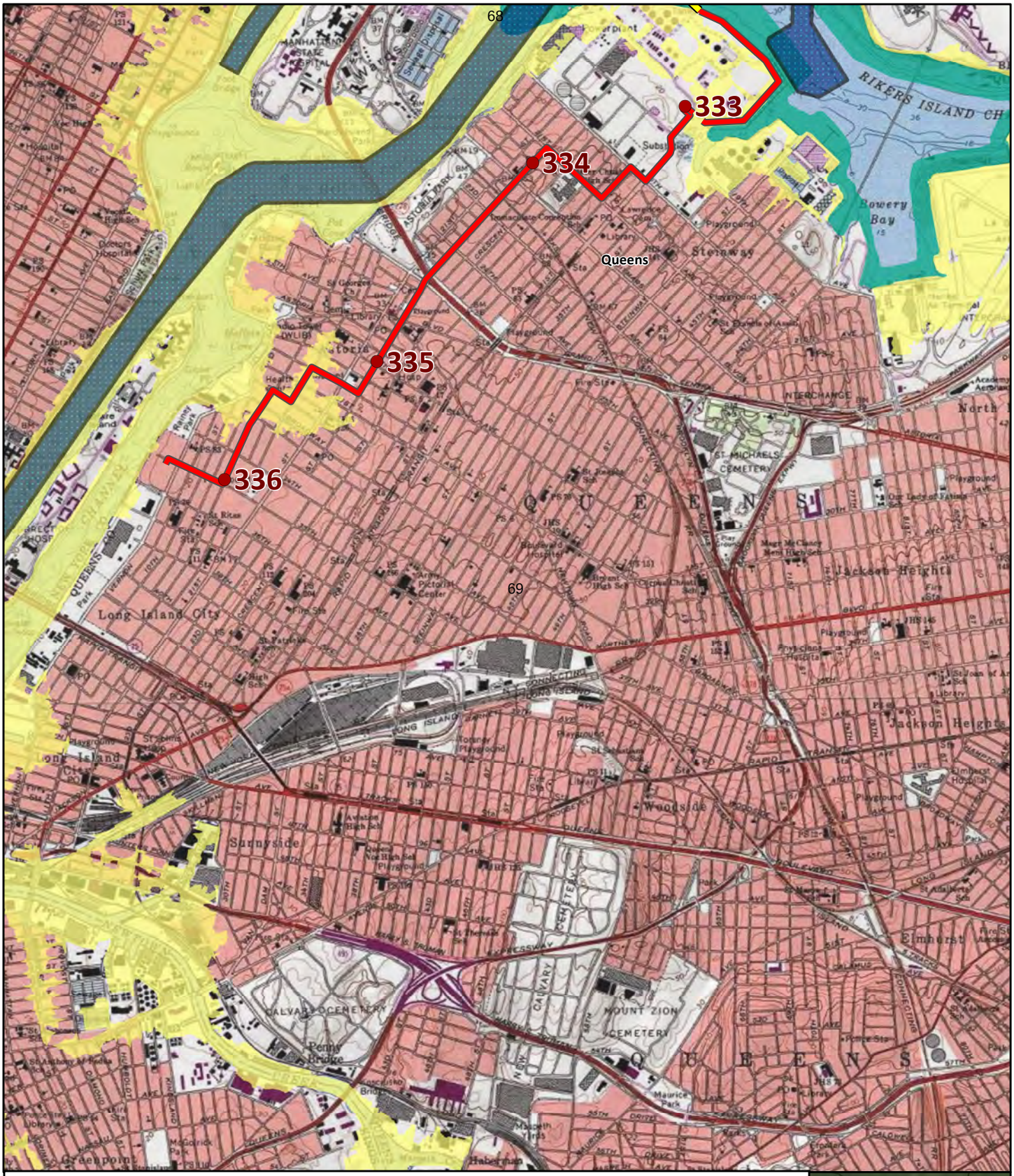

Source: Imagery -(c) 2010 Microsoft Corporation and its data suppliers.

APPENDIX B

CWA Section 404 Permit Application
Alternatives Analysis Report

CHAMPLAIN HUDSON POWER EXPRESS

HVDC TRANSMISSION PROJECT

UPDATED LEAST ENVIRONMENTALLY DAMAGING PRACTICABLE ALTERNATIVE EVALUATION

CHAMPLAIN HUDSON POWER EXPRESS, INC.

Albany, New York

USACE Application 2009-01089-EYA

July 3, 2013

CHAMPLAIN HUDSON POWER EXPRESS
HVDC TRANSMISSION PROJECT
UPDATED LEAST ENVIRONMENTALLY DAMAGING
PRACTICAL ALTERNATIVE EVALUATION

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HVDC TRANSMISSION PROJECT
UPDATED LEAST ENVIRONMENTALLY DAMAGING PRACTICAL ALTERNATIVE EVALUATION

LIST OF TABLES

List of Acronyms

AC	Alternating current
Article VII	Article VII of New York State Public Service Law
Astoria-Rainey Cable	Proposed set of HVAC cables from the Astoria Annex substation, which would be located within the streets of New York City for approximately three miles to Con Edison's Rainey Substation
BMP	Best Management Practices Manual
Certificate	Article VII Certificate of Environmental Compatibility and Public Need
CHPEI	Champlain Hudson Power Express, Inc.
CO_2	Carbon dioxide
Con Edison	Consolidated Edison Company of New York, Inc.
Corps or USACE	U.S. Army Corps of Engineers
CP	Canadian Pacific Railway
CSX	CSX Transportation, Inc.
CWA	Clean Water Act
D&H	Delaware and Hudson Railway
DC	Direct current
DOE	U.S. Department of Energy
Dredging Project	Upper Hudson River PDB Dredging Project
EM&CP	Environmental Management and Construction Plan
EMF	Electromagnetic fields
EPC	Engineering, Procurement and Construction
EPC	Engineering, Procurement and Construction
FERC	Federal Energy Regulatory Commission
FHWA	Federal Highway Administration

GHG	Greenhouse gas
Guidelines	Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230)
HDD	Horizontal directional drilling
HDPE	High density polyethylene
HVAC	High-voltage alternating current
HVDC	High-voltage direct current
J&B	Jack and Bore
kPA	Kilopascals
kV	Kilovolt
LEDPA	Least environmentally damaging practicable alternative
LEI	London Economics International, LLC
MNCR	Metro-North Commuter Railroad Co.
MP	Milepost
MTA	Metropolitan Transit Authority
MW	Megawatt
NAAQS	National ambient air quality standards
NE-ISO	New England Independent System Operator
NIETC	Mid-Atlantic Area National Interest Electric Transmission Corridor
NYISO	New York Independent System Operator
NYPA	New York Power Authority
NYPSC	New York Public Service Commission
NYRI	New York Regional Interconnect Project
NYSCC	New York State Canal Corporation

NYSDEC	New York State Department of Environmental Conservation
NYSDOS	New York State Department of State
NYSDOT	New York State Department of Transportation
NYSDPS	State of New York Department of Public Service
PAAA	New York State Public Accountability Act of 2005
PCBs	Polychlorinated biphenyls
PM	Particulate matter
Project	Champlain Hudson Power Express Project
RAP	Realistic achievable potential
RGGI	Regional Greenhouse Gas Initiative
RNA	Reliability Needs Assessment
ROV	Remotely-Operated Vehicle
ROW	Right-of-way
RSU Route	Uninterrupted submarine route between the Hertel substation located near Quebec and potential converter station locations within the NIETC and the vicinity of New York City
RWS	Gestion RSW, Inc.
SCFWH	Significant Coastal Fish and Wildlife Habitat
SPCC	Spill Prevention, Countermeasure, and Control Plan
TIGER	U.S. Census Bureau's Topologically Integrated Geographic Encoding and Referencing data files
USACE or Corps	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
VOCs	Volatile organic compounds
West Point	West Point Military Academy
XLPE	Cross-link polyethylene

Executive Summary

The U.S. Environmental Protection Agency ("USEPA") developed Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230) ("Guidelines") to implement Section 404(b)(1) of the Clean Water Act.[1] Pursuant to § 230.10 of the Guidelines, an applicant for a U.S. Army Corps of Engineers ("USACE") permit under Section 404 of the Clean Water Act must demonstrate that the proposed action is the least environmentally damaging practicable alternative ("LEDPA").

Specifically, applicants must demonstrate that there is no "practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem" and which "does not have other significant adverse environmental consequences" (40 C.F.R. § 230.10(a)). The Guidelines consider an alternative practicable "if 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)). In accordance with the Guidelines, Champlain Hudson Power Express, Inc. evaluated several alternatives to the Champlain Hudson Power Express Project ("Project").

Consistent with the Guidelines, the following alternatives analysis incorporates the extensive alternatives analysis undertaken as part of the New York State siting and permitting process.[2] As part of that proceeding, Settlement Parties undertook an intensive review of Project routing, with a specific focus on locating the cables out of the water to the extent practical and feasible. The Applicants also completed an alternatives analysis for the New York State Department of State as part of its review of the consistency certification for the Project in accordance with the Coastal Zone Management Act.[3] Based on consultation prior to the state proceeding, the State's alternatives analysis, and the ensuing settlement discussions and resultant Joint Proposal settlement, the Project incorporated a number of design and route changes.

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1 33 U.S.C. § 1344. See http://www.law.cornell.edu/uscode/text/33/1344.

2 230.10(a)(5). (Stating, in part, "[t]o the extent that practicable alternatives have been identified and evaluated under a Coastal Zone Management program, a § 208 program, or other planning process, such evaluation shall be considered by the permitting authority as part of the consideration of alternatives under the Guidelines."). See http://www.wetlands.com/epa/epa230pb.htm.

3 New York State Department of State, *Champlain Hudson Power Express Conditional Concurrence with Consistency Certificate* (June 8, 2011). See http://www.chpexpress.com/docs/regulatory/F-2010-1162%20CondCCR.PDF.

While these changes resulted in significant cost increases to the Project, the changes also ensured that the Project route was the least environmentally damaging practicable alternative consistent with the Project purpose (*i.e.*, the delivery of clean sources of generation from Canada into New York City in an economically efficient manner). As noted by the settlement parties in the state proceeding:

> *The preferred route as presented in this [settlement] was determined to be the best suited for the Facility, since it provides an appropriate balance among the various state interests, and it represents the minimum adverse environmental impact, considering the state of available technology, the nature and economics of the studied alternatives and other pertinent considerations.*

The New York State Public Service Commission issued an order granting Certificate of Environmental Compatibility and Public Need for the Project on April 18, 2013.[4]

As part of its LEDPA analysis, the Applicants reviewed three routes provided by the New York State Department of Public Service as part of the Article VII proceedings and three additional routes requested by the USACE. One of these alternatives, the Hell Gate Bypass, was accepted by the Applicants during the Article VII proceedings while segments of the Hudson River Western Rail Line Route were also incorporated into the Project. Each of the remaining alternatives was assessed for their overall practicability based on existing technology, logistics and costs. As summarized in the table below, when evaluated in terms of logistics and costs, the alternatives presented various logistical hurdles including engineering complexity, site access, and adverse affects to existing development, as well the potential for political and public opposition. All of the alternatives had projected costs, when coupled with the additional costs associated with the route designs accepted during the Article VII process, which would result in substantially greater costs than are normally associated with the particular type of project.

[4] Order Granting Certificate of Environmental Compatibility and Public Need at 256, *Application of Champlain Hudson Power Express, 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*, Case No. 10-T-0139 (N.Y. P.S.C. Apr. 18, 2013), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={A71423C8-B489-4996-9C5A-016C9F334FFC}.

Evaluation of Practicality of Alternatives to Project

	Logistics	Cost
Hudson River Western Rail Line Route	• Long HDD installations • Narrow work spaces • Installation in close proximity to residences/ businesses • Access restrictions • Increased construction duration • Four tunnel segments • Potential for public and political opposition	Increase in Project costs of ~$620 million or 42% over Article VII baseline route.
Harlem River Rail Route	• Busy passenger and rail usage • Geotechnical challenges • Access restrictions on rail trestle by NYSDOT and MTA • Increased risk of cable damage • Increased construction duration • High uncertainty as to engineering feasibility	Increase in costs from ~$81 million (305% of segment cost, 6% of Project cost) to $189 million (15%) over Article VII baseline route.
Existing ROW – West of Adirondack Park	• Difficult HDD installations • Narrow work spaces • Installation in close proximity to residences/ businesses • Density of aboveground utilities and other features • Underground utility avoidance • Increased construction duration • Potential for public and political opposition	Increase in project costs of ~$512 million or 35% over Article VII baseline route.
Existing ROW – East of Hudson River	• Long HDD installations • Narrow work spaces • Installation in close proximity to residences/ businesses • Density of aboveground utilities and other features • Underground utility avoidance • Increased construction duration • Potential for public and political opposition	Increase in project costs of ~$508 million or 35% over Article VII baseline route.
Overland Using New Power Line Route	• Potential long and difficult HDD installations • Increased construction duration • Potential for public and political opposition	Increase in project costs of ~$1.14 billion or 79% over Article VII baseline route.

As part of the Article VII proceeding and consistency review under the Coastal Zone Management Act, the Applicants have accepted a number of Project routing changes aimed at locating the cables out of the water to the extent practical and feasible. While these changes resulted in significant cost increases to the Project, the changes also ensured that the Project route was the least environmentally damaging practicable alternative consistent with the Project purpose (*i.e.*, to deliver clean sources of generation from Canada into New York City in an economically efficient manner). The further analysis undertaken here, pursuant to the Guidelines, confirms that the Project — when evaluated against other alternatives based on logistics, existing technology, and costs — is the least environmentally damaging practicable alternative.

Section 1
Introduction

The U.S. Environmental Protection Agency ("USEPA") developed Guidelines for Specification of Disposal Sites for Dredged or Fill Material (40 CFR Part 230) ("Guidelines") to implement Section 404(b)(1) of the Clean Water Act.[5] Pursuant to § 230.10 of the Guidelines, an applicant for a U.S. Army Corps of Engineers ("USACE") permit under Section 404 of the Clean Water Act must demonstrate that the proposed action is the least environmentally damaging practicable alternative ("LEDPA").

In accordance with the Guidelines, Champlain Hudson Power Express, Inc. ("CHPEI", and, together with its wholly owned subsidiary, CHPE Properties, Inc., the "Applicants") has developed this alternatives analysis to evaluate several alternatives considered for the Champlain Hudson Power Express Project ("Project"). This document provides an overview of the proposed Project and describes the alternatives considered in the Project's design process. As summarized in this analysis, the Applicants evaluated several alternatives in relation to the Project's purpose, need, and geographic requirements, as well as the practicability and environmental consequences of each alternative.

Consistent with the Guidelines, this analysis incorporates the extensive alternatives analysis undertaken as part of the New York State siting and permitting process.[6] As a consequence of that process, many alternatives were evaluated and the Project has been revised significantly since it was originally proposed. Thus, as demonstrated below, the Project – as currently proposed – is the least environmentally damaging practicable alternative.

1.1 Project Background

The discussion below provides an overview of the development of the Project and identifies the various environmental, regulatory, cost, and political factors that informed the routing of the Project.

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5 33 U.S.C. § 1344. See http://www.law.cornell.edu/uscode/text/33/1344.

6 230.10(a)(5). (Stating, in part, "[t]o the extent that practicable alternatives have been identified and evaluated under a Coastal Zone Management program, a § 208 program, or other planning process, such evaluation shall be considered by the permitting authority as part of the consideration of alternatives under the Guidelines."). See http://www.wetlands.com/epa/epa230pb.htm.

1.1.1 Original Project

In 2008, the Applicants commissioned Gestion RSW, Inc. ("RSW") to conduct feasibility studies of possible HVDC submarine transmission cable projects that would deliver power to the Mid-Atlantic Area National Interest Electric Transmission Corridor ("NIETC"). RSW developed an uninterrupted submarine route between the international border and potential converter station locations within the NIETC and the vicinity of New York City (the "RSW Route").[7] The RSW Route utilized the Richelieu River, Lake Champlain (within New York State), the Champlain Canal, the Hudson River, and other parts of the waters in and around New York City.

As a result of Applicants' consultation prior to filing a state siting permit with New York State, the New York State Canal Corporation ("NYSCC") staff raised concerns over its legal authority to enter into a long-term agreement providing the Applicants with the right to locate cables within the Champlain Canal. Among other state constitutional and statutory obstacles, the NYSCC is subject to certain restrictions under the New York State Public Authorities Accountability Act of 2005 with regard to the transfer of real property rights.[8] Additionally, after consultation with state and federal regulatory agencies (including the USEPA), it became evident that the HVDC submarine cables should not be installed within the Upper Hudson River before completion of the dredging activities associated with the Upper Hudson River PCB Dredging Project ("Dredging Project"), which was estimated to continue through 2016.[9] Therefore, the Applicants identified a terrestrial bypass route to circumvent the Dredging Project area to ensure the Project would not exacerbate existing water quality issues or otherwise interfere with the Dredging Project.[10]

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7 *Attachment Q: Supplemental Alternatives Analysis at 2 -3, 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 Public Service Law for the Construction, Operation and Maintenance of a High-Voltage Direct Current Circuit from the Canadian Border to New York City*, Case No. 10-T-0139 (N.Y. P.S.C. July 22, 2010) http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={D6AC823D-402A-4E1F-A621-8E7FF1906D7D}.

8 New York State Public Authorities Law Section 2897. See http://codes.lp.findlaw.com/nycode/PBA/9/5-A/2897.

9 General Electric. 2008. Phase 2 Intermediate Design Report, Hudson River PCBs Superfund Site. Accessed on-line on April 28, 2013 at: http://www.epa.gov/hudson/pdf/2008_5_13_phase_2_intermediate_design_report_text.pdf.

10 The northern portion of the Upper Hudson River PCB Dredging Project begins near the former Fort Edward Dam at Lock C7 and moves south to Troy Dam.

1.1.2 New York Regional Interconnection

In designing the Project to incorporate the overland bypasses described above, the Applicants attempted to maximize the use of existing rights-of-way ("ROW") and bury the transmission cables as a consequence of the failed New York Regional Interconnect ("NYRI") project. NYRI was a New York company that attempted to obtain authorization from New York State to construct a 1,200 MW, HVDC transmission line from the Edic substation in Marcy, New York to the Rock Tavern substation in New Windsor, New York.[11] The NYRI project, as proposed, would have been completely overhead with no burial.[12] NYRI's sponsors argued that the line would reduce congestion and help meet state goals regarding renewable energy, fuel and locational supply diversity, and greenhouse gas reduction.[13]

Citizen groups organized against the project (*e.g.*, STOPNYRI, Communities Against Regional Interconnect, Upstate New York Citizen's Alliance)[14] due to the use of overhead lines and the potential for NYRI to use eminent domain to take homes within its proposed project area.[15] Over 2,000 people attended thirteen (13) public hearings held by the New York Public Service Commission ("NYPSC") and more than 2,600 letters and e-mails from the public were received by the NYPSC.[16] Various hearings regarding the project drew over-capacity crowds and, in the

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[11] *Application of New York Regional Interconnect, Inc. for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII for a high voltage direct current electric transmission line running between National Grid's Edic Substation in the Town of Marcy, and Central Hudson Gas & Electric's Rock Tavern Substation located in the Town of New Windsor,* Case No. 06-T-0650, http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=06-T-0650.

[12] Comments of NYSDEC Regarding the Application at 3, *Application of New York Regional Interconnect, Inc. for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII for a high voltage direct current electric transmission line running between National Grid's Edic Substation in the Town of Marcy, and Central Hudson Gas & Electric's Rock Tavern Substation located in the Town of New Windsor,* Case No. 06-T-0650 (N.Y. P.S.C. July 18, 2006), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={DC7B9711-93BB-450F-8166-6A4D09D16169}.

[13] Rebuttal Testimony of Jonathan A. Lesser and J. Nícholas Puga on Behalf of New York Regional Interconnect, Inc. at 15-16, *Application of New York Regional Interconnect, Inc. for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII for a high voltage direct current electric transmission line running between National Grid's Edic Substation in the Town of Marcy, and Central Hudson Gas & Electric's Rock Tavern Substation located in the Town of New Windsor,* Case No. 06-T-0650 (N.Y. P.S.C. Mar. 2, 2009), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={5EDB6D60-3CD7-4F6E-9504-E706A6B3D07A}.

[14] Fritz Mayer, *The Year of the Power Line Battles*, The River Reporter (Dec. 28, 2006), http://www.riverreporter.com/issues/06-12-28/news-power.html.

[15] New York Transportation Corporation Law (N.Y. Transp. Corp. L. § 11(3-a) (McKinney 1996)) generally allows an electric corporation to take private property if needed for a public purpose.

[16] Press Release, New York State Public Service Commission, *Commission Officially Dismisses NYRI, New Application Must Be Filed if Company Wants to Pursue Project* (Apr. 21, 2009),

later stages, required police presence to maintain order.[17] Reports indicated that approximately $2,397,000 was spent in opposition to the project.[18]

Community opponents argued that the line would traverse historic areas, raise upstate electricity prices, increase the risk of childhood cancers as a result of electromagnetic fields (EMF), and reduce property values in a part of the state already struggling economically. The seven (7) counties which would be occupied by the proposed NYRI transmission system organized against the project.[19] Local media coverage of the project was intense and hostile. In addition to local community concerns, the project was opposed by upstate business, utilities, and state agencies.[20]

Attempts to stop the project occurred in several venues. Market opponents attempted to frustrate the project during interconnection proceedings before the New York Independent System Operator ("NYISO").[21] In addition, NYRI became a high-visibility issue for the New York State Legislature. The first legislative response was a proposal to fund opposition to the project.[22] As opposition grew, however, opponents demanded that the legislature do more to definitively terminate the project. As a result, Governor George Pataki enacted legislation limiting the use of

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http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={6F0413CF-6EB1-4695-A65B-82AC65D682D3}.

17 Brendan Scott, *High-voltage Line Ignites Crowd's Ire*, The Herald-Record (Apr. 28, 2006), http://www.recordonline.com/apps/pbcs.dll/article?AID=/20060428/NEWS/304289999&cid=sitesearch.

18 Elizabeth Cooper, *NYRI Quits; Power Line Project Dead*, Utica Observer-Dispatch (Apr. 4, 2009), http://www.uticaod.com/news/x1525913735/NYRI-Quits-power-line-project-dead?zc_p=1.

19 Melissa deCordova, *County Leaders Strategize Against NYRI*, The Evening Sun (June 13, 2006), http://www.evesun.com/news/stories/2006-06-13/99/County-leaders-strategize-against-NYRI/.

20 Comments and testimony in opposition to the NYRI project either wholly or in part as proposed were provided by, among others, the New York Chapter of the National Federation of Independent Business, Con Edison, the New York Power Authority, New York State Department of Environmental Conservation, New York State Attorney General, New York State Department of Public Service and New York State Department of Agriculture and Markets, *See Application of New York Regional Interconnect, Inc. for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII for a high voltage direct current electric transmission line running between National Grid's Edic Substation in the Town of Marcy, and Central Hudson Gas & Electric's Rock Tavern Substation located in the Town of New Windsor*, Case No. 06-T-0650, http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=06-T-0650.

21 Companies expressing concerns were Con Edison, Orange and Rockland Utilities, Central Hudson, and Long Island Power Authority. *See Power Line near Delaware Hits Snag*, Pocono News (June 2, 2008), http://www.pocononews.net/news/June08/02/02Jun08-5.html.

22 Jeff Genung, *Libous Announces $1M to Fight NYRI*, The Evening Sun (Aug. 30, 2006), http://www.evesun.com/news/stories/2006-08-30/461/Libous-announces-1M-to-fight-NYRI/.

eminent domain to acquire rights-of-way generally, making it "virtually impossible" for NYRI to build the power line.[23]

After several unfavorable NYISO, court, and Federal Energy Regulatory Commission ("FERC") decisions, NYRI filed a letter with the NYPSC on April 6, 2009 (as clarified on April 8, 2009) withdrawing its petition for a certificate to construct the power line.[24] On April 21, 2009, the NYPSC granted the withdrawal "with prejudice," indicating that, if NYRI decided to resurrect the project, it would need to file a new application and begin the process anew.[25] The magnitude of public and political opposition that NYRI faced, and which ultimately killed the NYRI project, substantially informed Applicants' approach to the design and route of the Project. More specifically, Applicants avoided, to the extent practicable, proposing a Project route that would locate the line near homes and business or otherwise rely significantly on eminent domain to achieve its routing.

In the ensuing analysis, when the Applicants state that public or political opposition is likely, this characterization is directly based on NYRI's experience and its failed outcome.

1.1.3 New York State Article VII Settlement Process

In addition to the Project route configurations resulting from pre-filing consultation and the lessons learned from the failed NYRI project, the current Project route was shaped significantly by the New York State permitting process. Specifically, the alternatives analysis set forth herein includes and incorporates information and analysis undertaken pursuant to Article VII of the

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23 Fritz Mayer, *Citizen Groups Still Fighting NYRI*, The River Reporter (Nov. 9, 2006), http://www.riverreporter.com/issues/06-11-09/head2-nyri.html.

24 NYRI Submits Notification that it is Suspending its Application filed under Article VII of the Public Service Law, *Application of New York Regional Interconnect, Inc. for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII for a high voltage direct current electric transmission line running between National Grid's Edic Substation in the Town of Marcy, and Central Hudson Gas & Electric's Rock Tavern Substation located in the Town of New Windsor*, Case No. 06-T-0650 (N.Y. P.S.C. Apr. 6, 2009), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={7241B9D8-8B9C-4A92-B19E-4446DF4D0F9D}.

25 Letter from Jaclyn A. Brilling, New York State Public Service Commission, to Leonard H. Singer, Esq., Couch White LLP, Regarding a Certificate of Environmental Compatibility and Public Need, *Application of New York Regional Interconnect, Inc. for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII for a high voltage direct current electric transmission line running between National Grid's Edic Substation in the Town of Marcy, and Central Hudson Gas & Electric's Rock Tavern Substation located in the Town of New Windsor*, Case No. 06-T-0650 (N.Y. P.S.C. Apr. 21, 2009), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={26743727-8726-4A5D-9DB6-64ABD60BA7CB}.

New York State Public Service Law ("Article VII").[26] Through the Article VII process, the Applicants, along with a number of state regulatory agencies and non-governmental public interest organizations ("Settlement Parties"),[27] conducted an intensive and thorough review of the Project's proposed routing, with a specific focus on locating the cables out of the water to the extent practical and feasible. After consideration of various alternative routes, the Settlement Parties established a route that "represents the minimum adverse environmental impact, considering the state of available technology, the nature and economics of the studied alternatives and other pertinent considerations."[28] The Settlement Parties' findings were recently affirmed by the NYPSC when an Article VII Certificate of Environmental Compatibility and Public Good was issued to the Applicants on April 18, 2013.[29]

Concurrently with the Article VII process, the New York State Department of State (NYSDOS) completed its review of the consistency certification for the Project in accordance with the Coastal Zone Management Act.[30] As part of this process, the NYSDOS requested that the Applicants provide an analysis of alternative routes considered.[31] In its decision, the NYSDOS

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[26] N.Y. Pub. Serv. Law §§ 120-130. In New York State, Article VII governs the state siting and environmental review process for transmission facilities. See http://public.leginfo.state.ny.us/LAWSSEAF.cgi?QUERYTYPE=LAWS+&QUERYDATA=@SLPBS0A7+&LIST=LAW+&BROWSER=EXPLORER+&TOKEN=27396543+&TARGET=VIEW.

[27] Settlement endorsing the Joint Proposal for all purposes include: the Applicants, New York State Department of Public Service; New York State Department of Environmental Conservation; New York State Department of State; Adirondack Park Agency; New York State Office of Parks, Recreation and Historic Preservation, Riverkeeper, Inc.; Scenic Hudson, Inc.; and New York State Council of Trout Unlimited. The New York State Department of Transportation and Vermont Electric Power Company signed the JP for the limited purposes of participating in the sections of importance to them.

[28] Joint Proposal at 46, *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 Public Service Law for the Construction, Operation and Maintenance of a High-Voltage Direct Current Circuit from the Canadian Border to New York City*, Case No. 10-T-0139 (N.Y. P.S.C. Feb. 24, 2012) ("Joint Proposal" or "Joint Proposal of Settlement"), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={C5F63E41-5ED5-46A2-99A5-F1C5FC522D36}.

[29] Order Granting Certificate of Environmental Compatibility and Public Need, *Application of Champlain Hudson Power Express, 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*, Case No. 10-T-0139 (N.Y. P.S.C. Apr. 18, 2013), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={A71423C8-B489-4996-9C5A-016C9F334FFC}.

[30] New York State Department of State, *Champlain Hudson Power Express Conditional Concurrence with Consistency Certificate* (June 8, 2011). See http://www.chpexpress.com/docs/regulatory/F-2010-1162%20CondCCR.PDF.

[31] Article VII Updated Alternatives Analysis, *Application of Champlain Hudson Power Express, 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*

note that "while the project does not itself constitute a "water dependent" use, several conditions ensures 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."[32] The conditions imposed by the NYSDOS, which in general address burial depth, utilization of horizontal directional drilling, routing and construction windows, have all be incorporated into the Applicants' Project as confirmed in a letter sent to the USACE on July 7, 2011.

1.1.4 Impacts of Revised Routing on Costs

As a result of changes to the Project route that occurred during the Article VII process, the cost of the Project has already increased significantly as compared to the original Project design. Thus, in assessing the cost of the various alternatives discussed below, it is important to note that the baseline cost of the Project as currently proposed includes significant additional costs to account for the various alternatives that have already been incorporated into the Project through both pre-application consultation and the New York State siting process. These incorporated alternatives – all designed to ensure the Project is both able to be permitted and the least environmentally damaging – have increased the original cost of the Project substantially.

As a result, the true magnitude of cost increase that could result from the alternatives discussed below is often masked because the Project baseline cost already accounts for substantial cost increases that resulted from the New York State siting process. As CHPE already has absorbed significant cost increases associated with incorporating various alternatives routes, even relatively small incremental additional costs may have a disproportionate impact on the Project. Therefore, in the context of this Project, which has already incorporated a significant number of alternatives to date as a result of the state siting process, the cost of the alternative as compared to the overall Project cost is not necessarily an accurate measure of whether an alternative is practical. Rather, the LEDPA analysis must account for the significantly increased costs that have already been imposed on the Applicants to revise the Project route, and the impact that

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to New York City, Case No. 10-T-0139 (N.Y. P.S.C. Feb. 24, 2012) ("Article VII Updated Alternatives Analysis"), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={1376106E-8A60-4BC8-B601-EA7C43ECC0BB}.

[32] New York State Department of State, *Champlain Hudson Power Express Conditional Concurrence with Consistency Certificate* at 5 (June 8, 2011). See http://www.chpexpress.com/docs/regulatory/F-2010-1162%20CondCCR.PDF.

additional costs will have on the Applicants' ability to effect the Project purpose. As the EPA has noted, "[w]e consider it to be implicit that, to be practicable, an alternative must be capable of achieving the basic purposes of the proposed activity."[33]

1.2 Project Purpose

The purpose of the Project is as follows:

> The Project will deliver clean, renewable power[34] generated from the Canadian province of Quebec into New York City through a new 1,000 MW HVDC underground/underwater transmission line that is economically efficient.

1.3 Project Need

The Project is consistent with state and municipal energy policies, which call for the increased use of energy from renewable/sustainable resources.

1.3.1 State Energy Policy

In his 2012 State of the State Address, Governor Andrew Cuomo announced a plan to build a private sector funded $2 billion "Energy Highway" system, specifically referring to an "energy expressway down from Quebec."[35] The goal of the Energy Highway is to ensure that a "cost-efficient, reliable and environmentally sustainable supply of power is available to fuel the state's economic growth and to meet the needs of its residents."[36] The Energy Highway Task force issued a Request for Information that solicited information related to "sustainable and environmentally responsible" projects and requested that respondents provide details on how their project would "help to reduce the carbon footprint of electricity consumed in New York,

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[33] Preamble to Guidelines for Specification of Disposal Sites for Dredged or Fill Material, 45 Fed. Reg. 85,336, 85,343 (Dec. 24, 1980) as referenced in U.S. Envtl. Prot. Agency & U.S. Army Corps of Engineers, *Memorandum: Appropriate Level of Analysis Required for Evaluating Compliance with the Section 404(b)(1) Guidelines Alternatives Requirements* § 3.b. (Aug. 23, 1993) ("Section 404(b)(1) Compliance Memorandum"), http://water.epa.gov/lawsregs/guidance/wetlands/flexible.cfm.

[34] See Certificate, Pg. 54

[35] Press Release, N.Y. State Governor's Office, *Governor Cuomo Outlines Plan to Continue Building a New York by Growing the Economy, Reinventing State Government, and Advancing New York as a Progressive Leader* (Jan. 4, 2012), http://184.106.78.18/press/sos2012.

[36] Press Release, N.Y. State Governor's Office, *Governor Cuomo's Energy Highway Task Force Holds Summit* (Apr. 4, 2012), http://184.106.78.18/press/04042012Energy-Highway.

regardless of where electricity is produced."[37] Additionally, New York State developed an Energy Plan with the goal of "Increasing Reliance on Renewables," including "expanding the State's purchases of hydropower."[38] The Energy Plan noted that "the prospect of securing hydro power from Canada increases the likelihood that we will be able to reduce [Greenhouse Gas] emissions 80 percent by 2050."[39]

The City of New York also recognized the importance of increasing the amount of renewable electricity available to consumers in New York City. In its "PlaNYC" update, the City calls for diversifying the City's supply portfolio through, among other options, "harnessing cleaner resources outside the city."[40]

1.3.2 Greenhouse Gases

The Project supports established state and federal goals to reduce Green House Gas ("GHG") emissions and other air emissions associated with electric generation. On August 6, 2009, then-New York Governor David Paterson issued Executive Order No. 24 setting a goal of reducing the state's greenhouse gas emissions 80 percent from 1990 levels by 2050.[41] The New York State Energy Plan calls for an increase in renewable energy to reduce the emissions of GHGs, nitrous oxides, sulfur dioxide, particulate matter ("PM"), and volatile organic compounds ("VOCs") associated with traditional fossil-fuel-fired power plants.[42] The New York State Department of Environmental Conservation ("NYSDEC"), as a settlement party in the Project's Article VII process, represents the State on the Regional Greenhouse Gas Initiative, which is a cooperative effort to cap and reduce GHG air emissions associated with the production of electricity.[43]

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37 N.Y. Energy Highway, *Request for Information* at 13 (Apr. 19, 2012), http://www.nyenergyhighway.com/Content/pdf/EH_RFI_Brochure_2012.pdf.

38 N.Y. State Energy Planning Board, *2009 State Energy Plan*, Vol. I at 93 (Dec. 2009), http://www.nysenergyplan.com/final/New_York_State_Energy_Plan_VolumeI.pdf ("State Energy Plan").

39 *Id.* at xvii.

40 City of New York, *PlaNYC: A Greener, Greater New York* at 112 (Apr. 2011), http://nytelecom.vo.llnwd.net/o15/agencies/planyc2030/pdf/planyc_2011_planyc_full_report.pdf.

41 N.Y. State Dep't of Envtl. Conservation, *Executive Order No. 24 (2009): Establishing a Goal to Reduce Greenhouse Gas Emissions Eighty Percent by Year 2050 and Preparing a Climate Action Plan*, http://www.dec.ny.gov/energy/71394.html (last visited Apr. 22, 2013).

42 *See* State Energy Plan at xiii, 3-5.

43 N.Y. State Dep't of Envtl. Conservation, *The Regional Greenhouse Gas Initiative (RGGI): Carbon Dioxide Budget Trading Program*, http://www.dec.ny.gov/energy/rggi.html (last visited Apr. 22, 2013).

The 2009 New York State Energy Plan indicates that infrastructure investments are necessary to support the state's transition to a clean energy system with very low GHG emissions.[44] The Plan goes on to state that hydroelectric power from Canada could increase the likelihood of achieving an 80% reduction of GHG gases by 2050.[45]

The Clean Air Act also requires states, at a minimum, to meet national ambient air quality standards ("NAAQS").[46] When a state is in nonattainment of one or more of the NAAQS, such as New York, it must have a plan to come into attainment. The New York City metropolitan area is currently considered to be in nonattainment of the ground level ozone NAAQS and in nonattainment of the PM_{10}[47] and $PM_{2.5}$[48] NAAQS. Ground level ozone is created by emissions of nitrous oxides and VOCs, which are emitted by all fossil-fuel-fired electric generating facilities. PM_{10}, $PM_{2.5}$, and sulfur dioxide are also emitted by fossil-fuel-fired electric generating facilities.

London Economics International, LLC ("LEI") conducted an analysis for the Project and concluded that in 2018 the electricity produced via the type of generation to be transmitted by the Project into New York City would reduce emissions of CO_2 by 2.5 to 2.9 million tons, sulfur dioxide (SO_2) by 454 to 571 tons, and oxides of nitrogen ("NOx") by 952 to 1,114 tons, with no offsetting emissions at the point of generation.[49] A separate analysis completed by the State of New York Department of Public Service ("NYSDPS") estimated reductions of 1.5 to 2.2 million tons of CO_2, 499 to 828 tons of SO_2, and 748 to 1,432 tons of NOx.[50]

1.3.3 Transmission Congestion

The 2009 National Electric Transmission Congestion Study conducted by the U.S. Department of Energy ("DOE") identified the metropolitan areas of New York southward through Northern

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44 State Energy Plan at 4.

45 *Id.* at xvii.

46 U.S. Envtl. Protection Agency, *National Ambient Air Quality Standards (NAAQS)* (Dec. 14, 2012), http://www.epa.gov/air/criteria.html, .

47 U.S. Envtl. Protection Agency, *Particulate Matter (PM-10) Nonattainment State/Area/County Report* (Dec. 14, 2012), http://www.epa.gov/oar/oaqps/greenbk/pncs.html (New York).

48 U.S. Envtl. Protection Agency, *Particulate Matter (PM-2.5) 2006 Nonattainment State/Area/County Report* (Dec. 14, 2012), http://www.epa.gov/oar/oaqps/greenbk/rncs.html (New York).

49 London Economics International LLC, *Results of the 2018 Test Year Modeling Analysis* (Jan. 18, 2010), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={E7E08BDC-E247-4C08-9922-3E9A90A05015}.

50 Joint Proposal of Settlement at 59-60 & Fig. 2.

Virginia (the Mid-Atlantic Coastal area) as a Critical Congestion Area.[51] This is an area in which the DOE determined that it is critically important to remedy existing or growing transmission congestion problems because the current and/or projected effects of transmission congestion in terms of economic cost and reliability are severe. The report noted that while there are many projects in the NYISO generation interconnection queues, "new generation is slow to come on-line and is often offset by retirement of older generation capacity."[52]

As noted in the New York State Energy Plan.[53]

> Because New York's electric infrastructure is old, significant capital investments will need to be made in the utilities' electric transmission and distribution system to meet future electric demand and allow them to continue to provide reliable service. Replacement and improvement of existing aging infrastructure are critical, as system failures not only raise safety and reliability concerns, but can also lead to increased system congestion and therefore higher emissions and costs.

The document further notes that the construction of new infrastructure may be required regardless of economic and reliability benefits, to achieve New York State's clean energy policy goals.[54]

Additionally, New York State's Energy Highway Plan Request for Information noted:

> Most of New York State's transmission lines were built more than 50 years ago. It is estimated that about 25 percent of the State's transmission system will have to be replaced within the next 10 years and nearly 50 percent will require replacement in the next 30 years. The utilities that own the transmission lines continue to invest in them, and the system can still be operated with utmost reliability. However, physical limitations and congestion on the grid at times prevent excess power supplies from upstate and Canada from reaching the downstate region, where demand is greatest. These transmission bottlenecks have a number of actual and potential consequences in terms of economics, the reliability of the power supply, the environment and public health:
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> - Many higher-cost downstate power plants must run even when cheaper plants are available because power from the cheaper plants cannot be delivered. This can result in higher costs for consumers and cost-effective solutions need to be sought.

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51 U.S. Dep't of Energy, *National Electric Transmission Congestion Study* § 4.4 (Dec. 2009), http://energy.gov/sites/prod/files/Congestion_Study_2009.pdf

52 *Id.* at 51.

53 State Energy Plan at 65.

54 *Id.* at 66.

- The downstate area lacks diversity in its power supply and relies mostly on natural gas-fired generation to meet its needs.
- Older plants in urban areas must run at peak hours, increasing air pollution and health risks in the summer months when these effects are most pronounced.
- At times, bottlenecks limit downstate access to renewable power.

In addition to addressing these concerns, investments in new and upgraded transmission lines will provide substantial economic benefits. For example, a recent national report concluded that every $1 billion of transmission investments "supports approximately 13,000 full-time-equivalent years of employment and $2.4 billion in total economic activity.[55]

The Project enables distant generators to serve a portion of the regional load while bypassing locations where the transmission system experiences congestion. It avoids the challenges associated with building new generation capacity within the NYC load pocket, which include air quality restrictions, high real estate values, fuel supply problems, and local opposition to power plants. Energy efficiency, demand response, and other demand-side measures can reduce loads and improve the balance between supply and demand, but those measures must be pursued over extended periods (often with uncertain results) in order for their impacts to grow to transmission or power-plant-equivalent quantities.[56]

1.4 Geographic Requirements

The Project is intended to connect clean generation sources with the New York City load center. The majority of New York's existing generation portfolio is composed of gas- and/or oil-fueled facilities, which accounts for approximately 61 percent of the total installed capacity in the state.[57] The vast majority of these gas and oil facilities tend to be older; about 65 percent of them were built before 1980, and therefore are relatively inefficient.[58]

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55 New York Energy Highway: Request for information, pgs 7-8 ((2012).

56 U.S. Dep't of Energy, *National Electric Transmission Congestion Study* at 43 (Aug. 2006) ("2006 Transmission Congestion Study"), http://energy.gov/sites/prod/files/oeprod/DocumentsandMedia/Congestion_Study_2006-9MB.pdf.

57 *See* N.Y. Independent Sys. Operator, 2012 Load and Capacity Data "Gold Book" at Table III-2 (Apr. 2012) ("2012 Gold Book"), http://www.nyiso.com/public/webdocs/media_room/publications_presentations/Planning_Reports/Planning_Reports/2012_GoldBook_V3.pdf.

58 *Id.*

There are currently no proposed renewable energy projects in the interconnection queue in the vicinity of New York City – in fact, over 3,500 MW has been withdrawn from the queue since 2007.[59] Therefore, other new generation sources in the New York City region are not anticipated to provide a significant increase in energy supply capacity and a resultant enhancement in system reliability comparable to the Project[60] and sources from locations outside of New York City must be identified. Hydropower projects in Canada currently generate excess electrical capacity, thereby making clean sources of generation in Canada the most practical choice for providing the additional capacity needed to help fulfill regional demands, while increasing the stability and security of the grid.[61]

The current and/or projected effects of transmission congestion in New York are complex and will be difficult to resolve.[62] The Project enables generators in Canada to serve a portion of the regional load without further increasing transmission congestion in the region. To do so effectively requires interconnection to the grid at locations within the load pocket. This design allows electricity generated outside of the region to be delivered without the need to rely significantly on the existing transmission facilities that are already suffering congestion.

In analyzing the potential solutions to congestion in the New York City region, the DOE's National Electric Transmission Congestion Study concluded that construction of major new transmission lines from north of the city would significantly increase the options available to the city for power.[63] Such transmission lines would deliver relatively inexpensive electricity from Canadian hydroelectric power plants and other renewable sources to load centers in major metropolitan areas.[64]

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59 *Id.*
60 Joint Proposal of Settlement at 14.
61 U.S. Dep't of Energy, *National Electric Transmission Congestion Study* at 43 (Aug. 2006) ("2006 Transmission Congestion Study"), http://energy.gov/sites/prod/files/oeprod/DocumentsandMedia/Congestion_Study_2006-9MB.pdf
62 *Id.*
63 *Id.*
64 *Id.*

Section 2
Proposed Project

The Project consists of a 1,000 MW underwater/underground HVDC electric transmission system extending from the international border between Canada and the United States to Queens, New York City, New York. The Applicants propose to develop the Project to deliver clean sources of power to New York City.

2.1 Proposed Project Route

As discussed earlier, the Project as currently configured, represents the alternatives incorporated as part of the New York Sate siting and permitting process.

The Project originates at the international border between the United States and Canada and continues south within Lake Champlain for approximately 101.5 miles in waters of the state of New York. The cables will be located to the east of Rouses Point, Point au Fer, Chazy Landing, Point Au Roche and Cumberland Head, east of Valcour Island and the Four Brothers islands, and then would continue towards the New York – Vermont border near the middle of the lake. From Split Rock Point south, the cables will be located closer to the New York shoreline. Proceeding southward from Crown Point, the waters of the lake become shallower, and the cable route would be closer to the New York-Vermont border near the middle of the narrow water body.

At milepost ("MP") 101.5, in the town of Dresden, Washington County, New York, the transmission cables would transition from the waters of Lake Champlain to the land on the western shore via a horizontal directional drill ("HDD"). The cables would then transition from under Lake Champlain to land owned by the Delaware and Hudson Railway ("D&H")[65] and other property owners, and then enter the ROW of New York State Route 22. The cables would continue south within the Route 22 ROW until MP 111.9, except for a crossing of South Bay at MP 109.7. The cable route would continue within the Route 22 ROW into the Village of Whitehall and then would enter the Canadian-Pacific Railway ("CP") ROW on lands owned by the D&H within the Village of Whitehall. The cables would remain primarily within the CP ROW and lands owned by the D&H for approximately 65.1 miles, crossing the Washington

[65] The D&H was acquired some years ago by the Canadian Pacific Railway Company, but it still operates for many purposes under the D&H name.

County municipalities of Whitehall, Fort Ann, Hartford, Kingsbury, Fort Edward Town and Village; the Saratoga County municipalities of Moreau, Northumberland, Wilton, Greenfield, City of Saratoga Springs, Malta, Milton, Ballston, and Clifton Park; the Schenectady County municipalities of Glenville, Rotterdam and the City of Schenectady. Along this portion of the overland route, the cable route would have relatively minor deviations out of the CP ROW onto private and public lands for various engineering constraints, such as a narrow section of ROW, buildings, railroad developments, and sensitive habitat areas. In Schenectady, the proposed route would leave the CP ROW at MP 173 to be installed within Erie Boulevard so as to bypass a section of railroad bridges. The cables would re-enter the CP ROW around MP 173.6, but would exit again at MP 173.7 to utilize largely vacant land to pass beneath Interstate I-890. The cables re-enter the CP ROW at MP 174.3 and would continue to the Town of Rotterdam.

Around MP 177 in Rotterdam, the cables would transfer from the CP ROW to the CSX Transportation Railroad ("CSX") ROW. The cables would be located within the CSX ROW southeasterly for approximately 22 miles through the Albany County municipalities of Guilderland, New Scotland, Voorheesville, Bethlehem and Coeymans. From MP 199, the cables would continue along a CSX ROW that runs south parallel to the Hudson River within the Town of Coeymans and the Village of Ravena, and the Greene County municipalities of New Baltimore, Town and Village of Coxsackie, Town of Athens, and the Town and Village of Catskill. There are relatively minor deviations from the CSX ROW due to engineering constraints such as bridges, roadway crossings, and areas where the existing ROW is too narrow to permit cable installation while meeting established railroad clearance criteria.

In the Town of Catskill north of the hamlet of Cementon, the cable route would exit the CSX ROW at MP 227.5 and turn easterly to follow Alpha Road, which terminates at a landing area at MP 228.2. At this point the cables would transition into the Hudson River via an HDD. The cables would be located within the Hudson River south from Cementon for approximately 67 miles. The cable route has been sited to avoid known sensitive habitat, potential cultural resources, contamination zones and navigation hazards to the extent practicable.

At MP 295.7, the cables would transition from the Hudson River via an HDD and enter a CSX ROW in the Rockland County Town of Stony Point. The cables subsequently would follow the CSX route and a public road (Route 9W) ROW for a 7.7-mile overland bypass of Haverstraw

Bay, which has been identified as one of the most sensitive significant coastal habitats within the Hudson River. The cable route then would travel through the Town of Haverstraw, Village of West Haverstraw and Village of Haverstraw primarily within the CSX ROW, although there are deviations to avoid engineering constraints such as bridges and roadway crossings. At MP 300.8, the CSX ROW is bordered on the east and then on both sides by Haverstraw Beach State Park; therefore, starting at MP 301.4, an HDD would be established to install the cables under Rockland Lake State Park and Hook Mountain State Park (comprising portions of Palisades Interstate Park) to enter the ROW of NYS Route 9W in the Town of Clarkstown. From MP 301.8 to 302.4, the cables would be located within the Route 9W ROW. At this point, another HDD would install the cables beneath the two parks and transition the cables into Hudson River.

From MP 302.8 south of Haverstraw Bay, the cables would be located within the New York State section of the Hudson River for approximately 20.7 miles. As with the other in-water segments, the routing has been designed so as to avoid sensitive resources. At MP 324, the cable would turn easterly and enter Spuyten Duyvill Creek and the Harlem River within the borough of Manhattan in New York City. The cable route would be located within the Harlem River for 6.58 miles, and then transition to land via an HDD to enter a CSX ROW in the borough of the Bronx. The cable route along the CSX ROW would cross lands owned by the New York State Department of Transportation, cross beneath the Robert F. Kennedy Bridge and the Hell Gate railroad bridge and then transition via an HDD to cross beneath and into the East River. After a short jet plow installation, the cable route would transition to land via another HDD in the borough of Queens in New York City, and would continue easterly to the Luyster Creek converter station site in Astoria, north of 20th Avenue on lands of Consolidated Edison Company of New York, Inc. ("Con Edison").

The converter station would be a "compact type" with a total footprint (i.e., building and associated equipment and related areas) of approximately five (5) acres. Gas insulated HVAC cables would connect the converter station to the New York Power Authority (NYPA) Astoria Annex 345 kilovolt ("kV") substation. In addition, the NYISO may require the Applicants to construct a four-breaker gas-insulated ring bus in a building to be located on the same parcel as the converter station, unless a preferable location for this ring bus can be found closer to the Astoria Annex.

From the Astoria Annex substation, another set of HVAC cables would be located within the streets of New York City for approximately three miles to Con Edison's Rainey Substation ("Astoria-Rainey Cable"). The cable would run north parallel along 20th Avenue before crossing 20th Avenue southwesterly onto 29th Street. The cable route would continue within 29th Street for one city block before turning northwest onto 21st Avenue and continuing within 21st Avenue until 23rd Street. The cable route would turn onto 23rd Street and continue southerly, including crossing under the Triborough Bridge, until 30th Drive. The cable route would then turn westerly on to 30th Drive and then southerly within 14th Street. The cable route would turn to the west onto 31st Drive for one city block before turning to the south onto 12th Street. The cable route would turn west onto 35th Avenue and continue to the Rainey Substation.

The proposed Project route is shown in Figure 2-1.

FIGURE 2-1
PROPOSED PROJECT ROUTE

2.2 Proposed Project Construction Techniques

Given the length of the route from the Canadian border to New York City (approximately 333.3 miles from the international border to the converter station plus the Astoria-Rainey Cable which is approximately 3.5 miles) and the diversity of landforms and water areas that are crossed by the cable route, a variety of construction methods and equipment will be employed. As part of Settlement Parties' Joint Proposal filed in the Article VII proceeding, the Applicants developed a Best Management Practices ("BMP") Manual, which details BMPs to be utilized during Project construction. The BMP Manual was included as Attachment O to Applicants' Supplemental Application.[66]

2.2.1 Underwater Installation Methods

The two HVDC underwater cables associated with the Project would be bundled and laid together within the same trench. The cables would be initially placed in a vertical position (one on top of the other) in the trench, although sediment conditions may allow for slumping into a horizontal position (side-by-side) relative to each other. Cable burial would generally be performed at the same time the cable is laid or at a later date, as deemed appropriate or necessary due to subsurface conditions. The cables would be laid by specialized cable-laying vessels or a specially outfitted laybarge, depending on navigation constraints along the Project route.

The cables would be transported from the manufacturer by a special cable transport vessel and transferred onto the cable installation vessel. The linear cable machines onboard the installation vessel would pull the cables from coils on the transport vessel onto the installation vessel and into prefabricated tubs. After the cable has been transferred, the installation vessel would travel to the construction commencement location. This process would be repeated as necessary to deliver and install the cable along the length of the various waterways.

Based on the sediment data collected during the spring 2010 Marine Route Survey,[67] it is not anticipated that a backfill plow would be needed. As the cables would be simultaneously laid

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[66] Attachment O: Best Management Practices, Champlain Hudson Power Express Inc., Supplement to U.S. Army Corps of Engineers Application, No. 2009-1089-EHA (Feb. 10, 2012) ("CHP Supplemental Application"), http://www.chpexpress.com/docs/regulatory/permit-application/Attachment%20O%2020120229.pdf.

[67] *See* Attachment E: Marine Route Survey Summary Report, Champlain Hudson Power Express Inc., U.S. Army Corps of Engineers Application, No. 2009-1089-EHA (Dec. 6, 2010),

and buried, the majority of displaced sediments would refill the trench. In addition, due to the natural dynamic processes in the lakes, rivers and estuaries, sediments would be naturally deposited within the trench. Post-installation bathymetric and sediment surveys would be conducted to monitor benthic habitats and sediment conditions.

2.2.1.1 Jet Plow/Water Jetting

The proposed method for laying and burial of the majority of the underwater cable is the jet plow/water jetting embedment process. These methods involve the use of a positioned cable vessel and a hydraulically powered water jetting device that simultaneously lays and embeds the cables in one continuous trench. At this time, the primary proposed installation vessel would be dynamically positioned, using thrusters and the vessel propulsion system. Deeper draft vessels equipped with dynamic positioning thrusters are proposed for deeper water locations. Dynamically positioned cable installation vessels do not contact or impact the bottom. However, there may be limited circumstances such as in relatively shallow water depths (typically less than 15 feet) where shallow draft vessels/barges using anchors for positioning may be used for installation. An anchor-positioned vessel would propel itself along the Project route with forward winches while letting out on aft winches with other lateral anchors holding the side-to-side alignment during the installation. In the event that an anchor-positioned vessel is needed, it is assumed that a 4-to-8 point anchor mooring system would be used in this process and requires an anchor-handling tug to move anchors while the installation and burial proceeds uninterrupted on a 24-hour basis.

The jet plow/water jetting embedment methods for underwater cable installations are considered to be the most effective and least environmentally damaging when compared to traditional mechanical dredging and trenching operations.[68] This method of laying and burying the cables simultaneously ensures the placement of the underwater cable system at the target burial depth with minimum bottom disturbance, with much of the fluidized sediment settling back into the trench. For these reasons, it is the installation methodology that appears to be preferred by state

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http://www.chpexpress.com/docs/regulatory/USACE/CHPE_USACE_Application_E.pdf. Sediment data can be found on pages 20 to 27 of this report.

[68] Bureau of Ocean Energy Management, *Cape Wind Final Environmental Impact Statement* at 2-11 (Jan. 2009), http://www.boem.gov/uploadedFiles/BOEM/Renewable_Energy_Program/Studies/Cape%20Wind%20Energy%20Project%20FEIS.pdf.

and federal regulatory agencies based on review of past underwater cable projects[69] and the Settlement Parties concluded that "no permanent or long-term impacts to water quality from cable installation are expected."[70]

Jet Plow/water jetting equipment uses pressurized water (taken from ambient waterbodies) from water pump systems onboard the cable vessel to fluidize sediment. The water jetting device is typically fitted with hydraulic pressure nozzles located down the length of "swords" that are inserted into the sediment on either side of the cable and which create a direct downward and backward "swept flow" force inside the trench. This provides a down and back flow of re-suspended sediments within the trench, thereby "fluidizing" the *in situ* sediment column as the equipment progresses along the cable route such that the underwater cable settles into the trench under its own weight to the planned depth of burial. The water jetting device's hydrodynamic forces do not work to produce an upward movement of sediment into the water column, since the objective of this method is to maximize settling of re-suspended sediments within the trench to bury or "embed" the cable system. The pre-determined deployment depth of the jetting swords controls the cable burial depth using adjustable hydraulics on the water jetting device.

The cable system location and burial depth would be recorded during installation for use in the preparation of as-built location plans. The water jetting device is equipped with horizontal and vertical positioning equipment that records the laying and burial conditions, position, and burial depth. This information is monitored continually on the installation vessel. This information

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69 *See, e.g.*, Order Granting Certificate of Environmental Compatibility and Public Need, *Application of Hudson Transmission Partners, LLC for a Certificate of Environmental Compatibility and Public Need for a 345 Kilovolt Submarine/Underground Electric Transmission Line Between Manhattan and New Jersey*, Case No. 08-T-0034 (N.Y. P.S.C. Sept. 15, 2010), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={CAFAD145-3C87-4E33-ACDF-45D87B7A76C6}; Order Adopting the Terms of a Joint Proposal and Granting Certificate of Environmental Compatibility and Public Need, With Conditions and Clean Water Act §401 Water Quality Certification, *Application of Bayonne Energy Center, LLC for a Certificate of Environmental Compatibility and Public Need for the Construction of the New York State Portion (Kings County) of a 6.6 Mile, 345 kV AC, 3 Phase Circuit Submarine Electric Transmission Facility Pursuant to Article VII of the PSL*, Case No. 08-T-1245 (N.Y. P.S.C. Nov. 12, 2009), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={8BF803F7-E587-439E-AB32-83C01BB41401}.

70 Joint Proposal at 21, *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 Public Service Law for the Construction, Operation and Maintenance of a High-Voltage Direct Current Circuit from the Canadian Border to New York City*, Case No. 10-T-0139 (N.Y. P.S.C. Feb. 24, 2012), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={C5F63E41-5ED5-46A2-99A5-F1C5FC522D36}.

would be forwarded to appropriate agencies and organizations as required for inclusion on future navigation charts.

Burial can be performed by either a towed or self-propelled burial machine. In this instance, the self-propelled water jetting device moves forward by the reaction of the backward thrust of the hydraulic jetting power that is fluidizing the soil and keeping the created trench open for the cable to sink into. The forward rate of progress is regulated by the varying types of sediment and the water pressure applied through the jets.

A skid/pontoon-mounted jet plow/water jetting device or wheeled, frame-mounted water jetting device, deployed and operated in conjunction with the cable-laying vessel, is proposed for the underwater installation operations. For burial, the cable vessel is used as the platform to operate the water burial device at a safe distance as the laying/burial operation progresses. The cable system is deployed from the vessel to the funnel of the water jetting device. The water jetting swords are lowered onto the bottom, pump systems are initiated, and the jet trencher progresses along the cable route with the simultaneous lay and burial operation. The pontoons can be made buoyant to serve different installation needs.

Temporarily resuspended in-situ sediments are largely contained within the limits of the trench wall, although a small percentage of the re-suspended sediments are transported outside of the trench. Any resuspended sediments that leave the trench generally tend to settle out quickly in areas immediately flanking the trench. However, the amount of sediment transported out of the trench, the residence time of sediment suspension, and the distance suspended sediments are transported are dependent upon multiple factors, including sediment grain-size, composition, hydrodynamic forces, trench depth, and the hydraulic jetting pressures imposed on the sediment column necessary to achieve desired burial depths. Water quality modeling specific to the conditions in Lake Champlain and the Hudson, Harlem, and East Rivers is provided in Attachment M of the Supplemental Application.[71]

As the jetting device progresses along the route, the water pressure at the device nozzles would be adjusted as sediment types or densities change to achieve the required water quality

[71] Attachment M: Water Quality Modeling, CHP Supplemental Application, http://www.chpexpress.com/docs/regulatory/permit-application/Attachment%20M%2020120229.pdf.

standards.[72] A test trench may be preformed to ensure proper depth of burial. In the unlikely event that the minimum burial depth is not met during water jetting embedment, additional passes with the water jetting device or the use of diver-assisted water jet probes would be utilized to achieve the required installation target depth.

Jet water pressure varies with different bottom sediment materials, with typical pressures including:

Material	Estimated Jet Water Pressure
Sand and Silt	400-600 psi
Soft Clay	600-800 psi
Hard Clay	800-1,000 psi

Some types of water jetting devices also employ an ejector system to assist in the trenching operation in certain sediment types that do not fluidize well. The ejector system employs an airlift system to create a suction force within the ejector pipes that entrains sediment and releases it at the end of the ejector pipes to either side of the water jetting device. This addition to the water jetting methodology would only be employed to assist in burial if monitoring of the installation reveals difficulty in obtaining the required burial depth due to lack of adequate fluidization of sediments.

In addition to continuous closed circuit video monitoring, divers would make regularly scheduled dives in order to monitor the cable installation operation and inspect the condition of the cable trench and jet sled. Occasionally, the jet sled may require maintenance during cable burial operations due to nozzle wear or loss. During these maintenance periods, the jet leg roller load cells, suction piping, and hose connections are checked, and hydraulic fluid is replenished as required. As necessary, a Spill Prevention, Countermeasure, and Control ("SPCC") Plan or its

[72] New York State Public Service Commission 401 Water Quality Certification, 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 Public Service Law for the Construction, Operation and Maintenance of a High-Voltage Direct Current Circuit from the Canadian Border to New York City, Case No. 10-T-0139 (N.Y. P.S.C. Jan. 1, 2013), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={E992FA4C-1906-44EB-9B92-8567F410F660}

equivalent would be developed pursuant to federal and/or state regulations and would be followed during construction equipment maintenance and repair activities.

In certain small areas, typically transition areas between shoreline HDDs and underwater cable trenches, a diver-operated hand jet or Remotely-Operated Vehicle ("ROV") may be used to bury the cable. In this process, a support vessel provides pressurized water through a hose with a nozzle that is maneuvered by a diver or ROV. The jet of water works the sediment under the cable to create a trench into which the cable settles. This method would be employed for short distances only, typically less than one hundred (100) feet.

2.2.1.2 Plowing

For the plowing technique, a trench is made for the cables by towing a plow, and the cables are simultaneously fed into the trench as it is created by the plow. The plow is not self-propelled, but is instead tethered to a surface support vessel, which supplies the pulling power. Usually, the bottom sediment is allowed to naturally backfill the trench over the cable by slumping of the trench walls, wave action, or bed load transport of sediments.

Shear plows can potentially reduce sediment disturbance as they do not fluidize the sediment and generally require less force to create a narrower trench in the riverbed or lakebed to bury underwater cables than other types of cable installation equipment. Some issues that affect the suitability of shear plows for underwater cable installation and burial are sediment cohesiveness and burial depth. Use of the shear plow is typically limited to sediments that have shear strengths less than 20 Kilopascals ("kPa"). Also, shear plows are typically used with shallower burial depths (less than four (4) feet), which generally reduces the overall amount (i.e., volume) of sediment disturbed during installation.

2.2.1.3 Conventional Dredging

While it is intended that the use of conventional underwater trench excavation methods would be avoided or minimized, there would be some locations where conventional dredging would be used to meet required installation depths, or to install cofferdams associated with shoreline HDD installations. These circumstances may include instances where the cable route crosses an existing Federal navigation channel. In these locations, either a clam-shell dredge or a barge-

mounted excavator would be used to pre-dredge a trench into which the cable would be laid. Dredge material would be brought to the surface to be placed on barges for approved disposal and would not be used for backfill. This work would most likely occur from spud barges, although anchor-moored or jack-up barges may also be employed, depending upon equipment availability and site conditions. A typical spud dredge barge would be equipped with two or more legs, with one spud being a walk-away spud. The barge would have a crane, typically outfitted with a 6 to 9 cubic yard clamshell bucket. Alternatively, the barge may have a track hoe excavator working off the deck of the barge, possibly with an extended boom for areas of deeper water. Once a segment of trench is excavated, cable would be laid, and the clam-shell dredge or excavator would place clean backfill sediment back into the trench.

2.2.1.4 Infrastructure Crossing

A preliminary review of the underwater cable route identified areas where cable installation activities would occur in the vicinity of or cross existing infrastructure (e.g., electric cables, gas pipelines, ferry cables, etc.). There are several different installation techniques that can be utilized when crossing existing infrastructure based on the type, burial depth, and existing protective coverings of the infrastructure. The design of utility crossings would follow industry standards.

When crossing utilities that are owned by a third party, the design of the protection at existing cables and pipelines would require formal consultations with the owners and/or operators of this collocated infrastructure. Detailed discussions on coordination, design and installation methodologies and safety issues would be conducted with the owners of these infrastructures, as specified in the Article VII Certificate Conditions.[73] The detailed designs for each crossing would be provided as part of the Environmental Management and Construction Plan ("EM&CP"), which will be filed with the NYS Public Service Commission for approval.

[73] Order Granting Certificate of Environmental Compatibility and Public Need at 86, *Application of Champlain Hudson Power Express, 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*, Case No. 10-T-0139 (N.Y. P.S.C. Apr. 18, 2013), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={A71423C8-B489-4996-9C5A-016C9F334FFC}.

Crossing of Fiber Optic and Telecommunication Cables

Wherever possible, the HVDC cables would cross existing fiber optic and telecommunication cables at right angles, extending approximately one hundred fifty (150) to three hundred (300) feet in length. The method of embedding and protection would be determined by the burial depth of the existing cables. The details of these crossings would be coordinated with the owners and/or operators of the existing facilities as well as the USACE.

Crossing of Gas or Oil Pipelines and Power Cables

Where the cables cross existing pipelines or power cables, the cables would cross the existing infrastructure as close as possible to right-angles, extending up to three hundred (300) feet on each side of the crossing point. The method of cable embedding and protection would be determined by the burial depth of the existing infrastructure. The details of these crossings would be coordinated with the owners and/or operators of the existing facilities as well as the USACE.

Crossings of Other Infrastructure Types

A "chain-ferry" operates across the proposed underwater cable route within Lake Champlain. The chain ferry utilizes ferry cables laid on the bottom of Lake Champlain. The normal penetration of the ferry cables into the lakebed would be assessed, and if deemed necessary, additional protection in the form of deeper cable burial at the crossing point or the use of an outer protection sleeve to guard against abrasion would be installed. The ferry cables would be temporarily removed to facilitate the installation of the underwater cables. The ferry cables would then be replaced over the top of the transmission cables. The ferry operator reports that its cables are replaced every four years; therefore, there may be an opportunity to coordinate the HVDC cable installation schedule with the ferry cable replacement schedule. Detailed coordination and discussions with the ferry operator on methodologies and scheduling will occur.

The underwater HVDC cables would also be routed beneath overhead infrastructures, including road bridges and electrical transmission lines. These would not be of concern for the cable systems once in operation, but the superstructure on the cable-laying vessels would be designed to take account of any height restrictions

2.2.2 Terrestrial Installation Methods

For the overland portions of the cable route, the cables will be buried via excavated trenches or trenchless technology (HDD or Jack and Bore ("J&B")) methods. The majority of the overland portion of the cable route is located within or immediately adjacent to the existing CP, CSX, and NYS Routes 22 and 9W ROWs. Standard and typical diagrams, which include details representing various methods and equipment to be used during Project construction, were provided as Attachment H to Applicants' Supplemental Application.[74]

A minimum separation distance is required from the rails to the cables by each railroad; CP requires a minimum separation of ten (10) feet from the centerline of the outermost track to the cable trench, and CSX requires a minimum separation of twenty-five (25) feet from the centerline of the outermost track. The typical and preferred layout is to have the bipole (two cables) installed on one (same) side of the railroad tracks. With this layout, the limits of anticipated construction activity extend forty (40) feet beyond the required minimum setback of the railroads. This 40-foot area would include the area needed for excavation of the trench (approximately four (4) feet wide), installation of erosion and sediment control measures, and stockpiling of excavated material.[75] There are areas that would require different configurations and pose additional engineering challenges, such as steep slopes, environmentally sensitive areas, and existing structures. These areas would be identified and site-specific engineering solutions would be developed as part of the Environmental Management and Construction Plan ("EM&CP"). The EM&CP, which represents the final design phase of the Project, will be filed with the NYS Public Service Commission for approval. A minimum construction corridor of 25 feet would be required along the edge of Routes 22 and 9W for installation of the two HVDC cables, although a wider width may be employed to allow for more efficient construction and quicker completion of the work in these areas.[76]

Each of the two (2) overland cables would require a number of joints and a temporary flat pad would be installed underneath each joint for splicing activities.[77] The number of joints would be

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[74] Attachment H – Revised Attachment H: Cross Section Diagrams, CHP Supplemental Application, http://www.chpexpress.com/docs/regulatory/permit-application/Attachment%20H%2020120229.pdf.
[75] *Id.* at 13, 16.
[76] *Id.* at 19.
[77] *Id.* at 12.

kept to a minimum and would be determined either by the maximum length of cable that can be transported in a single piece or by the maximum length of cable that can be pulled, whichever is less, as well as the number of HDD and J&B locations. For land installation, the expected maximum segment lengths between splices would be approximately one-half mile. The jointing for both cables would be performed in a single jointing pit, with typical pit dimensions being 30 feet long, 12 feet wide, and four (4) feet deep.[78] Subsequent to completion of cable jointing, the jointing pit would be backfilled primarily with native soils to the original contours/conditions. As further described in Section 5 and shown in the diagrams included in Attachment H of the Supplemental Application,[79] thermal resistivity sand and a protective covering may be used around the immediate vicinity of the buried cables.

The following sections identify the general construction sequence for routine cable installation along the overland portion of the cable route:

- Initial clearing operations and storm water and erosion control installation;
- Trench excavation;
- Cable installation;
- Backfilling; and
- Restoration and revegetation.

2.2.2.1 Initial Clearing Operations & Stormwater and Erosion Controls

Initial clearing operations would include the removal of vegetation within the cable trench area and within any temporary additional construction workspace (e.g., HDD workspace, cable joint pits, access roads and staging areas) either by mechanical or hand cutting. Vegetation would be cut at ground level, leaving existing root systems intact except for the immediate trench area, and the aboveground vegetation removed for chipping or disposal. Tree stumps and rootstock would be left undisturbed in the temporary workspace wherever possible to encourage natural revegetation. Brush and tree limbs would be chipped and spread in approved locations or hauled

[78] *Id.*
[79] *Id.* at 11.

off-site for disposal. Timber would be removed from the ROW for salvage or to approved locations.

The cleared width within the ROW and temporary construction workspace would be kept to the minimum that would allow for spoil storage, staging, assembly of materials, construction vehicle passage, and all other activities required to safely install the cables and associated equipment.

Prior to or closely following initial disturbance of the soil, erosion controls would be properly installed as required. Representational drawings of erosion control methods are included in Attachment H of the Supplemental Application (see "Silt Fence," Figure 176764-UM-21[80] and "Straw Bale Dike," Figure 176764-UM-22).[81] Design of the stormwater and erosion controls would be completed as part of the development of the EM&CP and would include measures such as silt fences, hay bales, temporary mulching, etc.

2.2.2.2 Trench Excavation

The typical cable trench along the overland portion of the route would be four (4) feet wide at the bottom and approximately four (4) to five (5) feet deep to allow for the proper depth required for the burial of the cables (see "Typical Trench Cross Section," Figure 176764-UM-08).[82] The cables would generally be installed side-by-side; although in some situations there may be up to three (3) feet of spacing between the cables within the four-foot-wide trench.

In normal terrain where the soil conditions range from organic loam, sand, gravel or other unconsolidated material and sufficient clearances exist, traditional excavation equipment would be used. The mixing of topsoil with subsoil would be minimized by using topsoil segregation construction methods in agricultural lands and wetlands (except when standing water or saturated soils are present). Topsoil would be stripped from the trench and placed on one side of the trench. The subsoil stockpile area (trench plus spoil side method) would be placed on the other side of the trench or otherwise segregated. Representative drawings of stockpile placement and management are included in Attachment H of the Supplemental Application (see "ROW Top

[80] Attachment H – Revised Attachment H: Cross Section Diagrams at 32, CHP Supplemental Application, http://www.chpexpress.com/docs/regulatory/permit-application/Attachment%20H%2020120229.pdf.
[81] *Id.* at 33.
[82] *Id.* at 11.

Soil Segregation Techniques").[83] Should it become necessary to remove water from the trench, it would be pumped to a stable, vegetated upland area (where practical) or filtered through a filter bag or siltation barrier.

Based on review of soils and geologic maps of the routing area, shallow bedrock has the potential to be encountered along some portions of the overland segment of the Project route. The technique selected to remove bedrock encountered during cable installation activities is dependent on relative hardness, fracture susceptibility, and expected volume of the material. Techniques include the following:

- Conventional excavation with a backhoe;
- Hammering with a pointed backhoe attachment followed by backhoe excavation;
- Rock saw/trencher; or
- Blasting followed by backhoe excavation.

All blasting activity would be performed by licensed professionals according to strict guidelines designed to control energy release. Proper safeguards will be taken to protect personnel and property in the area. Charges would be kept to the minimum required to break up the rock. Where appropriate, mats made of heavy steel mesh or other comparable material or trench spoil would be utilized to prevent the scattering of rock and debris. These activities would strictly adhere to all industry standards that apply to controlled blasting and blast vibration limits with regard to structures and underground utilities. Blasting in the vicinity of nearby utilities and railroads would be coordinated with the owner, as necessary. Blasted rock would be hauled off-site and disposed of in an appropriate manner. Details of blasting controls and safety procedures would be specified in the EM&CP filing.

2.2.2.3 Cable Installation

For the overland sections of the Project route, the two (2) power cables would typically be laid side-by-side in a trench approximately four (4) feet wide and four (4) to five (5) feet deep.[84] Once a pre-selected length of trench is excavated to the necessary depth and the base prepared,

[83] *Id.* at 23.
[84] *Id.* at 11.

rollers would be placed in the bottom of the trench (or along the upper rim of the excavation) to facilitate pulling the cable into the trench. A cable attached to a winch at the opposite end of the trench from the cable spool would be attached to the cable and reeled in, pulling the cable down the length of the trench on the rollers. Depending upon the soil conditions on the bottom of the trench, the bottom of the trench may require padding fill (i.e., clean sand) before pulling the cable into the trench. Once the cable segment is pulled down the length of the trench, it is moved off the rollers and the rollers are re-used at a different location. Given the need to schedule work with the railroads and the overall construction schedule, it is anticipated that cable installation activities would occur twenty four (24) hours per day/seven (7) days per week in most areas, with nighttime shutdowns occurring in select sensitive receptor areas.[85]

During cable installation along railroad corridors, it is anticipated that the railroads would be used to transport heavy equipment such as cable drums to centralized stockpiling areas. Final transport of the cable spools, construction equipment, and supplies would be transported on roadways and so it would be necessary for vehicles to arrive and depart from work areas via local roadways. Workers may arrive at contractor yards or the right-of-way in pickup trucks, supplies may be delivered directly to the site, and equipment such as dewatering pumps, generators, or excavators may also need to access the site via local roads. Along the NYS Routes 22 and 9W corridors, all equipment and supplies would be delivered via the roadways. Within New York City, equipment and supplies would be delivered by roadway, rail, or water transport. Procedures for traffic management would be included in the EM&CP and may include items such as detours, police details, and signage.

2.2.2.4 Backfilling

Subsequent to laying the cables, the trench would be backfilled with a layer of soil exhibiting the required low thermal resistivity properties needed to surround the cables, which may include non-native material if the native materials do not exhibit the required low thermal resistivity properties. Because the operation of the cables results in the generation of heat, and heat reduces

[85] Environmental Impacts Associated with Routing Proposed in Joint Proposal at 5, *Application of Champlain Hudson Power Express, 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*, Case No. 10-T-0139 (N.Y. P.S.C. Feb. 24, 2012), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={4CC6BFC1-1945-401B-8EF9-D67CB3C263FB}.

the electrical conductivity of the cables, it is important to backfill with soil having a low thermal resistivity. The soil's ability to conduct heat to the atmosphere would limit the temperature build-up in the soil around the cable and prevent heat from one cable affecting the nearby cable. There would be a protective concrete or high density polyethylene ("HDPE") cover plate directly above the low thermal resistive backfill material, which is anticipated to be one to two feet above the bottom of the trench. A safety marker tape would be placed approximately two (2) feet below the ground surface and directly above the cables. The top of the trench may be slightly crowned to compensate for settling. Excess clean spoil material from trench excavation would be disposed of by spoiling on site where approved, or properly disposed of off site at an approved location. Contaminated spoils would be disposed of as required by federal and/or state regulation.

2.2.2.5 Restoration and Re-vegetation

Cleanup crews would complete the restoration and revegetation of the ROW and temporary construction workspace. In conjunction with backfilling operations, any remnant woody material and construction debris would be removed from the rights-of-way or as allowed by state and federal regulators. The construction area would be seeded with an approved seed mix for the temporary work area and allowed to further revegetate naturally. Paved areas would be restored to match existing conditions in accordance with NYSDOT requirements.

2.2.2.6 Wetland Crossings

As part of the Joint Proposal, the Applicants agreed to a condition which required that they "minimize disruption to regulated wetlands during the construction, operation, and maintenance activities of the Facility."[86] This condition further requires that any activities that may affect regulated wetlands shall be designed and controlled to minimize adverse impacts, giving due consideration to the environmental values and functions of the regulated wetlands and the adjacent area. The Applicants are also required "to the maximum extent practicable, avoid direct

[86] Order Granting Certificate of Environmental Compatibility and Public Need at 256, *Application of Champlain Hudson Power Express, 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*, Case No. 10-T-0139 (N.Y. P.S.C. Apr. 18, 2013), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={A71423C8-B489-4996-9C5A-016C9F334FFC}.

impacts to regulated wetlands and construct access roads outside regulated wetlands and adjacent areas."[87] Pursuant to another condition, the Applicants will establish and implement a program to monitor the success of wetland and stream restoration upon completion of construction and restoration activities.[88]

Routing construction equipment working along the overland portions of the route will operate primarily from the railroad bed, railroad access roads, embankments, along the road shoulder, or other upland areas. If any construction equipment needs to operate within wetlands that are likely to be impacted by soil compaction or rutting, based on conditions at the time of construction, the Applicants will use equipment mats or low-ground-pressure tracked vehicles to avoid and/or minimize impacts to wetland soils.[89] Clearing of existing vegetation within wetlands and/or in or near waterbodies will be limited to the area necessary to allow for completion of construction activities and to allow for reasonable access for long term maintenance.[90]

To avoid increases in erosion and sedimentation into waterbodies and wetlands from land disturbance in nearby construction areas, the Applicants will install temporary and permanent erosion control measures along the construction corridor and adjacent to soil stockpiles, as needed, and will manage construction stormwater in accordance with a Storm Water Pollution Prevention Plan ("SWPPP") for the Project.[91] If dewatering is required within the excavated trench, water will be discharged to a well-vegetated upland area, a properly constructed dewatering structure, or thorough a filter bag.[92]

In addition to the requirements of the Certificate Conditions, the Applicants have also agreed to implement Best Management Practices ("BMPs"), which establish basic procedures to be followed during construction, operation and maintenance of the Project[93]. Topics covered in the BMPS include stormwater pollution prevention, protection of streams and wetlands, and the

87 *Id*.
88 *Id*. at 264.
89 *Id*.
90 *Id*. at 260.
91 *Id*. at 262.
92 *Id*.
93 *Id*. at 368.

cleanup and restoration of disturbed lands. The complete document was provided to the USACE in Appendix O of the Supplemental Application.[94]

2.2.2.7 Overland Infrastructure/Waterway Crossings

The Project route would result in multiple river, stream, road, and other crossings by the cables and construction equipment. Cable installation options for the infrastructure and/or waterway crossings include trenching, HDD (see Section 2.2.2 below), or attachment to existing structures such as bridges or railroad trestles. The specific design for each crossing would address the conditions at the particular location, owner/operator design requirements and the preferences of the Engineering, Procurement and Construction ("EPC") contractor, or the Conditions of the Article VII Certificate of Environmental Compatibility and Public Need ("Certificate") and would be detailed in EM&CP.

2.2.3 Horizontal Directional Drilling Installation Methods

HDD is a common technique used to install transmission cable projects to avoid or minimize environmental impacts as well as to address engineering or infrastructure constraints associated with traditional trench installation (e.g., major highway crossings). HDD is a trenchless method for installing pipelines and conduit beneath other facilities or resources of concern, including habitats, archeological sites, waterbodies, or existing infrastructure. HDD is a multi-stage process[95] composed of the five steps listed below:

- Pre-site planning;
- Drilling a pilot hole;
- Expanding the pilot hole by reaming if necessary;
- Pull back of drill string with simultaneous installation of conduit; and
- Cable pull through the conduit.

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[94] Attachment O: Best Management Practices, Champlain Hudson Power Express Inc., Supplement to U.S. Army Corps of Engineers Application, No. 2009-1089-EHA (Feb. 10, 2012) ("CHP Supplemental Application"), http://www.chpexpress.com/docs/regulatory/permit-application/Attachment%20O%2020120229.pdf.

[95] Attachment H – Revised Attachment H: Cross Section Diagrams at 26, CHP Supplemental Application, http://www.chpexpress.com/docs/regulatory/permit-application/Attachment%20H%2020120229.pdf.

For each proposed HDD location, two separate drills would be required, one for each cable. Each cable would be installed within a 10-inch-diameter, or larger, HDPE casing. To maintain appropriate separation between the two cables, a minimum of six (6) feet would be required between each drill path. HDD would be employed in a number of situations during construction, including both overland sections of the Project route and at shoreline land/water transition locations. HDD locations along the Project route would have both the entry and exit holes staged on land. The HDD locations are shown on the Terrestrial Route Plan View Map provided in Attachment E of the Supplemental Application.[96] All HDD locations would be engineered on a site-specific basis during development of the final design phase for inclusion in the EM&CP.

At the seven (7) locations along the Project route where the cables transition from water to land (and vice versa), installation would be accomplished through the use of HDD methodology in order to avoid or minimize disturbance to the banks and near-shore areas. The HDD would be staged at the onshore landfall area and would involve the drilling of the boreholes from land toward the offshore entry/exit point. Two (2) conduits (one for each cable) would then be installed through the length of the boreholes and the transmission cable would be pulled through the conduit from the submarine end toward the land. A transition manhole or transmission cable-splicing vault would be installed using conventional excavation equipment (backhoe) at the onshore transition point where the underwater and overland transmission cables would be connected (see "Typical Terrestrial Transition" Figure 176764-UM-41[97] and "Typical Splice Vault" Figure 176674-UM-35[98] in Attachment H of the Supplemental Application).

A drill rig would be set up onshore behind a bentonite pit, where a drill pipe with a pilot-hole drill bit would be set in place to begin the horizontal drilling. Drilling fluid would then be pumped into the hole as the cutting head is advanced into the soil. The HDD construction process would involve the use of drilling fluid in order to transport drill cuttings to the surface for recycling, aid in stabilization of the in situ soil/sediment to keep the hole open, and to provide lubrication for the HDD drill string and down-hole assemblies. This drilling fluid is composed of a carrier fluid and solids. The selected carrier fluid for this drilled crossing would consist of

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96 Attachment E – Revised Attachment D: Plan View Maps – Overland Route, CHP Supplemental Application, http://www.chpexpress.com/docs/regulatory/permit-application/Attachment%20E%2020120229.pdf.

97 Attachment H – Revised Attachment H: Cross Section Diagrams at 10.

98 *Id.* at 12.

water (approximately 95 percent) and inorganic bentonite clay (approximately 5 percent). The bentonite clay is a naturally occurring hydrated aluminosilicate composed of sodium, calcium, magnesium, and iron that is environmentally benign.

After each section of drilling, an additional length of drill pipe is added until the final drill length is achieved. To avoid or minimize the release of the bentonite drilling fluid into the water, freshwater may be used as a drilling fluid to the extent practicable for the final section of drilling, just prior to the drill bit emerging in the pre-excavated pit. This would be accomplished by pumping the drilling fluid out of the drill stem and replacing it with freshwater as the drill bit nears the pre-excavated pit. When the drill bit emerges in the pre-excavated pit, the bit is replaced with a hole-opening tool called a reamer to widen the borehole. It is anticipated that a single reaming pass would be necessary to allow installation of the conduit. Once the desired hole diameter is achieved, a pulling head is attached to the end of the drill pipe and the drill pipe is used to pull back the HDPE conduit pipe into the bored hole. As with the pilot hole drilling process, freshwater would be utilized, if practicable, as the reaming tool nears the pre-excavated pit. Once the HDPE conduits are in place, the underwater cables would be pulled through the conduit, which would be permanently sealed at each end to complete the installation process.

A temporary cofferdam would be constructed at the offshore entry/exit hole location for HDD cable installation at major land-water transitions. The cofferdam would be rectangular in shape and approximately sixteen (16) feet by thirty (30) feet. The cofferdam would generally be constructed using steel sheet piles driven from a barge-mounted crane. The cofferdam is intended to help reduce turbidity associated with the dredging and HDD operations as well as to help maintain the exit pit (see "Typical Terrestrial Transition, Figure 176764-UM-41,[99] in Attachment H of the Supplemental Application). The area inside the cofferdam would be dredged to create an entry/exit pit typically six (6) feet deep. The dredged material would be temporarily placed on a barge for storage and ultimate disposal at an upland permitted facility. Upon completion, the exit pit would be backfilled with clean sand to restore the bottom to preconstruction grade.

After the HDD conduit is installed, the ends of the conduit would be sealed with plastic caps until the subsequent installation of the HVDC transmission cables. After the cables have been

[99] *Id.* at 10.

installed, it is anticipated that the excess annular space with the HDD installed conduit and the installed cable would be backfilled with a thermal grout to help dissipate excess heat generated by the cable. The requirements for the backfill material would be determined in the final design, which would be included in the EM&CP.

The drilling fluid system would recycle drilling fluids (made up of a combination of water, bentonite, and the material being excavated) and contain and process drilling returns for offsite disposal. Although considered environmentally benign, the discharge or release of drilling fluids to the water would be minimized by implementing appropriate techniques and controls to be specified in a drilling fluid overburden breakout monitoring and response plan. It is likely that some residual volume of drilling fluid would be released into the pre-excavated exit pit when the pilot hole and reaming cutting heads come to the surface. The depth of the pit and the temporary cofferdam are expected to contain much of the drilling fluid. The drilling fluid will be removed from the cofferdam prior to removal of the cofferdam.

It is expected that the HDD conduit systems would be drilled through sediment overburden at the landfall location. However, it is anticipated that drilling depths in the overburden would be sufficiently deep to avoid pressure-induced breakout of drilling fluid through the sediments along most of the length of the drill path. Nevertheless, a visual and operational monitoring program will be implemented during the HDD operation to detect a fluid loss as part of the Best Management Practices program.[100] This monitoring includes:

- Visual monitoring of surface waters along the drill path and in the vicinity of the exit hole on a daily basis to observe potential drilling fluid breakout points.
- Drilling fluid volume monitoring by technicians throughout the drilling and reaming operations for each HDD conduit system.
- Implementation of a fluid loss response plan and protocol by the drill operator in the event that a fluid loss occurs. The response plan could include injection of loss circulation additives such as Benseal that can be mixed in with drilling fluids at the mud tanks, and other mitigation measures as appropriate.

[100] Attachment O: Best Management Practices at 8-7, CHP Supplemental Application, http://www.chpexpress.com/docs/regulatory/permit-application/Attachment%20O%2020120229.pdf.

Section 3
Alternatives Analysis Methodology

3.1 USACE Requirements for LEDPA Analysis

Projects subject to the individual permitting process by the USACE under the Clean Water Act ("CWA") must comply with Section 404(b)(1) guidelines (40 CFR Part 230) for discharge of dredge and/or fill material into waters of the U.S. The Guidelines generally require applicants to demonstrate there is no "practicable alternative to the proposed discharge which would have less adverse impact on the aquatic ecosystem" and which "does not have other significant adverse environmental consequences" (40 C.F.R. § 230.10(a)). The Guidelines consider an alternative practicable "if 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)).

The "404(b)(1) Alternatives Analysis" assesses alternatives from which the "least environmentally damaging practicable alternative" is determined. The list of alternatives from which the LEDPA is selected is created after the overall purpose of the project is identified, as only those alternatives which meet the project's overall purpose are considered. The geographic scope of the alternatives considered are determined by the project purpose and would include locations typically considered in similar projects. The level of review required under a LEDPA analysis depends on the nature and severity of the project's impact on the environment.[101] Many of this Project's impacts have been already eliminated or mitigated as a result of the New York State Article VII permitting process.[102]

Once the alternatives have been identified, the practicability of each alternative is evaluated using specific criteria. Any alternative which does not meet the screening criteria is eliminated from further consideration.

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[101] *See* U.S. Envtl. Prot. Agency & U.S. Army Corps of Engineers, *Memorandum: Appropriate Level of Analysis Required for Evaluating Compliance with the Section 404(b)(1) Guidelines Alternatives Requirements* (Aug. 23, 1993) ("Section 404(b)(1) Compliance Memorandum"), http://water.epa.gov/lawsregs/guidance/wetlands/flexible.cfm.

[102] Order Granting Certificate of Environmental Compatibility and Public Need at 2, *Application of Champlain Hudson Power Express, 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*, Case 10-T-0139 (N.Y. P.S.C. Apr. 18, 2013), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={A71423C8-B489-4996-9C5A-016C9F334FFC}.

3.2 Alternatives Analysis Evaluation Criteria

The purpose and need for the proposed Project as described in Section 1, as well as the practicability criteria laid out in 40 C.F.R. 230.10(a)(2), were formulated as criteria against which each alternative would be evaluated, as shown in Table 3-1. Each individual criterion is described below.

TABLE 3-1
ALTERNATIVE ANALYSIS CRITERIA

Evaluation Category		Basis for Criterion
Purpose	Must meet Project purpose	An alternative must achieve Project purpose.
Existing Technology	Must use proven technology.	An alternative's technological methods for transmission must be tested and proven to minimize the risk of failing.
Logistics	Must not require extraordinary technical effort to overcome site conditions or pose difficult-to-overcome constructability issues.	Must not require complex or significant additional means to overcome difficult access or site conditions or require engineering solutions that may not accommodate long-term performance.
	Must be located outside areas having incompatible land use plans or existing incompatible land uses that could pose a risk to the transmission system.	Displacing or adversely affecting existing or planned development is likely to encounter significant regulatory hurdles, as well as political and public opposition.
	Must be located entirely within the State of New York	The proposed Project is delivering power to the New York Control Area; as the benefits of this power will accrue to New York State, regulatory approvals sought in other regions (i.e. New England) would likely face significant regulatory hurdles, as well as public and political opposition.
Cost	Must not be unreasonably expensive to the Applicant, based on costs of similar merchant or participant-funded transmission projects.	The cost of each alternative must be reasonable in the terms of not being substantially higher that the costs of similar merchant or participant-funded projects. As a *merchant* transmission line, Applicants are without captive wholesale customers and guaranteed rate recovery.

3.2.1 Evaluation of Cost

An alternative is not practicable when it is unreasonably expensive to the applicant.[103] The evaluation of cost is not based on the financial standing of the applicant, but rather on what are reasonable costs for the proposed Project. According to the USACE and EPA, "[t]he determination of what constitutes an unreasonable expense should generally consider whether the projected cost is substantially greater than the costs normally associated with the particular type of project".[104]

Unlike traditional utilities – which recover their cost-of-service from captive wholesale customers – the Applicants' Project is a merchant transmission line that assumes the full risk of market development; the Project must therefore be competitively-priced in order to attract transmission customers and provide a rate of return sufficient to retain and attract equity investors and secure debt financing. [105]. As is true for similarly-situated merchant developers, if the cost of the transmission line becomes unreasonably expensive then the proposed transmission line is not likely to be attractive to power generators because the transmission service is cost-prohibitive. CHPE has already absorbed significant cost increases associated with incorporating various alternatives routes, even relatively small incremental additional costs may have a disproportionate impact on the Project. Therefore, in the context of this merchant Project, which has already incorporated a significant number of alternatives to date as a result of the state siting process, the cost of the alternative as compared to the overall Project cost must account for the significantly increased costs that have already been imposed on the Applicants to revise the Project route, and the impact that additional costs will have on the Applicants' ability to effect the Project purpose. As the USACE Regulatory Guidance acknowledges: "It is important to emphasize, however, that it is not a particular Applicants' financial standing that is the primary

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[103] Preamble to Guidelines for Specification of Disposal Sites for Dredged or Fill Material, 45 Fed. Reg. 85,336, 85,343 (Dec. 24, 1980) as referenced in U.S. Envtl. Prot. Agency & U.S. Army Corps of Engineers, *Memorandum: Appropriate Level of Analysis Required for Evaluating Compliance with the Section 404(b)(1) Guidelines Alternatives Requirements* § 3.b. (Aug. 23, 1993) ("Section 404(b)(1) Compliance Memorandum"), http://water.epa.gov/lawsregs/guidance/wetlands/flexible.cfm.

[104] *See* U.S. Envtl. Prot. Agency & U.S. Army Corps of Engineers, *Memorandum: Appropriate Level of Analysis Required for Evaluating Compliance with the Section 404(b)(1) Guidelines Alternatives Requirements* § 3.b. (Aug. 23, 1993) http://water.epa.gov/lawsregs/guidance/wetlands/flexible.cfm.

[105] See Allocation of Capacity on New Merchant Transmission Projects and New Cost-Based, Participant-Funded Transmission Projects; Property Rights to New Participant Funded Transmission, 142 FERC ¶ 61,038 at P 1 (2013) at http://www.ferc.gov/whats-new/comm-meet/2013/011713/E-2.pdf

consideration for determining practicability, but rather the characteristics of the project and what constitutes a reasonable expense for these projects that are most relevant to practicability determinations."

In order to determine the costs normally associated with a transmission project of this type, four recent representative projects were selected. They are described as follows:

Juan de Fuca Project: The Juan de Fuca Project will be an approximately 31-mile-long, 550-megawatt (MW) submarine HVDC cable that extends beneath the Strait of Juan de Fuca to connect View Royal, British Columbia, with Port Angeles in the State of Washington. The expected construction cost of this project is $750 million.[106]

Trans Bay Cable Project: The Trans Bay Cable Project is a 57-mile-long, 400-MW[107] submarine HVDC transmission line located in San Francisco Bay and the Carquinez Straits, extending from a terminus in the City of Pittsburg in Contra Costa County to a terminus in the City of San Francisco in the vicinity of Potrero Point. Its construction costs are estimated to be $505 million.[108]

Neptune Regional Transmission System: The Neptune Regional Transmission System is a 65-mile-long submarine HVDC electric transmission line that connects Sayreville, New Jersey, to Long Island, New York. Construction costs for this project were approximately $600 million.[109]

Northern Pass: The Northern Pass Transmission Project proposes to bring 1,200 MW of energy from Canada to the Northeast region through a primarily overhead transmission system

[106] Stephan Burckhardt, *US-Canadian HVDC Transmission*, CleanTechies Blog (Feb. 7, 2012), http://blog.cleantechies.com/2012/02/07/us-canadian-hvdc-transmission/.

[107] TD World. *Trans Bay Cable to Build Undersea Link to San Francisco.* October 15, 2007. Accessed on-line on April 28, 2013 at: http://tdworld.com/underground-tampd/trans-bay-cable-build-undersea-link-san-francisco

[108] Chuck Bunton, *Cable Laying Ops Begin on Trans Bay Cable Project*, Maritime Professional Blog (Oct. 8, 2009 11:16 AM EST), http://www.maritimeprofessional.com/Blogs/Subsea/October-2009/Cable-Laying-Ops-Begin-on-Trans-Bay-Cable-Project.aspx.

[109] *Neptune Underwater HVDC Project Saves LIPA $20 Million*, Transmission & Distribution World (Oct. 25, 2007), http://tdworld.com/projects_in_progress/announcements/neptune-hvdc-lipa/.

comprised of approximately 140 miles of HVDC and 40 miles of AC cables.[110] Construction costs in 2010 were estimated to be $1.1 billion.[111]

Table 3-2 below shows the costs of the Project as proposed against the three primarily submarine cable installation projects and one primarily overland cable installation project. The selected metric, cost per MW, is appropriate as it has a direct bearing on the costs which must be charged to transmission customers (and the attendant ability of those customers to deliver power at a competitive rate).

TABLE 3-2
CONSTRUCTION COSTS PER MW FOR PROJECT AND COMPARISONS

	CHPE Project	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
Cost Per MW	$ 1,999,800	$ 909,091	$ 1,363,636	$ 1,262,500	$ 916,667

As shown in Table 3-2, the Project's cost per MW of power is already significantly higher (47%) than the next closest project, the Port Angeles – Juan de Fuca transmission system. The source of this cost differential is the overland sections of the route which have been added to the Project since its inception through consultation and the Article VII process.

3.2.2 Evaluation of Logistics

For the purposes of this analysis, logistical factors may include the following: engineering constraints, utility and other public infrastructure, topography and geology, conformance to federal and state laws, social feasibility, regulatory hurdles, public and political opposition, and other consequences to the applicant and the public. The ability to utilize roadways as potential alternatives is limited by Federal Highway Law,[112] New York Highway Law,[113] New York State

[110] Northern Pass FERC Transmission Service Agreement at 51.(Dec. 13, 2010),.http://www.northernpass.us/assets/permits-and-approvals/FERCTransmissionServiceAgreementFiling.pdf

[111] *Id.* at 2..

[112] 23 U.S. Code §§ 101 et seq. http://www.ecfr.gov/cgi-bin/text-idx?&c=ecfr&tpl=/ecfrbrowse/Title23/23tab_02.tpl

[113] New York State Highway Law §§ 10 and 52. See http://public.leginfo.state.ny.us/LAWSSEAF.cgi?QUERYTYPE=LAWS+&QUERYDATA=@LLHAY+&LIST=LAW+&BROWSER=EXPLORER+&TOKEN=40947028+&TARGET=VIEW

Transportation Regulations,[114] and the Accommodation Plan for Longitudinal Use of Freeway ROW by Utilities issued by the NYSDOT.[115] The NYSDOT, which signed the Joint Proposal for Settlement, has indicated that it would highly restrict the longitudinal use of limited access highway ROW by utilities (see Appendix A).[116] In a letter sent during the NYRI Article VII proceeding,[117] the NYSDOT stated that it has an agreement with, and an obligation to, the Federal Highway Administration ("FHWA") on how utility facilities are accommodated on controlled access highways in New York State.[118] Under the "Accommodation Plan for Longitudinal Use of Freeway Right-of-Way by Utilities" only communication facilities were currently permitted to longitudinally occupy New York State freeway rights-of-way with the control of access.[119] The NYSDOT further noted that any requests for non-highway use of controlled access highways must be submitted for approval by the FHWA and that "all alternatives must be exhausted before FHWA approval of an exception can be granted."[120] As of December of 2006, the NYSDOT stated only one exception had been granted by the FHWA.[121]

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114 New York State Department of Transportation Rules and Regulations, 17 NYCRR § 131 (2013). See http://government.westlaw.com/linkedslice/default.asp?SP=nycrr-1000

115 NYSDOT, *Accommodation Plan for Longitudinal Use of Freeway Right-of-Way by Utilities* (1995), https://www.dot.ny.gov/divisions/engineering/design/dqab/dqab-repository/accommod.pdf?nd=nysdot.

116 *See, e.g.*, Article VII Updated Alternatives Analysis at 8, *Application of Champlain Hudson Power Express, 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*, Case No. 10-T-0139 (N.Y. P.S.C. Feb. 24, 2012), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={1376106E-8A60-4BC8-B601-EA7C43ECC0BB}.

117 *See Application of New York Regional Interconnect, Inc. for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII for a high voltage direct current electric transmission line running between National Grid's Edic Substation in the Town of Marcy, and Central Hudson Gas & Electric's Rock Tavern Substation located in the Town of New Windsor*, Case No. 06-T-0650, http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=06-T-0650.

118 NYSDOT, *Accommodation Plan for Longitudinal Use of Freeway Right-of-Way by Utilities* (1995), https://www.dot.ny.gov/divisions/engineering/design/dqab/dqab-repository/accommod.pdf?nd=nysdot.

119 NYSDOT Letter Clarifying Its Position at 1, *Application of New York Regional Interconnect, Inc. for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII for a high voltage direct current electric transmission line running between National Grid's Edic Substation in the Town of Marcy, and Central Hudson Gas & Electric's Rock Tavern Substation located in the Town of New Windsor.* Case No. 06-T-0650 (N.Y. P.S.C. Dec. 18, 2006), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={7EEEDE23-E552-4741-A528-707F1FD866E7}.

120 *Id.* at 2

121 *Id.* at 2

The evaluation of logistics also considers whether an alternative is "available" to the applicant.[122] Legal restrictions that prohibit site development are also considered in determining whether an alternative site is available.

3.2.3 Evaluation of Existing Technology

Any technology found to be technically infeasible to construct and operate should be removed from consideration.[123] In terms of ensuring that the cable technology is tested and proven, only HVDC cable technology is considered in this analysis. HVDC has the ability to transmit large amounts of power over long distances with lower capital costs and with lower energy losses than HVAC.[124] HVDC can carry more power per conductor because, for a given power rating, the constant voltage in a HVDC line is lower than the peak voltage in an HVAC line.[125] HVAC transmission is limited by the amount of reactive power required to deliver active power through transmission lines, so that long distances are technically unreachable with HVAC lines due to limitations on how far reactive power will travel.[126]

In terms of environmental impacts, HVDC cables do not emit fluctuating electric and magnetic fields so they do not raise the health concerns as HVAC power lines.[127] The only field present is a low static magnetic field in close proximity to the cables which is similar to the background

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122 40 C.F.R. § 230.10(a)(2) (2012), See http://www.law.cornell.edu/uscode/text/33/1344.

123 U.S. Envtl. Protection Agency & U.S. Army Corps of Engineers, EPA842-B-92-008, *Evaluating Environmental Effects of Dredged Material Management Alternatives: A Technical Framework* at 21 (revised Mar. 2004), http://water.epa.gov/type/oceb/oceandumping/dredgedmaterial/evaluation.cfm.

124 Ex. 122: Report to Parties – XLPE at 9, *Application of Champlain Hudson Power Express, 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*, Case No. 10-T-0139 (Feb. 24, 2012), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={42265426-A2D8-4BB4-9B0F-669847596CEB}.

125 *Id.* at 9.

126 *Importance of Reactive Power for System*, Electrical Notes & Articles (Mar. 21, 2011), http://electricalnotes.wordpress.com/2011/03/21/importance-of-reactive-power-for-system/.

127 Environmental Impacts Associated with Routing Proposed in Joint Proposal at 306, *Application of Champlain Hudson Power Express, 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*, Case No. 10-T-0139 (N.Y. P.S.C. Feb. 24, 2012), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={4CC6BFC1-1945-401B-8EF9-D67CB3C263FB}.

magnetic field of the Earth.[128] HVDC cables use a strong polymeric insulating material so they do not contain oils for cooling.[129]

Given there are no demonstrated environmental advantages to the use of HVAC cables and the costs are generally greater over longer distances, only HVDC cables will be considered in terms of the cable technology.

[128] Joint Proposal at 42, *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 Public Service Law for the Construction, Operation and Maintenance of a High-Voltage Direct Current Circuit from the Canadian Border to New York City*, Case No. 10-T-0139 (N.Y. P.S.C. Feb. 24, 2012), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={C5F63E41-5ED5-46A2-99A5-F1C5FC522D36}.

[129] *Id.* at 44.

Section 4
New York State Department of Public Service Alternatives

As part of the review of the Project conducted pursuant to Article VII of the New York State Public Service Law, the New York State Public Service Commission Administrative Law Judges invited parties to the proceeding to submit alternative routes for the Project.[130] The NYSDPS submitted three alternative route segments which it considered to be "reasonable."[131] No other party to the proceeding provided an alternative for consideration.

The three NYSDPS alternatives – Hudson River Western Rail Line Route, Harlem River Rail Route, and the Hell Gate Bypass Route – and the outcome of their consideration, are discussed below.

4.1 Existing Technology

For each of the alternatives described in this section, the cable system would be buried. Buried overland installation of the cables is described in Section 2.2.2 above. The typical cable trench along the overland portion of the route would be four (4) feet wide at the bottom and approximately four (4) to five (5) feet deep to allow for the proper depth required for the burial of the cables. A minimum separation distance is required from railroad rails to the cables by each railroad; CP requires a minimum separation of ten (10) feet from the centerline of the outermost track to the cable trench, and CSX requires a minimum separation of twenty-five (25) feet from the centerline of the outermost track. The permanent ROW is anticipated to be thirteen (13) feet in the railroad

[130] Ruling on Schedule and Other Procedural Matters, *Application of Champlain Hudson Power Express, 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,* Case No. 10-T-0139 (N.Y. P.S.C. Oct. 4, 2010), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={F91C8DC4-973C-403F-B32C-F763D67B62F5}.

[131] NYSDPS Staff Submits Proposed Alternative Routes, *Application of Champlain Hudson Power Express, 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,* Case No. 10-T-0139 (N.Y. P.S.C. Oct. 27, 2010), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={421FD837-98B0-4E31-9B46-CCDA62591D73}.

ROW and seventeen (17) feet in other areas[132]. Based on typical construction configurations, the temporary construction zone is assumed to be thirty-one (31) to thirty-three (33) feet wide[133].

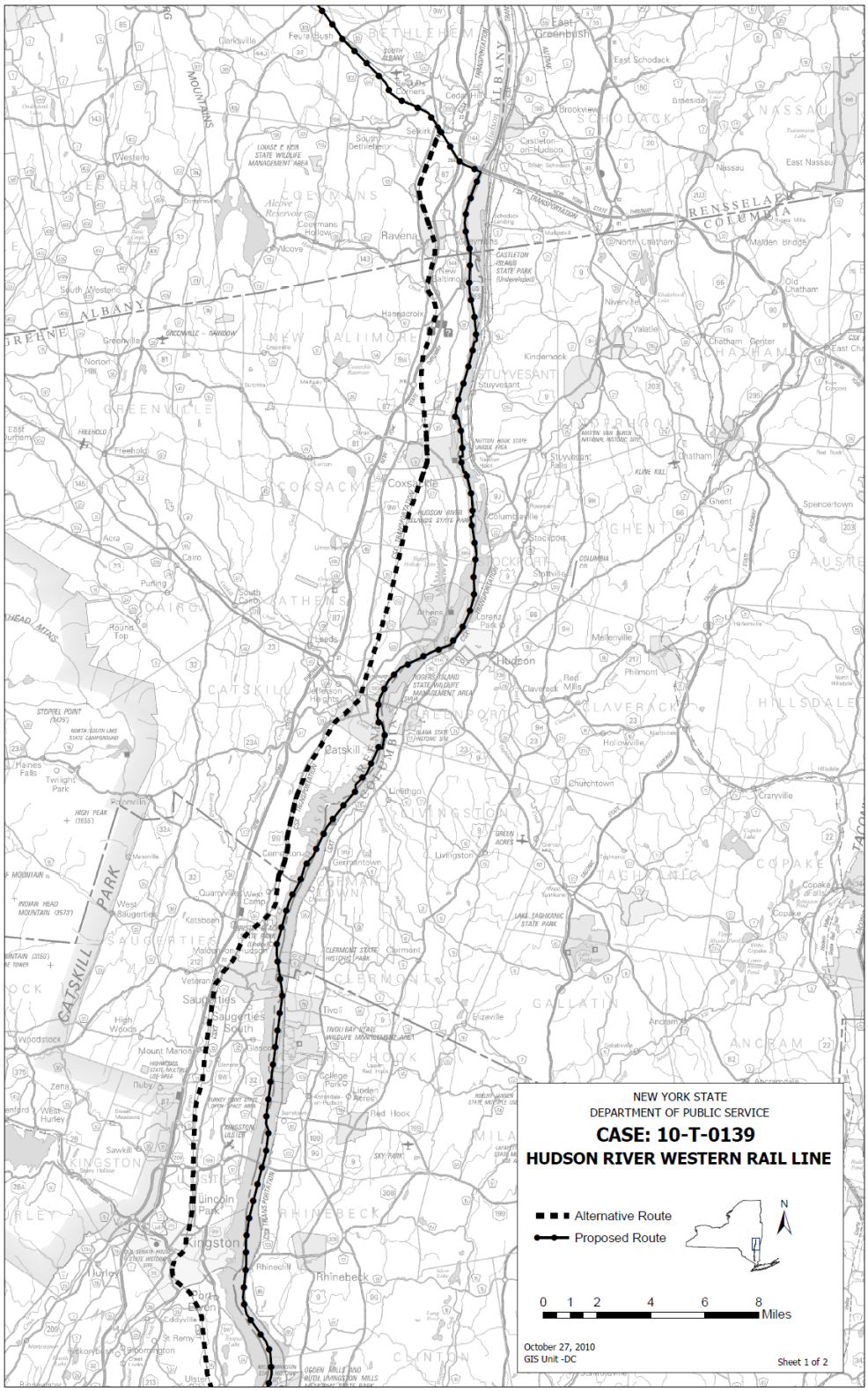
4.2 Hudson River Western Rail Line Route

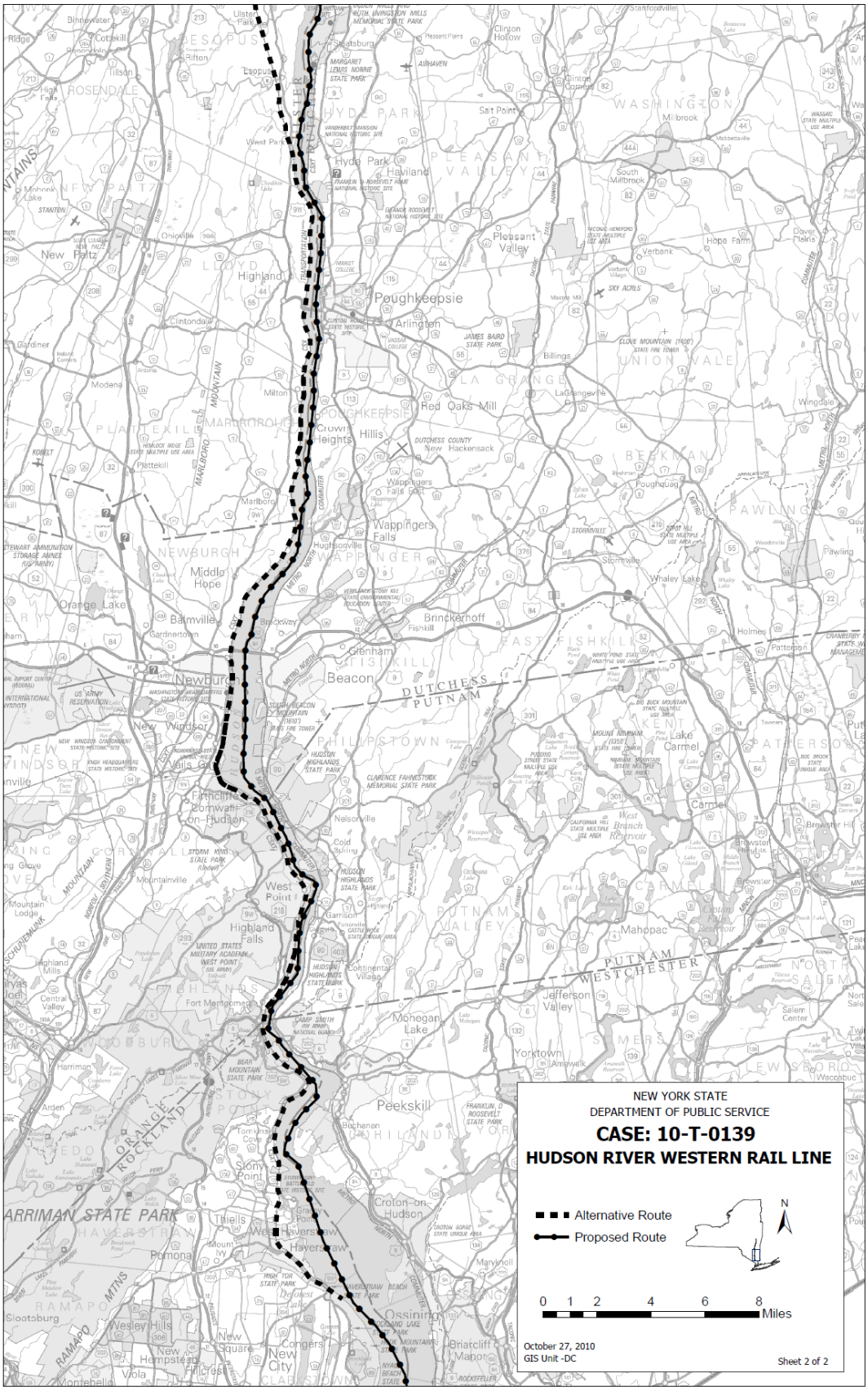
NYSDPS staff described the Hudson River Western Rail Line Route alternative as beginning in the Town of Bethlehem, Albany County and following with the CSX ROW to the west of the Hudson River. The proposed route would enter the Hudson River in the Town of Clarkstown, Rockland County. The route is shown on Figure 4-1.

[132] Order Granting Certificate of Environmental Compatibility and Public Need at 101, *Application of Champlain Hudson Power Express, 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*, Case No. 10-T-0139 (N.Y. P.S.C. Apr. 18, 2013), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={A71423C8-B489-4996-9C5A-016C9F334FFC}.

[133] Attachment H – Revised Attachment H: Cross Section Diagrams, CHP Supplemental Application, http://www.chpexpress.com/docs/regulatory/permit-application/Attachment%20H%2020120229.pdf.

FIGURE 4-1
HUDSON RIVER WESTERN RAIL LINE




NEW YORK STATE
DEPARTMENT OF PUBLIC SERVICE
CASE: 10-T-0139
HUDSON RIVER WESTERN RAIL LINE
Alternative Route
Proposed Route
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October 27, 2010
GIS Unit -DC
Sheet 2 of 2

Practicable Alternatives

At the request of Settlement Parties and the NYSDOS, the Applicants conducted a detailed analysis of the routing constraints and available alternatives along the entirety of this route.[134] This analysis included a review of potential roadway ROWs which could be utilized in locations where the use of the railroad ROW was considered impractical. The following segments were determined to be practicable based on cost, available technology, and logistics.

Route Mile 202 to 223 (Coeymans to Catskill)

The Project route as originally proposed would have entered the Hudson River in Coeymans, New York, reaching that point by following the CSX ROW. The Applicants reviewed the CSX ROW from Selkirk south to north of Catskill and identified no significant engineering constraints. Therefore, this portion of the Hudson River Western Rail Line was accepted by the Settlement Parties as practicable.

Route Mile 296 to 303 (Haverstraw Bay – Stony Point to Clarkstown)

The Project route as originally proposed would traverse Haverstraw Bay by utilizing portions of the existing navigation channel. Haverstraw Bay, however, represents one of the most significant coastal habitats within the Hudson River; consequently, the Applicants worked collaboratively with Settlement Parties to develop a practicable bypass route of Haverstraw Bay, which roughly follows the southern portion of the Hudson River Western Rail Line Route.

Non-Practicable Alternatives

The Applicants' review of the portion of the Hudson River Western Rail Line Route between Catskill and Stony Point indicated that the route was not practicable based on logistics and costs. This analysis is provided below.

[134] Article VII Updated Alternatives Analysis, *Application of Champlain Hudson Power Express, 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*, Case No. 10-T-0139 (N.Y. P.S.C. Feb. 24, 2012) ("Article VII Updated Alternatives Analysis"), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={1376106E-8A60-4BC8-B601-EA7C43ECC0BB}.

Logistics

The constraints based on access, topography and geology are presented below. For ease of review, the Hudson River Western Rail Line Route was divided into segments with reference to the route miles. The anticipated construction duration for the segments described below would exceed thirty-two months utilizing multiple crews, compared to the three months estimated by a contractor for in-water burial.

Route Mile 223 to 233 (Catskill to Malden-on-Hudson)

From Catskill to Malden-on-Hudson (north of Saugerties), Applicants identified CSX's Catskill Trestle, which crosses Catskill Creek and Route 9, as an engineering issue, as there is not a practicable alternative to bring the cables to the Hudson River. While the cables could be laid within the Route 34 right-of-way to connect to Riverside Road, the only parcel adjacent to the Hudson River with sufficient acreage for a HDD into the Hudson River was determined by the NYSDPS to be classified as a municipal park and therefore the rights to the land could not be transferred to a private party without state legislation.[135] Based on the logistics involved in obtaining access to this site, it was determined to be impractical.

Route Mile 233 to 245 (Malden-on-Hudson to Kingston)

Siting in this segment is logistically complicated due to the dense development within the Ulster / Kingston area. As the CSX railroad travels beneath Route 209 in Ulster, the railroad corridor is constrained by existing overhead transmission lines on both sides of the railroad ROW. It would not be possible to maintain a significant separation from these other facilities within the railroad ROW, so the cables would need to be located adjacent to John M. Clark Drive, which runs parallel to the tracks until they both intersect with Route 157, at which point the transmission lines no longer run on both sides of the railroad ROW. As a consequence, certain municipal approvals would be needed. After passing through the Kingston railyard and over Route 32/Flatbush Avenue, the railroad corridor traverses the middle of St. Mary's Cemetery with an overhead transmission line on the western side of the railroad corridor. There is insufficient room between the cemetery

[135] *See, e.g., Friends of Van Cortlandt Park v. City of New York*, 95 N.Y.2d 623, 631-32 (2001) ("[O]ur law is well settled: dedicated park areas in New York are impressed with a public trust for the benefit of the people of the State. Their use for other than park purposes, either for a period of years or permanently, requires the direct and specific approval of the State Legislature, plainly conferred.") (internal quotations omitted).

(actual gravestones) and the railroad tracks along the eastern side of the railroad corridor to install the Project's cables with traditional trenching methods; moreover, the extent of development would prevent the use of HDD. A roadway bypass would require utilizing the Route 32 ROW to access Farrelly Street to the east or Foxhall Avenue to the west. Utilizing either of these roadways would require traveling through residential neighborhoods where the houses are very close to each other and close to the roads, making installation extremely difficult; moreover, utilizing these roadways would likely generate significant local opposition from homeowners.

View (Looking East) of the Railroad Corridor Extending through St. Mary's Cemetery in Kingston

Immediately south of the cemetery, the railroad corridor extends through a heavily developed urban area where large buildings are located immediately adjacent to the railroad corridor (within ~10 feet), resulting in insufficient horizontal clearance to install the Project cables within this section of ROW. This level of development is intermittent until the railroad crosses a small bridge over the Broadway roadway. As with the roads proximal to the cemetery, the roadways that might be utilized as an alternative to this segment (e.g. Foxhall Avenue, Cornell Street, Ten Broeck Avenue, and Grand Street) also have buildings immediately adjacent to the roadway as well as residential houses where construction would be disruptive. As with the above segment, there is likely to be public opposition to construction in close proximity to homes and businesses.

View of Large Buildings Immediately Adjacent to Railroad Corridor in Kingston

Roadway alternatives that would bypass the City of Kingston were also reviewed. Route 9W could be accessed by following Route 157 east at the terminus of John M. Clark Drive. While Route 9W has a low density of development north of Route 32, it becomes a limited access highway (controlled-access road) once it crosses Route 32. As discussed in Section 3.2.2, the NYSDOT has indicated that it would highly restrict the longitudinal use of limited access highway ROW by utilities (see Appendix A).[136]

Route 32 becomes Flatbush Road and Flatbush Avenue as it passes within the city center and experiences the same high level of development as other roadways within the city. Based on this analysis, the Applicants were unable to identify any practicable alternative that traversed the municipalities of Ulster and Kingston and therefore the cables would need to enter the water prior to this point.

In terms of roadway alternatives, the only road that travels in relatively close proximity to the Hudson River is Route 32 with a separation distance of approximately one-half mile. However, this roadway, as well as Route 9W, traverses the Esopus Creek Bridge to cross the Esopus Creek in

[136] *See, e.g.,* Article VII Updated Alternatives Analysis at 8 and Appendix A of this document.

Saugerties. The NYSDOT has indicated that it would not permit hanging cables on structures owned and operated by the agency.[137] An HDD would be complicated by the depth of the gorge (approximately 75 feet), the gravity dam downstream of the bridge, and existing buildings at both ends of the bridge. There are no existing launch /exit sites that meet the necessary spacing criteria for a safe drill under these constraints. Therefore, routes 9W and 32 south of Esopus Creek are considered inaccessible to the northern portion of the cable route and therefore not a practical alternative.

Route Mile 245 to 254 (Kingston to West Park)

At the southern edge of Kingston, the railroad corridor enters a tunnel which leads onto a raised trestle bridge crossing the Rondout River. Cable burial within a tunnel is considered infeasible because adequate separation from the track is not possible; additionally, the cables would be susceptible to damage from the trains, which would pose a risk to the reliability of the cable system.

To access this portion of the alternative from the Hudson River, the cables would need to be installed within Rondout Creek. Rondout Creek been designated by the NYSDOS as a Significant Coastal Fish and Wildlife Habitat ("SCFWH"), as it is one of the largest freshwater tributaries of the Hudson River Estuary and the concentrations of anadromous and resident freshwater fish have been described by the NYSDOS as unusual in Ulster County.[138] Thus, it would have more significant environmental impacts than the proposed route. In addition, there is a former gasification plant at the mouth of the creek and soil remediation in the waterway is currently being conducted, which would severely limit the construction window.[139]

Route Mile 254 to 261 (West Park to Highland)

South of the intersection with Route 9W, the railroad ROW runs adjacent to the Hudson River and there are multiple instances where there is only a narrow strip of land between the edge of the Hudson River to the east and large rock outcroppings or very steep terrain to the west. Installation in these areas would require either blasting of the bedrock to create a sufficient degree of separation from the railroad or an expensive HDD installation (assuming that there is available space for this

[137] Article VII Updated Alternatives Analysis at 5.
[138] *Id.* at 6.
[139] *Id.*

technique).[140] Using on-line aerial photography, sixteen distinct outcrops with an estimated average length of 490 feet and a range of 230 to 1,020 feet were identified. This estimate of bedrock material should be considered conservative as the desktop analysis only accounts for exposed outcroppings. In Highland, Oakes Road runs immediately adjacent to the railroad ROW for approximately 3,200 feet, so there is insufficient room to install the cables for the majority of this stretch.[141]

View of Railroad Route on a Steep Embankment (opposite Hyde Park)

[140] *Id.* Blasting within a railroad ROW is a normally not permitted by railroads. If such work was approved, the cost would vary depending on rock hardness, location, quantity, size requirements, hauling rates, etc. A unit rate of $ 100 /cubic yard would not be unusual under typical railroad ROW conditions. Horizontal directional drills would also be costly, with unit costs in rock of near $1,000/ linear foot.

[141] Article VII Updated Alternatives Analysis at 6.

View of Railroad on a Steep Embankment (continued south of photo above)

The use of Route 9W was also considered, as this roadway initially travels through largely undeveloped countryside. Transmission poles border only one side of the road for less than two (2) miles until it intersects with Upper North Road in Highland. However, a short distance after the intersection with Upper North Road, Route 9W expands to four lanes. Over the next approximately four (4) miles, the transmission system switches sides eight times. In order to maintain the required separation, the cables would need to cross underneath the roadway. As Routes 44 and 55 overlap with Route 9W in Highland, the transmission system poles occupy both sides of the roadway. In addition, the density of businesses with access points on the roadway increases. Route 9W also crosses two bridges before it connects with Route 44/55 for which there are no readily identifiable bypasses. Overall this route would present severe logistical challenges in terms of identifying a constructible route. The intensity of development along Route 9W, particularly as it enters Highland, would result in insufficient room to install the cables for the majority of this stretch. Further, high traffic volume, as well as the presence of bridges, would further make utilization of Route 9W impracticable.

View of 9W at Intersection with Routes 55 and 44 in Highland

Route Mile 261 to 277 (Highland to Newburgh)

Immediately south of where the railroad ROW goes under the Route 44 bridge, a maintenance road or other limited roadway is located to the west of the tracks. The distance between this road and the ROW is insufficient to meet CSX's minimum separation distance from the tracks. Between the Route 44 bridge and U.S. Highway 84 bridge in Newburgh, eighteen rock outcrops were identified using aerial photography that would significantly complicate installation if the railroad companies allowed for the necessary construction activities. The average length of each outcrop is approximately 770 feet with a range of 160 feet to 2,950 feet. This segment also has seven instances where the railroad has water on both sides of the tracks for an average distance of 1,250 feet. As was noted earlier, the desktop analysis only accounts for visible bedrock and so the actual length of ROW where upland construction is essentially infeasible may be far longer. A short distance south of the U.S. Highway 84 bridge, the railroad occupies a raised berm. The cables would either need to be laid at the foot of the berm with HDDs for the road crossings or, in congested sections, the ROW of an alternate roadway such as Water Street would need to be accessed. Based on these geological and engineering logistical issues, installation in this section of railroad ROW is considered to be impractical.

View of Railroad and Culvert Located along Hudson River Southeast of Milton

In terms of roadway alternatives, Oakes Road passes under the Route 44 bridge but reaches a dead end within a mile. Other roadway route alternatives would need to be accessed through Highland and, as previously discussed, the intensity of development in the vicinity of the intersection of Routes 9W and 44 would result in insufficient room to install the cables for the majority of this stretch.

Following the Hudson River south from Highland, the first roadway to come in close proximity to the river is Old Indian Trail Road in Milton at approximately Route Mile 266. At its closest point, the road is adjacent to the railroad ROW and is less than a mile away from connecting to Route 9W. As Route 9W travels south, it traverses lightly to moderately developed areas. However, as was observed in a northern segment, the transmission poles cross the roadway multiple times which would require HDD drillings or open cut trenching at each location. The transmission line crossings are often necessary in order to avoid natural and anthropogenic obstacles,[142] thereby

[142] These natural and anthropogenic obstacles include street lights, isolated utility poles and rock outcrops,

making installation of the Project's cables more impractical since cables would not only need to avoid the transmission lines but also these features.

As the road approaches Marlboro, development becomes more pronounced with the hamlet buildings directly adjacent to the roadway. South of the hamlet's center, the road has transmission poles on one side and a cemetery on the other for approximately five hundred (500) feet. Bypassing this section would require utilizing residential roads for approximately one-half mile. Continuing south, Route 9W continues to travel through low to moderate density developments, with transmission poles that cross the highway at infrequent intervals. Based on the existing utility and development constraints, as well as the likely public opposition to construction in close proximity to homes and businesses, installation in this roadway alternative is considered to be impractical.

Route Mile 277 to 280 (Newburgh to Cornwall on Hudson)

South of Newburgh, where the railroad reaches Cornwall on Hudson where Shore Road is proximal to the railroad tracks, it would not be possible to meet minimum setbacks along much of this section.

Within a one-half mile distance of the Route 84 bridge, Route 9W experiences significant industrial development. In the center of Newburgh, the road is bordered by closely spaced packed residential houses as well as occasional park and recreational facilities. South of Newburgh proper, Route 9W becomes a divided four-lane highway for approximately two miles with transmission poles on the eastern side of the road. Once the divided highway ends, there is a bridge crossing of Moodna Creek which, based on NYSDOT's previously stated position about installation of transmission cables on agency bridges, would require that the Project utilize an HDD drill to cross under the creek.[143] As Route 9W crosses Route 107 in Cornwall, it transitions to a limited access highway and the collocation of transmission cables in the ROW of limited access highways is highly restricted and discouraged by NYSDOT.[144] Due to constraints in the Hamlet of Newburg and engineering constraints at Cornwall on Hudson, installation of the cables in this alternative section is impractical.

[143] Article VII Updated Alternatives Analysis at 8.
[144] *Id.*

Route Mile 280 to 284 (Cornwall on Hudson to West Point)

As the railroad reaches Cornwall on Hudson, Shore Road runs parallel to the tracks for approximately one mile and for more than half that distance the Hudson River lies along the eastern side. Five (5) rock outcroppings with an average length of 960 feet (range of 380 to 1,920 feet) were identified as well as a berm through a water way extending approximately 300 feet. In West Point, River Road and the Upton Road run parallel to the railroad tracks with the Hudson River to the east for approximately 4,060 feet before entering the tunnel beneath West Point Military Academy ("West Point").

As previously discussed, Route 9W becomes a limited access highway in Cornwall and NYSDOT has indicated that it would highly restrict the collocation in the ROW of limited access highways.[145] As an alternate route, Route 218 -- which intersects the highway prior to the transition to a limited access roadway -- was considered. However, this roadway travels through the center of Cornwall on Hudson through closely spaced residential houses and commercial districts. Trees line both sides of road through the town, so that any installation would either require their removal or risk damage as well as overcome any opposition from local residents and businesses. Outside the town proper, Route 218 enters Storm King State Park and climbs up Storm King Mountain along a steep and windy roadway. As the road crosses the front of the mountain, there is an approximately half-mile stretch where the road has been carved out of the cliff face. Based on the access and engineering constraints, this roadway is not considered to be a practical alternative.

Route Mile 284 to 285 (West Point)

The railroad tunnel beneath West Point extends for approximately 3,500 feet. As discussed earlier, the railroad company has specified safety setbacks which could not be met within this tunnel through burial installation. Rock cuts into the sides of the wall were considered, but railroad representatives indicated that they would not allow this approach as it would require work within the tunnel for months, significantly impacting railway use.[146] Installation of the cables within the tunnel ceiling would also require significant construction time and would present a serious liability should any type of failure occur. As the railroad tracks leave the tunnel, there is a short stretch

[145] *Id.*
[146] *Id.*

(approximately 500 feet) where an Academy parking lot lies to the east and Williams Road to the west. The parking lot would need to be excavated in order to install the cables or an HDD constructed. Installation in this section of railroad ROW is considered to be impractical.

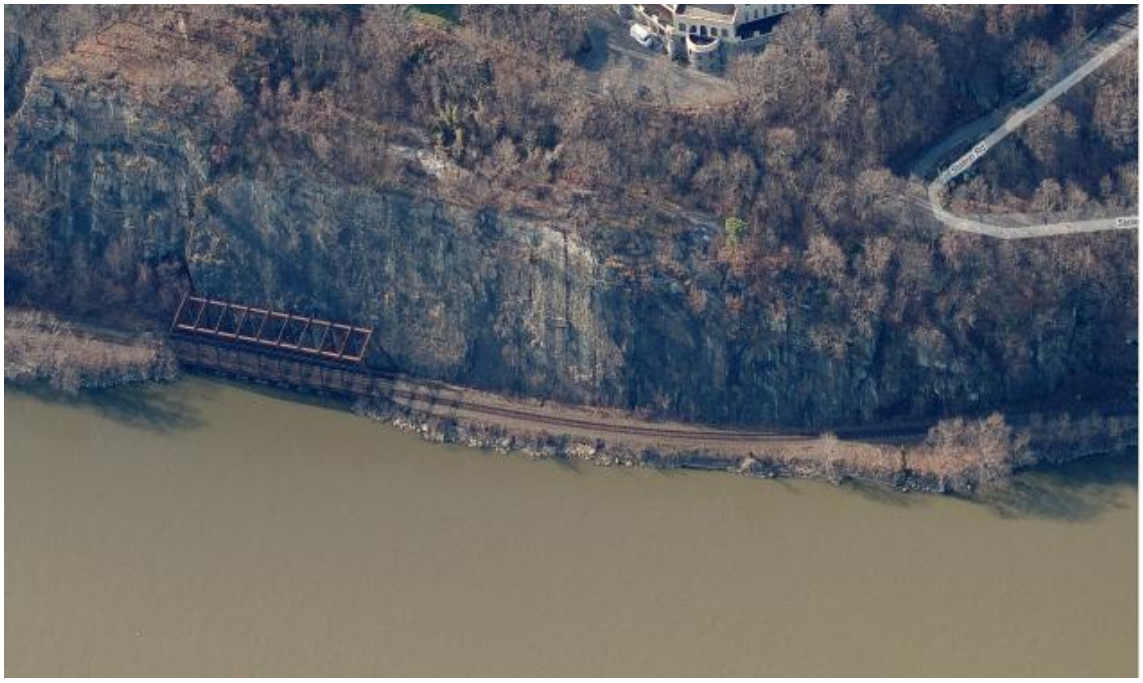
There are no state roads in close proximity to either entrance to the tunnel. Both River Road and Upton Road are in close proximity to the water and connect into existing local roads. However, these roads are built perpendicular to the slope of the foothills of Storm King Mountain and the rights-of-way are narrow.

View of Railroad and Roads along Storm King State Park & Hudson Highlands State Park

Route Mile 285 to 290 (West Point to Fort Montgomery)

As with earlier segments, the railroad runs parallel to the Hudson River. Ten rock outcroppings with an average length of 720 feet (range of 265 to 1,606) were identified in addition to four water crossings with an average length of approximately 490 feet (range of 402 to 644). In addition, the ROW travels through the Bear Mountain tunnel, which extends for approximately 800 feet. Installation in this section of railroad ROW is considered to be impractical.

View of Railroad and Bridge Located South of West Point



View of Tunnel and Waterbody Crossing in Bear Mountain State Park

View of Railroad along Bear Mountain State Park

There are no state roads or local roads in close proximity to the water for this segment. Mine Dock Road in Fort Montgomery could be accessed if the cables came out of the water into the railroad ROW and were laid a short distance before entering the road. However, Mine Dock Road runs underneath Route 9W and private homes are located on either side of the bridge abutments, posing significant logistical concerns.

Route Mile 290 to 296 (Fort Montgomery to Stony Point)

Six rock outcroppings were identified with an average length of 490 feet (range of 190 to 860) and seven water crossings with an average length of 1,080 feet (range 391 to 2,373). In addition, north of Stony Point Lighthouse is an approximately 2,020-foot stretch of railroad where water is to the east and utility grade transmission lines are to the west. As the railroad curves around Dunderberg Mountain past Jones Point, River Road runs parallel to the tracks for approximately 1,400 feet. Further along the tracks, West Shore Drive in Tomkins Cove runs in close proximity to the railway for approximately 1,600 feet. Installation in this section of railroad ROW is considered to be impractical due to the constrained ROW.

A steep rock embankment lies beneath the bridge that connects Routes 6/202 into a round-about with 9W/202 and the Palisades Interstate Parkway, which is a limited access highway that terminates at this traffic circle. As there is a toll-collection area associated with the bridge to the east, consultation would need to occur with the NYSDOT as they have indicated that the use of the ROW of limited access highways would be highly restricted.[147] Moreover, the roadway travels south through Bear Mountain State Park and trees line both sides of the road, which is kept in a natural setting. The roadway passes a boat launch near Iona Island, whose bay is a SCFWH. Six rock outcroppings of an average length of 850 feet (range of 141 to 2,556 feet) were identified. Installation in this section of road is considered to be impractical due to the extent of clearing, blasting and/or other activities that would be required within a state park for a relatively short overland segment.

Cost

The Hudson River Western Rail Route entails an upland section from Catskill to Stony Point. These 96 miles include a number of challenging and costly installation measures including;

- Requirements for long horizontal directional drills;
- Accommodating extremely narrow work areas;
- Incorporating interim bypasses on roadways;
- Avoiding conflicts with existing utilities;
- Crossing of 11 waterways and 2 areas of Significant Coastal Fish and Wildlife Habitat;
- Construction through 61 areas with predominately rock conditions; and
- Passing through or around 4 tunnel sections.

Only for the purpose of preparing a cost estimate is it assumed that engineering solutions can be developed for all of the listed challenges; however, given the complexity of some of the challenges, engineering solutions or agency approvals may not, in fact, be attainable. The installation problems are more pronounced in the urban and industrial areas of Ulster, Kingston and Newburgh due to the existing developed landscape conditions. Engineering solutions will also require extensive

[147] Article VII Updated Alternatives Analysis at 8.

discussions with local municipalities, NYSDOT and with CSX to secure variances from conventional protocols for construction and installation in their busy freight rail corridor.

The estimated costs per mile for the additional 96 miles upland section ranges from$ 4.8M/mile to $9.0M/mile, as compared to the $3.5M/mile for the Article VII proposed marine route. Extending these estimated costs results in a net increase to the Project costs for installation of the cables from Catskill to Stony Point of approximately $620M or a 42% increase from the cost of the Article VII baseline cable installation estimate. The Hudson River Western Rail Route also represents a net additional twenty-four (24) miles of installation when compared to the baseline route.

Additional information on the comparative costs is shown in Table 4-1.

Analysis

NYSDPS staff described the Hudson River Western Rail Line Route alternative as beginning in the Town of Bethlehem, Albany County and following with the CSX ROW to the west of the Hudson River. During settlement negotiations, the Applicants agreed to the segment from Coeymans to Catskill (21 miles) and the bypass around Haverstraw Bay (7 miles).

However, the section from Catskill to Stony Point posed significant engineering issues, including insufficient room to install the cables around existing development and utility features, tunnel features, and the requirements for the long HDD installations that would be required in places. Access is also an issue for the alternative in areas where the land is restricted because of existing regulations and laws (e.g. limited access highways, municipal parks, federal land). The installation of the transmission cables in close proximity to homes and business will likely generate public opposition based on the experience of the NYRI project (particularly as the construction duration will be more than a ten-fold increase over in-water installation).

In addition to the logistical issues which would pose difficult issues as well as likely political and public opposition, the complete Hudson River Western Rail Route also has significant cost implications. Project costs would increase by approximately 43% from the current Project; at that cost, there would be no transmission customers that would take service on the transmission line. For these reasons, the Hudson River Western Rail Line Route is not a practical alternative.

TABLE 4-1
PROPOSED PROJECT AND HUDSON RIVER WESTERN RAIL ROUTE

Section	Upland or Marine	Distance (Miles)	Cost per mile ($million)	Project Cost ($million)	Hudson River Western Rail Cost ($million)
International Border to Dresden	Marine	101.5	2.9	$ 290.7	$ 290.7
Dresden to Catskill	Upland	126.8	5.3	$ 666.1	
	Upland	118.3	5.3		$ 621.5
Catskill to Stony Point	Marine	67.4	3.5	$ 237.4	
	Upland	100	9.0		$ 900.0
Stony Point to Clarkstown	Upland	7.9	12.7	$ 100.4	$ 100.4
Clarkstown to Bronx	Marine	27.6	4.4	$ 122.6	$ 122.6
Bronx to Astoria Converter site	Upland	2.3	15.0	$ 34.5	$ 34.5

	Project	Hudson River Western Rail
Marine Distance (miles)	196.5	129.1
Upland Distance (miles)	135.5	227.1
Total Distance (miles)	332.1	356.2
Total Cost ($millions)	$ 1,451.72	$ 2,069.6
Cost Variance from Project ($millions)		**$ 617.92**
Cost Variance from Project (%)		**42.6%**

Notes:

1. Baseline pricing based on estimate provided by reliable contractor in August 2012.
2. Distances based on segment lengths.
3. Marine costs/mile vary due to sub-bottom conditions, turbidity, installation methods, navigation and other considerations.
4. Estimate assumes that engineering solutions and CSX concurrence can be secured for challenging conditions.
5. Engineering solutions to some challenges may not be obtainable.

4.3 Harlem River Rail Route

This proposed alternative would begin in the Hudson River and make landfall at Spuyten Duyvill in the Bronx. The route would then proceed along the Metropolitan Transit Authority and New York State Department of Transportation railroad corridor along the northern and eastern banks of the Harlem River for approximately six miles to the rail yards west of Willis Avenue, where it would join the alignment of the Hell Gate Bypass Route described below. The route is shown in Figure 4-2.

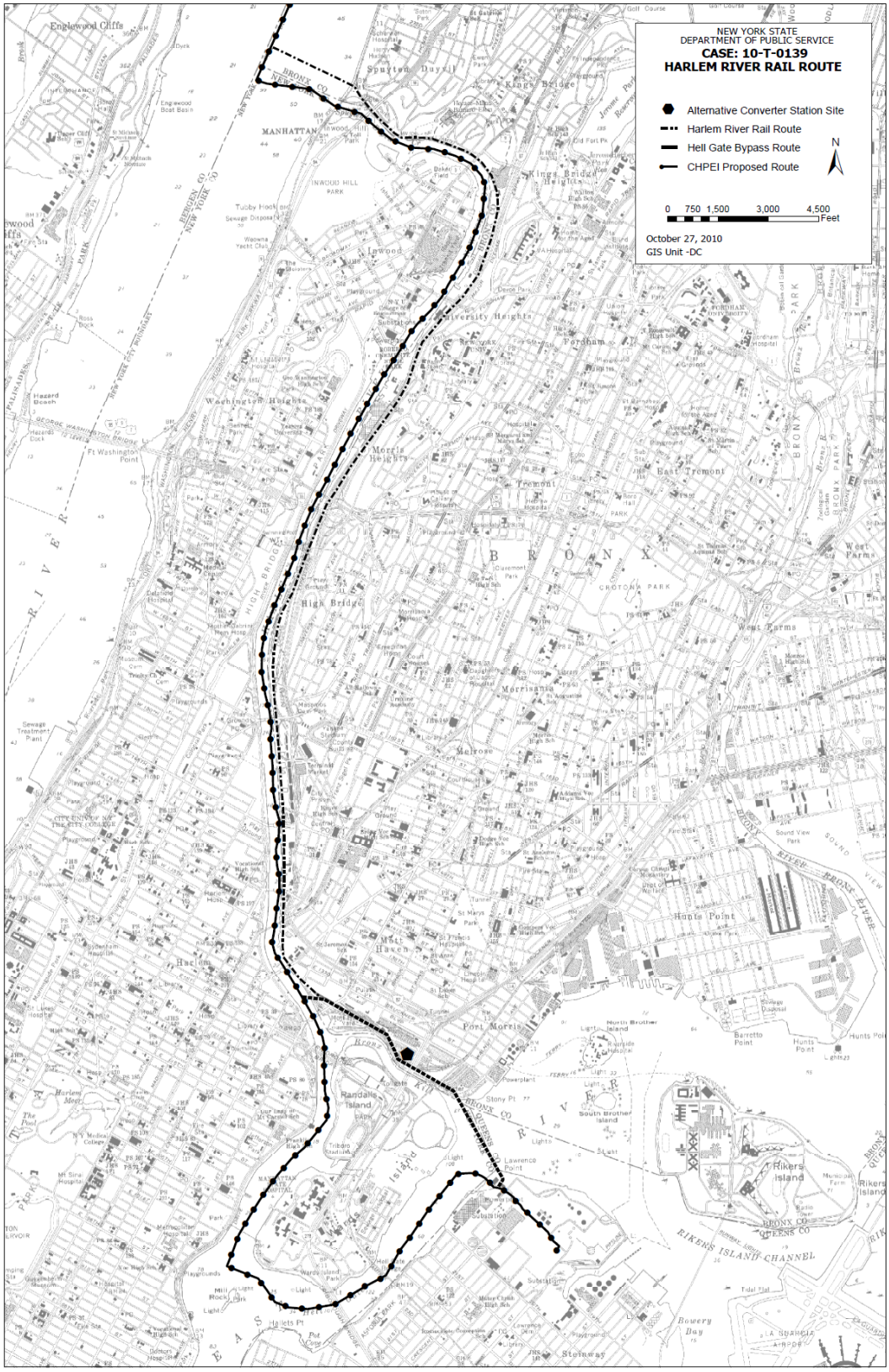
Logistics

The Harlem River Rail Route alternative entails a six mile upland section through the Bronx along rail corridors. The Harlem Rail Line along the river's edge on the Bronx side of the Harlem River provides a near direct upland course within a rail corridor, built in 1851, on trestles set in "rip-rap" foundations. In the northern portion, the route extends through the neighborhoods of the southwest

Bronx in challenging geotechnical conditions (e.g., Fordham gneiss and Inwood marble). The corridor is narrow and construction of a buried HVDC line will entail extended lengths of direct attachments of the cables to the supporting trestles which entail an increased risk of damage to the cables because the cables will be exposed in a high traffic area. Also, approval from the Metropolitan Transit Authority ("MTA") and NYSDOT would be required and it is not clear that such authorizations would be granted.[148] In the southern portion, the route follows a 1.9 mile section of the Oak Point Link which connects the Metro-North Railroad's Hudson Line ("MNCR") with the Harlem River Intermodal Yard and the CSX Transportation Oak Point Yard. Along the route, the cables would pass through three passenger stations and a rail maintenance facility. The Harlem River Rail Route passes under nine bridges and includes a six hundred (600) foot length segment between West Tremont Avenue and the Harlem River Park Bridge where it passes under a building.

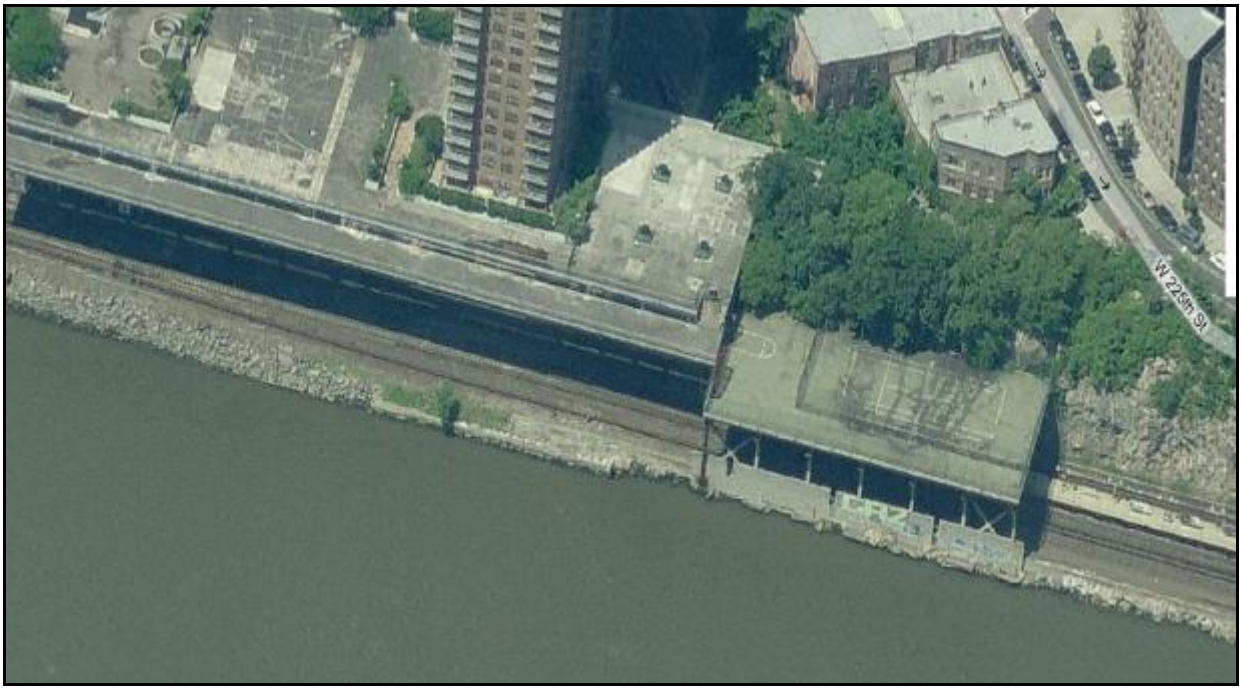
[148] For a discussion of NYSDOT's goals with regards to increasing the utilization of rail freight service in the New York City metropolitan area, see Comparison of Alternative Converter Station Sites Application of Champlain Hudson Power Express, Inc. for a Certificate of Environmental Compatibility 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, Case No. 10-T-0139 (N.Y. P.S.C. Feb. 24, 2012), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={F78693D0-6E5B-4E71-BA6E-53D4A3445A15}.

FIGURE 4-2
HARLEM RIVER RAIL ROUTE



View of Railroad between Large Rock Outcropping along Harlem River

View of Building over Railroad along the Harlem River



View of Building Immediately adjacent to Railroad along Harlem River

Given the challenges of obtaining approvals to secure to the railroad trestle, an additional alternative was assessed; this alternative entails a landing on the west side of Manhattan and an upland route across the City and along a greenway on the western shore of the Harlem River. This route also would require the need for approvals from an assortment of City and State agencies. Working within the City of New York is replete with challenges (e.g. utility relocations, City-imposed work moratoriums) and production rates will likely range from 0 feet/day to 30 feet/day at the high end. Consequently, the overland through the City could disrupt City traffic for more than two years.

Cost

Only for the purpose of preparing this cost estimate is it assumed that engineering solutions can be developed for all of the listed challenges. Scheduling restraints will be most pronounced along the passenger lines. Engineering solutions also will require extensive discussions with the NYSDOT, MTA and with CSX to secure variances from conventional protocols for construction and installation in their busy passenger and freight rail corridor. Given the complexity of some of the challenges, engineering solutions and/or agency approvals may not be attainable.

The estimated cost per mile for the approximately 6 mile upland section ranges is $18M/mile, as compared to the $4.4M/mile for the Article VII proposed marine route, a four-fold increase. The Harlem River Route therefore represents a cost increase of approximately $81 million (305%) compared to in-water installation over the same segment. This results in an overall net increase to the Project costs of approximately 6% above the cost of the Article VII baseline cable installation estimate.

For the overland alternative across the City of New York, the estimated cost per mile for the approximately 6 miles upland section is $32.5 M/mile, as compared to the $4.4M/mile for the Article VII proposed marine route, almost an eight-fold increase. This results in a net increase to Project of approximately $189 M or a 15% increase from the cost of the Article VII baseline cable installation estimate.

Additional information on the comparative costs is shown in Table 4-2.

TABLE 4-2
PROPOSED PROJECT AND HARLEM RIVER RAIL ROUTE

Section	Upland or Marine	Distance (Miles)	Cost per mile ($million)	Project Cost ($million)	Harlem River Rail Cost ($million)	Harlem River (Manhattan)
International Border to Dresden	Marine	101.5	2.9	$ 290.7	$ 290.7	$ 290.7
Dresden to Catskill	Upland	126.8	5.3	$ 666.1	$ 666.1	$ 666.1
Catskill to Stony Point	Marine	67.4	3.5	$ 237.4	$ 237.4	$ 237.4
Stony Point to Clarkstown	Upland	7.9	12.7	$ 100.4	$ 100.4	$ 100.4
Clarkstown to Bronx	Marine	27.6	4.4	$ 122.6		
	Marine	21.6	4.4		$ 95.0	
Clarkstown to Manhattan	Marine	28.5	4.4			$126.60
Bronx (Inwood) to Bronx (HRY)	Upland	6	18		$ 108.0	
Manhattan (Landing to Launch)	Upland	6.5	32.5			$211.25
Bronx to Astoria Converter site	Upland	2.3	15.0	$ 34.5	$ 34.5	$34.5

	Project	Harlem River Rail	Harlem River (Manhattan)
Marine Distance (miles)	196.5	190.5	197.4
Upland Distance (miles)	135.5	141.6	142.1
Total Distance (miles)	332.1	332.3	339.5
Total Cost ($millions)	$ 1,451.72	$ 1,532.2	$1,666.97
Cost Variance from Project on Harlem River ($millions)		**$ 81.35**	**$188.59**
Cost Variance from Project on Harlem River (%)		**305.2%**	**707.6%**
Cost Variance from Overall Project ($millions)		**$ 80.44**	**$215.25**
Cost Variance from Overall Project (%)		**5.5%**	**14.8%**

Notes:

1. Baseline pricing based on estimate provided by reliable contractor in August 2012.
2. Distances based on segment lengths.
3. Marine costs/mile vary due to sub-bottom conditions, turbidity, installation methods, navigation and other considerations.
4. Estimate assumes that engineering solutions and CSX concurrence can be secured for challenging conditions.
5. Engineering solutions to some challenges may not be obtainable.

Analysis

The six-mile Harlem River Rail Route presents enormous logistical and engineering challenges on a busy passenger and freight rail corridor in the most densely populated city in the US. Engineering issues include: attaching the cables to the railway in such a manner that will both ensure the security of the transmission system and maintain existing railway use; installing the cables under buildings; and poor geotechnical conditions. Access to this corridor also would require substantial negotiations with the Metropolitan Transit Authority and NYSDOT; as has been discussed, the NYSDOT does not allow cables on their bridge structures. The construction costs for this segment of the route, even if achievable, are approximately 305% higher than the in-water installation. An alternative route buried in Manhattan would have a net increase to the Project costs of approximately $189 M or a 15% increase from the cost of the Article VII

baseline cable installation estimate. Based on the higher construction costs as well as the extreme uncertainty as to whether it is feasible from an engineering perspective, this alternative is impractical.

4.4 Hell Gate Bypass Route

The Hell Gate Bypass Route alternative begins north of the Willis Avenue Bridge, and proceeds easterly to landfall at the NYSDOT railroad corridor and rail yards, following the rail corridor along the northerly side of the Bronx Kill to the East River. This route proceeds southeasterly across the East River to landfall at the power plant complex at Lawrence Point in Astoria, Queens. See Figure 4-3.

NYSDPS Staff noted that this alternative avoided installing the transmission cables in a longitudinal occupancy of the Hell Gate reach of the East River, where engineering constraints and environmental conditions may limit constructability.[149] Furthermore, this alternative minimized conflicts with proposed development of renewable hydrokinetic energy demonstration projects in the East River.[150]

Based on an analysis of this alternative as part of the Article VII proceeding, it was determined to be practical in terms of cost, available technology, and logistics and, therefore, was incorporated into the proposed Project.

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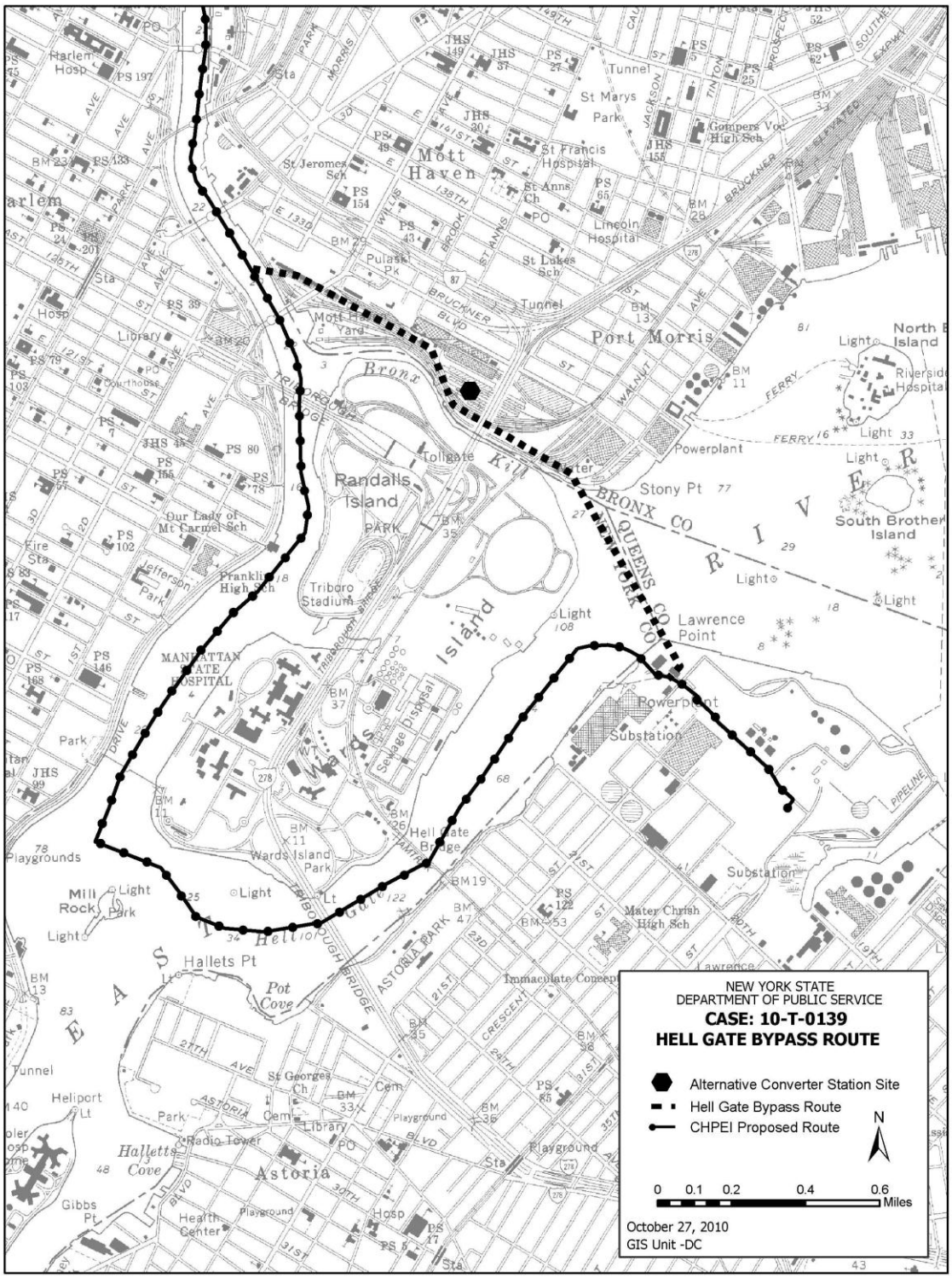
[149] NYSDPS Staff Submits Proposed Alternative Routes at 3, *Application of Champlain Hudson Power Express, Inc. for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII of the PSL for the Construction, Operation and Maintenance of a High Voltage Direct Current Circuit from the Canadian Border to New York City*, Case No. 10-T-0139 (N.Y. P.S.C. Oct. 27, 2010), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={421FD837-98B0-4E31-9B46-CCDA62591D73}.

[150] New York East River Tidal Project, FERC Docket P-12665, and Roosevelt Island Tidal Project, FERC Docket P-12611. See http://web2.uconn.edu/seagrantnybight/documents/Energy%20Docs/6_Hydrokinetic.pdf

FIGURE 4-3
HELLGATE BYPASS ROUTE



Section 5
U.S. Army Corps of Engineers Alternatives

The USACE requested that the following alternatives be considered:[151]

a) A new overland power line route through a combination of road right-of-way (ROW), railroad ROW, and new power line ROW.

b) A new overland power line route through a new power line ROW.

Each of these alternatives is evaluated below.

5.1 Existing Technology

For each of the alternatives described in this section, the cable system would be buried. Buried overland installation of the cables is described in Section 2.2.2 above. The typical cable trench along the overland portion of the route would be four (4) feet wide at the bottom and approximately four (4) to five (5) feet deep to allow for the proper depth required for the burial of the cables. A minimum separation distance is required from railroad rails to the cables by each railroad; CP requires a minimum separation of ten (10) feet from the centerline of the outermost track to the cable trench, and CSX requires a minimum separation of twenty-five (25) feet from the centerline of the outermost track. The permanent ROW is anticipated to be thirteen (13) feet in the railroad ROW and seventeen (17) feet in other areas.[152] Based on typical construction configurations, the temporary construction zone is assumed to be thirty-one (31) to thirty-three (33) feet wide.[153]

5.2 Overland Using Existing Rights-of-Way

The proposed alternative using existing ROWs is presented in segments: 1) west of Adirondack Park; and 2) east of the Hudson River.

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[151] U.S. Army Corps of Engineers. 2013 USACE File Number 2009-01089-WRY, Transmission Developers Inc., Champlain Hudson Power Express Transmission Line Project, OE Docket N.O. PP-362. USACE Comments on Preliminary Draft Environmental Impact Statement dated December 2012. Letter to Brian Mills, U.S. Department of Energy and Donald Jessome, TDI dated February 19, 2013.

[152] Order Granting Certificate of Environmental Compatibility and Public Need at 101, *Application of Champlain Hudson Power Express, 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*, Case No. 10-T-0139 (N.Y. P.S.C. Apr. 18, 2013), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={A71423C8-B489-4996-9C5A-016C9F334FFC}.

[153] Attachment H – Revised Attachment H: Cross Section Diagrams, CHP Supplemental Application, http://www.chpexpress.com/docs/regulatory/permit-application/Attachment%20H%2020120229.pdf.

5.2.1 West of Adirondack Park

Based on the US National Transportation Atlas developed by the U.S. Department of Transportation's Research and Innovative Technology Administration, (see Figure 5-1), there are no major railroad routes which travel around the perimeter to the west of Adirondack Park.[154] CSX operates a railroad line that crosses the international border at Massena, New York, travels southwest to Syracuse, New York, then continues to the east to connect with the proposed Project route in Rotterdam, New York, for a total of 280 miles. As this routing would be approximately 100 miles more than the proposed routing for this section (of which approximately 40% is overland), a combination of railroad and roadway routing was selected for this alternative.

The alternative under consideration (see Figure 5-2) would follow the CSX railroad ROW from the U.S. – Canada border near Massena, New York and travel to the southwest for approximately 100.1 miles to the town of Evans Mills, New York. The route would enter the Route 46 ROW which, after a short distance, becomes Route 26. Route 26 would be utilized for approximately 27.1 miles past the municipalities of, among others, Great Bend, West Carthage, Sterlingville, Carthage, and Castorland before entering Lowville.

[154] U.S. Dep't of Transp. Research & Innovative Tech. Admin., *National Transportation Atlas Database* (2012), http://www.rita.dot.gov/bts/sites/rita.dot.gov.bts/files/publications/national_transportation_atlas_database/2012/index.html.

FIGURE 5-1
EXISTING RAILROAD LINES

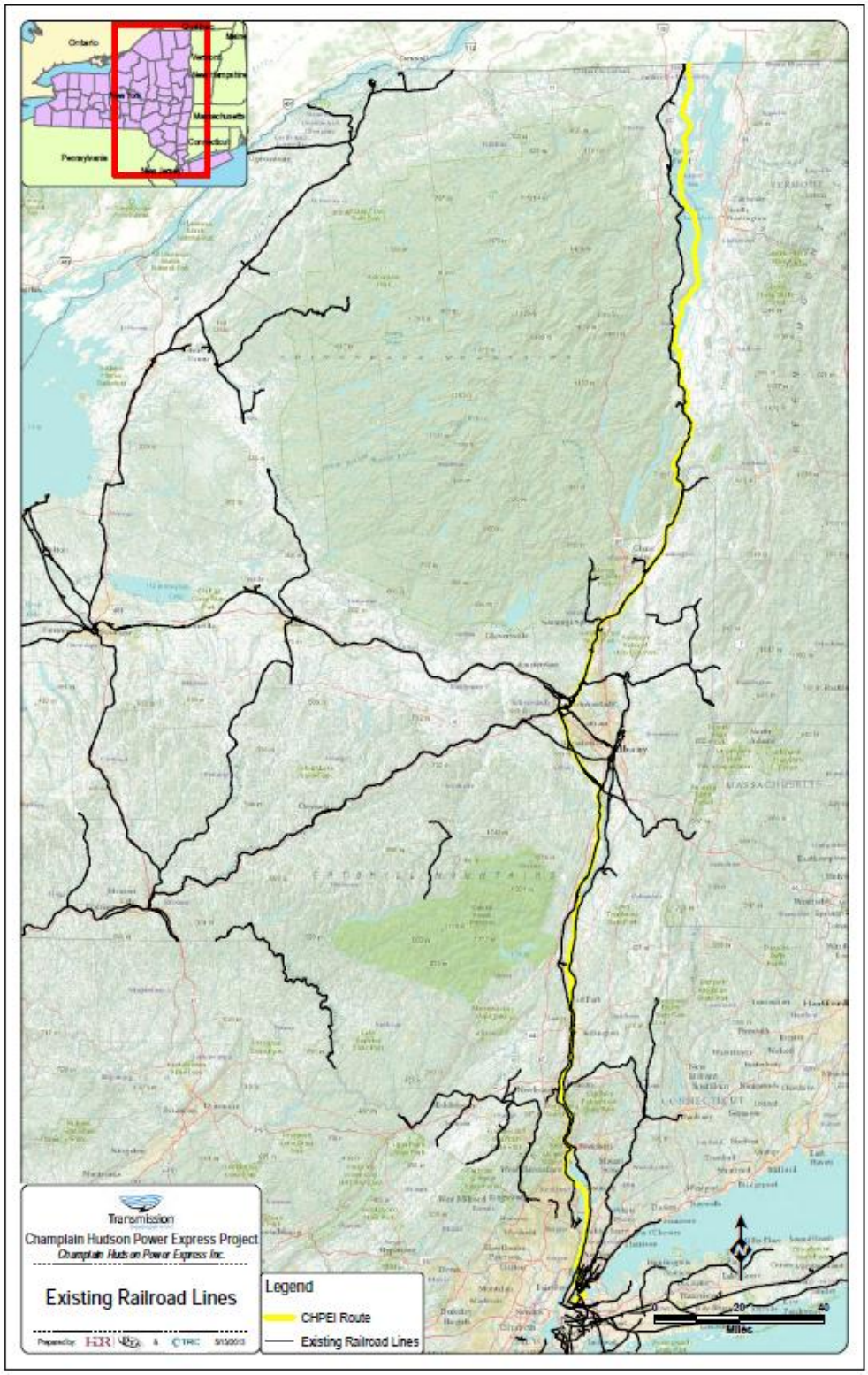
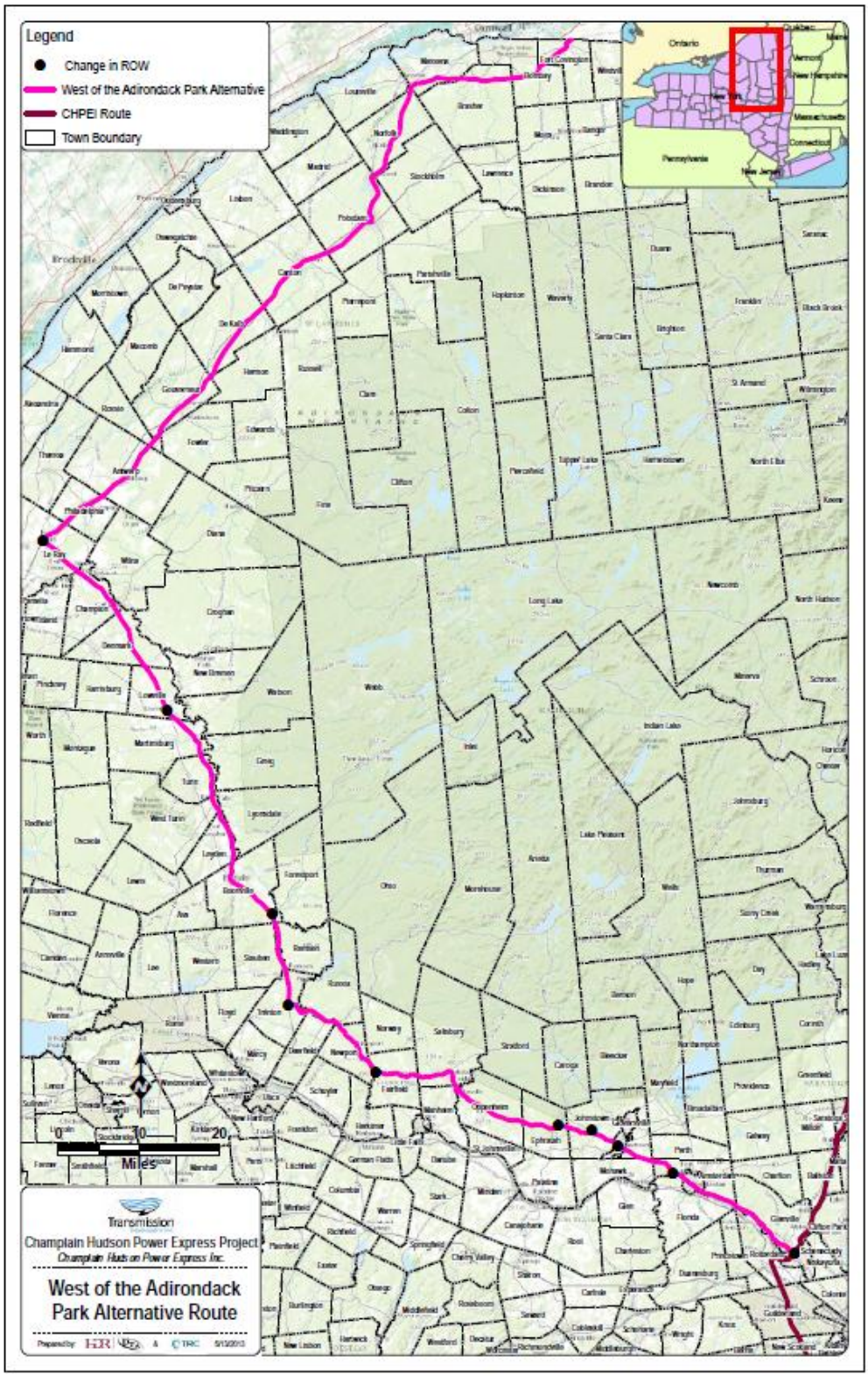


FIGURE 5-2
WEST OF ADIRONDACK PARK EXISTING RIGHTS-OF-WAY ALTERNATIVE



Leaving Lowville, the route would connect into the Route 12 ROW and proceed south for 30.8 miles along this roadway, crossing through, among others, Lewis, Port Levden, Glendale and Boonville. The alternative continues on Route 12 before intersecting with Route 28 in Alder Creek. These two roadways overlap for approximately 11.7 miles until diverging in Trenton.

The alternative would be installed in the Route 28 ROW to the east / southeast for approximately 15.6 miles before intersecting with Route 29 in Middleville.

The Route 29 ROW would be utilized for approximately 27.1 miles before entering Ephratah just after the intersection with Route 10, where Old State Road /Watershed Road and Red School House Road would provide a bypass of the section of Route 29 that enters the Adirondack Park (4.5 miles). Continuing along Route 29, the alternative would transfer from Route 29 to Route 67 in Johnstown after 4.0 miles. The alternative will follow Route 67 for 8.3 miles, overlapping with Route 5 from Fort Johnson to Amsterdam. After 18.6 miles, Route 5 connects to the proposed Project route in Schenectady. The total route length is approximately 247.8 miles.

Logistics

The route would enter the United States near Fort Covington, New York and travel along the railroad corridor primarily through rural areas. Along this route, there are eleven notable water crossings and a wetlands area near DeKalb. The line also passes through a G&W railroad yard. Passing through the towns of Norwood and Potsdam, there are houses in close proximity to the railroad ROW. The crossing of the Racquette River would be complicated by the limited available area on the southern side in which to establish an HDD operation and the presence of the Route 11 bridge abutments. In Canton, the railroad corridor narrows with existing development in close proximity, so that HDDs may be required. The crossing of the Grass River via HDD would be complicated by transmission lines on the northern side of the existing trestles. In Gouverner, towards the center of town, the tracks divide with Route 11 to the west/northwest and existing development to the east/southeast. There are on-going track improvement projects currently underway. The freight rail traffic on this alignment is anticipated to be moderate.

In Evans Mills, the alternative would shift from utilizing a railroad ROW to a series of roadway ROWs. Construction for the first approximately half-mile, as the route leaves the CSX railroad ROW to the Route 46 ROW, will cross through commercial and residential buildings on both sides

of the road, resulting in disruption as the cables are installed in the roadway. Route 26 traverses primarily rural countryside with limited development. There are two notable water crossings at Champion and Denmark, which will require special measures. The crossing at Champion may not lend itself to a HDD and the NYSDOT has stated that it will not allow cables to be attached to their bridges. In Lowville, buildings are immediately adjacent to the Route 26 roadway and include residential houses where construction would be disruptive; as a consequence, there will likely be local opposition to this alternative route.

View of Route 26 in Lowville

As with Route 26, Route 12 primarily traverses rural areas with limited development (e.g. Lewis, Port Levden, Glendale). In Boonville, there is a half-mile section where the roadway is bordered on one site by buildings and water bodies on the other. The landscape remains roughly the same after the roadway intersects with Route 28 in Alder Creek and continues southbound, although the roadway widens to four lanes. As the roadway enters Trenton, existing development is located on both sides of the roadways, which is two-lane highway in this area, so that there is not a clear location in which to locate the transmission cables.

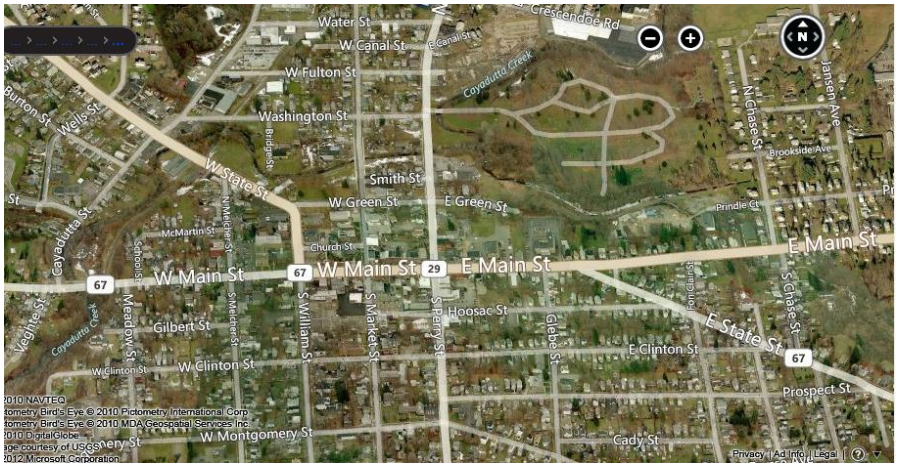
Route 28 primarily travels through rural areas. In centers of Poland, Newport, and Middleville, the roadway is bordered on each side by residential and limited commercial buildings, so that construction associated with installation would be disruptive and may encounter opposition. The construction corridor is particularly constrained in Newport due to the density of buildings adjacent to the roadway.

View of Route 28 in Newport

As with Route 28, residential properties are located on each side of the Route 29 ROW as it moves through the Middletown center. There are smaller communities along this length of this route (e.g. Fairfield, Salisbury Center) where construction will be disruptive to residential homes. More significantly, in Dolgeville, there are closely packed buildings immediately adjacent to the roadway as well as residential houses where construction would be disruptive. Crossing under the East Canada Creek will be severely complicated by the density of buildings on the west side of the waterway.

In Johnstown, the alternative will transfer from Route 29 to Route 67. There is an approximately one-mile segment where residential and commercial buildings are located close together on both sides of the roadway ROWs. There will likely be public opposition to construction in close proximity to homes and businesses, and construction would be further complicated by existing utilities.

View of Routes 29 / 67 in Johnstown



Outside of Johnstown, Route 67 continues the pattern of installation within rural land uses. After intersecting with Route 5, the alternative enters Amsterdam. Construction in this municipality would be severely complicated by the Amtrak railroad line along one side and commercial and residential buildings on the other. This situation is particularly pronounced where Routes 67 and 5 diverge as the existing road networks and buildings occupy all of the likely construction corridors.

Views of Sections of Routes 67 / 5 within Amsterdam

Outside of Amsterdam, installation within the Route 5 roadway would primarily need to be located along the northern side of the roadway due to the railroad to the south. A review of the route using available aerial photography indicates that rock outcrops will occur at sporadic locations along the roadway. In Glenville there are streetlights and transmission poles on both sides of the roadway for approximately a mile so that the cables would need to be installed beneath the state route. A similar situation occurs within Scotia and Schenectady, as utility poles and buildings on both sides of the road would require that installation of the cables occur within the road itself. The construction of the proposed upland alternative to the west of Adirondack Park would likely require, utilizing multiple crews, more than 70 months or 5 years, a more than three-fold increase.

Cost

Only for the purpose of preparing this cost estimate is it assumed that engineering solutions can be developed for all of the listed challenges. Engineering solutions, however, would require discussions with the NYSDOT, G&W, CSX and possibly other short-line owners to secure variances from conventional protocols for construction and installation in their freight rail right-of-way. The most notable engineering challenge appears to be a water crossing at Champion.

The estimated costs per mile for the approximately 240 miles upland section ranges from $3M/mile to $6M/mile, as compared to the Project route's 101 miles of marine burial at $2.9M/mile and 71 miles of upland burial at $5.3M/mile. The added cost of this alternate is approximately $512M or 77% higher than the comparable costs for the corresponding Project segment. These estimated costs would result in a net increase to the Project costs of approximately $512M or a 35% increase from the cost of the Article VII baseline cable installation estimate.

Additional information on the comparative costs is shown in Table 5-1.

Analysis

The proposed routing west of the Adirondack Park entails a 247.8 miles upland section from the Canadian border to Schenectady that passes west of the Adirondack Park along the existing DOT and rail rights-of-way in lieu of the Article VII proposed routing that is principally marine through Lake Champlain and the Champlain Channel. Elimination of the installation of approximately 101

miles of marine cable results in an additional 109 miles of upland cable installation when compared to the Article VII route.

Although the alternative utilizes existing ROWs, there are a number of engineering challenges that would need to be addressed. Specifically, there are a number of water crossings where long HDD installations would be required and, in some locations, there is limited available space to establish an HDD landing area (e.g. Racquette River, Grass River, and East Canada Creek). As the route moves south, it will cross through municipalities (e.g. Johnstown, Amsterdam) where construction would need to occur within close proximity to homes and businesses, which is likely to generate public concern. In certain communities such as Glenville, Scotia and Schenectady, the density of utility infrastructure such as transmission poles and streetlights present on both sides of the roadways will require complicated engineering solutions as well as extensive discussions with local municipalities and NYSDOT.

Moreover, the costs for this alternative represent a significant increase compared to the estimated Project costs. As with the Hudson River Western Rail Route, overland routing presents a number of challenging and costly installation measures including long HDD installations, accommodating narrow work areas, avoiding conflicts with existing utilities, and working in roadways. A buried overland route would represent an approximately 35% increase in the total costs of the Project, making it commercially infeasible. Therefore, this routing is not a practical alternative. As it represents one of the shortest potential routes around the Adirondack Park, all similarly situated routes would also be impractical.

TABLE 5-1
PROPOSED PROJECT AND WEST OF ADIRONDACK PARK OVERLAND ROUTE

Section	Upland or Marine	Distance (Miles)	Cost per mile ($million)	Project Cost ($million)	West of Adirondack Park Cost ($million)
International Border to Dresden	Marine	101.5	2.9	$ 290.7	
Dresden to Rotterdam	Upland	75.5	5.3	$ 396.62	
International Border to Rotterdam	Upland	280	5.0		$1,200.0
Rotterdam to Catskill	Upland	51.2	5.3	$ 268.95	$268.95
Catskill to Stony Point	Marine	67.4	3.5	$ 237.4	$ 237.4
Stony Point to Clarkstown	Upland	7.9	12.7	$ 100.4	$ 100.4
Clarkstown to Bronx	Marine	27.6	4.4	$ 122.6	$ 122.6
Bronx to Astoria Converter site	Upland	2.3	15.0	$ 34.5	$ 34.5

	Project	West of Adirondack Park
Marine Distance (miles)	196.5	95
Upland Distance (miles)	135.5	300
Total Distance (miles)	332.1	395.2
Total Cost ($millions)	$ 1,451.72	$ 1,963.84
Cost Variance from Project for Border to Rotterdam ($millions)		**$ 512.66**
Cost Variance from Project for Border to Rotterdam (%)		**77.2%**
Cost Variance from Project ($millions)		**$ 512.66**
Cost Variance from Project (%)		**35.3%**

Notes:

1. Baseline pricing based on estimate provided by reliable contractor in August 2012.
2. Distances based on segment lengths.
3. Marine costs/mile vary due to sub-bottom conditions, turbidity, installation methods, navigation and other considerations.
4. Estimate assumes that engineering solutions and CSX concurrence can be secured for challenging conditions.
5. Engineering solutions to some challenges may not be obtainable.

5.2.2 East of Hudson River

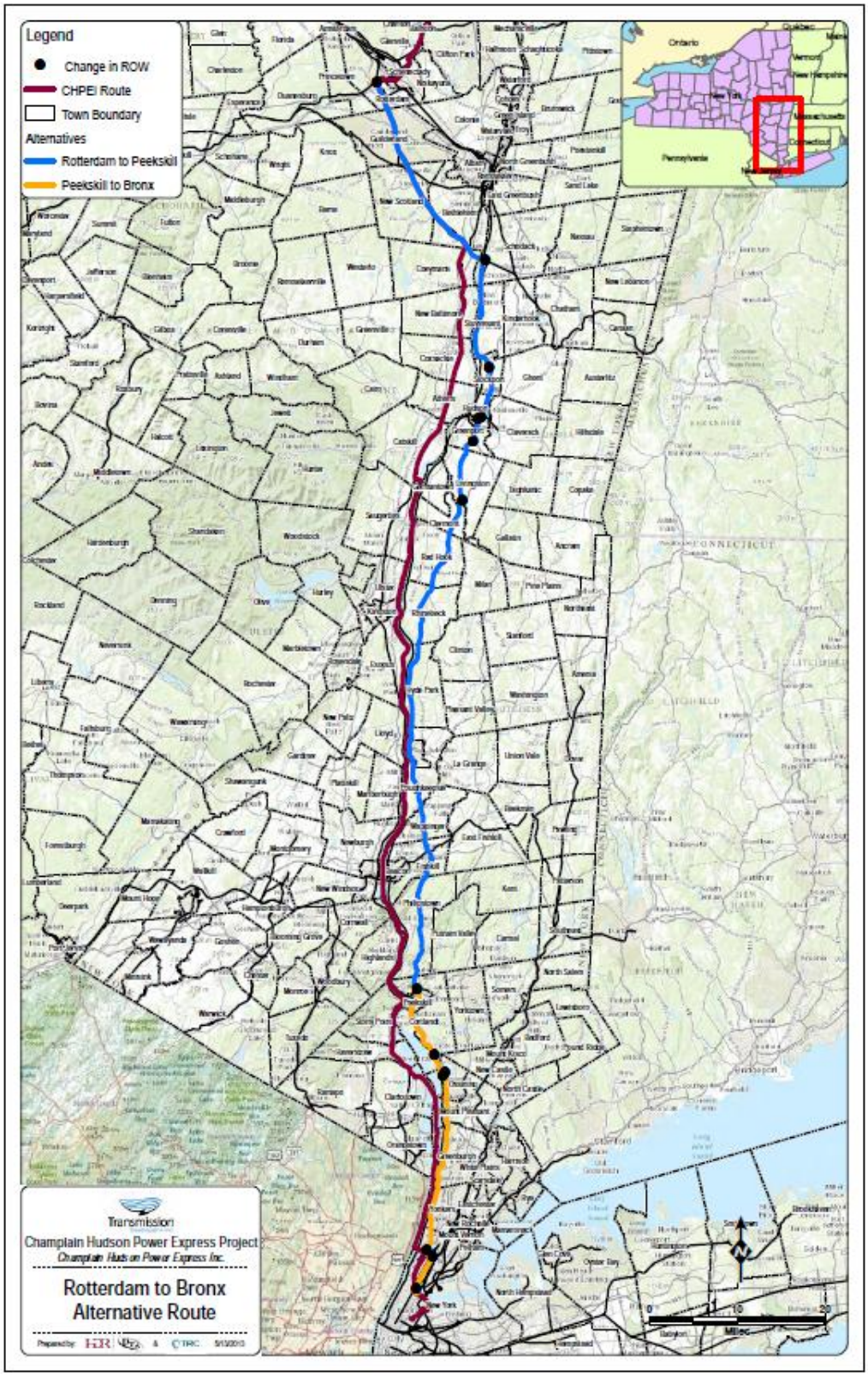
The East of Hudson River proposed alternative would follow the Project route along the CP railroad until it connects to the CSX railroad in Rotterdam and travels 24.7 miles southeast past Selkirk, where it crosses under the Hudson River. The alternative would enter the Route 9J ROW and travel south for 13.3 miles before intersecting with Route 9 in Stockport. Following Route 9 south for 6.1 miles to Greenport, the alternative would shift to Prospect Avenue (0.4 miles) and then back onto Route 9 south for 2.7 miles until reaching the intersection with Route 23. The alternative would be in the Route 31 South ROW for 7.5 miles before connecting again to Route 9 south in Blue Store. The route would be located in the Route 9 south for 60.1 miles, travelling through Nevis, Red Hook, Rhinebeck, Staatsburg, Hyde Park, Poughkeepsie, Wappingers Fall, North Highland and Graymoor. In Annsville, the alternative would follow the Old Albany Post Road into Peekskill as Route 9 becomes a parkway at the intersection with Routes 202 and 6.

In Peekskill, the alternative route would travel south along Highland Avenue, Route 63 / North Division Street, and South Street. South Street transitions to Lower South Street, which connects into Route 9A / Albany Post Road. The alternative would continue for 9.3 miles along Route 9A until Croton, where it would enter the Amtrak ROW for 2.7 miles utilizing Municipal Place and Half Moon Bay Drive before Route 9A shifts onto the Route 9 parkway. In Ossining, the route would connect to Route 9 via Snowden Avenue (0.6 miles).

Following Route 9 south for 21.3 miles the alternative would cross through Sleepy Hollow, Tarrytown, Irvington, Dobbs Ferry, and Yonkers. In Marble Hill to the north of the Harlem River, the alternative would travel south along Route 9 before crossing into Exterior Street, then it would travel east/southeast along West Kingsbridge Road for 1.2 miles to the Grand Concourse. Travelling south along the Grand Concourse, the alternative would be installed for 4.2 miles before intersecting with E 138th Street. Following E 138th to the east, the alternative would connect with Lincoln Avenue and, travelling south, connect to the current Project route (0.8 miles).

Figure 5-3 shows the proposed routing.

FIGURE 5-3
EAST OF HUDSON RIVER EXISTING RIGHTS-OF-WAY ALTERNATIVE



Logistics

The proposed east of the Hudson River route entails a routing similar to the Project route through Selkirk, where the line includes a challenging cross-Hudson River horizontal directional drill (HDD) of almost a mile in length. This HDD under these conditions may be a first of its kind and will have a notable price premium due to its inherent technical difficulty.

Route 9J is primarily located in a rural area with little development other than residential houses and the railroad line to the west. However, there are locations with municipalities such as Schodack and Stuyvesant where buildings are located immediately adjacent or in close proximity to the roadway where there is likely to be public opposition to construction in close proximity to homes and businesses. Route 9 is similarly predominantly set in an area with a low density of development. In Stottville center, transmission lines are located on the western side of the road and residential houses are located in close proximity to the roadway ROW. Within Greenport proper, there are significant stretches of ROW with utility poles on both sides of the roadway and development abutting the roadway, so that construction would need to occur in the roadway itself. Prospect Avenue also has utilities poles and buildings along both sides of its ROW before reconnecting with Route 9.

South of Greenport, the primary land use is rural and residential, but there is a continuous line of utility poles located on one side of the road with sporadic features (e.g. transmission poles, trees, buildings) along the other. A similar network of utility poles is found along Route 31, although the poles are on occasion located some distance from the road.

In Blue Store, the route transfers back to Route 9. As with earlier segments, there is a low density of development. Utility poles are located along the majority of the route with other features (e.g. houses, buildings, additional utility poles) periodically being located on the other side, thereby presenting routing concerns. In the center of municipalities such as Red Hook, Rhinebeck, and Hyde Park, houses are located more closely together in near proximity to the roadway so there may be public opposition to construction in close proximity to homes and businesses.

Views of Section of Route 9 within Red Hook

In Poughkeepsie, installation would be logistically demanding. The route passes through an urban area with a number of grade separations and water crossing (i.e., Sprout Brook) which will entail six to ten HDDs, as well as the other challenges of underground work in heavily trafficked roadways. The road becomes a two-way highway with development located adjacent to the ROW. The intersection of Routes 44 and 55 and Route 113 with Route 9 would pose significant challenges as construction will need to be sited so as to not affect the structural integrity of the extensive road and bridge network in this location. Further south, there is a one mile segment of road occupied by area businesses within and serving the South Hills Mall and Poughkeepsie Galleria. The high volume of traffic in this area would present safety concerns. This segment ends with a cloverleaf intersection of Routes 9 and 113, which poses the same concerns as the earlier intersection with Routes 44 and 55 in terms of siting so as to avoid impacts to the transportation structures.

Views of Section of Route 9 within Poughkeepsie

South of Poughkeepsie, the route traverses another forty-two (42) miles through suburban areas to Peekskill, through Tarrytown and Sleepy Hollow before its final section to New York City. Route 9 has a mix of open areas and commercial development, with utility poles largely eliminating half of the potential construction corridor. As the route enters into Peekskill, residential homes and some commercial buildings are densely packed and close to the road. This trend is found along Highland Avenue, North Division Street, and the upper portion of South Street. Development is still present but not as dense along Lower South Street and Route 9A.

In Croton, Route 9A is bordered by residential homes on the north/northeast and Route 9 to the south/southwest. Installation in this area would be complicated due to the presence of buildings and the roadway structures. Installation within the Municipal Place ROW would require consideration of the supporting structures for Route 9, which crosses over the roadway. The Amtrak facilities are located to the south of the intersection of the railroad ROW with Half Moon Bay Drive, thereby limiting installation to beneath a busy parking lot.

The cables would cross the Croton River, which will require another notably long HDD with limited work areas. After crossing the Croton River, the railroad ROW is closely bounded to the west by the Hudson River. Installation in this segment would be significantly slower as work would need to stop each time a train passed on one of the two sets of track. Snowden Avenue has a moderate level of residential development while Route 9 has a high density of homes and businesses as it extends through Ossining, as well as utility poles and other features on both sides of the roadway. With regard to construction in close proximity to homes and businesses, the NYRI

experience suggests there may significant opposition to a disruption that is perceived to primarily benefit the City of New York.

South of Ossining, Route 9 primarily traverses residential and light commercial zones. Utility poles tend to be located along only one side although they can shift to service individual buildings or side roads. In a portion of Mount Pleasant, Rockefeller State Park borders the roadway to the east while a wall and transmission poles are located immediately to the west.

As the route transitions into first Sleepy Hollow and then Tarrytown, there is increased development on both sides of Route 9. There are also locations listed as public parks, where the Applicants would be unable to obtain access rights for a private venture.[155] Route 9 crosses the New York State Thruway (287/87) via a bridge. As the NYSDOT would not allow collocation on their bridges,[156] the Applicants would need to obtain authorization to cross under the federal interstate so as to not affect the integrity of the road system. Immediately south of the New York State Thruway intersection is a segment with parklands to the west and utility poles to the east of Route 9.

South of Tarrytown, Route 9 experiences a pattern of crossing through residential areas with utility poles occupying one side of the road with the occasional obstruction on the other, then a higher level of development density as it crosses through municipalities such as Dobbs Ferry and Hastings-On-Hudson. In these more urban areas installation would be complicated by close development and multiple situations where utility or traffic features are on both sides of the roadway. Public opposition to the Project would also be more likely to develop. Development within Yonkers is located particularly close to the road, so that it would be necessary to install beneath the pavement for most of this segment.

As the line approaches New York City, there are increasing engineering challenges. Due to existing structures, utilities, and heavy traffic a number of HDDs would be required. As Route 9 enters the Bronx, Van Cortlandt Park is located to the east and development borders the western side of the road, as well as the Henry Hudson Parkway crossing. At the intersection of Manhattan College

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155 *See, e.g., Friends of Van Cortlandt Park v. City of New York*, 95 N.Y.2d 623, 631-32 (2001) ("[O]ur law is well settled: dedicated park areas in New York are impressed with a public trust for the benefit of the people of the State. Their use for other than park purposes, either for a period of years or permanently, requires the direct and specific approval of the State Legislature, plainly conferred.") (internal quotations omitted). See http://www.law.cornell.edu/nyctap/I01_0003.htm.

156 Article VII Updated Alternatives Analysis at 5.

Parkway and Route 9, a series of buildings occupy the area to the west of the road followed by the MTA rail tracks. As the road travels south, the MTA continues to occupy the area to the west.

View at intersection of Manhattan College Parkway and Route 9

As the alternative traverses Exterior Street, West Kingsbridge Road, and Grand Concourse, development continues to be densely packed. Further complicating installation is the City of New York's extensive utility network. To put this issue in perspective, for the three (3) mile connection between the Astoria Substation to the Rainey Substation, the City of New York identified only one routing alternative which would, in the City's opinion, accommodate its requirements in terms of the safety and reliability of their existing infrastructure.[157] It is unlikely that a similar pathway could be identified along or in close proximity to this proposed alternative. The alternative as presented would then follow E 138th Street to Lincoln Avenue before connecting into the current Project route. However, as with the earlier segment, the City of New York's utility network as well as the railroad and road infrastructure, may require that the final routing would need to follow a less direct pathway with a commensurate increase in the construction duration.

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[157] Alternatives Analysis for AR Cable, *Application of Champlain Hudson Power Express, 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,* Case No. 10-T-0139 (N.Y. P.S.C. Feb. 24, 2012), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={4E927BAD-DD51-4E89-AA31-9B856BC95FA8}.

This alternative entails an additional estimated 25 miles to the overall route and an increase of the direct burial portion of approximately 120 miles; both increases contribute to a longer construction schedule than what had been anticipated for route described in the Article VII submission. The construction of the proposed upland alternative to the east of the Hudson River would likely require, utilizing multiple crews, more than 50 months or 4 years.

Cost

Notwithstanding the identified logistical issue that make this alternative impractical, the estimated costs per mile for the approximately one hundred fifty-five (155) miles upland section from Selkirk to the Bronx ranges from $4.9 to $19.2M/mile, as compared to Project route's ninety-five (95) miles of marine burial at $3.5 to 4.4M/mile and thirty-five (35) miles of upland burial at $5.3M/mile. For comparable sections from Selkirk to the Bronx, the East of the Hudson upland route represents an approximately 83% increase in costs compared to the baseline route. These estimated costs result in a net increase to the Project costs of approximately $508M or a 35% increase from the cost of the Project's installation estimate.

Additional information on the comparative costs is shown in Table 5-2.

TABLE 5-2
PROPOSED PROJECT AND EAST OF HUDSON RIVER ROUTE

Section	Upland or Marine	Distance (Miles)	Cost per mile ($million)	Project Cost ($million)	East of Hudson River Cost ($million)
International Border to Dresden	Marine	101.5	2.9	$ 290.7	$ 290.7
Dresden to Catskill	Upland	126.8	5.3	$ 666.12	
Dresden to Selkirk	Upland	98.5	5.3		$ 517.45
Selkirk to Castleton-on-the-Hudson (HDD)	HDD	0.95	12.0		$11.36
Castleton-on-the-Hudson to Poughkeepsie	Upland	72.2	4.9		$ 353.78
Catskill to Stony Point	Marine	67.4	3.5	$ 237.4	
Poughkeepsie to Peekskill	Upland	42.1	5.6		$ 235.76
Stony Point to Clarkstown	Upland	7.9	12.7	$ 100.4	
Clarkstown to Bronx	Marine	27.6	4.4	$ 122.6	
Peekskill to Yonkers	Upland	26	9.5		$247.0
Yonkers to Bronx	Upland	14	19.2		$ 268.8
Bronx to Astoria Converter site	Upland	2.3	15.0	$ 34.5	$ 34.5

	Project	East of Hudson River
Marine Distance (miles)	196.5	101.5
Upland Distance (miles)	135.5	255.65
Total Distance (miles)	332.1	357.15
Total Cost ($millions)	$ 1,451.72	$ 1,959.36
Cost Variance from Project for Selkirk to Bronx ($millions)		**$ 507.64**
Cost Variance from Project for Selkirk to Bronx (%)		**83.0%**
Cost Variance from Project ($millions)		**$ 507.64**
Cost Variance from Project (%)		**35.0%**

Notes:

1. Baseline pricing based on estimate provided by reliable contractor in August 2012.
2. Distances based on segment lengths.
3. Marine costs/mile vary due to sub-bottom conditions, turbidity, installation methods, navigation and other considerations.
4. Estimate assumes that engineering solutions and CSX concurrence can be secured for challenging conditions.
5. Engineering solutions to some challenges may not be obtainable.

Analysis

The logistical challenges posed by this approximately one hundred fifty-five (155) mile upland alternative would be similar to those of the previous alternatives but even more intensive in scope. Beginning with the HDD installation under the Hudson River, the routing would traverse several small communities where the construction would need to occupy their downtown areas. South of Greenport along Route 9, utility poles occupy one side of the roadway while the periodic presence of other features (e.g. houses, buildings, additional utility poles) on the opposite would limit installation options. The route crosses a number of municipalities such as Red Hook, Rhinebeck, Hyde Park, Poughkeepsie, Tarrytown, Sleepy Hollow and Croton where the density of development

along the road will require construction in near proximity residences and businesses. The engineering challenges and likelihood of public opposition increase as the route approaches and enters the Bronx, as the complexity of land uses and existing utility networks will result in a protracted construction period. Resolving all of the engineering issues associated with this alternative would require discussions with an extensive number of state, local and private agencies.

Moreover, the complex engineering solutions necessitated by these concerns would significantly affect costs. The proposed route east of the Hudson River would increase overall Project costs by approximately 35% as the alternative would add an estimated $507.64 million to construction costs. Therefore, this routing is not a practical alternative as the costs would be unreasonably high, particularly for a merchant transmission line. Moreover, as it represents an almost directly southern route to the east of the Hudson River, it demonstrates that other routes of this type would be similarly impracticable.

5.3 Overland Using New Power Line Route

A new power line route was developed with extended 1) west of Adirondack Park; and 2) east of the Hudson River.

Logistics

In the State of New York, the development of new power line rights-of-way must be considered in the context of the recent NYRI project. Section 1.1.2 describes the opposition that arose from local groups, politicians, businesses and others. One of the key elements of this opposition was NYRI's proposal to utilize eminent domain to obtain required lands, as evidenced by legislation signed by Governor George Pataki limiting the use of eminent domain to acquire rights-of-way .[158]

Cost

To demonstrate the potential costs of an overland route utilizing a new power right-of-way, Figure 5-4 shows an alternative route which approximately represents the shortest reasonable overland route that connects into New York City. The routing was based on the following assumptions:

1. The route would be within the state of New York, so it would need to be installed to the west of Adirondack Park.

[158] Fritz Mayer, *Citizen Groups Still Fighting NYRI*, The River Reporter (Nov. 9, 2006), http://www.riverreporter.com/issues/06-11-09/head2-nyri.html.

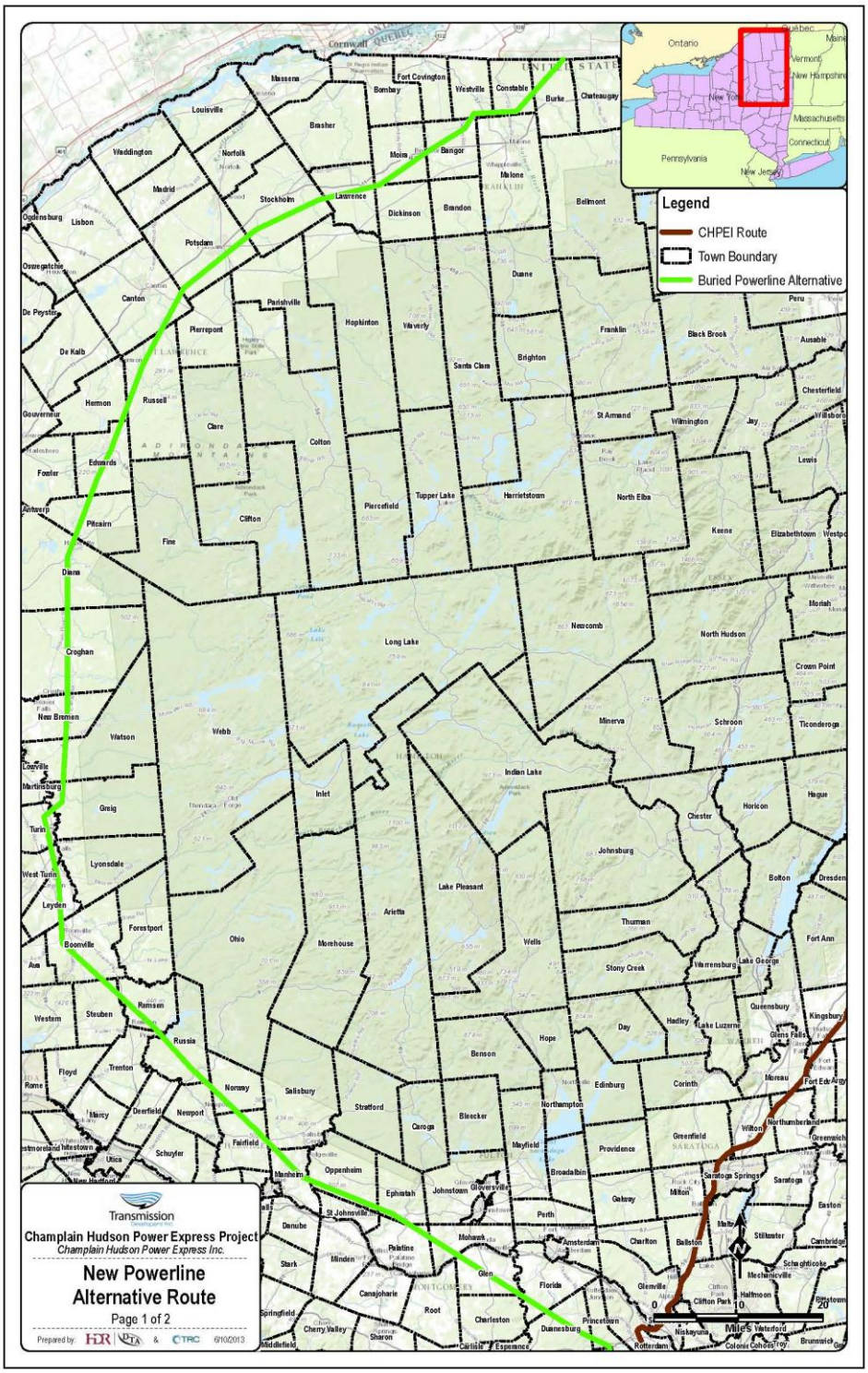
2. The overhead lines would not be acceptable within the close proximity to the Catskill Mountain region and could not cross into the Catskill Park.
3. The cable system would avoid developed areas such as village or town centers, due to the higher construction costs associated with burying the cables.

Costs for the buried routing include higher unit rates due the nature of the work, likelihood of HDDs for multiple water and street crossings, as well as the likelihood of rock excavation and difficult terrain. The estimated costs per mile for the approximately 385 miles of buried cable from the Canadian Border to the Bronx ranges from $5 to $15M/mile or an average of $6.4M/mile, as compared to the comparable aggregate cost of $4.4M/mile for the Project route. Extending these estimated costs results in a net increase to the Project costs by approximately $1.14B or a 79% increase from the cost of the Project's cable installation estimate.

This alternative entails an additional approximately 50 miles to the overall route and an increase of the direct burial portion which contributes to a longer construction schedule than what had been anticipated for route described in the Article VII submission. The construction of the proposed upland alternative to the west of Adirondack Park and east of the Hudson River would likely require, utilizing multiple crews, at least 67 months or more than 5 years.

Additional cost information for a new power line that is installed to west of the Adirondack Park and east of the Hudson River is shown in a Table 5-3.

FIGURE 5-4
ILLUSTRATIVE OVERLAND NEW POWER LINE ALTERNATIVE



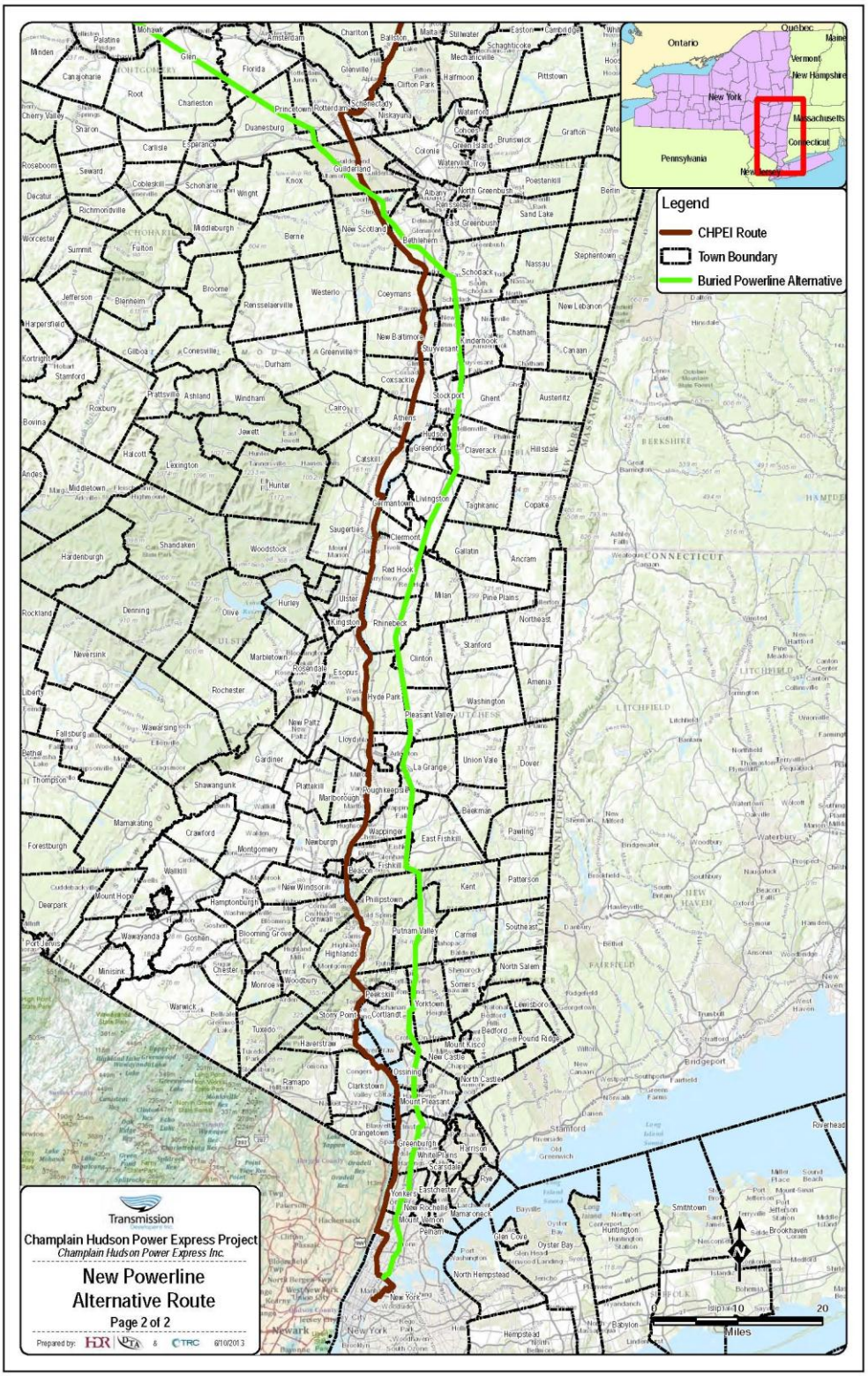

Legend
CHPEI Route
Town Boundary
Buried Powerline Alternative
Transmission
Champlain Hudson Power Express Project
Champlain Hudson Power Express Inc.
New Powerline Alternative Route
Page 2 of 2
Prepared by: HDR & TRC 6/10/2013
Miles

TABLE 5-3
PROPOSED PROJECT AND NEW POWER LINE TRANSMISSION ROUTE

Section	Upland or Marine	Distance (Miles)	Cost per mile ($million)	Project Cost ($million)	New Power Route Cost Buried ($million)
International Border to Dresden	Marine	101.5	2.9	$ 290.7	
International Border to Greenbush	Upland	256	5.0		$ 1,280
Greenbush to Poughkeepsie	Upland	64	5.2		$ 332.8
Dresden to Catskill	Upland	126.8	5.3	$ 666.12	
Catskill to Stony Point	Marine	67.4	3.5	$ 237.4	
Stony Point to Clarkstown	Upland	7.9	12.7	$ 100.4	
Clarkstown to Bronx	Marine	27.6	4.4	$ 122.6	
Poughkeepsie to Bronx	Upland	64	14.8		$ 947.2
Bronx to Astoria Converter site	Upland	2.3	15.0	$ 34.5	$ 34.5

	Project	New Power Route Cost Buried
Marine Distance (miles)	196.5	0
Upland Distance - Buried (miles)	135.5	385.8
Total Distance (miles)	332.1	385.8
Total Cost ($millions)	$ 1,451.72	$ 2,594.5
Cost Variance from Project ($millions)		**$ 1,142.8**
Cost Variance from Project (%)		**78.7%**

Notes:

1. Baseline pricing based on estimate provided by reliable contractor in August 2012.
2. Distances based on segment lengths.
3. Marine costs/mile vary due to sub-bottom conditions, turbidity, installation methods, navigation and other considerations.
4. Estimate assumes that engineering solutions and CSX concurrence can be secured for challenging conditions.
5. Engineering solutions to some challenges may not be obtainable.

Analysis

As this alternative was developed as a demonstration of the likely costs associated with a new power line, no assessment was completed as to the engineering challenges that would be encountered along the routing. However, this alternative likely would need to employ at least some long and difficult HDD installations similar to the routes west of Adirondack Park and east of the Hudson River. More importantly, this type of routing would require agreements with hundreds of landowners and/or condemnation through eminent domain along its entire length to develop the necessary easement corridor. The previously discussed NYRI project encountered significant public and political opposition to the use of eminent domain (even though the majority of the proposed route was in an existing ROW), which led to legislation curtailing NYRI's use of that power. If a similar level of opposition developed for this Project, even a small group of determined landowners could block the Project or require costly re-routings.

In addition, the proposed route west of Adirondack Park and east of the Hudson River would increase overall Project costs by approximately 79% as the alternative would add an estimated $1.14 billion to construction costs. This increase represents only construction costs and not the multiple landowner agreements that would need to be established. Therefore, this routing is not a practical alternative. Moreover, as it represents an almost directly southern route to the west of the Adirondack and the east of the Hudson River, it demonstrates that other routes of this type would be similarly impracticable.

Section 6
Other Alternatives Considered

The following alternatives were not requested by the USACE, but were considered as part of the extensive alternatives analysis undertaken as part of the New York State siting and permitting process and so, consistent with the Guidelines,[159] are presented as part of this assessment.

6.1 Overhead Alternative

6.1.1 Overhead Installation

The overhead transmission system alternatives considered in this analysis would all utilize a bipolar configuration, consisting of two conductors per pole (one positive and one negative) and a ground wire. In general, conductors would have a spacing of approximately 18 inches apart, and each conductor would have an overall diameter of approximately 1.75 inches. A metallic return conductor with a fiber optic core would be installed in the shield wire position above the electrical pole conductors to provide protection against lightning strikes. The return conductor would also provide a communication path between converter stations. A separate shield wire may be necessary on towers with a horizontal arrangement.

Several different transmission tower configurations may be utilized for overhead alternatives. In general, the potential transmission tower types can be defined as "lattice" or "monopole" designs. Lattice towers are constructed of galvanized steel and are assembled on site. These freestanding towers are widely used as transmission line support structures across the United States. Lattice towers have a relatively wide base, and their design requires greater clearance along rights-of-way. Their larger size and framework design make lattice towers suitable for areas where the visual/aesthetic impacts of tower installation are not a significant concern and for locations where adequate right-of-way easements can be acquired. The modular design of lattice towers makes them an economical choice for large-scale transmission lines linking distant endpoints.

[159] 230.10(a)(5). (Stating, in part, "[t]o the extent that practicable alternatives have been identified and evaluated under a Coastal Zone Management program, a § 208 program, or other planning process, such evaluation shall be considered by the permitting authority as part of the consideration of alternatives under the Guidelines.") See http://www.wetlands.com/epa/epa230pb.htm.

In contrast to the lattice design, monopole towers have a single-shaft, tubular structure. Because of their smaller footprint, monopole towers are well-suited to right-of-way locations where space is limited. Overall, monopole towers are less obtrusive and offer aesthetic benefits over conventional lattice tower designs. Notwithstanding these benefits, monopole towers tend to be more expensive;[160] one transmission study estimated that the total costs for monopole towers were 25% higher than for lattice towers.[161]

The specific height and design of each monopole or lattice tower would be determined by the angle of the conductor bundles, the span between towers, and the topography. In general, the lattice or monopole steel support structures for +/-320-kV would be expected to vary from approximately 65 to 135 feet in height, although some configurations require greater than 150 feet in height. Spans would range from 600 to 700 feet between monopole towers and 800 to 1,000 feet between lattice towers.

The width of the transmission line's permanent right-of-way is generally determined by the voltage of the system, to provide for adequate setbacks, maintenance and other concerns. A review of existing projects indicates that typical widths of existing 115-kV rights-of-way are approximately 90 to 130 feet wide. In comparison, +/- 320-kV rights-of-way (which would be the voltage of the Project) are typically about 150 feet wide. The transmission line clearing for construction purposes is dependent on the type of tower, topography, span, location, existing utility rights-of-way, and other factors. The precise rights-of-way would vary along sections of the lines. Vegetation-clearing activities along the rights-of-way may include cutting, grubbing, or other mechanized/hand-clearing techniques of shrubs and trees, as well as the removal of "danger trees" that could potentially damage the conductors. Vegetation management practices would continue after construction to ensure that the rights-of-way are maintained and that trees posing a threat of danger to the line are eliminated.

Access roads, lay-down areas, wire-pulling sites, and turnaround areas would also be required along the transmission line to facilitate construction equipment and vehicles. These areas would

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[160] Fabrimet, *Advantages of Lattice Towers*, http://www.fabrimet.com/advantages-lattice-towers.html (last visited Apr. 22, 2013).

[161] Joseph J. Seneca, Michael L. Lahr, James W. Hughes & Will Irving, *Economic Impacts on New Jersey of Upgrading PSE&G's Susquehanna-Roseland Transmission System* (May 2009), http://www.pseg.com/family/pseandg/powerline/pdf/rutgersjobreport.pdf.

need to be cleared of vegetation (i.e. shrubs and trees), and additional material may be deposited to ensure that access roads remain passable throughout construction. Trenching may also be necessary along the margins of access roads to avoid rutting.

Each transmission tower location would require a concrete foundation to ensure structural stability of the towers. The specific foundation requirements would be dependent on the geotechnical conditions at each tower location. Foundation size and depth would be decided based on the type of tower structure, load bearing capacity of soils, and other factors. For installation in areas of rock outcroppings, anchor bolts may be installed and a concrete pad poured over and around these anchors. At other locations, steel caissons may be necessary to create a dry work area that would allow concrete to be poured. Combinations of these techniques may be utilized to install foundations in areas where rock is encountered below grade.

6.1.2 Overland Using Existing Power Line Routes Alternatives

An alternative using existing power line ROWs was considered. Based on the U.S. Census Bureau's TIGER (Topologically Integrated Geographic Encoding and Referencing) data files (see Figure 6-1), there is an existing utility ROW network which circumvents the Adirondack Park to the west. From Montreal, an existing 765-kV transmission line travels southwest toward a substation in Massena, New York. The New York Power Authority (NYPA) owns a 765-kV transmission line corridor that extends from Massena to a substation in Marcy, New York. A 345-kV transmission corridor owned by National Grid continues toward the Pleasant Valley substation in Dutchess County, New York. South past the Pleasant Valley substation, a 345-kV transmission line owned by Con Edison connects into the greater Manhattan area. The total length of these connecting ROWs is approximately 430 miles from the Hertel substation near Montreal, Canada to Manhattan, New York and it is shown on Figure 6-2.

FIGURE 6-1
EXISTING TRANSMISSION LINES AS SHOWN ON TIGER FILES

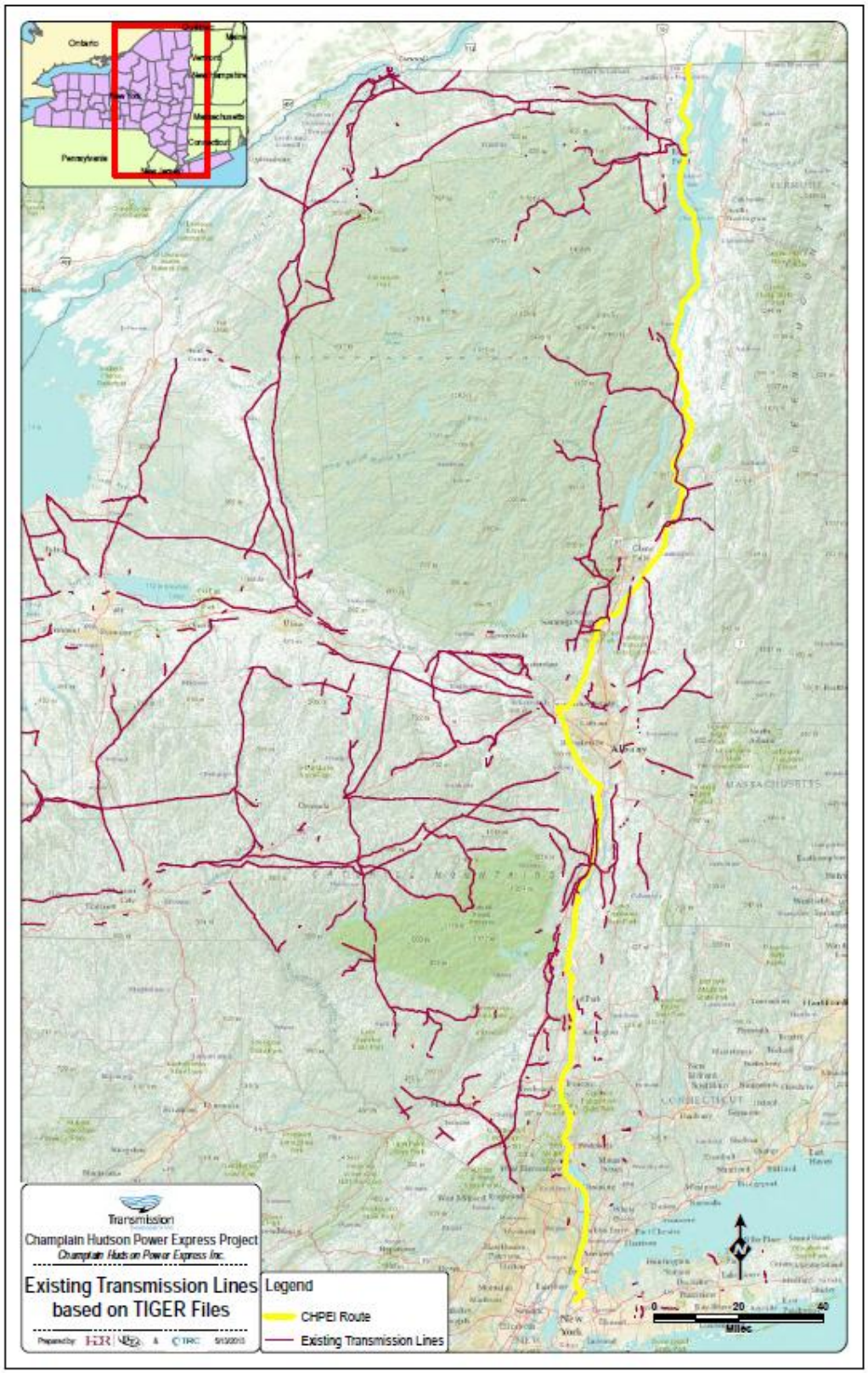
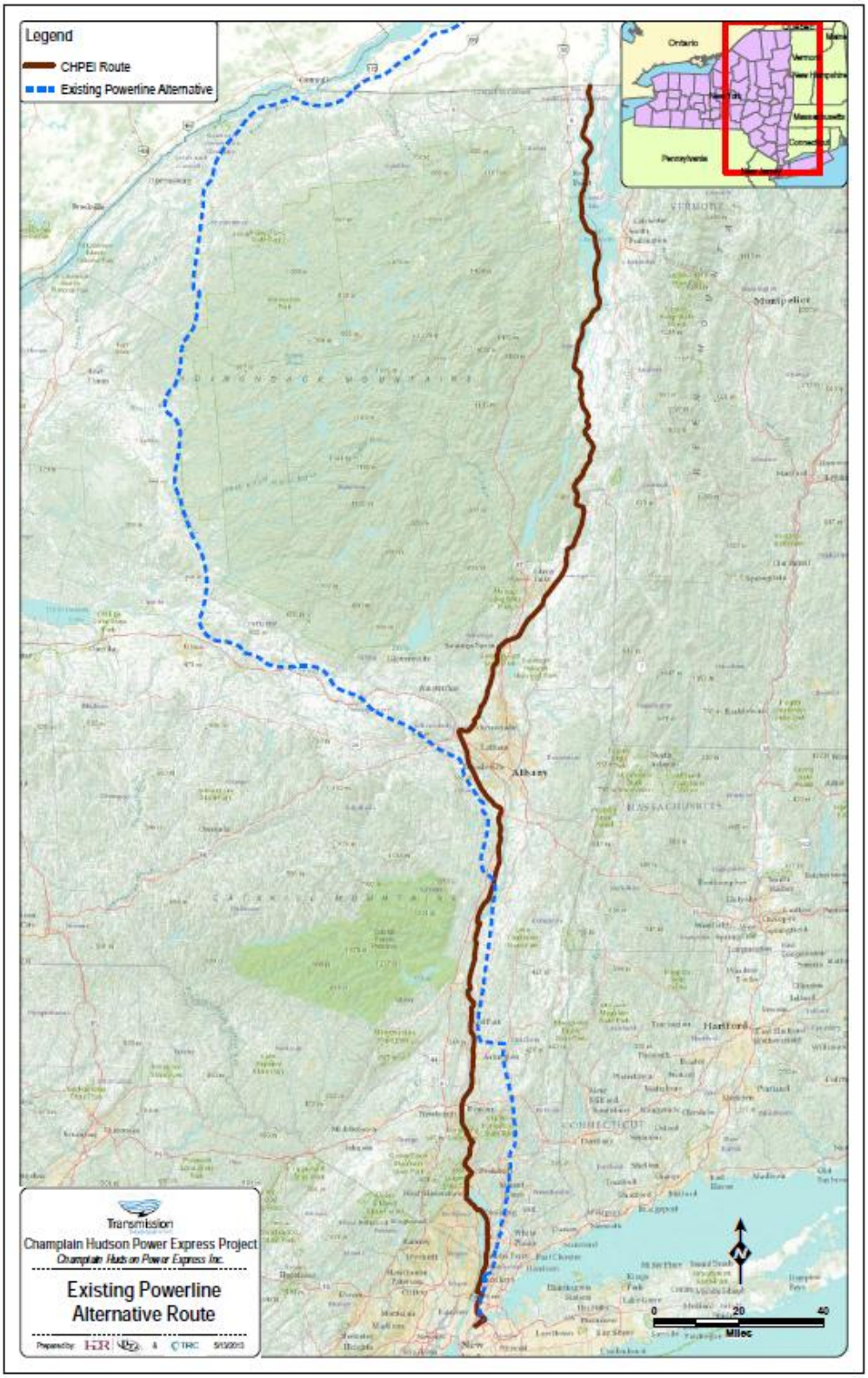


FIGURE 6-2
ALTERNATIVE USING EXISTING TRANSMISSION LINES



Logistics

As part of an alternatives analysis requested by the NYSDOS,[162] the Applicants spoke with the three utilities who own the ROWs under discussion. NYPA stated that it did not believe it would have the ability to grant the necessary long term land interests. Under the New York State Public Accountability Act of 2005 ("PAAA"), any public authority seeking to dispose of real property (i.e. transfer title or any other beneficial interest including a long-term lease) must conduct a public auction unless certain limited exceptions apply.[163] As part of the auction process, an explanatory statement detailing why the property is unneeded or unwanted must be transmitted to the State Comptroller, the Director of the Budget, the Commissioner of General Services, and the State Legislature not less than 90 days in advance of such disposal.[164] PAAA permits a private disposition if "the purpose of the transfer is within the purpose, mission, or governing statute" of the authority, if the Governor and the two houses of the legislature all sign off on the transfer, and if the private disposition is "otherwise authorized by law.".[165] Seeking approval of the Governor and the two houses of the legislature is impractical, and no party has attempted to utilize this exception since the PAAA was enacted.

In addition, in the NYRI proceeding a NYPA representative provided testimony that, "the Power Authority would not grant any permit or permission to conduct activities on its permanent easement that the Power Authority determined would or potentially could adversely impact the Power Authority's present facilities and operations or future development options on the Marcy South Line right-of-way."[166]

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162 *See* Article VII Updated Alternatives Analysis.

163 New York State Public Authorities Law Section 2897(3). See http://public.leginfo.state.ny.us/LAWSSEAF.cgi?QUERYTYPE=LAWS+&QUERYDATA=@LLPBA+&LIST=LAW+&BROWSER=EXPLORER+&TOKEN=50318073+&TARGET=VIEW.

164 New York Power Authority, Guidelines and Procedures for the Disposal of Real Property at § 5.4, 5.5 (Mar. 21, 2013), http://www.nypa.gov/doingbusiness/RealProperty2013/2013%20Disposal%20Guidelines%20-Clean.pdf.

165 New York State Public Authorities Law Sections 2897(7) (ii) and (iii) and 2896(6)(c)(vi). See http://public.leginfo.state.ny.us/LAWSSEAF.cgi?QUERYTYPE=LAWS+&QUERYDATA=@LLPBA+&LIST=LAW+&BROWSER=EXPLORER+&TOKEN=50318073+&TARGET=VIEW.

166 Direct Testimony of Witnesses for the Power Authority of the State of New York at 3, *Application of New York Regional Interconnect, Inc. for a Certificate of Environmental Compatibility and Public Need Pursuant to Article VII for a high voltage direct current electric transmission line running between National Grid's Edic Substation in the Town of Marcy, and Central Hudson Gas & Electric's Rock Tavern Substation located in the Town of New Windsor*, Case No. 06-T-0650 (N.Y. P.S.C. Jan. 9, 2009). Accessed on-line on April 18, 2013 at: http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={EF6A91DC-A71A-44F5-A1DC-B2855A9DDFE4}.

NYRI further testified that because the Power Authority's permanent easements for its Marcy South Line were taken by appropriation by the People of the State of New York, the Power Authority may be precluded from transferring or conveying any rights to its Marcy South right-of-way to a private party.[167] Presuming that the Power Authority had such a legal right, the representative stated, the Power Authority Trustees could not convey a real property interest that would adversely impact the Power Authority's ability to maximize the benefits of its transmission assets.[168]

National Grid also expressed concern regarding the impact the proposed Project would have on their system reliability and potential expansion of their own facilities within the ROW.[169] A representative of Con Edison stated that for safety and reliability reasons they would not want the cables installed in near proximity to their tower foundations.[170] In addition, Con Edison's transmission lines within Westchester County are buried and its representative did not believe Con Edison could grant the right to use their ROW to a separate private entity.[171]

Cost

While this assessment was not completed under the Article VII process, the Applicants did develop costing information for the purposes of understanding the cost differential between the Project route and an overhead transmission system. The New Power Line alternative discussed in Section 5.3 was modified to assume overhead installation, with concept-level estimated costs assuming routing where 80% of the line is overhead and 20% is buried within heavily developed areas. Lattice structural steel towers were assumed, as the costs for monopoles are typically 20-25% higher. The comparative costs are shown in Table 6-1.

167 *Id.* at 4.
168 *Id.*
169 Article VII Updated Alternatives Analysis at 3, *Application of Champlain Hudson Power Express, 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*, Case No. 10-T-0139 (N.Y. P.S.C. Feb. 24, 2012), http://documents.dps.ny.gov/public/Common/ViewDoc.aspx?DocRefId={1376106E-8A60-4BC8-B601-EA7C43ECC0BB}.
170 *Id.*
171 *Id.*

TABLE 6-1
PROPOSED PROJECT AND NEW POWER LINE TRANSMISSION ROUTE

Section	Upland or Marine	Distance (Miles)	Cost per mile ($million)	Project Cost ($million)	New Power Route Cost 80% Overhead/ 20% Buried ($million)
International Border to Dresden	Marine	101.5	2.9	$ 290.7	
International Border to Greenbush	Upland	256	3.2		$ 819.2
Greenbush to Poughkeepsie	Upland	64	4.2		$ 268.8
Dresden to Catskill	Upland	126.8	5.3	$ 666.12	
Catskill to Stony Point	Marine	67.4	3.5	$ 237.4	
Stony Point to Clarkstown	Upland	7.9	12.7	$ 100.4	
Clarkstown to Bronx	Marine	27.6	4.4	$ 122.6	
Poughkeepsie to Bronx	Upland	64	10.0		$ 640.0
Bronx to Astoria Converter site	Upland	2.3	15.0	$ 34.5	$ 35.5

	Project	New Power Route Cost Buried
Marine Distance (miles)	196.5	0
Upland Distance - Buried (miles)	135.5	385.8
Total Distance (miles)	332.1	385.8
Total Cost ($millions)	$ 1,451.72	$ 1,762.5
Cost Variance from Project ($millions)		**$ 310.77**
Cost Variance from Project (%)		**21.4%**

Notes:

1. Baseline pricing based on estimate provided by reliable contractor in August 2012.
2. Distances based on segment lengths.
3. Marine costs/mile vary due to sub-bottom conditions, turbidity, installation methods, navigation and other considerations.
4. Estimate assumes that engineering solutions and CSX concurrence can be secured for challenging conditions.
5. Engineering solutions to some challenges may not be obtainable.

Analysis

For the purpose of exploring an overhead option, the Applicants applied a route which was "efficient" in terms of the total distance and avoiding developed areas. The estimated costs of this conceptual alternative would raise the overall construction costs by an estimated 21%. However, as with the discussion of the buried construction line, the full increase in cost would also include establishing individual landowner agreements with the multiple property owners along the line. In addition, as discussed in the New Power Line alternative (Section 5.3) it is reasonable to assume that the engineering challenges will be similar to those associated with the alternatives west of Adirondack Park and east of the Hudson River. The NYRI experience suggests that the logistical issues would be considerable, particularly as this alternative represents an overhead installation that would require use of eminent domain and would likely generate significant opposition.. Therefore, this routing is not a practical alternative. Moreover,

as it represents an almost directly southern route to the west of the Adirondack and the east of the Hudson River, it demonstrates that other routes of this type would be similarly impracticable.

6.2 Demand Side Management

With increased concern over greenhouse gas emissions, energy prices, and energy security, energy conservation has received increased attention. The federal government has enacted several pieces of legislation to promote more efficient use of energy, including the Energy Policy Act of 2005, the Energy Independence and Security Act of 2007, and the American Recovery and Reinvestment Act of 2009.[172] The New York State Energy Plan's goal of "Increasing Reliance on Renewables" includes "expanding the State's purchases of hydropower."[173] New York City's PlaNYC 2030 targeted a 30% reduction of greenhouse gases by 2030.[174]

However, demand side management is not a practical alternative inasmuch as it is difficult to predict how its implementation would affect overall energy use. In its discussion of the aforementioned 15 percent goal of energy efficiency, the New York State Energy Plan notes that, even with the considerable achievements made to date in the state's end-user efficiency programs, meeting the 15 percent objective would require nearly a five-fold increase in annual energy savings by 2015.[175] An evaluation of energy efficiency potential conducted by Con Edison for its downstate markets of New York City and Westchester County concluded that the realistic achievable potential ("RAP") improvements in energy efficiency for electricity ranged from 8 to 10%.[176] The RAP savings for gas, steam, and fuel oil ranged from 3 to 7%.[177] Furthermore, in a report advising Governor Cuomo on how to bring New York's aging infrastructure into the future, none of the recommendations provided by the New York State

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172 U.S. Department of Energy, *Alternatives Fuels Data Center: Key Federal Legislation* (May 2013), http://www.afdc.energy.gov/laws/key_legislation.

173 State Energy Plan at 93.

174 City of New York, *PlaNYC: A Greener, Greater New York* at 150 (Apr. 2011), http://nytelecom.vo.llnwd.net/o15/agencies/planyc2030/pdf/planyc_2011_planyc_full_report.pdf.

175 State Energy Plan at 23.

176 Global Energy Partners, LLC, *Energy Efficiency Potential Study for Consolidated Edison Company of New York, Inc.* (June 2010), http://www.coned.com/documents/Volume_1_Executive_Summary.pdf.

177 *Id.* at 13.

Energy Highway Task Force addressed additional demand side management or energy efficiency as part of the plan to modernize New York's infrastructure.[178]

Demand side management would not meet the Project's overall goal of providing clean energy to New York, or state goals which call for an increase in clean energy in addition to energy efficiency.[179] In the Joint Proposal for Settlement, the Signatory Parties concluded that "conservation and distributed generation cannot be considered to be effective alternatives to the Facility"[180] and that the Project "should be viewed as a complement to the Commission's public policy objectives to promote renewable generation facilities, reduce environmental impacts, such as air pollution, and increase fuel diversity."[181] Therefore, this alternative was eliminated from further consideration.

6.3 Other New Generation Sources

From 2000 to 2013 in New York City and Long Island, approximately 4,800 MW of new capacity has been added, of which over 90% are natural gas-fired generating facilities.[182] During this same timeframe, nearly 1,900 MW of generation has been retired, therefore the incremental increase in capacity is about 2,900 MW.[183] Currently, all of the generation in New York City is fossil fuel fired (natural gas or oil).[184] In the NYISO interconnection queue, there is 2,300 MW of summer capacity to be added to New York City; other than the 660 MW Hudson Transmission Partners DC-based transmission line, all additions are also fired by fossil fuel[185] (and the HTP project is bringing energy into New York City from Eastern PJM, which has predominately fossil fuel fired generation).[186]

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178 New York Energy Highway Task Force, New York Energy Highway Blueprint, http://www.nyenergyhighway.com/PDFs/BluePrint/EHBPPT/ (last visited Apr. 22, 2013).

179 *See* Governor Andrew M. Cuomo, Building a New NY...With You, 2012 State of the State Address (2012), http://www.nyenergyhighway.com/Content/pdf/Building-a-New-New-York-Book.pdf.

180 Joint Proposal at 53.

181 *Id*.

182 Ventyx Velocity Suite. Generating Unit Capacity Dataset. Data Version 2013-03.

183 *Id*.

184 *See* 2012 Gold Book.

185 NYISO, NYISO Interconnection Queue, http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Documents_and_Resources/Interconnection_Studies/NYISO_Interconnection_Queue/NYISO_Interconnection_Queue.xls.

186 PJM, *Regional Transmission Expansion Plan – Book 2* (2012), http://www.pjm.com/sitecore%20modules/web/~/media/documents/reports/2012-rtep/2012-rtep-book-2.ashx.

In 2012, the NYISO identified resource adequacy gaps and reliability concerns as part of Reliability Needs Assessment ("RNA") for the NYC area. The "market solution" proposed in the NYISO's Comprehensive Reliability Plan is one that involves repowering of existing generation with gas fired generators.[187] Although the market solution would be more efficient than the steam turbines they would displace, they would still be CO_2, NOx, and SO_2 emitting resources. In the NYISO interconnection queue, currently there are 42 proposed renewable energy projects, representing nearly 2,600 MW of potential generation from wind, solar, hydro, pumped storage, wood, solid waste, methane, and energy storage (NYISO 2013).[188] However, many of the projects in the queues will likely be withdrawn, will not be constructed by the proposed timeline, or will change the proposed generating capacity, as evidenced by the 64 renewable energy projects, equaling over 13,000 MW, withdrawn from the NYISO queue since 2007 (NYISO 2013).[189]

There are currently no proposed renewable energy projects in the interconnection queue in the vicinity of southern New York City – in fact, over 3,500 MW has been withdrawn from the queue since 2007 (NYISO 2013).[190] Therefore, other new generation sources in the New York City region are not anticipated to provide the clean and renewable energy capacity, increased grid reliability, or transmission congestion solutions comparable to the Project. Accordingly, this set of alternatives is eliminated from further consideration.

6.4 No Build

Under the No Build Alternative, the Project would not be constructed. Therefore, to meet projected electricity needs in New York City, a) existing generation facilities would need to increase their power output, b) transmission facilities would need to be constructed or upgraded and/ or c) new generating facilities would need to be brought on line. This alternative would be inconsistent with the Project's purpose and need (see Section 1.2 and 1.3).

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187 NYISO, *2012 Comprehensive Reliability Plan – Final Report* (Mar. 19, 2013), http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Planning_Studies/Reliability_Planning_Studies/Reliability_Assessment_Documents/2012_Comprehensive_Reliability_Plan_Final_Report.pdf.

188 NYISO, NYISO Interconnection Queue, http://www.nyiso.com/public/webdocs/markets_operations/services/planning/Documents_and_Resources/Interconnection_Studies/NYISO_Interconnection_Queue/NYISO_Interconnection_Queue.xls.

189 *Id.*

190 *Id.*

Moreover, in terms of existing generation, summer operating capacity in New York State totals 38,902 MW, with 9,466 MW of the generating capacity located in New York City. The majority of New York's existing generation portfolio is composed of gas- and/or oil-fueled facilities, which accounts for approximately 61% of the total installed capacity in the state.[191] The vast majority of these gas and oil facilities tend to be older; about 65% of them were built before 1980, and therefore are relatively inefficient[192] (NYISO 2012 Load and Capacity Data, 2012).

The No Build Alternative, which relies on increased generation from existing sources, would result in higher energy costs and higher GHG emissions and was therefore considered inconsistent with the Project's purpose and eliminated from further consideration.

[191] *See* 2012 Gold Book.
[192] *Id.*

Section 7
Conclusion

Prior to undertaking this LEDPA analysis, practical alternatives for the Project were comprehensively investigated and analyzed during the New York State Public Service Law Article VII proceeding. As part of that proceeding, Settlement Parties undertook an intensive review of Project routing, with a specific focus on locating the cables out of the water to the extent practical and feasible. Based on consultation prior to the state proceeding, the state alternatives analysis, and the ensuing settlement discussions and resultant Joint Proposal settlement, the Project incorporated a number of design and route changes. While these changes resulted in significant cost increases to the Project, the changes also ensured that the Project route was the least environmentally damaging practicable alternative consistent with the Project purpose (*i.e.*, to deliver clean sources of generation from Canada into New York City in an economically efficient manner).

As part of its LEDPA analysis, the Applicants reviewed three routes provided by the New York State Department of Public Service as part of the Article VII proceedings and three additional routes requested by the USACE. One of these alternatives, the Hell Gate Bypass, was accepted by the Applicants during the Article VII proceedings while segments of the Hudson River Western Rail Line Route were also incorporated into the Project. Each of the remaining alternatives were assessed for their overall practicability based on existing technology, logistics and costs. As summarized in the table below, when evaluated in terms of logistics and costs, the alternatives presented various logistical hurdles including engineering complexity, site access, and adverse affects to existing development, as well the potential for political and public opposition. All of the alternatives had projected costs, when coupled with the additional costs associated with the route designs accepted during the Article VII process, which would result in substantially greater costs than are normally associated with the particular type of project.

Evaluation of Practicality of Alternatives to Project

	Logistics	Cost
Hudson River Western Rail Line Route	• Long HDD installations • Narrow work spaces • Installation in close proximity to residences/ businesses • Access restrictions • Increased construction duration • Four tunnel segments • Potential for public and political opposition	Increase in Project costs of ~$620 million or 42% over Article VII baseline route.
Harlem River Rail Route	• Busy passenger and rail usage • Geotechnical challenges • Access restrictions on rail trestle by NYSDOT and MTA • Increased risk of cable damage • Increased construction duration • High uncertainty as to engineering feasibility	Increase in costs from ~$81 million (305% of segment cost, 6% of Project cost) to $189 million (15%) over Article VII baseline route.
Existing ROW – West of Adirondack Park	• Difficult HDD installations • Narrow work spaces • Installation in close proximity to residences/ businesses • Density of aboveground utilities and other features • Underground utility avoidance • Increased construction duration • Potential for public and political opposition	Increase in project costs of ~$512 million or 35% over Article VII baseline route.
Existing ROW – East of Hudson River	• Long HDD installations • Narrow work spaces • Installation in close proximity to residences/ businesses • Density of aboveground utilities and other features • Underground utility avoidance • Increased construction duration • Potential for public and political opposition	Increase in project costs of ~$508 million or 35% over Article VII baseline route.
Overland Using New Power Line Route	• Potential long and difficult HDD installations • Increased construction duration • Potential for public and political opposition	Increase in project costs of ~$1.14 billion or 79% over Article VII baseline route.

The further analysis undertaken here, pursuant to the Guidelines, confirms that the Project is the least environmentally damaging practicable alternative when other alternatives are considered based on factors of logistics, technology, and cost.

Appendices

Note: The appendices included in the Alternatives Analysis report are available in the full version of the report provided in the CHPE EIS website Document Library.
The library is accessible at the following link: http://www.chpexpresseis.org

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APPENDIX C

NYSPSC Order Granting Certificate of Environmental Compatibility and Public Need for the Proposed CHPE Project

Appendix C
NYSPSC Order Granting Certificate of Environmental Compatibility and Public Need for the Proposed CHPE Project

This appendix contains the Order Granting the Certificate of Environmental Compatibility and Public Need (Certificate) for the proposed CHPE Project issued by the New York State Public Service Commission (NYSPSC) to the Applicant on April 18, 2013 (NYSPSC 2013).

This appendix contains the full text of the Certificate itself. The attachments to the Certificate are not included in this appendix, but might be valuable to the reader. The full version of the Certificate (including attachments) is available at the CHPE EIS Web site Document Library found at the following link: http://www.chpexpresseis.org/docs/NYSPSC_Order.pdf. The attachments to the Certificate and the page number at which each attachment starts in the full version of the Certificate are provided below.

- The main text of the Joint Proposal (starting at page 108)
- Revised Certificate Conditions (January 2013) (starting at page 197)
- Five attachments to the Revised Certificate Conditions:
    - Attachment 1: Champlain Hudson Power Express Suspended Sediment/Water Quality Monitoring Plan Scope of Study (starting at page 309)
    - Attachment 2: Champlain Hudson Power Express Benthic and Sediment Monitoring Scope of Study (starting at page 315)
    - Attachment 3: Champlain Hudson Power Express Bathymetry, Sediment Temperature, and Magnetic Field Scope of Study (starting at page 320)
    - Attachment 4: Champlain Hudson Power Express Atlantic Sturgeon Pre- and Post-Energizing Scope of Study (starting at page 323)
    - Attachment 5: List of Approved Projects for the Champlain Hudson Environmental Research and Development Trust (starting at page 328)
- Draft EM&CP (starting at page 339)
- Best Management Practices (starting at page 356)
- Other selected Joint Proposal exhibits (starting at page 513).

The Joint Proposal was attached to the Certificate. The Joint Proposal itself included nearly 200 attachments, called appendices and exhibits. These appendices and exhibits are available for download from the NYSPSC's Document Matter Master (DMM) Web site for the CHPE Project at:

http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?Mattercaseno=10-T-0139

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STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

CASE 10-T-0139 - Application of Champlain Hudson Power Express, 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

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STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

At a session of the Public Service Commission held in the City of Albany on April 18, 2013

COMMISSIONERS PRESENT:

Garry A. Brown, Chairman
Patricia L. Acampora
Maureen F. Harris
James L. Larocca
Gregg C. Sayre

CASE 10-T-0139 - Application of Champlain Hudson Power Express, 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 and Effective April 18, 2013)

BY THE COMMISSION:

INTRODUCTION

By this Order, we grant to Champlain Hudson Power Express, Inc. (CHPEI) and CHPE Properties, Inc. (CHPE; collectively, Applicants), pursuant to Article VII of the Public Service Law (PSL), a Certificate of Environmental Compatibility and Public Need to construct and operate a transmission project known as the Champlain Hudson Power Express Project (Project or Facility). The certificate will adopt most of the terms and conditions presented to us in a Joint Proposal (JP) and in stipulations that have the full or partial support of a wide range of parties to this case.

The principal portion of the Project is a High Voltage, Direct Current (HVDC) transmission line extending

approximately 330 miles from the New York/Canada border to a converter station in Astoria, Queens. The HVDC transmission line will be underwater in Lake Champlain and the Hudson River, with underground upland segments. The line consists of two solid dielectric (i.e., no fluids) HVDC electric cables, each approximately six inches in diameter. The cables will be installed either underwater or underground along the entire length of the route, minimizing visual and other potential environmental impacts.

Applicants propose to install the converter station on properties currently owned by Consolidated Edison Company of New York, Inc. (Con Edison) in an industrial zone in Astoria. From there, one High Voltage, Alternating Current (HVAC) circuit will connect, via underground conduit, to the nearby substation of the New York Power Authority (NYPA). From the NYPA substation, another set of HVAC cables will be installed beneath the streets of New York City for approximately three miles to the Rainey Substation.

The Project will have the capacity to transmit 1,000 MWs of electricity into the New York City load pocket. It is anticipated that the electricity transmitted by the Project will be primarily hydroelectric power.

The parties have worked collaboratively for over a year to resolve the many complex technical details that have culminated in the Joint Proposal before us. As described in the Joint Proposal, the route has been constructed to minimize potential adverse environmental impacts. Although extensive portions of the route are located under the waters of Lake Champlain and the Hudson River, the line will transition to upland underground segments in order to avoid portions of the Hudson River designated by the US Environmental Protection Agency (USEPA) as contaminated with polychlorinated biphenyls

(PCBs) and to avoid environmentally sensitive River areas, including Haverstraw Bay, an important breeding and spawning habitat for various species. In addition, the Applicants have agreed to donate $117.15 million over time to establish and maintain a Hudson River and Lake Champlain Habitat Enhancement, Restoration, and Research/Habitat Improvement Project Trust, to be used to study and to mitigate possible impacts of the underwater cables on water quality or aquatic habitat in the Hudson, Harlem and East Rivers, Lake Champlain, and their tributaries. Other provisions of the JP would limit the times or locations of construction to further protect the Lake and River environments.

With the addition of the Astoria-Rainey Cable portion of the Project, the parties have solved problems of deliverability identified in this case. And, Applicants' commitment to assume the financial risk of this Project has been significantly strengthened in post-JP stipulations.

This proposal was filed over 3 years ago. Over 20 parties participated in lengthy, intensive, detailed settlement negotiations that spanned almost 16 months. These parties reached an accord on a proposal that they believe permits us to make the requisite PSL §126(1) findings and determinations. The fact that so many parties, representing myriad interests and advocating a broad spectrum of concerns, could reach agreement on so many detailed, technical and policy-based issues is a remarkable achievement and is consistent with our settlement rules.

Based on our review of the record, including the JP, we find that this proposal satisfies the requirements of Article VII of the PSL. Construction of the Project would offer significant benefits, among them: creating a new transmission entry into the New York City load pocket and enabling a

substantial increase in the State's utilization of renewable resources. Further, the adverse environmental impacts of construction and operation, relatively modest to begin with, have been further mitigated by route modifications and a commitment to follow best practices during construction. Finally, construction and operation of the line will impose minimal financial risk on ratepayers. As further discussed below, we find that the grant of the certificate here is in the public interest.

PROCEDURAL BACKGROUND

On March 30, 2010, CHPEI filed an application pursuant to Article VII of PSL for a Certificate of Environmental Compatibility and Public Need to construct and operate a transmission line it calls the Champlain Hudson Power Express Project. On April 30, 2010, the Secretary issued a deficiency letter identifying seven deficiencies and containing 83 requests for further information. Four supplements were provided on July 22 and 29, and August 6 and 11, 2010. The cover letter accompanying the July 22nd supplement noted that CHPE had been added as a co-applicant;[1] the proposal had been revised to eliminate the HVDC circuit from Rouses Point, to Bridgeport, Connecticut; and the proposed end point of the New York State HVDC circuit had been changed from a substation in Sherman Creek to a substation in Astoria, Queens.

On August 12, 2010, the Secretary issued a compliance letter informing Applicants that, as of August 11, 2010, their Article VII application, as supplemented, was in compliance with

[1] In order to ensure that one of the certificate holders will be a transportation corporation, CHPEI formed CHPE as a wholly-owned subsidiary pursuant to the Transportation Corporations Law (July 22nd cover letter at 1, note 1).

PSL §122. A prehearing conference was held before the Administrative Law Judges (ALJs or Judges) on Tuesday, September 21, 2010, in Albany,[2] to discuss, among other things, requests for intervenor funding.[3] In accordance with PSL §123(1), a public statement hearing was held on Monday, October 25, 2010, in Yonkers. Additional public statement hearings were held in Kingston on Thursday, October 28; Schenectady on Wednesday, November 3; Whitehall on Thursday, November 4; and Plattsburgh on Tuesday, November 9, 2010.

By letter dated November 2, 2010, Applicants filed a notice of intent to enter into settlement negotiations. They noted that the topics to be addressed as part of the discussions included need, environmental issues, alternatives, best management practices, construction techniques, and ordering clauses.[4] Settlement discussions ensued and continued for approximately 16 months, culminating in the February 2012 filing of a JP purporting to resolve all issues in this proceeding among the Signatory Parties. The JP has the following signatories: Applicants; Department of Public Service Staff (Staff); Department of Environmental Conservation (DEC); Department of State (DOS); Department of Transportation (DOT); Department of Agriculture and Markets; Office of Parks, Recreation, and Historic Preservation (OPRHP); the Adirondack Park Agency (APA); the Cities of New York (NYC) and Yonkers; the Palisades Interstate Park Commission; Riverkeeper, Inc. (Riverkeeper); Scenic Hudson, Inc. (Scenic Hudson); the N.Y.S.

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[2] A video conference link to the Commission's New York City offices was provided.

[3] Pursuant to PSL §122(5), an intervenor fund of $450,000 was established for this proceeding.

[4] In accordance with 16 NYCRR 3.9, the notice was reported to the Commission on November 4, 2010.

Council of Trout Unlimited; and Vermont Electric Power Company, Inc. (VELCO). VELCO and DOT support the JP only with respect to Certificate Conditions that address their specific concerns, which are, respectively, the requirements and restrictions governing work activities and infrastructure co-location, and the provisions addressing the use and protection of highways, roads, streets or avenues and other transportation facilities owned or operated by DOT or under DOT's jurisdiction. The Department of Agriculture and Markets in its supporting statement also indicates that it limits its endorsement of the JP to the terms and conditions designed to identify, protect, mitigate, and, if need be, remediate agricultural resources impacted by construction.

The JP addresses, *inter alia*, the findings we must make pursuant to PSL §126(1). It contains proposed Certificate Conditions, Environmental Management and Construction Plan (EM&CP) guidelines, and a proposed Water Quality Certification (WQC). It also contains a list of the testimony and the JP exhibits and JP appendices proffered by the signatories in support of the terms of the JP and Applicants' requested Article VII certificate.

After the JP was filed, there followed another procedural conference; public statement hearings in Washington, Schenectady, Albany, Greene, Rockland, and Queens Counties; and site visits in Rockland and Queens Counties.[5] Additional stipulations, two signed by Applicants, Staff and Con Edison and one signed by Applicants and Con Edison were filed in June and July 2012. The first two stipulations further addressed

[5] In total, the ALJs conducted four site visits, three on November 17 and 18 and December 1, 2010, and one on May 1, 2012.

merchant status and Certification Condition 15 (June 4th Stipulation, Hearing Exhibit 150) and deliverability and Certification Condition 133 (June 26th Stipulation, Hearing Exhibit 151). The third stipulation resolved issues surrounding the location of the converter station and use of the Luyster Creek property owned by Con Edison, and proposed changes to Certificate Conditions 21 and 22(f) (July 11th Stipulation, Hearing Exhibits 129 and 130). In addition, Applicants and Con Edison agreed to revise the proposed routing through the Astoria site in order to avoid an existing liquefied natural gas facility (Hearing Exhibit 152).

Evidentiary hearings were held on July 18, 19, and 20, 2012. At the evidentiary hearings, testimony and exhibits were proffered by witnesses for Applicants, Staff, and the Independent Power Producers of New York, Inc. (IPPNY). The evidentiary hearing record consists of 219 hearing exhibits[6] and over 700 transcript pages. In addition, parties submitted initial and reply statements on March 16 and 30, 2012, and initial and reply briefs on August 22 and September 7, 2012.

Except as noted above, the signatories recommend adoption of all of the terms of the JP, along with the proposed Certificate Conditions as modified by the stipulations filed on June 4 and 26, July 11, and October 19, 2012.[7] NYPA neither supports nor opposes the Project but it requests approval of several proposed Certificate Conditions that address its concerns. Con Edison originally opposed the Project; however, in July 2012, it reached a resolution of its objections to the

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[6] The hearing exhibits include, *inter alia*, the 125 exhibits that accompanied the JP.

[7] The October 19th stipulation, filed by Applicants, revised Certificate Condition 165 to extend the time for submission of the Trust Agreement.

Project, and now requests approval of the JP provisions that address its concerns.[8] Entergy Nuclear Marketing, LLC and Entergy Nuclear Fitzpatrick, LLC (collectively Entergy), IPPNY, Central Hudson Gas & Electric Corporation (Central Hudson), and International Brotherhood of Electrical Workers Local 97 (IBEW) oppose the Project and the JP.

By notice dated December 27, 2012, the Acting Secretary issued the Judges' Recommended Decision (RD) and established January 17 and February 1, 2013, respectively, as the due dates for the filing of briefs on and opposing exceptions. In their RD, the Judges recommended that we (1) adopt most of the terms and conditions of the JP as revised in this proceeding and in their RD; and (2) grant a Certificate of Environmental Compatibility and Public Need. They further recommended that the proposed WQC for the Project be issued by the Director of the Office of Energy Efficiency and the Environment (OEEE) in the Department of Public Service prior to the expiration of the U.S. Army Corps of Engineers (USACE) February 24, 2013 waiver deadline.

The WQC was issued on January 18, 2013. On that day, Applicants submitted a revised, final version of the Proposed Certificate Conditions designed to reflect all changes that were made to the proposed Certificate Conditions in one document (JP Appendix C). Briefs on exceptions were filed by IPPNY, Entergy, IBEW, Central Hudson, the Business Council of New York State (the Business Council), Applicants, Staff, Con Edison, and DEC. IPPNY's brief included a motion requesting official notice or incorporation into the record of a U.S. Dept. of Energy

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[8] As a result of the stipulations, Con Edison and NYPA did not introduce their pre-filed testimony and/or exhibits into the record at the evidentiary hearing.

document; the motion was opposed by Applicants and Staff and was denied by ruling issued on January 30, 2013. On January 18, 2013, Applicants moved to strike the briefs of Entergy and the Business Council on the grounds that they were filed after the 4:00 p.m. deadline; Entergy responded to the motion on January 28, 2013, and the motion was denied by ruling issued January 30, 2013.

Briefs opposing exceptions were filed by VELCO, Con Edison, Riverkeeper/Scenic Hudson, DEC, Applicants, NYC, and Staff.

JOINT PROPOSAL

The JP provides the bases upon which the signatories assert that the Commission may make its required PSL §126 findings regarding need, minimizing environmental impacts, undergrounding, conformance to state and local laws and regulations, and whether the project conforms to a long-range plan and is in the public interest. The JP includes a request that the Commission not apply local laws and regulations identified in Hearing Exhibit 115 because, as applied to the Facility, such local legal provisions are unreasonably restrictive in view of existing technology, cost, and the needs of consumers. Except for such identified local laws, Applicants will comply with, and the location of the Facility as proposed conforms to, all substantive State and local legal provisions applicable thereto.[9] The JP proposes that all of the proposed line be underwater or underground;[10] these requests are unopposed.

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[9] JP ¶¶128-133.

[10] JP ¶124.

The JP lists the Project's emission benefits, its ability to help mitigate the potential adverse impacts that may be associated with risk factors identified by the New York Independent System Operator (NYISO) in its planning processes and its ability to significantly increase supply capability into and fuel diversity in New York City as factors supporting the required need finding.[11]

Regarding the Facility's environmental impacts, the JP indicates that the environmental impacts associated with the Facility 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 agreed to by the signatories are adhered to in the preparation of the Environmental Management and Construction Plan (EM&CP) and are strictly complied with during construction, operation, and maintenance.[12] The JP adds that, as located and configured therein, the Facility 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.[13] In addition, under the JP, Applicants have agreed to fund the Hudson River and Lake Champlain Habitat Enhancement, Restoration, and Research/Habitat Improvement Project Trust (Trust). This Trust will be used to study and mitigate any possible impacts of the Facility's underwater cables on habitat in the Hudson River Estuary, the Harlem and East Rivers, Lake Champlain, and their

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[11] JP ¶¶19-21.

[12] JP ¶¶24, 152; see also sections D and E, and JP appendices E and F.

[13] Id.

tributaries.[14] The JP also contains terms specifying Applicants' other obligations, including limitations on construction periods in both Lake Champlain and the Hudson River; establishment of "Exclusion Areas" within the Hudson River where construction may occur only as agreed to by DEC or as determined by the Commission.[15]

With respect to the Project's conformance with a long-range plan, the JP states that the Facility is consistent with the most recent State Energy Plan and with New York City's goal of providing its residents with increased access to renewable energy supplies, as described in the City's *PlaNYC*.[16]

The benefits identified in the JP as bases supporting the required finding that the Project would serve the public interest, convenience and necessity include its ability to increase the reliability of the Bulk Power System in New York City, reduce wholesale market prices and reduce air emissions in New York City, Long Island and the lower Hudson Valley.[17]

JP Appendices set forth detailed and comprehensive Certificate Conditions (Appendix C, dated January 18, 2013, revised and updated to reflect changes to conditions as set forth in the stipulations submitted subsequent to the filing of the JP), EM&CP guidelines (Appendix E) and BMPs (Appendix F) that were crafted and agreed to by the signatories.

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[14] JP ¶¶144-147.

[15] See, JP Appendix C, Certificate Condition 156(b).

[16] JP ¶¶125-127.

[17] JP ¶¶134-149.

PROPOSED ROUTE

The proposed route of the Facility (the Route) is shown on a series of maps, included as JP Appendix B,[18] depicting a nominal centerline (the Centerline) and an Allowed Deviation Zone. Those portions of the Allowed Deviation Zone ultimately determined to be actually affected by construction of the Facility (a process encompassed in the EM&CP phase of this case), as well as certain areas outside the Allowed Deviation Zone that are needed temporarily for site investigation, access, and construction, are referred to as the Construction Zone.

The HVDC portion of the proposed transmission system would originate underwater at the international border between the United States and Canada in the Town of Champlain, New York and continue south under Lake Champlain. Two cables would extend south through Lake Champlain for approximately 101 miles entirely within the jurisdictional waters of New York State. At the southern end of Lake Champlain, the cables would exit the water in the Town of Dresden, New York.

From Dresden, the cables would be buried along an overland, underground route for approximately 11 miles primarily within the right-of-way (ROW) of NYS Route 22, to the Village of Whitehall. In the Village of Whitehall, the cables would transition from the Route 22 ROW to enter the existing railroad ROW owned by Canadian Pacific Railway (CP) and remain buried for approximately 65 miles in and along the railroad ROW from Whitehall to Schenectady.

In Schenectady, the proposed cable route would enter Erie Boulevard just north of the railroad crossing at Nott Street and continue along Erie Boulevard to a point south of

[18] See also Hearing Exhibit 152.

State Street where it would again enter the railroad ROW.[19] The route would follow the railroad ROW for a short distance, and would then deviate west of the railroad property, pass under Interstate 890, then turn south along the eastern edge of the General Electric property, approximately parallel with the CSX railroad (CSX), re-entering the CP railroad ROW just north of Delaware Avenue. From this point in Schenectady, the line would follow the CP railroad ROW to the Town of Rotterdam. In Rotterdam, the route would transfer from the CP ROW to the CSX ROW and proceed southeast for approximately 24 miles before entering the Town of Selkirk. The cables would then travel south for approximately 29 miles generally in and along the CSX ROW through Ravena, New Baltimore, Coxsackie, the Town of Athens, and the Village and Town of Catskill, before entering the Hudson River in the Town of Catskill (Hamlet of Cementon).[20]

Upon entering the Hudson River via a tunnel excavated by means of horizontal directional drilling (HDD), the HVDC underwater cables would be located within the Hudson River for approximately 67 miles until reaching a point north of Haverstraw Bay. The cables would leave the water via HDD and enter the CSX ROW in the Town of Stony Point, Rockland County.

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[19] Along this portion of the route there are several alternative routings that include both the railroad ROW and various public ways for transitioning from the railroad to the city streets. The public ways include Nott Street, North Jay Street, Green Street, North Center Street, Pine Street, Union Street, Liberty Street and State Street as well as private property (Parking Lot) at or near 160 Erie Boulevard. (The precise route will be determined in the EM&CP phase.)

[20] The overland route from Dresden to Cementown is proposed primarily to avoid installing HVDC cables within the Hudson River polychlorinated biphenyl (PCB) site designated by the U.S. Environmental Protection Agency, which stretches from Hudson Falls, New York, to the Federal Dam at Troy, New York.

The cables would bypass Haverstraw Bay for approximately 7.66 miles, via a combination of trenching and three HDD excavations under the Stony Point State Historic Park Site and Rockland Lake State Park.[21]

The cables would then re-enter the Hudson River via HDD, and be buried in the river for approximately 20.7 miles to the Spuyten Duyvil, which leads to the Harlem River. The cables would extend south-easterly within the Harlem River for approximately 6.6 miles, exiting the water to a location along an existing railway ROW in the Bronx and continuing along that ROW for approximately 1.1 miles. At this point, the line would enter the East River via HDD, cross the East River and make landfall at Astoria.

At Astoria, the cables would terminate at a converter station to be located near Luyster Creek, north of 20th Avenue. From the converter station, a 345 kV underground circuit would connect to the existing 345 kV substation owned by NYPA. The circuits would interconnect with the NYPA substation near the site of the Charles Poletti Power Project in Queens. From NYPA's substation, another set of HVAC cables will be located within the City streets for approximately three miles to the Rainey Substation.

[21] The JP notes that the parties considered but rejected the alternative of diverting the line along the east side of the Hudson River. JP ¶ 103. They relied on Exhibit 86, which noted that the railroad ROW on the eastern bank is heavily travelled with passenger trains and that, due to its close proximity to the water and existing infrastructure, there would be numerous engineering constraints to the eastern alternative.

PROJECT OPERATION

Under the JP, Applicants would build and operate the HVDC portion of the Facility without relying on cost-of-service rates to recover their costs. Applicants state they will recover the majority of the Project's costs from users of the HVDC Facility.[22] The Facility has received authorization from FERC to charge negotiated rates and to enter into negotiated pre-subscription agreements with one or more "anchor" customers for up to 75% of the Facility's throughput, with the remaining 25% of the line's capacity to be available to all bidders in an open season.[23] Under the JP, there would be a Certificate Condition requiring Applicants to have 75% percent of their service under binding contract for a period of at least 25 years before commencing construction in New York State.[24]

As of the close of the record, Applicants did not have any contracts with shippers. However, Applicants and Hydro-Québec (HQ)[25] are exploring the possibility of HQ becoming an "anchor tenant" for the Project.[26] If HQ becomes the anchor tenant, it may commit to up to a 40-year purchase of 75% of the

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[22] Applicants have reserved the right to recover the costs associated with the use of the Astoria Rainey cable to deliver energy and capacity not transmitted over the HVDC transmission system pursuant to cost-based rates set by the Federal Energy Regulatory Commission (FERC). Tr. 65 and 76.

[23] Champlain Hudson Power Express, Inc., 132 FERC ¶61,006 (2010); see also Hearing Exhibits 197 (at 7) and 198 (at 11).

[24] Tr. 65, Hearing Exhibit 150.

[25] HQ is a Crown corporation wholly owned by the province of Québec. It has been developing and operating Québec's hydropower resources for over 50 years. HQ generates, transmits and distributes electricity. Hearing Exhibit 197 at 1.

[26] Hearing Exhibit 197 at 3.

transmission rights and would invest in new transmission in Québec needed to support the Project's 1,000 MW capacity.[27]

Applicants expect to ship mostly hydroelectric power through the proposed HVDC cables, with the most likely source being the four-station, 1500 MW Romaine hydro complex that is currently under construction by HQ in Canada, and expected to be put in service in 2015.[28]

POST-RD PUBLIC COMMENT AND PROCEEDINGS

After issuance of the RD on December 27, 2012, seven letters were received from elected officials and citizens of Rockland County who requested a 60-day extension of the exceptions schedule, to allow members of the public additional time to express their concerns.

In addition, by letter dated March 28, 2013, Honorable Congressman Brian Higgins expressed his opposition to the Project, making two points. Congressman Higgins contends that the Facility would cause higher electricity prices in Upstate New York and he also questions whether providing hydroelectric generating capacity from Quebec to New York City would result in greater reliance within Quebec on its nuclear and fossil fuel generating resources, thus having no net environmental benefit on an international level.

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[27] Id. Applicants have not finalized interconnection plans and details, but studies show that the project can be connected to the New York State Bulk Power System without adversely affecting reliability. JP ¶127. Exploration is underway to determine the feasibility of an interconnection on the Canadian side of the border. See Comments filed on March 30, 2012, by H.Q. Energy Services (U.S.), Inc. (HQUS). HQUS is the U.S. power marketing subsidiary of Hydro-Québec Production, the power generating division of HQ.

[28] Hearing Exhibit 197 at 1.

Also on April 9, 2013, Sierra Club, Atlantic Chapter, filed approximately 2,020 identical form letters, on behalf of its members, in opposition to the Project. The letters identify five points in opposition: that the Project contradicts the objectives of the Energy Highway, threatens in-state renewable energy and energy efficiency programs, violates Article XIV of the New York Constitution, adversely impacts Canadian indigenous peoples, and exaggerates claims of job creation. These issues have been identified by various other commenters in opposition to the Project, as described in the RD.

State Assemblyman James Skoufis (99th District) wrote twice in January 2013 to inform us that many constituents have contacted him about this application. He requested a 60-day extension of the exceptions schedule to allow constituents additional time to express their concerns. Assemblyman Skoufis noted that he has observed overwhelming opposition to this Project among Rockland County residents in his District, and he requested that a Commission representative hold a meeting in Stony Point to meet with concerned residents.

Two Rockland County legislators, Ilan S. Schoenberger and Douglas J. Jobson, jointly, sent a letter dated January 16, 2013, in which they requested a 60-day extension of the public comment period to allow the public to respond to the RD. This request was supported by other similar requests from Town of Stony Point Supervisor Geoffrey Finn, Town of Haverstraw Supervisor Howard T. Phillips, Jr., three Rockland citizens identified as the “Just Say No! to the Champlain Hudson Power Express” Committee (Just Say No!), and Susan Wright, a Stony Point resident. Enclosed with Supervisor Finn’s letter was a copy of the letter from Just Say No!

Those requesting an extension were advised that the requests to extend the schedule for filing exceptions were

denied, because the schedule for exceptions to the Judges' Recommended Decision applied only to parties in the proceeding, and those requesting the extension were not parties in this proceeding. The Secretary had issued a notice in May 2012 indicating that there was no firm deadline for public comments and that comments would be accepted throughout the pendency of this proceeding.

PARTIES' POSITIONS ON EXCEPTIONS[29]

IPPNY, Entergy, IBEW, and the Business Council oppose the ALJs' recommendation that we grant Applicants an Article VII certificate. Central Hudson also opposes the ALJs' recommendation, but in the event a certificate is granted, Central Hudson asks that several other recommendations by the ALJs be revised. The opponents generally argue that the Project is not needed; does not minimize adverse environmental impacts nor conform to a long-range plan that will serve the interests of electric system economy and reliability; and will not serve the public interest, convenience and necessity.

IPPNY and Entergy claim that the ALJs erroneously: relied on the 2012 Reliability Needs Assessment (RNA) performed by NYISO; concluded that the Project would not require out-of-

[29] Applicants, Staff, Con Edison, and DEC also filed briefs on exceptions, but for limited purposes. Applicants and Staff offered limited factual corrections to the RD. DEC "clarified" its jurisdictional role and urged us to accept the ALJs' conclusion that this proceeding is not the appropriate forum for determining the Office of General Services' authority to grant leases for or other property rights to land under Lake Champlain, but otherwise ignore their "dicta" on the topic; and Con Edison recounted the procedural developments that resolved its concerns and reiterated that it otherwise has no position on the project. In this section, we will limit the summary to briefs on exceptions filed by parties that oppose all or some of the ALJs' recommendations or findings.

market subsidies; credited Staff's "production cost" analysis; and failed to prohibit Project shippers from indirectly recovering "extra-market" subsidies. IPPNY also contends that the ALJs relied on "flawed and inconsistent conclusions" concerning the Project's alleged capacity market benefits, wholesale energy price savings and job-inducing benefits. Entergy argues that the ALJs ignored or marginalized arguments against finding that environmental impacts had been avoided or minimized and accepted standards that are at odds with USACE pronouncements.

IBEW contends, among other things, that "insufficient weight" was given to claims that this Project would reduce wholesale energy prices in upstate New York and harm generators in northern and western New York.

Central Hudson asserts that the ALJs did not correctly resolve its issues with proposed Certificate Conditions 5 and 27-29. Central Hudson also requests that, as a matter of policy, we require transmission corridor developers, including merchants, to propose a project that improves known grid constraints and problems, rather than a point-to-point delivery project.

Finally, the Business Council argues that: the Project does not expand transmission to carry excess power from upstate to downstate; its costs "warrant significant review"; Applicants should be required to accept the incremental costs to Central Hudson that result from placing CHPE facilities on top of Central Hudson's facilities; and the need determination cannot be made in this proceeding until after the Commission concludes several proceedings it instituted last year.

STATUTORY REQUIREMENTS

The PSL provides that we may not grant a certificate for the construction or operation of a major utility transmission facility unless we shall find and determine:

> (a) the basis of the need for the facility;
>
> (b) the nature of the probable environmental impact;
>
> (c) that the facility 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 including but not limited to, the effect on agricultural lands, wetlands, parklands, and river corridors traversed;
>
> (d) …(1) what part, if any, of the line shall be located underground; (2) that such facility conforms to a long-range plan for expansion of the electric power grid of the electric systems serving this state and interconnected utility systems, which will serve the interests of electric system economy and reliability;
>
> (e) [not applicable][30]
>
> (f) that the location of the facility as proposed conforms to applicable state and local laws and regulations …, all of which shall be binding upon the commission, except that the commission may refuse to apply any local ordinance, law, resolution or other action or any regulations ... or any local standard or requirement which would be otherwise applicable if it finds that as applied to the proposed facility such is unreasonably restrictive in view of the existing technology, or of factors of cost or economics, or of the needs of consumers whether located inside or outside of such municipality;

[30] PSL §126(e) applies to gas transmission lines.

> (g) that the facility will serve the public interest, convenience, and necessity ….[31]

We generally have used the statute as our guide for the sequence in which we will discuss the contested issues. Therefore, we will start with need, followed by the extent to which adverse environmental impacts have been avoided or minimized, then undergrounding and the Project's conformance to applicable laws and to a long-range plan, and, lastly, public interest, convenience and necessity.

NEED

In recent major Article VII cases we have set forth grounds on which we base our statutory finding of need. Thus, when Bayonne Energy Center (Bayonne) proposed to build a submarine electric cable to provide a dedicated connection between a new natural gas-fired generator in Bayonne, New Jersey and the Con Edison substation in Brooklyn, we found that the facility would provide system reliability benefits and economic benefits for customers and New York State, and would achieve public policy goals.[32] With respect to reliability, we found that Bayonne would provide an additional source of supply in the event that other, expected generation and transmission projects were not completed as projected, generation retired or was unavailable as a result of relicensing disapproval, emissions control requirements, or for any other reason. We also found that Bayonne's direct interconnection with Con Edison's system allowed it to be considered in-city generation that would count

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[31] PSL §126(1).

[32] Case 08-T-1245, Bayonne Energy Center, LLC, Order Adopting the Terms of a Joint Proposal and Granting Certificate of Environmental Compatibility and Public Need, With Conditions, and Clean Water Act §401 Water Quality Certification (issued November 12, 2009) (Bayonne Order).

towards the City's Locational Capacity Requirement.[33] From an environmental perspective, we found that the addition of Bayonne would allow the City's electricity needs to be met with a cleaner generation mix and should reduce present annual NOx, SO_2, and CO_2 emissions in New York City.[34] We also found that Bayonne's economic benefit's included reducing prices and that all of its favorable impacts would benefit New York without imposing additional costs on electric ratepayers.[35] When Hudson Transmission Partners (HTP) proposed to build and operate a 345 kV electric transmission link between midtown Manhattan and the neighboring regional electric system located in Pennsylvania, New Jersey and Maryland (PJM), we grounded our statutory need determination on findings that the facility would provide a useful bulk transmission connection to another region; alleviate existing transmission constraints; be used as an additional in-city capacity reserve; offer network security attributes that would help protect the security of the transmission network; help enhance and maintain system reliability in the event of plant closings or in response to air quality or climate change initiatives; and provide economic benefits by importing lower cost power, providing production cost savings and by not imposing the economic project risks on public utility ratepayers.[36] Applying the same reasoning to this case, and, as discussed more fully below, we determine that there is more than ample basis to find that this Project is needed.

Initially, it is important to reiterate the aspects of need that are not contested. They are:

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[33] Bayonne Order at 13.

[34] Bayonne Order at 13-14.

[35] Id.

[36] HTP Order at 42-47.

- the Project will offer additional transmission capacity into the New York City load pocket;
- by providing a link to abundant hydropower resources, the Project will significantly reduce harmful emissions and will enhance fuel diversity; and,
- due to these and other characteristics, it will help achieve public policy objectives expressed in the 2009 State Energy Plan and New York City's *PlaNYC*, among other documents expressing State policy.

As did the Judges in the RD, we accept these uncontested propositions as supported by the record and demonstrative of need. These, standing alone, are ample bases for our finding and determination that this Project is needed. However, as noted above, IPPNY, Entergy, IBEW, and the Business Council contest other factors that also could support a finding of need for this Project. We discuss their objections, below.

Reliability

The question of whether this Facility is "needed" for reliability purposes was the subject of extensive litigation. In finding a basis of need for the Facility, the ALJs did not rely on a finding that this Facility was being proposed to remedy a forecast system deficiency as of a certain date. Instead, they noted that the RNA was "not automatically dispositive" of the need issue, and found that this case presented an opportunity to authorize an investment in a merchant electrical infrastructure project not tied tightly to any forecast reliability need.[37] The ALJs listed a series of bases for a need finding: (i) the addition of a transmission interface into the New York City Control Area; (ii) likely long-

[37] RD at 29-30.

term economic benefits; (iii) short-term reductions in the wholesale price of energy; (iv) enhanced fuel diversity, and (v) consistency with public policy goals of increased use of renewable energy and reduction in emissions of various pollutants.[38]

The 2012 RNA was issued after post-hearing briefs were submitted in the case. Prior to that time, the parties referred instead to the NYISO's 2010 RNA and its 2010 Comprehensive Reliability Plan (CRP), which found that no new supply resources were needed over the 10-year planning horizon through 2020. Nevertheless, the JP proponents had relied on certain "risk factors" articulated in the RNA that might trigger a supply need, such as higher than expected load growth, environmental initiatives, and the closing of the Indian Point nuclear power plants, to argue that the Project could mitigate adverse impacts that could result if any of those risk factors came to pass.

The 2012 RNA differed from the 2010 version. The 2012 RNA found a potential increased need for installed capacity in New York City beginning in 2020, due to factors such as higher load growth, the recent mothballing or proposed mothballing of generating plants, the possible retirement of the Indian Point nuclear plants, a reduction in the forecast of customers' willingness to positively respond to requests to curtail their electric power demands (Special Case Resources or SCRs), and the possibility of further retirements of plants in the face of stricter air quality requirements. Following the issuance of the 2012 RNA, the parties were afforded an opportunity to submit

[38] The RD considers "reliability need" and "fuel diversity" as two separate issues in separate sections. As we discuss below, we consider fuel diversity to be an important reliability benefit and therefore we have collapsed the two issues here.

supplemental briefs to address its implications. The ALJs relied on these supplemental materials as well as the record materials addressing the 2010 RNA in reaching the conclusions in the RD.

IPPNY and Entergy claim that the ALJs erroneously relied on the 2012 RNA. They assert that the need found in the 2012 RNA may not materialize because: mothballed generators may not actually retire; the 2012 RNA's Zones at Risk analysis found that one could eliminate up to 1,000 MW of capacity from various downstate zones before reliability violations would occur; and the prospect that the Indian Point units would retire is highly speculative. Entergy argues that it is irrational to conclude (as did the RD) that the 2010 and 2012 RNAs examined similar scenarios because the 2012 RNA is not the end of the NYISO's planning process.

IPPNY argues that the 2012 RNA's assumption that SCRs might decline over time is not supported. IPPNY also contends that the State's energy efficiency and renewable resources programs are likely to further reduce or eliminate any future reliability needs.

Applicants respond that the ALJs correctly concluded that the 2012 RNA shows that the additional capacity provided by the Facility may be needed by 2020, and perhaps sooner.[39] They say that IPPNY and Entergy are in effect, asserting that mothballed facilities should have a guaranteed right to reenter the market before new competitors are allowed to serve consumers in New York City, an assertion they say belies IPPNY's oft-repeated support for a fully competitive electric market in New York.

[39] Applicants Brief Opposing Exceptions at 3-8.

They note our Order Instituting Proceeding and Soliciting Indian Point Contingency Plan in Case 12-E-0503, contending that we expressly rejected IPPNY's claim that due to the retirement of Indian Point (IP) nuclear facilities a reliability violation in 2016 is "highly speculative." They also highlight our statement that the potential retirement of such a significant electric generating facility "requires significant advanced planning" and the development of a contingency plan "now."[40] Applicants contend that the institution of the IP proceeding provides powerful evidence of the need for additional capacity to serve New York City and the lower Hudson Valley.

NYC argues that IPPNY's contention that the State's efficiency and renewables programs may eliminate any potential reliability need is "not persuasive," asserting there are "recognized implementation challenges and other circumstances" that render uncertain the achievement of those policy goals. Further, New York City observes that, as a general proposition, year–to-year need determinations are subject to a wide variety of changing circumstances[41]

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[40] Applicants Brief Opposing Exceptions at 6, quoting Order at 4.

[41] NYC Brief Opposing Exceptions at 13. NYC notes recent developments (i.e., the December 7, 2012, decision of the New York State Reliability Council's Executive Committee increasing the current 16% Installed Reserve Margin for the New York Control Area to 17%, effective May 1, 2013, and a January 17, 2013, NYISO's Operating Committee vote that increased the City's Locational Capacity Requirement (which establishes the percentage of capacity to meet the needs of customers within the New York City capacity market that must be purchased from supply resources located within the New York City market) from 83% to 86%) that it says demonstrate that the need determination is fluid and the ALJs properly accounted for that fluidity by analyzing all of the factors identified in the RD. NYC at 11-12.

Staff asserts that because Applicants are not requesting rate-based treatment to recover the cost of the Project, there is no need to address whether the Project satisfies a "reliability need" pursuant to the RNA.[42] Instead, says Staff, this proposal represents a merchant investment, which would help to avoid the need for potential regulated investments -- exactly as the RD concludes.[43]

The Business Council argues that we should await the outcome of a number of recently instituted cases[44] before deciding to advance this Project now. Applicants oppose the Business Council's suggestion, arguing that outcome "would cast a pall on all siting applications in the State."[45]

Discussion

We do not approach a need determination under Article VII as a narrowly-defined exercise, exclusively based on elective supply/demand forecasting –- forecasts that as New York City notes can change significantly from year-to-year based on a myriad of factors. In that regard, contrary to the arguments of Project opponents, the most recent RNA is not dispositive on the issue of need. In both the HTP and Bayonne cases, the then-current RNA found no reliability need during the next 10-year

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[42] Staff Brief Opposing Exceptions at 11-12.

[43] Staff Brief Opposing Exceptions at 12, citing RD at 30.

[44] Case 12-T-0502, Proceeding on Motion of the Commission to Examine Alternating Current Transmission Upgrades; Case 12-E-0503, Proceeding on Motion of the Commission to Review Generation Retirement Contingency Plans; Case 12-G-0297, Proceeding on Motion of the Commission To Examine Policies Regarding the Expansion of Natural Gas Service; and Case 12-E-0577, Proceeding on Motion of the Commission to Examine Repowering Alternatives to Utility Transmission Reinforcements.

[45] Applicants Brief Opposing Exceptions at 60.

planning period, yet we found those projects were needed for reliability. Specifically in the case of HTP, we found that the facility would provide a useful bulk transmission connection to another region; alleviate existing transmission constraints; be used as an additional in-city capacity reserve; offer network security attributes that would help protect the security of the transmission network; and help enhance and maintain system reliability in the event of plant closings or in response to air quality or climate change initiatives.[46] With Bayonne, we found that the facility would provide additional in-city generation; reduce transmission constraints for New York City; and contribute to ensuring system reliability in the event a range of possible regulatory and legal changes or events might transpire and reduce available generation.[47]

In this case, we find and determine need, in part, because, as an additional transmission interface into the City of New York, the Project will (1) alleviate existing transmission constraints, (2) protect the security of the transmission network, (3) enhance system reliability,[48] and (4) enhance fuel diversity. The Project opponents have failed on exceptions to undercut the ALJs' findings regarding the system reliability benefits that would flow therefrom.

The claims that too much reliance has been placed on the 2012 RNA and its underlying assumptions are misplaced, since other uncontested bases properly support a finding of need pursuant to PSL §126(1)(a). In any event, it is indisputable that if load increases, or Indian Point retires, or SCRs decrease, or, in short, if any adverse reliability events

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[46] HTP Order at 42-47.

[47] Bayonne Order at 12-16.

[48] Id.

materialize in the next 10 years, then a Project like this one would be beneficial as a means to help alleviate such adverse impacts.

Arguments about the various risk factors and events that have and may yet affect "need" and the information highlighted on exceptions by parties on both sides of the dispute merely serve to confirm that the State's generation and capacity markets are fluid, and often change in ways that are unexpected – the Danskammer retirement being a prime example.[49] In fact, the NYISO's 2012 CRP, approved and published subsequent to its 2012 RNA, advanced the year of need to 2019, based mainly on the Danskammer retirement announcement.[50] Finally, we reject the requests of the Business Council to consider transmission and generation proposals sequentially and to delay addressing this Project. By issuing this Article VII Certificate, we are merely allowing the Applicant to evaluate other generation and transmission projects in deciding whether to move ahead to construction. Delaying this decision will only add to market uncertainty, and that would be inconsistent with allowing market actors to do their own sorting of possible futures.

Installed Capacity

The RD states that the Project will provide installed capacity benefits. IPPNY excepts.[51]

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[49] On January 3, 2013, Dynegy Danskammer, L.L.C. (Danskammer) filed a written notice of intention to permanently retire (and then demolish) its 495 MW Danskammer Generating Station in Newburg, New York. See Case 13-E-0012, Petition of Dynegy Danskammer, LLC For Waiver of the Generation Facility Retirement Notice Period and Requesting Other Related Relief.

[50] See 2012 CRP at 8.

[51] IPPNY Brief on Exceptions at 18-19.

IPPNY cites Mr. Younger's testimony that the NYISO's buyer-side mitigation rules will prohibit the Project from selling its installed capacity into the markets for many years. IPPNY states that the ALJs seemingly acknowledged this prohibition but then appeared to confuse "additional transmission capacity on the one hand, and increased installed capacity on the other."[52] To the extent that the ALJs confused these two, IPPNY says we must reject any reliance on installed capacity benefits.

Applicants observe that IPPNY does not deny that the Facility will add an additional 1,000 MW of transmission capacity into the New York City load pocket, or that 1,000 MW of generating capacity in Québec will be able to serve load in the New York City load pocket over the proposed transmission line.[53] Applicants contend that, in the unlikely event that any of the installed capacity provided by the Facility is excluded from participating in the NYISO's capacity markets under the NYISO rules, that capacity would remain physically available to NYISO in its operation of the State Transmission System and would benefit consumers by enhancing the reliability of electricity supply.[54]

Discussion

Regardless of whether the ALJs relied on the Project's "installed capacity" benefits, we do not rely upon the Project's

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[52] IPPNY Brief on Exceptions at 19. IPPNY explains that transmission capacity refers to the ability of a transmission system to import and export energy, whereas installed capacity refers to a reliability product purchased by load serving entities to ensure they have sufficient supply, plus a reserve, to meet their load obligations. Id.

[53] Applicants Brief Opposing Exceptions at 27-28.

[54] Id.

potential ability to provide additional installed capacity as support for our decision. Our conclusion, however, does not mean that we find the potential for the Project to provide installed capacity benefits in the future to be non-existent. It simply means that our need finding is supported on other grounds.

Economics

The ALJs reviewed a number of economic analyses advanced by the parties in support of and opposition to the Project. They rejected two separate analyses proffered by Mr. Younger, one a cash-flow analysis and one a production cost savings analysis, in favor of Staff's long-term production cost savings analysis.[55] They determined that "the most meaningful economic analysis of this project is one that focuses on the long-term and gauges whether the proposal will provide net benefits to society as a whole." They then concluded that "Staff's long-term analysis is the one that is best suited to determining whether the proposed Facility will provide overall net societal benefits" because it "was performed in such a way that it reasonably balanced the competing assumptions and views advocated by the Project's opponents, on the one hand, and Applicants, on the other."[56]

In the analysis credited by the ALJs, Staff compared the cost of 1,000 MW of Canadian hydropower delivered to New York City via the Project to the cost of a combined cycle gas-fired turbine (CCGT) of similar capacity located in New York

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[55] Applicants' witness Frayer estimated annual average "production cost savings" of $606 million, or $6.1 billion in total over the 10-year period from 2018 to 2027. The RD did not credit her analysis and no party excepts, so we will not discuss it further.

[56] RD at 47.

City. Staff reasoned that because the Project would alleviate the need to construct the CCGT, the CCGT costs represented the savings attributable to the Project. Staff estimated the net present value of production cost savings over a 35-year period in a range from $0.4 billion to $2.6 billion (in 2015 dollars).[57] In other words, Staff found that the Project was economically beneficial and that the economic benefit constituted a basis for a need finding.

IPPNY's witness Younger testified that the Project would be uneconomic. Employing the same General Electric Multi-Area Production Simulation (GE MAPS) model J database that Staff used for its economic analysis of wholesale market benefits in the JP, Mr. Younger used Staff's representation of the physical and economic characteristics of the Project to model the first ten years of the Project's expected operation. Mr. Younger then made limited updates to Staff's MAPS database to account for the most recent available data on gas prices, generator retirements and full deliveries of 1,550 MW out of the Astoria Annex. Using the methodology the NYISO employs to conduct its Congestion Assessment and Resource Integration Study (CARIS) to determine whether a transmission project is economic, Mr. Younger compared the first ten years of the annualized cost of the Project to its production cost savings over the same period. He concluded that, over the first ten years of Project operation, it would cost a total of over $2 billion but create only $590 million in benefits, thus producing a benefit/cost ratio of only 0.29, substantially below the minimum threshold used by the NYISO to determine whether a proposed transmission project is economic.

[57] Tr. 198-199; see also Hearing Exhibit 202. Staff initially estimated these benefits as ranging between $1.2 billion and $3.2 billion dollars over a 35-year period (net present value in 2015 dollars). Tr. 165.

A second production cost analysis produced by Mr. Younger consisted of proposed corrections to the Staff analysis and also came to the conclusion that the Project was uneconomic.

In rejecting IPPNY's position, the ALJs found, *inter alia*, that IPPNY's overarching views on economic need were informed by the outdated 2010 RNA and by the incorrect assumption that the generation would not be needed for reliability purposes until 2026.

Production Cost Analyses

On exceptions, IPPNY asserts that Staff's analysis did not calculate the production cost savings that would result from the Project. According to IPPNY, by comparing the cost of the Project to the cost of a CCGT in New York City, Staff did not actually measure the long-term net benefits to society as a whole, but instead measured the amount of savings that, if realized, inure to the benefit of only the Project developer. Entergy argues that the RD claims Dr. Paynter's rebuttal savings estimate as a "societal" benefit even though such a finding is at odds with the JP's statement that such savings "should not be interpreted as ratepayer benefits" as they will be "captured by the Applicants, their financial backers and/or users of the Facility."[58]

In response, Staff argues that by comparing total economic costs, while ignoring transfer payments (due to price impacts), it has, in fact, measured economic benefits to society, rather than ratepayer benefits or profits to one party, as claimed by IPPNY.[59]

[58] Entergy Brief on Exceptions at 19-20.

[59] Staff at 4.

Applicants argue that documented savings to a developer are indeed a benefit to "society." They cite an IPPNY statement in support of this view:

> [C]ompetitive market structures motivate power producers to undertake investments and improvements that lead to productivity gains, and many of the nation's generating facilities now are operated much more efficiently than in the past. Just as in any competitive market, market signals embedded in the competitive wholesale markets in New York have created incentives for producers to undertake needed investments and creative improvements in operating practices to achieve such cost savings.[60]

Applicants observe that the Commission has recognized in other contexts that, over time, competition will force producers to share cost reductions with consumers as other suppliers achieve similar cost reductions.

IPPNY reiterates its arguments that Staff significantly understated the combined costs of the Project and the HQ hydro facility while at the same time substantially overstating the CCGT costs that would otherwise be avoided. According to IPPNY, Staff understated Project costs by using the costs of a hydro facility with unique permitting and operating circumstances, failing to include all the costs of the new hydro facility in the calculation, understating the losses associated with delivering power from the hydro facility to the injection point for the Project and using an "abnormally long, 35-year amortization period" for the Project, which, according to the IPPNY witness, proved that any benefits are not likely to occur for decades, long after substantial, required expenditures.

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[60] Applicants at 9, citing Hearing Exhibit 165 (IPPNY White Paper "The Policies of Power: Energy Planning for New York's Future Recommendations from the IPPNY," November 2008, at 15).

IPPNY adds that Staff overstated the CCGT costs by calculating them as if they would be incurred in 2016, the year that Staff expected CHPE to bring the Project into service, instead of using 2026 (IPPNY's asserted need date). IPPNY reiterates its conclusion that the Project's costs are more than $5 billion more expensive than waiting to build CCGTs in New York City when they are needed.

Both Applicants and Staff urge us to affirm the ALJs' adoption of Dr. Paynter's analysis[61] because (1) Dr. Paynter properly dismissed Mr. Younger's concerns with respect to his use of Canadian hydro facilities and addressed Younger's concerns with respect to the facilities needed to transmit electricity from the Canadian hydro facilities to interconnect with the Facility;[62] (2) Dr. Paynter explained that transmission from hydroelectric facilities in Québec to the Facility will occur on lines with a documented history of line losses that vary from "4.5% to 8%, depending on operating conditions and temperatures";[63] and (3) IPPNY's reliance on 2026 as the date on which the proposed combined cycle plant would commence operations, instead of 2016, the date used by Dr. Paynter, relied on the outdated 2010 RNA and improperly introduces short-term market conditions into a long-term economic analysis.[64]

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[61] Applicants at 10; Staff at 5.

[62] Applicants at 10-12.

[63] Applicants at 12, citing Paynter rebuttal at 178; Staff at 5.

[64] Applicants at 13; Tr. 179-180. Applicants add that Dr. Paynter also explained that if he corrected his analysis to recognize short-term market conditions affecting the Facility in Canada, the total costs of the Facility would be reduced to less than one-third of the costs of Mr. Younger's CCGT facility. Applicants at 14, with recitation of testimony at Tr. 180-181 omitted.

Opponents argue that the RD misconstrues Mr. Younger's purpose in conducting a CARIS-type cost-benefit analysis, asserting that the CARIS model was appropriately applied because: (1) the Project failed the cash flow test by such a wide margin that it further supports the conclusion that a subsidy will be required; and (2) there is no other generally accepted benefit-cost methodology.[65]

With respect to IPPNY's CARIS analysis, Staff argues that the RD correctly dismissed it because it applies to regulated projects rather than merchant projects, and it fails to account for HQ's legitimate financial interests in the Project, including, *inter alia*, meeting the needs of HQ's financial backers; consideration of HQ's actual financing costs, which may be very different than CARIS' 16% rate; finding a market for HQ's new hydroelectric supplies; and considering the potential impacts of HQ's new hydro electric supplies on market prices and congestion. Staff notes that witness Paynter listed these "valid considerations," noting that they "are all outside the narrow scope of the CARIS analysis."[66]

Applicants argue that Mr. Younger's analysis also was properly rejected on the basis that it improperly assumed that the full output of the hydroelectric generating facilities now under development in Québec could simply be sold into New York State across existing, already constrained transmission lines.[67] Applicants argue that Ms. Frayer pointed out in rebuttal testimony that Mr. Younger's "production cost" analysis was flawed by this assumption, and that, in reality, differences in market design between control areas, sometimes referred to as

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[65] Entergy at 12-13.

[66] Staff at 7, citing Tr. 192-193 and referring to Tr. 190-193.

[67] Applicants at 20-21.

"seams," limit the extent to which energy can flow between control areas in response to differences in market prices, as FERC recognized in a recent Order.[68] Applicants state that Ms. Frayer explained that the effect of this erroneous assumption is that Mr. Younger's GE MAPS model substantially overstates actual trading opportunities[69] and his production cost analysis understates the Facility's true impacts on total production costs.

Revenue/Cash Flow Analysis

The ALJs also rejected a revenue/cash flow analysis proffered by IPPNY witness Younger. In that analysis, Mr. Younger calculated an annual cost, based on the Applicants' estimated construction costs and 90% capacity factor and the costs to connect with the transmission system in Québec. He then estimated annual revenues based on the historic price differential between the New York-Canada border and New York City. He concluded that it would cost a shipper, per MWh, over $50 to receive an $8 benefit and that therefore the Project was not economic pursuant to this analysis. On exceptions, IPPNY asserts that the Commission should credit this analysis.

IPPNY states that Applicants improperly refused to introduce affirmative evidence of their business plan or potential income stream. IPPNY reiterates its claim that no rational investor, including HQ, would risk its assets by participating in this Project absent some assurance of extra-market funding. It argues that this "undeniable need" for such funding means that subsidization by ratepayers in regulated

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[68] Applicants at 21, citing *Blumenthal v. ISO New England, Inc.*, 135 FERC ¶ 61,117 at P 44 (2011).

[69] Applicants at 21-22.

rates will be necessary to enable the Applicants to recoup their costs.

Applicants point to the rebuttal testimonies of Dr. Paynter and Ms. Frayer, saying both made clear that Mr. Younger "stacked the deck against the Facility in several important ways," including using today's historically low energy prices, and failing to demonstrate that existing interconnections between New York and Québec would be sufficient to accept the full output of the massive hydroelectric generating facilities now under development in Québec. Applicants and Staff note that the record shows that those existing interconnections are already constrained during periods of peak demand, leaving little opportunity for HQ to sell additional hydroelectric power into New York over those existing interties. For this reason, among others, Staff asserts that IPPNY's "Cash Flow" analysis is fundamentally flawed, and the RD was correct to dismiss it.

Discussion

First, it must be emphasized that no one can make any definitive statements about the future economics of the Facility. One can only talk about the future in terms of forecasts that are made at this point in time and the likelihood that the economics of the Facility may actually turn out to be better than forecasted or worse than forecasted. We must therefore recognize the role that uncertainty plays in the investment decisions of potential developers.

Staff, IPPNY, and Entergy agree that the primary economic analysis is the comparison of the overall societal benefits and costs of the Facility, which is sometimes called a production cost savings analysis. While undoubtedly important, the results of a production cost savings analysis are but one factor we consider.

Analyses of production cost savings were performed by IPPNY witness, Mr. Younger and Staff witness, Dr. Paynter. Mr. Younger's production cost savings analysis, using G.E.'s MAPS model, while subject to several weaknesses that were identified by the parties, must be given some weight. The analysis supports a conclusion that the Facility may not be economic on a forecast basis using low gas price forecasts, which lead, in turn, to forecasts of low wholesale electric prices for New York City. At low New York City electric prices, the Facility may not produce enough production cost savings to cover its costs.

We also give weight to Staff's long-run production cost savings analysis. Contrary to IPPNY's allegation, Staff's long-run production cost savings analysis is proper: it properly compares the cost of the added project to the cost savings that will result from it, in the form of an alternative project (a combined cycle gas facility located in New York City) that will be avoided. This analysis should be given the most weight. Its results are highly instructive because they show how sensitive the economics of the Facility are to gas price forecasts. Using its "low" and "high" gas price forecasts,

Staff estimated a net benefit of $0.4 billion and $2.6 billion, respectively.[70]

We acknowledge IPPNY's criticism that Staff's method overstated the net benefit of the Facility by assuming that its in-service date, originally forecasted to be 2016, exactly matched the date that a new CCGT would otherwise need to be built in New York City. According to IPPNY, excess supply in New York City means that a new CCGT would not be needed until substantially later than 2016. This criticism is valid. We recognize, however, that more recent analyses of supply and demand suggest that the need for new supply will likely occur much earlier than 2026. This recognition, combined with delays in the Facility's schedule that puts its in-service date out beyond 2016 by one or two years, brings the expected in-service dates of the Facility and the CCGT much closer into alignment with each other. Nevertheless, there would remain a slight

[70] In its Brief on Exceptions, IPPNY attempted to introduce into the record, the U.S. Energy Information Administration's Annual Energy Outlook (2013 AEO) Early Release Overview, for the purpose of bringing to our attention gas forecasts lower than those previously used by the parties in their production costs analyses. By Ruling Denying Motion to Incorporate or Take Official Notice (issued January 30, 2013) and Errata Notice (issued February 1, 2013), the Acting Secretary determined that the draft document would not be introduced into the record because the forecasts were preliminary in nature (subject to future revision). We agree that the ruling was proper at the time made. On April 15, the EIA issued the final 2013 AEO, which retains the gas price forecasts contained in the Early Release Overview. We recognize that incorporating these gas forecasts at issue into Staff's analysis (holding all other inputs constant), Staff's estimate of production cost savings would turn negative. Such a result, however, would only change one element in our overall analysis and would not change our conclusion that there is more than ample basis to conclude that the granting the Certificate is warranted.

mismatch in the two dates and therefore a slight overstatement by Staff of the Facility's production cost savings.

Based on the information available to us, we find the production cost savings estimates to be inconclusive, as the results of such an analysis depend very heavily on, among other things, the trajectory of actual gas prices. As was clear from the record and is well understood within this Commission's experience, gas price forecasts can change dramatically in a very short time. However, by granting the Facility a certificate, we are providing its investors with the option to move forward with construction of the Facility if circumstances such as a revised gas price forecast lead its investors to believe that it will be an economic project. As we explain below, the Project is in the public interest because its non-monetary benefits outweigh its environmental harm. This weighing of the Project's non-monetary aspects holds irrespective of any conclusion we make on the economics of the Project. If the economics are positive and the Project is built, then society will be better off for it, because of the important non-monetary benefits. If the economics become worse and the Project never gets underway, then no harm will come of our decision to grant the Facility a certificate.[71]

As an alternative to a production cost savings analysis, IPPNY's witness, Mr. Younger, performed a revenue/cash flow analysis. The analysis looked at the economics of the project from the perspective of the project owner: is the project likely to be reasonably profitable? We find that

[71] We note that, pursuant to Certificate Condition 13, the Applicants do not have unlimited time in which to go forward with the Project. Rather, Condition 13 allows us to vacate the Certificate if Applicants have not filed their EM&CP or commenced construction by certain specified deadlines.

IPPNY's revenue/cash flow analysis cannot be relied upon because it keyed on historical bus prices instead of forecasted bus prices. Historical bus prices fail to capture key future factors such as gas price forecasts, and, as Staff points out, the historical bus prices used by IPPNY were artificially depressed by the recent recession.

Wholesale Price Impacts

The ALJs observed that "[n]o party disagrees that this facility will (or is likely to) reduce wholesale electricity prices; parties disagree on whether these reductions should be viewed as a benefit, whether the estimates are accurate, and whether the metric should be relied on by the Commission in this proceeding."[72] The RD summarizes the various estimates put forward by the parties, noting Applicants' figure of $503 million for 2018 and $3.4 billion for the ten years starting with 2017, and Staff's estimate of $492 million in 2018.[73] According to the RD, IPPNY witness Younger argued that the 2018 numbers were overstated by $211 million.[74] The ALJs found that, "even after accounting for opponents' criticisms and proposed offsets, the proponents have successfully demonstrated that the Project will have sizable benefits in the form of reductions in the wholesale price of electricity" and that these particular benefits, though likely short-term, should be considered as evidence supporting both the required need and public interest findings.[75] IPPNY, Entergy, IBEW and the Business Council take exception to this recommendation, arguing that the wholesale price reductions should not be viewed as benefits nor be

[72] RD at 48.

[73] Id.

[74] RD at 49.

[75] RD at 54, 72-73.

considered as evidence supporting the need or public interest findings.

IPPNY and Entergy say any claimed benefits from wholesale energy price reductions produced by this Project must be disregarded entirely because they are temporary transfer payments between generators and consumers, rather than sustainable benefits to society as a whole. They also assert that any wholesale price reductions caused by this Project's "uneconomic entry" would be the result of anti-competitive price suppression and thus cannot be considered a benefit. IPPNY adds that the RD's conclusion that wholesale energy price savings will "nonetheless be realized" is erroneous and it is "pure speculation" whether such savings would have a perceptible impact on consumers. Entergy reiterates, and cites Dr. Paynter's testimony as support, that "[wholesale energy] price reductions benefit consumers at the expense of the suppliers; but the reduction in prices does not represent an economic (or societal) benefit, just a transfer payment from suppliers to consumers." Entergy argues that the RD's finding that such transfer payments somehow support both need and public interest is misplaced.

IBEW also disagrees with viewing wholesale price impacts as a benefit, especially in Upstate New York, while the Business Council states that if the projected wholesale energy market savings cannot be delivered, the Project simply cannot be in the public interest.

Applicants and Staff contest IPPNY's claim that wholesale price savings are "inherently unreliable because, *inter alia*, they do not account for market responses."[76] Applicants contend that it is unsupported by any citation to the

[76] Applicants at 25, citing Brief on Exceptions at 20.

record and cannot be reconciled with the testimony of DPS Staff witnesses Gjonaj and Wheat that "the Commission should be aware of these [wholesale price] benefits when considering whether this project is in the public interest."[77]

Applicants argue that the ALJs clearly considered and rejected IPPNY and Entergy's claim that the lower wholesale electricity prices resulting from the Facility should be ignored simply because they are likely to be transitory.[78] Applicants argue that IPPNY and Entergy have provided no explanation why this "obviously correct conclusion" should be rejected by the Commission.

Discussion

The Project will create significant benefits to consumers in the form of lowered wholesale prices. Even allowing for adjustments proposed by IPPNY, the wholesale price reductions for 2018 alone are forecast to be $281 million. We do not rely on these consumer benefits to find need. Instead, as discussed elsewhere in this Order, we find other bases for granting the certificate.

Price Impacts at U.S.-Canada Border

In response to claims that the Project could raise wholesale electricity prices at the U.S.-Canada border, the ALJs stated that:

> This potential scenario, however, is premised on the assumption that all other circumstances would remain constant. In fact, no basis for that assumption is substantiated on this record, where we have credible testimony that markets tend to

[77] Applicants at 25, citing Tr. 245.

[78] Applicants at 25-26, citing RD at 53.

> respond to such price differentials, eventually offsetting them over time.[79]

IPPNY and Entergy contest this conclusion, arguing that the RD's rationale for rejecting the border price information is inconsistent with the RD's rationale for crediting wholesale energy price savings. They argue that either all price impacts are relevant regardless of certainty and expected duration, or none of them are. Entergy argues that it demonstrated that we must take into account the higher energy prices that the Project will cause in the already struggling regions of Upstate New York, claiming this Project would increase Upstate power prices without providing any other tangible benefits. Entergy asserts that this scenario was suggested by Dr. Paynter.

Applicants assert that the ALJs correctly rejected IPPNY and Entergy's contention that the Facility will harm consumers in Upstate New York by increasing prices at the Canadian border because that contention was unsupported by record evidence.[80] Staff asserts that the contention is simply false.

Specifically, Applicants note that Entergy quotes from Dr. Paynter's testimony on cross-examination, but fails to include the very narrow question to which he was responding or the last fifteen words of Dr. Paynter's answer, both of which, Applicants state, make clear that Dr. Paynter is answering a purely hypothetical question posed by Entergy's counsel. Applicants argue that when the complete question and answer is viewed in context, the quotation presented by Entergy provides it no support.

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[79] RD at 65, citing as an example Tr. 172.

[80] Applicants at 34.

Staff says that Dr. Paynter, in fact, determined that the Project would reduce prices across New York State, including Upstate. Staff adds that IPPNY's claim is based, not on Staff's testimony, but on a hypothetical, presented on cross-examination, which assumes that HQ would invest in 1,000 MW of additional hydroelectric supply and sell this at the New York border, without any transmission upgrades in New York. Referring to its Reply Brief (p. 11), Staff states that the "increase" in border prices is only in comparison to the depressed prices in the hypothetical and that compared to current market prices, the impact of the additional hydroelectric resources delivered by the Facility is to reduce prices statewide, including at the Canadian border. Applicant makes a similar argument.

Applicants state that the only record evidence directly addressing the impact of the Facility on power prices in upstate New York is the testimony of Ms. Frayer, whose testimony included a chart clearly showing that the Facility will have no significant impacts on the price of electricity in upstate markets (Tr. 279, lines 1-7).

Discussion

Staff witness Paynter testified that when large supplies enter a market, they naturally tend to depress prices.[81] Based on this testimony, and on the arguments provided by Staff on exceptions, we reject claims that the Project will increase wholesale electric prices at the U.S.-Canada border.

Competitive Markets and Existing Generation

The ALJs rejected arguments that this Facility will harm competitive markets if it is granted a certificate, instead concluding that its addition should improve the competitiveness

[81] Tr. 171.

of the market in New York City and is consistent with State, Commission, and City policies encouraging competitive markets. Their reasons were: (1) short-term price decreases should not harm existing generators who are able to adapt to an evolving competitive market; (2) the entry of additional energy and capacity supply could help consumers, particularly in the City load pocket, since it could reduce the potential for market manipulation; (3) the "persuasive" record evidence rebutting the claims that the Project will be an uneconomic entrant; and (4) if some of the Project's costs prove uneconomic, Certificate Conditions should protect captive ratepayers from a significant portion of any such costs and the buyer-side mitigation rules should protect incumbent generators.[82]

The ALJs rejected claims that the Project would hasten the exodus of fossil or renewable generation because they found "far too many variables at play that could influence or explain a generator's decision to exit the competitive market, including changes in environmental regulations or tax laws" and "no credible basis for concluding that any generator's decision to exit the market can be definitively and exclusively linked to the entry of this Project."[83] IPPNY, Entergy and IBEW except to the ALJs' conclusion and renew arguments that certification of this Project will harm competitive markets and cause existing generators to exit the market.

IBEW contends that existing fossil or renewable generators' lack of usable transmission facilities denies them the opportunity to compete. IBEW also argues that, with 1,000 MW being delivered from Canada to downstate, (1) there would be no immediate need for renewable or fossil power generated in-

[82] RD at 66-67.

[83] RD at 66.

State to be transmitted downstate and (2) the upstate renewable and fossil generators' financing ability would be curtailed.[84]

IPPNY reiterates its claims that the "fact" that this Project is uneconomic and "likely to be financed by above-market, subsidized contracts," would turn the bases underlying the Commission's determination to implement competitive markets on their head and significantly harm the very competitive market the Commission sought to produce. These same arguments form the bases for IPPNY's claims this Project would hasten the exodus of existing generators.

IPPNY asserts that the policy implications of building uneconomic capacity are clear and were recognized long ago by FERC in its Order approving the NYISO's proposed measures to mitigate the impact of market power. IPPNY claims that our issuance of a certificate to the Applicants will allow the Project to satisfy a significant milestone and will encourage uneconomic entry and the suppression of energy prices, which will chill market-based entry and ultimately cause New York's consumers to pay higher electricity prices.

IPPNY concedes that it is not always possible to identify or isolate the one factor that led to a generator's retirement but contends that simple economics demonstrates that existing economic generators are dependent on market revenues and cannot survive long-term when those revenues are "artificially depressed in a significant manner by uneconomic entry." IPPNY claims that this Project's costs are higher than the costs of new entrants that legitimately lower costs, and those higher costs will be foisted on consumers through indirect subsidies for this "anticompetitive" Project.

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[84] IBEW Exceptions at 3.

Applicants respond that IPPNY and Entergy ignored the portion of the RD expressly rejecting their claims. They say that when addressing claims that the Facility will harm competitive wholesale power markets, the ALJs make clear that rejection was due, in part, to rejecting IPPNY and Entergy's views of the Facility's economics and, in part, on their finding that the buyer-side mitigation provisions of the NYISO Services Tariff will protect competitive wholesale power markets in the unlikely event that IPPNY and Entergy's economic arguments prove correct.

Applicants assert that FERC has made clear its intention and obligation to adopt measures designed to prevent any such competitive harm, reflected by its decision to protect New York's markets from competitive injury due to uneconomic entry by directing NYISO to impose "net buyer mitigation."[85] As a result, Applicants assert that FERC has taken the regulatory actions required to ensure that uneconomic entry will not pose a threat to New York's wholesale power markets.

Applicants urge rejection of IBEW's exceptions because (1) generators in upstate New York are already free to compete to serve customers in New York City using transmission capacity between upstate New York and downstate New York on existing facilities; (2) the record reveals that the Facility will actually reduce congestion on New York's constrained Total-East Interface, making more transmission capacity available to generators in New York State; and (3) IBEW has failed to identify any concrete transmission expansion projects that will not go forward if the Facility is approved.

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[85] Applicants at 30-31, citing FERC's March 7, 2008 Order in Docket No. EL07-39-000, New York Independent System Operator, Inc., 122 FERC ¶61,211 at P 105 (2008).

Staff argues that IPPNY's claim of harm to competitive markets is unsupported because it is based on IPPNY's "discredited" assertion that the Project is uneconomic and would be financed by contracts subsidized by New York consumers. Staff further asserts that IPPNY's "professed concern about 'chilling new investment' is not credible; indeed, it is difficult to imagine a more serious threat to competitive markets than to deny siting, thereby preventing a developer from even attempting to enter the market."[86]

Discussion

The single most important characteristic of a competitive market is ease of entry by new suppliers. One potential entry barrier is the siting process itself and the requirement that a potential new entrant, such as the Facility, obtain a certificate. One way to truly harm competitive markets is to deny potential suppliers the certificates they need without having a strong basis for doing so.

Opponents in this case ask us to deny the Facility a certificate because of the alleged possibility that the Facility will become part of a buyer market power scheme to artificially drive down New York City wholesale electric prices. Buyer market power problems tend to be rare and therefore do not need entry-blocking actions that cause more harm than good. Moreover, even if we were concerned about buyer market power in this case, we need not act now, at the siting stage of the process, to prevent hypothetical exercise of future buyer market power, since we can act later. Specifically, the single largest buyer of market-based electricity in New York City, Con Edison, would have to pass muster with us in the form of a prudence review, were it to later enter into a contract with a shipper

[86] Staff Brief Opposing Exceptions at 10.

such as HQ. Were Con Edison to pay above-market prices in such a contract, we have the authority to find the overpayments to be imprudent.[87] This regulatory power enables us to protect the market from buyer overpayments by Con Edison.

Furthermore, as the Applicants have noted, the NYISO has buyer market power mitigation measures in place, approved by FERC, and fully tested, whose sole purpose is to protect markets from buyer market power. Therefore, if the future entry of the Facility were to occur in the form of an alleged instance of buyer market power, the FERC-approved mitigation measures will be available to prevent damage to the market.[88]

An additional important factor that weighs in favor of a better functioning New York City competitive market is the benefit of the addition of a new supplier to New York City's existing mix. The reduced concentration of ownership of supply in New York City that occurs when a new supplier enters the market helps make for a more competitive market.

As for any impact of the Facility on incumbent generators, be they New York City generators or upstate generators, we acknowledge that the Facility will result in lower wholesale market prices, albeit for only a temporary

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[87] Of course, the payment of a reasonable premium above the regular market price for renewable power, or other desirable attributes, is common and could be prudent. We will carefully examine any future power purchase agreement entered into by a New York utility for power transmitted over this line, and we will not hesitate to disallow any amounts that are in any way imprudent.

[88] NYPA, for example, is a buying entity in New York City which we do not regulate, and therefore we cannot ourselves prevent it from exercising buyer market power. While we believe it is unlikely that the NYPA will overpay as part of a buyer market power scheme, the FERC-approved mitigation measures will be available to mitigate any such attempt to exercise buyer market power.

period. Therefore, as in any well functioning market, the entry of a new supplier will likely impact incumbent suppliers. This is an effect that is more than tolerable as a consequence of the proper workings of a competitive market.

In summary, the goal to have markets in New York that are more competitive rather than less competitive is well served by granting the Facility a certificate that is a prerequisite to entering the market. It would be folly to raise entry barriers by barring the entry of this new competitor, especially at the siting stage, out of a concern that doing so is needed to prevent the speculative potential for future buyer market power.

Public Policy

Emission Reductions

For the period 2017 to 2026, the Applicants' estimated reductions in total New York State emissions of SO_2, NO_x, and CO_2 are 1,329 tons, 5,612 tons and 35,434,166 tons, respectively.[89] The comparable estimates for 2018 are reductions in SO_2, NO_x and CO_2, of 243 tons, 1,026 tons and 3,801,502 tons, respectively. Staff estimates for annual (2018) New York City air emission reductions were 40 tons of SO_2, 320 tons of NO_x, and 1,037,062 tons of CO_2.[90] For the State as a whole, the Staff estimate of expected annual (2018) air pollutant emission reductions of SO_2, NO_x, and CO_2 were 751, 641, and about 1,500,000 tons per year, respectively.[91] By any of these measures, the Facility's expected emission reductions are a substantial environmental benefit, a benefit that is expected to be enduring.

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[89] Tr. 304.

[90] Tr. 248.

[91] Tr. 246-247; Hearing Exhibit 204. In the first full paragraph on page 31 of the RD, the word "million" should be inserted after the number "1.5" and before the word "tons."

Fuel Diversity

The Facility will increase fuel diversity, consistent with Commission and State policies encouraging diversification of the generation resource mix of energy sold in the State and increased reliance on renewable energy sources. The Project is also consistent with our policies of reducing dependence on natural gas as a fuel for electric generation.[92] These fuel diversity benefits are unique, having no recent precedent in terms of the source of supply –- mostly hydroelectric –- and the extent to which such supplies can enhance the diversity of generation sources and reduce dependence on natural gas as a fuel for electric generation.

Policies of the State, the PSC, and NYC

As noted above, the Judges found need for the Project based on its demonstrated ability to achieve public policy objectives expressed the 2009 State Energy Plan and New York City's *PlaNYC*, among other State policy documents,[93] and we adopt these uncontested findings. The 2009 State Energy Plan expresses support for the development of investments in energy infrastructure, especially infrastructure investments that support the State's transition to a clean energy economy, reduce greenhouse gas emissions, and "allow the State to fully exploit the potential benefits of ... additional Canadian imports."[94] Various Commission policies encourage diversifying the generation resource mix of energy sold in New York State as a means to improve energy security, while ensuring protection of system reliability and promoting and encouraging the development

[92] Tr. 307-308.

[93] RD at 30-34, 64-65, and 72-73.

[94] 2009 State Energy Plan, Executive Summary at xv.

of competitive markets. We find that this Project advances these goals, thus further demonstrating need for this Facility.

Conclusion

The Project satisfies a need by providing additional transmission capacity into the New York City load pocket and an additional source of supply – hydroelectric power -- that is both renewable and relatively stable in price, enhancing the fuel diversity in the City. Moreover, by allowing a new entrant into the New York City market, approval of the Project would advance our policy favoring competition. Finally, the Project advances State policies by enabling access to a source of clean energy supply.

THE NATURE OF THE PROBABLE ENVIRONMENTAL IMPACT AND MINIMIZATION OF ADVERSE ENVIRONMENTAL IMPACT

The RD found that the facility route is preferred because it would avoid or minimize the disturbance of natural habitat, and would use some existing and previously disturbed ROW (e.g., railroad ROW). The Judges recommend finding that the nature of probable environmental impacts have been identified, and that the facility, located and configured as conditioned by the JP's terms and conditions, and related stipulations, 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.

In its Brief on Exceptions, Entergy reiterates the arguments made in its initial post-hearing brief, that Applicants have not adequately characterized and minimized potential environmental impacts, including potential impacts on shortnose and Atlantic sturgeon, species listed under the

federal Endangered Species Act (federal ESA)[95] and the New York Environmental Conservation Law (state ESA).[96] Entergy argues that the RD's conclusions regarding nature and minimization of impacts are in error. Entergy also objects to the RD's conclusions regarding the JP's Hudson River Navigation Channel Cable Burial Provisions.

The ALJs concluded that the USACE has not made a determination to grant, modify, or deny Applicants' federal application for a USACE permit, including a determination on minimization regarding this facility. Certificate Condition 11 requires that Applicants obtain the necessary USACE permit. The Judges recommended that the Commission should allow USACE to complete its permit review and render its determination. The Judges found that that the JP's Certificate conditions regarding cable placement and burial depth are consistent with Commission practice in previous cases, and will minimize potential adverse impacts related to cable burial depth and the location of cables in federal navigation channels.

Sturgeon Habitat

Entergy raises four issues regarding potential impacts on ESA sturgeon: potential loss of habitat due to proposed installation of concrete mats or rip-rap (concrete mats) in limited areas of the Hudson River subaquatic route, lack of characterization of impacts outside sensitive habitat areas, improper deferral of minimization of impacts to the EM&CP phase of the project, and nature and potential magnetic field impacts.

Use of Concrete Mats

In Hudson River areas where it is necessary to protect utility crossings or where the river bottom is solid rock,

[95] 16 U.S.C. §1531.

[96] Environmental Conservation Law (ECL) §11-0535.

preventing burial of the cable, Applicants propose to cover the cables with concrete mats. Entergy contends that concrete mats will be installed for approximately 6.41 miles of river bottom, and that the record does not address the potential loss of those areas as sturgeon habitat.

Applicants respond that Entergy has overstated the use and effect of concrete matting, relying upon information that was developed using the Applicants' original routing[97] and is no longer accurate. Applicants contend that the revised routing described in the JP proposes the use of concrete matting for only 4.45 miles, approximately 25% less than Entergy contends.

In addition, it is uncontroverted that approximately 17% of this concrete matting would be installed over existing hard substrate. Applicants assert that Entergy offers no explanation as to how use of concrete matting over hard substrate, or any other proposed use of the concrete mat surface, would function differently from the existing substrate in terms of habitat. To the contrary, Applicants cite evidence in the record that, "[i]n areas of hard bottom, the mats will create similar habitat, and in soft bottom areas the mats will, in essence, create small artificial patch reefs. The surface of the mats may develop an epibenthic community over time as well as provide structure that is important for some benthic species and fish."[98]

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[97] Hearing Exhibit 2 at 4 (Location of Facilities (Exhibit 2 to the Application)) (describing the original routing); Hearing Exhibit 92 at 3 (Letter to New York State Department of State dated February 18, 2011).

[98] See Hearing Exhibit 121 at 193 ("The mats will have an insignificant effect on near bottom hydrodynamics, which may be similar to the conditions found in rocky bottom areas.").

Further, Applicants state that the February 18, 2011, letter from Applicants' consultant to DOS states that the final design will "optimize the placement of protection to minimize the area of the bottom covered by concrete mattresses or other protective devices" so that "[t]he actual area of additional protection is likely to be substantially less than the total width of the cable/pipeline area as depicted on the NOAA charts."[99]

Lastly, Applicants contend that Entergy's arguments ignore the beneficial effects of the $117.15 million trust for the enhancement of water quality in the Hudson River and Lake Champlain. The Hudson River and Lake Champlain Habitat Enhancement, Restoration, and Research/Habitat Improvement Project Trust (the "Trust") resulted from collaborative discussions among the Signatory Parties and provides exclusively for in-water mitigation studies and projects that have a direct nexus to the construction and operation of the Facility. These studies and projects will minimize, mitigate, study 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 Facility.[100]

Applicants conclude that Entergy has failed to demonstrate any factual basis for its argument that the proposed limited use of concrete mats will have a negative effect upon state ESA sturgeon habitat.

Discussion

With respect to the Project's potential impacts to state ESA sturgeon, we observe that the relevant portions of the JP ensure benthic habitat is not lost and that environmental

[99] Hearing Exhibit 92 at 3.

[100] JP ¶144.

impacts are minimized. The record includes an extensive analysis of river bottom bathymetry, fisheries data, acoustic fish tracking, annual Hudson River surveys of fish distribution, adult and juvenile sturgeon monitoring, submerged aquatic vegetation maps, tidal wetland maps, and existing Significant Habitats.[101]

The record shows that Entergy has overstated the extent of concrete matting by at least 25%. Moreover, Entergy has failed to present any evidence or legal authority to support its claim that the Applicants' installation of concrete mats will result in the adverse modification of sturgeon habitat amounting to a state ESA "take."

A "take" under the state ESA includes the killing of an endangered species and lesser acts including "disturbing, harrying or worrying" of the species.[102] A "take" also includes an interference with or impairment of an "essential behavior" of an endangered species.[103] Essential behavior means any of the behaviors exhibited by a species listed under the state ESA as endangered or threatened that are a part of its normal or traditional life cycle and that are essential to its survival and perpetuation. Essential behavior includes behaviors associated with breeding, hibernation, reproduction, feeding, sheltering, migration and overwintering.[104]

The Facility has been routed to avoid, to the maximum extent practicable, environmentally sensitive DOS Significant

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[101] Hearing Exhibit 102 (Description of Protected Areas within Hudson River); JP, Appendix C, Final Revised Proposed Certificate Conditions (January 18, 2013), ¶156(b)(1).

[102] See, 6 NYCRR 182.2(x).

[103] 6 NYCRR 182.2(f).

[104] Id.

Habitats and DEC Exclusion Areas. The Significant Habitats and Exclusion Areas were designated specifically because they contain sensitive habitat, including sensitive state ESA sturgeon habitat, relative to other areas of the Hudson River. By avoiding areas recognized as sensitive aquatic habitat areas, including sensitive habitat areas for sturgeon, Applicants will avoid potential adverse impacts to sturgeon.

The Environmental Impact Assessment (EIA) provides Applicant's comprehensive assessment of the nature of potential environmental impacts of the proposed facility and proposals for minimization of potential impacts. The EIA addressed the habitat impacts of use of concrete mats specifically, concluding that:

> The mats will alter local hydraulic conditions such that some sediment deposition or scouring may occur around the irregularity in the bottom formed by the mats. However, the overall change in bottom topography will be insignificant because the mats will extend only a short height above the bottom and functional benthic habitat will develop. The volume of the cable is extremely small relative to the sediment layer and bottom hydrography of the water bodies involved, and the effect of the cable on bathymetry will be insignificant relative to natural levels of fluctuation due to currents, storms, navigational traffic, and other pre-existing factors.[105]

The EIA further states that "[a]fter the cable is energized, the benthic community is expected to be similar to that from adjacent benthic [areas]."[106] Therefore, for the small

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[105] Hearing Exhibit 121, p. 168. The benthic zone is the ecological region at the riverbed or lakebed; bathymetry describes the contours of a riverbed or lakebed.

[106] Id., p. 206.

sections of the riverbed where concrete mats will be installed, the benthic community is anticipated to redevelop on or around the concrete mats, so that the benthic zone will include the concrete matted areas. Entergy provided no evidence to the contrary.

In the RD, the Judges correctly identified the nature of the potential habitat impact and found that the Facility conforms with the substantive requirements of the state ESA. The Judges reasonably concluded, based upon the record, that the proposed limited installation of concrete mats would not degrade state ESA sturgeon habitat or harm sturgeon. The record supports the RD finding, that the Project satisfies the applicable standards of the PSL concerning nature and minimization of potential habitat impacts of the limited use of concrete mats. In considering the RD and EIA sections discussed above, we reject Entergy's contention that the RD does not consider potential habitat impacts attributable to the permanent installation of concrete mats that could displace sturgeon habitat after the construction phase is completed.

DEC Exclusion Areas and DOS Coastal Zone Program Significant Coastal Fish and Wildlife Habitats

The RD concludes that the JP provides seasonal construction windows to prohibit construction during times when the Exclusion Areas and Significant Habitats are likely to be occupied by sensitive species. Entergy takes exception to this conclusion as facially insufficient because it addresses only the period of construction.

In addition, Entergy asserts that any final Facility design that minimizes impacts only to particular defined areas -– Exclusion Areas and Significant Habitats -- cannot ensure that impacts to sturgeon habitat outside those defined areas will not adversely affect sturgeon.

Applicants respond that Entergy has not identified any specific potential adverse impact to state ESA sturgeon habitat. Instead, Applicants contend, Entergy argues that omissions exist in the record regarding the nature of potential impacts to state ESA sturgeon.

Applicants and Staff respond, as discussed above, that the JP reflects lengthy, detailed consultation with DEC and other environmental parties concerning nature and minimization of environmental impacts. They state that the record shows that Applicants are largely avoiding routing the Facility within sensitive habitat areas identified by the Signatory Parties, the DEC Exclusion Areas and DOS Significant Habitats. In addition, the JP provides for designated seasonal construction windows for construction within Exclusion Areas and Significant Habitats, to the limited extent that these areas cannot be avoided. Further, in the EM&CP phase, the JP provides that Applicants will develop a final Facility design that minimizes potential impacts.

Discussion

The record shows that the installation of the cable is designed to avoid or minimize environmental impacts. As explained in the previous discussion section, for the limited areas of the river bed where concrete mats will be installed, the benthic community is anticipated to redevelop. Therefore, we conclude that permanent habitat loss is not anticipated to occur and that any permanent habitat loss that may occur due to the limited use of concrete mats on the Hudson River segment of the facility has been minimized.

In its Conditional Concurrence with Consistency Certification, the DOS noted: “The most certain way to minimize the impact on benthic habitats is by siting the cable route to

avoid particularly sensitive habitats."[107] Applicants, in collaboration with the JP's Signatory Parties, including the DEC, DOS, DPS Staff, Riverkeeper, Scenic Hudson and Trout Unlimited, have developed a Facility route based upon existing habitat information, including state ESA habitat, that avoids to the maximum extent possible, areas recognized as sensitive habitat for aquatic species.[108]

The DOS Significant Habitats and DEC Exclusion Areas were designated specifically because they contain sensitive habitat relative to other areas of the river, including sensitive state ESA sturgeon habitat. The record shows that Applicants' negotiations with the Signatory Parties resulted in the designation of fifteen Exclusion Areas, to be avoided to the maximum extent possible. DEC Staff developed the Exclusion Areas based on an extensive analysis of river bottom bathymetry, fisheries data, acoustic fish tracking, annual Hudson River surveys of fish distribution, adult and juvenile sturgeon monitoring, submerged aquatic vegetation maps, tidal wetland maps, and existing Significant Habitats.[109]

The Exclusion Areas go above and beyond identifying legally protected habitats to include other areas considered to be high quality habitat, including state ESA sturgeon habitat. The record shows that DEC identified the state ESA as its authority for development of the Exclusion Areas and stated that

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[107] Letter from the New York State Department of State to Applicants regarding Conditional Concurrence with Consistency Certification (June 8, 2011) at 6, *available at* http://docs.dos.ny.gov/coastal/cd/F-2010-1162%20CondCCR_web.pdf.

[108] See, JP Paragraphs 51 and 54.

[109] Hearing Exhibit 102 (Description of Protected Areas within Hudson River); JP, Appendix C, Final Revised Proposed Certificate Conditions (January 18, 2013), ¶156(b)(1).

"[r]outing of the Project outside of the Exclusion Areas, to the maximum extent possible, will help avoid a taking of endangered or threatened species."[110]

The Facility will also avoid Significant Habitats to the maximum extent possible. The Significant Habitats are designated by the DOS under its Coastal Zone program because the designated habitat areas are essential to the survival of a large portion of a particular fish or wildlife population, support populations of rare and endangered species, are found in low frequency, support fish and wildlife that have significant commercial or recreational value, or would be difficult or impossible to replace.[111]

In addition, to the extent that the Facility is located within a Significant Habitat or Exclusion Area, construction windows will be used to avoid times when these areas are more likely to contain sensitive species, including state ESA sturgeon.[112] Furthermore, in the EM&CP project phase, Applicants will develop a final Facility design for five nearby Significant Habitats to minimize adverse environmental impacts to those areas.[113]

Next, Entergy argues that segments of state ESA sturgeon habitat outside Exclusion Areas and Significant Habitats have gone unstudied and unprotected. However, this argument ignores the substantial record in this proceeding

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[110] Id.

[111] Id.

[112] Revised, Final JP Appendix C, ¶156(b)(1); Hearing Exhibit 121 at 250-52 (Revised Environmental Impacts Assessment).

[113] Applicants state that all of these efforts were premised on the existing information from the other agencies primarily responsible for protecting these endangered species.

evaluating potential Hudson River impacts.[114] We conclude that the JP's provisions regarding the avoidance of Exclusion Areas and Significant Habitats were specifically designed to minimize potential adverse impacts and avoid the possibility of a state ESA sturgeon "take". Therefore, we reject Entergy's contention that additional assessment of potential impacts to state ESA sturgeon outside the Exclusion Areas and Significant Habitats is required.

In sum, by largely avoiding Significant Habitats and Exclusion Areas, including the river areas where state ESA sturgeon are believed more likely to occur, Applicants will avoid or minimize any potential impacts to sturgeon habitat, in accordance with the PSL §126(1) and the state ESA.

Minimizing Impacts in EM&CP Phase

As noted in the RD, during the EM&CP phase, the JP "provides that Applicants must develop a final Facility design that minimizes impacts to the five nearby DOS Significant Coastal Fish and Wildlife Habitats (SCFWH)."[115] Entergy argues that this provision improperly relegates the obligation to address impacts to state ESA sturgeon to a future time, and fails to establish that the state ESA is satisfied.

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[114] For example, Hearing Exhibit 121, EIA, at 149, §6, Physical and Chemical Characteristics of Major Aquatic Systems, assesses Hudson River water quality; water quality monitoring; bathymetry; sediment physical and chemical characteristics; marine disposal areas, dumping grounds, disposal sites, and spoil areas; use of concrete mat and rip-rap protection; and avoidance or minimization of adverse impacts. EIA §7, Fisheries, assesses Hudson River existing shellfish and benthic resources; existing finfish; existing essential fish habitat. EIA §9 addresses Hudson River existing conditions of threatened and endangered species; and avoidance or minimization of potential impact to these Hudson River resources.

[115] RD at 94.

Discussion

As noted above, we find that the Project has avoided or minimized potential environmental impacts in satisfaction of PSL §126, without reference to any further avoidance or minimization that may be achieved from the EM&CP Plan. In acknowledging that the Facility design would be finalized during the EM&CP project phase, when all final construction details are determined, the Judges merely recognized that there would be a further opportunity, after issuance of a Certificate, for Applicants to ensure that any potential risk to state ESA sturgeon habitat, or other potential adverse environmental impacts, are minimized to the greatest extent practicable. In sum, Entergy's argument regarding minimization during the EM&CP phase is inapposite.

Magnetic Field and Electromagnetic Field Impacts

The RD concludes that the magnetic field generated by the operation of the facility's HVDC cables will be localized and insignificant.[116] Entergy asserts that the HVDC cables may emit a magnetic field that may affect state ESA sturgeon.

In rejecting Entergy's arguments regarding potential magnetic field impacts on State ESA sturgeon, the Judges noted that modern DC cables are designed with sheathing to substantially reduce or eliminate direct electric field. It is

[116] In the RD, the Judges used the term electromagnetic field (EMF) generally, to apply to potential EMF and magnetic field impacts. On exceptions, Applicants clarify the distinction between EMF and magnetic field. We accept Applicants' clarification distinguishing the EMF and magnetic fields and agree that these terms were somewhat confused in the RD.

undisputed that magnetic field impacts diminish exponentially with distance from the cables.

Entergy asserts that the record demonstrates that the energized cables are expected to generate a magnetic field of 526.5 milligauss (mG). Entergy further asserts that Applicants, in the Environmental Impact Assessment (EIA), filed with their Application concede that the energized cables would create a deviation from the background magnetic field of up to 26.2 mG at 10 feet from the centerline at one foot above the riverbed. Consequently, Entergy concludes that the design and installation of the cables will not eliminate the magnetic field emanating from the Facility, nor does burial of the cables cancel out the magnetic field. Entergy contends that some fish species can detect and use the background magnetic field for navigation.

Entergy also contends that Applicants have not characterized the nature of magnetic field impacts for areas where concrete mats would be installed. For these areas, Entergy states that potential navigation impacts to ESA sturgeon may result in a "take" of ESA sturgeon. However, Entergy does not argue that the potential magnetic field will result in a violation of the state ESA, but only that potential magnetic field impacts could possibly adversely affect navigation of state ESA sturgeon, to an extent resulting in such a violation. Entergy asserts that, absent analysis comparing the magnitude and extent of the magnetic field generated by the cables to the sensory threshold and behavioral responses of state ESA sturgeon, it cannot be concluded that the magnetic field generated by the Facility will minimize impacts on state ESA sturgeon.

Applicants respond that the record includes uncontroverted expert testimony that "research studies on a variety of fish and other marine species have not reported

adverse effects of exposure to magnetic fields."[117] Regarding potential magnetic field impact on migratory behavior, the research shows that no single environmental stimulus such as current flow, light, smell, taste, magnetic field, temperature, or salinity dominates migratory behavior; instead, marine organisms have the means to coordinate and make use of multiple cues and resolve discrepancies.[118] In addition, Applicants note that the expert made these statements regarding the proposed Facility with the knowledge that certain limited portions of the cables would be installed under protective concrete mats.

Further, regarding the potential magnetic field impact on eggs and larvae, the data suggest "that much greater magnetic fields are required than the proposed cable will produce, in order to create deleterious effects on eggs and larvae" and that "as a percentage of the overall spawning numbers, the area of potential effect is small and extremely weak."[119]

Applicants also state that the Facility's cables will be buried in the ground or installed in a trench at the bottom of the waterways, and when installed in this manner, electric field levels are reduced to inconsequential levels because of the earth cover over the cables. Applicants state that the record shows that the Facility will not actually produce an EMF, but only a magnetic field.

Discussion

Entergy's principal argument, that state ESA sturgeon will respond to the magnetic field that the Facility is anticipated to induce, is contradicted and rebutted by expert record evidence.

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[117] Hearing Exhibit 64 at 57.

[118] Id. at 57.

[119] ID. at 59.

The magnetic field induced by operation of the Facility would be *de minimis* or non-existent throughout most of the Hudson River. The cables will be buried in a single trench, vertically on top of one another. This configuration also should result in the EMF and magnetic field from each cable essentially cancelling out the other, thereby further minimizing magnetic field impacts. Very little change in total geo-magnetic field would be expected, if the cables were to be buried at a depth of six feet.

Moreover, the record shows that cables will be buried to a depth of at least 15 feet, for portions of the cable located in the Hudson River's federal navigation channel, and at least six feet below the sediment floor, for portions of the cable located in the Hudson River outside the federal navigation channel. The zone of influence in which the magnetic field may be detectable above background levels will be focused directly above the facility centerline. Any magnetic field emanations will be reduced further, in proportion to the cable burial depth.

Indeed, migrating fish could potentially travel the full length of the Hudson without encountering the zone of influence. Moreover, because the magnetic field weakens rapidly with increasing distance from its source, the induced magnetic field would be strongest only within a small portion of the zone of influence. The record shows that burial of the cable as proposed would yield the least change in the background geomagnetic field.[120]

Furthermore, the analyses underlying the EIA considered the impact of the magnetic field on the migration, spawning, feeding, and development of aquatic species, including

[120] Hearing Exhibit 92, p. 8.

limited areas covering the cables with concrete mats.[121] The record supports the conclusion that no single environmental stimulus, such as magnetic field, dominates migratory behavior. To the extent that the magnetic field may affect navigation abilities of State ESA sturgeon, any such impact would be minimal, including avoidance of the waters nearest the cables. State ESA sturgeon and other marine organisms have the means to coordinate and make use of multiple cues and resolve discrepancies. In all instances, both expert testimony and the EIA conclude that the Facility's magnetic field would have no significant impact.[122] Nonetheless, as an additional protective measure, the JP provides that Applicants will be obligated to conduct a study of sturgeon movement patterns before and after the Facility is energized.[123]

We find no basis for Entergy's argument that low level magnetic field created by the Facility cables, including in areas where concrete mats will be installed, will adversely impact essential behaviors of ESA sturgeon. We find that the record supports a finding that the magnetic field induced by the Facility will have minimal impact, if any, on migratory species, including state ESA sturgeon, in the Hudson River. The Facility represents the minimum adverse environmental impact

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[121] Hearing Exhibit 24 at 10-16, 36-37 (Appendix B: Requests for Additional Information (Appendix B to the Supplement)), Hearing Exhibit 64 (NYSDEC-1 through NYSDEC-6), Hearing Exhibit 87 (Applicants' Letter to New York State Department of State regarding Updated Alternatives Analysis (January 18, 2011)), Hearing Exhibit 92, Hearing Exhibit 100 (Applicants' Letter to New York State Department of State, dated March 18, 2011).

[122] Hearing Exhibit 121 at 203 – 207.

[123] Revised, Final JP Appendix C, ¶163, and Attachment 4 (Atlantic Sturgeon Pre-Installation and Post-Energizing Hydrophone Scope of Study).

regarding magnetic field and EMF impacts, and further, the Facility conforms with the state ESA.

Hudson River Navigation Channel

The USACE has jurisdiction over dredge and fill activities in the waters of the United States and construction activities in federally-maintained navigation channels, including the federally-maintained navigation channel in the Hudson River.

Entergy cites a July 5, 2011 USACE letter to Applicants that states:

> The Corps of Engineers does not permit permanent structures within the length of the right of way, including side slopes, of a Federal navigation channel (perpendicular crossings are permitted) ... Laying the cables on lake/river bed in limited areas with protective coverings would not be acceptable ...
> As the Corps of Engineers does not permit permanent structures within the length of the right of way of a Federal navigation channel (crossings are permitted), the cables must be moved outside the NLC Federal navigation channel limits.[124]

Entergy interprets the USACE letter to be an absolute prohibition on locating permanent structures within the length of the right of way of a Federal navigation channel. Further, Entergy asserts that the letter precludes making a finding that the Facility represents the minimum adverse environmental impact.

However, as described in the RD, Applicants and Staff assert that USACE has not yet established parameters for this project or made a determination upon Applicants' USACE permit application. They contend that USACE establishes individual

[124] Hearing Exhibit 215.

permit conditions regarding the longitudinal installation or burial depth of submarine cables within federally maintained navigation channels on a case-by-case basis. Applicants and Staff cite the Bayonne Energy Center project as an example where the USACE issued a permit authorizing Bayonne to install its cables across and along several federal navigation channels.

Applicants, Staff, Scenic Hudson, and Riverkeeper emphasize that pursuant to revised Certificate Condition 95(a)(i), Applicants will bury the cable proposed in this proceeding at a depth of at least 15 feet below the authorized depth of the federally maintained navigation channel. Lastly, the Signatory Parties contend, and the Judges recommend, that we should not substitute our judgment for that of the USACE.

Discussion

The USACE's review of Applicant's project is ongoing, Entergy relies upon Hearing Exhibit 215 as if it were USACE's final determination on the USACE permit, and argues that we should not issue a Certificate which includes conditions conflicts with USACE policy, as set forth in Hearing Exhibit 215.

It is simply premature to guess the outcome of USACE's review. We decline to adopt Entergy's view that the USACE's July 5, 2011 letter is dispositive, particularly in light of the USACE permitting of Bayonne. Proposed Certificate Condition 9 provides Applicants cannot commence site preparation or construction until all the necessary permits and consents are received. In the event USACE imposes conditions conflicting with the Article VII Certificate, such conflicting conditions must be reconciled either with USACE or this Commission.[125]

[125] In the event USACE denies Applicants' federal application, the project could not go forward.

UNDERGROUNDING

The ALJs found ample support for the proposal that the transmission line should be underground (or underwater) given that:

> Undergrounding provides beneficial visual and land use impacts that would not be achieved if the transmission lines were above ground. In addition, undergrounding is the proposed method, supported by the signatories.[126]

The Judges' finding on this uncontested issue is well-supported on the record and reasonable, and we adopt it.

LONG-RANGE PLAN

The ALJs stated that the main challenges to our ability to find that the Facility "conforms to a long-range plan for expansion of the electric power grid of the electric systems serving this state and interconnected utility systems, which will serve the interests of electric system economy and reliability" are claims by Entergy, IBEW and Central Hudson that the Facility would in effect be an "extension cord" with no NYS "on-ramps" providing access to existing in-State generation sources and would not address existing transmission constraints, especially in western and upstate portions of New York State.

The ALJs rejected such arguments for two reasons. First, they found that the challengers failed to point to any policy, rule, law or precedent that prohibits approval of a direct current transmission line. Second, they found that the 2009 State Energy Plan encourages facilities that, like this one, would provide infrastructure investments that support the State's transition to a clean energy economy, reduce greenhouse gas emissions, and allow the State to fully exploit the

[126] RD at 106.

potential benefits of additional Canadian imports. The ALJs further observed that the Facility would advance NYC's *PlaNYC* long-range goal of increasing NYC's clean energy supply by increasing the amount of clean energy that can be imported into the City.

The ALJs credited Staff's argument that the Facility would expand the State's electrical grid by providing an additional tie to Québec and to Québec's hydroelectric power, thus indirectly help relieve congestion on the existing HVAC electric transmission system.[127]

IPPNY claims that the Commission cannot find that the Project "conforms to a long-range plan for expansion of the electric power grid … which will serve the interests of the electric system economy and reliability" because the Project is uneconomic.[128] The ALJs rejected IPPNY's claim because the record did not demonstrate the Project was uneconomic.

Central Hudson, IBEW, the Business Council and IPPNY challenge the RD's conclusion that we have sufficient record bases to find that the Project conforms to a long-range plan for the State's electric grid. Central Hudson claims that the RD applied "policies developed in the context of short electric lines near New York City to the very different case of a long 'extension cord' electric line running virtually the length of the State from North to South." Central Hudson, IBEW and the Business Council assert that the need for grid improvements "to

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[127] RD at 106-108. The ALJs also noted that a System Reliability Impact Study for the interconnection of the HVDC Transmission System at NYPA's 345 kV bus located at Astoria has been completed by the NYISO, showing that the HVDC Transmission System can be connected to the New York State Bulk Power System without adversely affecting reliability.

[128] RD at 106-108. IPPNY renews this argument on exceptions.

the deliverability of bottled renewable and other upstate generation was simply not relevant to those earlier, near-NYC lines, but is very germane" in this proceeding. Opponents argue that the provision of some electric system benefits is insufficient and does no more than meet the "most narrow" of definitions of "expanding" the grid. Central Hudson asserts that we should establish, as a matter of policy in applying Article VII, that transmission corridor developers, including merchants, must propose a project that improves known grid constraints and problems, rather than a point to point delivery project.

IBEW also argues that approval of the Facility would provide foreign electric energy to a significant but relatively small congested area of the State with high demand and allow for the use of New York State land and waterways with no contribution to the economic well-being of the vast majority of communities and the power needs of constituents in Upstate and Western New York. IBEW asserts that, given the economic condition of northern and western New York, these vast areas with substantial populations should have been accorded greater consideration.[129]

Applicants argue that adoption of Central Hudson's argument would prevent the development of any future merchant transmission line. According to Applicants, merchant transmission lines can only be successful when the developer is able to exclude nonpaying customers, as is possible on HVDC lines and on radial generator leads, but not on the networked HVAC lines that would be required to meet Central Hudson's proposal. They add that Central Hudson and IBEW failed to identify any concrete transmission alternative to the Facility

[129] IBEW Brief on Exceptions at 2.

that would be frustrated if the Facility is approved. Applicants therefore conclude that, in the absence of any such competent evidence, Central Hudson's and IBEW's speculative concerns about the impacts the Facility might have on unidentified future projects at some unknown future date provide no basis for overturning the ALJs' finding that the Facility is consistent with long-range plans for the expansion of New York's electric power grid.

Staff argues that the Facility is consistent with long-range plans identified in the most recent State Energy Plan, which establishes as a policy objective, supporting the increased use of renewable energy and energy systems that enable the State to significantly reduce greenhouse gas emissions. Staff observes that the State Energy Plan recognizes that an increase in renewable energy will require additional transmission in-State.

Staff contends that the Facility provides the State with greater access to Québec's hydroelectric power without consuming capacity on New York's existing HVAC transmission system. Moreover, by increasing supply downstream of the congested interfaces, the Facility would reduce congestion on New York's HVAC transmission interfaces. Staff adds that the Facility is also consistent with long-range plans established in *PlaNYC*, which recognizes that providing New York City residents with increased access to renewable energy supplies will simultaneously reduce electricity prices, local air pollution, and greenhouse gas emissions in the City of New York.

Staff states that the ability of the Facility to advance these important public policy objectives of the State and New York City should be explicitly recognized by the

Commission in issuing a certificate, and provide the rationale for rejecting Central Hudson's arguments.[130]

Discussion

The exceptions on this issue merely repeat allegations that were raised and rejected by the ALJs below. As the RD states, the Project is consistent with express provisions of the 2009 State Energy Plan and New York City's *PlaNYC*, among other documents setting forth State planning goals. We therefore adopt the ALJs' recommendation, consistent with the arguments of Staff and Applicants in opposing exceptions, to find that this Facility "conforms to a long-range plan for expansion of the electric power grid of the electric systems serving this state and interconnected utility systems, which will serve the interests of electric system economy and reliability." We rely, in particular, on the policy and planning objectives of the 2009 State Energy Plan that support projects, such as this Facility, which will enable increased State reliance on renewable energy and which will enhance transmission capacity into the New York City load pocket. In making this finding, however, we are not closing our eyes to the need to strengthen the State's AC transmission backbone. We have already initiated a major proceeding to do so.[131]

LOCAL LAWS AND REGULATIONS

The ALJs found *prima facie* justifications for the request made by Applicants and reflected in the JP that we waive the substantive requirements of the local laws and regulations listed in Hearing Exhibit 115. The Judges' finding on this uncontested issue is supported on the record and reasonable, and

[130] Staff at 16-17.

[131] Case 12-T-0502.

we adopt it. We further find that the Facility conforms to all applicable State and all other applicable local laws not set forth in Hearing Exhibit 115. We further find that the Project conforms to all applicable State laws and all other local laws not set forth on Hearing Exhibit 115.

PUBLIC INTEREST, CONVENIENCE AND NECESSITY

Emission Reductions and Fuel Diversity

The Facility's expected emission reduction and fuel diversity benefits and its ability to provide additional transmission capacity into New York City – features of the Facility that are uncontested – more than amply support our finding that the Facility will serve the public interest.[132]

Adequacy of Ratepayer Protection (Condition 15)

The ALJs noted that Applicants had proposed to build and operate the HVDC portion of the Facility without relying on cost-of-service rates[133] to recover the majority of the Project's costs.[134] The ALJs declined to focus on whether the Project would be merchant,[135] and instead focused on determining if there were sufficient bases to conclude that the majority of the Project's costs would not be funded by captive ratepayers. They found, *inter alia*, that proposed Certificate Condition 15

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[132] RD at 30-34, 64-65, and 72-73.

[133] RD at 69. The ALJs observed that, here, "cost-of-service rates" include any charges established by NYPA or a utility operating under cost-based regulation, including without limitation base rates, surcharges, adjustments, or any other recovery mechanism.

[134] RD at 10. Thus, they recognized that Applicants had reserved the right to recover the costs associated with the use of the Astoria Rainey cable to deliver energy and capacity not transmitted over the HVDC transmission system not as a merchant but rather pursuant to cost-based rates set by the FERC. RD at 10, footnote 15, citing Tr. 65, 76.

[135] RD at 67-72.

assigns the majority of the risk associated with the financing and recovery of Project costs to private investors and that a "demonstration that at least 75% of the [P]roject's output is under contract prior to commencing construction is consistent with Commission precedent in the HTP case (where the fact that approximately 76% of HTP's anticipated 660 MW output was already committed was sufficient for the Commission to find that it was merchant) and the Bayonne case (where the fact that 50% of its output was subject to identified and firm commitments was a sufficient basis for the Commission to find that is was a merchant project)."[136]

IPPNY and Entergy contend that the RD applies a far too narrow definition of a merchant project, asserting that such projects cannot rely on government or ratepayer dollars, directly (which they concede is not the issue here) or indirectly. They argue that indirect subsidization by the government will, of necessity, occur because the Project is uneconomic. Based on their shared view of the Project's economics, they renew claims that proposed Condition 15(b) must also prohibit any indirect subsidy, including, for example, prohibiting one or more of the Project's shippers from entering into an agreement with a New York State agency or authority to provide electricity to New York City at above-market prices. Indirect subsidies are the reason Entergy says it recommended additional conditions.[137]

Entergy and IPPNY also argue that we cannot rely on the 75% pre-subscription requirement because it does not prevent

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[136] RD at 71, citing HTP Order at 4 and Bayonne Order at 3.

[137] In the interest of brevity the proposed conditions are not recited here; see Entergy's Brief on Exceptions at 14-15 and/or the RD at 64 to review the additional conditions proposed by Entergy.

indirect subsidies and thus will not protect New York consumers against the adverse consequences that they opine are likely to be caused by indirect subsidies. IPPNY adds that, if existing resources are not able to meaningfully participate in the procurement process, perhaps due to its "discriminatory nature," the resulting contract will yield above-market prices. Entergy says that there will be significant adverse impacts if consumers are forced to fund the Project's costs, and therefore we cannot make the requisite public interest finding unless we expressly proscribe indirect subsidization. Entergy also asserts that the ALJs give "unreasonably short shrift" to whether a future change in business model by Applicants or future contractual arrangements by Applicants might result in costs of the Facility, in whole or in part, being recovered in cost-based rates.[138] Finally, Entergy asserts that the Project is "unquestionably non-merchant as to the Astoria-Rainey Cable" and, on that basis alone, is distinguishable from HTP and Bayonne and unworthy of review as a merchant.

IPPNY and Entergy concede that Condition 15(b) prohibits a direct subsidy."[139] For this reason, and because the commitments made by Applicants in Certificate Condition 15(b) go far beyond the commitments made by other merchant transmission

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[138] Entergy Brief on Exceptions at 8-9. Entergy also contends the RD applies the broader standard of need and benefit as established by the Commission in the Bayonne proceeding but did not consider (1) whether Applicants have carried their burden of proving that this project would actually be merchant or (2) whether the Facility's costs will be recovered exclusively through rates set by the competitive market. Because these contentions are belied by the RD's discussion at 67-72, we reject these claims.

[139] Briefs Opposing Exceptions by Applicants (at 32) and NYC (at 17), citing Briefs on Exceptions by IPPNY (at 28) and Entergy (at 14).

facilities approved by the Commission, Applicants argue that the ALJs correctly concluded that Condition 15(b) adequately protects captive ratepayers from being forced to bear the costs of the Facility in cost-based rates.

NYC asserts that IPPNY and Entergy presented no rationale to explain why a State agency or authority would elect to enter into a 25-year contract for 750 MW of transmission capacity at an above-market rate. Con Edison also argues that IPPNY and Entergy hypothesize a "speculative and highly unlikely scenario" and then fail to explain why someone would volunteer to pay above-market energy prices."[140]

NYC argues that the record supporting the ALJs' conclusions that "the risks associated with the financing and recovery of project costs will be borne, in large part, by private investors and that project revenues will be recovered from wholesale power transactions" is extensive and compelling.[141] NYC asserts that the ALJs properly evaluated whether the JP sufficiently ensures that the costs and risks of Facility development and operation would be borne by investors and also properly concluded that the "cost risk" associated with the Astoria-Rainey Cable is limited.

NYC contends that the record similarly supports the ALJs' decision to reject the argument that the pre-subscription requirement would compel, not prevent, indirect subsidies to the Facility. NYC notes that, under Condition 15(b), the Commission

[140] Con Edison at 2.

[141] NYC Brief Opposing Exceptions at 14-16.

retains the authority to review the subject contract before accepting Applicants' report if it so elects.[142]

Con Edison reiterates that one of its major concerns was the potential for the Project's risks and costs to be shifted from investors to utility ratepayers; and, to address this concern, it spent months negotiating with Applicants, ultimately obtaining changes that provide the strongest possible protections to customers from any subsidization of this Project.

Con Edison asserts that the 75% pre-subscription requirement will ensure that the Project does not go forward without a substantial portion of the capacity under contract. It adds that, if a willing buyer of that capacity establishes a price that is acceptable to the developer, that result is consistent with a competitive market.

Staff responds that those seeking conditions against indirect subsidization have not explained why consumers are at risk and how proposed Condition 15 fails to minimize that risk. Staff contends that allegations of "a phantom subsidy (the origin and form of which are never fully explained)" must be rejected as "baseless" and recognized as "fear of additional market competition."[143]

Discussion

The protections embodied in Condition 15 are adequate to protect consumers. The protections clearly prohibit the Facility from receiving cost-of-service rates, and that protection is sufficient to satisfy us that consumers are adequately protected from overpaying.

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[142] NYC states that it "assumes that the Commission may desire to review the contract underlying the report before it decides whether to 'accept' the report." NYC Brief Opposing Exceptions at 19.

[143] Staff Brief Opposing Exceptions at 20-21.

IPPNY and Entergy have focused much attention on the related question of whether the certificate should include a condition that prohibits the Facility from being financed indirectly via an agreement between a shipper, presumably HQ, and a utility we regulate, such as Con Edison, or a New York agency or authority. IPPNY and Entergy believe that such a condition is needed to protect consumers from a buyer that might in the future overpay for the electricity delivered by the Facility to New York City. As we noted above, through our regulation of the rates of Con Edison, we already have the authority to protect consumers from such an event, so we need not use the siting process to provide such protection. As for New York State authorities, we can presume that they can protect their own interests.

Moreover, we consider it important to maintain the possibility of a future power purchase agreement between a New York City buyer and a shipper. It is quite possible that the price offered by the shipper for Canadian hydroelectric power delivered to New York City could prove to be a good one, given the valuable characteristics of such power, and it may also be true that the whole enterprise could depend on a shipper obtaining a long-term power purchase agreement from a buyer. Therefore, the fact that the Certificate Conditions don't prohibit such an agreement is seen by us to be a positive element.

We presume that an important force behind IPPNY's and Entergy's views on this subject is their desire to prevent a possible future exercise of buyer market power. We have discussed above why it would be unwise to use the denial of a Certificate in a siting case for that purpose.

As for the issue of the definition of a merchant project, we reject IPPNY and Entergy's contention that the RD

applies a far too narrow definition of what it means to be a merchant project. The ALJs properly relied on our precedent to find that a project is non-merchant if its investors are seeking cost recovery through regulated cost-of-service rates and merchant when they are seeking to recover their costs through wholesale power transactions.

We furthermore reject Entergy's claims that any recovery of any portion of the costs associated with the HVAC cable should alter our conclusion that ratepayers are adequately protected from the majority of the Project's costs. The record establishes that the costs of the HVAC cable constitute about 10% of the overall Project cost, and not all of that small portion would be subject to recovery through cost-based FERC rates. Entergy makes no attempt to explain how provisions that prevent free ridership on the HVAC Astoria-Rainey Cable by virtue of cost-based FERC rates and that avoid constraining the existing capacity of Astoria Energy II can have any possible adverse consequences for the public interest; nor does it explain how ratepayer subsidy of the Astoria-Rainey cable is possible, given that the costs of the cable will be subject to regulatory scrutiny by us (via the filing provision of Condition 15) and also by FERC.

Job Creation

In the RD, the ALJs noted that "the evidence regarding the number of direct construction jobs that would be created if the Project is constructed is unopposed."[144] They therefore found that "Applicants' evidence regarding the number of direct construction jobs that would be created if the Project is

[144] RD at 120-121.

constructed provides support for the public interest finding that is required by PSL §126(1)(g)."[145]

The ALJs questioned the accuracy of Applicants' estimates of the indirect and induced jobs resulting from the construction and operation of the Facility. They noted opponents' assertion that jobs created by the Project must be offset by the loss of jobs it will cause but they found a lack of evidence substantiating this assertion. They ultimately recommended that the Project's potential for creating indirect and induced jobs, though imprecise and not a decisive decisional factor, should be viewed as additional support for the public interest finding required by PSL §126(1)(g).[146]

IPPNY asserts that the RD's conclusions about the Project's job-inducing effects rest on "flawed and internally-inconsistent conclusions concerning the Project's alleged capacity market benefits and wholesale energy savings."

Discussion

The Applicants' evidence on job creation was incomplete in a fundamental way. While evidence was proffered on the number of direct jobs created by the 1,000 MW Facility, the record is void on the critical question of whether those jobs would be offset, or more than offset, by the jobs displaced at the conventional generation facilities that would not be built as a consequence. IPPNY cited this important shortcoming and no party rectified it.

As was demonstrated in our discussion of the economics of the Facility, a reasonable way to analyze the Applicants' proposal to build the Facility is to compare the Facility to the resource that would otherwise have been built in the absence of

[145] Id.

[146] RD at 121-122.

the Facility. Staff's economic analysis followed this approach when it used a 1,000 MW combined cycle gas turbine located in New York City as the resource for which the Facility substitutes in New York's resource mix. Accordingly, for us to give any credit to an assertion of job creation, we need, at a minimum, a comparison of the Facility's job creation to the job creation of a combined cycle gas turbine. No such comparison was performed by any party.

IPPNY asserts that the Facility will be accompanied by a massive subsidy, and that the subsidy will cause lost jobs by taking money out of the hands of the source of the subsidy, presumably consumers. We find elsewhere that no such subsidy should be assumed to occur. Therefore, we reject IPPNY's assertion about subsidy-induced job losses.

Applicants cite wholesale price reductions caused by the Facility and estimates that substantial jobs will be created by the improved financial position of the retail buyers of electricity as a result of lowered electricity prices. As was found by the Judges, the number of jobs created by the wholesale price effect was heavily contested. We agree with the validity of this component of the overall accounting for job impacts.[147] Nevertheless, as just one component of an overall analysis, it cannot overcome the important failure of the Applicants to quantify the number of displaced jobs.

In conclusion, we will not give any weight, positive or negative, to the impact on jobs in our determination in this case.

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[147] A proper analysis would also account for the reduced profits of New York's existing generation owners and the resultant effect on New York jobs of reduced spending by the owners of New York generators.

NON-STATUTORY FINDINGS

CONTESTED

Co-Located Infrastructure

Proposed Certificate Conditions 27 through 29

Central Hudson objects to proposed Certificate Conditions 27 through 29, regarding co-located infrastructure.[148] Certificate Condition 27 sets a basic standard governing the Applicants' work in connection with co-located infrastructure: Applicants have committed to ensure that their project will be fully compatible with existing co-located infrastructure. Proposed Certificate Condition 28 imposes specific obligations on Applicants to consult with infrastructure owners or operators prior to finalizing designs and beginning construction. Proposed Certificate Condition 29 imposes upon Applicants certain cost reimbursement and indemnification obligations, and establishes a process by which any other infrastructure owners or operators (not limited to JP Signatory Parties) may secure cost reimbursement from the Applicants. Analyzing this issue below, the Judges found that there is no basis to conclude that Proposed Certificate Conditions 27 through 29 are designed to affect or displace laws governing existing rights and obligations of owners or operators of co-located infrastructure. The RD, at page 128, states:

> [i]n Article VII proceedings, the exact location of proposed facilities often is determined in the EM&CP process because that is when a certificate holder will have conducted the in-field inspections that will permit it and the staff of relevant agencies to ascertain whether there are any conditions that warrant a deviation that is

[148] JP, Appendix C, Final Revised Proposed Certificate Conditions (January 18, 2013), Proposed Certificate Conditions ¶¶27 through 29).

> still within the approved ROW but that may vary from the proposed centerline ... It is not yet clear where the proposed transmission line would be placed relative to existing infrastructure, but it is clear that the JP provisions at issue are designed to protect existing CI [Co-located Infrastructure] to the maximum extent practicable and to provide for reimbursement on reasonable terms. Finally, there is no basis for concluding that the provisions are designed to affect or displace laws governing parties' existing rights and obligations. Accordingly, we recommend that Central Hudson's opposition to the CI provisions be rejected [footnote omitted].

It is Central Hudson's view that in the event its co-located infrastructure is damaged by Applicants, Proposed Certificate Conditions 27 through 29 improperly would require Central Hudson to exhaust administrative remedies as a condition precedent to pursuing judicial remedies, by requiring Central Hudson to submit any disagreement to the Commission. Central Hudson contends that these Certificate Conditions may bind the JP Signatory Parties, but should not limit the rights of non-signatories, including Central Hudson, from pursuing judicial remedies.

Applicants respond that they accepted Conditions 27 through 29 in negotiations, in order to obtain an agreement by certain parties to the JP not to contest the grant of the Article VII Certificate. Applicants contend that although these Proposed Certificate Conditions address matters that are also governed by other laws -- both statutory and common law –- the conditions do not limit, restrict, replace, or modify such other laws. Applicants conclude that, to the extent that Proposed Certificate Conditions 27 through 29 create rights and impose liabilities, they can only be interpreted as creating rights and liabilities that are in addition to those created by such other laws.

VELCO states that Central Hudson asserts these arguments notwithstanding its acknowledgement that the Commission lacks the authority to restrict Central Hudson's access to the courts. VELCO further disputes Central Hudson's suggestion that the JP Signatory Parties have waived their rights to pursue other remedies and have agreed that the requirements of Condition 29 are prerequisites to pursuing other avenues available for seeking cost reimbursement. VELCO contends that none of Central Hudson's arguments regarding Proposed Certificate Conditions 27 through 29 have merit.

Staff emphasizes that the RD clearly states that "there is no basis for concluding that the provisions [Certificate Conditions 27 through 29] are designed to affect or displace laws governing parties' existing rights and obligations."[149] In addition, both Staff and Applicants have made affirmative statements that the proposed Certificate Conditions are not intended to, nor can they, impair Central Hudson's legal rights.

Discussion

A Certificate granted pursuant to PSL Article VII only places obligations and limitations upon the Certificate Holder. The provisions of the JP, including Proposed Certificate Conditions 27 through 29, do not purport to limit owners or operators of co-located infrastructure from seeking cost reimbursement through other available avenues, or to require such owners or operators seeking indemnification to employ the Condition 29 procedures.

To the extent that Central Hudson, or another owner or operator of co-located infrastructure, wishes to benefit from the cost reimbursement process created by Proposed Certificate

[149] RD at 128.

Condition 29, it must follow the procedures laid out in subparagraph (c). However, there is no basis for concluding that Proposed Certificate Conditions 27 through 29 are designed to affect or displace laws governing parties' existing rights and obligations regarding co-located infrastructure (except in the case of local municipal laws that the Commission explicitly overrides for being unreasonably restrictive).

We conclude that Central Hudson's exceptions regarding Proposed Certificate Conditions 27 through 29 are without merit.

Proposed Certificate Condition 5

Proposed Certificate Condition 5 provides:

> The portions of the Allowed Deviation Zone to be occupied by the Facility once construction is complete are referred to herein as the Facility ROW. The Certificate Holders shall also acquire and maintain the continuing right to enter onto and use certain additional lands immediately adjacent to the Facility ROW needed for repair and maintenance purposes, including preclusion of vegetative encroachment, on terms prohibiting the owners of such land from taking any action on that land that would interfere with such repair and maintenance activities.

Central Hudson objects to Proposed Certificate Condition 5. Central Hudson claims that Condition 5 is overbroad, mandating greater acquisitions of property rights by Applicants than actually may be required. Central Hudson also claims that Condition 5 provides Applicants with paramount authority over property rights of utility owners or operators of pre-existing co-located infrastructure. The RD rejected both arguments.

Central Hudson excepts, asserting that Proposed Certificate Condition 5 should be revised to authorize the Certificate Holders to acquire such lands and/or land rights to the extent consistent with all applicable requirements of law

and necessary for project construction, but should not mandate that the Certificate Holders make such acquisitions. Condition 5 should be further revised, Central Hudson contends, by striking the following phrase: “terms prohibiting the owners of such land from taking any action on that land that would interfere with such repair and maintenance activities.” Central Hudson argues that this phrase would improperly establish superior property rights in the Applicants over Central Hudson's pre-existing facilities (or property of other owners or operators of co-located infrastructure), and concludes that Article VII provides no authority for such a Certificate Condition.

Staff asserts that Proposed Certificate Condition 5, considered in its entirety, is appropriate and will not interfere with Central Hudson’s ability to maintain its existing infrastructure. Staff states that the requirement to obtain the right to enter and use certain lands is limited by Condition 5 to “certain additional lands immediately adjacent to the Facility ROW needed for repair and maintenance purposes.” These provisions of Conditions, Staff asserts, are not universal as Central Hudson posits; rather, these provisions are limited to the property rights that the Certificate Holders will need in order to maintain and repair their Facility in the future.

Staff explains that the requirement that the property rights be sufficient to avoid interference with the Certificate Holders’ ability to maintain and repair their Facility will ensure that Certificate Holders will not be prevented from performing necessary maintenance and repair of the Facility by adjacent or underlying landowners. Further, Staff contends that Condition 5 is limited by Conditions 27 through 29. Staff asserts that Condition 27 requires that the Facility must be fully compatible with co-located infrastructure. Therefore,

reading Conditions 27 and 5 together, Staff reasons that these Conditions preclude Certificate Holders from interfering with Central Hudson's existing co-located infrastructure (or the existing co-located infrastructure of any other owner or operator).

Discussion

Central Hudson's exceptions to Proposed Certificate Condition 5 are rejected. Condition 5 would not prevent Central Hudson (or any other owner or operator of co-located infrastructure) from repairing or maintaining its own infrastructure. We adopt Staff's view that Conditions 27 and 5, read together, preclude Certificate Holders from interfering with Central Hudson's co-located infrastructure (or the co-located infrastructure of any other owner or operator).

UNCONTESTED

Litigation of Rights to State-Owned Land

The ALJs stated that this proceeding is not the appropriate venue for litigating land rights given that, even with an Article VII certificate, Applicants will have to acquire any necessary land rights through other applicable means.[150] With the exception of DEC urging us to accept the conclusion that this proceeding is not the appropriate forum for determining the Office of General Services' authority to grant leases for or other property rights to land under Lake Champlain, but otherwise ignore the ALJs "dicta" on this issue, no party addressed this topic in their briefs on exceptions.

EM&CP Guidelines

The ALJs noted that the proposed BMPs and EM&CP Guidelines (JP ¶¶24, 152; Appendices E & F) were unopposed and are consistent with similar practices and guidelines adopted in

[150] RD at 113.

other Article VII proceedings.[151] No party takes exception to their resulting recommendation to adopt and apply the proposed practices and guidelines to the Facility.

Water Quality Certification

The ALJs recommended that the proposed WQC be issued by the Director of OEEE prior to the expiration of the USACE's February 24, 2013 waiver deadline.[152] As noted above, the WQC was issued by OEEE's Director on January 18, 2013. No party took exception.

Other Issues

JP ¶5 – deletion of "directly"

JP ¶5 begins by stating:

> Nothing in this Joint Proposal or any appendix thereto is intended: (a) to directly impose any obligations on or limit ay pre-existing rights of any party other than Applicants;

In response to concerns expressed by Central Hudson, the ALJs recommended that the word "directly" be deleted from JP ¶5(a).[153] No party excepted.

Certificate Condition 15(a)

Certificate Condition 15(a) states in relevant part that the Certificate is granted and the required determinations of need and public interest are explicitly contingent on Certificate Holders delivering a minimum of 1,550 MW of energy out of NYPA's Astoria substation. Central Hudson opposed Certificate Condition 15(a), claiming it is unknown whether the deliverability criterion can be met. The ALJs observed that Central Hudson's position in this regard had been refuted by (1)

[151] RD at 136-137.

[152] RD at 139.

[153] RD at 129.

Hearing Exhibit 151, a stipulation between Applicants and Con Edison, in which Con Edison agreed that the deliverability target had been met, and (2) Applicants' Deliverability Panel testimony[154] that the Astoria Annex Phase Angle Regulator, together with NYPA's two existing lines and the Astoria-Rainey Cable, would be able to deliver more than 1,550 MW of electric energy out of the Astoria substation.[155] Central Hudson did not reiterate its position on exceptions.

Certificate Conditions, Section S, ¶¶138-144[156]

Central Hudson asserted that Certificate Conditions in Section S, entitled "Mapping, Land Acquisition, and as-built Drawings for the Facility," should be modified to assure that Central Hudson is provided with as-built drawings for any new facility or acquisition of any interest in land within 50 feet of existing Central Hudson property and for the full length of the route in the Hudson River within Central Hudson's service territory. Applicants responded that proposed certificate Condition 139 requires them to provide DPS Staff with as-built design drawings for each Facility segment following final completion of construction of that segment and that they would also provide copies of such drawings to Central Hudson for portions of the Facility in Central Hudson's service territory, so long as Central Hudson agrees to maintain the confidentiality of any Critical Infrastructure Information contained in those drawings. The ALJs found that there was no obvious dispute on this issue and opined that Applicants and Central Hudson should

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[154] Tr. 577-578.

[155] RD at 132.

[156] Provisions concerning mapping, land acquisition and "as-built" drawings for the facility. See JP Appendix C, dated January 18, 2013.

be able to agree to a process for sharing such information.[157] Neither party excepted.

Non-adoption of Specified JP Paragraphs

The ALJs recommended that the general terms governing the behavior and rights of the JP signatories, including paragraphs 1, 2, 3, 4, 6, 7, 8 and 9, not be adopted as terms of the Commission Order if a certificate is granted. They observed that if and to the extent the Commission adopts the terms of the JP, Central Hudson will have the same rights as any other party with respect to filing a petition with the Commission regarding the correct interpretation of one or more of the Order's terms or requesting dispute resolution assistance or services.[158] There were no exceptions.

[157] RD at 134.

[158] RD at 134-135.

Other Central Hudson Concerns

Non-specific Claims

Central Hudson expressed confusion about JP paragraphs 11, (and maybe 12), 107-119, 122, 132, 136-138 and 140 and opposed all or portions of JP ¶¶11, 20, 107-119, 122, 132, 136-138, and 140, and proposed Certificate Condition 5. The ALJs found there was insufficient explanation of the bases for confusion or opposition to these provisions to provide a response and therefore recommended that Central Hudson's opposition to these provisions be rejected.[159] Central Hudson did not pursue these issues on exceptions.

Discrimination Claims

Section §28-105.1 of the New York Administrative Code (N.Y. Adm. Code) makes it unlawful to construct a building in New York City without first obtaining a written permit. This permit, in turn, implicates N.Y. Adm. Code §28-105.12.7.1, a section that requires Applicants to procure insurance to, *inter alia*, insure adjacent property owners from loss, property damage and personal injury. Central Hudson claimed that the JP was discriminatory because "[t]he City Administrative Code requires essentially the indemnification protections to property affected by the proposed facilities in New York City that Central Hudson requested Applicants provide to Central Hudson's pre-existing property and operations that would be similarly affected by the proposed facility." The ALJs rejected Central Hudson's claim for being untimely (i.e., it was raised for the first time in reply brief).[160] They also rejected the claim because Central Hudson asserted that it was "similarly situated" to NYC when, in fact, it was not; the ALJs reasoned that the Administrative Code

[159] RD at 135.

[160] RD at 136.

section cited by Central Hudson applies because Applicants plan to build the converter station in New York City, not because they plan to lay cable there.[161] In addition, the ALJ noted that, with regard to plans to lay cable, Central Hudson has the same protections as any other owner or operator of co-located infrastructure.[162]

Central Hudson also claimed that discrimination was evidenced by the presence of the proposed environmental Trust because it will be pre-funded while the CI provisions do not provide for pre-funding. The ALJs recommended rejection of Central Hudson's assertion.[163] Central Hudson no longer pursues these issues on exceptions.

Conclusion Regarding Uncontested Matters

We find the Judges' conclusions on the foregoing, uncontested issues to be well-supported on the record and reasonable, and we adopt them.

CONCLUSION

PSL §126 requires that we find and determine need for a proposed facility; whether a facility will achieve the minimum imposition of adverse environmental impacts, considering the state of available technology and the nature and economics of various alternatives; what portion of the line should be underground; that the facility conforms to a long-range plan for expanding the State grid; and that the location of the facility conforms to applicable State and local laws and regulations, except for those local laws we refuse to apply because they are

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[161] Id.

[162] Id.

[163] Id.

unreasonably restrictive in view of the existing technology, factors of cost or economics, or the needs of consumers; and that the facility will serve the public interest, convenience, and necessity. After considering all of the relevant factors, we find and determine that the record in this proceeding enables us to make the findings that are set forth in PSL §126(1)(a), (b), (c), (d)(1) and(2), (f) and (g).

This 1,000 MW Facility would allow imports of energy, nearly year round, into one of the most congested load pockets in the State. The energy imported could amount to over 10% of the energy consumption in New York City. This is a significant amount of additional capability that would enhance energy security to the City by providing another source of power into the City.

New York City relies significantly on gas- and oil-fired generation, thus raising fuel diversity concerns and electric reliability concerns. The addition of this Facility would allow renewable energy imports, thus increasing diversity of the City electricity supply sources and improving electric reliability. Providing this magnitude of renewable energy from local resources would be extremely difficult and would take a long time, even if possible.

Demand for natural gas use is increasing in New York City due to increased use of gas for electric generation and the gas conversion needs resulting from NYC rules to phase out use of #4 and #6 oils for home and business heating purposes. The increase in gas demand is putting a strain on the gas transportation system into and within the City. This Facility would help reduce the strain by allowing imports of electricity from outside the City.

The City is a load pocket with in which pivotal suppliers have the ability to exercise market power through

restrained by market rules enforced by FERC. Addition of a major new supplier into the pocket would help reduce the ability of various players to exercise market power.

We are recognizing the price stability benefits that flow from using energy generated by hydro resources and according weight to such a benefit as additional support for finding economic need for this Project.

Lastly, the need for this Project has been demonstrated by the Project's ability to advance important public policies set forth in the State Energy Plan and *PlaNYC,* among other documents expressing State policy.

Based on the foregoing, we conclude that there are sufficient bases in the record to find and determine need for this Project.

In addressing the nature and minimization of potential environmental impacts, it is significant that, because the Facility is subaquatic and underground, potential adverse visual impacts have been largely avoided. At the same time, the detailed provisions of the JP protect the State's valuable natural resources by ensuring that Lake Champlain and riverine benthic habitat is not lost and that environmental impacts are minimized. The subaquatic Facility segments have been routed to avoid, to the maximum extent practicable, areas deemed environmentally sensitive by DOS and DEC. Where the Facility would be located within a significant habitat or exclusion area, construction will be restricted to avoid times when these areas are more likely to contain sensitive species, thereby avoiding impacts during important life cycle periods. We find that any magnetic field induced by the Facility will have de minimus impact, if any, on migratory species, in the Hudson River.

The upland Facility segments primarily are located in existing railroad or State highway rights-of-way. Selective use

of horizontal directional drilling for upland segments and for land to water transitions, as proposed, will serve to avoid or minimize potential adverse environmental impacts.

We find that the nature of the probable environmental impacts have been identified, and further, that the facility 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, including but not limited to, the effect on agricultural lands, wetlands, parklands, and river corridors.

We find that the Facility's transmission lines should be underground or underwater, as proposed.

We find that the Facility conforms to a long-range plan for expansion of the electric power grid serving this state and interconnected utility systems, which will serve the interests of electric system economy and reliability, in particular the planning objectives contained in the State's 2009 Energy Plan. The Champlain Hudson Power Express Facility can be constructed and operated consistent with the achievement of the State's long-range energy planning objectives. In allowing development of this New York interconnection with the regional transmission system of Quebec, Canada, we continue the State's efforts to increase use of renewable energy resources and to bring such resources to the State's major urban areas. As we have observed in other recent Article VII proceedings, there is a continuing need in the downstate area to establish better interconnections with our neighboring regional transmission systems, to provide citizens better access to diverse, renewable generation resources and stronger transmission ties than those currently existing.

We grant Applicants' request that we waive the substantive requirements of the local laws and regulations

listed in Hearing Exhibit 115 and find that the Project otherwise conforms to applicable State and local laws.

Finally, we conclude that the Project will serve the public interest, convenience and necessity. That this Project will serve New York City load while displacing more-polluting generation sources, advance major energy and policy goals as set forth in the City's *PlaNYC 2030: A Greener, Greater New York* and in Commission and State documents, and rely almost entirely on private investment are significant Project benefits, which can be realized without substantial negative environmental impacts. A decision not to permit the Project the opportunity to proceed will, in all likelihood, mean that these unique and substantial benefits will not be realized. Ratepayers are not assuming the risks associated with the investment in the project. The Certificate Conditions and stipulations effectively shield ratepayers from the project's construction and operation risks. This is precisely what the competitive markets envisioned: project developers taking calculated risks and investing in resources that ultimately provide benefits to consumers.

RD CORRECTIONS:

We adopt the following corrections to the RD:

1. On page 3, the second full sentence, reads, in relevant part as follows: "The JP, attached as Appendix 2, has the following signatories: …." The JP was not attached to the RD so the sentence should read "The JP has the following signatories: …."
2. On page 7, the second sentence of the second full paragraph lacks the words "converter station" after "HVDC." The sentence should read: "The HVDC converter station would be a "compact type" with a total footprint (i.e., building and

associated areas and equipment) of approximately 4.5 acres."

3. On page 31, in the last sentence of the first full paragraph the word "million" should be inserted between "1.5" and "tons" so that the sentence reads: "For the State as a whole, Staff witnesses Gjonaj and Wheat calculated expected annual air pollutant emissions reductions of SO_2, NO_x, and CO_2 to be 751, 641, and about 1.5 million tons per year, respectively, in 2018 (footnote omitted)."
4. On page 80, in discussing Certificate Condition 99, the second full paragraph states "The dredged material will be placed in scows and either replaced in the trench or pits (if determined by the appropriate permitting authority to be suitable for replacement), or removed for disposition at an authorized location…Placement of imported backfill when dredge spoil is not used would create some additional increases in suspended sediment." In fact, Certificate Condition 99 prohibits the use of dredge materials for backfill.
5. On page 105, the RD recites Staff's statement that the Facility's underground configuration "requires a 35-foot ROW to protect the cables." We note that Certificate Condition 140, however, states that "[e]ach edge of the permanent overland Facility ROW shall be no closer than (a) when located entirely within lands owned or controlled by a railroad company or a public highway, six (6) feet to the outer surface of the nearest installed cable and (b), in all other areas, eight (8) feet to the outer surface of the nearest installed cable."

The Commission orders:

1. Except as here modified, the Recommended Decision of Administrative Law Judges Michelle L. Phillips and Kevin J. Casutto is adopted as part of this Order. Except as here granted, all exceptions to the Recommended Decision are denied.

2. Except as modified in the RD and to the extent consistent with the discussion in this Order, the terms and provisions of the February 24, 2012 Joint Proposal submitted by Champlain Hudson Power Express, Inc., and CHPE Properties, Inc. on behalf of the Signatory Parties to the Joint Proposal, and stipulations dated July 11, 2012 (Luyster Creek), June 4, 2012 (Certificate Condition 15), June 26, 2012 (Deliverability), and October 19, 2012 (Trust), and attached to this Order, are adopted and made a part of this Order.

3. Subject to the conditions adopted in this Order, Champlain Hudson Power Express, Inc., and CHPE Properties, Inc. (Certificate Holders) are granted a Certificate of Environmental Compatibility and Public Need (Certificate) authorizing construction and operation of a 1,000 MW, High Voltage Direct Current (HVDC) sub-aquatic and underground electric transmission line, approximately 332 miles, from the Canadian border to a Converter Station to be located in the Astoria Annex of Con Edison, and a 345 kV AC transmission line, approximately 3 miles, from Con Edison’s Astoria Annex to Con Edison’s Rainey Substation in Astoria, within New York State along the project route depicted as Joint Proposal Appendix B, and Hearing Exhibit 152 attached hereto (Certified Route), and associated equipment comprising the Facility. The Facility is the New York State portion of a sub-aquatic high voltage direct current transmission line linking the Facility with the Province of Quebec, Canada, HVDC Interconnection.

4. The terms of the Certificate Conditions included as Joint Proposal, Appendix C, attached to this Order are hereby approved and incorporated into this Order, including the requirement that the Certificate Holder shall, within 30 days after the issuance of the Certificate, submit to the Public Service Commission either a petition for rehearing or a verified statement that it accepts and shall comply with the Certificate and the conditions placed upon the Certificate.

5. A Water Quality Certification pursuant to §401 of the Clean Water Act (33 U.S.C. §1341(a)(1)) and PSL Article VII having previously been issued, it is hereby certified that, if the Certificate Holders submit an acceptable Environmental Management and Construction Plan (EM&CP) and comply with all conditions contained in this Order, construction of the facility will comply with the applicable requirements of §§301, 302, 306 and 307 of the Clean Water Act, as amended, and will not violate New York State Water Quality standards and requirements.

6. The Certificate Holders shall file one or more Environmental Management and Construction Plans for the Project, either as a single filing or as a sequence of filings each pertaining to a segment of the Project, as provided in the Certificate Conditions. Certificate Holders shall not commence construction on any segment of the Project until the Commission has, by written Order, approved an EM&CP pertaining to that segment. Consistent with the Proposed Certificate Conditions, Certificate Holders shall provide notice to all landowners adjoining the Project or adjoining the Project segment, as may be appropriate, for each EM&CP filing.

7. Prior to the commencement of construction, the Certificate Holders shall comply with those requirements of Public Service Law §68 that do not relate to the construction

and operation of the facility by obtaining Commission permission and approval as an electric corporation.

8. This Certificate may be vacated if the Certificate Holders fail to file an EM&CP or to commence construction consistent with the milestones set forth in Certificate Condition 13.

9. This proceeding is continued.

By the Commission,

(SIGNED) JEFFREY C. COHEN
Acting Secretary

APPENDIX D

Scoping Summary Report

APPENDIX D.1 – 2010 SCOPING REPORT

SCOPING SUMMARY REPORT

CHAMPLAIN HUDSON POWER EXPRESS TRANSMISSION LINE PROJECT ENVIRONMENTAL IMPACT STATEMENT

U.S. Department of Energy
Office of Electricity Delivery and Energy Reliability
Washington, DC 20585

Cooperating Agencies:
U.S. Environmental Protection Agency
U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service
New York Department of State
New York Department of Environmental Conservation

DECEMBER 2010

ACRONYMS AND ABBREVIATIONS

AC	Alternating Current
CFR	Code of Federal Regulations
CHPEI	Champlain Hudson Power Express, Incorporated
CP	Canadian Pacific Railway
CSX	CSX Railroad
CZMA	Coastal Zone Management Act
DC	Direct Current
DOE	U.S. Department of Energy
EIS	Environmental Impact Statement
EMF	Electromagnetic Fields
EO	Executive Order
EPAct	Energy Policy Act of 2005
HVAC	High Voltage Alternating Current
HVDC	High Voltage Direct Current
km	kilometer
kV	kilovolt
MW	megawatt
NEPA	National Environmental Policy Act
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NYISO	New York Independent Systems Operator
NYSPSC	New York State Public Service Commission
NYSCC	New York State Conservation Council
NYSDEC	New York State Department of Environmental Conservation
NYSDPS	New York State Department of Public Service
NYSTA	New York State Thruway Authority
SCFWH	Significant Coastal Fish and Wildlife Habitats
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service

SCOPING SUMMARY REPORT
CHAMPLAIN HUDSON POWER EXPRESS EIS

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1. Introduction

1.1 Overview

On January 25, 2010, Champlain Hudson Power Express Inc.[1] (CHPEI) applied to the U.S. Department of Energy (DOE) for a Presidential permit in accordance with Executive Order (EO) 10485, as amended by EO 12038, and the regulations codified at 10 Code of Federal Regulations (CFR) 205.320 et seq. (2000), "Application for Presidential Permit Authorizing the Construction, Connection, Operation, and Maintenance of Facilities for Transmission of Electric Energy at International Boundaries." The DOE Office of Policy, Siting and Analysis, in the Office of Electricity Delivery and Energy Reliability (OE-20) is responsible for issuing Presidential permits. The Presidential permit for CHPEI (OE Docket Number PP-362), if issued, would authorize CHPEI to construct, operate, maintain, and connect the U.S. portion of the project, which consists of an electric transmission line that would cross the international border between the United States and Canada, near the village of Rouses Point, New York. A project overview is provided in **Section 1.5**, and additional project details are provided in CHPEI's January 25, 2010, application letter to DOE, as amended on August 5, 2010. All of these documents are available on the DOE Web site at http://chpexpresseis.org, and additional project information is also available on the Applicant's Web site at http://chpexpress.com.

Pursuant to the National Environmental Policy Act of 1969 (NEPA), and in considering an application for a Presidential permit, the DOE must take into account possible environmental impacts of the proposed facility. DOE has determined that an Environmental Impact Statement (EIS) is the appropriate level of environmental review under NEPA for granting the requested Presidential permit. DOE will use the NEPA planning process to encourage agency and public involvement in the review of the proposed project, and to identify the range of reasonable alternatives. The public outreach process is designed to facilitate the public discussion of the scope of appropriate issues to be addressed in the EIS.

1.2 Public Outreach

On June 18, 2010, DOE published in the *Federal Register* its Notice of Intent (NOI) to Prepare an EIS and to Conduct Public Scoping Meetings; Notice of Floodplains and Wetlands Involvement; Champlain Hudson Power Express, Inc. (75 FR 34720). The Notice of Intent (NOI), provided in **Appendix A**, explained that DOE would be assessing potential environmental impacts and issues associated with the proposed project and reasonable alternatives. The NOI was sent to interested parties including Federal, state, and local officials; agency representatives; stakeholder organizations; local libraries, newspapers, and radio and TV stations; and private individuals in the vicinity of the proposed transmission line. Issuance of the NOI commenced a 45-day public scoping period that ended on August 2, 2010. However, the NOI did note that comments submitted after the deadline "would be considered to the extent practicable."

DOE placed advertisements in 32 local and regional newspapers along the proposed project corridor to invite the public to local scoping meetings, and to announce their times and locations. Copies of newspaper tear sheets and affidavits are included in **Appendix B**. In addition, press releases were

[1] CHPEI is a joint venture of TDI–USA Holdings Corporation (TUHC), a Delaware corporation, and National Resources Energy, LLC (NRE). TUHC is owned by Transmission Developers, Inc. (TDI), a Canadian Corporation and by Sithe Global TDI LLC (Sithe Global TDI). Sithe Global TDI is a wholly owned subsidiary of the Blackstone Group L.P. NRE is a wholly owned subsidiary of National RE/sources Group, a limited liability corporation duly organized under the laws of the State of Connecticut.

sent out to 10 local radio and 17 television stations and to 26 newspapers prior to the meetings. **Appendix C** contains an example of the press releases and a list of media outlets to which they were sent.

During the public scoping period, DOE conducted seven scoping meetings: one in Connecticut and six within the Hudson River Valley corridor of New York State. **Figure 1** provides an overview of the route of the proposed transmission line along with an identification of the locations where scoping meetings were held. The meetings occurred between July 8 and July 16, 2010, as noted in **Table 1**.

Table 1. Dates and Locations of the Public Scoping Meetings

Meeting Date	Location	Number of Attendees
July 8, 2010	City Hall, Bridgeport, CT	10
July 9, 2010	Federal Building, Manhattan, New York City	25
July 12, 2010	Royal Regency Hotel, Yonkers, NY	27
July 13, 2010	Holiday Inn, Kingston, NY	28
July 14, 2010	Holiday Inn, Albany, NY	31
July 15, 2010	Ramada Inn, Glens Falls, NY	18
July 16, 2010	North Country Chamber of Commerce, Plattsburgh, NY	28

The meetings provided the public with the opportunity to learn more about the proposed project and to provide comments on potential environmental issues associated with the project. A total of 33 people gave verbal comments at the meetings, and their comments were transcribed by court stenographers. Transcripts of the scoping meetings along with materials submitted at the meetings are provided in **Appendix D**. In addition, DOE received scoping comments in the form of 22 written letters or emails from private citizens, government agencies, and nongovernmental organizations. A copy of the comment letters received during the scoping period and written materials submitted for the record at the scoping meetings are included in **Appendix E** to this report and are also available at http://chpexpress.org.

DOE's Draft EIS will also contain a subsection that summarizes the comments received during the scoping period.

1.3 Cooperating Agencies

DOE has invited several Federal and state agencies to participate in the preparation of the EIS to ensure that it satisfies the environmental requirements of those agencies to make their respective determinations regarding their permitting processes and to engage their specialized expertise. Region 2 of the U.S. Environmental Protection Agency (USEPA), the New York District of the U.S. Army Corps of Engineers (USACE), and the New York Field Office (Region 5) of the U.S. Fish and Wildlife Service (USFWS) are Federal cooperating agencies. In addition, the New York State Department of Public Service (NYSDPS) and the New York State Department of Environmental Conservation (NYSDEC) are cooperating agencies in the development of the CHPE Project EIS.

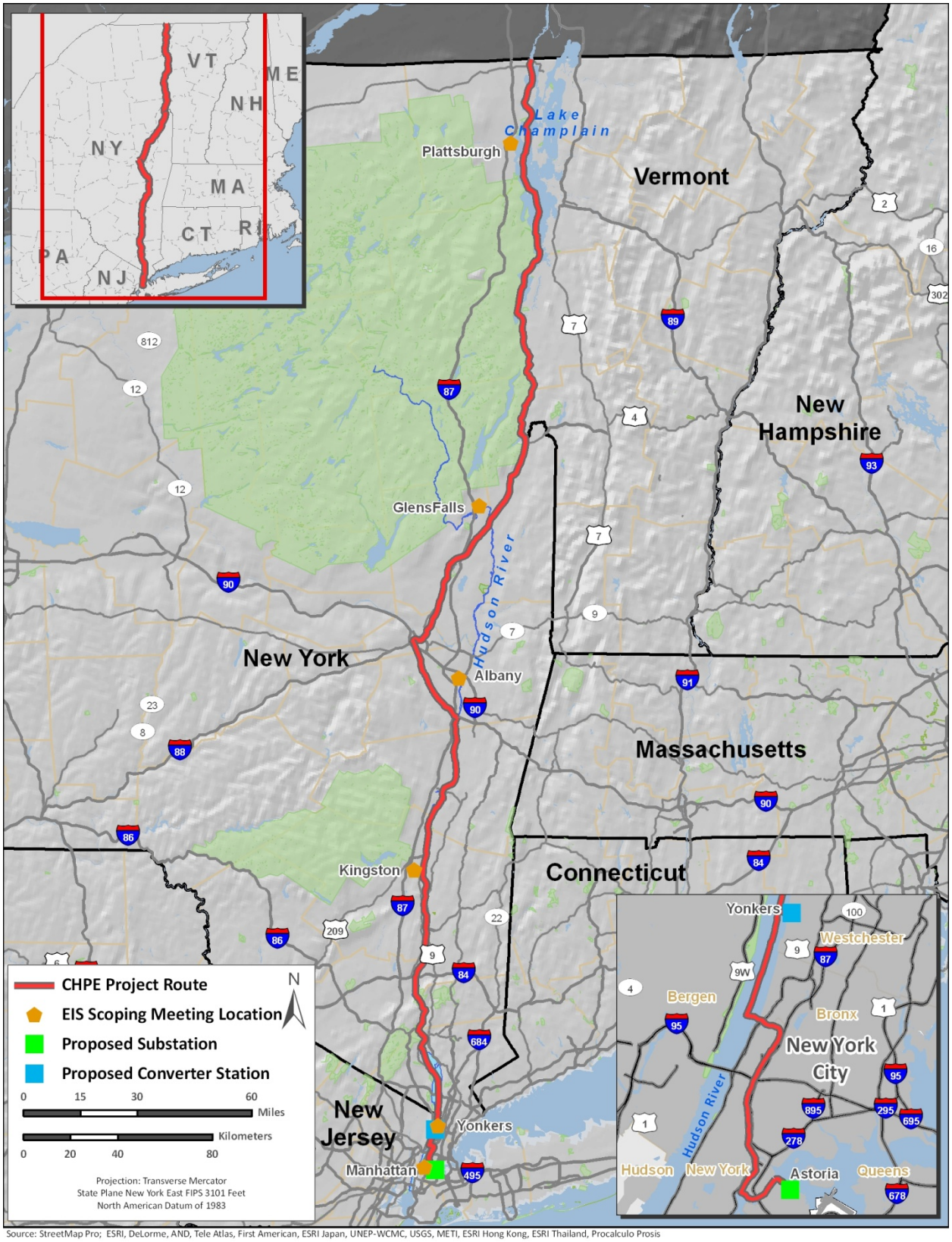

Figure 1. Project Regional Map

The following outlines each agency's requirements for the EIS:

USEPA. The USEPA does not have a direct regulatory role in the permitting process for the CHPE Project. However, Federal law provides for USEPA review of draft and final EISs. Specifically, the USEPA's Office of Federal Activities has the following responsibilities:

1. Review and prepare written comments on NEPA documents prepared by Federal agencies.
2. Review all major proposed Federal actions subject to NEPA and work with Federal agencies to avoid, minimize, and mitigate adverse environmental impacts.
3. Coordinate with Federal agencies to maximize environmental protection of proposed projects
4. Foster interagency partnerships to promote environmental stewardship in planning and implementing Federal actions.

USACE. The USACE will use the EIS in their decisionmaking for the permits that would be required under Section 10 of the Rivers and Harbors Act of 1899 and Section 404 of the Clean Water Act. In accordance with 33 CFR Part 325 Appendix B (8)(c), the USACE will coordinate with DOE to ensure that the CHPE Project EIS can be adopted by USACE in support of its decisionmaking requirements on the Section 10 and Section 404 permit application by CHPEI.

USFWS. The USFWS role as a cooperating agency will include evaluation of environmental impacts on fish and wildlife, in general. They will also evaluate potential environmental impacts on federally listed threatened and endangered species and designated critical habitat and might issue a Biological Opinion based on a potential Biological Assessment prepared for the project.

NYSDPS. Construction and operation of the CHPE Project would require that the New York State Public Service Commission (NYSPSC) issue a Certificate of Environmental Compatibility and Public Need (Certificate) and a Federal Clean Water Act of 1972 (CWA) Section 401 Water Quality Certification. The NYSDPS, who serve as staff to the Commission, has requested Cooperating Agency status to coordinate its review with that of DOE.

NYSDEC. NYSDEC has responsibility for the review and approval of projects that would affect water quality, wetlands, and air quality within the state and has promulgated a number of regulations that would affect the development of the CHPE Project. NYSDEC has requested cooperating agency status in the NEPA process to participate in reviewing the scope and the analysis included in the EIS. NYSDEC will review the EIS, evaluate impacts and mitigation measures in accordance with the State Environmental Quality Review Act, and provide comments on the EIS to DOE.

1.4 Project Chronology to Date

The following timeline summarizes the scoping process events previously described:

January 25, 2010	DOE received CHPEI application for Presidential permit.
June 18, 2010	DOE issued *Federal Register* NOI (75 FR 34720) to Prepare an EIS.
July 8 to 16, 2010	Seven public scoping meetings held in Connecticut and New York State.
August 2, 2010	Scoping period ended.
August 5, 2010	CHPEI submitted addendum to Presidential permit application eliminating the Connecticut portion of the project, changing the proposal from two parallel cables to one cable, and moving a portion of

the transmission line from the Champlain Canal to a railroad right-of-way.

1.5 Project Overview

The CHPE project is described in the January 25, 2010, application letter to DOE as amended by additional correspondence on August 5, 2010, both of which are available on the DOE project Web site at http://chpexpressEIS.org.

According to the Applicant's Presidential permit application, the proposed transmission system comprises a 1,000- megawatt (MW) Voltage-Sourced Converter controllable High Voltage Direct Current (HVDC) bipole. A bipole consists of two connected submarine or underground cables, one of which is positively charged (+), and the other negatively charged (-). This two-cable bipole would be laid between Quebec, Canada, and a converter station in Yonkers, New York (see **Figure 1**). The CHPEI stated purpose of and need for the proposed transmission line is that it would connect sources of renewable power generation in Canada with load centers in and around New York City.

Detailed maps showing the entire proposed project route are included in **Appendix F** and posted on DOE's Web site at http://chpexpressEIS.org. The Project's precise final route is subject to a number of factors, including resource issues, permitting, land acquisition, and stakeholder agreement. As noted in Section 1.4, since the publication of the NOI, the Applicant's proposal was revised to eliminate the Connecticut portion of the project, reduce the project's total transmission capacity, and change the location of one segment of the transmission line route from the Champlain Canal to a nearby railroad right-of-way.

The project would originate at an HVDC converter station near Hydro-Québec TransÉnergie's 765/315-kilovolt (kV) Hertel substation, located southeast of Montreal, and travel approximately 35 miles (56.3 kilometers [km]) to the international border between the United States and Canada, crossing the border to the east of the village of Rouses Point, New York, within the town of Champlain, New York. South of the international boundary, the bipole would travel south under Lake Champlain for approximately 111 miles (178.6 km) entirely within the jurisdictional waters of the State of New York. At the southern end of Lake Champlain, the bipole would exit the water just north of Lock C12 of the Champlain Canal in the town of Whitehall, New York, and would be buried within an existing railroad right-of-way owned by Canadian Pacific Railway (CP) for approximately 65.7 miles (105.7 km) through the municipalities of Comstock, Fort Ann, Kingsbury, Fort Edward, Moreau, Northumberland, Wilton, Greenfield, Saratoga Springs, Milton, Ballston, Clifton Park, Glenville, and Schenectady, New York. In the town of Rotterdam, New York, the buried route would transfer to the CSX Railroad (CSX) right-of-way and proceed south for approximately 23.7 miles (38.1 km) through the municipalities of Guilderland, New Scotland, Voorheesville, and Bethlehem, New York. The proposed project route would exit the railroad right-of-way (ROW) and enter the Hudson River south of Albany at the town of Coeymans, New York.

Upon entering the Hudson River, the bipole would be buried in the river bottom for 118 miles (189.9 km) until it reaches the City of Yonkers, New York. The HVDC bipole cables would terminate at the converter station near Wells Avenue in Yonkers, New York, for a total length of approximately 319 miles (513.4 km) from the U.S. border with Canada to Yonkers, New York. From the Yonkers Converter Station, double-circuit 345-kV High Voltage Alternating Current (HVAC) cables would enter the Hudson River and travel south through the Hudson and Harlem rivers for a distance of approximately 14.3 miles (23 km). The HVAC cables would terminate in a spare bay at a new electric substation being constructed by the New York Power Authority on Consolidated Edison

Power Park property near the site of the former Charles Poletti Power Plant in Astoria, Queens, New York.

In addition, Champlain Hudson applied to DOE on September 12, 2009, for a Federal loan guarantee for the proposed project in response to a DOE competitive solicitation, "Federal Loan Guarantees for Electric Power Transmission Infrastructure Investment Projects," issued under Section 1705, Title XVII, of the Energy Policy Act of 2005 (EPAct). Section 406 of the American Recovery and Reinvestment Act of 2009 amended EPAct by adding Section 1705. This section is designed to address the current economic conditions of the nation, in part by facilitating the development of eligible renewable energy and transmission projects that commence construction no later than September 30, 2011. The Loan Programs Office of DOE is carrying out an evaluation of the application submitted by Champlain Hudson. Should DOE decide to enter into the negotiation of a possible loan guarantee with Champlain Hudson, DOE would use the CHPE EIS to meet its NEPA requirements in making a determination associated with the funding. Additional information on the Loan Program Office is available at http://lpo.energy.gov/.

2. Scoping Comments

A variety of issues and concerns were raised during the public scoping period. DOE considered the content of all comments in determining the scope of the EIS and identified the following representative issues and concerns:

- Many commenters questioned the purpose of and need for the project, noting that the EIS needs to establish the evidence that the necessary electricity demand exists (or will exist) for the proposed project.
- Many commenters expressed concerns about the proposed Yonkers location for the Convertor Station. Commenters noted potential visual impacts, land use issues, impacts on cultural resources, health and safety concerns, potential air quality impacts, and concerns about the convertor station having disproportionate impacts on the low-income and minority populations in Yonkers.
- Commenters noted the potential environmental impacts from burying the transmission line in Lake Champlain and the Hudson River. Commenters expressed concerns regarding sediment disturbance and the impacts that sediment would have on wildlife, fish habitat, endangered species, and benthic habitat. Commenters also noted that the sediment disturbance could churn up PCBs and other contaminants into the water column and have an adverse impact on drinking water quality and human health and safety.
- Commenters requested that the EIS contain an analysis of the effects of Electromagnetic Fields (EMFs) and thermal effects produced by both Direct Current (DC) and Alternating Current (AC) transmission lines on aquatic ecosystems, including behavior and reproduction of fish and other animals.
- Many commenters expressed concerns about the impacts of the transmission line and Yonkers Convertor Station on existing infrastructure. Commenters noted the presence of pipelines, power cables, outfalls, and other electricity lines that the proposed transmission line could impact.
- Commenters noted that the transmission line route contains many visually important resources and that the EIS should analyze the impact that construction of the transmission line would have on these resources.
- Many commenters also identified additional alternatives that they believed should be analyzed in the EIS. Based on scoping comments, the following alternatives have been included in the analysis:
    - Substation siting alternatives. Several commenters requested DOE discuss a siting alternative to the CHPE interconnection at ConEd Power Park.
    - Several commenters requested that alternative converter station sites in the City of Yonkers be examined, including the possible re-use of the former Glenwood Power Plant building.
    - Alternative transmission line routing alternatives that would follow upland rights-of-way, such as highways and rail lines.
- Commenters requested information on the potential for impacts associated with the use of HVDC technology.

A summary of the comments received during the scoping period is provided in **Table 2**, which identifies the major issues raised, arranged by general topic. Each issue that is within the scope of the

EIS will be addressed in the Draft EIS. **Table 3** presents a list of the individuals or organizations who submitted scoping comments along with the date each comment was received by DOE.

Transcripts of the scoping meetings along with materials submitted at the meetings are provided in **Appendix D**. Copies of the complete comments are included in **Appendix E** and are also available on the DOE project EIS Web site at http://chpexpresseis.org. **Appendix G** presents a summary compilation of all of the comments received, arranged by the date the comments were received. The Draft EIS will also contain a subsection that summarizes the comments received during scoping. For the purposes of this Scoping Report, the comments are paraphrased and condensed from the actual comments; however, the environmental analysis included in the EIS will rely on the full text of the comments as submitted.

Table 2. Summary of Scoping Comments Received by DOE

Subject Area	Comment Summary
NEPA Process	*Purpose and Need.* Nine commenters noted that the purpose and need statement should establish the evidence that the need for electricity exists in the area, or will exist if projected population and planned land use growth are realized. *Cooperating Agencies.* One commenter noted that the National Oceanic and Atmospheric Association (NOAA) should be included as a cooperating agency, because of the agency's expertise in evaluating impacts on fisheries and aquatic biota. In addition, the New York State Hudson Valley Greenway Council should also be included as a cooperating agency to evaluate potential project impacts and consistency with the criteria established by New York State during the creation of this organization (see New York Environmental Conservation Law Article 44, Hudson River Valley Greenway). *Public Involvement.* One commenter noted that the development of the EIS should proceed with a perspective of incorporating transparency during the review process and post-approval (if approved). The alternatives that are evaluated should include a consideration of opportunity for public scrutiny of impacts, such as thorough review of monitoring data. Accordingly, the alternatives design should incorporate facilities or options that promote public assessment during the project lifetime. These might be metering abilities, equipment locations, or other facilities that aid in sampling and reviewing project impacts and success of mitigation measures. *Worst-Case Analysis.* One commenter noted that the EIS should analyze the possible worst-case scenarios if any of the infrastructure or equipment used in its installation fails in any way. *Precautionary Principle.* One commenter noted that the precautionary principle should be used to frame the analysis in the EIS. *Permits.* One commenter noted that the EIS should include a discussion of all potential permits, including Section 404 permits from the USACE that might be required for this project.

Subject Area	Comment Summary
Proposed Action and Alternatives	*Project Description.* Four commenters noted that the EIS should describe the construction, operation, and maintenance of the transmission line, convertor station, and other components of the Proposed Project. The description of construction should include a discussion of the locations of staging areas; the installation method, exact location, and depth of underwater transmission lines; and any facilities, maintenance, or other activities needed to ensure project compliance with North American Electric Reliability Corporation standards. One commenter noted that the EIS should discuss the feasibility of installing an underwater cable for distances greater than 50 miles. The EIS should include a discussion of operations in relation to the New York Independent System Operator (NYISO), regional entities (e.g., New England Independent System Operator, PJM Interconnection, and Northeast Power Coordinating Council), and non-discriminatory open access. One commenter noted that the EIS should include a discussion of anticipated project life and a description of decommissioning and abandonment of facilities. *Yonkers Converter Station.* Four commenters noted that the EIS should describe the siting of the Yonkers Converter Station and the risks of flashovers. The area surrounding the proposed converter station, particularly the Alexander Street area, is made land that did not exist 100 years ago. The cable landfall might have to be supported on piles and the impacts of that activity should be investigated in the EIS. Alternatives to the proposed location of the Yonkers Converter Station should be considered, including the Glenwood Power Plant site and property on the south side of the American Sugar Refinery site.
Proposed Action and Alternatives (continued)	*Alternatives Analysis.* Fourteen commenters noted that the EIS should include an evaluation of alternatives to the Proposed Action, including reasonable alternatives not within the jurisdiction of the lead agency, and the No Action Alternative. The alternatives analysis should include discussion of diversified generation, and upgrading existing transmission infrastructure to meet the purpose of meeting existing and future electricity demands in New York City. Alternative locations for the transmission line should be evaluated, including construction in existing utility corridors, highway rights-of-way (e.g., the I-87 corridor), and railroad rights-of-way. The EIS should consider the potential of extending the proposed transmission line or expanding capacity if market conditions should become favorable to such enhancements in future years, including expansion east into Long Island Sound. In the event that renewable resources are not used for power generation or are discontinued, then the environmental impact of the project would vary from the proposal. Therefore, the EIS should consider alternative power generation sources, for example fossil fuel sources, that can be used with the new CHPEI facilities and evaluate environmental impacts. In addition, it is possible that the CHPEI facilities would be used to transmit New York-generated electricity for export to Canada. Under this scenario, fossil-fuel sources, rather than renewable sources, might be used. Alternative transmission and generation scenarios should thus be considered in the evaluation of environmental impacts. *Connected Actions.* Nine commenters noted that implementation of the Proposed Project would result in development of hydroelectric power sources, which should be evaluated in the EIS. If the Applicant is exploring the use of upstate wind or other U.S. energy sources, the DOE should include those sources in the EIS, as well.
Biological Resources	*Impacts on Flora and Fauna.* Eight commenters noted that the EIS should evaluate the impacts of construction and operation of the CHPE project on biological resources, including threatened and endangered terrestrial and aquatic species. The

Subject Area	Comment Summary
	analysis should include evaluation of impacts on sensitive wetlands, aquatic and terrestrial wildlife and habitat, and spawning periods. One comment noted that impacts on biological resources can occur from increased turbidity in the water column, resuspension of contaminants, electromagnetic fields, storm water discharges into terrestrial environments, thermal resistivity, and shoreline disturbance. *Impacts of Burying Underwater Pipelines.* One comment noted that burying the transmission line beneath Lake Champlain and the Hudson River might be unnecessarily disruptive ecologically and hydrologically. The EIS should include an analysis of the projected underwater sediment disturbance caused by the dredging and trenching techniques along the Richelieu River, Lake Champlain, and the Hudson River onto wildlife, fish habitat, endangered species, micro-organisms, vegetation, and human activities such as swimming and fishing. In addition, the EIS should describe the area and quality of benthic habitat (e.g., oyster beds and submerged aquatic vegetation) that will be disturbed due to the placement of cables. The EIS should also discuss the area and quality of benthic habitat that will be permanently lost due to the placement of concrete mats on the cables if it is laid on the surface of the sediment. This EIS should evaluate different methods (e.g., water jet trenching, mechanical plowing, or dredging) that will be used in different areas and the varying environmental impacts of each of these methods, and the potential for resuspension of contaminants and ways that risks can be minimized.

Subject Area	Comment Summary
Biological Resources (continued)	*Impacts of Electromagnetic Fields.* Four commenters noted that the EIS should include a rigorous and independent analysis of the effects of EMFs and thermal effects produced by both DC and AC transmission lines on aquatic ecosystems, including behavior and reproduction of fish and other animals. One comment noted that EMF could affect aquatic species that use the Earth's magnetic field for orientation during navigation. Electra-sensitive species could be attracted or repelled by the electrical fields generated by the transmission cables. Areas of breeding, feeding, or nursing are particularly prone to these effects because of the congregation or dispersion of sensitive individuals in the benthic community. *Special Status Species.* One commenter noted that the EIS should assess the impacts on the federally listed endangered Karner blue butterfly, the species that has the greatest potential for impacts from the proposed project *(Lycaeides melissa* sarnuelis*).* Suitable habitat occurs in several portions of the project, and there are some known occurrences. One comment noted that the NOI discussed federally listed species under NOAA jurisdiction, but omitted species under USFWS jurisdiction. *Protected Areas.* One commenter noted that the EIS should also consider the effects on Essential Fish Habitat designated under the Magnuson-Stevens Act; Haverstraw Bay has some other designations that should be considered. The transmission line would pass through the Hudson River National Estuarine Research Reserve, a marine protected area. Two commenters noted that the EIS should analyze all Significant Coastal Fish and Wildlife Habitats (SCFWHs) that would be affected by the installation, operation, or maintenance of the proposed transmission line and determine if they would affect the viability of the SCFWHs. Any difference in effects between installations in disturbed versus undisturbed areas of applicable SCFWHs should be discussed. *Invasive Species.* Two commenters noted that the EIS should evaluate the potential of the project to spread aquatic invasive species, including the zebra mussel, Chinese mitten crab, and the purple loosestrife. *Coastal Zone Management.* One commenter noted that the EIS should include an analysis of all applicable Coastal Management Program and Local Waterfront Revitalization Programs (LWRP) policies. The New York State Department of State requires all applicants seeking concurrence with a consistency certification to provide an analysis of all applicable Coastal Management Program or applicable LWRP policies. The proposed action would traverse multiple communities with federally approved LWRPs and, as such, where the proposed action would have an effect on such a community, an analysis of applicable LWRP policies for each LWRP community should be provided.
Geology and Soils	*Seismic Activity.* One commenter noted that the EIS should evaluate the impact of seismic activity on power cable integrity. *Geology and Soils.* One commenter noted that the EIS should characterize sediment size and soil type along the entire transmission line route and characterize the suitability of each area to use the proposed installation method.

Subject Area	Comment Summary
Visual Resources	*Aesthetic and Visual Resources.* Two commenters noted that the EIS should characterize all visually important resources affected by construction and operation of the Proposed Project, including below-ground construction of the transmission line. Visually important resources include Scenic Areas of Statewide Significance, and areas that have been specially designated as scenic districts by New York State under New York Environmental Conservation Law Article 49, Protection of Natural and Man-Made Beauty (e.g., the Tappan Zee East Scenic District, Olana Scenic District). One comment noted that extended construction and maintenance of facilities, including below-ground facilities, can produce visual and aesthetic impacts. As such, these impacts should be identified and evaluated. Presently, the NOI only states that aboveground components will be evaluated. Another comment indicated that the EIS should consider temporary visual impacts of nighttime lighting and equipment near the Hudson River. *Visual Impacts from the Yonkers Convertor Station.* Three commenters noted that the EIS should assess the visual impact of the converter station and discuss mitigation strategies. A thorough visual analysis determining places from which the converted station would be seen should be prepared. The analysis should include computer-generated visual simulations in order to understand how the converter station would look from important vantage points. These should include the Library, Yonkers Station, Hudson River, upland neighborhoods, adjacent sidewalks, and nearby intersections. At a minimum the visual impacts from the Yonkers Train Station Platform should be shown. Views from Palisades Interstate Park (National Natural Landmark), located across the river in New Jersey and in Rockland County, New York; and from the Bell Place National Register Historic District, the Old Croton Aqueduct State Park, and Philips Manor Hall, listed on the National Register of Historic Places and a State Historic Site, must be assessed. Other locations should be identified in consultation with City officials.
Land Use and Infrastructure	*Transmission Line Land Use.* One commenter suggested proposed signage to alert river users to the presence of the buried power cables to avoid disturbance and damage. Another comment suggested that the EIS should identify and characterize all agricultural land that might be affected by the proposed transmission line. *Yonkers Convertor Station Land Use.* One commenter noted that the EIS should characterize land use around the proposed Yonkers Convertor Station and analyze the potential impacts of constructing the convertor station on surrounding land uses. The analysis should discuss future land values, impacts on the Alexander Street Master Plan, impacts on future redevelopment by the City of Yonkers near the convertor station, impacts on commuter parking, impacts on marina development and harbor management by the City of Yonkers, impacts on continued use of the Yonkers Recreation Pier as a ferry point and embarkation point for other boats, impacts on the Beczak Environmental Education Program and on the Yonkers Canoe Club, and impacts on the City of Yonkers Jail.

Subject Area	Comment Summary
Land Use and Infrastructure (continued)	*Infrastructure.* One commenter noted that the development of the EIS should consider the impacts on existing infrastructure in the vicinity of the proposed transmission line route and the proposed Yonkers Convertor Station. Specifically, commenters noted the presence of Rip Van Winkle Bridge piers, pipelines, power cables, outfalls, and the high-voltage electrified lines along the Metro-North Railroad. The analysis in the EIS should also consider the operation of existing infrastructure on the proposed project. One commenter noted that electrical or magnetic interference with the proposed transmission line could occur with existing infrastructure. With respect to the upland placement of the cables, the General Accounting Office briefing on "Issues Associated with High-Voltage Direct-Current Transmission Lines along Transportation Rights of Way" dated February 2008, stated that electromagnetic fields and stray current could interfere with railroad signaling systems and highway traffic operations, and accelerate pipeline corrosion. The Hudson River Federal Navigation Channel is authorized at 32-foot depth. The EIS should analyze how to avoid damage to the power cables due to periodic maintenance dredging to maintain that depth. One commenter asked the questions: Would the converter station require service from City of Yonkers infrastructure including water, storm, or sanitary sewer? What volume of water will be required at the converter station? Will potable water be used for any reason other than human consumption and sanitary needs? Where will connections for city infrastructure be made? Does sufficient capacity exist for the need of the converter station or will new connections be required to be made? One commenter suggested that the EIS determine if the Hudson River navigation channel's maximum depth is practicable to support existing and future commercial navigation given existing, authorized depths, topography, necessary channel side slopes, port infrastructure, and aerial clearances.
Cultural Resources	*Transmission Line Cultural Resources.* Five commenters noted that the EIS should evaluate the impacts of construction on historic resources along the transmission line route, including the Glenwood Power Station, historic shipwrecks within Lake Champlain, and the Champlain Canal (part of the Erie Canal National Heritage Corridor). *Yonkers Convertor Station Cultural Resources.* One commenter noted that the EIS should evaluate the impacts of construction and operation of the convertor station on surrounding National Register of Historic Places-eligible resources, including the Otis Elevator Plant, the Philips Manor Hall, the Habishaw Club site (the Beczak Environmental Education Center), and the North Yonkers Pump Station. The EIS should discuss means to blend the proposed convertor station into the surroundings. *Impacts on the Champlain Canal.* One commenter noted that the EIS should evaluate the impacts on the Champlain Canal (a National Heritage Corridor). The potential impacts on the canal include evaluating underground utility depth requirements in order to minimize potential impacts on vessel operations and channel maintenance operations; placement of cables within the official canal channel, which would not be permitted (alternatives to effective crossing of the canal that do not impact maintenance and use of the channel should be discussed); impacts on New York State Conservation Council (NYSCC) corporate operations; impacts on commercial boating traffic due to delays during construction; impacts on NYSCC employee safety; impacts on the canal from electromagnetism; and impacts associated with turbidity within the canal system. The EIS should also discuss that real property rights or a permit must be acquired from the NYSCC to use the Champlain Canal.

Subject Area	Comment Summary
Health and Safety	*Public Health and Safety near the Yonkers Converter Station.* One commenter noted that the EIS should consider the impacts on public health and safety from electrical and magnetic fields generated near the proposed Yonkers Convertor Station. The EIS should also consider the potential impacts on the public from fires and explosions at the convertor station. *Occupational Health and Safety*. Three commenters noted that the EIS should discuss the potential for explosions and fire from electrical equipment contained in the Yonkers Convertor Station. The EIS should discuss mitigation measures to be taken to reduce the probability and reduce the impacts of fires and explosions, such as deluge and fire suppression systems. As the Consolidated Edison substations near the proposed converter station site have had major transformer fires, the EIS should discuss the potential for impacts from similar fires at the convertor station. The EIS should discuss whether workers would be more likely to be injured given the increased safety risk of close proximity of the transmission lines to transportation rights-of-way. One comment asked if there would be any human health impacts upon workers in adjacent buildings in the I-Park/Otis Elevator Plant complex near the Yonkers Convertor Station. Are there any potential impacts upon equipment or manufacturing or research activities that might take place in the buildings surrounding the proposed converter station or adjacent to the cables serving the station?
Air Quality	*Air Quality Analysis.* One commenter noted that the air quality analysis in the EIS should include a General Conformity Applicability Analysis and a carbon footprint analysis. One commenter suggested using diesel particulate filters on construction equipment to reduce impacts from particulate matter. *Air Quality near the Yonkers Convertor Station.* One commenter noted that the EIS should discuss air quality impacts of operation of the converter station. Will there be ozone creation from the electrical equipment? Will there be any public health issues to area residents from the operation of the plant? What mitigation can be instituted to deal with air quality issues to area residents? One comment noted that Southwest Yonkers is an asthma problem area and suggested that the EIS discuss any impact that might add to the asthma problem stemming from the proposed converter station. *Ozone Standards.* One comment noted that the USEPA is on the verge of finalizing a revised National Ambient Air Quality Standard for ozone. The new standard will be 20 to 40 percent more stringent than the current standard and will require significant emissions reductions, possibly by 70 percent or more, within the eastern United States. DOE should work with the NYISO and the New York State Public Service Commission (NYSPSC) to assess the air quality impacts associated with importing an additional 1,000 MW of clean new capacity to the greater New York City metropolitan area. This effort should assess ozone precursor reductions, toxic air pollutant emissions reductions, and any environmental justice benefits associated with reduced emissions from older, less-efficient electric generating units in the area to be served by this new capacity. One commenter noted that DOE should also work with NYISO to identify those electrical generating units likely to become uneconomic as a result of an influx of significant new capacity so that USEPA can develop appropriate air quality modeling assumptions for the implementation of the revised ozone standard.

Subject Area	Comment Summary
Water Resources	*Water Quality.* One commenter noted that the EIS should address the potential impacts of sediment disturbances in the Superfund Area along the transmission line route on drinking water quality supplied by the Hudson River to the residents of Rhinebeck, Port Ewen, Lloyd, Poughkeepsie, Stillwater, Halfmoon, Waterford, and Green Island. The commenter suggests assessing sediment contamination before working in these areas to minimize disturbance. Six commenters noted that the EIS should identify and characterize all pollutants along the route and analyze the likelihood of resuspension or release. Where specific pollutants are identified, adequate preventative measures, including applicable alternatives, should be analyzed and their anticipated coastal effects should be included in the EIS. One commenter noted that the EIS should investigate the potential in Lake Champlain for impacts from fuel leaks from the wrecked tugboat McAllister. *Surface Water and Wetlands.* Four commenters noted that the EIS should characterize the potential effects of construction, operation, and maintenance of the proposed transmission line on the surface water regime along all buried portions of the route including freshwater and tidal wetlands. Further, the impacts of Horizontal Directional Drilling, which is proposed for transition points where the cables enter and exit the water, on wetlands must be investigated. *Floodplains.* One commenter noted that the portions of the proposed route using the railroad right-of-way would cross Federal Emergency Management Agency-mapped floodplains associated with the Hudson River, as would the underground connection to the Yonkers converter station. Any potential impacts from construction equipment and activities on wetlands should be evaluated in the draft EIS. *Resuspension of PCBs.* Four commenters noted that the EIS should address the potential for resuspension of PCBs and other contaminants in the Mid- and Lower-Hudson River due to the burying of cable in contaminated sediment. While the concentration of PCBs is greatest in the Upper Hudson, it is undisputed that PCBs contaminate the Mid- and Lower-Hudson River as well. The resuspension of PCBs would impact wildlife and aquatic species, and human health.
Environmental Justice	*Environmental Justice Analysis for the Proposed Yonkers Convertor Station.* Three commenters noted that the EIS should include a detailed environmental justice analysis of the siting of the proposed Yonkers Convertor Station. The City of Yonkers contains a number of utility and transportation land uses that serve the greater New York City area. These utility and transportation land uses could have a disproportionate impact upon area residents. Additionally, the City of Yonkers has a higher share of the county's low- income and minority populations than would be proportionate to its share of the county's overall population. The area around the proposed converter station is overwhelmingly low-income and minority. *Socioeconomic Impacts.* One commenter noted that since the proposed project will pass through but provide no benefits to the communities along the route of the cable, the EIS should consider mitigation opportunities for these communities.

Subject Area	Comment Summary
Socioeconomics	*Economic Benefits.* One commenter noted that the EIS should evaluate the economic benefits of the additional 1,000 MW of additional electricity capacity and its impact on marginal electric supply costs, including the potential for these benefits to accrue beyond the immediate New York City metropolitan area. *Economic Impacts of the Yonkers Convertor Station.* One commenter noted that the EIS should examine the impacts upon the planned changes to the Yonkers downtown area around the site of the proposed converter station. The comment asks what socioeconomic changes are likely with and without the converter station? The analysis should include employment at the site, income tax implications of employment at the site, sales tax spin-off impacts of employment at the site, and the impacts upon the surrounding downtown with the converter, with other planned uses and without the converter station. One comment requested that the EIS investigate and discuss area businesses that would be negatively impacted by construction period air quality impacts. Another comment requested that the EIS discuss the property tax implications of the proposed converter station in Yonkers and any other real property installations that are a part of the proposed action. An additional comment suggested that the EIS examine and analyze the occupancy impacts of the converter station upon nearby properties. The comment asked if the converter station would cause a change in the quality of occupancy in the commercial buildings to the east of the proposed site and if the converter station would have any impacts upon the residential community to the north of the I-Park/Otis Elevator Plant Site?
Hazardous Materials and Waste	*Hazardous Materials at the Yonkers Convertor Site.* One commenter noted that the EIS should discuss the presence of any toxic materials used at the facility. Are there nontoxic materials used at the facility that when combined with other nontoxic materials at the facility might become toxic? *PCBs.* One commenter noted that there are known or likely accumulations of paper-processing waste including PCBs in the areas of Cumberland Bay and near the mouth of the LaChute River. The area around the existing International Paper Plant in Ticonderoga should also be considered a potential area of contamination.
Recreation	*Recreation.* Six commenters noted that the EIS should contain an analysis of the impacts on recreational river traffic, including impacts on public access to recreational opportunities along the transmission line route. One commenter noted that the EIS should analyze the impacts of the proposed project and alternatives on anchoring boats in Lake Champlain. The issue would be particularly relevant in the shallow and narrow southern part of the lake. If there are any risks to swimmers, divers, or snorkelers, these should also be addressed in the EIS.
Cumulative Impacts	*Cumulative Impacts Analysis.* Seven commenters noted that the EIS should consider the following projects in the cumulative impacts analysis: New York State Thruway Authority (NYSTA) ongoing maintenance and capital improvements projects for the Tappan Zee Bridge, demolition and replacement of the Crown Point Bridge, previous and future dredging projects along the transmission line route, and projects in the downtown Yonkers area.
Mitigation	*Mitigation Measures.* One commenter noted that the EIS should consider all appropriate mitigation measures to avoid sensitive aquatic and terrestrial habitats; cable installation during mating, spawning, and migration seasons; resuspension of contaminants; and permanent alternation of lake and river bed substrates.

Subject Area	Comment Summary
Other Issues	*Impacts in Canada.* Three commenters noted that the EIS should consider impacts on the Canadian environment and the social and economic impacts upon native people affected by new power development in Canada as a result of the CHPE transmission line. *Balance of Payments.* Three commenters noted that from an economic perspective, purchasing of energy from outside New York State is bad for the state's balance of payments, and for national balance of payments. The public interest would not be served by the project from this perspective, and the comment requests that this be considered in the EIS. *Energy Efficiency and Conservation Measures.* Three commenters noted that the EIS should include an evaluation of alternatives to the Proposed Project that includes energy efficiency and conservation measures in lieu of construction of the transmission line.

Table 3. Directory of Stakeholder Comments

Stakeholder Name and Affiliation	Comment Date and Source
Federal Agencies	
Grace Musumeci, Chief Environmental Review Section, U.S. Environmental Protection Agency Region 2	July 28, 2010, letter to DOE
David Stilwell, Field Supervisor, U.S. Department of the Interior, U.S. Fish and Wildlife Service, Cortland, NY Office	August 2, 2010, letter to DOE
Native American Tribes and Canadian First Nations	
Patrycja Ochman, O'Reilly & Associes Avocats, stated as on behalf of the Uashannuat, Innu of Uashat mak Mani-Utenam First Nation	August 2, 2010, letter to DOE
State and Provincial Agencies	
Alain Olivier, Government of Quebec	July 9, 2010, public scoping meeting July 14, 2010 , public scoping meeting
Peter Casper, Assistant Counsel, New York State Thruway Authority, New York State Canal Corporation	July 29, 2010, letter to DOE
M. Jodi Rell, Governor, State of Connecticut	July 30, 2010, letter to DOE
Jeffrey Zappieri, Supervisor, Consistency Review Unit, Office of Coastal, Local Government and Community Sustainability, New York State Department of State	August 2, 2010, letter to DOE
Local Government Agencies	
Chuck Lesnik, City Council President, City of Yonkers	July 12, 2010, public scoping meeting August 2, 2010, letter to DOE
Lee Ellman, Planning Director, Planning Bureau, City of Yonkers	July 12, 2010, public scoping meeting July 30, 2010, letter to DOE
Frank Stilo, Yonkers 1st Precinct Community Council	July 12, 2010, public scoping meeting
John Bowacic, New York Senate, 42nd District	July 13, 2010, public scoping meeting
Ronald Miller, Trustee, Village of Menands	July 14, 2010, public scoping meeting
Roland R. Vosburgh, Principal Planner, Columbia County	July 28, 2010, letter to DOE
Christopher Crane, Legislative Counsel, Westchester County Board of Legislators	August 1, 2010, letter to DOE
Philip A. Amicone, Mayor, City of Yonkers	August 2, 2010, letter to DOE
Non-Governmental Organizations and Individuals	
Angela Pernice, private citizen	July 8, 2010, email to DOE
Scott Lorey, Legislative Director, Adirondack Council	July 12, 2010, public scoping meeting
James Frakes, Adirondack Council	July 16, 2010, public scoping meeting
Steve Davis, private citizen	July 29, 2010, email to DOE
Mike Winslow, Staff Scientist, Lake Champlain Committee	August 1, 2010, letter to DOE
John Davis, Conservation Director, Adirondack Council	August 2, 2010, letter to DOE

Stakeholder Name and Affiliation	Comment Date and Source
Non-Governmental Organizations and Individuals (continued)	
Rose Van Guilder, Alliance for Independent Long Island; Long Island Rockaway Ratepayers Alliances	July 9, 2010, public scoping meeting
Frank Eadie, private citizen	July 9, 2010, public scoping meeting
Joel R. Kupferman, NY Environmental Law and Justice Organization	July 9, 2010, public scoping meeting
Demosthenes Matsis, private citizen	July 9, 2010, public scoping meeting
Annie Wilson, Energy Committee Chair, Sierra Club Atlantic Chapter	July 9, 2010, public scoping meeting August 2, 2010, letter to DOE
Susan Leifer, private citizen	July 12, 2010, public scoping meeting
Richard S. Tarantelli, private citizen	July 12, 2010, public scoping meeting
Clifford Schneider, Beczak Environmental Education	July 12, 2010, public scoping meeting
Philip Musegaas, Hudson River Program Director, Riverkeeper	July 12, 2010 , public scoping meeting July 13, 2010, public scoping meeting August 2, 2010, letter to DOE
Hayley Mauskapf, Environmental Advocacy Associate, Scenic Hudson, Inc.	July 12, 2010, public scoping meeting July 13, 2010, public scoping meeting August 2, 2010, letter to DOE
George Klein, Chairman, Sierra Club Lower Hudson Group	July 12, 2010, public scoping meeting August 2, 2010, letter to DOE
William Overstone, private citizen	July 13, 2010, public scoping meeting
David Ladenheim, private citizen	July 13, 2010, public scoping meeting
Jurgen Wekerle, Sierra Club - Ramapo/Catskill Group	July 13, 2010, public scoping meeting
Randolph Horner, Solar Evolution, LLC	July 13, 2010, public scoping meeting
Geddy Sveikauskas, Ulster Publishing Company	July 13, 2010, public scoping meeting
Tom Ellis, Citizens' Environmental Coalition	July 14, 2010, public scoping meeting
Julia Stokes, Saratoga Plan	July 15, 2010, public scoping meeting
Gordon Boyd, Energy Next, Inc.	July 15, 2010, public scoping meeting
Skip Stranahan, private citizen	July 15, 2010, public scoping meeting
David Manwell, private citizen	July 16, 2010, public scoping meeting
Peter D'Elia, private citizen	July 16, 2010, public scoping meeting
Lori Fisher, Lake Champlain Committee	July 16, 2010, public scoping meeting
Jack Hills, private citizen	July 16, 2010, public scoping meeting
Jean Public, private citizen	July 21, 2010, email to DOE
Roger L. Jennings, President, RJennings Company	August 2, 2010, letter to DOE
Doris Delaney, PROTECT	Undated letter to DOE, received August 2, 2010

Note

A full version of the 2010 Scoping Report, including appendices, is available in the CHPE EIS website document library at http://www.chpexpresseis.org.

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APPENDIX D.2 – 2012 SCOPING REPORT ADDENDUM

SCOPING SUMMARY REPORT ADDENDUM

CHAMPLAIN HUDSON POWER EXPRESS TRANSMISSION LINE PROJECT ENVIRONMENTAL IMPACT STATEMENT

U.S. Department of Energy
Office of Electricity Delivery and Energy Reliability
Washington, DC 20585

Cooperating Agencies:
New York State Department of Environmental Conservation
New York State Department of Public Service
U.S. Army Corps of Engineers
U.S. Coast Guard
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service

SEPTEMBER 2012

ACRONYMS AND ABBREVIATIONS

BMP	best management practice
CHPE	Champlain Hudson Power Express
CHPEI	Champlain Hudson Power Express, Incorporated
CSX	CSX Transportation
DOE	U.S. Department of Energy
EIS	Environmental Impact Statement
EMF	electromagnetic field
HDD	horizontal directional drilling
NEPA	National Environmental Policy Act
NOI	Notice of Intent
NYSPSC	New York State Public Service Commission
NYSDEC	New York State Department of Environmental Conservation
NYSDOT	New York State Department of Transportation
RCRA	Resource Conservation and Recovery Act
ROW	right-of-way
TDI	Transmission Developers, Inc.

SCOPING SUMMARY REPORT ADDENDUM
CHAMPLAIN HUDSON POWER EXPRESS TRANSMISSION LINE PROJECT EIS

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1. Introduction

1.1 Overview

On January 25, 2010, Transmission Developers Inc. (TDI) submitted an application to the U.S. Department of Energy (DOE) for a Presidential permit for the Champlain Hudson Power Express (CHPE) project (proposed project).[1] On June 18, 2010, DOE issued the *Notice of Intent to Prepare an Environmental Impact Statement and to Conduct Public Scoping Meetings, and Notice of Floodplains and Wetlands Involvement; Champlain Hudson Power Express, Inc.* (75 FR 34720), and conducted public scoping from June 18, 2010 to August 2, 2010. The Champlain Hudson Power Express Scoping Report (December 2010) (2010 Scoping Report) summarizes comments received during that DOE public scoping period.

On February 28, 2012, TDI submitted an amendment to the Presidential permit application that reflected changes to the proposed transmission line route. The proposed changes are the result of settlement negotiations among New York State agencies, Champlain Hudson Power Express, Inc. (CHPEI), CHPE Properties, Inc. and other stakeholders as part of the project review under Article VII of the New York State Public Service Law. The amendment is referred to as the Joint Proposal. In response to submission of the Joint Proposal DOE published an *Amended Notice of Intent to Modify the Scope of the Environmental Impact Statement for the Champlain Hudson Power Express Transmission Line Project in New York State* (77 Federal Register 25472) (Amended NOI) on April 30, 2012, and accepted public comments from April 30, 2012 to June 14, 2012. DOE also stated that it will consider comments submitted after June 14th to the extent practicable. In the Amended NOI, DOE stated that it did not intend to hold further public scoping meetings, but recognized that comments provided by the public during the New York State Public Service Commission's (NYSPSC's) April 2012 public statement hearings might be relevant to the National Environmental Policy Act (NEPA) scoping process. Therefore, DOE explained that it "intends to review the Commission's April public hearing statement transcripts and consider them, to the extent matters relevant to the federal environmental review process arise, as scoping comments for the purposes of the EIS." This 2012 Scoping Summary Report Addendum summarizes scoping comments related to the Joint Proposal.

The 2010 Scoping Report, this 2012 Scoping Summary Report Addendum, comments submitted directly to DOE, and copies of the April 2012 NYSPSC public statement hearings are available on the Champlain Hudson Power Express Project Environmental Impact Statement (EIS) Website at http://chpexpresseis.org. Comments submitted to the Commission are available at http://documents.dps.ny.gov.

1.2 Summary of Project Changes

The Joint Proposal Route (see **Figure 1**) is essentially the same as the original proposed route, as amended in August 2010, for major portions of the transmission line route, except for adjustments in the route alignment at five primary locations and minor route adjustments in other areas along the route. The proposed primary route adjustments are as follows:

- A relocated 10-mile stretch of route between Dresden, New York, and Whitehall, New York, underground along New York State Route 22 to avoid installing the cables in the southern end of Lake Champlain. This change is being proposed to remove the transmission line from the environmentally sensitive southern portion of Lake Champlain.

[1] TDI submitted amendments to the proposed route in its original application on August 5, 2010 and July 7, 2011.

- The routing of the transmission line underground off the railroad right-of-way (ROW) for more than 1 mile through city streets in the City of Schenectady to avoid engineering constraints.
- Relocation of a portion of the transmission line into the Hudson River. As originally proposed the transmission line would have entered the Hudson River at the Town of Coeymans, New York. Under the Joint Proposal, the line would enter the Hudson River at the Town of Catskill via horizontal directional drilling (HDD). From Selkirk to Catskill, the transmission line would primarily be in the CSX Transportation (CSX) railroad ROW for approximately 30 miles instead of in the Hudson River.
- Removal of the transmission line from the Hudson River at Haverstraw Bay where the segment would instead run along the railroad ROW through the community of Stony Point for approximately 7 miles. The transmission line would be installed underground here to avoid impacts on aquatic resources in Haverstraw Bay.
- Relocation of the transmission line from a portion of the Harlem and East rivers to the Hell Gate Bypass Route, north of the Willis Avenue Bridge, and proceeding east approximately 1 mile through the New York State Department of Transportation (NYSDOT) railroad corridor and rail yards. From there, the transmission line would follow the rail corridor along the northern side of the Bronx Kill and then enter the East River.

Additionally, the proposed location of the converter station would be constructed in Astoria, Queens County, New York (Luyster Creek Converter Station) under the Joint Proposal, rather than as previously proposed in Yonkers, New York. Additional details about the Joint Proposal can be found on the DOE Champlain Hudson Power Express Project EIS Website at http://chpexpressEIS.org.

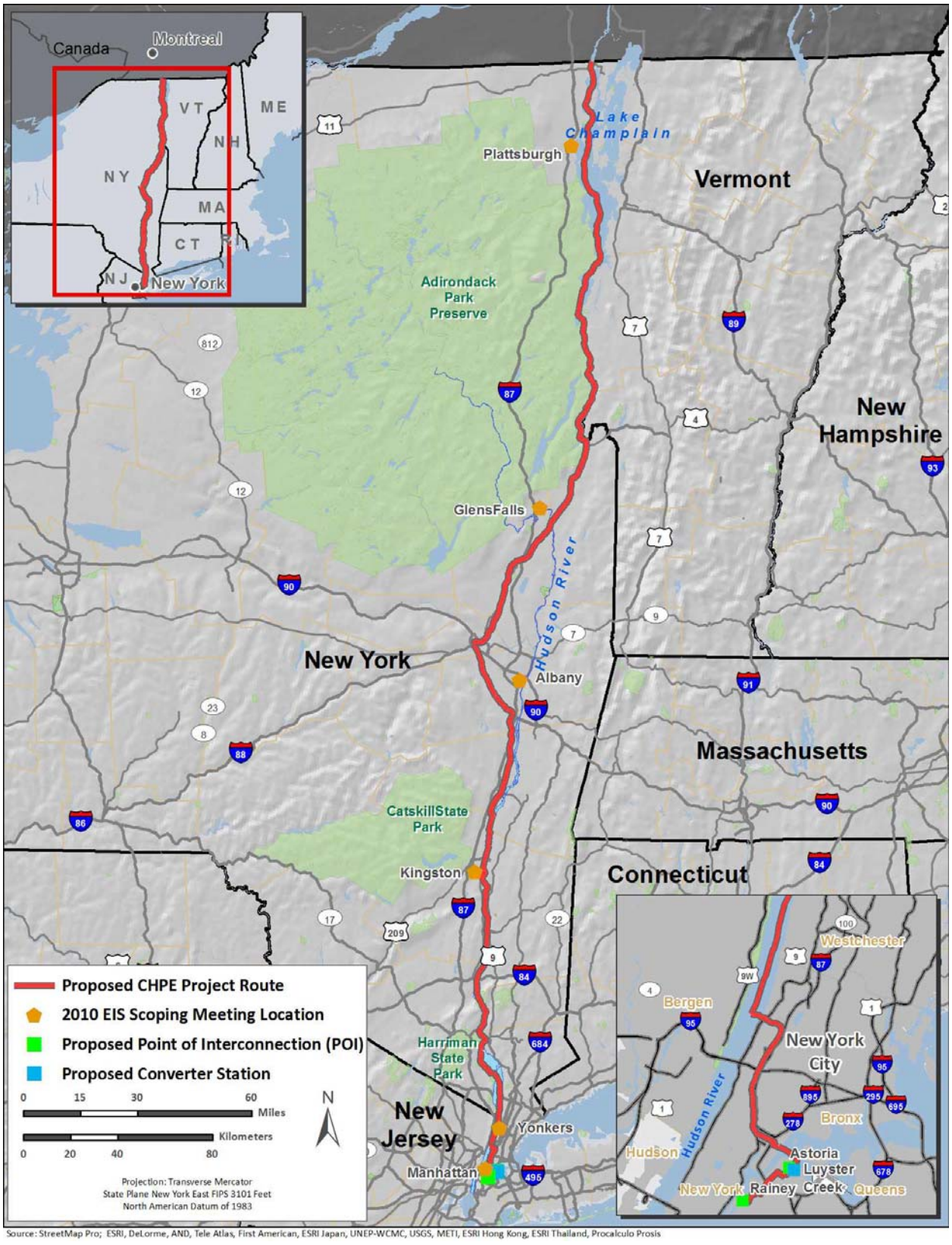

Figure 1. Joint Proposal Route

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2. Scoping Comments

An overview of comments received during the 2012 public scoping period, catalogued by general topic, is provided in **Table 2-1** below. Issues potentially relevant to the scope of the EIS will be considered by DOE during development of the Draft EIS.

Table 2-1. Summary of 2012 Public Scoping Comments

Subject Area	Comment Summary
NEPA Process	***Public Involvement.*** Comments requested an extension of the public comment period.
Proposed Project	***Project Life Cycle.*** Comments stated that they EIS should examine the lifespan of the proposed project, potential failure scenarios, how well the proposed project would withstand being under water for many years, and eventual removal of the cable following decommissioning. ***Project Description.*** Comments stated that the analysis should include potential operational issues that could arise for other power entities operating in New York, including the New York Independent Systems Operator, Central Hudson Gas and Electric, Consolidated Edison, Entergy Nuclear Power, and the New York Power Authority. Comments also requested further explanation of the purpose and need from CHPE for the proposed project. ***Alternatives.*** Comments stated that the purpose of and need for the proposed project would be met by constructing renewable energy sources, building new power generation sources in the United States, or refurbishing existing power plants, rather than importing power from Canada. Comments sought evaluation of an overland transmission route using highway corridors; a railroad ROW underground route; any New York State Department of Public Service proposed alternative; any combination of route alternatives that would have less impact to the aquatic environment. Comments stated that it would be preferable to invest in weatherization and conservation projects. ***Alternative Transmission Line Locations.*** Comments stated that constructing the proposed project along the Old Champlain Canal should be evaluated as an alternative in the EIS. Other comments stated that the transmission line from the Astoria substation to the Consolidated Edison Rainey Substation should be placed in the East River rather than through neighborhoods in Queens. ***Luyster Creek Converter Station Location.*** Comments stated that the environmental impacts from the Luyster Creek Converter Station location should be addressed in the review of the proposed transmission line project. ***Alternative Converter Station Locations.*** Comments stated that additional locations for the converter station should be evaluated, including a site in Brooklyn near the Gowanus Substation, the Harlem River Rail Yards, and an area near the Consolidated Edison Rainey Substation. ***System Reliability.*** Comments stated that the potential impacts of the proposed transmission line project on electric reliability, system redundancy, and bulk power systems, both within and adjacent to New York, should be considered. ***Permitting Requirements.*** Comments stated that the Joint Proposal would be in conflict with the parameters established by the U.S. Army Corps of Engineers for the Clean Water Act Section 404 permitting process for this project.

Subject Area	Comment Summary
Land Use	***Potential Use of Forest Preserves.*** Comments stated that the proposed project could be a violation of Article 14 of the state constitution, which states that lands constituting a forest preserve cannot be sold to a private entity. Comments stated that the Attorney General of New York has stated that underwater lands adjacent to Adirondack Park were considered forest preserve lands. ***Impacts on Residential Areas.*** Comments stated that the EIS needs to address potential impacts on future land use in residential areas. ***Luyster Creek Converter Station Land Use Consistency.*** Comments stated that the Luyster Creek Converter Station would be consistent with the existing land use at the site and would be appropriate for construction of a converter station. Other comments stated that the construction of the Luyster Creek Converter Station would not be consistent with Consolidated Edison's proposed use of the site for utility purposes. ***Encroachment Outside of Right-of-Way.*** Comments stated that the proposed project would encroach on additional lands outside of the existing right-of-way and that these impacts should be considered. **ROWs.** Comments expressed concern that the use of ROWs and approval of the proposed project could create a competitive monopoly for CHPE and lead to lawsuits related to access to land.
Infrastructure	***Water Utilities.*** Comments stated that the proposed project needs to address potential impacts on workers and a new main water line that is being repaired in the Town of Whitehall.
Water Resources	***Lovett Plant.*** Comments stated that the closure of the Lovett Plant left a coal ash plume in the groundwater table and requested that the impacts of the proposed transmission line on that plume be evaluated. ***Sludge Bed.*** Comments stated concern about the potential for the proposed project to resuspend pollutants found in the sludge bed at the mouth of the LaChute River, noting that when the paper mill on site was closed in the 1960s, approximately 945,000 cubic meters of waste were left behind covering approximately 98 hectares. ***Resuspension of Phosphorus.*** Comments stated that the proposed project would disturb sediments and increase the concentration of phosphorus in the water column within Lake Champlain, and the EIS should address any potential impacts and prescribe mitigation measures, as appropriate.
Cultural Resources	***Luyster Creek Converter Station Cultural Resources***. Comments stated that the Luyster Creek Converter Station site in Astoria has been identified by the State Historic Preservation Office as an archaeologically sensitive area.
Geology and Soils	***Impacts on Agricultural Lands.*** Comments expressed concern that the proposed project would result in potential impacts on agricultural lands through the construction of temporary access roads and work areas, and from any deviations from the centerline.
Wildlife and Fish	**Electromagnetic Fields (EMF).** Comments stated concerns about EMF on fish and birds.

Subject Area	Comment Summary
Visual Resources	***Visual Impacts on Lake Champlain.*** Comments stated that construction on Lake Champlain would lead to potential visual impacts from the visibility of the construction equipment at the surface of the lake. ***Visual Impacts along Route 9W.*** Comments requested evaluation of the removal of trees on the eastern side of Route 9W in Rockland County, which currently provides screening from the roadway and existing residential areas.
Transportation and Traffic	***Local Traffic.*** Comments asked how the proposed project would impact local traffic during construction.
Recreation	***Recreation Areas.*** Comments stated that the proposed project would disturb park lands including the Tompkins Cove and Waldron Revolutionary War Cemetery historic areas, Rockland Lake State Park, Stony Point Park, and the Haverstraw Little League Fields.
Public Health and Safety	***Public Safety.*** Comments stated that the proposed transmission line would pose a public health threat by being located too close to residential areas. Comments requested analysis of the effects of EMF in proximity to residential areas and public spaces. ***Navigation Safety.*** Comments stated that the placement of the transmission line 6 feet below the river bottom and plan to lay the cable over rock areas could result in a potential safety hazard for ships attempting to anchor in the Hudson River and could disrupt marine traffic and use of the cables. Comments stated that if the cables occupy any federally maintained navigation channels, they should be buried at least 15 feet below the authorized depth within those channels. Comments also expressed concern about impacts the proposed project could have on future navigational improvements (e.g. dredging) in the Hudson River.
Hazardous Materials and Wastes	***Contamination of Luyster Creek Site.*** Comments stated that the Luyster Creek Converter Station site in Astoria is the site of a former manufactured gas plant, has ongoing contamination issues, and is included in the New York State Department of Environmental Conservation's (NYSDEC's) Resource Conservation and Recovery Act (RCRA) Corrective Action program.
Air Quality	***Reduction in Air Pollution.*** Comments stated that the proposed project would result in a reduction of air pollution. Other comments stated that constructing the proposed transmission line would mean fewer power plants in New York City, which would reduce air quality issues in the city.
Socioeconomics	***Socioeconomic Impacts.*** Comments stated that the EIS should evaluate the potential for real estate values to drop in areas where the proposed transmission line is constructed.
Environmental Justice	***Environmental Justice.*** Comments stated that the proposed project would increase the cost of electricity, which would place an unfair burden on the low-income residents of New York.

Subject Area	Comment Summary
Mitigation/Best Management Practices	***Champlain Canal.*** Comments stated that, as part of mitigation, the project proponent should invest in the construction of a portion of the proposed Champlain Canalway Trail. The trail could be used by the contractors as a means of accessing the project site during construction. Following construction, the trail would become a long-term tourist attraction. ***Mitigation Fund.*** Comments stated that the mitigation fund created to account for unanticipated effects of the proposed project would be insufficient and fail to address the unanticipated impacts on water quality and other resources along the proposed transmission line route. Comments also stated that the Commission needs to evaluate the fairness of the process for determining which projects receive funding from the mitigation fund, including ensuring that there is an appropriate balance of projects along upland areas, Lake Champlain, and the Hudson River. Other comments praised the creation of the mitigation fund, noting that the creation of the fund would result in a net benefit to the Hudson River and Lake Champlain. ***Best Management Practices.*** Comments stated that the EIS needs to disclose best management practices (BMPs) for erosion and sediment control, vegetation clearing and disposal, activities in streams and wetlands, access road construction, invasive species control, protection of threatened and endangered species, and inspection and monitoring.
Cumulative Impacts	***Cumulative Impacts.*** Comments requested that the cumulative impacts analysis for the proposed project consider the construction of the United Waters Desalination Plant and potential closure of the Indian Point nuclear facility. Comments stated that other entities have proposed similar projects within portions of the Hudson River and asked how many other lines could be located along the same route. Other comments expressed concern that approval of the proposed project could lead to construction of additional transmission lines from Canada.

Subject Area	Comment Summary
Other Issues	***Economic Opposition.*** Comments stated that the proposed project would not lower electricity rates, improve the electricity grid, alleviate congestion, grow or improve New York State's electricity infrastructure, or provide local or long-term jobs to the communities along the proposed transmission line. Comments also stated the proposed project would mean higher energy bills and create more reliability problems. Comments also stated that the project would send jobs and economic development to Canada rather than generating new jobs in New York. **Economic Support.** Comments expressed support for more electricity and lower costs. **Energy Highway.** Comments expressed concern that development of the proposed project was inconsistent with and/or would undercut Governor Cuomo's "energy highway" initiative that seeks to invest in New York State resources to upgrade the State's energy infrastructure. Comments stated that the proposed project will bypass the existing grid and existing New York generators who will not be able to access the line and could lead to the shuttering of upstate power generators. **Article X.** Comments stated that the proposed project is inconsistent with Article X legislation designed to expedite construction of new power generation in New York State. ***Local Government Authority.*** Comments stated that Public Service Law Section 126 (1)(f) allows local government to enact substantive requirements on transmission facilities that are not unreasonably restrictive. Comments note that these guidelines should be clarified to identify the scope of the authority that local governments have to enact these requirements. **Renewable Energy.** Comments raised questions about how the use of "green power" would be guaranteed. Other comments stated support for the use of "clean energy." Other comments stated that the proposed project would impede the development of renewable energy as well as New York's ability to meet the Renewable Portfolio Standard goal of 30 percent renewable resources by 2015 and shut out New York State's growing renewable energy market. **Eminent Domain.** Comments raised questions about the potential use of eminent domain. **Hydroelectricity.** Comments stated that hydroelectricity generation in Canada would have impacts in Canada, including: damming miles of dikes, impounding large amounts of water, flooding river valleys, increasing levels of methylmercury in water, fish, birds and humans, destroying wildlife habitat, nesting and spawning grounds, social and dietary impacts to Native people, and increasing methane gas release from decaying vegetation.

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APPENDIX E

EIS Distribution List

Appendix E
EIS Distribution List

Appendix E lists individuals and organizations who have received varying forms of media related to the development of the CHPE EIS.

Federally Elected Officials

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1st Congressional District of New York
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The Honorable Yvette Clarke
9th Congressional District of New York
2351 Rayburn HOB
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The Honorable Eliot L. Engel
16th Congressional District of New York
2161 Rayburn HOB
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The Honorable Chris Gibson
19th Congressional District of New York
1708 Longworth HOB
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The Honorable Kirsten Gillibrand
United States Senate
478 Russell
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The Honorable Michael Grimm
11th Congressional District of New York
512 Cannon HOB
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The Honorable Brian Higgins
26th Congressional District of New York
2459 Rayburn HOB
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The Honorable Steve Israel
3rd Congressional District of New York
2457 Rayburn HOB
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The Honorable Hakeem Jeffries
8th Congressional District of New York
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The Honorable Peter King
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339 Cannon HOB
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The Honorable Nita Lowey
17th Congressional District of New York
2365 Rayburn HOB
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The Honorable Carolyn Maloney
12th Congressional District of New York
2308 Rayburn HOB
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The Honorable Sean Patrick Maloney
18th Congressional District of New York
1529 Longworth HOB
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The Honorable Carolyn McCarthy
4th Congressional District of New York
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The Honorable Gregory Meeks
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New York State Assembly
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44th Senate District
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Albany, NY 12247

Assemblymember Kevin A. Cahill
New York State Assembly
Assembly District 103
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38th Senate District
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The Honorable Andrew M. Cuomo
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