



CHAMPLAIN HUDSON POWER EXPRESS

PRESENTATION TO HUDSON 7

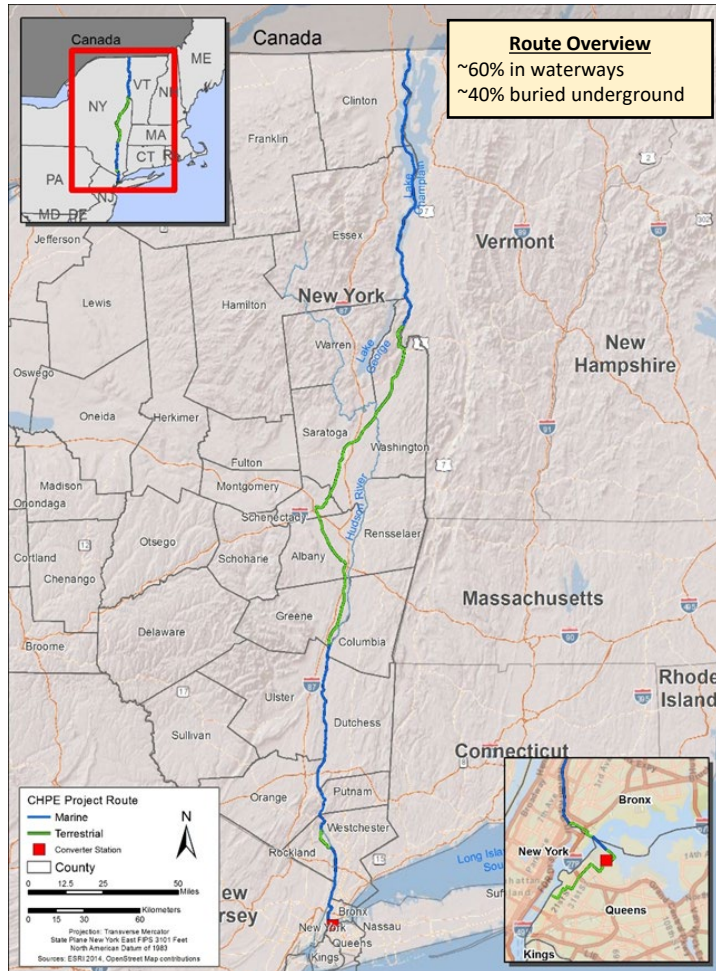
JANUARY 21, 2021



Transmission
Developers Inc.

A **Blackstone** Portfolio Company

Champlain Hudson Power Express – Overview



CHPE, LLC is supported by world class suppliers, engineers and energy infrastructure builders, and backed by Blackstone, one of the world's leading alternative asset managers.

Project Overview

- 1,000-1,250 MW fully buried HVDC transmission project
- Delivering up to 10.4 TWh/year of new clean energy⁽¹⁾
- ~300 mile route from Canadian border to Astoria, Queens
- Target in-service of 2025; 40+ year expected operating life
- Construction-ready to help meet New York's immediate energy needs (replaces up to 50% of Indian Point generation)

Business Model

- Merchant transmission project seeking to transport Canadian renewable energy directly into New York City
- Host municipalities will receive ~\$1.7 billion in new tax revenue over the first 30 years of the project, positively impacting 73 municipalities and 59 school districts in NY State

Regulatory & Community Support

- All major permits received (Article VII, Presidential Permit, Army Corps Permit)
- Widespread support (environmental, union, business, host communities)
- Strong local support as evidenced by 28 host municipalities passing resolutions of project support

Environmental & Economic Benefits, Energy Resiliency

- Estimated to decrease carbon emissions by ~3.4 million metric tons per year and harmful local air pollutants by ~30%⁽²⁾
- Significant economic benefits in NY – project will utilize organized labor and is estimated to create ~2,000 jobs during construction⁽³⁾
- Buried infrastructure will make New York's aging energy grid safer, more resilient and reliable in climate change related events.

(1) Equivalent to powering one million homes

(2) Equivalent to removing 28% of passenger vehicles from New York City streets

(3) PA Consulting, [Analysis of Economic, Environmental, and Reliability Impacts to the State of New York](#)

Champlain Hudson Power Express – Overview (Cont'd.)

Fully Permitted

Article VII State Siting Permit Issued April 2013

- On April 18, 2013, CHPE received the Certificate of Environmental Capability & Public Need from the NYS Public Service Commission



Presidential Permit Issued October 2014

- Led by the U.S. Department of Energy, an Environmental Impact Statement was completed due to the cross-border nature of Project

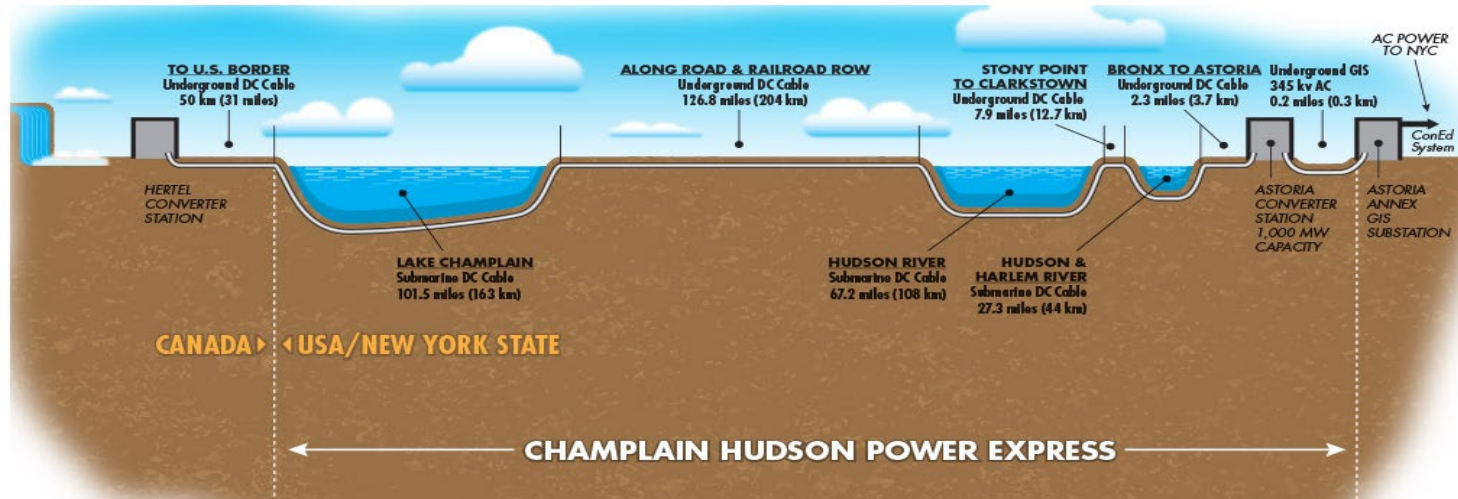


Army Corps Permits Issued April 2015

- ACOE Sections 10 and 404 permits are required to ensure compliance with Clean Water Act and Rivers and Harbors Act



**US Army Corps
of Engineers®**



Transmission Developers, Inc. (TDI)

- TDI was founded in 2008 with the goal of developing unique energy transmission projects in an environmentally responsible manner
- The company, headquartered in New York, NY, uses HVDC cable to link clean, highly competitive generation resources with markets that need supply diversity, enhanced reliability and long term lower costs
- TDI was acquired by the Blackstone Group in January 2010:
 - New York based asset management firm founded in 1985; public in 2007 (NYSE:BX)
 - Significant development capital invested to date in TDI's Champlain Hudson Power Express and New England Clean Power Link projects
 - Fully prepared to commit 100% of the project equity capital required to develop and construct
 - Deep, long term commitment to energy and natural resources with significant greenfield and brownfield development experience
- Additional information is available at <https://chpexpress.com>

Intertek

- Intertek Energy & Water Consultancy Services (formerly Metoc):
 - >20 major power cable systems, incl. >10 interconnectors
 - >25 offshore wind farm projects

Planning & Design

- Route & Landfall Feasibility
- Survey Design & Management
- Subsea & Land Cable Route Engineering
- Burial Assessment & Protection Strategy

Procurement & Construction

- Cable supply & installation contract and procurement strategy
- Asset integrity strategy
- Factory acceptance testing
- Load-out supervision
- Installation supervision and QC

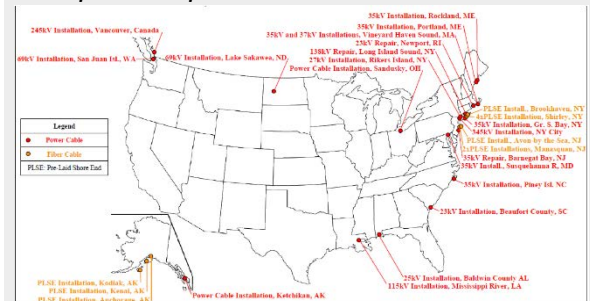
Operation & Maintenance

- Post-installation inspection
 - Depth of burial monitoring
 - GIS-based asset management
 - Emergency response plans
 - Client survey representation
- Additional information is available at <http://www.intertek.com/>

Caldwell Marine International (CMI)

- With over 60 years of marine construction and submarine cable experience, CMI (1) provides a highly effective team of professionals experienced with all aspects of submarine cable operations and (2) maintains an array of specialized cable handling equipment, cable embedment plows, cable and cable support vessels, and marine facilities
 - The Caldwell Group specialized in submarine cable operations from 1963 until 1998 when it was purchased by General Dynamics (GD) Corp.
 - In 2003, the Caldwell division was sold to Northeast Remsco Construction (JAG Companies), a heavy civil general contractor, and renamed Caldwell Marine International
 - The combined companies have completed over \$1 billion in construction projects and have a Performance Bonding limit of \$500+ million, reflecting the ability to complete projects within schedule and on budget
- Additional information is available at <http://www.caldwellmarine.com/>

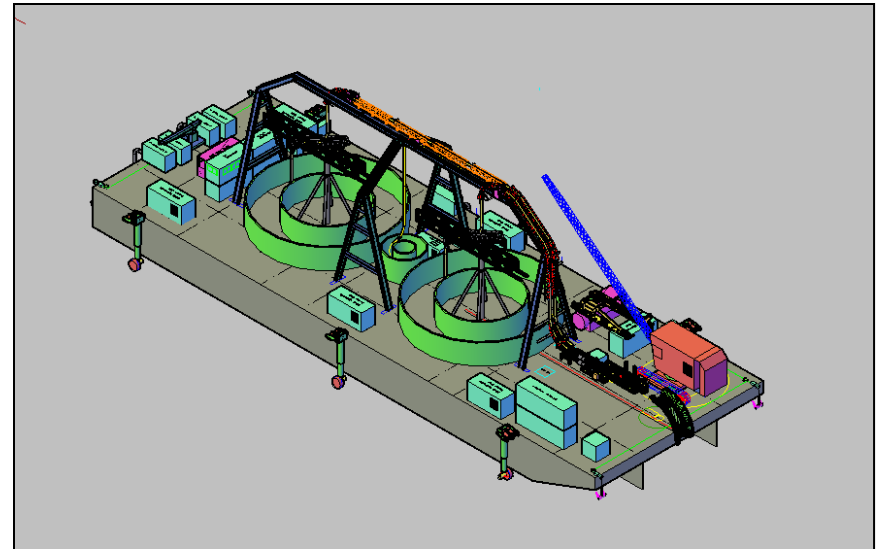
CMI Experience Map



Hudson River DP II Barge

Dynamically Positioned, 300'x100' Cable Lay Barge

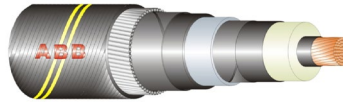
- Propulsion
 - 3,500 HP
 - Six 360° Azimuthing Thrusters
 - Class II
- All major systems have redundant backup
- Machinery
 - 15 ton LCEs
 - 5 Point Moor on Wire
 - Mechanized Coiling Machine
 - 100 ton Crane
 - Two 400kW Generators
 - 100kW House Power



Overview of Technology and Installation

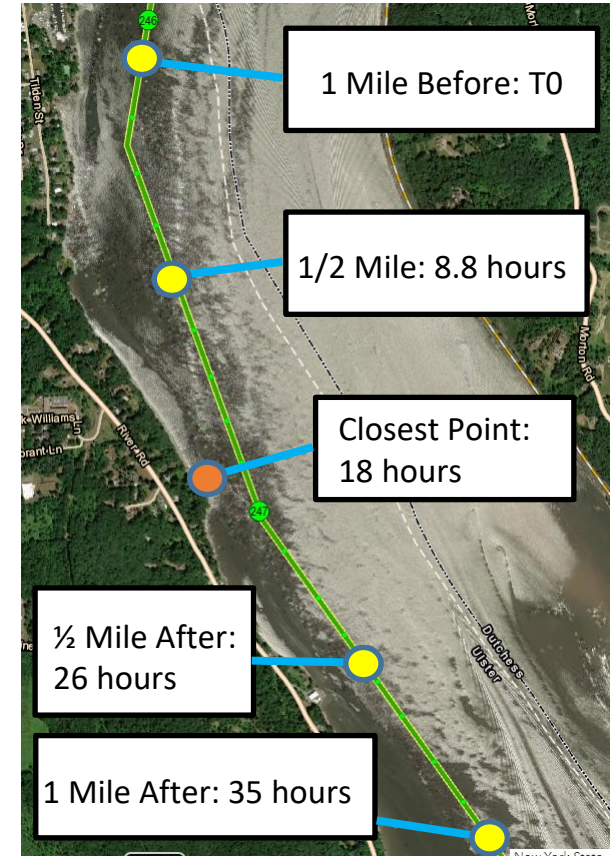
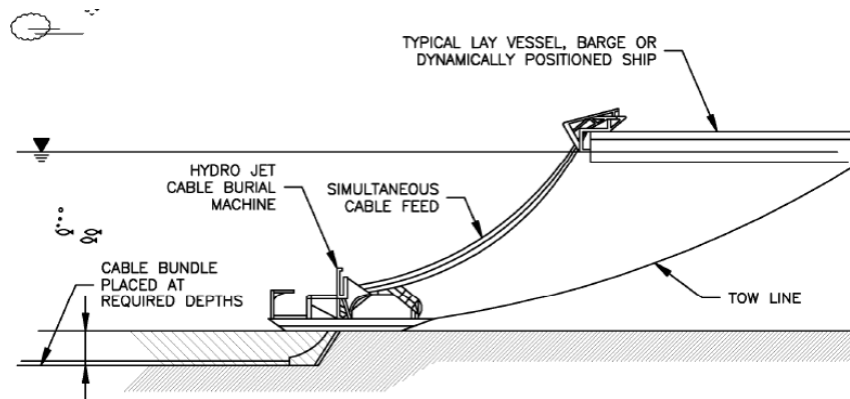
HVDC Transmission Cables

- Two ~5-inch diameter cables are buried / submerged along the entire route
- Cables bundled into single 2-foot wide trench
- Cables are solid state and do not contain liquids



HVDC Installation

- Cables near Hudson 7 PWS installed with jet plow
- Sediment fluidized, with much of sediment settling back into trench
- Minimum installation rate of 300 feet / hour and supervised by environmental inspectors based on permit conditions
- Impacts related to installation and operation deemed minimal by state and federal agencies

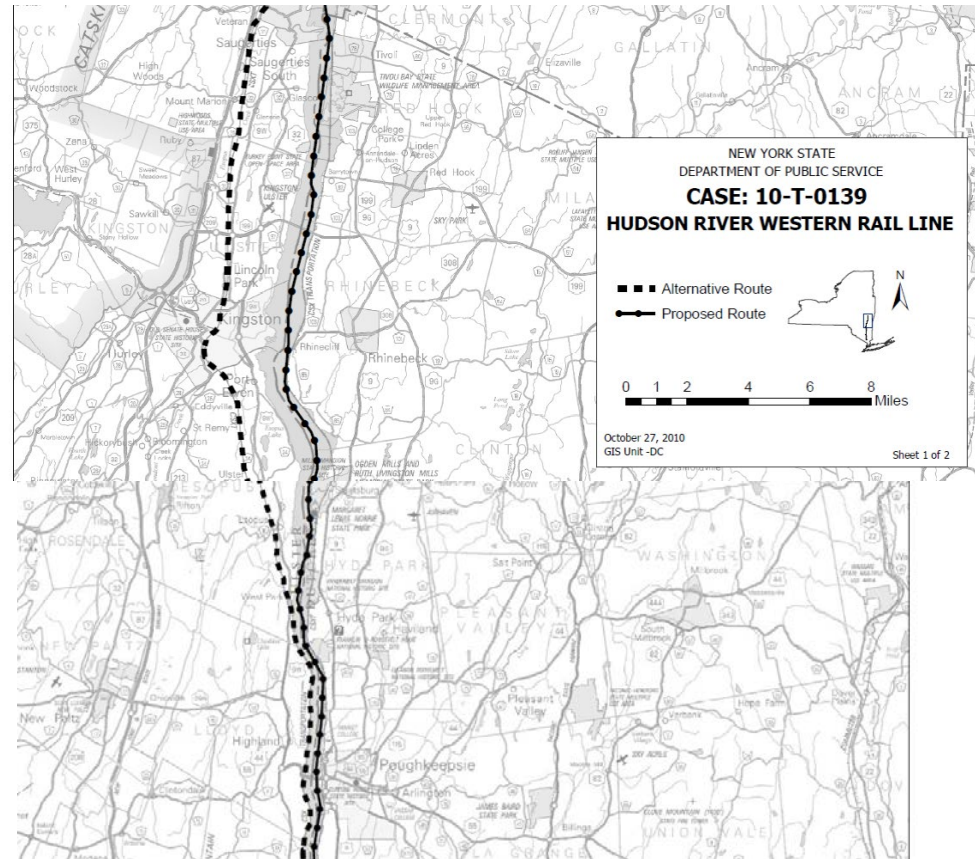


Burial Tools – High Performance Plow System



Alternatives Analyses

- New York State Department of Public Service provided alternatives, including Hudson River Western Rail Line
- Alternative routing would be overland from Bethlehem to Clarkstown
- Overland routing was incorporated to Cementon and then a bypass of Haverstraw Bay
- Joint Proposal states “alternatives analysis provided as Exhibit 86 demonstrated that there were no feasible alternatives to locating the HVDC Transmission System in the Hudson River between Cementon and Haverstraw Bay.”



CSX Rail ROW – Rockland



Previously was only single-track with substantial room for construction

No equipment access or area in drop off for installation



Requires a substantial HDD with private property easements for launching/receiving



The construction of a 2nd track will result in no space for access / installation



Railroad ROW completely occupied with CSX and Orange & Rockland facilities



No ROW available due to rock faces -- State park prohibits ledge installation



The drop-off, construction of a 2nd track and Orange & Rockland facilities in ROW make installation impossible

Joint Proposal of Settlement

Joint Proposal of Settlement

- Agreement that interests of parties given “fair and reasonable” consideration and project is in “public interest”
- Thirteen signees, including seven state agencies, Riverkeeper, and Scenic Hudson

Settlement Negotiations

- Settlement negotiations conducted over 16-month period and covered wide variety of topics, including water quality and water intake systems
- Public Service Commission’s regulations for settlement require participants to keep the positions of all parties confidential
- TDI is therefore limited in terms what can be said about the process of developing the Joint Proposal and the associated Certificate Conditions

BEFORE THE
PUBLIC SERVICE COMMISSION
STATE OF NEW YORK

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.

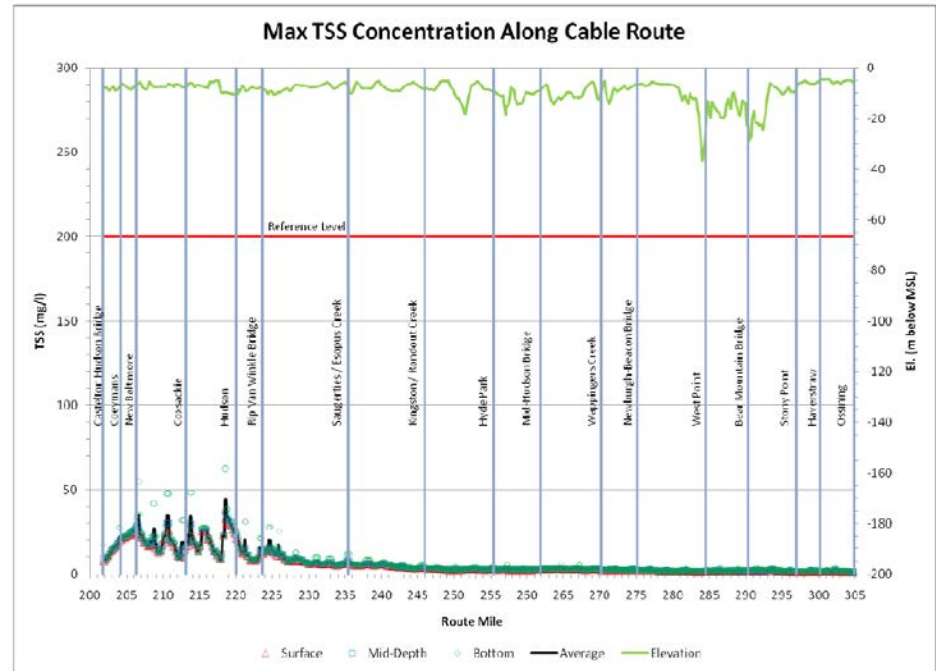
Case No. 10-T-0139

JOINT PROPOSAL

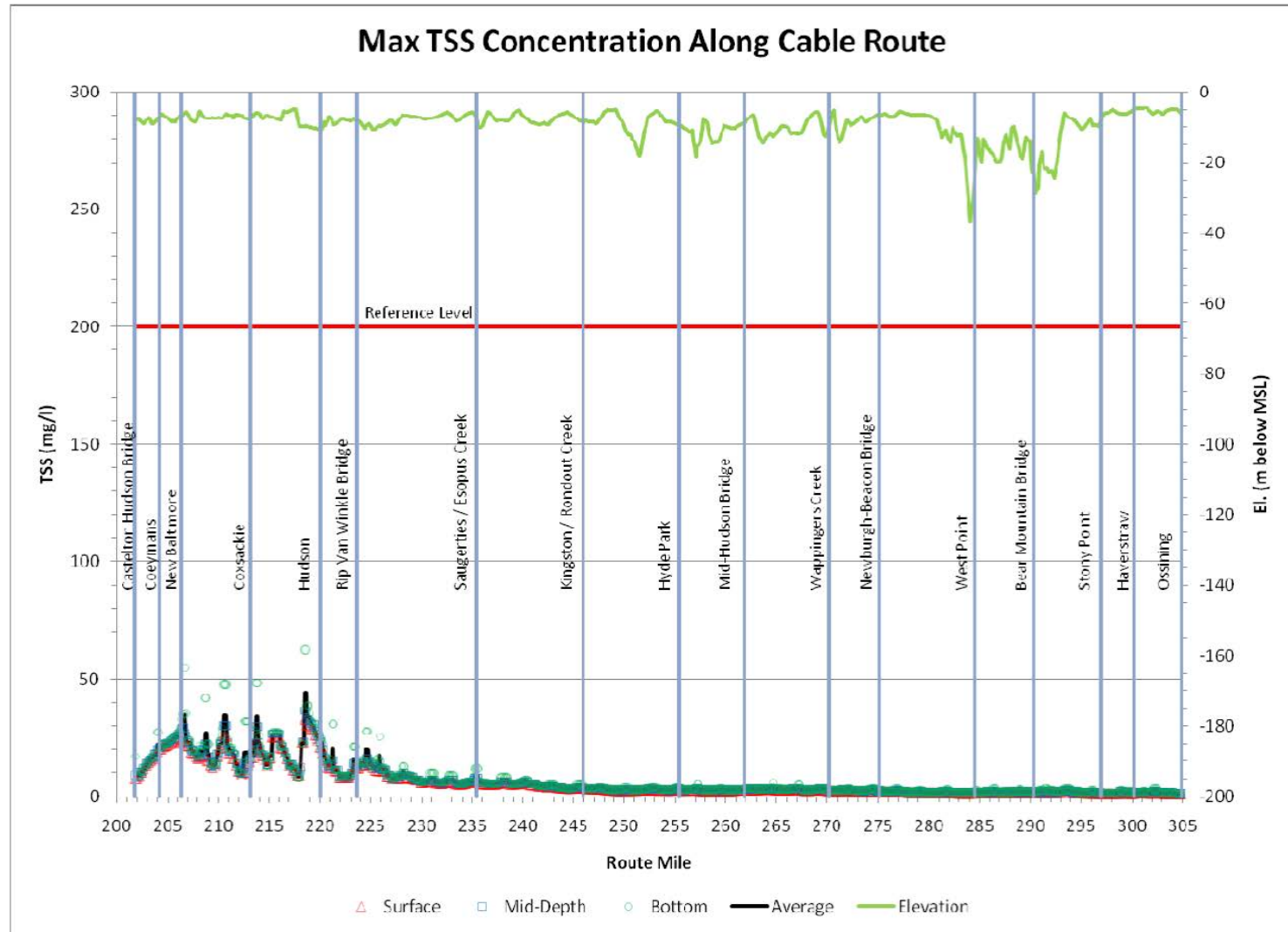
Champlain Hudson Power Express, Inc. (“CHPEI”), CHPE Properties, Inc. (“CHPE Properties,” and, together with CHPEI, “the Applicants”), Staff of the New York State Department of Public Service designated to represent the public interest in this proceeding (“DPS Staff”), the New York State Department of Environmental Conservation (“NYSDEC”), the New York State Department of State (“NYSDOS”), the New York State Department of Transportation (“NYSDOT”), the Adirondack Park Agency (“APA”), the New York State Department of Agriculture and Markets (“Ag & Mkts”), Riverkeeper, Inc. (“Riverkeeper”), Scenic Hudson, Inc. (“Scenic Hudson”), the City of Yonkers, the New York State Council of Trout Unlimited (“Trout Unlimited”), the City of New York (“CNY”), the New York State Office of Parks, Recreation and Historic Preservation (“OPRHP”) and the Palisades Interstate Park Commission, and any other parties executing this Joint Proposal (collectively, “the Signatory Parties”) respectfully submit this Joint Proposal on the 24th day of February, 2012,

Water Quality Modeling

- Three-dimensional hydrodynamic and time-variable water quality model
- From Rhinebeck (MP 244) to Lloyd (MP 260), the expected increase in the concentration of Total Suspended Solids (TSS) is expected to be less than 10 mg/L at the surface
- Modeling for arsenic, cadmium, mercury, benz(a)anthracene, pyrene, copper, lead, and phenanthrene showed levels below Acute Aquatic Standard
- For PCBs, concentrations below Class A water quality standard for human health as a water supply



Water Quality Modeling (Cont'd.)



Monitoring Procedures

Pre-Installation Trial

- Pre-installation trials of jet plow to simulate cable installation and refine operating configurations
- Results submitted to Department of Public Service and Department of Environmental Conservation
- Report provided as part of Environmental Management and Construction Plan (EM&CP)

Installation Monitoring

- Real time monitoring of Total Suspended Solids and turbidity
- Laboratory testing for TSS (to calibrate field instruments) and chemical parameters
- Daily reporting of monitoring results

PWS Monitoring

- Funding for pre- and post-installation and debris removal work
- Open to providing funding for turbidity monitoring while in-water work is occurring

Other Concerns

PWS Notification

- Notice of EM&CP availability will be provided one month in advance
- Notify operators at least 30 days before any underwater work within one mile of facility

Construction Window

- Letter suggests no construction between May 15th and September 15th
- However, required to install from August 1st and October 15th in this section of the Hudson River
- Installation in August also avoids higher turbidity levels in the fall reported by operators



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CHPE PROJECT - PROTECTING THE HUDSON RIVER DRINKING WATER SUPPLY?

HUDSON 7

Paul Malmrose, PE
January 21, 2020

WHO IS THE HUDSON 7?

- **Seven municipalities that withdraw water from the Hudson River.**

- City of Poughkeepsie
- Town of Poughkeepsie
- Town of Esopus
- Town of Llyod
- Village of Rhinebeck
- Town of Rhinebeck
- Town of Hyde Park



- **Agreed to form the Hudson River Drinking Water Intermunicipal Council in May 2018**

REASONS FOR THE HUDSON 7

- Major Goal – To protect the Hudson River drinking water supply
- Hudson 7 serves 106,000 people
- Created with the help of the Riverkeeper
- Safe operation of five water treatment plants
- Identified gaps regarding drinking water protection
- To work together to address common issues



HUDSON 7 HAS SERIOUS CONCERNS ABOUT CHPE

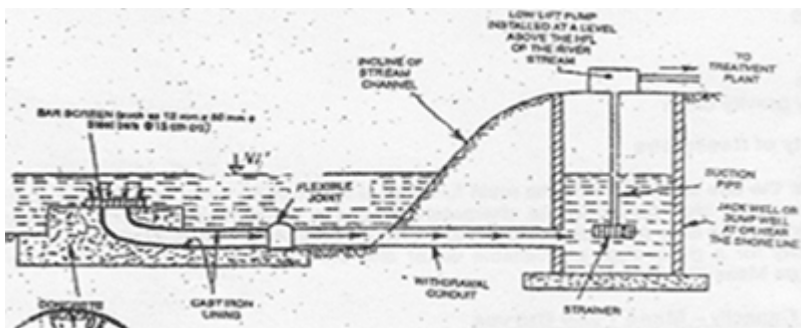
- The project was developed without adequate input from the Hudson 7 and NYSDOH.
- Construction will present unacceptable risks to 106,000 people, 3 hospitals and 3 colleges and potential risk to TDI. **We don't want a Flint, MI.**
- TDI's planned protections are flawed, inadequate and not preventative.
- A terrestrial route must be considered.
- Jet plowing will churn up pollutants which will remain in suspension at the river bottom.

JET PLOWING WILL CHURN UP POLLUTANTS



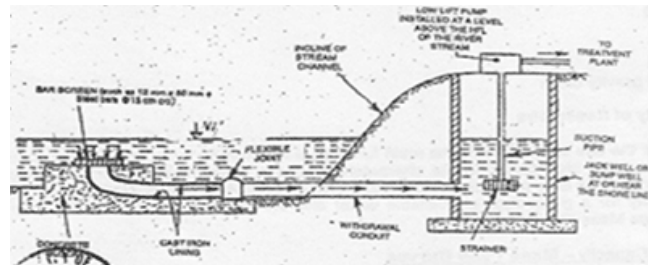
TDI'S CONSIDERATIONS FOR PROJECT ROUTE

- **Fish & Environment**
- **Marine Traffic**
- **Soil Conditions**
- **Infrastructure**



WHAT THE PRIORITIES SHOULD BE TO **PREVENT RISK**

- **Drinking water for 106,000 people**
- **Fish & Environment**
- **Marine Traffic**
- **Soil Conditions**
- **Infrastructure**



TDI'S QUESTIONS IN 2010 ABOUT INTAKES

- **Coordinates for intake**
- **Depth**
- **Flow rates**
- **Size of Intake**
- **Cross sectional area**
- **Dimensions and slots of screens**
- **Permitted withdrawal**
- **Location of other structures**
- **Additional environment information**

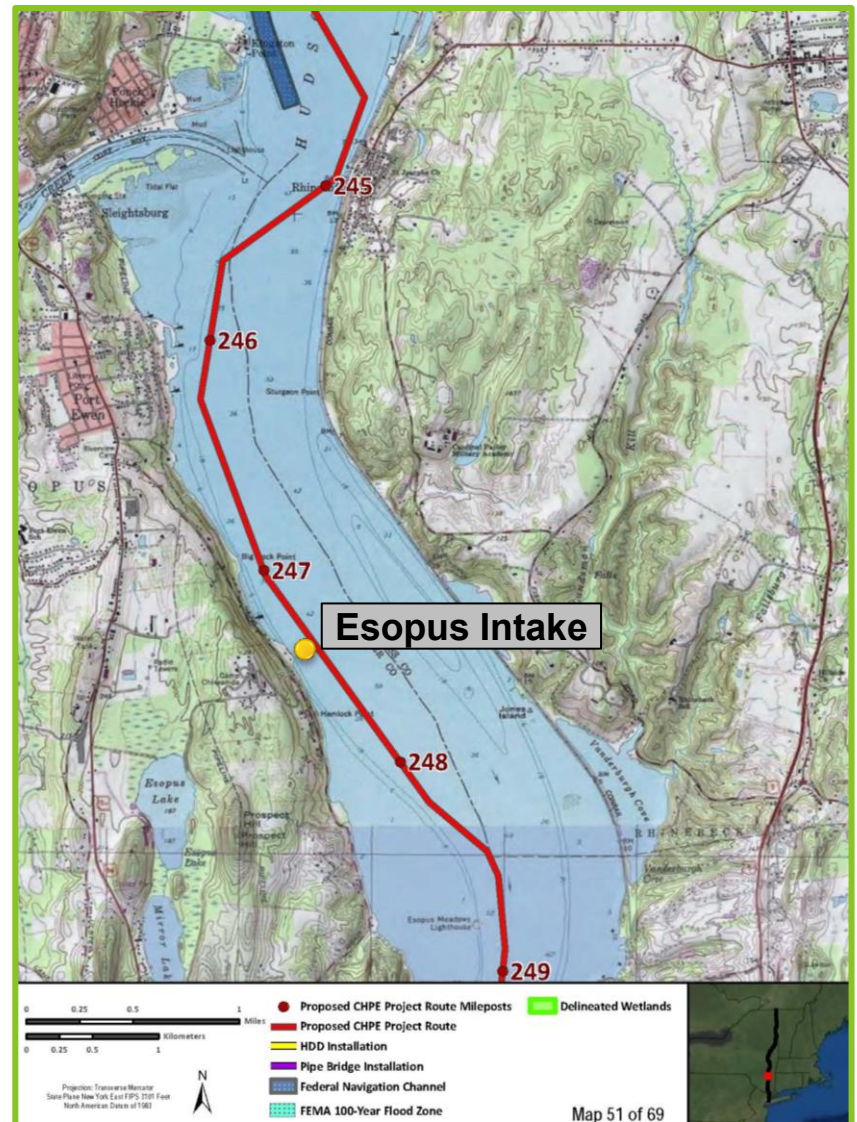
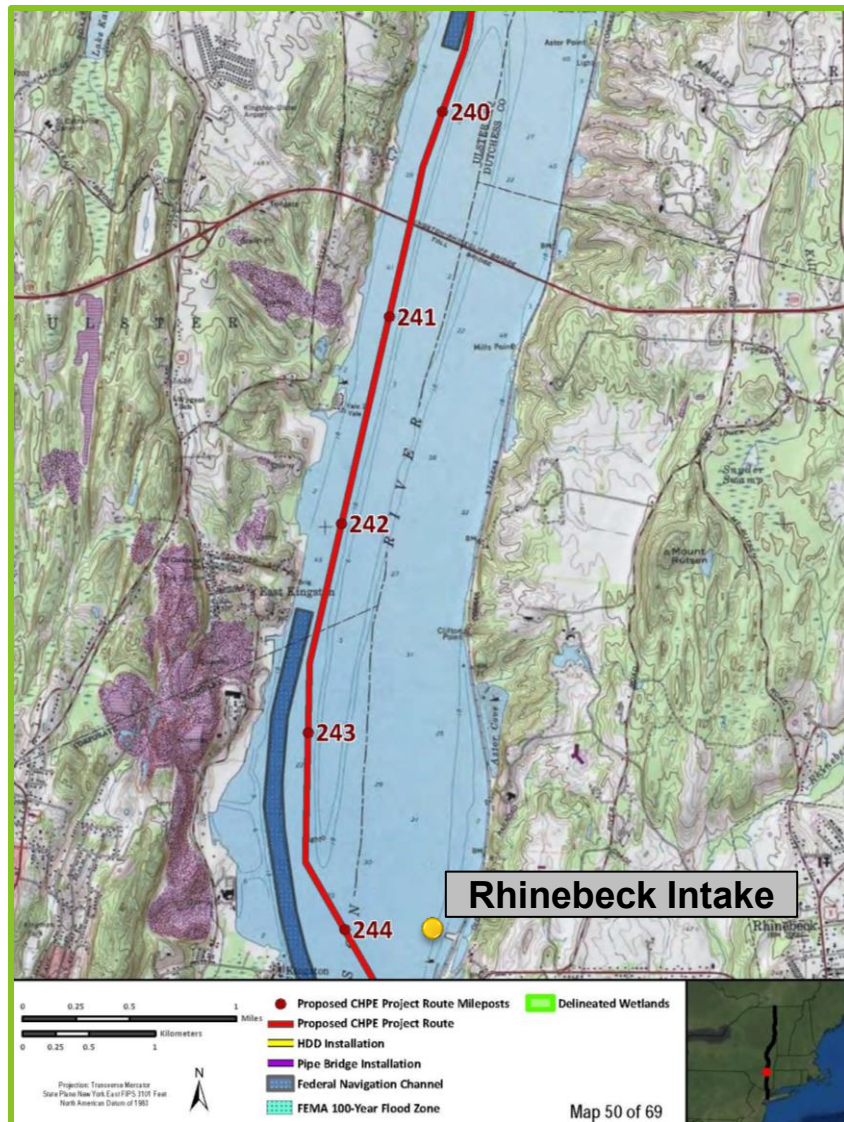
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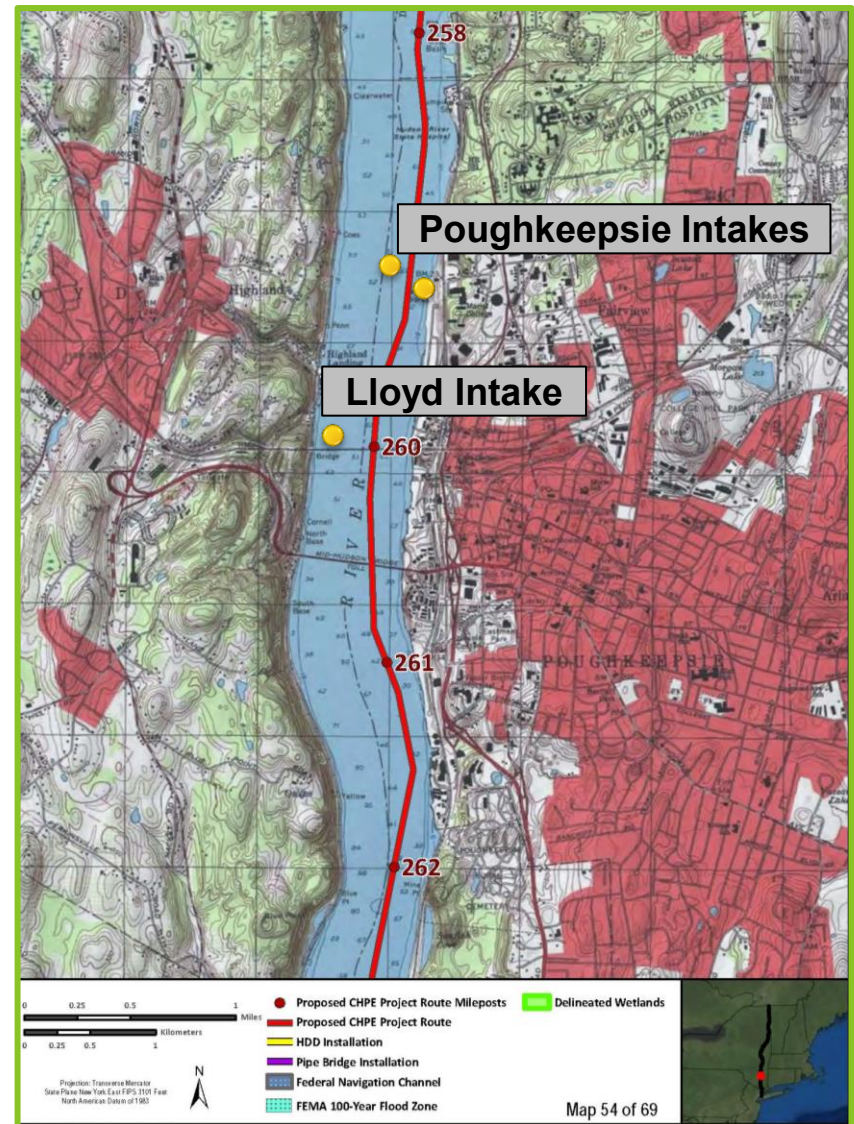
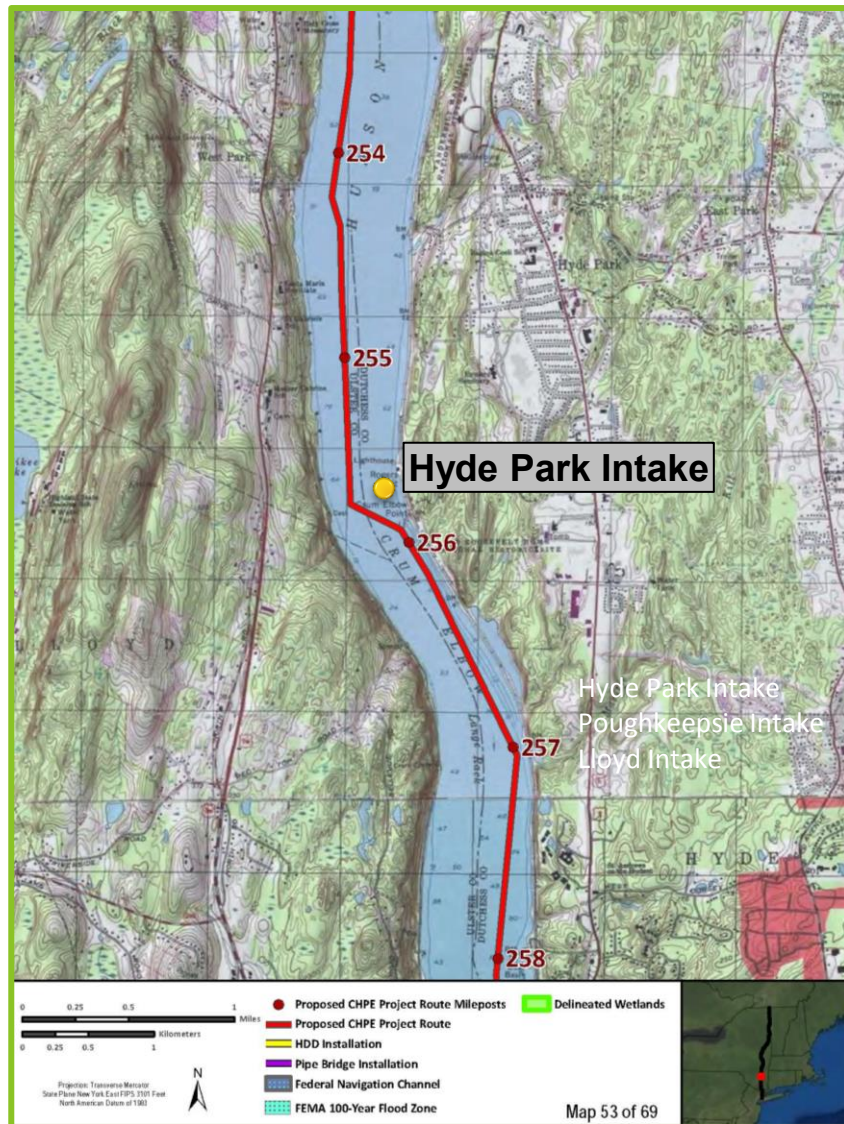
Do you see any questions about protecting drinking water?

Did NYSDOH review this information?

RHINEBECK AND ESOPUS INTAKES



HYDE PARK, POUGHKEEPSIE & LLOYD INTAKES



POLLUTANTS FROM HUDSON RIVER SEDIMENTS

ACCORDING TO TDI'S FINAL ENVIRONMENTAL IMPACT STATEMENT FOR CHPE

PCBs

Dioxins

Heavy Metals

- Arsenic
 - Cadmium
 - Mercury
 - Copper
 - Lead
-
- Total suspended solids (TSS)

Petroleum Compounds

Polycyclic Aromatic Hydrocarbons (PAHs)

- Benz(a)anthracene
- Pyrene
- Phenanthrene
- Naphthalene

Pesticides

- 4,4 DDE

Turbidity

THE ONLY POLLUTANTS TDI WILL MONITOR

PCBs

Heavy Metals

- Arsenic
 - Cadmium
 - Mercury
 - Copper
 - Lead
-
- **Total suspended solids (TSS)**

Dioxins

Petroleum Compounds

Polycyclic Aromatic Hydrocarbons (PAHs)

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Pesticides

- 4,4 DDE

Turbidity

THESE POLLUTANTS SHOULD ALSO BE MONITORED

- **Total Organic Carbon (TOC)** – Can form cancer causing compounds, regulated by EPA and NYSDOH. Remains in solution after being churned up.
- **PFAS** – Newly regulated cancer-causing compounds found in Newburgh, Hoosick Falls, Rockland County and elsewhere

CENTRAL HUDSON MGP REMEDIATION PROJECT

- Company and regulators didn't perceive risk to intakes
- Models didn't accurately predict PAH dispersal in tidal estuary
- Project contaminated intakes
- Result: multi-million dollar re-engineering, pilot testing, and multi-year delay of project
- **(some) lessons learned**
 - Focus on prevention, not just reaction
 - Pilot testing is a must in the Hudson 7 area



MONITORING THE CONSTRUCTION

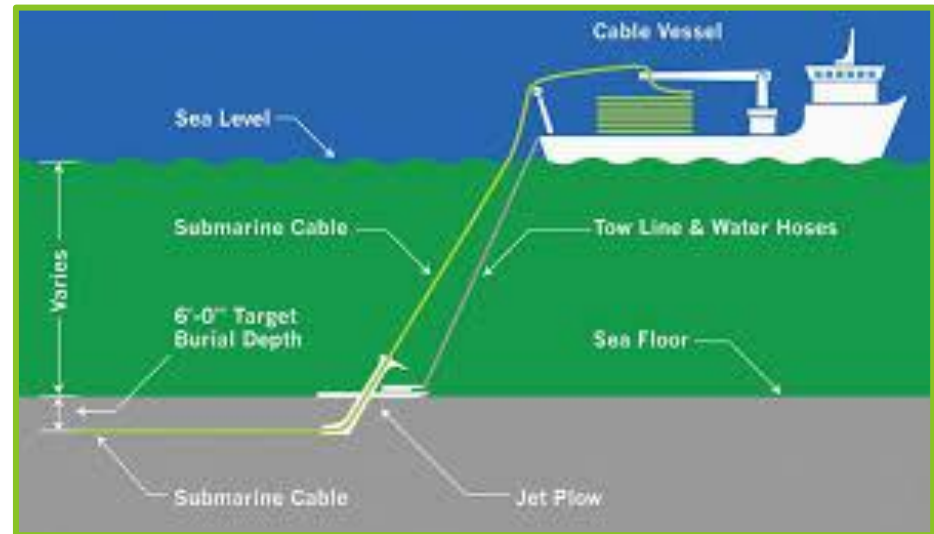
ANY MONITORING PLAN SHOULD BE APPROVED BY NYSDOH

- **TDI will monitor TSS before and after**

- Hudson River – Difference: 200 mg/L
- Lake Champlain – Difference: 100 mg/L
- TDI will report to DPS and DEC and modify operation but not stop

- **A *preventative* approach would be:**

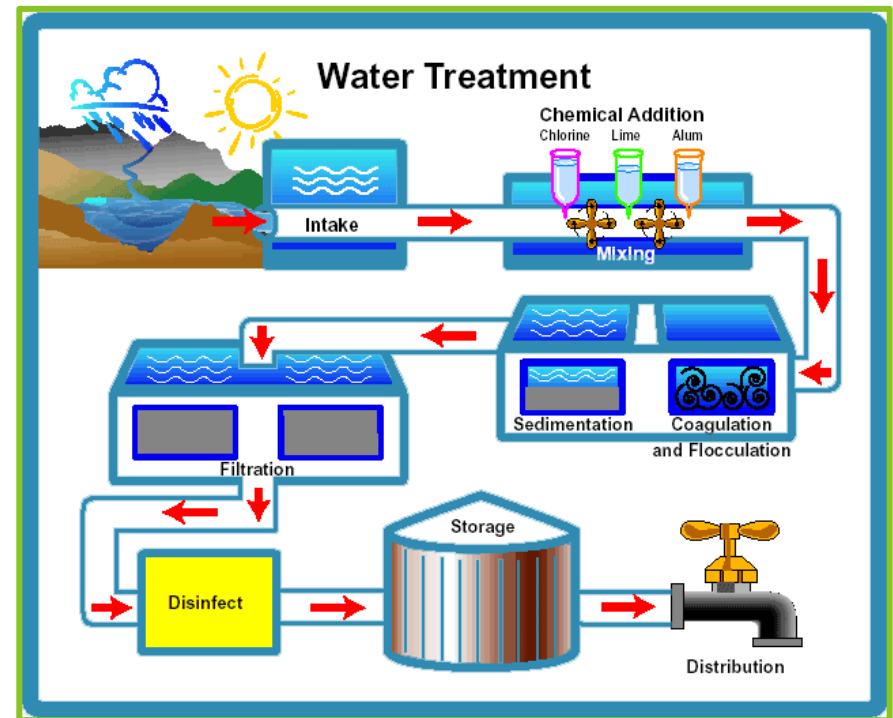
- Continuously monitor turbidity
- Stop operation at a difference of 100 NTU
- To monitor all pollutants of concern



MONITORING WATER TREATMENT PLANTS

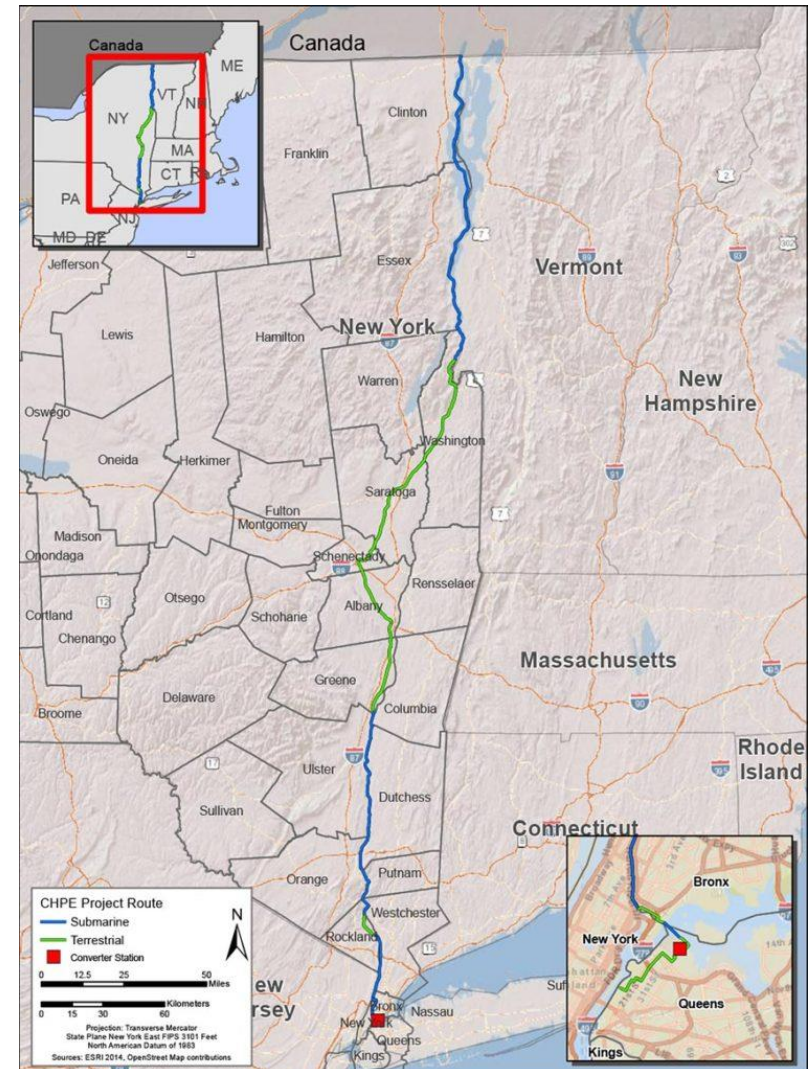
ANY MONITORING PLAN SHOULD BE APPROVED BY NYSDOH

- TDI will take action only *after* an MCL in the **finished water is exceeded**
 - Step 1 – Modify operations but not shutdown. No notification to DOH.
 - Step 2 – If modifications do not work, then shutdown
 - This will allow polluted water to enter distribution system for days
- A **preventative approach** would be:
 - Monitor raw water at intakes continuously for turbidity & TOC
 - If turbidity increases by 50 NTU, shutdown
 - If TOC increases by 1.5 mg/L, shutdown
 - To monitor all pollutants of concern



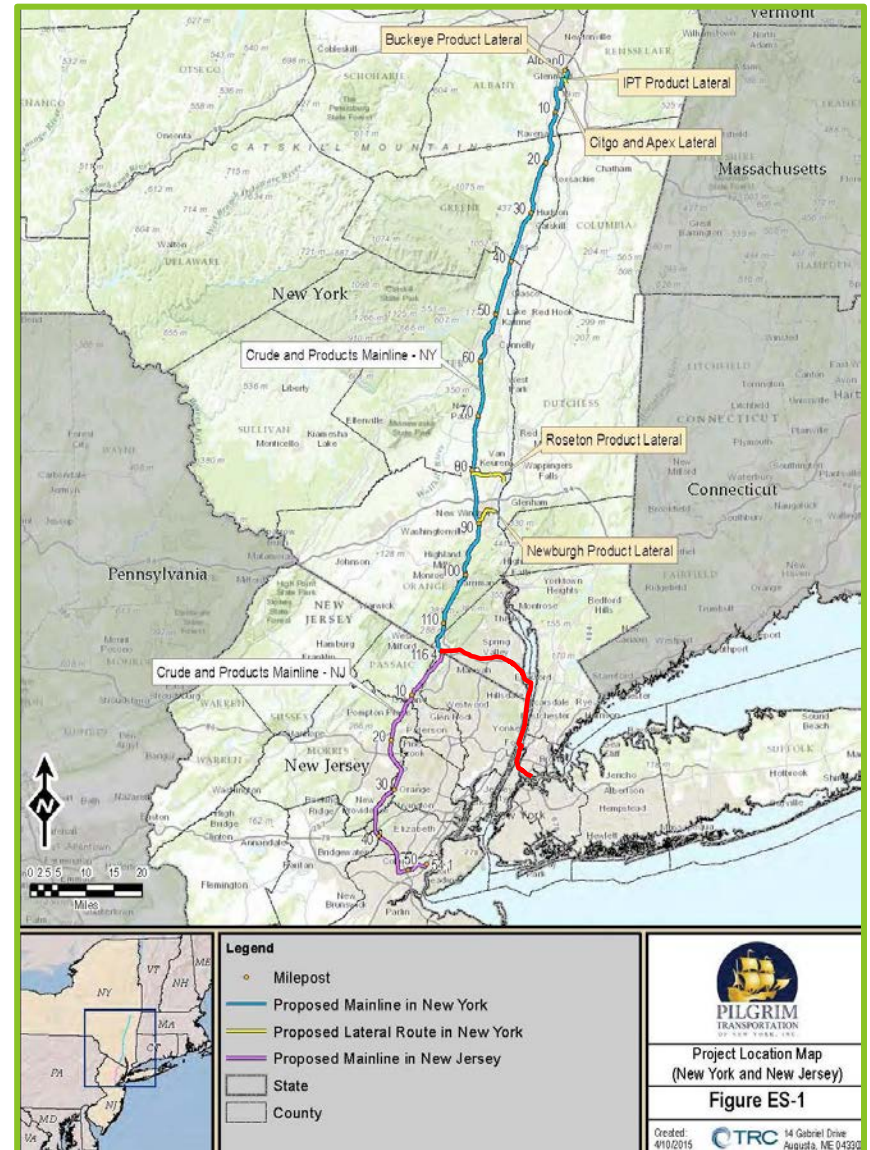
WHY NOT A TERRESTRIAL ROUTE?

- Route is terrestrial north of Ulster and Dutchess Counties
- CSX Railroad – No
- NYS Thruway said no at the start of the CHPE Project (2008)
- But how about now in 2021?
- The NYS Thruway said, “YES” to the Pilgrim Pipeline



A BETTER ROUTE (PILGRIM PIPELINE)

- Northway
- NYS Thruway
- Enter Hudson River at the Mario Cuomo Bridge



FINAL QUESTION

Would NYC allow jet
plowing in the
Ashokan Reservoir?





DISCUSSION / QUESTIONS?

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