Summary of Licensing Studies at Cannonsville, Pepacton and Neversink Developments

Cannonsville

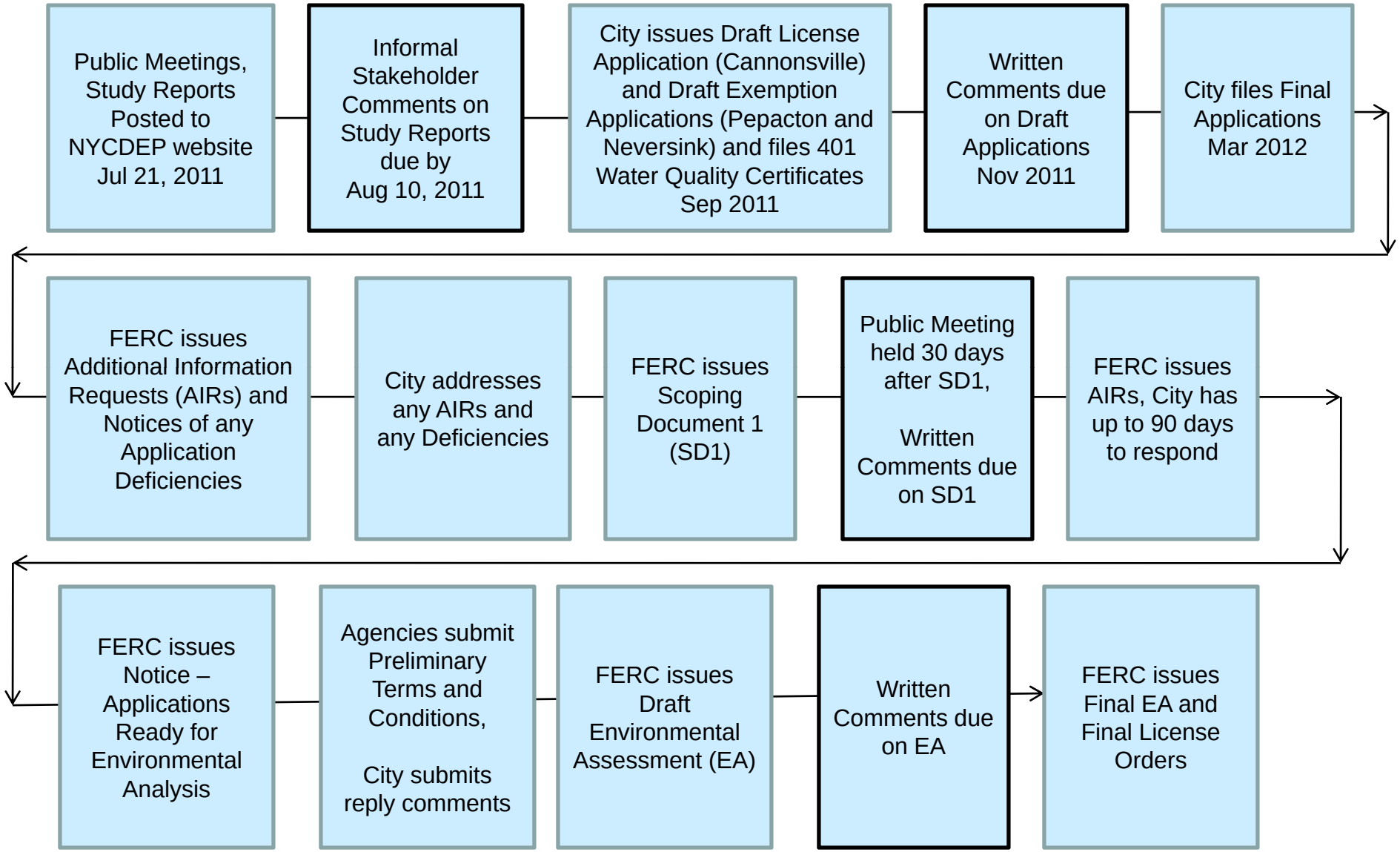
Pepacton

Neversink

Agenda

- Overview of Licensing Schedule
- Project Layouts
- Operating Regime
- Studies
  - Entrainment
  - Wetlands, Wildlife, and Rare, Threatened and Endangered Species
  - Erosion
  - Aesthetics
  - Cultural Resources
  - Socioeconomics
- Questions/Comments

Licensing Schedule

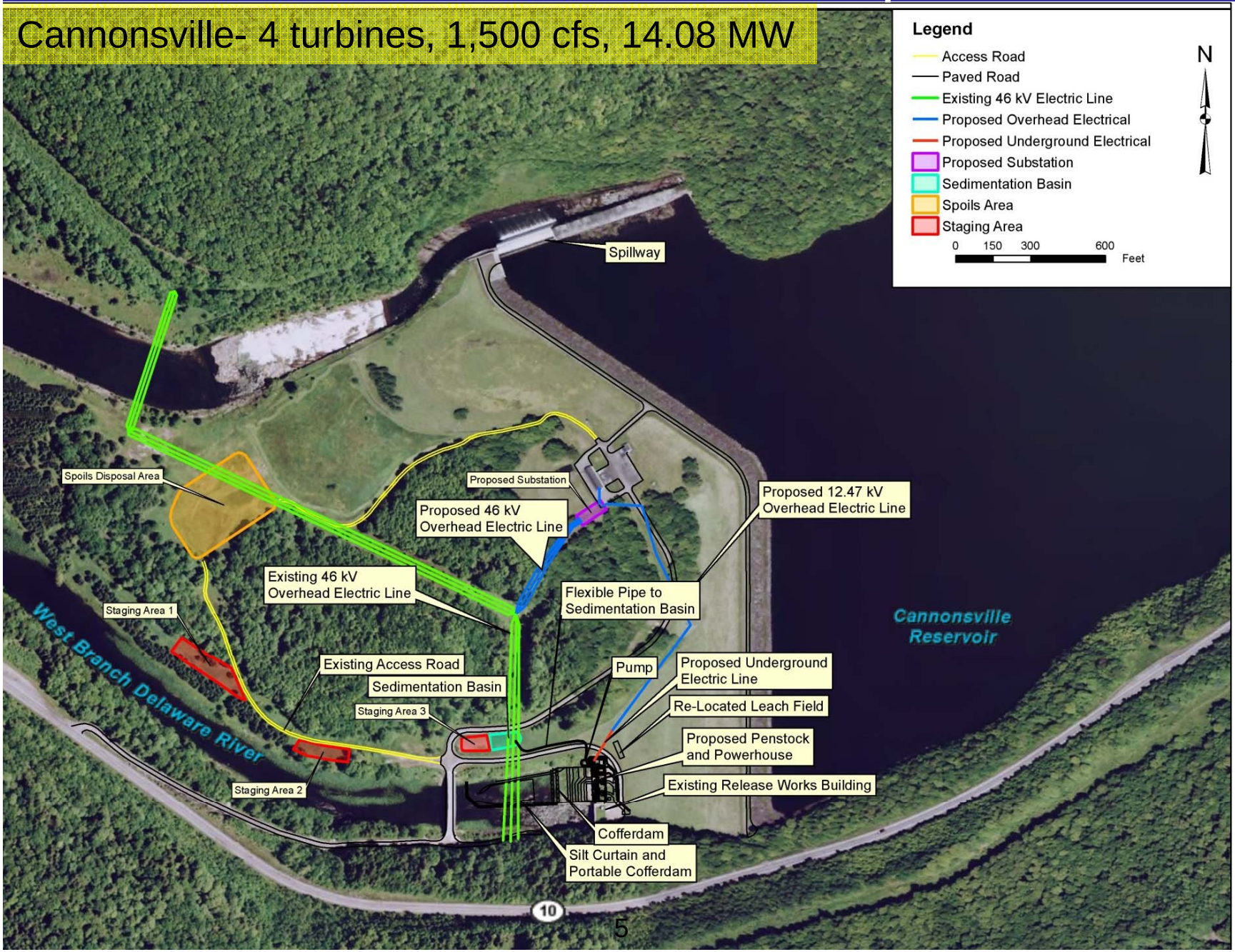


Schoharie Development

- A feasible project has not yet been identified for this location
- We continue to investigate options that will contribute to a viable project
- If a feasible project is identified, the necessary studies will be determined, scoped, and conducted
- Designing a connection point on the new lower release works to support future hydroelectric generation

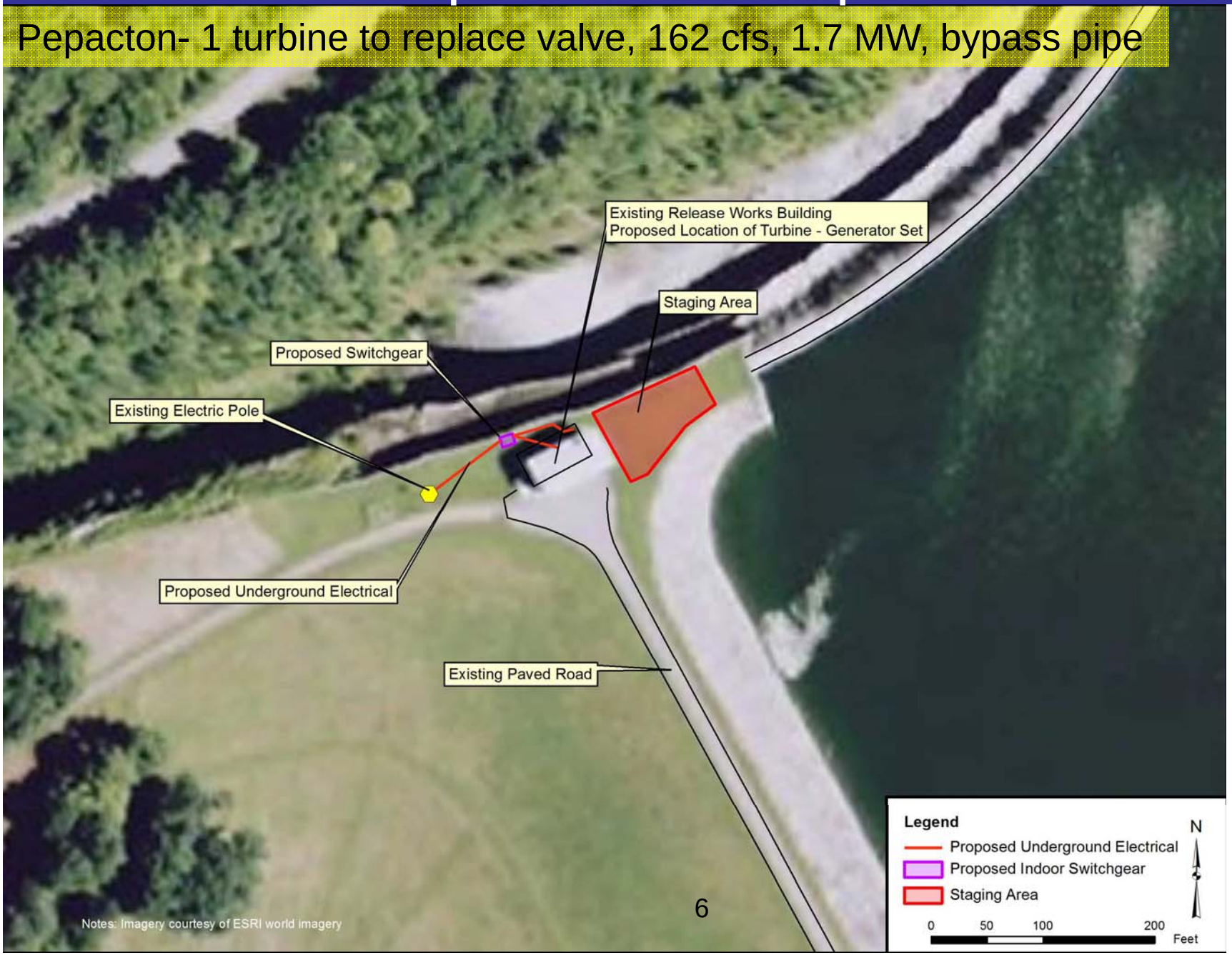
Cannonsville Development

Cannonsville- 4 turbines, 1,500 cfs, 14.08 MW



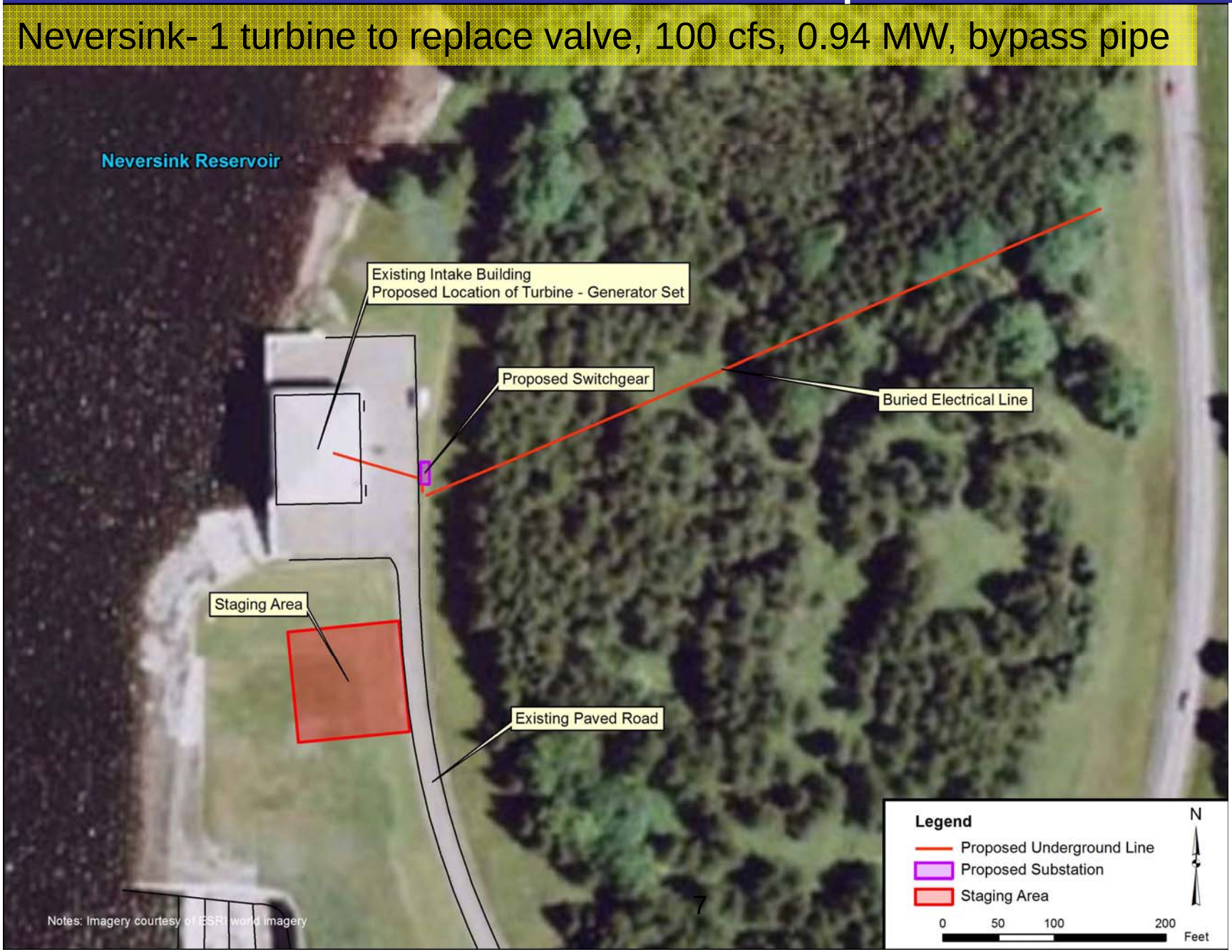
Pepacton Development

Pepacton- 1 turbine to replace valve, 162 cfs, 1.7 MW, bypass pipe



Neversink Development

Neversink- 1 turbine to replace valve, 100 cfs, 0.94 MW, bypass pipe



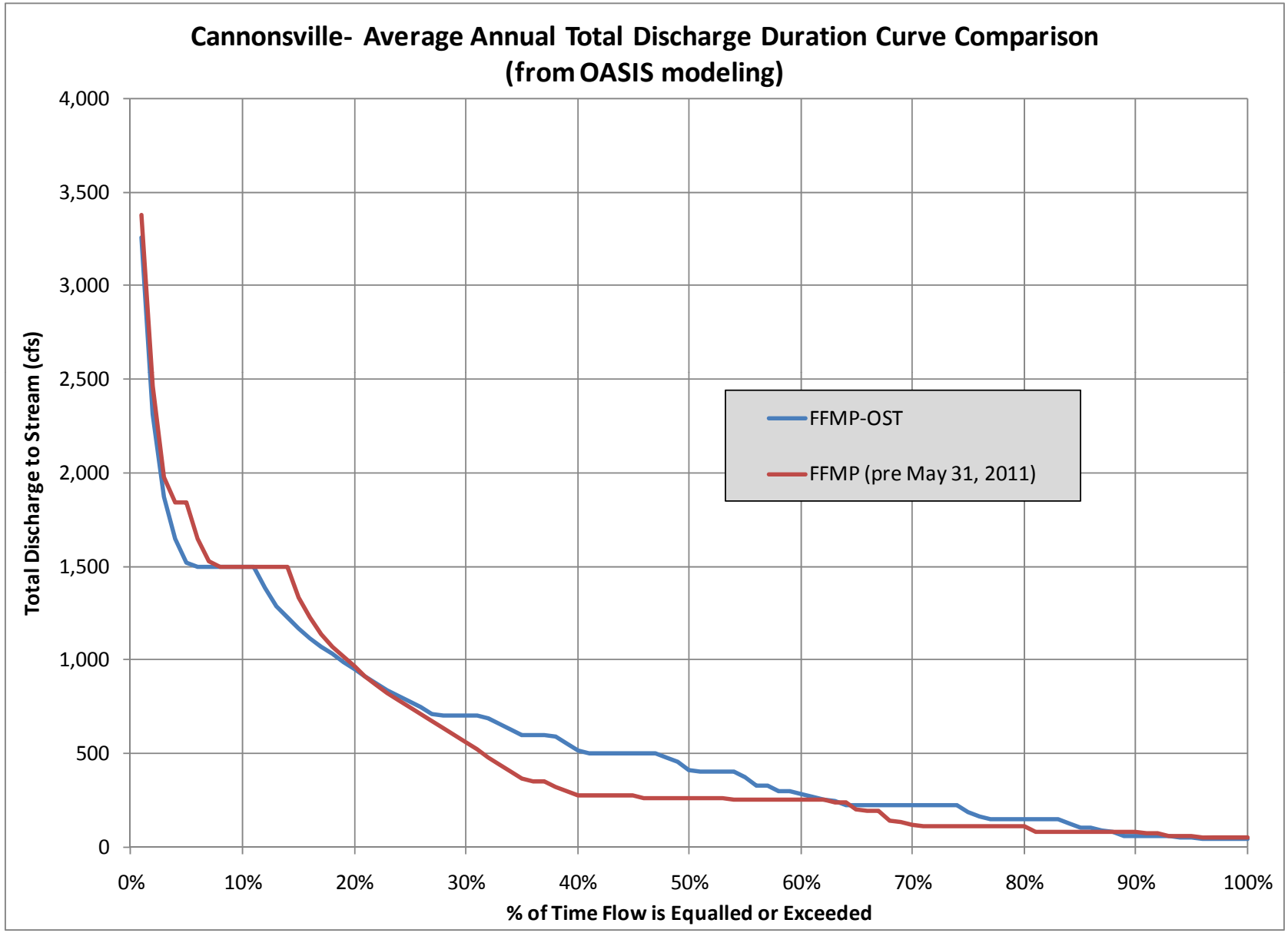
Operating Regime

- As of June 1, 2011, non-water supply discharges from the Cannonsville, Downsville, and Neversink Dams have been governed by the Flexible Flow Management Program – Operations Support Tool (FFMP-OST)

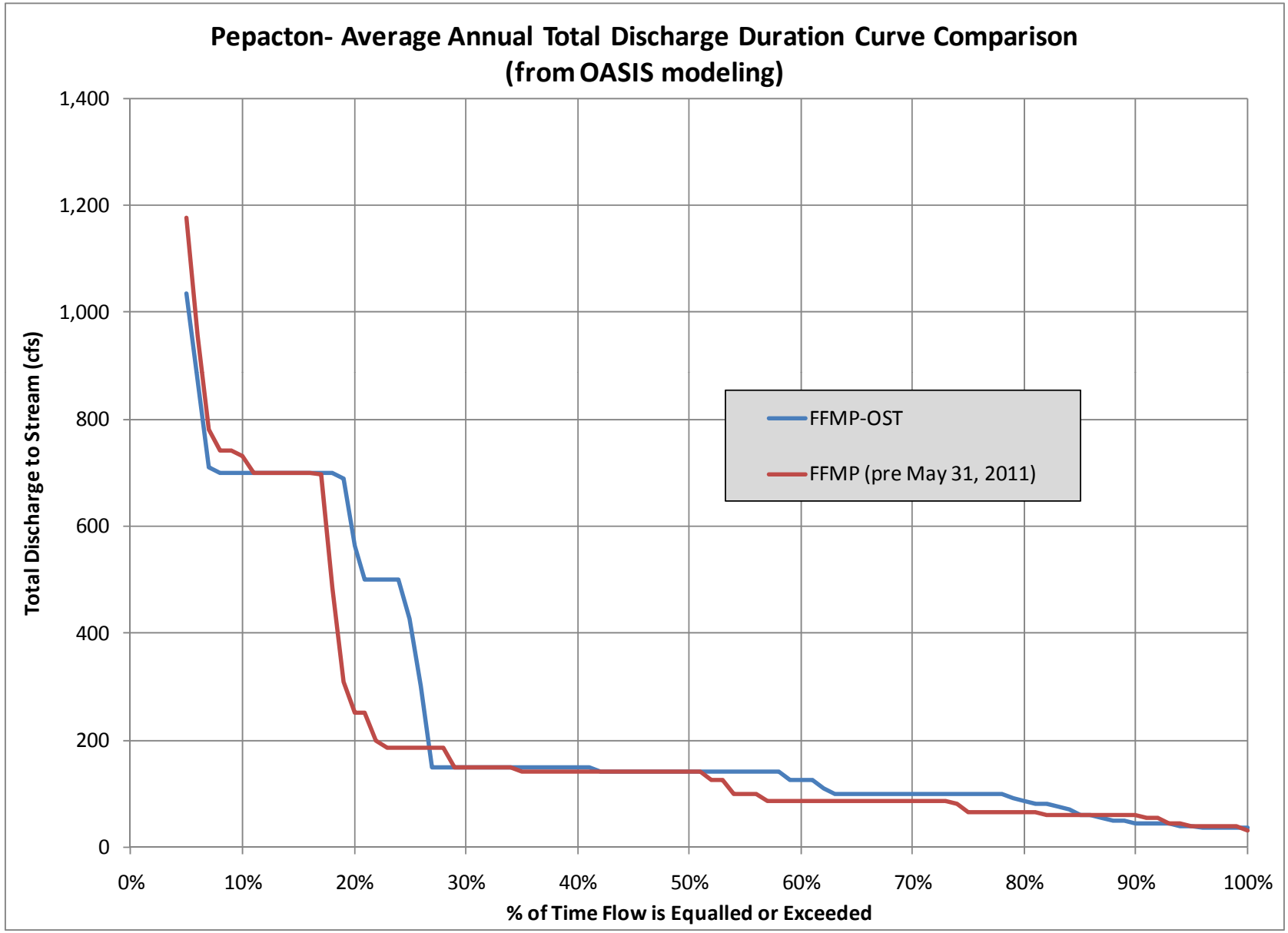
- The FFMP-OST will remain in place through May 31, 2012 and may be extended by agreement among the Decree Parties (the City and States of New York, Pennsylvania, New Jersey, and Delaware)
  - A successor flow regime will be established by the Decree Parties when the FFMP-OST expires

- Generally FFMP-OST results in greater discharges below the Dams than under prior flow regimes

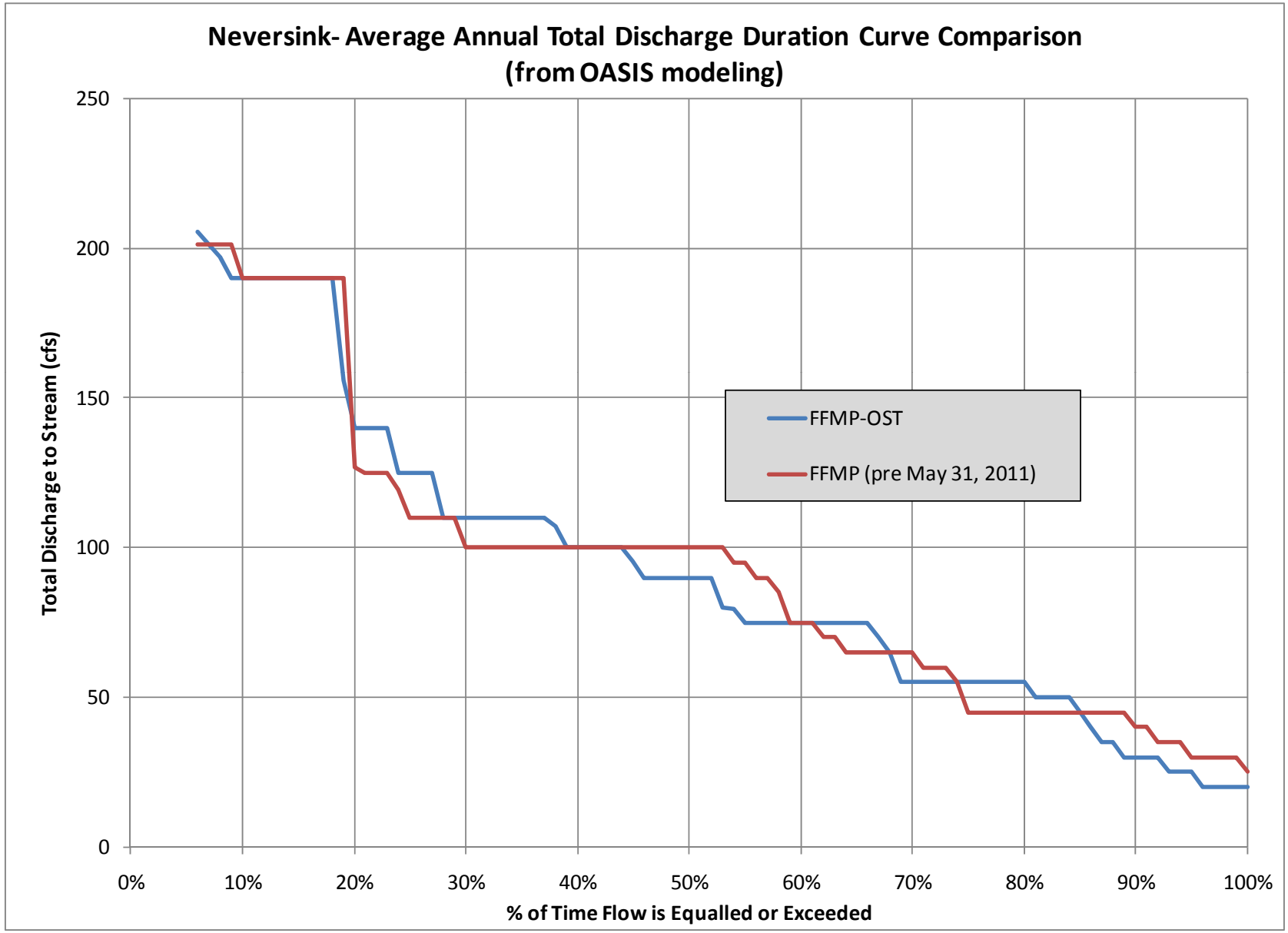
Comparison of FFMP and FFMP-OST – Cannonsville



Comparison of FFMP and FFMP-OST – Pepacton



Comparison of FFMP and FFMP-OST – Neversink



Entrainment Study - Work Undertaken

- Entrainment
  - Conducted literature search to determine potential for entrainment and impingement
  - Evaluated likelihood of fish presence near intakes based on water quality, species composition, and reservoir water level operations
  - Compared fish swim speeds to intake velocities
- Mortality
  - Evaluated pressure differentials between low-level intakes and release works
- Intake Protection
  - Evaluated sufficiency of existing intake protection measures (bar racks) and need for additional measures (physical and behavioral)
- Downstream Fish Passage
  - Evaluated need and alternatives for downstream fish passage

Entrainment Study - Results

- Entrainment
  - Based on the habitat/life history requirements and fish swimming speeds, entrainment is expected to be low for all species
  - The risk of entrainment for fry and juvenile fishes is minimal

- Mortality
  - Pressure differentials between the intake structures and release works cause fish mortality regardless of the hydropower facilities

- Intake Protection
  - Additional intake protection measures are not needed based on the assessment of entrainment and mortality

- Downstream Fish Passage
  - A low level fish passage is not practical due to the pressure differential and nature of the existing facilities
  - A surface level fish passage is not desirable due to mixing warmwater with downstream coldwater fishery and its incompatibility with the habitat of the species of most interest (*e.g.*, trout)

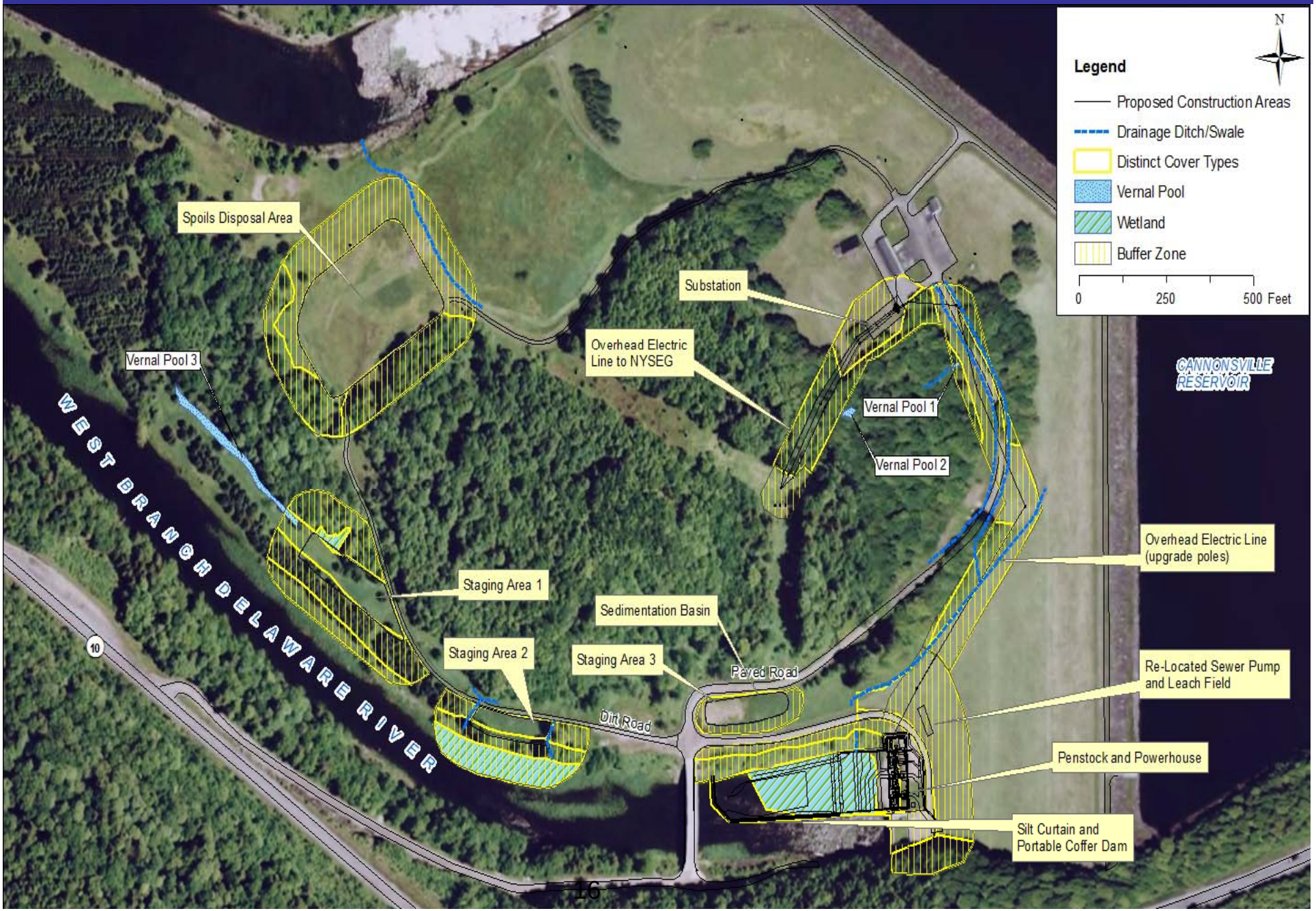
Wetlands, Wildlife, and RTE Report Study - Work Undertaken

- Identified potential species, habitats, and wetlands that may be present at each development site
- Consulted with DEP biologists and field personnel regarding the presence of the identified species, potential habitats, and locations of wetlands
- Developed base maps of proposed disturbed areas and buffer zones
- Conducted field studies on June 28-30, 2010 and April 25-26, 2011
- Revised maps to overlay identified species, habitats, and wetlands on project areas and buffer zones
- Developed plans for mitigating impacts from construction and operation of the Project

Wetlands, Wildlife, and RTE Report - Cannonsville Results

- Botanical Resources
  - Vegetative cover types in impact areas include: open fields, mixed forest, and emergent and riverine wetlands
  - Location of the staging areas will have limited impacts - primarily to existing mowed fields
  - Locations of the generator lead, substation and interconnection facilities are not expected to cause or lead to adverse environmental impacts
  - 10 invasive plant species were found in the Project areas
- Wetlands, Riparian and Littoral Habitats
  - Location of the new powerhouse and tailrace will result in the conversion of a low-quality wetland to an open water area
  - Two other wetlands were identified in the buffer zones, but outside of impact areas
  - Three vernal pools were identified in or adjacent to the Project areas, but outside of impact areas
- Wildlife
  - Numerous bird species were observed, but no nesting areas were found in the Project areas
  - Evidence of reptiles and amphibians were found in the Project areas, but impacts to these species are expected to be limited as their habitats are located outside impact areas
- Rare, Threatened, and Endangered (RTE) Species
  - Bald eagles were observed, but no bald eagle nests were found in the Project areas; Dam area is known for a winter roosting area for bald eagles.
  - Jefferson's and longtail salamanders may use at least one of the vernal pools
- Mitigation
  - No wildlife or important habitats will be impacted by the Project or its construction, so no mitigation measures are needed. However, because bald eagles have been seen in the Project areas, bald eagle protection measures will be developed and instituted prior to construction. City will consult with agencies relative to limiting impacts to eagles during construction.

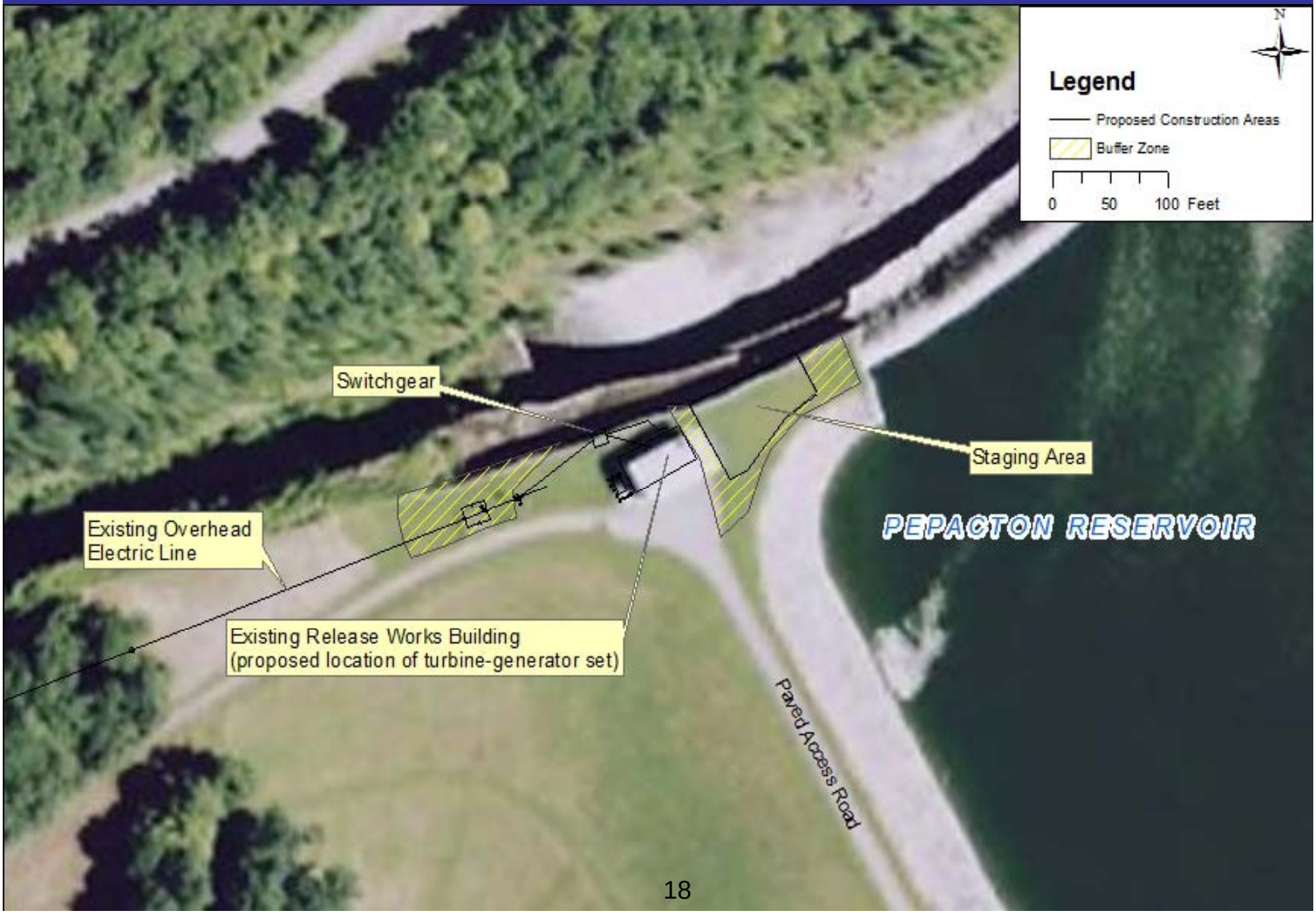
Cannonsville Site Conditions



Wetlands, Wildlife, and RTE Report - Pepacton Results

- Botanical Resources
  - Vegetative cover types in the Project areas consist of mowed grass and paved roads
  - Staging area located in an area of mowed grass and will not cause any adverse impacts
- Wetlands, Riparian and Littoral Habitats
  - None of these habitats are located in the Project areas
- Wildlife
  - Various bird species were observed in the Project areas
  - Cliff swallow nests were found in corners of the release water chamber building
- RTE Species
  - Bald eagles were observed, but no bald eagle nests were found in the Project areas
- Mitigation
  - No wildlife or important habitats will be impacted by the Project or its construction, so no mitigation measures are needed. However, because bald eagles have been seen in the Project areas, bald eagle protection measures will be developed and instituted prior to construction. City will consult with agencies relative to limiting impacts to eagles during construction.

Pepacton Site Conditions



Wetlands, Wildlife, and RTE Report - Neversink Results

- Botanical Resources
  - Vegetative cover types in the Project areas consist of mowed grass, paved roads, and a forest plantation
  - The staging area will be located in an area of mowed grass and will not cause any adverse impacts
  - No disruption to the forest plantation should occur because the interconnection facilities will use a pre-existing duct bank constructed through that area
  - One invasive plant species was found

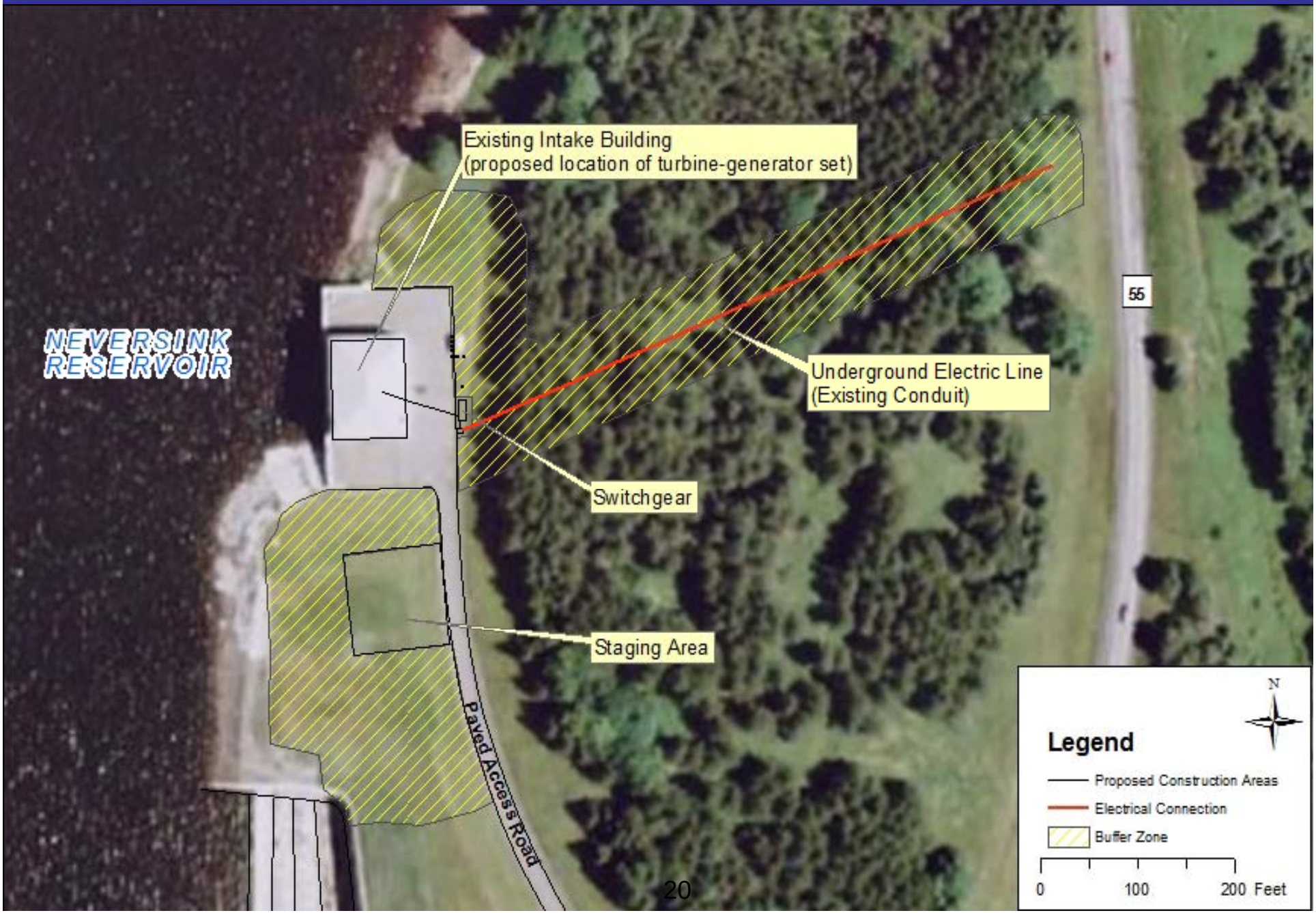
- Wetlands, Riparian and Littoral Habitats
  - None of these habitats are located in the Project areas

- Wildlife
  - Various bird species and white-tailed deer were observed in Project areas
  - Cliff swallow nests were found in corners of the intake structure

- RTE Species
  - Bald eagles were observed, but no bald eagle nests were found in the Project areas

- Mitigation
  - No wildlife or important habitats will be impacted by the Project or its construction, so no mitigation measures are needed. However, because bald eagles have been seen in the Project areas, bald eagle protection measures will be developed and instituted prior to construction. City will consult with agencies relative to limiting impacts to eagles during construction.

Neversink Site Conditions



Erosion Study - Work Undertaken

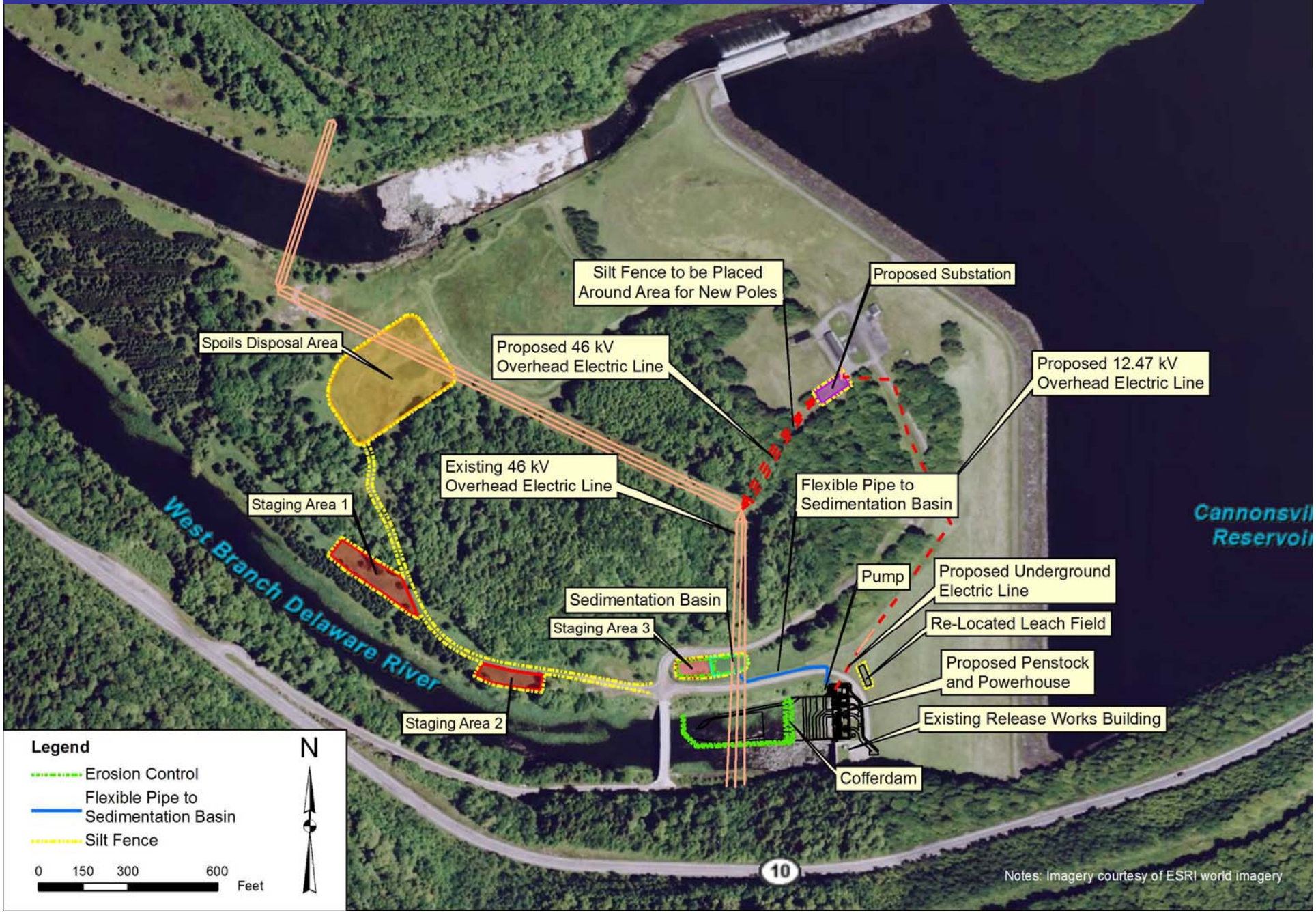
- Identified areas of potential impacts and need for erosion control measures during construction
- Developed conceptual level plans showing proposed sediment and erosion control measures
- Detailed erosion and sediment control plans will be prepared and incorporated into the final design of the Project

Erosion Study - Results

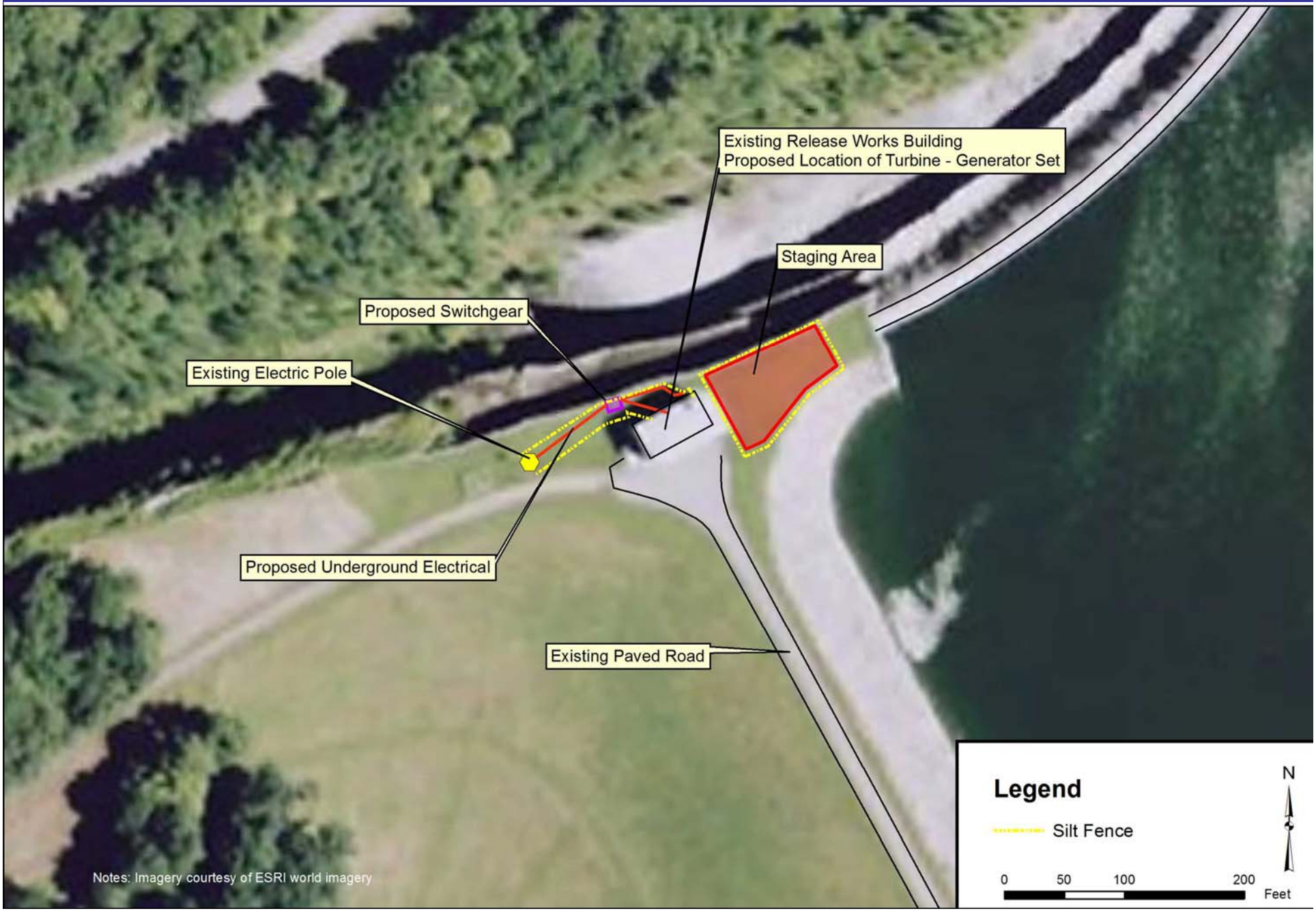
- All Projects:
  - Erosion control measures will comply with NY State Standards and Specifications for Erosion and Sediment Controls
  - Upon completion of construction, all staging and temporarily disturbed areas will be regraded and reseeded to restore their original appearance

- Cannonsville:
  - NYSDEC State Pollution Discharge Elimination System General Permit for Stormwater Discharges will be obtained in an area of soil disturbance greater than 1 acre (applies to Cannonsville only). As part of this permit, a Stormwater Pollution Prevention Plan is required.
  - All water pumped out of the dewatered area of the tailrace will be conveyed to the sedimentation basin to contain and prevent sediment from entering the West Branch of the Delaware River
  - Upon completion of construction, the spoils disposal area will be graded to match the area topography and seeded

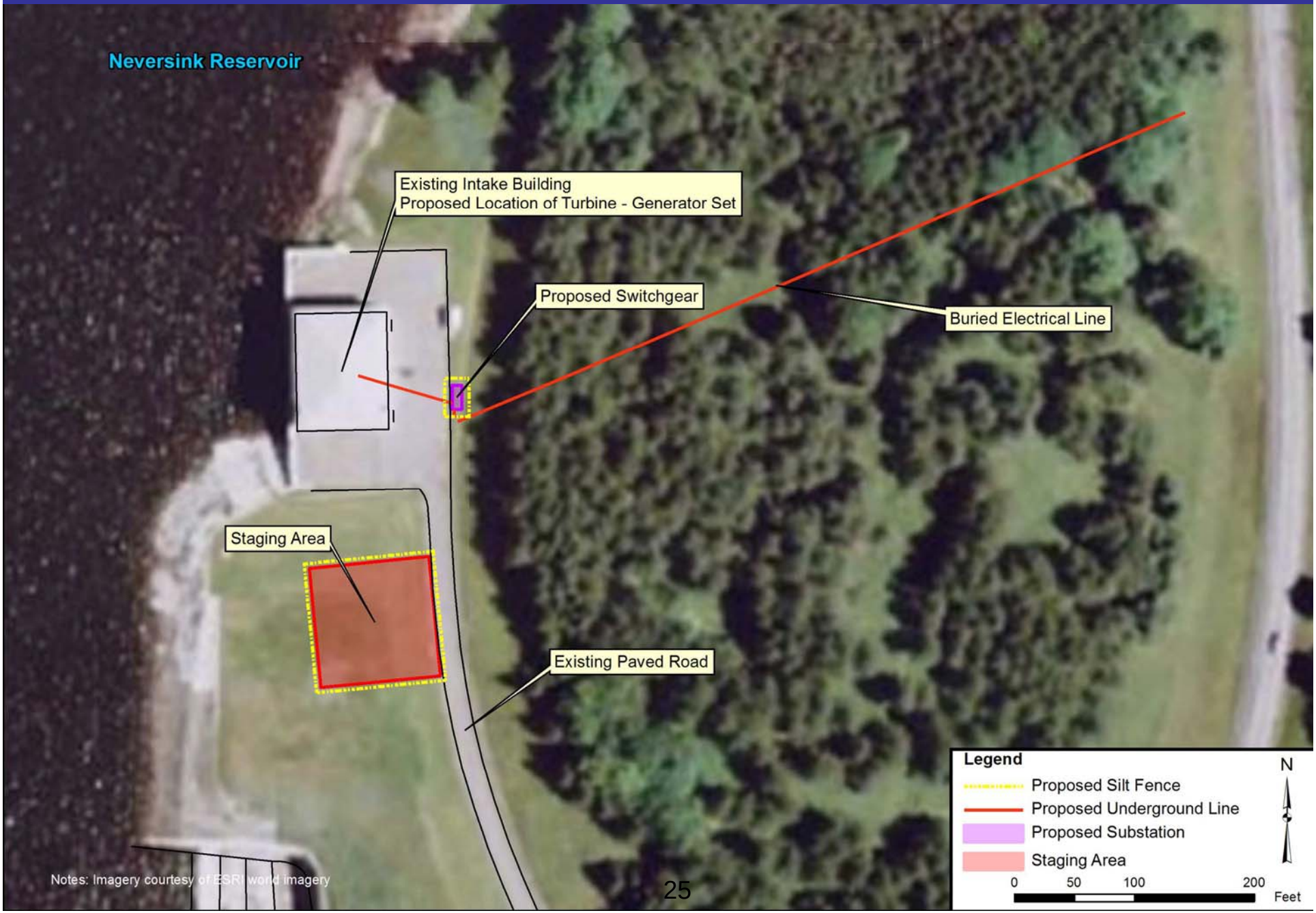
Cannonsville Erosion Control Measures



Pepacton Erosion Control Measures



Neversink Erosion Control Measures



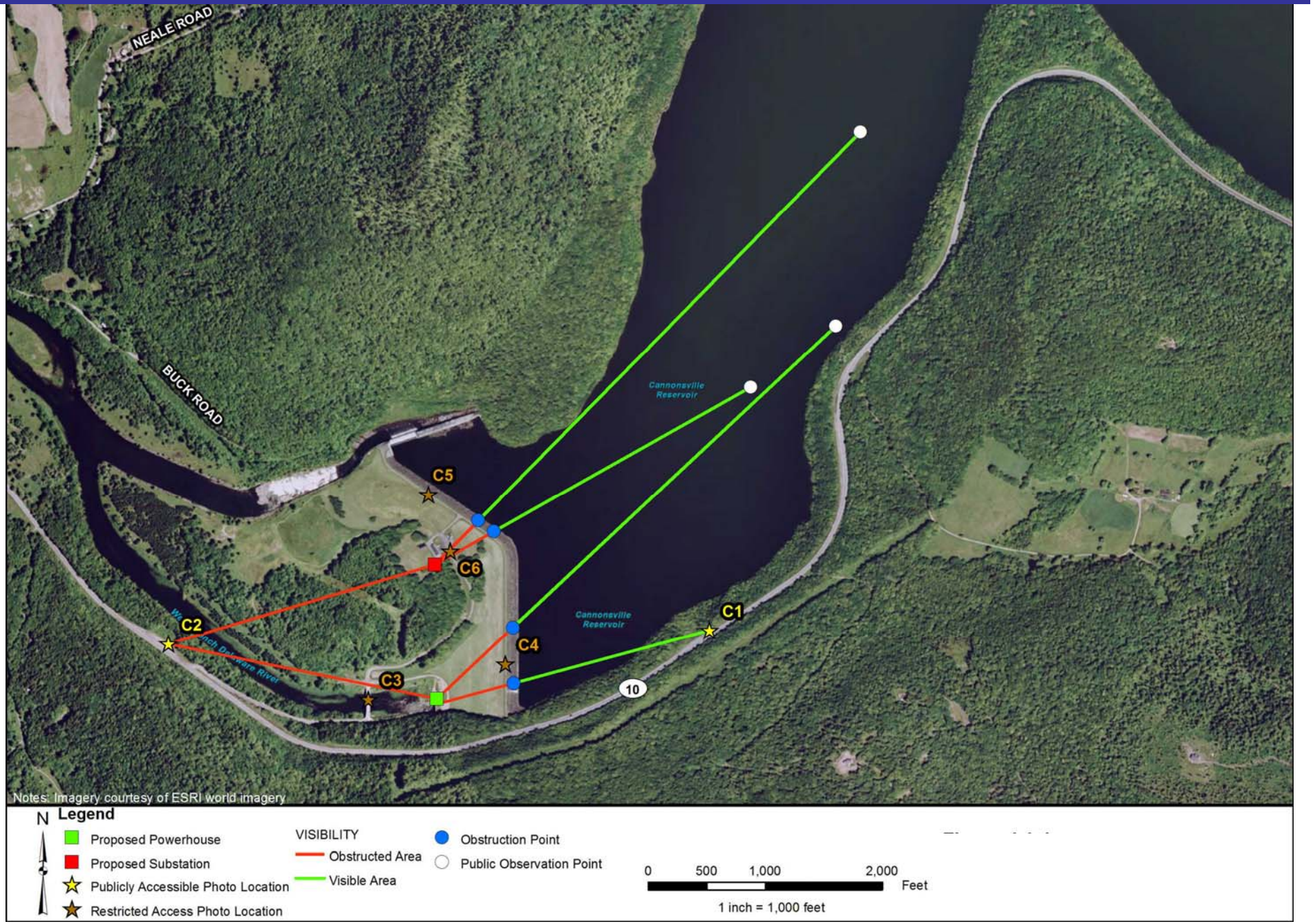
Aesthetics Study - Work Undertaken

- Photo-documented existing visual character on June 28-30, 2010 from public viewsheds and within City-owned lands
- Used ArcGIS analysis to evaluate if public viewsheds of Project areas could be seen via boat on the reservoirs
- Evaluated how new structures and construction-related activities impact aesthetics
- Created renderings to show appearance of new structures
- Identified need for mitigation

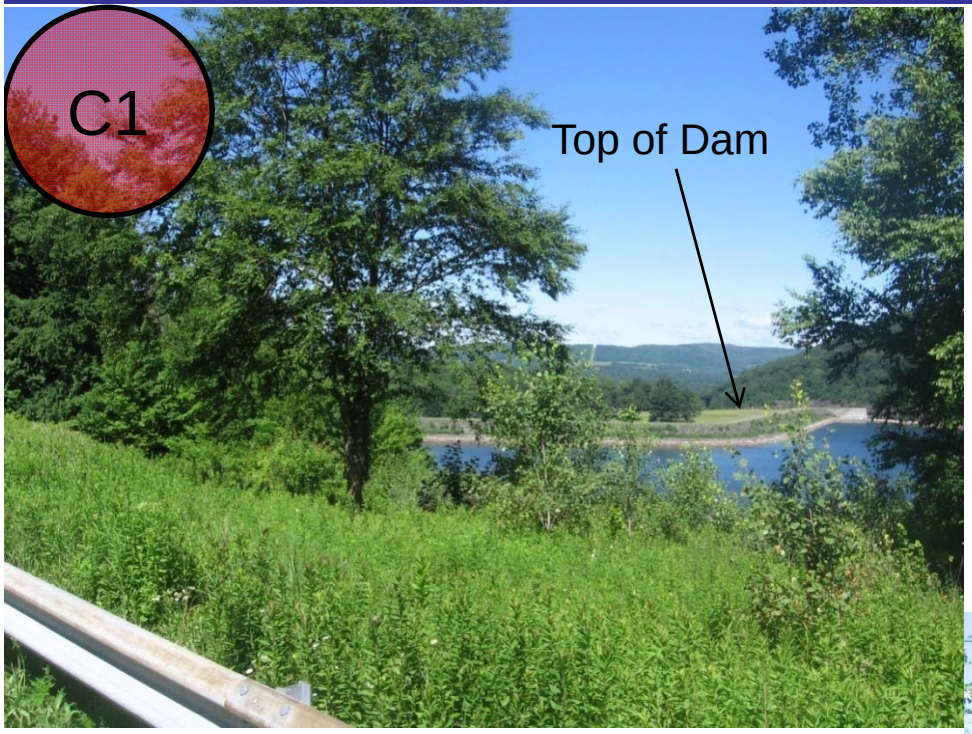
Aesthetic Study – Cannonsville Results

- Primary public viewsheds are limited to Route 10
  - Pull-offs are heavily impacted by surrounding vegetation and offer limited viewsheds
- Project areas are not visible from the reservoir because the height of dam effectively screens new structures
- Due to the absence of public viewsheds, the Project will not have material adverse impacts on aesthetics
- To ensure that the Project is consistent with the general character of the area:
  - The new powerhouse will be constructed so that its appearance is consistent with the appearance of the existing release works building and surroundings
  - New power lines will be constructed, to the extent possible, in the same location as existing power lines
  - The new substation will be constructed adjacent to an existing building
  - Staging and spoils areas will be located primarily in areas that have been or are disturbed (i.e., mowed grass areas rather than forested areas)

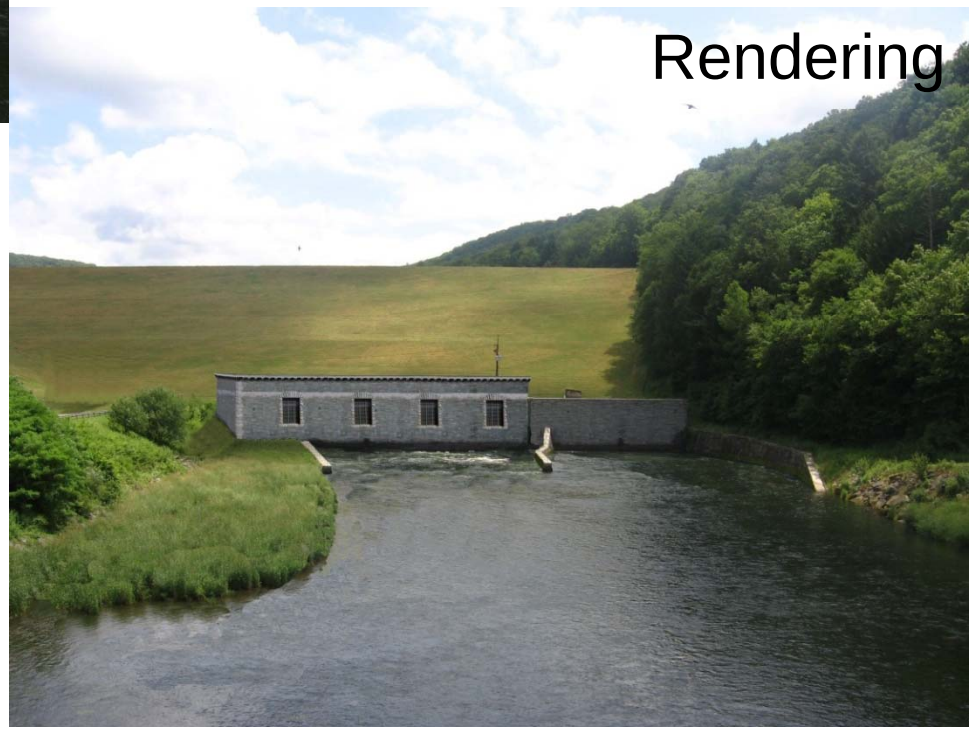
Cannonsville Viewsheds



Aesthetic Study – Cannonsville Viewsheds



Aesthetic Study – Cannonsville Project Rendering



Rendering

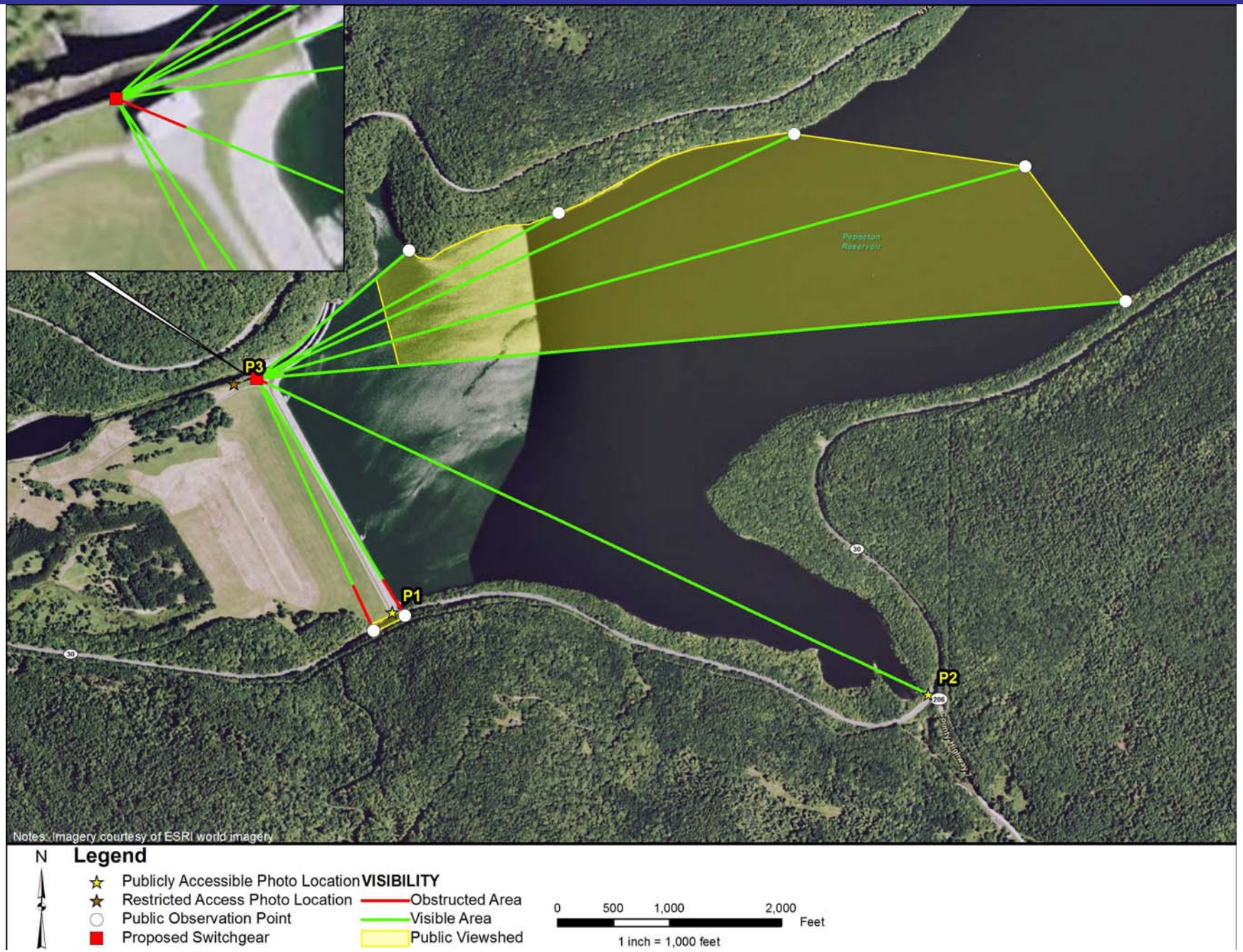
Aesthetic Study – Cannonsville Project Rendering

Rendering

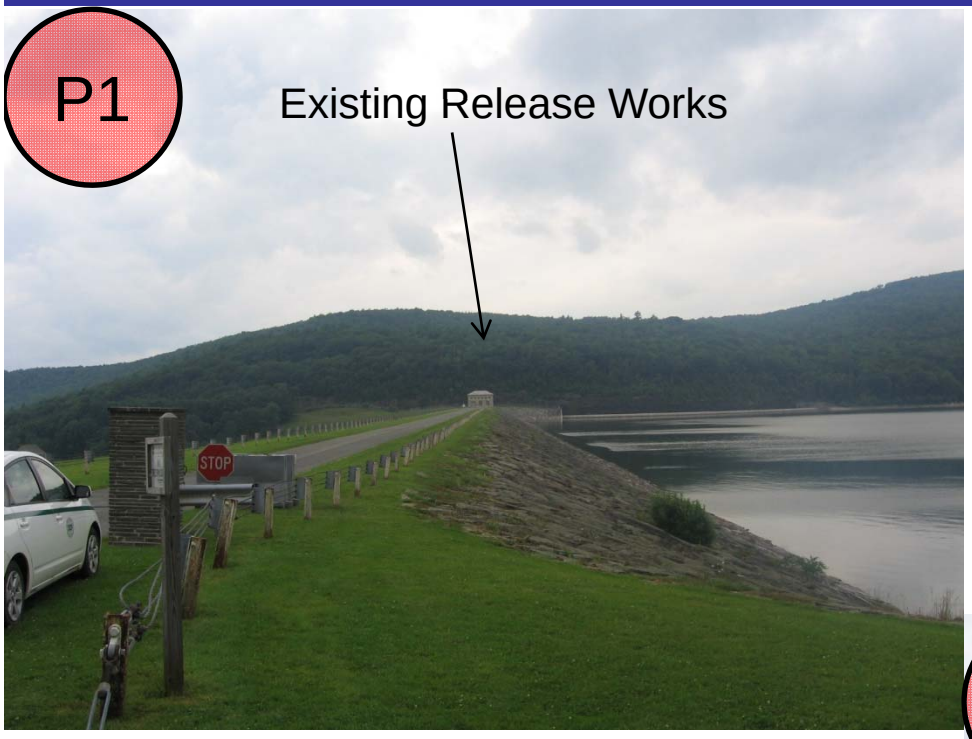
Aesthetic Study – Pepacton Results

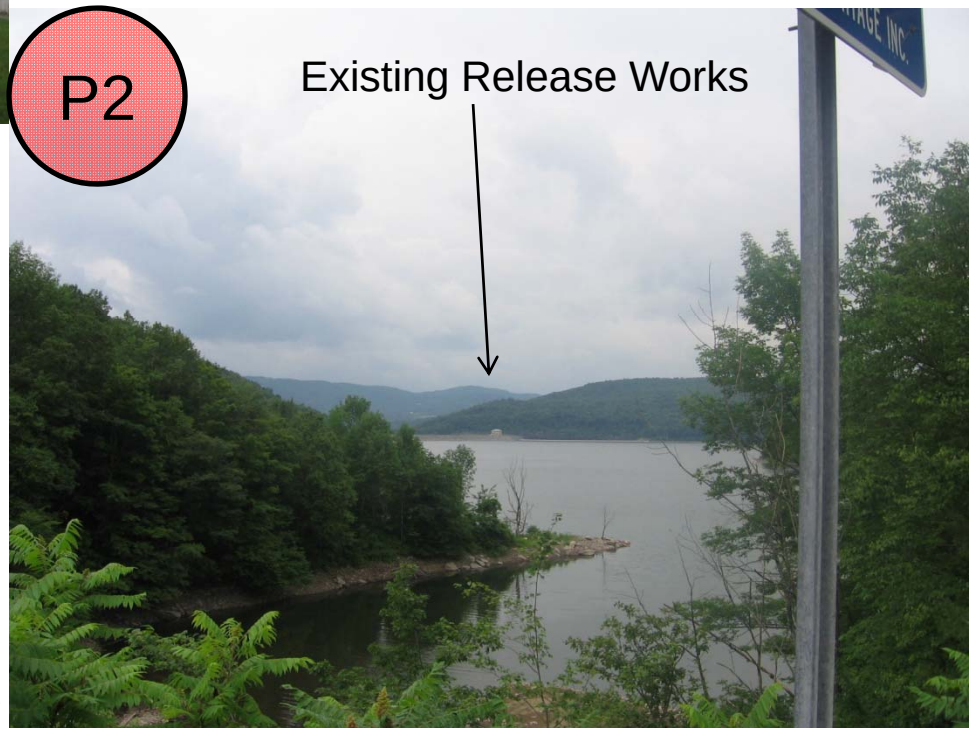
- Primary public viewsheds are from Route 30 and the reservoir
- Distances from the public viewsheds are very long, which reduces the visibility of the construction activities and permanent structures
- The existing release works building will obscure the electrical equipment, and some of the construction activities, from most viewpoints on land and from the reservoir
- Construction will take place inside the release works building or on areas that consist of mowed lawns or pavement/gravel roads, which limits the impact of the Project on the character of the area
- Because disturbed areas will be restored to their pre-Project condition, and the construction activities are relatively small in scale and duration, the Project will not have material adverse impacts on aesthetics or the general character of the area

Pepacton Viewsheds



Aesthetic Study – Pepacton Viewsheds





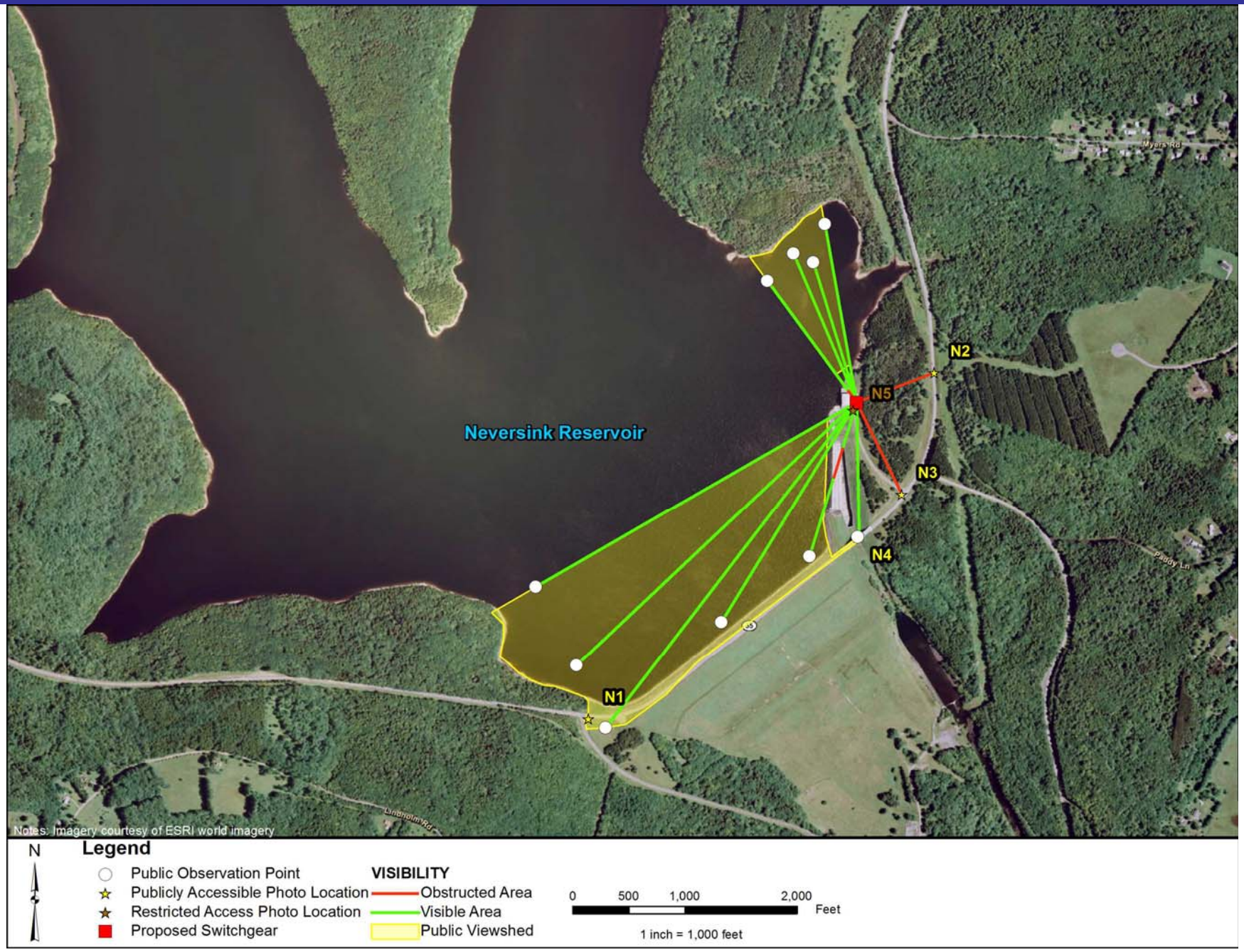
Aesthetic Study – Pepacton Project Rendering

Rendering

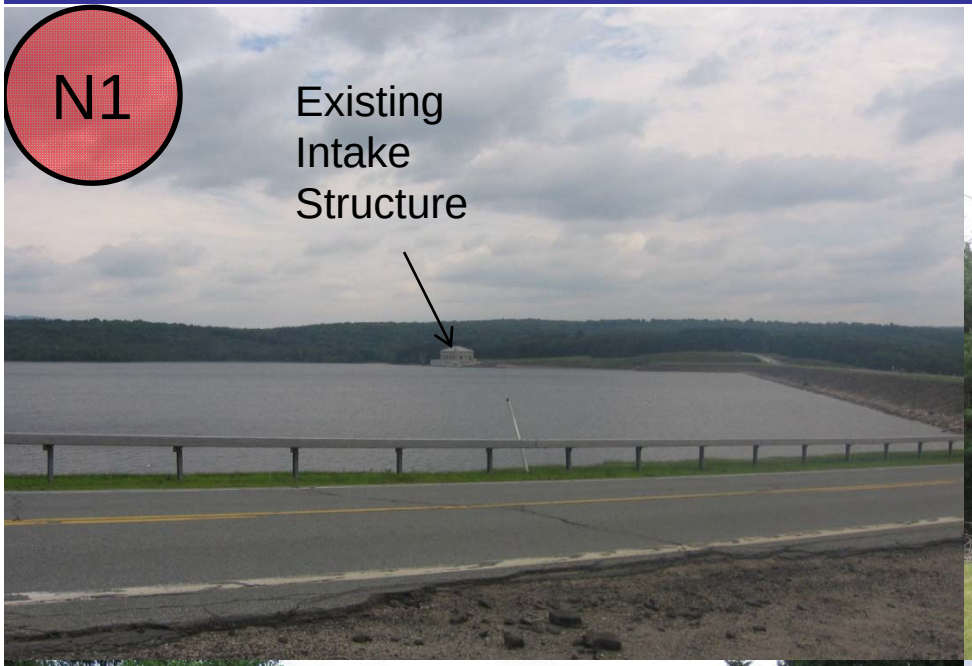
Aesthetic Study – Neversink Findings

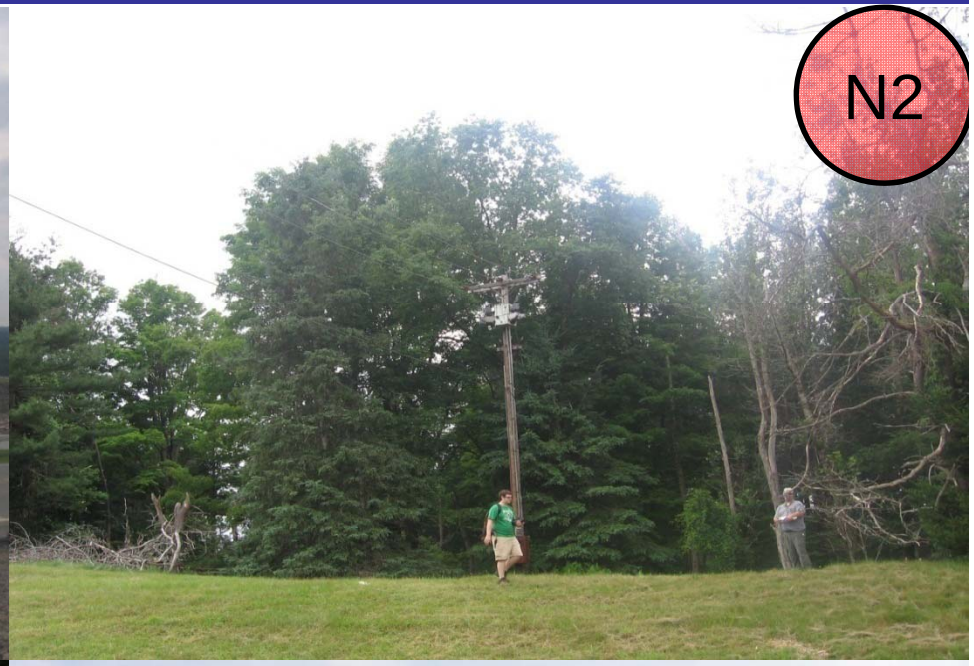
- Primary public viewsheds are from Route 55 and the reservoir
- The existing intake structure and surrounding vegetation will obscure the electrical equipment from many viewpoints on land and from the reservoir
- Topographic differences between the staging area and the reservoir, and the distances from the land-based viewsheds to the staging area, will also reduce the visibility of the construction activities and new equipment
- Construction will take place inside the intake structure or on areas that consist of mowed lawns or pavement, which limits the impact of the Project on the character of the area
- Because disturbed areas will be restored to their pre-Project condition, and the construction activities are relatively small in scale and duration, the Project will not have material adverse impacts on aesthetics or the general character of the area

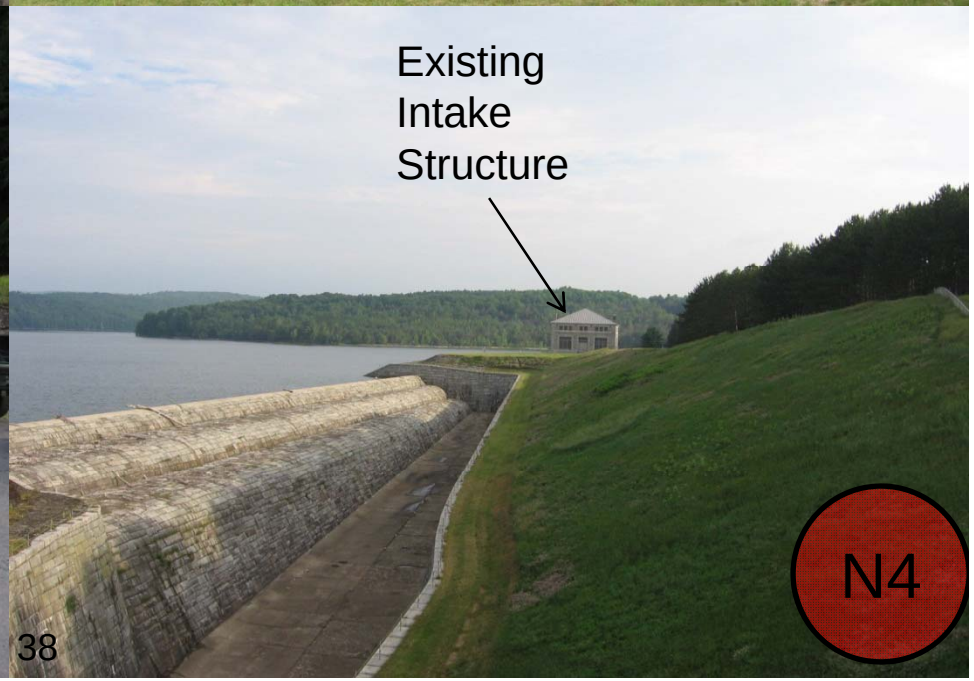
Neversink Viewsheds



Aesthetic Study – Neversink Viewsheds







Aesthetic Study – Neversink Project Rendering

Rendering

Cultural Resources Study - Work Undertaken

- Conducted research on soils, bedrock geology, and topography in Project Area to evaluate potential for existence of archeological resources or cultural artifacts
- Conducted documentary research of archeological site files maintained by the Office of Parks, Recreation and Historic Preservation (OPRHP) and the New York State Museum
- Researched DEP files on the history of the Project lands and predecessor communities
- Searched OPRHP database for properties listed on, or eligible for, listing on both the State and National Registers of Historic Places that are located within or immediately adjacent to each of the development sites
- Conducted site visits on April 13, 2010

Cultural Resources Study - Results

- Although the Areas of Potential Effect have moderate sensitivity for both precontact and historic archeological sites, the potential for locating intact archeological or cultural sites within the Project Areas is virtually non-existent because of the prior construction of the water supply system

- There are no properties listed on the State or National Register of Historic Places, or places eligible for such listing, located adjacent to the Project areas

- Given the locations of the new facilities and equipment and the scope of the construction activities, the Project will not have a material adverse impact on archeological or cultural resources

- An Historic Properties Management Plan (HPMP) will be developed

Socioeconomic Study - Work Undertaken

- Identified and quantified the impact of Project construction and operation on employment, personal income and other relevant factors
- Identified demographic and economic trends in municipalities and counties in the vicinity of the Project developments (“Impact Area”)
- Identified the economic impacts (direct, indirect and induced) of Project construction and ongoing Project operation in the Impact Area
- Estimated the potential environmental externality benefits associated with the Project
- Estimated the potential impacts of the Project generation on wholesale electricity prices

Socioeconomic Study - Results

- Local economic impact of the Project will primarily be generated through employment of local residents for part of the construction-related work done on-site and/or through some use of local subcontracting

- Total estimated direct, indirect and induced (i.e., multiplier effect) economic benefits of Project construction:
  - Cannonsville: one-time increase in economic output in Delaware County of approximately $4 million and approximately 16 full-time equivalent local jobs per year during the construction period
  - Pepacton: one-time increase in economic output in Delaware County of approximately $700,000 and approximately 2 full-time equivalent local jobs per year during the construction period
  - Neversink: one-time increase in economic output in Sullivan County of approximately $400,000 and approximately 1 full-time equivalent local job per year during the construction period

Socioeconomic Study - Results

- Project developments are essentially zero variable cost generation resources
  - When operating and generating electricity, will displace generation from higher-cost, fossil-fuel fired generation resources

- Project-related electricity generation estimated to slightly reduce wholesale electricity prices in Upstate New York
  - Wholesale electricity prices reduced 0.7% or $0.27 per MWh annually
  - Total annual estimated savings to Upstate New York of approximately $13.6 million

- Project-related electricity generation estimated to produce modest reduction in pollutant emissions from generation resources in New York
  - Reduce CO_2 emissions by approximately 32,000-64,000 tons annually, depending on the type of fossil-fuel fired generation displaced
  - Equivalent of removing approximately 5,500-11,000 passenger vehicles from the road

Questions and Comments

- Questions?
- Comments?
- Please feel free to submit additional questions or comments to:

  Ms. Zinnia Rodriguez
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  Flushing, New York 11373
  Phone: 718-595-6553
  Fax: 718-595-6543
  Email: zinniar@dep.nyc.gov

- Study reports may be found on the DEP website: www.nyc.gov/dep
  Look under A to Z
  Go to “H” for Hydro