



**Water for the Future Program:
Delaware Aqueduct Rondout-West Branch Tunnel Repair DEIS
Final Scope of Work**

CEQR No. 10DEP042U

Prepared by New York City Department of Environmental Protection
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August 31, 2011

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List of Acronyms

AMR	Automatic Meter Readers
ATR	automatic traffic recorder
ANSI	American National Standards Institute
AUV	Autonomous Underwater Vehicle
CEQR	New York City Environmental Quality Review
CO	carbon monoxide
dB	decibel
dba	A-weighted decibel
DEP	New York City Department of Environmental Protection
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
GHG	greenhouse gas
GIS	Geographical Information System
gpd	gallons per day
HCM	Highway Capacity Manual
L_{eq}	Equivalent sound level
LOS	levels of service
LWRP	Local Waterfront Revitalization Program
mgd	million gallons per day
NAAQS	National Ambient Air Quality Standards
NHL	National Historic Landmark
NMFS	National Marine Fisheries Service
NO ₂	nitrogen dioxide
NWI	National Wetland Inventory
NYSDEC	New York State Department of State
NYSDOH	New York State Department of Health

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NYSDOS	New York State Department of State
NYSDOT	New York State Department of Transportation
NWI	National Wetlands Inventory
O ₃	ozone
PCEs	passenger car equivalents
PM _{2.5} /PM ₁₀	particulate matter
RWBT	Rondout-West Branch Tunnel
SEQRA	New York State Environmental Quality Review Act
S/NR	New York State/National Registers
SO ₂	sulfur dioxide
SPDES	State Pollutant Discharge Elimination System
SRF	New York State Revolving Fund Program
TBM	tunnel boring machine
THC	total hydrocarbons
TMCs	turning movement counts
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Services
v/c ratio	volume-to-capacity ratio *

Water for the Future: Delaware Aqueduct Rondout-West Branch
Tunnel Repair Program DEIS
Final Scope of Work

A. INTRODUCTION

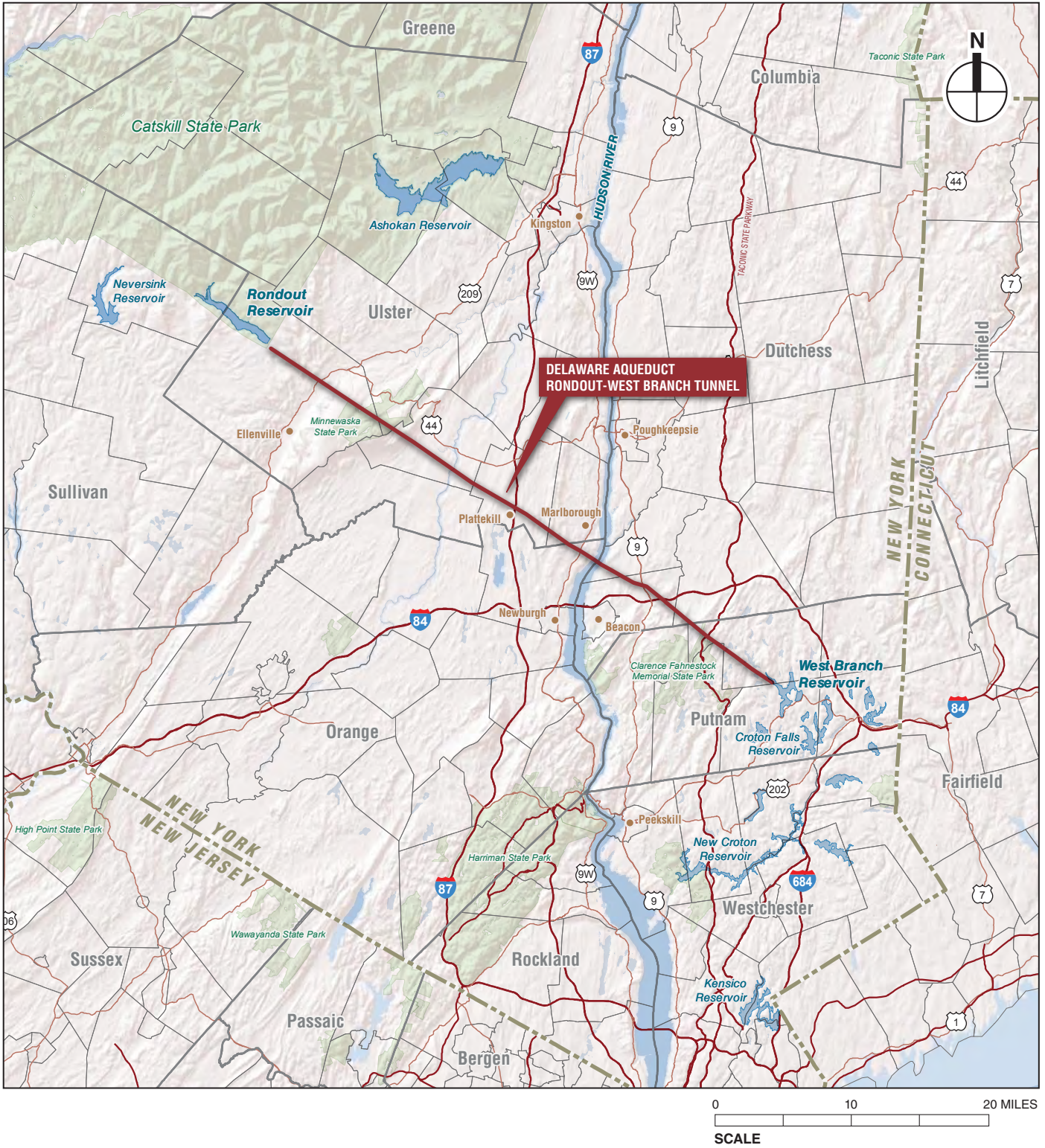
The New York City Department of Environmental Protection (DEP) is proposing the Water for the Future Program: Delaware Aqueduct Rondout-West Branch Tunnel Repair ~~program~~ (proposed program) to address the known leaks in the Rondout-West Branch Tunnel (RWBT), an approximately 45-mile section of the Delaware Aqueduct that conveys approximately 50 percent of the drinking water for New York City and is the primary source of water for residents and businesses of the Towns of Newburgh and Marlborough (see **Figure 1**).

DEP plans to address the leaks in the RWBT by undertaking the proposed program, which would consist of two main efforts:

- Project 1—Shaft and Bypass Tunnel Construction;
- Project 2—RWBT repair and water supply system improvements. Project 2 would consist of two sub-projects:
 - ~~Project 2A—Identification and Implementation of Additional Water Augmentation Projects to Support the Bypass Tunnel Connection, referred to below as Project 2A~~—Water Supply System Augmentation and Improvement.
 - Project 2B—Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing.

Upon completion of Projects 1 and 2, the bypass tunnel would be in operation, and water would flow through the RWBT and the newly-constructed bypass tunnel.

DEP ~~will undertake~~ is undertaking a two-part approach to the Environmental Impact Statement (EIS) for the proposed program. As detailed later in this ~~Draft~~ Final Scope of Work (Final Scope), the first EIS will provide a detailed analysis of the proposed program's Shaft and Bypass Tunnel Construction project (Project 1). Since the designs of the Water Supply System Augmentation and Improvement sub-project (Project 2A) and Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing sub-project (Project 2B) will not be available for several years, the first EIS will assess to the extent possible a mostly qualitative analysis of all of Project 2. When such design information is available, DEP will undertake a second EIS that will provide further details and will quantitatively assess the potential impacts from Project 2 of the proposed program in detail.



Specifically, DEP plans to construct a new tunnel segment to bypass a leaking section of the existing tunnel; this new tunnel segment would be the *bypass tunnel*. It would be constructed between a site to be located west of the Hudson River in the Town of Newburgh, Orange County (called the *west connection site* in this ~~Draft~~ Final Scope) and a site east of the river on DEP's existing Shaft 6 property located in the Town of Wappinger, Dutchess County (called the *east connection site*). This ~~Draft~~ Final Scope refers to Project 1 as Shaft and Bypass Tunnel Construction.

~~The Delaware Aqueduct is critical to the New York City water supply. Shutting down~~ Completing the connection of the bypass tunnel to the Delaware Aqueduct during the Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing sub-project (Project 2B) would require DEP to will require a shut down the Delaware Aqueduct, a critical component of the New York City water supply system. Therefore, the DEP must first implement the Water Supply System Augmentation and Improvement sub-project (Project 2A), which would comprise a number of additional projects to supplement DEP's water supply sources, and to ready the water supply system for the effects of the shutdown period.

After Project 2A is implemented, DEP would shut down the Delaware Aqueduct and connect the bypass tunnel to the existing tunnel in Project 2B. During the connection period, inspections and repairs from within the remainder of the Rondout-West Branch Tunnel would be made in areas outside the bypassed section, including known leaking sections in the Town of Wawarsing. After the repairs are complete and the bypass tunnel is connected to the RWBT, water would flow through the RWBT and the newly constructed bypass tunnel.

Because the proposed program is located in the State of New York and is an action to be undertaken by an agency of the City of New York, it is subject to environmental review pursuant to the New York State Environmental Quality Review Act (SEQRA) and the City of New York's City Environmental Quality Review (CEQR) process. Development of the proposed program may potentially result in significant adverse environmental impacts, requiring that an ~~Environmental Impact Statement (EIS)~~ EIS be prepared. Scoping is the first step in the EIS preparation and provides an early opportunity for the public and other agencies to be involved in the EIS process. It is intended to determine the range of issues and considerations to be evaluated in the EIS.

On May 3, 2011, DEP issued a Positive Declaration and Notice of Intent to Prepare a Draft EIS (DEIS) on the proposed program, in accordance with SEQRA and CEQR procedures. A Draft Scope of Work (Draft Scope), prepared in accordance with SEQRA and CEQR regulations and the guidance of New York City's CEQR Technical Manual, was also distributed on May 3, 2011, for public review and comment. Copies of the Draft Scope were made available for public review at the Town of Newburgh Town Hall, the Town of Wappinger Town Hall, and DEP offices in Queens, Valhalla, and Kingston, NY. The document was also made available for public review on DEP's website.

To solicit public comments on the proposed program and, specifically, on the scope of the environmental analysis, public meetings on the Draft Scope were held on June 7, 2011, at the Town of Wappinger Town Hall, 20 Middlebush Road, Wappingers Falls, NY; on June 9, 2011, at the Town of Newburgh Town Hall, 1496 Route 300, Newburgh, NY; on June 14, 2011, at the Town of Wawarsing, Town Hall, 108 Canal Street, Ellenville, NY; and on July 14, 2011, at Wappingers Junior High School, 30 Major McDonald Way, Wappingers Falls, NY. Written comments were also accepted through the public comment period, which was extended and held open until July 29, 2011.

The Final Scope is being issued to address comments received during the public review and finalize changes to assessment methodologies that were made subsequent to publication of the Draft Scope. In addition, this Final Scope includes responses to comments received on the Draft Scope in Appendix A, “Response to Comments.” Specifically, the Final Scope reflects the following changes to the proposed program since the publication of the Draft Scope:

- DEP has advanced acquisition of several parcels that would make up the west connection site, and the site is now identified in this Final Scope (see Figure 6).
- Project planning and design have advanced, and DEP has decided to use the west connection site as the launch site for the tunnel boring machine (TBM) and the east connection site (Shaft 6 site) as the receiving site.
- Based on more refined designs, the list of potential major permits, approvals, consultation, and coordination has been updated (see Tables 1, 2, and 3 in this Final Scope).
- Based on more refined designs and scheduling estimates, the anticipated dates of construction have been updated (see Section F, “Program Schedule and Phasing”).
- Based on comments received during the public scoping period, additional locations for baseline traffic and noise data collection have been added (see Section I. “Organization and Scope of the Environmental Impact Statement,” subsections I.3.11, “Chapter 2.10, Transportation,” and I.3.14, “Chapter 2.14, Noise,” and Figures 9 and 10).

Based on the Final Scope, a DEIS will be prepared, certified as complete, and circulated for public review. A public hearing will be scheduled with a period for submitting written comments on the DEIS. Subsequently, the Final EIS (FEIS) will be prepared and circulated and will include written responses to address comments received on the DEIS.

Where relevant and appropriate, new text and editorial changes have been made to the Draft Scope and incorporated in this Final Scope. These changes are indicated with double underlines.

B. ORGANIZATION OF THE FINAL SCOPE

This Final Scope includes the following discussions:

- **Section C, Background and Planning Context**. This section describes the New York City water supply system, the current condition of the RWBT, and the efforts undertaken

by DEP to monitor and characterize the conditions in the tunnel, to determine the amount and areas of leakage, and to prepare for the repair of the tunnel.

- **Section ~~CD~~, Purpose and Need for the Proposed Program.** This section describes the need for the proposed program.
- **Section ~~DE~~, Water for the Future: Delaware Aqueduct Rondout-West Branch Bypass Tunnel Repair Program—Program Description of Projects 1, 2A, and 2B.** This section describes the main components of the proposed program and their proposed locations.
- **Section ~~EF~~, Program Schedule and Phasing.** This section describes the anticipated schedule for the proposed program.
- **Section ~~FG~~, Program Approvals and Coordination.** This section discusses the anticipated permits and approvals that would be required for the proposed program and the additional coordination efforts that would be required.
- **Section ~~GH~~, Analytical Framework for Environmental Review.** This section describes how the proposed program and method for analysis will be defined, and is used in the technical analysis areas of the ~~Draft~~ Final Scope (detailed in Section ~~HJ~~).
- **Section ~~HI~~, Organization and Scope of the Environmental Impact Statement.** This section lays out the organization of the EIS that will be prepared and presents the methodologies and scope of work for that EIS.

C. BACKGROUND AND PLANNING

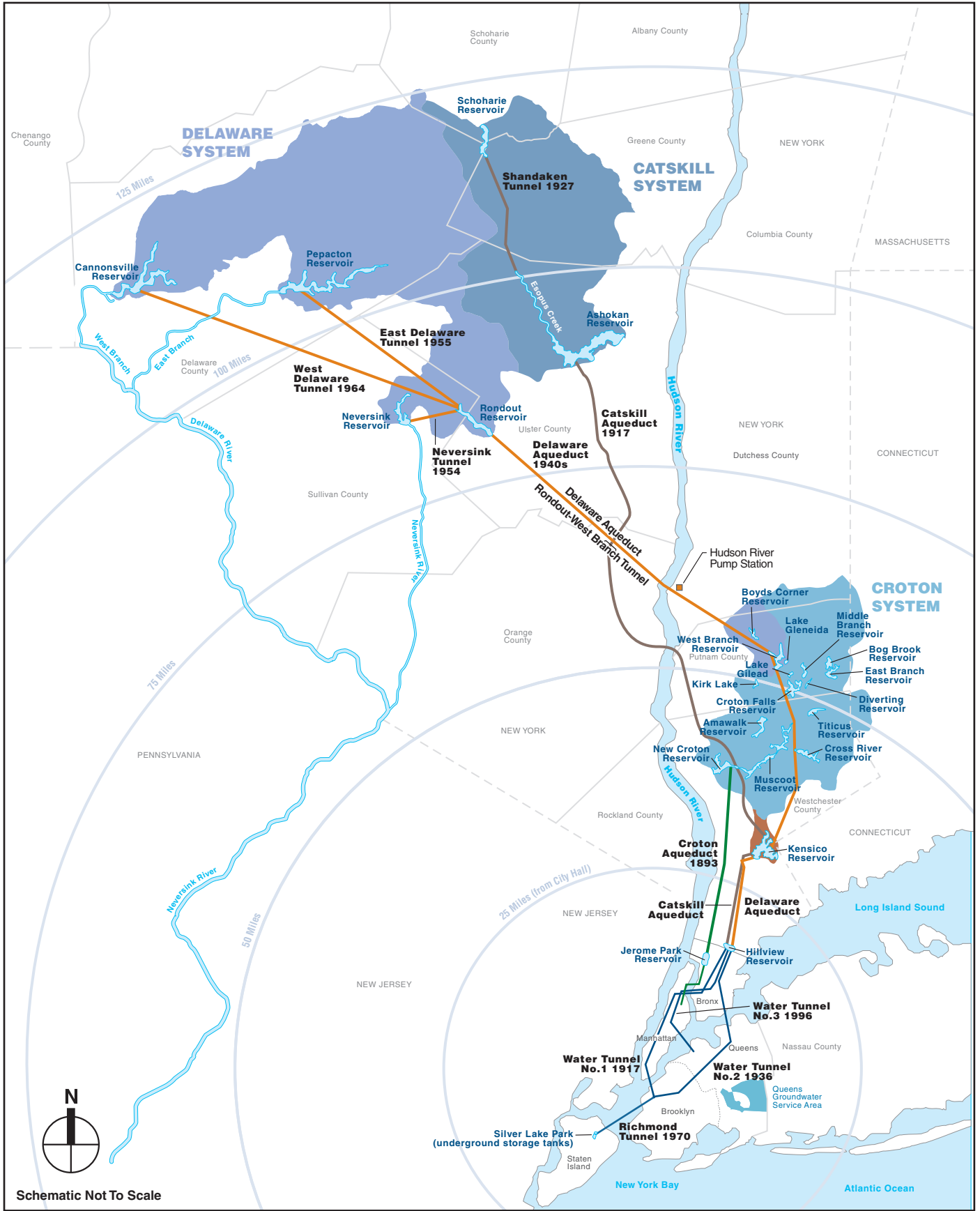
This section provides an overview of the New York City water supply system and explains the current state of the RWBT. It also describes efforts undertaken by DEP to monitor and characterize the conditions in the tunnel, to determine the amount and areas of leakage, and to prepare for the repair of the tunnel.

C.1 NEW YORK CITY WATER SUPPLY SYSTEM

C.1.1 OVERVIEW

DEP operates and maintains the New York City water supply system and is responsible for providing drinking water to more than 8 million customers in New York City as well as approximately 1 million upstate customers. The entire system consists of 19 reservoirs and three controlled lakes with a total storage capacity of approximately 580 billion gallons. The average total system demand is approximately 1.1 billion gallons of water a day.

New York City receives its drinking water from surface water from three upland reservoir systems: the Croton, Catskill, and Delaware systems (see **Figure 2**). Together, these watersheds encompass a 1,968-square-mile area and all or parts of eight counties in New York and a small portion of western Fairfield County in Connecticut. From these upland storage reservoirs, water flows by gravity to New York City through three aqueducts—New Croton Aqueduct, Catskill



Delaware Aqueduct Rondout-West Branch Tunnel Repair Program

Figure 2
Water Supply System

Aqueduct, and the Delaware Aqueduct (including the RWBT)—and four tunnels—City Tunnel Nos. 1, 2, and 3, and the Richmond Tunnel.

C.1.2 DELAWARE SYSTEM

Constructed between 1936 and 1964, the Delaware system extends as far as 125 miles northwest of Manhattan. With a total storage capacity of 326 billion gallons, the Delaware system provides approximately 50 percent of New York City’s drinking water on an annual average basis. This drinking water is conveyed to New York City through a series of reservoirs connected by tunnels, as described below.

The 1,010-square-mile Delaware watershed is the system’s westernmost watershed, consisting of four reservoirs: Cannonsville, Pepacton, Neversink, and Rondout. Three of these reservoirs (Cannonsville, Pepacton, and the Neversink) collect water from the region surrounding the branches of the Delaware River. These reservoirs feed the water eastward to the West Delaware, East Delaware, and the Neversink Tunnels and then to the Rondout Reservoir, where the Delaware Aqueduct begins (see Figure 2).

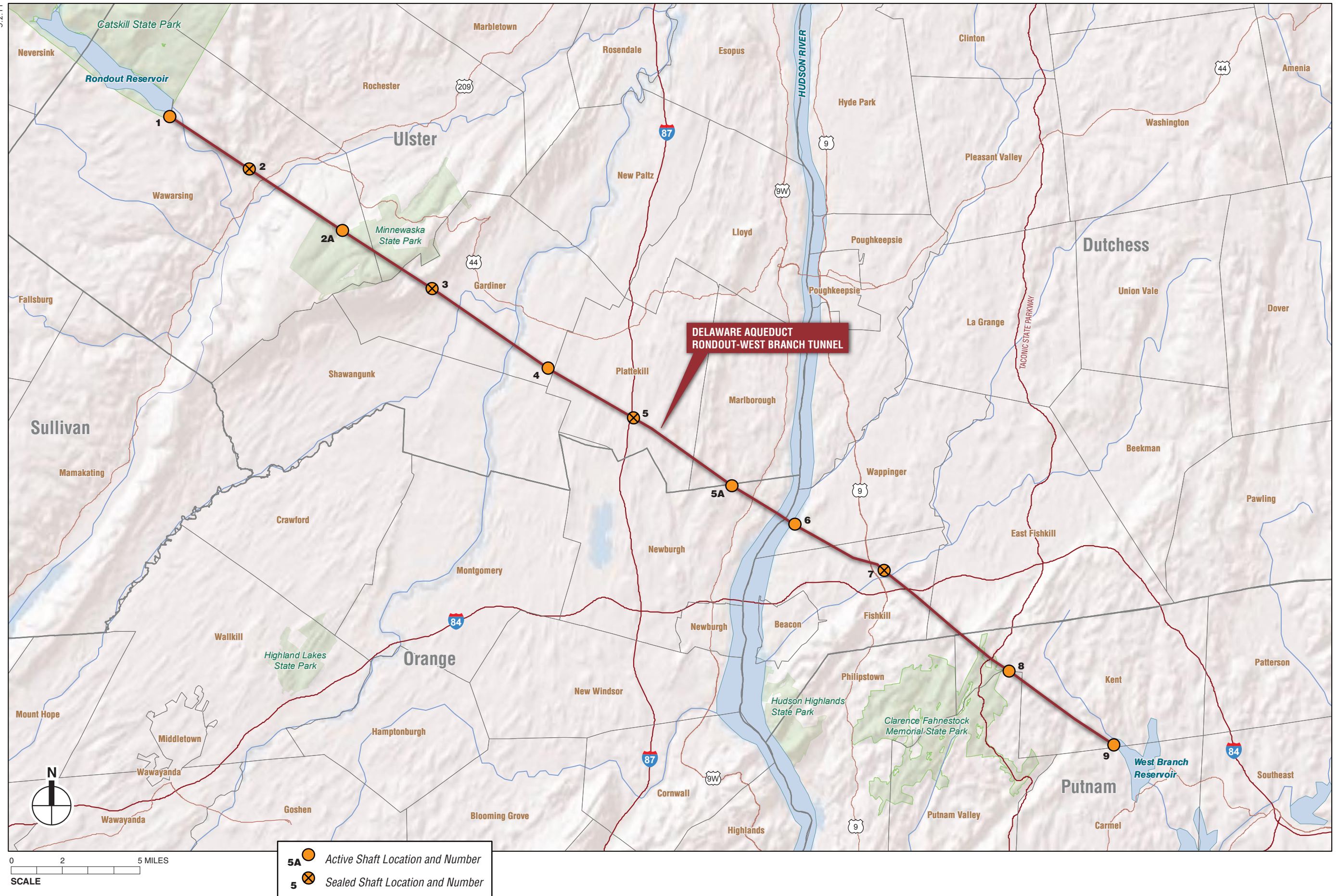
At the Rondout Reservoir, the water is conveyed approximately 45 miles via the RWBT portion of the Delaware Aqueduct to the West Branch Reservoir, located east of the Hudson River in Putnam County (see **Figure 3**). The RWBT is 13.5 feet in diameter, lined with concrete, and varies in depth from 300 to 2,300 feet below ground (crossing the Hudson River at nearly 600 feet beneath the water surface). The tunnel is a deep rock, pressurized aqueduct that has been in nearly continuous service since it was brought online in 1944. It can convey up to approximately 900 million gallons per day (mgd) of water and delivers an average of 600 mgd on an annual basis. All water from the Delaware system flows through the RWBT.

Two municipalities are supplied water from the RWBT. The Town of Newburgh, Orange County, draws water from two primary sources: Chadwick Lake and the Delaware Aqueduct. The Town of Marlborough, Ulster County, receives water from the Delaware Aqueduct via the Town of Newburgh.

Finally, from the West Branch Reservoir, the Delaware Aqueduct proceeds south to Kensico Reservoir and then to Hillview Reservoir. From Hillview Reservoir, water is conveyed to New York City by City Water Tunnels Nos. 1, 2, and 3.

C.1.3 CATSKILL SYSTEM

The Catskill system includes the Schoharie Reservoir, Shandaken Tunnel, and Ashokan Reservoir. Schoharie Reservoir delivers up to 615 mgd to the Catskill system via the Shandaken Tunnel, which releases into Esopus Creek. Downstream of the Shandaken Tunnel outflow, Esopus Creek flows into the West Basin of Ashokan Reservoir. Water from Ashokan Reservoir is conveyed via the Catskill Aqueduct to Kensico Reservoir, where it typically mixes with water from the Delaware system before being disinfected, fluoridated, and conveyed to Hillview Reservoir. The upper Catskill Aqueduct spans from Ashokan to Kensico Reservoirs, and the



5A		Active Shaft Location and Number
5		Sealed Shaft Location and Number

lower Catskill Aqueduct spans from Kensico to Hillview Reservoirs. The Catskill system provides an average of approximately 40 percent of New York City's average daily demand.

C.1.4 CROTON SYSTEM

The Croton system is the oldest and smallest of the New York City's three reservoir systems. The Croton watershed is a series of interconnected reservoirs and lakes in northern Westchester and Putnam Counties. The Jerome Reservoir, a distribution reservoir, is located at the downstream end of the Croton system and is the point where Croton water enters the city's water distribution network. The Croton system provides an average of approximately 10 percent of the city's average daily demand. During droughts, it can provide up to 30 percent of in-city consumption.

C.2 EXISTING RWBT CONSTRUCTION AND GEOLOGY

During the construction of the RWBT, in zones where the rock was weak or disintegrated, heavy reinforcement and steel interlinings were installed in the tunnel to guard against rupture and excessive leakage and potential collapse. The heavily reinforced and steel-lined sections of the tunnel are known as the *Roseton and Wawarsing crossings* (see **Figures 4 and 5**). The Roseton crossing lies just to the west of the Hudson River and includes two sections totaling about 1,030 feet in length where special construction techniques were required. Both sections have a heavily reinforced concrete outer lining, a circular steel plate interlining, and the typical concrete tunnel lining forming the waterway. In addition to the interlining, large quantities of grout were required to seal the tunnel. The Wawarsing crossing is a section of tunnel approximately 600 feet long with multiple contact zones between various rock types. Similar construction techniques to those employed for the Roseton crossing were also used in Wawarsing.

Eleven shafts were excavated along the tunnel route to provide access and/or ventilation during construction (see Figure 3). The shafts are located along the tunnel, as follows:

- Shafts 1, 2, and 2A—Town of Wawarsing in Ulster County.
- Shafts 3 and 4—Town of Gardiner in Ulster County.
- Shaft 5—Town of Plattekill in Ulster County.
- Shaft 5A—Town of Newburgh in Orange County.
- Shaft 6—Town of Wappinger in Dutchess County.
- Shaft 7—Town of Fishkill in Dutchess County
- Shaft 8—Town of Putnam Valley in Putnam County.
- Shaft 9—Town of Kent in Putnam County.

C.3 OVERVIEW AND CONDITION OF THE RWBT

The last unwatering and physical inspection of the RWBT occurred in 1957-1958. DEP regularly conducts ongoing monitoring of the RWBT and, since the 1990s, has been investigating the Roseton and Wawarsing crossings in particular. These two sections of the RWBT appear to be



2 Shaft Site and Number





5A  Shaft Site and Number

0 1000 2500 FEET
SCALE

leaking a total of between 10 and 35 mgd of water from the aqueduct, depending on the amount of water the aqueduct is carrying.

DEP's monitoring efforts have been continuous and varied and have included visual inspections of the tunnel using an autonomous inspection device and tunnel leakage investigations to determine the amount and specific location of the leaks. These monitoring efforts serve as a baseline by which to assess any changes in the tunnel condition and to determine priorities for tunnel repair.

Testing and monitoring efforts have included using dye, backflow, and hydrostatic tests, and hourly flow monitors. In 2003 and 2009, DEP launched an Autonomous Underwater Vehicle (AUV)—a self-propelled submarine-shaped vehicle—to conduct a detailed survey of the entire approximately 45-mile length of tunnel from the Rondout to the West Branch Reservoirs. The AUV took 360-degree photographs every 8 feet, while also gathering sonar, velocity, and pressure data to assist in determining the location, size, and characteristics of the cracks in the tunnel lining.

Monitoring to date has shown that the leakage rate is stable and has not increased, and that the areas of leakage are correlated with the tunnel's surrounding geology; specifically, DEP's years of comprehensive inspections, testing, and study indicate that cracking and leakage are occurring in the aqueduct where it passes through limestone, a rock more susceptible to wear and tear than the sandstone, shale, gneiss and granite that form the vast majority of the ~~tunnel~~ tunnel's surrounding geology.

DEP is currently undertaking or planning several projects to learn more about the RWBT's condition and leakage, including continued monitoring of the surface expressions of the leakage at the Roseton and Wawarsing crossings; hydraulic monitoring; visual inspections of the tunnel interior; and engineering risk assessments of the tunnel's structural integrity.

C.4 PLANNING FOR THE REPAIR OF THE RWBT

As discussed above, all water from the Delaware system flows through the RWBT, providing approximately 50 percent of New York City's drinking water on an annual average basis. Because the tunnel is such a critical component of DEP's water supply system, and because it has been known to be leaking, DEP has undertaken a multitude of planning and design efforts in preparation for the repair of the RWBT as part of both its emergency and long-term planning. As part of these efforts, DEP has identified a number of improvements to the RWBT that would facilitate emergency or planned repair work. Some of these improvements have already been constructed or are under construction, others are planned, and others are being evaluated. Some of these improvements would occur along the length of the RWBT, and others would occur at other locations within the water supply system. These projects include:

- Tunnel and shaft rehabilitation of Shaft 6 that will improve DEP's capability to unwater the tunnel. Completion of the tunnel unwatering system is expected in 2013.

- Flow metering, instrumentation, and control improvements that allow DEP to continue to investigate the condition of the tunnel.
- In addition to the construction projects along the RWBT, DEP is already investing in other projects to modernize and improve the reliability of its water supply system. A number of these projects would also aid in the planning of Project 2B, the connection of the bypass tunnel and the inspection of the RWBT, including Wawarsing:
 - Croton Filtration Plant, Bronx, NY. This effort, which is being undertaken to ensure reliability of the Croton system, is under construction and expected to be completed in 2012.
 - Croton Falls, NY, Pumping Station Plant Improvements (Shaft 11). This effort, which is to increase pumping capacity, is expected to be complete in 2014.
 - Cross River, NY, Pumping Station (Shaft 13). This effort, which is to increase pumping capacity, is expected to be finished in 2012.

D. PURPOSE AND NEED FOR THE PROPOSED PROGRAM

DEP is responsible for ensuring the safe and reliable transmission of drinking water from the watershed to consumers in sufficient quantity to meet all present and future water demands. As described above, the RWBT is a critical component of DEP's Delaware water supply system and is currently leaking between 10 and 35 mgd in two critical areas in the vicinity of the Wawarsing and Roseton crossings. DEP has an ongoing program to evaluate the condition of the tunnel's structural integrity, especially with respect to changes in the tunnel liner or leakage characteristics to determine whether there is an increased risk of further cracking or tunnel collapse. Construction of the bypass tunnel would minimize the time that the RWBT is taken out of service, thereby reducing risks, supporting inspections of other tunnel segments, and providing greater flexibility to inspect and repair the RWBT itself.

This project is also consistent with the water network initiatives detailed in the Mayor's Office of Long Term Planning and Sustainability's *PlaNYC: A Greener, Greater New York*, by enabling DEP to continue to reliably deliver drinking water to upstate and New York City consumers.

E. WATER FOR THE FUTURE PROGRAM: DELAWARE AQUEDUCT RONDOUT-WEST BRANCH TUNNEL REPAIR PROGRAM—PROGRAM DESCRIPTION PROJECTS 1, 2A, AND 2B

As described above in Section BC, "Background and Planning," DEP has conducted and is continuing to conduct studies to determine the specific locations of the RWBT problem areas. Concurrently, DEP is also undertaking ~~preliminary planning and~~ design of the proposed bypass tunnel construction and connection.

This section describes the proposed program, which would consist of two main efforts:

- Project 1—Shaft and Bypass Tunnel Construction;

- Project 2—RWBT repair and water supply improvements. Project 2 would consist of two sub-projects:
 - Project 2A— Water Supply System Augmentation and Improvement.
 - Project 2B— Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing.

Project 1 would begin with site preparation and construction of shafts at the east and west connection sites, which would start in 2013 and be complete in ~~2016~~ 2015. Construction of the bypass tunnel itself would begin in 2015 and be complete in ~~2019~~ 2020. When the new bypass tunnel is complete and Project 2A has been implemented, Project 2B would commence. In this sub-project, the RWBT would be taken out of service and excavation would begin to connect the new bypass tunnel to the existing tunnel. It is anticipated that 6 to 15 months would be needed to complete the bypass connection and to undertake the RWBT inspection and repair, including within the Town of Wawarsing. Upon completion of Projects 1 and 2, which is anticipated to occur in 2021, the bypass tunnel would be in operation, and water would flow through the RWBT and the newly-constructed bypass tunnel.

Project 1 and Project 2B of the proposed program would include construction within Orange, Ulster, Dutchess, and Putnam Counties, NY (see **Figure 1**). Project 2A would occur at various locations within the water supply system, within and in the vicinity of New York City, and may include work in Nassau County and eastern New Jersey.

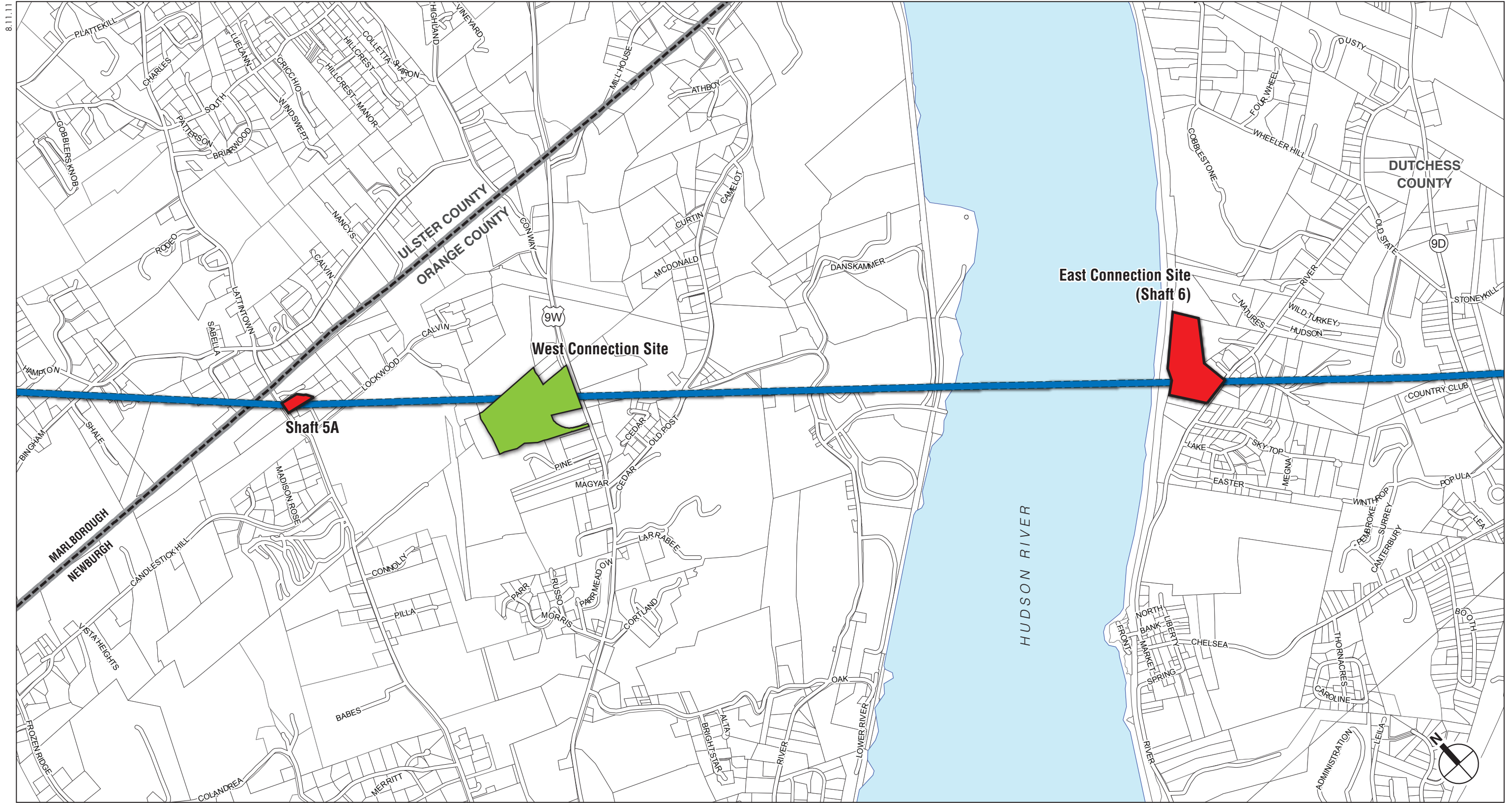
The planning, design, and implementation of the proposed program would ensure reliable service of the RWBT to satisfy water supply needs to users of the New York City water supply system into the future. More detail on the proposed program, including Projects 1 and 2 and its sub-projects, is presented below.

E.1 PROJECT 1: SHAFT AND BYPASS TUNNEL CONSTRUCTION

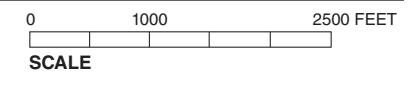
Project 1 would consist of construction of the bypass tunnel around the highest leakage section of the RWBT. The new tunnel to be constructed is referred to as the *Rondout-West Branch Bypass Tunnel* or *bypass tunnel*.

At this time, the exact route of the bypass tunnel has not been determined, but it ~~would likely~~ is assumed to be constructed ~~within~~ approximately 1 mile 1,725 feet to the north of the existing RWBT, between a site ~~to be acquired~~ west of the Hudson River consisting of three parcels that DEP is in the process of acquiring—referred to as the *west connection site*—and Shaft 6 (east of the Hudson River)—referred to as the *east connection site* (see **Figure 6**). ~~The tunnel would be sized to accommodate the full Delaware Aqueduct capacity (i.e., approximately 900 mgd). The tunnel would be located approximately 600 feet below the Hudson River water surface, and approximately parallel to the north and at the same depth as the existing RWBT.~~

Construction for the bypass tunnel would occur underground, with construction staging and support activities at both the west and east connection sites. ~~DEP has examined the potential use~~



- Existing DEP Property
- West Connection Site Location
- Delaware Aqueduct
Rondout-West Branch Tunnel



~~of properties already under DEP jurisdiction for the west and east connection sites; however, DEP has limited properties in the project area, and, therefore, some acquisition of property would be needed. Acquisition of any properties needed for use to support the project would undergo a separate environmental review; the EIS will identify specific sites that have been or would be acquired and would evaluate any potential environmental effects from the use of the sites. In addition, the EIS will include an evaluation of the potential environmental effects of alternative sites that were initially considered and later rejected (see Section H.8, “Alternatives”).~~

~~DEP is still evaluating various options to construct the bypass tunnel. At the current time, it is anticipated that~~The bypass tunnel would be constructed using a tunnel boring machine (TBM) ~~For tunnel construction, it is anticipated that~~, and two shafts would be required—one each at the west and east connection sites. These shafts would be offset to the north of the existing aqueduct alignment along the bypass tunnel and would be excavated to approximately the same depth as the bypass tunnel (i.e., approximately ~~600~~ 700 feet deep at the east connection site and 900 feet below the ground); ~~at the west connection site~~. The shafts would be used for the following purposes during ~~Shaft and Bypass Tunnel Construction~~ Project 1:

- **Launch and reception of the TBM.** ~~One of~~ Since the shafts Draft Scope was issued, DEP has decided that the west connection site shaft would be used to launch the TBM, while the ~~other~~ shaft at the east connection site would be used to receive the TBM. ~~At this time, DEP is continuing to evaluate whether its preferred option would be to launch the TBM from the east connection site and receive it at the west connection site or to launch from the west connection site and receive it at the east connection site. The EIS will identify the preferred option and will assess the other option as an alternative (see Section H.8, “Alternatives”).~~
- **Access during construction of the bypass tunnel.** Workers would access the bypass tunnel through the shafts, and materials would be delivered via the shafts as well. In addition, excavated materials would be removed through the shafts. Shaft excavation would require blasting activities and would result in a substantial amount of material that would need to be removed from the east and west connection sites. DEP is currently evaluating various options for removal of material. Potential options could include removal of material by barge, rail, or truck. These options are discussed below in Section ~~H~~.8, “Alternatives.”

These shafts would continue to be used during Project 2B, Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing (see Section ~~D~~E.3, below).

In addition to the shafts and the bypass tunnel, “inundation plugs” would be constructed at both the west and east connection sites; these plugs would be used to block off the leaking area of the RWBT in Roseton in the event that water inflow exceeds DEP’s ability to pump water out of the tunnel during construction of Project 2B.

During construction, groundwater would infiltrate the tunnel as the TBM advances; this water would need to be removed, ~~and it is anticipated that the connection site that is used.~~ As the launch site for the TBM ~~would,~~ the west connection site is expected also serve as the bypass dewatering location during tunnel construction. Recovered groundwater would be treated prior to discharge to the Hudson River.

At the west connection site, a pipeline ~~could~~ would be needed to convey the groundwater infiltrating the RWBT tunnel[†] from the west connection site to a new outfall on the Hudson River. The pipeline route has not yet been determined, but, ~~if needed,~~ it would likely extend along existing rights-of-way and some private property before reaching the new outfall.

E.2 PROJECT 2A: WATER SUPPLY SYSTEM AUGMENTATION AND IMPROVEMENT

~~The various additional projects that would be implemented to support Project 2A—Conservation, Catskill Aqueduct Optimization, Queens Groundwater Pumping, New Jersey New York City Interconnection, Nassau County Interconnection, and the Delaware Watershed Reservoir Improvements—are all in the preliminary stage of facility planning, and not enough information has been developed at this time to enable a complete environmental review. Therefore, this EIS will provide a project description for each of these projects, a preliminary list of actions and approvals necessary to implement each project, an estimated timeframe for when each project would be implemented, and a generic assessment of the potential impacts from each project. Prior to the approval and implementation of any of these projects, additional environmental review as part of a second EIS will be undertaken to evaluate and disclose the potential environmental impacts from these projects.~~

~~As discussed below, Project 2B, Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing, would require that the flow of water within the RWBT be stopped. As a result, the City of New York will need to augment the water supply to prevent a supply deficiency during the Delaware Aqueduct shutdown. Therefore, DEP has identified and is currently evaluating a series of~~ As discussed above, the Delaware Aqueduct is critical to the New York City water supply system. Shutting down the Delaware Aqueduct during Project 2B would require DEP to first implement Project 2A, Water Supply System Augmentation and Improvement, which would comprise a number of additional projects to supplement DEP's water supply sources and ready the water supply system for the effects of the shutdown period.

To date, DEP has identified, and is currently evaluating five supplemental water supply sources that could be activated during the shutdown to ensure the available water supply during the shutdown period. In addition, water flowing into the Delaware watershed reservoirs would not be diverted to the RWBT. These are the potential augmentation projects:

[†] Water may require treatment to meet discharge water quality standards.

Therefore, two types of projects would be needed to support Project 2B:

- ~~Potential Augmentation Projects:~~
 - ~~Conservation~~
 - Demand Management
 - Upper Catskill Aqueduct Optimization
 - Queens Groundwater Pumping Reactivation
 - New Jersey-New York City Interconnection
 - Nassau County Interconnection

In addition, during the shutdown period, water flowing into the Delaware watershed reservoirs would not be diverted to the RWBT. Therefore, some potential projects that may be necessary to accommodate the cessation of flow in the RWBT, since water that would normally flow through the RWBT would need to flow elsewhere.

These projects are varied in scope and location (see **Figure 7**). DEP is continuing to evaluate these projects to determine the most cost-effective strategies to meet its water supply demands. The projects identified and discussed in the following sections (see ~~DE.2.1~~ through ~~DE.2.6~~) are all in the facility planning stage and are conceptual at this time and will be retained for further study. It is possible that as project planning continues, one or more of the projects identified in this ~~Draft~~Final Scope may not move forward, and/or additional projects may be identified.¹

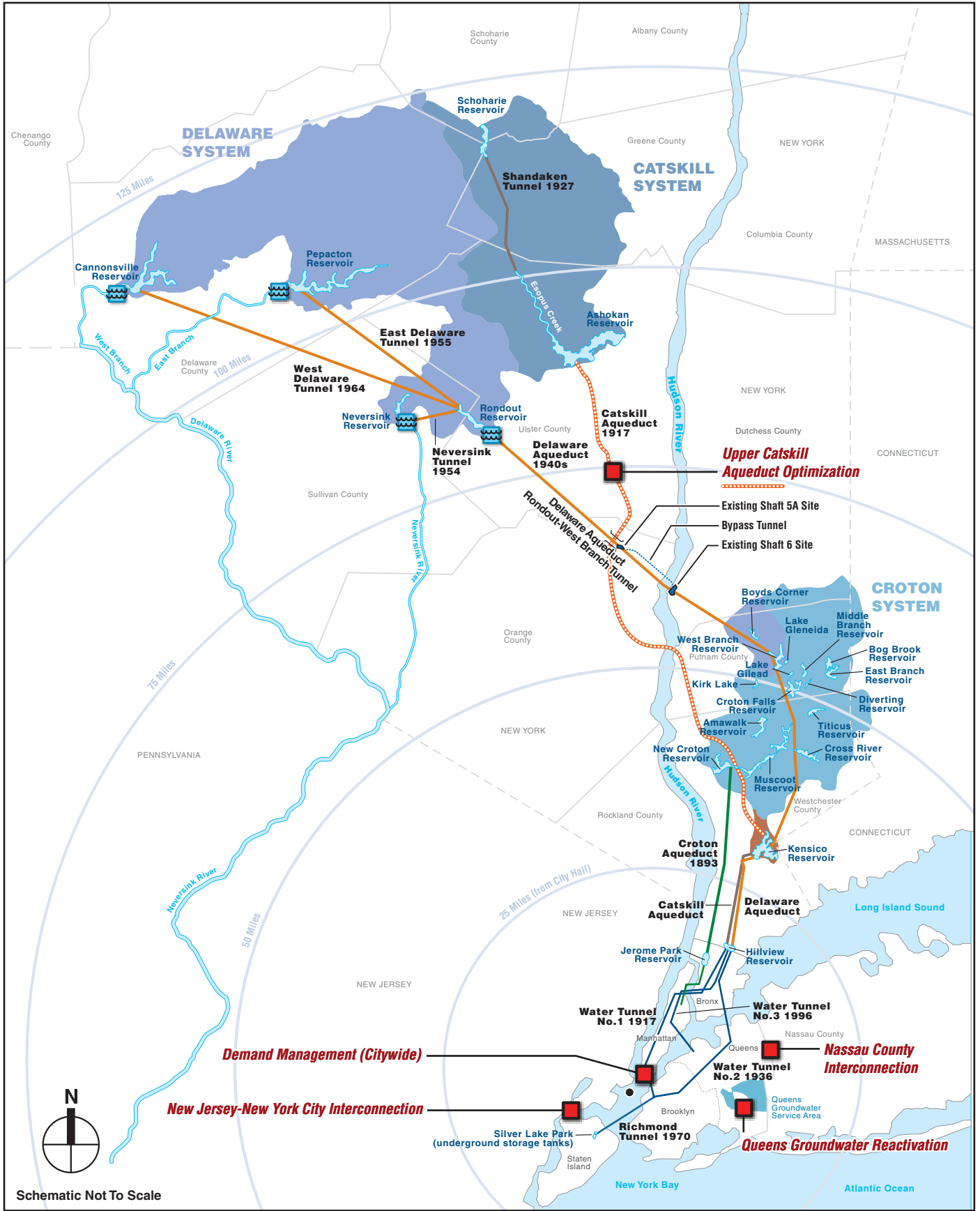
CONSERVATION

E.2.1 DEMAND MANAGEMENT

DEP has an ongoing ~~conservation~~ demand management program that could reduce water demand during the time of Project 2B, Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing.

DEP's policy and experience is that saving water is usually the most cost-effective and environmentally benign method of ensuring an ample supply of water for the region. The city's water ~~conservation~~ demand management programs address the many sources of water use and waste and have been developed in cooperation and collaboration with regulators, non-governmental organizations, and the citizens and businesses of the city over a period of more than 20 years. With the city's population expected to rise to 9.1 million by 2030, water efficiency will continue to have an important role to play, not just to help assure supply but also to assist in

¹ As stated above, DEP will undertake a second EIS that will provide further details and will quantitatively assess the potential impacts from Project 2A in detail. Before the approval and implementation of any of these projects, additional environmental review as part of a second EIS will be undertaken to evaluate and disclose the potential environmental impacts from these projects.



Schematic Not To Scale

■ Projects Proposed to Supplement the DEP Water Supply System

🏞 Delaware Watershed Reservoir Improvements

Figure 7

Water Supply System Augmentation and Improvement

meeting goals to reduce combined sewer overflows, maintain wastewater quality, and meet nitrogen removal goals.

DEP has previously implemented and is currently implementing a number of water ~~conservation~~ demand management programs including, but not limited to, distribution of water saving kits, implementation of a toilet rebate program, and public educational campaigns. The installation of the city-wide Automated Meter reading (AMR) system, which began in 2008, provides a source of detailed water use information on a customer level. It also enables DEP's Water Leak Notification Program, which can detect unknown leaks by monitoring spikes in usage. In addition, new water use rules took effect on June 22, 2009. The changes address several water quality and leak prevention issues in addition to a number of technical and procedural changes. A "Green Code" task force has been set up in the city with the goal of revising specific parts of the city's Building Code to meet environmental and "green building" goals, including water ~~conservation~~ demand management.

DEP would continue to develop both short-term and long-term strategies that could reduce demand during Project 2B.

E.2.2 UPPER CATSKILL AQUEDUCT OPTIMIZATION

The Upper Catskill Aqueduct Optimization project would consist of two main components: (1) cleaning and/or lining the aqueduct and (2) constructing and replacing air vents. Both of these components would occur in the section of the aqueduct between the Ashokan and Kensico Reservoirs. Together, these two components could improve the capacity of the Catskill Aqueduct to supply water.

- **Cleaning and/or Lining.** This component of the Upper Catskill Aqueduct Optimization program may require a series of shutdowns of the Catskill Aqueduct, during which teams of workers would enter the aqueduct and, using pressure washers, clean the aqueduct by removing the existing biofilm layer adhered to the interior of the aqueduct. The aqueduct could then be lined with an epoxy coating to seal the concrete walls and enhance the flow characteristics of the aqueduct.
- **Venting.** The Catskill Aqueduct is a closed conduit, cut-and-cover aqueduct that conveys water at grade. Water flows as open channel or free-surface flow within portions of the conduit; however, there are several segments of the aqueduct that travel under rivers and use pressure tunnels or siphons in these locations. Each segment requires adequate ventilation, especially when at capacity, to prevent trapped air from slowing the flow of the water. This component of the Upper Catskill Aqueduct Optimization project would add and replace air vents along the aqueduct to ensure that, as the flow of water in the aqueduct increases and decreases, sufficient air is ventilated to maintain a maximum flow of water.

E.2.3 QUEENS GROUNDWATER PUMPING REACTIVATION

Since 1996, DEP has owned and operated the Queens groundwater supply system that was formerly part of the Jamaica Water Supply Company. At the time of purchase, the groundwater supply system consisted of 68 wells. The well supply has been slowly phased out of operation, and no well has been operated to distribution since 2007. The source of this water is largely the Magothy Aquifer, located approximately 200 feet below sea level.

The Queens Groundwater ~~Pumping~~ Reactivation project would consist of the reactivation of groundwater wells during Project 2B.

E.2.4 NEW JERSEY-NEW YORK CITY INTERCONNECTION

This project would consist of constructing a hydraulic connection between New Jersey and New York City. The proposed interconnection with New Jersey water systems would allow DEP to use excess capacity in the system, when it is available, during the tunnel outage. There is a potential for multiple connections to more than one New Jersey water supply entity.

E.2.5 NASSAU COUNTY INTERCONNECTION

This project would consist of the construction of a hydraulic connection to source water from Nassau County. The proposed interconnections with adjacent Nassau County water systems would allow DEP to use Nassau County's excess well and treatment capacity during the tunnel outage. There is a potential of multiple connections to more than one Nassau County water supply entity.

E.2.6 DELAWARE WATERSHED RESERVOIR IMPROVEMENTS

When the Delaware Aqueduct is shut down during Project 2B, water flowing into the Delaware watershed reservoirs would need to be released from the Cannonsville, Pepacton, Neversink, and Rondout Reservoirs into the West and East Branches of the Delaware River, the Neversink River, and the Rondout Creek, respectively.

It is possible that at one or more of the reservoirs will require construction of limited facilities to facilitate and control the increased releases.

E.3 PROJECT 2B: BYPASS TUNNEL CONNECTION AND RWBT INSPECTION AND REPAIR, INCLUDING WAWARSING

~~This sub-project~~ Project 2B would consist of the connection of the bypass tunnel to the existing tunnel and the inspection and repair of the leaking area at Wawarsing and the remainder of the RWBT.

As discussed above, because ~~this sub-project~~ Project 2B would require that the flow of water within the RWBT be stopped, a number of measures to ensure a continued supply of water to New York City would be required to be in place before the shutdown could commence. The water supply augmentation and improvement efforts (Project 2A) are discussed in section ~~DE~~.2.

E.3.1 BYPASS TUNNEL CONNECTION

Connection of the bypass tunnel to the existing RWBT would involve constructing final bypass tunnel segments that would extend several hundreds of feet from the shafts constructed as part of Project 1, ~~Shaft and Bypass Tunnel Construction~~. Before making the connection, flows within the RWBT would be stopped and the tunnel unwatered. ~~DEP's Shaft 6 site (i.e.,~~ The east connection site (Shaft 6) would likely be used to unwater the tunnel. Once the tunnel is unwatered, the bypass tunnel would be connected to the existing tunnel. ~~DEP is exploring various options to seal off the existing tunnel in the event of a tunnel collapse and subsequent inundation; these options consist of various connection and plug configurations that will be described in more detail in the EIS.~~

As discussed above, inundation plugs would be used to block off the leaking area of the RWBT in Roseton in the event that water inflow exceeds DEP's ability to pump water out of the tunnel during the construction of Project 2B. Construction of the inundation plugs would be undertaken during construction of Project 1.

Construction activities would occur at the east and west connection sites but would occur primarily underground within the shafts, the RWBT, and the bypass tunnel. ~~The~~ Construction activity at the surface is anticipated to be more limited than during Project 1, ~~Shaft and Bypass Tunnel Construction~~.

E.3.2 RWBT INSPECTION AND REPAIR, INCLUDING WAWARSING

During the period when flows are stopped and after the tunnel has been unwatered, inspections and repairs would be made at the leaking area at Wawarsing ~~as well as~~ and to various areas of the RWBT.

It is anticipated that Shafts 1, 2A, 8, and 9 of the Delaware Aqueduct ~~could~~ would be used during inspection and repair of the RWBT for ventilation of, or access to, the tunnel.

Methods of repair could range from patching and grouting to repairing or adding sections of interliners, which are permanent liners used to support the tunnel. Further inspections would take place along the entire length of the RWBT to assess if additional repairs are necessary along the length of the approximately 45-mile tunnel.

E.4 BYPASS TUNNEL OPERATION

When the connection and the repairs are completed, water flow would be restored to the Delaware Aqueduct, and water would flow through the RWBT and the newly constructed bypass tunnel of the RWBT.

No additional workers or substantial vehicle trips would be added at the east or west connection sites or within the water supply system. Maintenance of the west connection site would generate only a minimal increase in on-site vehicular activity. These maintenance activities would include security inspections, maintenance of site landscaping, and visual inspections of the shaft.

Maintenance of the east connection site (Shaft 6) would be similar to existing conditions since this site is in active use by DEP.

F. PROGRAM SCHEDULE AND PHASING

F.1 PROJECT 1: SHAFT AND BYPASS TUNNEL CONSTRUCTION

Project 1 would begin with site preparation and construction of the shafts at the west and east and west connection sites, which would start in 2013 and be complete in ~~2016~~ 2015.

Construction of the bypass tunnel itself would begin in 2015 and be complete in ~~2019~~ 2020. Specifically, tunnel excavation would be complete in 2017, with tunnel lining and Project 1 demobilization and preparation for Project 2B expected to be complete in 2020.

F.2 PROJECT 2A: WATER SUPPLY SYSTEM AUGMENTATION AND IMPROVEMENT

Since these projects are critical to support the bypass tunnel connection, the implementation of Conservation Demand Management efforts, Upper Catskill Aqueduct Optimization, Queens Groundwater Pumping Reactivation, New Jersey-New York City Interconnection, Nassau County Interconnection, and Delaware Watershed Reservoir Improvements would be undertaken and completed before Project 2B, Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing.

F.3 PROJECT 2B: BYPASS TUNNEL CONNECTION AND RWBT INSPECTION AND REPAIR, INCLUDING WAWARSING

When the bypass tunnel addressing the leak at the Roseton crossing is complete, and the water supply system augmentation and improvement projects to support the connection are in place, the existing tunnel would be taken out of service and excavation would begin to connect the bypass tunnel to the existing tunnel. It is anticipated that between 6 and 15 months would be required to complete the bypass tunnel connection and that this would be expected to be complete in 2021.

During this time, while the RWBT is unwatered, inspection and repair of the leaking portions of the aqueduct at Wawarsing, along with additional tunnel sections not bypassed, would be undertaken.

F.4 BYPASS TUNNEL OPERATION

Upon completion of Projects 1 and 2 in 2021, water flow would be restored to the Delaware Aqueduct, and water would flow through the RWBT and the newly constructed bypass tunnel.

G. PROGRAM APPROVALS AND COORDINATION

The proposed program would require permits and approvals from federal, state, and local agencies. Anticipated permits and approvals are listed in **Tables 1 through 3**, and are organized by project.

The proposed program could also require the use of eminent domain (N.Y. Eminent Domain Procedure Law; N.Y. Public Authorities Law §§1266, 1267) related to the easements needed for the bypass tunnel route.

Table 1
Potential Major Permits, Approvals, Consultation, and Coordination—
Project 1, Shaft and Bypass Tunnel Construction

Agency/Entity	Permit/Approval/Consultation/Coordination
FEDERAL	
Coastal Zone Management Act	Projects affecting New York's coastal zone must be consistent with the Coastal Zone Management Act, through the New York State Department of State's Coastal Management Program and approved Local Waterfront Revitalization Plans
U.S. Army Corps of Engineers (USACE)	<u>Joint Individual Permit Application</u> <ul style="list-style-type: none"> • for tunnel construction under the dewatering pipeline outfall into Hudson River; <u>Nationwide Permit 12—Utility Line Activities; Nationwide Permit 7—Outfall Structures and Associated Intake Structures</u> for work in/adjacent to wetlands
United States Fish and Wildlife Service (USFWS)	<u>Consultation under Section 7 of the Endangered Species Act; Biological Assessment; Federal Fish and Wildlife Permit</u>
Advisory Council on Historic Preservation	Consultation under Section 106 of the National Historic Preservation Act of 1966
STATE	
New York State Department of State (NYSDOS)	Coastal Zone Management Consistency
New York State Department of Environmental Conservation (NYSDEC)	<u>Joint Permit Application</u> <ul style="list-style-type: none"> • for tunnel construction under the Hudson River • for work in/adjacent to wetlands <u>State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity - GP-0-10-001 (Erosion and Sediment Control for construction activities)</u> <u>State Pollutant Discharge Elimination System (SPDES) General Permit (GP-0-05-001) for Stormwater Groundwater Discharges of Sanitary Waste or SPDES Permit (Individual Permit) for Discharge of Wastewater from Construction Activity - GP-0-10-001 (Erosion and Sediment Control for construction activities) Publicly Owned Treatment Works (NY-2A) for treatment of sanitary waste at connection sites</u> <u>SPDES Multisector General Permit for Stormwater Discharges Associated with Industrial Activity (GP-06-002)</u> Individual SPDES Permit or Application Form NY-2C for Industrial Facilities (Shaft dewatering activities requiring discharge to surface water) <u>Stormwater Pollution Prevention Plan for Stormwater Discharges</u> <u>Section 401 Water Quality Certification</u> <u>Public Water Supply Permit</u> <u>Minor Facility Registration or NYSDEC State Facility Permit (air quality) or Title V Facility Permit</u> <u>Waste Transporter Permit for transport of excavated materials</u> <u>Hazardous Substance Bulk Storage Registration (Chemical Bulk Storage Registration)</u> <u>Petroleum Bulk Storage Facility Registration</u>
New York State Office of Parks, Recreation and Historic Preservation (NYSOPRHP)	Consultation to determine potential presence of archaeological and/or historic resources and determine project's potential effects
New York State Office of General Services (NYSOGS)	Application for Use of Lands Underwater
New York State Department of Health (NYSDOH)	<u>Approval of Plans for Public Water Supply Improvement</u> <u>State Environmental Review Certification for New York State Revolving Fund</u>
New York State Department of Transportation (NYSDOT)	<u>Divisible Load Overweight Permits (Form PERM 92)</u> <u>Major Traffic Generator Permit (depending on the level of construction traffic generated by the project during the peak hours)</u> <u>Special Hauling Permit (Form PERM 39-1 or PERM 39-2)</u> <u>Highway Work Permit for Non-Utility Work</u>
New York State Department of Transportation (NYSDOT)	Design Related, Highway Work and Traffic Enhancement Permits; General Coordination

Table 1 (cont'd)
Potential Major Permits, Approvals, Consultation, and Coordination—
Project 1, Shaft and Bypass Tunnel Construction

<u>Agency/Entity</u>	<u>Permit/Approval/Consultation/Coordination</u>
AREA MUNICIPALITIES	
<u>New York City</u>	
Public Design Commission of New York City	Design Commission Approval
<u>Dutchess County</u>	
<u>Dutchess County Public Works Coordination</u>	<u>Design Related, Highway Work and Traffic Enhancement Permits; General Coordination</u>
<u>Dutchess County Health Department</u>	<u>Potable Water Supply; On-site Sanitary Treatment</u>
<u>Orange County</u>	
<u>Orange County Public Works Coordination</u>	<u>Design Related, Highway Work and Traffic Enhancement Permits; General Coordination</u>
<u>Town of Wappinger</u>	
Town of Wappinger Planning Board	Site Plan Approval; <u>possible wetland permits, flood plain development permits;</u>
Town of Wappinger Zoning Board of Appeals	Zoning Board Approval <u>if variance is required</u>
Town of Wappinger Building Department	Building Permits; Blasting Permits; <u>Tree Harvesting Registration</u>
<u>Town of Wappinger Highway Superintendent</u>	<u>Design Related, Highway Work and Traffic Enhancement Permits; General Coordination</u>
<u>Town of Newburgh</u>	
Town of Newburgh Planning Board	Site Plan Approval; Clearing and Grading Permits; <u>Wetland Permit</u>
Town of Newburgh Zoning Board of Appeals	Zoning Board Approval <u>if variance is required</u>
Town of Newburgh Building Department	Building Permits; Clearing and Grading Permits; Blasting Permits; <u>Water and Sewer Connection Permit</u>
<u>Town of Newburgh Highway Superintendent</u>	<u>Design Related, Highway Work and Traffic Enhancement Permits; General Coordination</u>
<u>OTHER ENTITIES</u>	
<u>NYCDEP - Police</u>	<u>Coordination</u>
<u>MTA Metro North Railroad</u>	<u>Coordination</u>
<u>Midtown Tracking Ventures</u>	<u>Coordination</u>
<u>CSX Transportation Inc.</u>	<u>Coordination</u>
<u>Central Hudson</u>	<u>Coordination</u>
<u>Dynegy</u>	<u>Access Agreement</u>

Table 2
Potential Major Permits, Approvals, Consultation, and Coordination—Project 2A:
Water Supply System Augmentation and Improvement

Regulatory Agency	<u>Upper Catskill Optimization</u>	<u>Queens Groundwater Pumping Reactivation</u>	<u>Nassau County Interconnection</u>	<u>New Jersey – New York City Interconnection</u>
Federal Emergency Management Agency			X	X
U.S. Army Corp of Engineers				X
U.S. Environmental Protection Agency		X		
U.S. Fish and Wildlife Service	X			X
Delaware River Basin Commission				X
Office of the Governor – New Jersey				X
New Jersey Department of Environmental Protection				X
New York State Department of Environmental Conservation	X	X	X	X
New York State Department of Health		X	X	

Table 2 (cont'd)
Potential Major Permits, Approvals, Consultation, and Coordination—Project 2A:
Water Supply System Augmentation and Improvement

<u>Regulatory Agency</u>	<u>Upper Catskill Optimization</u>	<u>Queens Groundwater Reactivation</u>	<u>Nassau County Interconnection</u>	<u>New Jersey – New York City Interconnection</u>
New York State Department of State			X	X
New York State Department of Transportation	X	X	X	X
New York State Office of General Services				X
New York State Office of Parks, Recreation & Historic Preservation	X	X	X	X
Nassau County			X	
Orange County	X			
Ulster County	X			
Putnam County	X			
Westchester County	X			
Village of New Paltz	X			
City of Newburgh	X			
Town of Marlborough	X			
Village of Cornwall-on-Hudson	X			
Town of New Windsor	X			
Village of Cold Spring	X			
Town of Putnam Valley	X			
Continental Village	X			
City of Peekskill	X			
Town of Cortlandt	X			
Village of Buchanan	X			
Town of Yorktown	X			
Town of New Castle	X			
Village of Pleasantville	X			
Town of Mount Pleasant	X			
New York City Council		X	X	X
New York City Department of Mental Health and Hygiene	X	X	X	X
New York City Department of Transportation		X	X	X
New York City Department of City Planning		X	X	X
New York City Landmarks Preservation Commission		X		
New York City Department of Parks and Recreation		X	X	X
New York City Department of Small Business Services			X	X
New York City Design Commission		X		
NYC Community Boards		X	X	X
NYC Borough Presidents		X	X	X

Table 3
Potential Major Permits, Approvals, Consultation, and Coordination—
Project 2B: Bypass Tunnel Connection and RWBT Inspection
and Repair, including Wawarsing

Agency/Entity	Permit/Approval/Consultation/Coordination
STATE	
New York State Department of Environmental Conservation (NYSDEC)	Joint Permit Application (for Freshwater Wetlands, related to elimination of leaks)
New York State Department of State (NYS DOS)	Joint Permit Application (for Coastal Consistency Concurrence, related to elimination of leaks)
New York State Department of Health (NYS DOH)	Water Supply Improvement Approval
AREA MUNICIPALITIES	
New York City	
New York City Department of Health and Mental Hygiene	Water Supply Improvement Approval
Ulster County	
Ulster County Department of Health	Coordination
Town of Wawarsing	Coordination
Orange County	
Orange County Department of Health	Coordination
Dutchess County	
Dutchess County Department of Health	Coordination
Putnam County	
Town of Putnam Valley	Coordination
Town of Kent	Coordination

H. ANALYTICAL FRAMEWORK FOR ENVIRONMENTAL REVIEW

As the lead agency, DEP is required to examine the environmental effects of a proposed action and, to the maximum extent practicable, avoid or mitigate significant adverse impacts on the environment consistent with social, economic, and other essential considerations. In disclosing impacts, the EIS uses an analytical approach that considers the proposed program’s potential adverse impacts on the environmental setting. Typically, the majority of a project’s effects would occur upon completion of the project, once the project is operational; for example, once a site plan application is approved and construction is complete and the development is occupied, there could be the potential for traffic impacts from people driving to and from the site. Therefore, typically, the technical analyses in an EIS describe conditions today and forecast these conditions to the future first without and then with the proposed project. A project’s potential to result in significant adverse impacts upon completion and operation is then analyzed.

The Water for the Future Program: Delaware Aqueduct Rondout-West Branch Tunnel Repair program requires a modified analytical approach since it has a substantial multi-year construction effort related to various project elements over a broad geographic area, and relatively limited operational impacts. In addition, the designs of Project 2A, Water Supply System Augmentation and Improvement, and Project 2B, Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing, will not be available for several years. Therefore, as described above, DEP is undertaking a two-part approach to the EIS for the proposed program.

~~Below are~~ This first EIS provides a detailed analysis of Project 1, Shaft and Bypass Tunnel Construction, and a mostly qualitative analysis, to the extent possible, of Projects 2A and 2B. For the detailed analysis of Project 1, relevant analytical terms used in the environmental review process, and in subsequent sections these terms are further defined as they will be used in the environmental review for the proposed program. are described:

- **Existing conditions.** ~~In this EIS, The assessment of existing conditions are observed and assessed, establishing~~ establishes a baseline—not against which Project 1 is measured, but from which future conditions can be projected. The prediction of future conditions begins with an assessment of existing conditions because these can be measured and observed. Generally, existing conditions will be evaluated for the study areas and time periods most likely to be affected by the proposed program. For example, the existing traffic conditions are analyzed during the time periods when the greatest numbers of new vehicular trips during Project 1, Shaft and Bypass Tunnel Construction, to and from the connection sites are projected to occur.
- **No Build condition.** Using existing conditions as a baseline, conditions known to occur or expected to occur in the future, regardless of ~~the proposed program Project 1,~~ are then evaluated for the proposed program’s interim and operational analysis years (see “Analysis year,” below). This is the No Build or future without ~~the proposed program Project 1~~ condition and is the baseline condition against which the effects of the Project 1 can be measured.
- **Analysis year.** The analysis year refers to a particular future year for which an EIS analyzes a proposed ~~program’s project’s~~ likely effects on its environmental setting. There could be a number of analysis years depending on the technical analysis under consideration. For example, if a project would result in substantial construction (like ~~the proposed program Project 1~~), there could be separate interim analysis years for the traffic and air quality analyses since the peak year for traffic may differ from the peak year for air emissions.

The subsequent section, Section ~~HI,~~ “Organization and Scope of the Environmental Impact Statement,” discusses the proposed organization of the EIS and provides the methodologies for analysis of the proposed program.

I. ORGANIZATION AND SCOPE OF THE ENVIRONMENTAL IMPACT STATEMENT

Since the sponsor of the project is DEP, a New York City agency, it is subject to CEQR in addition to SEQRA. The City of New York’s *CEQR Technical Manual* (2010) provides suggested methodologies for conducting environmental assessments performed under CEQR.

The methodologies in the *CEQR Technical Manual* provide a structured approach to addressing the potential for significant adverse impacts, and the proposed ~~Draft~~ Final Scope follows its suggested analytical approaches. These methodologies are considered to be appropriate technical

analysis methods and guidelines for environmental impact assessment of discretionary actions in New York City. However, since the proposed program would ~~be largely located~~ involve construction is locations outside New York City, locally and/or state-accepted EIS methodologies ~~will be~~ have been applied in cases where New York City methodologies are either irrelevant or less stringent.

The remainder of the document describes the analysis and methodologies that will be used in the EIS to assess the potential environmental effects of the proposed program.

- Sections H.I.1 and H.I.2 describe how the EIS will include an Executive Summary and a Program Description.
- Section H.I.3 describes the methodologies that will be used to analyze the probable impacts of Project 1, Shaft and Bypass Tunnel Construction.
- Section H.I.4 describes how Project 2A, Water Supply System Augmentation and Improvement will be assessed.
- Section H.I.5 describes how Project 2B, Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing, will be assessed.
- Section H.I.6 describes the methodologies that will be used to analyze the proposed program upon operation.
- Section H.I.7 describes how the proposed program's cumulative effects will be assessed.
- Section H.I.8 describes how alternatives to the proposed program will be addressed.
- Sections H.I.9 and H.I.10 describe how the EIS will disclose any unavoidable adverse impacts and any irreversible and irretrievable commitment of resources.
- Section H.I.11 describes how technical appendices will be included as part of the EIS.
- Section H.I.12 describes how a glossary of acronyms will be included as part of the EIS.

I.1 EXECUTIVE SUMMARY

The EIS will include an Executive Summary providing the reader with a clear understanding of the information found in the main body of the EIS. A synopsis of all potential significant adverse impacts from the construction and operation of the proposed program, along with proposed mitigation measures for such impacts, will be summarized in this chapter.

Specifically, the Executive Summary will include:

- Brief description of the proposed program, including background leading to its development and anticipated analysis years.
- List of involved and interested agencies, and required approvals/permits.
- Concise list of the anticipated significant adverse impacts and proposed mitigation measures.

- Description of the alternatives to the proposed program considered in the EIS. A table will be presented that assesses and compares each alternative relative to the various impact issues.

I.2 CHAPTER 1: PROGRAM DESCRIPTION

This chapter of the EIS will provide an understanding of the proposed program and provide the public and decision-makers with context from which to evaluate the proposed program and its alternatives.

The Program Description chapter will contain an overview of the proposed program, including a description of the various project locations, list of all actions and approvals associated with the proposed program, identification of the applicant, and a discussion of the regional setting for the proposed program. It will also incorporate a statement of purpose and need for the proposed program.

This chapter of the EIS will also describe the major project components:

- Project 1: Shaft and Bypass Tunnel Construction;
- Project 2: RWBT repair and water supply system improvements consisting of the following two sub-projects:
 - Project 2A: Water Supply System Augmentation and Improvement; and
 - Project 2B: Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing.

This chapter will also describe operation of the bypass tunnel.

This section will provide charts, graphics, maps, site plans, and renderings, as well as other supporting documents related to the two major project components of the program, as appropriate. Tax map identification, land ownership, and existing uses of all parcels of land comprising the potential connection sites will be identified. The proposed program will be described in detail, including relative dimensions of project components, where appropriate. An overview of the proposed program's construction schedule and phasing will be provided, and locations where construction may occur (including construction staging areas) will be identified.

Other actions associated with the proposed program will be identified, including but not limited to approvals required and procedures to be followed in the EIS and SEQRA/CEQR processes. Significant components or actions associated with the proposed program will also be described in detail. Involved agencies will be identified in the EIS.

I.3 CHAPTER 2: PROBABLE IMPACTS OF PROJECT 1, SHAFT AND BYPASS TUNNEL CONSTRUCTION

I.3.1 OVERVIEW

As described above, Project 1, Shaft and Bypass Tunnel Construction would involve construction at the east and west connection sites within the Towns of Newburgh and

Wappinger, respectively, as well as the bypass tunnel itself. This portion of the EIS will provide a detailed assessment of potential impacts related to Project 1.

Unlike potential impacts from the operation of a project, which are permanent, impacts from construction are in many cases temporary. These impacts, though temporary, can have a disruptive and noticeable effect on the adjacent community. Because of the complexity and lengthy construction schedule associated with Project 1 it is anticipated that this project could result in potential impacts.

Since Project 1 would consist of intense construction activity, the EIS will focus on the potential effects from this construction effort. The determination of the significance of impacts from construction activities will be based on an assessment of the predicted intensity, duration, and the geographic extent of the impacts. Where potentially significant adverse impacts are identified for each of the technical areas, mitigation measures will be explored and, if feasible, mitigation for any impacts will be presented.

Detailed analyses of the following will be included in the EIS. Categories not listed here (growth inducement) will be screened in the EIS:

- Land Use, Zoning, Public Policy, and Open Space
- Neighborhood Character
- Visual Character
- Historic and Archeological Resources
- Socioeconomic Conditions
- Community Facilities and Services
- Natural Resources and Water Resources
- Hazardous Materials
- Transportation
- Air Quality
- Energy and GHG/Climate Change
- Noise
- Infrastructure
- Solid Waste
- Coastal Zone Consistency
- Public Health

I.3.2 CHAPTER 2.1: DESCRIPTION OF PROJECT 1, SHAFT AND BYPASS TUNNEL CONSTRUCTION

A detailed description of Project 1 construction activities will be provided, including an estimated timeline showing the major proposed activities by each stage of construction through completion of the Project 1, as well as a description of the proposed activities and their locations during each stage. This discussion will include potential storage areas, potential staging and

parking areas, truck routes, likely sequencing, and techniques to minimize impacts during construction. For each technical area, a discussion of the impacts for the entire Project 1 construction period and for the evaluated/modeled reasonable worst-case condition will be provided.

1.3.3 CHAPTER 2.2: LAND USE, ZONING, PUBLIC POLICY, AND OPEN SPACE

The land use, zoning, public policy, and open space analysis will assess the potential for impacts on any sensitive land uses and open spaces from Project 1, Shaft and Bypass Tunnel Construction. The analysis will evaluate impacts within an area of approximately ¼-mile around the project locations where above-ground construction work for Project 1 may occur.

1.3.3.1 Existing Conditions

This analysis will describe existing land uses for the potential connection sites and surrounding study areas. **Figure 8** shows the land uses within a general study area; specific study areas will be defined as sites where above-ground facilities for Project 1 may be located are identified (i.e., connection site locations). All land use information will be compiled and mapped primarily from published data, supplemented with field surveys and aerial photography, as appropriate.

The zoning analysis will describe existing zoning regulations that apply to the potential connection sites, including information on allowed uses, building bulk, and setbacks required within the zoning districts. The analysis of public policy will outline the relevant land use policies that apply to the potential connection sites, including local, county, and state policies.

Open spaces within the study areas will be identified using available local, county, and state resources (such as county open space maps, GIS data, and plans) and coordination with the various county planning departments.

1.3.3.2 The Future Without the Project 1, Shaft and Bypass Tunnel Construction

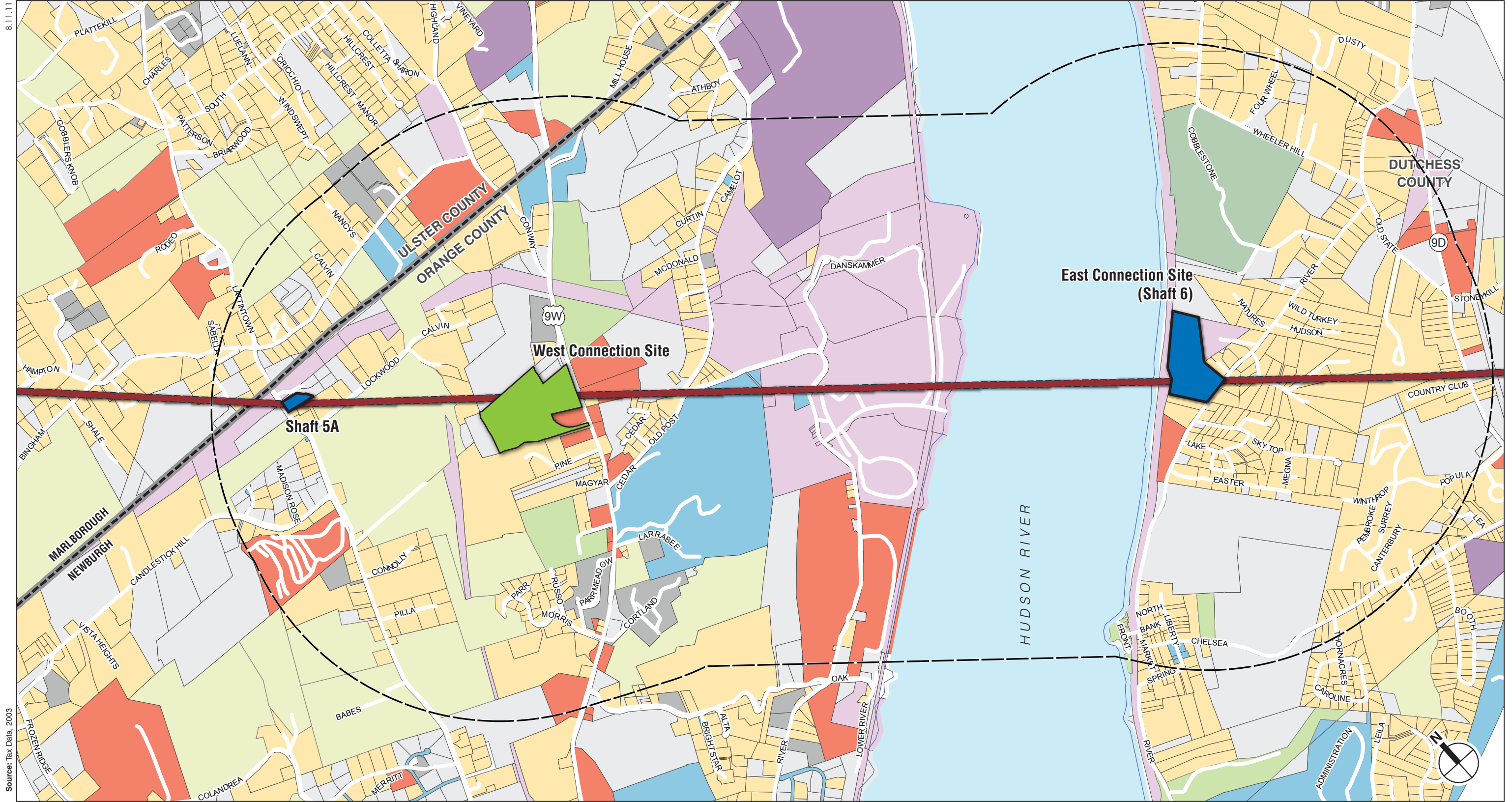
Information on pertinent projects undertaken by DEP, other development projects, and other actions in the study areas will be presented. Anticipated changes included in this section will be based on officially approved or adopted future plans or developments that are anticipated to be completed by the start of operation of the proposed program. If there are any relevant planned and proposed changes to public policy that would occur independent of the proposed program, these will be described.

1.3.3.3 Potential Impacts of Project 1, Shaft and Bypass Tunnel Construction

Potential land use impacts will be assessed based on the activities associated with Project 1, relative to the surrounding land uses. The impact assessment will consider whether the duration of construction activities at certain sites would constitute a land use that could thereby affect land use patterns in the neighborhood.

The public policy analysis will consider consistency of the Project 1 with existing local, state, and federal policies, including the Smart Growth Public Infrastructure Policy Act.

8.11.11



Source: Tax Data, 2003

- | | | | |
|--|----------------------|--------------------|----------------------------|
| Existing Shaft Sites 5A and 6 | Water Supply | Parks/Conservation | Transportation and Utility |
| Delaware Aqueduct Rondout-West Branch Tunnel | Residential | Agricultural | Vacant Parcel |
| West Connection Site Location | Commercial/Office | Recreation | Not Classified |
| Study Area Boundary | Community Facilities | Industrial | |



Figure 8
Bypass Tunnel Land Use
and Open Space Study Area Overview

The analysis of open space will determine whether Project 1 would directly affect any open space, whether by an increase in shadows, air emissions, or noise.

I.3.4 CHAPTER 2.3: NEIGHBORHOOD CHARACTER

Neighborhood character is an amalgam of the many components that give an area its distinctive personality. These components can include land use; street layout; scale, type, and style of development; historic features; visual resources; patterns and volumes of traffic; noise levels; and other physical or social characteristics that help define a community. However, not all of these elements affect neighborhood character in all cases; a neighborhood usually draws its distinctive character from a few defining elements.

This section of the EIS will assess the potential for impacts on neighborhood character due to Project 1, Shaft and Bypass Tunnel Construction. The analysis will be closely coordinated with the assessment of “Land Use, Zoning, Public Policy, and Open Space” to determine whether construction activities have the potential to result in impacts to the various components that define the character of the neighborhood.

I.3.5 CHAPTER 2.4: VISUAL CHARACTER

This section of the EIS will assess the potential for impacts on visual character from Project 1, Shaft and Bypass Tunnel Construction. Specifically, the analysis will consider the potential for nighttime lighting impacts. The analysis will also consider any local applicable codes, the most recent edition of the Illuminating Engineering Society Handbook, and the most recent edition of the American National Practice for Roadway Lighting (RP-8) approved by the American National Standards Institute (ANSI).

I.3.6 CHAPTER 2.5: HISTORIC AND ARCHAEOLOGICAL RESOURCES

Project 1, Shaft and Bypass Tunnel Construction would necessitate in-ground work for the excavation of shafts at the connection sites and the bypass tunnel; in-ground work would also be needed for the potential pipeline. This subsurface excavation and disturbance may directly affect potential archaeological resources in the area, and the EIS will assess the potential for Project 1 to affect historic and archaeological resources.

I.3.7 CHAPTER 2.6: SOCIOECONOMIC CONDITIONS

~~As discussed above, DEP has examined~~ The Draft Scope stated that DEP was examining the potential use of properties already under DEP jurisdiction for the bypass and connection sites and the associated construction staging area that would be needed for Project 1. ~~However, but that~~ DEP has had limited properties in the project area ~~and; therefore, in the Draft Scope, it was~~ assumed that some acquisition of property ~~is~~ would be needed, and therefore, some direct displacement ~~may could~~ occur. As such, the Draft Scope stated that if direct displacement would occur, an analysis of such displacement will be undertaken in the DEIS. Since publication of the Draft Scope, DEP has commenced acquisition of the properties needed for the west connection

site through willing negotiations with property owners, and therefore, no direct displacement would occur.

As such, this section of the EIS will provide a summary of DEP's acquisition of the west connection site and also include estimates of the number of employees expected to work on Project 1 and the economic benefits that would result.

1.3.8 CHAPTER 2.7: COMMUNITY FACILITIES AND SERVICES

The section of the EIS will address the potential for impacts to community facilities and emergency service providers. It will address the ability of local emergency service providers to respond to emergencies at the construction sites during the construction period. Staffing levels and equipment for each service provider will be discussed. Any impacts to these service providers that affect their ability to respond to emergencies or result in longer response times will be discussed.

1.3.9 CHAPTER 2.8: NATURAL RESOURCES AND WATER RESOURCES

Following the methodologies presented in the *CEQR Technical Manual*, a natural resources assessment is conducted when such resources are present on or near a project site, and when an action involves disturbance to natural resources. The *CEQR Technical Manual* defines natural resources as “(1) the City’s biodiversity (plants, wildlife and other organisms); (2) any aquatic or terrestrial areas capable of providing suitable habitat to sustain the life processes of plants, wildlife, and other organisms; and (3) any areas capable of functioning in support of the ecological systems that maintain the City’s environmental stability.”

During Project 1, Shaft and Bypass Tunnel Construction, water would continue to flow through the RWBT. Therefore, the natural resources and water resources analysis will assess the potential for Project 1 to adversely affect natural and water resources in and near the connection sites and the pipeline between the west connection site and a new outfall on or near the Hudson River, with emphasis on the potential areas of disturbance from construction activities.

1.3.9.1 Existing Conditions

Project 1 has the potential to result in clearing of some terrestrial vegetation with the potential to provide habitat for wildlife. Therefore, this analysis will describe existing natural resources in and near the connection sites and the proposed pipeline route and new outfall location, including terrestrial habitats and wildlife, threatened or endangered species, floodplain and groundwater resources, and any surface water bodies and wetlands in and near the connection sites, pipeline route, and new outfall location, as appropriate. ~~The description of existing natural and water resources will be developed on the basis of current information from literature sources and other information obtained from governmental and non-governmental agencies.~~ Existing conditions of surface waters and wetlands with the potential to be affected by Project 1 will be described based on the following sources:

- Current information from literature sources;

- Information from governmental and non-governmental agency sources, including:
 - U.S. Fish and Wildlife Services (USFWS) National Wetland Inventory (NWI) maps;
 - NYSDEC classified water bodies;
 - NYSDEC Natural Heritage Program;
 - National Marine Fisheries Service (NMFS).
- Site reconnaissance visits.

I.3.9.2 Future Without Project 1, Shaft and Bypass Tunnel Construction

The potential for pertinent DEP and other development projects and other actions to affect natural and water resources within the study areas will be assessed on the basis of existing resources and the activities that would be associated with such projects.

I.3.9.3 Potential Impacts of Project 1, Shaft and Bypass Tunnel Construction

As discussed above, the impact assessment will address the potential for construction of the shafts, bypass tunnel, pipeline, and outfall on or near the western bank of the Hudson River to affect natural and water resources in and near these project elements. This assessment will consider potential impacts to vegetation and wildlife from such construction activities as the clearing of vegetation, noise associated with construction equipment, possible nighttime lighting, construction traffic, increased human activity, and to water resources from the management of stormwater and potential discharges of stormwater and water recovered during dewatering of the shafts and bypass tunnel to surface waters. Potential impacts to natural and water resources from construction of the bypass tunnel will be assessed, particularly with respect to both temporary and long-term adverse effects to terrestrial resources associated with permanent loss of habitat (e.g., breeding birds and other wildlife).

I.3.10 CHAPTER 2.9: HAZARDOUS MATERIALS

The EIS will address the potential presence of hazardous materials either in soil/groundwater or in existing structures that may be disturbed during Project 1, Shaft and Bypass Tunnel Construction. For locations where it is known that construction would occur, the EIS will ~~summarize~~ include a summary of any hazardous materials assessments that have already been conducted. The EIS will include any necessary recommendations for additional testing or other activities that would be required either prior to or during Project 1, including ~~a discussion of~~ any necessary remedial or ~~related other~~ measures, if warranted, to ensure any hazardous materials are properly addressed. The EIS will ~~include~~ also contain a general discussion of the health and safety measures that would be implemented during Project 1 ~~and will identify any appropriate remediation measures, if applicable.~~

I.3.11 CHAPTER 2.10: TRANSPORTATION

A quantitative construction traffic impact analysis will be undertaken due to the anticipated duration of Project 1, Shaft and Bypass Tunnel Construction and the estimated number of construction workers and construction vehicles. This analysis will identify the relative duration

of construction activities (focusing on peak construction conditions) and will assess the potential effects of construction-related traffic at selected key study area intersections. Trip-generation estimates of construction worker vehicle and truck trips will be developed. On- and off-street areas that may be available for construction worker parking will be surveyed and considered in the analyses. Pedestrian issues (particularly safety along truck routes) will be considered, if applicable. Graphics of the study area roadways and intersections with street widths, traffic flow directions, lane markings, parking regulations, and other appropriate information, will be provided.

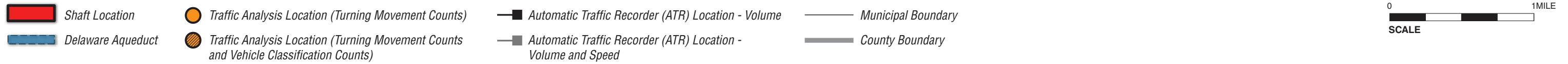
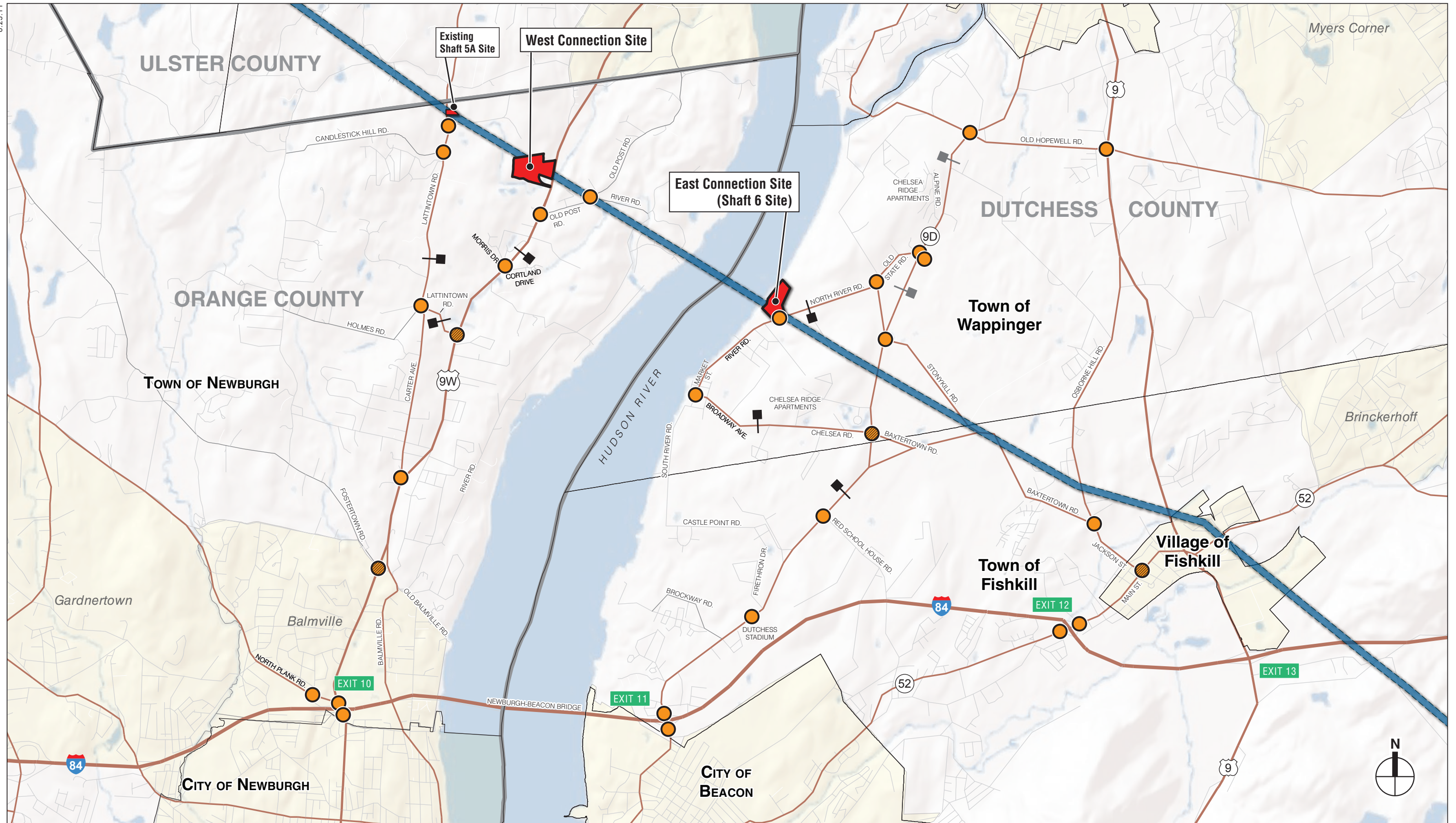
1.3.11.1 Existing Conditions

Study areas will be established based on anticipated traffic volumes, logical traffic routes for both trucks and construction workers, off-site parking locations, and potentially problematic areas. The study area is presented in **Figure 9**. Data collection will conform to the recommendations in the *CEQR Technical Manual* as outlined in the following paragraphs.

As shown in Figure 9, automatic traffic recorder (ATR) counts (24-hour measurements) will be performed for nine consecutive days (in order to collect two weekends of data) at six locations in the study area. Turning movement counts (TMCs) will be collected for one weekday at the Figure 9 locations from 6 AM to 9 AM and from 2 PM to 8 PM (by doing so, the construction and commuter peak hours will be covered). In addition, in anticipation that traffic/noise impact assessments may be required for construction work through the weekends at times, TMCs will be conducted on Saturday from 6 AM to 9 AM and 2 PM to 5 PM. These counts will be collected on the same day the ATR data collection is also being performed. As also shown in Figure 9, vehicle classification counts will be conducted at up to four intersections in the study area concurrent with the turning movement counts. Observations of running speeds on U.S. Route 9W and NYS Route 9D, north and south, will be collected concurrent with the TMCs. In addition, pedestrian conditions will be observed at key study area roadways and intersections for use in the capacity analysis. School bus routes will be identified.

The existing conditions analysis will also present current traffic counts representative of the existing conditions and will be supplemented as necessary. The analysis will present a capacity study of the street network, which will rely on the *2000 Highway Capacity Manual* latest Synchro methodology. The capacity study will include existing traffic volumes and volume-to-capacity (v/c) ratios of roadways, and levels of service (LOS)¹ of intersections for two peak-hour analysis periods (the AM and PM construction peak hours). The morning and evening construction peak hours generally occur earlier than the weekday AM and PM peak hours; the rationale for selecting the peak hour will be included in the DEIS. If necessary, potential impacts

¹ The levels of service are expressed in levels A through F, with level A representing the best operating condition (shortest delay) and F representing the worst operating condition (longest delay).



from ~~lesser~~ lower levels of project-generated traffic during commuter peak hours will be examined as well.

Furthermore, field information will be presented, including street widths, traffic flow directions, lane markings, and curbside parking regulations, as well as other items required for traffic analysis and parking impact evaluations. In addition, traffic control devices, including traffic signal timings and other traffic controls, will be inventoried and mapped, as appropriate.

Existing pedestrian levels and conditions will be assessed while undertaking the traffic data collection, and the pedestrian characteristics in the immediate vicinity of the potential connection sites will be discussed.

In addition, accident records for a three-year period will be reviewed from NYSDOT accident files and other sources to determine whether any locations in the study area exhibit a high accident frequency.

A general assessment of the existing transit availability and capacity will be presented. Bus routes and schedules serving the study areas will be described. However, since the potential connection sites are not likely to be conveniently accessible via public transit, it is assumed all construction workers would commute by car; thus, no detailed transit analyses are anticipated.

Current parking conditions will be presented. This will include a survey of existing parking facilities and availability of on-street and off-street parking conditions within a reasonable walking distance of the potential work entrances to potential connection sites.

1.3.11.2 Future Without Project 1, Shaft and Bypass Tunnel Construction

In coordination with the land use, zoning, public policy, and open space analysis, future developments in the study area and associated future without the project traffic volumes will be presented. Traffic volumes, v/c ratios, LOS, and problem intersections will be identified. The future traffic volumes will be estimated using existing traffic volume information, adding incremental increases from future developments, and applying a background growth factor. The growth factor will be identified in coordination with the local planning agencies and NYSDOT. Expected traffic improvements from future developments, if any, will also be taken into consideration.

The future without the project analysis will also project future conditions of parking capacity on the project areas. These conditions will reflect anticipated changes in the parking supply and any changes in accumulated parking demand generated in the future without the project conditions.

1.3.11.3 Potential Impacts of Project 1, Shaft and Bypass Tunnel Construction

The transportation demands due to Project 1, Shaft and Bypass Tunnel Construction will be assessed. Trips will be assigned to the network along truck routes, potential construction worker routes, potential access/egress points on the potential connection sites, and any other logical paths. Trip volumes will be assigned to key intersections. A traffic impact analysis will be performed, and changes in LOS related to the future with the project condition will be identified

using *CEQR Technical Manual* criteria guidance and applicable state and local guidance and regulations. In addition, the analysis would address the potential impacts from oversize and overweight vehicles used to transport materials and/or equipment to and from the project locations. The potential for off-tracking at intersections and sharp curves will be evaluated as well as roadway, culvert, and bridge capacities for truck routes.

The evaluation of the construction-related traffic impacts will utilize thresholds established in the *CEQR Technical Manual* as a first level of analysis; although these thresholds are designed to determine impact for permanent operation they still serve as a useful tool in assessing traffic impacts during the construction period. These thresholds will be utilized in conjunction with an evaluation of the intensity and duration of the projected impact, as discussed above. The thresholds established in the *CEQR Technical Manual* state that the traffic impact is considered to be a significant adverse impact if an intersection projected to operate at LOS A, B, or C in the future without the project conditions would permanently deteriorate to marginally unacceptable mid-LOS D or unacceptable LOS E or F in the future with the project conditions. Therefore, for a signalized intersection, any LOS change in the future with the project conditions with a delay of 45 seconds (mid-LOS D based on a range of 35 to 55 seconds) or less is not considered an impact for the purposes of this analysis. The *CEQR Technical Manual* further states that for the future without the project, if LOS A, B, or C is predicted to permanently deteriorate to LOS D in future with the project conditions, mitigation to mid-LOS D is required. For a lane group LOS D in future without the project conditions, a permanent increased delay due to Project 1 activity by 5 or more seconds is considered a significant adverse impact if the future with the project conditions delay exceeds mid-LOS D. For a LOS E in future without the project conditions, the threshold is a 4-second increased delay during Project 1 activities, and for a LOS F in future without the project, a 3-second increased delay due to Project 1 activity is considered a significant adverse impact. In addition, delay and queuing results from the Synchro simulation will be reviewed.

These impact criteria are also applicable to unsignalized intersections. However, as mid-LOS D equates to a delay of 30 seconds for an unsignalized intersection, any LOS change due to Project 1 with a delay of 30 seconds or less would not be considered a significant adverse impact. For the minor street to trigger significant impacts, 90 passenger car equivalents (PCEs) must be identified in the future with the project conditions in any peak hour.

The results of the traffic analysis will be used to determine the potential for significant adverse traffic impacts and to support other EIS analyses, namely air quality and noise. For the assessment of mobile air pollution, volumes, speeds (if necessary), and vehicle classifications in principal study area corridors will be examined, as well as the arrival/departure and auto/truck splits for the project increment in the morning and evening peak periods. Traffic input data will also be used in the noise analysis. These data will include 24-hour background traffic volumes (at select locations) and peak-hour classifications for use in the appropriate existing, future without the project, and future with the project conditions.

A quantitative analysis of potential impacts from construction-related traffic will be conducted for the peak Project 1 construction year. The evaluation of impacts during other periods of construction will be based on the analysis results for the peak period to determine the magnitude and duration of other construction period impacts.

Construction-related traffic will be assigned to the network along truck routes and/or other logical paths. Parking demand during construction will also be evaluated. Locations with high accident frequency will be evaluated in light of the construction traffic volume.

Figure 9 illustrates the possible intersections identified for analysis. These total potential ~~22~~ 29 intersections for analysis include:

- East of Hudson:
 - I-84 Westbound ramps and NYS Route 9D
 - I-84 Eastbound ramps and NYS Route 9D
 - NYS Route 9D and Dutchess Stadium
 - NYS Route 9D Red ~~Schoolhouse~~ School House Road (County Route 36)
 - NYS Route 9D and Chelsea Road (County Route 92) and Baxtertown Road (County Route 34)
 - NYS Route 9D and ~~Old State~~ Stonykill Road
 - NYS Route 9D and Old State Road (Southern Intersection)
 - NYS Route 9D and Old State Road (Northern Intersection)
 - Old State Road and North River Road
 - ~~River Road and Fishkill~~ Broadway Avenue and Market Street
 - Baxtertown Road (County Route 34) and Osbourne Hill Road (County Route 35)
 - Jackson Street and NYS Route 52
 - I-84 Westbound Ramps and NYS Route 52
 - I-84 Eastbound Ramps and NYS Route 52
 - North River Road and ~~Shaft 6~~ East Connection Site Driveway
 - NYS Route 9D and New Hamburg Road/Old Hopewell Road (County Route 28)
 - U.S. Route 9 and Old Hopewell Road (County Route 28)
- West of Hudson:
 - North Plank Road (County Route 32)/I-84 Westbound ramps Off Ramp and U.S. Route 9W
 - I-84 Eastbound Ramps and U.S. Route 9W
 - N. Plank Road (County Route 32) and I-84 Westbound Ramps
 - U.S. Route 9W and Fostertown Road (County Route 86)

- U.S. Route 9W and Carter Avenue
- U.S. Route 9W and Lattintown Road
- U.S. Route 9W and Morris Drive/Cortland Drive
- U.S. Route 9W and Old Post Road
- Old Post Road and River Road
- Lattintown Road and Lockwood Lane
- Lattintown Road and Holmes Road and Carter Avenue
- Lattintown Road and Candlestick Hill Road

I.3.12 CHAPTER 2.11: AIR QUALITY

Information on existing ambient air quality conditions from the NYSDEC will be updated and verified, as available. Information will be provided on the following pollutants: nitrogen dioxide (NO₂), carbon monoxide (CO), inhalable particulate matter (PM₁₀ and PM_{2.5}); sulfur dioxide (SO₂); and ozone (O₃).

While NO₂ and total hydrocarbons (THC) are precursors to formation of ground-level ozone, the reactions are relatively slow and generally take place far from the site where the emissions occur. Therefore, their effects cannot be related on a localized level, but can be on a mesoscale, or regional scale. Consequently, these pollutants are examined for large projects that have the potential to affect ozone level on a regional scale. However, Project 1, Shaft and Bypass Tunnel Construction is not anticipated to result in enough mobile sources to require a mesoscale analysis.

The air quality assessment for construction activities will include an analysis of potential on-site construction activities. The potential for Project 1 to emit greenhouse gases during construction will be discussed in a separate section.

A mobile source analysis will also be conducted, as described below.

I.3.12.1 Existing Conditions

Mobile Sources

A study area for analyzing mobile sources of air pollution will be presented based on input from the traffic analysis. The pollutants of concern in the mobile source (traffic) analysis are CO, PM₁₀, and PM_{2.5}. The study area includes those intersections where traffic congestion is anticipated based on estimates of traffic conditions and incremental vehicular traffic associated with Project 1, Shaft and Bypass Tunnel Construction. Intersections in the study area will be considered using the methodology described in the *CEQR Technical Manual* and will conform to the EPA's *Guidelines on Air Quality Models*. The roadways that have the greatest potential for air quality impacts from motor vehicle traffic will be presented, and modeling of pollutants of concern will be presented. The exact locations of mobile source modeling will be based on a review of relevant traffic data.

Selection of the mobile source modeling sites will also reflect the location of critical sensitive receptors (e.g., schools, hospitals, etc.) and sites where project-generated traffic is highest and the LOS is poor. Vehicular CO emission factors will be obtained from the latest EPA-recommended model for both AM and PM weekday peak analysis periods and will be presented. Vehicle database factors for the appropriate counties that reflect the latest changes in input parameters (e.g., ambient temperature, inspection/maintenance program) will be used with the EPA's MOBILE6.2 Model to generate CO, PM₁₀, and PM_{2.5} emission rates for the dispersion model. The predicted vehicle emissions will be analyzed using EPA's CAL3QHC and CAL3QHCR dispersion model as appropriate. ~~For this analysis, five years of~~ The nearest meteorological data from La Guardia Airport monitoring station and concurrent upper air data from Brookhaven, New York, consistent with EPA guidance, will be utilized for the simulation program ~~(2005-2009, or later if available).~~ The 1-hour and 8-hour CO, and 24-hour PM₁₀ and incremental 24-hour and annual PM_{2.5} average concentrations will be calculated and compared to the applicable impact criteria.

Stationary Sources

Data from the land use and field surveys and searches of NYSDEC's permit data will be undertaken to determine if there are significant sources of stationary air pollutants near the potential connection sites that are not already accounted for in the monitored background levels of air pollutants for analysis.

I.3.12.2 Future Without Project 1, Shaft and Bypass Tunnel Construction

Mobile Sources

The future without the project condition will be determined based on the general background traffic growth in the study area, new trips from development expected to occur in the area, and projected changes in vehicle types on the road (based on turnover), and projected advancements in motor vehicle engine technology. The analysis will be coordinated with the analysis of land use, zoning, open space, and public policy, and traffic and transportation.

Stationary Sources

The future without the project condition will be determined based on projected changes in land use in the study area and existing conditions.

I.3.12.3 Potential Impacts of Project 1, Shaft and Bypass Tunnel Construction

Mobile Sources

The analysis will reflect the air quality impact of construction vehicles, including trucks. The potential impacts will add any changes resulting from Project 1 to the conditions predicted in the future without the project. The differences between these two future conditions and the subsequent potential for significant impacts will be assessed. If applicable, the vehicular emissions from construction worker parking areas will be determined.

The resulting concentrations of pollutants will be compared to applicable impact criteria. Potential significant adverse mobile source air quality impacts from emissions of CO would

occur if (1) the incremental increases in CO concentrations with Project 1 exceed CEQR criteria, or (2) Project 1 exceeds the National Ambient Air Quality Standards (NAAQS). A potential significant adverse impact on air quality from mobile sources would occur for PM_{2.5}, if the 24-hour average concentration increments are predicted to be greater than 5 µg/m³ at a discrete receptor location, or if the predicted increments are greater than 2 µg/m³ but not greater than 5 µg/m³ based on the frequency, duration, and location of the predicted concentrations. In addition, an annual neighborhood-scale incremental impact greater than 0.1 µg/m³ for PM_{2.5} would be considered significant. Note that a neighborhood-scale mobile source impact is the concentration of a receptor placed at a distance from the roadway similar to that used for the placement of neighborhood-scale ambient monitoring stations.

Stationary Sources

An air quality analysis of on-site construction activities will be performed for the peak construction period. The assessment will consider construction equipment and size and their potential locations and hours of operation during the construction period. The analysis will address combustion emissions from stationary on-site engines, such as cranes, and fugitive dust emissions from construction-related equipment, such as unpaved surfaces, excavation, and debris loading at potential connection sites. Emission factors for NO₂, CO, PM₁₀, and PM_{2.5}, from on-site construction engines (excluding delivery trucks or other on-road vehicles) will be developed using the EPA's NONROAD (version 2008a) Emissions Inventory Model. Emission rates of NO₂, CO, and PM from combustion of fuel for delivery trucks or other on-road vehicles will be developed using the latest EPA recommended model. Currently, the MOBILE6.2 emissions model is the recommended model; however, it is expected that the EPA MOVES model will replace MOBILE6.2 in 2011 as the recommended model. Emission factors associated with fugitive dust emissions from on-site mobile equipment will be developed using equations presented in EPA's AP-42 *A Compilation of Air Pollution Emission Factors*. A dispersion modeling analysis will be performed to estimate ambient concentrations of air pollutants associated with the emissions produced by on-site construction activities using the EPA's AERMOD dispersion model following EPA's latest Implementation Guide (March 19, 2009) and in accordance with EPA guidance. The predicted ambient concentrations of criteria pollutants will be compared to applicable regulatory and CEQR thresholds to determine the potential for significant impacts.

Combined Impact Analysis

A combined mobile and stationary source air quality impact analysis for CO and PM will also be performed at discrete receptor locations. The results of this analysis will be compared to applicable regulatory and CEQR thresholds to determine the potential for significant impacts from Project 1.

I.3.13 CHAPTER 2.12: ENERGY AND GREENHOUSE GAS ANALYSIS/CLIMATE CHANGE

Given the importance of global climate change impacts and SEQRA and CEQR's mandate to address adverse environmental impacts, EISs are suggested to include a discussion of energy use or greenhouse gas (GHG) emissions in certain instances. The *CEQR Technical Manual* recommends an assessment of energy impacts for "larger" projects undergoing an EIS; however, the size of projects as addressed in the manual is focused mainly on development projects. Nonetheless, given the expected scale and duration construction, and since the program is a city capital project, an analysis of projected GHG emissions and an analysis of the program's consistency with city policy to reduce GHG emissions is appropriate. The potential need for supplemental energy supply to enable construction of the bypass tunnel will also be addressed.

The bypass tunnel, once constructed and operational, would not result in sources of GHG emissions requiring quantitative assessment. Therefore, the construction related emissions represent the net GHG emissions for the bypass tunnel over its lifetime. To the extent practicable, this section will include emissions from Project 1, the Shaft and Bypass Tunnel Construction, and Project 2B, the Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing, over all years of construction.

In addition to the guidance for evaluation and analysis given in the *CEQR Technical Manual*, the analysis will also adhere to the guidance given by NYSDEC for its review or preparation of analyses for EISs under SEQRA, "Guide for Assessing Energy Use and Greenhouse Gas Emissions in an Environmental Impact Statement," published July 15, 2009.

The demand for construction materials during construction of the bypass tunnel will generate GHG emissions. The GHG assessment will therefore include the calculation of GHG emissions from the operation of construction equipment, delivery trucks, and worker vehicle trips. In addition, emissions associated with the production of concrete, steel, and other construction materials that are associated with substantial process- or energy-related emissions during production would also be assessed. Opportunities for alternative fuels, materials, and/or construction approaches that may serve to reduce GHG emissions associated with construction will be qualitatively discussed. Emissions will be calculated based on estimates of the fuel and electricity consumption and material use for the entire construction process.

In addition to its goals to reduce GHG emissions, New York City is developing strategies to secure critical infrastructure against potential threats from sea level rise, and weather changes projected to result from climate change. As discussed in the *CEQR Technical Manual*, DEP is in the process of evaluating and implementing adaptive strategies for its infrastructure. The proposed program will be discussed in the context of all relevant long term strategies and policies of New York City and State.

I.3.14 CHAPTER 2.13: NOISE

Anticipated noise sources during Project 1, Shaft and Bypass Tunnel Construction, would include stationary sources, (e.g., equipment such as generators and compressors) and mobile sources (e.g., construction vehicles). The effect of construction activities depends on the type and quantity of construction equipment used as well as the distance from the construction site to any nearby sensitive receptors (sensitive receptors are land uses considered to be sensitive to noise, such as residences, schools, parks, churches, and hospitals). The on-site construction noise analysis will identify noise levels for the peak construction period (when the highest noise emissions would be generated), in addition to other construction periods. The noise analysis will also evaluate the type and quantity of construction-related equipment and vehicles, and the potential noise impacts on the surrounding community.

The analysis of stationary sources will identify sensitive receptors (e.g., residences) in the vicinity of where construction activities are anticipated to occur.

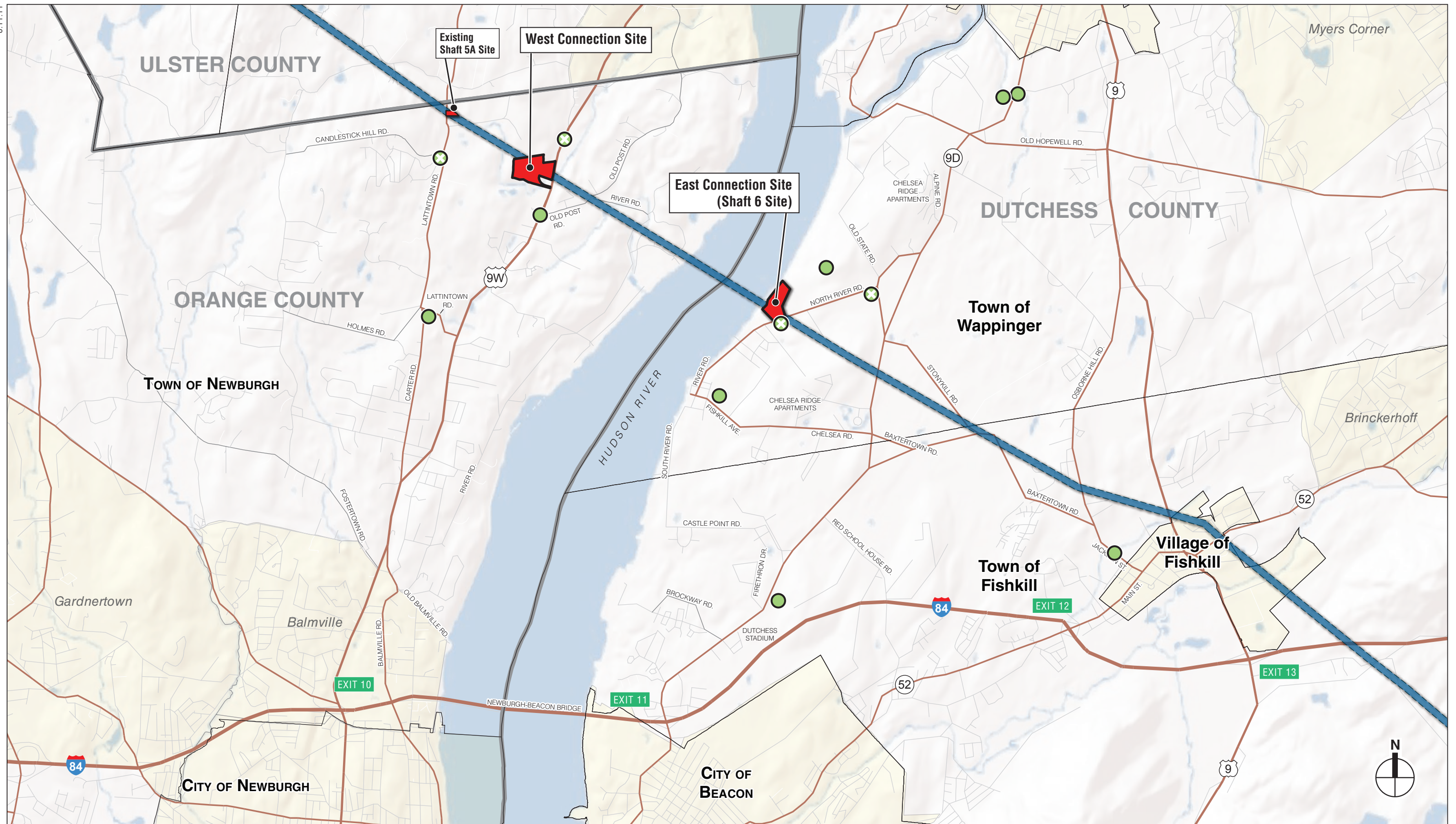
The mobile source analysis will evaluate the noise generated by construction vehicles at receptor locations along traffic routes to the work entrances to the connection sites. The assessment will be based on monitoring existing noise levels, and incorporating acoustical fundamentals and mathematical models. Existing noise levels will be determined by obtaining measurements during weekday daytime periods. The total or cumulative noise level for construction (both stationary and mobile sources) will be identified and compared to CEQR impact criteria and local noise ordinances.

Since the locations of Project 1, Shaft and Bypass Tunnel Construction, are located outside the City of New York, impact thresholds from state or local entities will be considered and may supersede the suggested *CEQR Technical Manual* impact criteria stated above if they are more stringent. For daytime hours, the *CEQR Technical Manual* suggests that 65 dBA (L_{eq}) is “an absolute noise level that should not be significantly exceeded.” Therefore, if the future without the project noise level is 62 dBA (L_{eq}) or above, an incremental increase of 3 dBA would be considered a significant noise level increase; alternatively, if the future without the project noise level is 60 dBA (L_{eq}), the incremental significant impact threshold would be 5 dBA (L_{eq}). For nighttime hours, a change of 3 dBA (L_{eq}) would be considered significant, regardless of the existing background level. In addition to the change in noise levels due to Project 1, the determination of environmental significance would consider the duration of the noise level increase.

Analysis locations for potential stationary and/or mobile source noise analyses are illustrated in **Figure 10**. These ~~total 12~~ nine intersections locations for analysis include:

East of the Hudson River (Dutchess County)

- ~~North River Road at North and Old State Road~~
- ~~Fishkill Avenue just east of North River Road~~
 - Chelsea Road at Liberty Street



- Shaft Location
- Noise Analysis Location (Spot Noise Monitoring)
- Municipal Boundary
- Delaware Aqueduct
- Noise Analysis Location (Continuous Noise Monitoring)
- County Boundary



Figure 10
Noise Data Collection Locations

- NYS Route 9D at Blossom Court, near ~~Beacon Light Tabernacle~~ the Seventh Day Adventist Church just north of ~~Firethorn Drive~~
- Jackson Street near ~~St. Mary Catholic Church~~ just west of ~~Main Street~~ NYS Route 52
- ~~North River Road and Shaft 6 Driveway~~ North at Sky Top Drive near the east connection site
- 30 Cobblestone Road
- Within Reese Park
- 2483 South Avenue

West of the Hudson River (Orange County)

- Lattintown Road at ~~Candlestick Hill~~ Holmes Road
- 165 Lattintown Road
- U.S. Route 9W at Old Post Road
- ~~Lattintown Road at Carter Avenue/Holmes Road~~
 - U.S. Route 9W between Carlino Drive and Pine Road

Noise effects due to Project 1 construction activities will be evaluated using the Cadna A computerized model, a state-of-the-art analysis tool based on the acoustic propagation standards promulgated in International Standard ISO 9613-2 for noise prediction and assessment developed by DataKustik.

1.3.14.1 Existing Conditions

Existing noise levels will be measured at noise receptor locations that could potentially experience a change in noise levels as a result of construction-related truck traffic. Monitoring locations where continuous noise measurements will be undertaken are considered to be representative of background noise levels near potential connection sites. Noise receptors are selected based on land uses and/or project trip assignments.

To assess the potential noise impacts of project-related mobile sources during construction, existing noise levels will be established for the selected receptor locations during the weekday peak and off-peak hours. The quietest (off-peak) and the noisiest (peak) hours for each day will be determined based on an examination of data collected for the traffic analysis. To establish the existing noise levels, a combination of continuous noise measurements and 20-minute noise measurements will be presented for the receptor locations during these hours. The measurements will be conducted in accordance with the procedures outlined in the *CEQR Technical Manual* and applicable state and local regulations. Following the current guidance in the *CEQR Technical Manual* regarding noise descriptors, it is anticipated that where and when appropriate,

the L_{10} ,¹ and 1-hour equivalent ($L_{eq(1)}$) noise levels will be examined. Sound analyzers that will be used for measurements are microprocessor-based state-of-the-art instruments that can monitor all the current noise exposure criteria and have tolerance of “type-1” (re: ANSI S1.4-1983) or better. The measurements will be made using a Type 1 noise analyzer and will include measurements of L_{eq} , L_1 , L_{10} , L_{50} , and L_{90} noise levels.

Existing conditions will be based on the results from continuous and 20-minute noise monitoring. Data from the land use analysis and field surveys will be presented as well as receptor locations. Noise from adjacent stationary sources will be included as part of the ambient background noise levels. Stationary sources of noise include machinery and equipment associated with industrial and manufacturing operations or heating, ventilating, and air-conditioning systems.

I.3.14.2 Future Without Project 1, Shaft and Bypass Tunnel Construction

Future noise levels associated with the future without the project conditions will be predicted at the selected receptor locations. The traffic data (volume and speed) and roadway geometry predicted for the future without the project will be incorporated into the modeling effort. Resultant levels will be presented.

I.3.14.3 Potential Impacts of Project 1, Shaft and Bypass Tunnel Construction

Mobile Source Noise

Future noise levels associated with the construction-related activities will be predicted using the same methodology used for the future without the project analysis. Resultant levels will be compared to the suggested thresholds in the *CEQR Technical Manual*, and absolute noise limit criteria, the noise exposure guidelines, and any applicable local ordinances. Noise levels predicted for the future without the project will be compared to the Project 1 levels to identify the relative changes in noise levels.

Stationary Source Noise

The type of mechanical equipment that would be used during construction will be identified, and the future noise associated with Project 1 will be predicted. The potential impacts for the quietest ambient conditions will be presented. Any adjacent noise generators not associated with Project 1 will be analyzed as part of the ambient background noise levels. The incremental increase in sound levels from the construction operations will be determined.

The same criteria used in assessing mobile source noise levels would be applied to assess stationary source impacts.

¹ L_{eq} is the constant sound level that in a given situation and time period conveys the same sound energy as the actual time-varying sound. For example, $L_{eq(1)}$ is the 1-hour equivalent noise level. Statistical sound levels, such as L_1 , L_{50} , or L_{90} , indicate a noise level that is exceeded 1, 50, or 90 percent of the time, respectively.

For those sensitive receptors that could be affected by both mobile and stationary noise contributions from the proposed construction activity at the potential connection sites, the stationary and mobile source noise contributions from construction will be considered to determine the combined noise impacts.

I.3.15 CHAPTER 2.14: INFRASTRUCTURE

The EIS will evaluate the potential for stormwater runoff caused by Project 1, Shaft and Bypass Tunnel Construction to affect flooding, sedimentation, and erosion during construction, and stormwater management plans will be described. The consequences of potential stormwater discharges to surface water resources during Project 1 will be presented in the EIS in the “Natural Resources and Water Resources” section.

I.3.16 CHAPTER 2.15: SOLID WASTE

Construction of Project 1, Shaft and Bypass Tunnel Construction would necessitate the disposal of excavated materials. This section of the EIS will present estimates of the amount of excavated materials and describe the disposal methods for these materials.

I.3.17 CHAPTER 2.16: COASTAL ZONE CONSISTENCY

This chapter will assess Project 1, Shaft and Bypass Tunnel Construction, with the applicable policies of the New York State Coastal Zone Management Program since the east connection site and the west connection site, as well as the bypass tunnel route, are located within the New York State Coastal Area Boundary, as detailed in the New York State Department of State Coastal Atlas.

I.3.18 CHAPTER 2.17: PUBLIC HEALTH

According to the guidelines of the *CEQR Technical Manual*, a public health assessment may be warranted if an unmitigated significant adverse impact is identified in other CEQR analysis areas, such as air quality, water quality, hazardous materials, or noise. The EIS will include an assessment of the potential for health-related effects associated with Project 1.

I.3.19 CHAPTER 2.18: MITIGATION

If any potential significant impacts from Project 1, Shaft and Bypass Tunnel Construction, are identified in the analysis areas discussed above, any practicable measures that could avoid or mitigate those impacts will be identified. This section of the EIS will summarize the findings of the relevant analyses and discuss potential mitigation measures. If any adverse impacts cannot be mitigated, they will be described as unavoidable adverse impacts.

I.4 CHAPTER 3: PROBABLE IMPACTS OF PROJECT 2A—WATER SUPPLY SYSTEM AUGMENTATION AND IMPROVEMENT

I.4.1 OVERVIEW

The various additional projects that would be implemented to support Project 2B, Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing—~~Conservation~~, Demand

Management, Upper Catskill Aqueduct Optimization, Queens Groundwater Pumping Reactivation, New Jersey-New York City Interconnection, Nassau County Interconnection, and the Delaware Watershed Reservoir Improvements—are all in the very preliminary stage of facility planning, and not enough information has been developed at this time to enable a complete environmental review. Therefore, the first EIS will provide a description of these projects and a generic assessment of their potential impacts (see HI.4.2, “Scope of Analysis,” below).

Prior to the approval and implementation of any of these projects, additional environmental review as part of a second EIS will be undertaken. In the second EIS, more detailed descriptions of the projects will be provided (since facility planning will have been advanced), and detailed evaluations of potential environmental impacts from these projects will be disclosed.

I.4.2 SCOPE OF ANALYSIS

As discussed above, the various additional projects required to support Project 2B, Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing are all in the preliminary stage of facility planning, and not enough information has been developed at this time to enable a complete environmental review. Therefore, this first EIS will provide:

- A project description for each of these projects;
- A preliminary list of actions and approvals necessary to implement each project;
- An estimated timeframe for when the project would be implemented, and;
- A generic assessment of the potential impacts from each project.

I.5 CHAPTER 4: PROBABLE IMPACTS OF PROJECT 2B—BYPASS TUNNEL CONNECTION AND RWBT INSPECTION AND REPAIR, INCLUDING WAWARSING

I.5.1 OVERVIEW

Project 2B, Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing is in the preliminary stage of facility planning, and not enough information has been developed at this time to enable a complete environmental review. Therefore, this EIS will provide a project description for Project 2B, a preliminary list of actions and approvals necessary, an estimated timeframe for when the project would be implemented, and a generic assessment of its potential impacts. However, to fully evaluate the potential effects of construction near the west and east connection sites, this EIS will provide an assessment of traffic, noise, and lighting impacts during the connection phase of bypass tunnel construction, during Project 2B. Prior to the approval and implementation of Project 2B, additional environmental review as part of the second EIS will be undertaken to evaluate and disclose in detail the Project 2B potential environmental impacts.

~~In general, Project 2B would be less intensive than Project 1, Shaft and Bypass Tunnel Construction. Therefore, this section of the EIS will focus only on those analysis areas where this~~

portion of the program would have the potential for impacts substantially different or greater than Project 1. These impacts Impacts from Project 2B relate to the following:

- Effects from physical construction of the inspection and repair (e.g., potential physical effects at shaft sites used to access the tunnel, specifically, at locations beyond those considered in Project 1);
- Effects from stopping the flow of water through the RWBT and unwatering the tunnel so repairs can be made; this would have various effects:
 - By reducing the existing leaks, there is the potential for effects on wetland areas that may be fed by the existing leakage;
 - By unwatering the tunnel during the tunnel shutdown period there is the potential for effects from the discharge of tunnel water;
 - By drawing down the Catskill and Croton reservoirs there is the potential for effects within these reservoir systems; and
 - By cessation of use of the RWBT during construction of Project 2B, there is the potential for effects at the spillways of the Delaware watershed reservoirs and on the receiving water bodies.

The EIS will address each of these effects separately since each would occur in a distinct geographic area. The EIS will analyze in detail the potential physical effects at shaft sites from undertaking the inspection and repair. The EIS will also conceptually discuss the potential effects of reducing the existing leakage, focusing specifically on natural resources and water resources; hazardous materials; and infrastructure. The EIS will generically assess the potential effects from the drawdown of the Catskill and Croton reservoirs and from the increased releases from the Delaware watershed reservoirs.

As stated above, prior to approval and implementation of Project 2B, additional environmental review as part of the second EIS will be undertaken to evaluate and disclose in the detail the Project 2B potential environmental impacts.

1.5.2 CHAPTER 4.1: OVERVIEW OF PROJECT 2B, BYPASS TUNNEL CONNECTION AND RWBT INSPECTION AND REPAIR, INCLUDING WAWARSING

A description of the proposed Project 2B construction program will be provided, including an anticipated timeline showing the major proposed activities by each stage through completion of this project. A description of the proposed activities and their locations during each stage, including potential storage areas, staging and parking areas, truck routes, likely sequencing, and techniques to minimize impacts during construction will be provided.

This section of the EIS will also include estimates of the number of employees expected to work on Project 2B construction and the economic benefits that would result.

I.5.3 CHAPTER 4.2: EFFECTS FROM PHYSICAL CONSTRUCTION

Shafts 1, 2A, 8, and 9 of the Delaware Aqueduct could be used during inspection and repair of the RWBT for ventilation of or access to the tunnel. The effects of Project 2B construction at these locations will be assessed in the EIS, including their consistency with the applicable policies of New York State's Coastal Zone Management Program. In addition, since construction efforts during Project 2B could be intensive at both the west and east connection sites, the effects of construction (e.g., transportation, noise, and lighting) at these two locations will be detailed in the DEIS.

I.5.4 CHAPTER 4.3: EFFECTS FROM REDUCING THE LEAKAGE

The potential impacts from unwatering the tunnel, from drawing down the Catskill and Croton reservoirs, and from the cessation of use of the RWBT during Project 2B construction will be addressed generically in the EIS.

The potential for Project 2B to affect the supply of water to DEP's customers will be addressed qualitatively.

The potential effects on wetland areas that may be fed by the existing leakage will also be assessed generically, as follows:

I.5.4.1 Chapter 4.3.1: Natural Resources and Water Resources

As a result of Project 2B, it is expected that leakage from the RWBT of the Delaware Aqueduct would be substantially reduced or cease. It is possible that cessation of the tunnel leakage could affect wetlands, surface waters, and groundwater. Therefore, this section of the EIS will qualitatively assess the potential for Project 2B to result in environmental impacts on natural and water resources within the study areas identified for these resources. Study areas would include wetlands and other water resources, including groundwater resources, with the potential to be affected by the unwatering of the RWBT and the repair of the leaking sections. These potentially affected resources would be identified on the basis of DEP studies being conducted as part of the Delaware Aqueduct RWBT Leakage Investigation, including wetlands and surface waters that may be receiving additional groundwater or water from the RWBT as a result of the leaks, and in consultation with state and federal resource agencies.

Existing Conditions

Based on the information collected as part of Section HJ-3.9 on existing natural and water resources and supplemented as needed for those resources not described as part of the Project 1 construction assessment, existing conditions of surface waters and wetlands with the potential to be affected by Project 2B will be described. In particular, to the extent it can be determined, the approximate areal extent and the characteristics of wetlands in the study area would be characterized, indicating dominant plant species, wetland hydrology, wildlife, their function within the landscape including the potential for use by threatened or endangered species. Surface waters within the study area would be described with respect to hydrology, water quality, and

aquatic biota developed on the basis of existing information and results of aquatic surveys conducted for this EIS.

Future Without Project 2B, Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing

The potential for pertinent DEP and other development projects and other actions to affect natural and water resources within the study areas will be assessed on the basis of existing resources and the activities that would be associated with these proposed projects.

Potential Impacts of Project 2B, Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing

Potential impacts to natural and water resources from construction of Project 2B will be assessed with a particular focus on the following:

- The potential impacts of groundwater discharge to the Hudson River (or local streams) during tunnel unwatering.
- The potential impacts to wetlands and surface waters from the cessation of possible inflows to these systems from the RWBT.
- The potential long-term negative effects to terrestrial resources associated with permanent loss of habitat (e.g., breeding birds and other wildlife).

I.5.4.2 Chapter 4.3.2: Hazardous Materials

This section will describe the potential for adverse impacts related to any infiltration of contaminated ground or surface water during tunnel unwatering.

I.5.4.3 Chapter 4.3.3: Infrastructure

This section of the EIS will generically address the potential for construction of Project 2B to result in impacts on infrastructure; specifically, the potential impacts to the water table and local water supply wells (e.g., drawing down) during tunnel unwatering. In addition, if any chemicals are needed for activation of the bypass tunnel, this will be described in this section of the EIS.

I.5.5 CHAPTER 4.4: EFFECTS FROM TUNNEL UNWATERING

This section of the EIS will generically assess the potential effects of tunnel unwatering from the discharge of tunnel water.

I.5.6 CHAPTER 4.5: EFFECTS OF RESERVOIR DRAWDOWN

This section of the EIS will generically address the potential effects of drawing down the Catskill and Croton system reservoirs.

I.5.7 CHAPTER 4.6: EFFECTS OF DELAWARE WATERSHED RESERVOIR RELEASES

This section of the EIS will generically address the potential effects of additional releases from the Delaware watershed reservoirs at the reservoir spillways and on the receiving water bodies.

I.5.8 CHAPTER 4.7: MITIGATION

If any potential significant impacts are identified in the analysis areas discussed above, any practicable measures that could avoid or mitigate those impacts will be identified. This section of the EIS will summarize the findings of the relevant analyses and discuss potential mitigation measures. If any project-generated adverse impacts cannot be mitigated, they will be described as unavoidable adverse impacts.

I.6 CHAPTER 5: PROBABLE IMPACTS OF BYPASS TUNNEL OPERATION

I.6.1 OVERVIEW

The EIS will address the potential for operational impacts once the bypass tunnel is in operation, i.e., once Projects 1, 2A, and 2B are complete and water is again flowing through the RWBT and bypass tunnel. In general, effects are anticipated to be minimal during operation since operation of the bypass tunnel would be substantially similar to current operations. Operation of the bypass tunnel is not expected to result in any additional workers or trucks, and the above-ground elements would be limited. Therefore, detailed analyses of the following areas, which may be affected by the operation of the bypass tunnel and by site changes undertaken as part of Project 1 and Project 2B, will be included in this first EIS:

- Land Use, Zoning, Public Policy, and Open Space
- Visual Character
- Socioeconomic Conditions
- Infrastructure
- Public Health

The second EIS will contain detailed analyses of operation of both the bypass tunnel and the proposed Water for the Future Program: Delaware Aqueduct Rondout-West Branch Tunnel Repair program in its entirety.

I.6.2 CHAPTER 5.1: LAND USE, ZONING, PUBLIC POLICY, AND OPEN SPACE

The land use, zoning, public policy, and open space analysis will assess the potential impacts of any expected changes in land uses resulting from operation of the bypass tunnel and any potential for adverse effects on publicly accessible open spaces. The analysis will evaluate impacts within various study areas, which for purposes of this analysis are defined as the areas that fall within approximately a ¼-mile of the proposed east and west connection site locations.

Information on existing conditions and conditions in the future without the proposed program will be used from other parts of the EIS.

Potential land use impacts will be assessed based on the activities associated with operation of the bypass tunnel relative to the surrounding land uses. The assessment will evaluate whether the bypass tunnel operation would change overall land use trends and patterns.

The zoning analysis will consider how continuing the sites' use would affect the surrounding residential areas.

The public policy analysis will consider consistency of operation of the bypass tunnel with existing policies and any relevant planned and proposed changes to public policy that would occur independent of the proposed program.

The analysis of open space will determine whether operation of the bypass tunnel would directly affect any open space, whether by an increase in shadows, air emissions, or noise.

I.6.3 CHAPTER 5.2: VISUAL CHARACTER

The proposed program may result in some new above-ground construction at certain locations and may necessitate the clearing of some vegetated areas. Therefore, if warranted, a visual character assessment for those changes resulting from Project 1 and Project 2B will be conducted for the EIS at select locations. In addition to the *CEQR Technical Manual* guidance, the assessment will consider NYSDEC's "Assessing and Mitigating Visual Impacts" guidelines, where applicable, as well as any local applicable codes. The visual and contextual relationship of any changes resulting from Project 1 and Project 2B to any nearby historic resources identified as part of the historic resources analysis will be assessed, as appropriate.

I.6.3.1 Existing Conditions

Existing visual resources will be described using photographs. In accordance with *CEQR Technical Manual* methodology, the study area for the visual character analysis will generally correspond to the land use study area. However, in cases where the relationships between visual resources and view corridors extend outside that area, the study area will be expanded to accommodate those specific corridors and resources. Significant visual resources will be identified and may include such landscape elements as water bodies, landmark structures and other cultural resources, parks, unique topographic or geologic features, and critical environmental areas, where applicable. Photographs will be used to document important visual resources.

I.6.3.2 Future Without the Proposed Program

Future conditions without the proposed program will be projected using information on future actions and proposed projects from the land use analysis.

I.6.3.3 Potential Impacts

Potential impacts on visual resources associated with the study areas will be identified and described. Any changes from Project 1 and Project 2B will be described in the context of proximity to identified visual resources, orientation, design context, bulk, and height.

In addition, while no significant impacts from incremental shadows are expected with the Project 1 and Project 2B, a screening analysis for shadows will be conducted in accordance with *CEQR Technical Manual* guidelines. If the screening indicates a detailed assessment is needed, further evaluation will be undertaken.

I.6.4 CHAPTER 5.3: SOCIOECONOMIC CONDITIONS

New York City finances construction of capital improvement projects through the New York City Municipal Water Finance Authority and/or the New York State Revolving Fund Program (SRF). The Municipal Water Finance Authority is authorized to issue bonds to fund the construction of capital improvement projects. The SRF (based on EPA and state matching grants) makes available to municipalities low-cost financing for capital improvement projects. Based on the estimated cost of the ~~proposed program~~ RWBT Bypass, an evaluation of the potential incremental costs to New York City water and sewer rates and upstate water rates of users of New York City-provided water will be undertaken.

I.6.5 CHAPTER 5.4: INFRASTRUCTURE

At some locations, the changes associated with Project 1 and Project 2B may result in the expansion of impervious surfaces, and, therefore, an assessment of potential stormwater discharges will be undertaken. If warranted, stormwater management plans will be developed for operation of the bypass tunnel, and stormwater management systems will be described. This chapter will evaluate the potential for additional flooding, sedimentation, and erosion.

I.6.6 CHAPTER 5.5: PUBLIC HEALTH

A discussion of public health will be included in this section of the EIS since the provision of clean, safe drinking water that meets all public health and regulatory requirements is a fundamental obligation of New York City. This chapter will discuss the program's potential to benefit public health by enabling DEP to continue to supply water to its New York City and upstate customers.

I.6.7 CHAPTER 5.6: MITIGATION

Where significant adverse impacts are likely to occur from operation of the bypass tunnel, detailed mitigation measures would be developed to alleviate or eliminate those adverse impacts. These measures would be developed in coordination with relevant agencies, as required, and in accordance with the *CEQR Technical Manual*, state, and/or local guidelines. A range of feasible mitigation measures would be presented, where practical. Mitigation measures that require implementation by or approval from other agencies would be identified.

I.7 CHAPTER 6: CUMULATIVE EFFECTS

Cumulative impacts are two or more individual effects on the environment that, when taken together, compound or increase other environmental impacts, which may rise to the level of significance. The EIS will summarize the potential cumulative impacts from construction and operation of the proposed program.

I.8 CHAPTER 7: ALTERNATIVES

The purpose of an alternatives analysis is to provide the decision-makers with a basis for comparing environmental conditions. This is accomplished by examining reasonable and

practicable options that avoid or reduce project-related significant adverse impacts and still achieve the stated goals and objectives of proposed actions.

The alternatives analysis will include an assessment of a No Action Alternative, in which the proposed program is not undertaken. The assessment of a No Action Alternative is required for all EISs. In addition to the No Action Alternative, the EIS will assess a Tunnel Repair Alternative in which a bypass tunnel is not constructed and various repair methods, such as surface pressure grouting or leak stabilization, are undertaken instead.

Additional alternatives will also be identified and assessed. These alternatives are expected to fall into several main categories:

- **Design Alternatives.** Such alternatives would consist of variations in the design of the proposed program.
 - As discussed above, since publication of the Draft Scope of Work, DEP is continuing to evaluate whether its preferred option has decided that the TBM would be to launch the TBM launched from the east connection site and receive it at the west connection site or to launch from the west connection site and receive it received at the east connection site. The EIS will assess whichever option is not identified as the preferred option as an alternative in which the TBM is launched from the east connection site and received at the west connection site.
 - The alternatives analysis will include an assessment of various site selection alternatives in which a different west connection site is assumed.
- **Construction Alternatives.** These alternatives would address different methods of handling construction of the proposed program.
 - The alternatives analysis will include an assessment of various options for the disposal of excavated materials. At this time, it is expected that the EIS will assume that such materials are removed from the TBM launch shaft solely by truck. Therefore, the alternatives addressing the disposal of excavated materials are anticipated to include a barging alternative, in which excavated materials from shaft construction are removed from the east connection site by barge, and a rail alternative, in which excavated materials from shaft construction are removed from the east connection site via the Metro-North rail line adjacent to the Shaft 6 property.
- **Impact Reduction Alternatives.** These alternatives would be evaluated to reduce or eliminate the specific potential impacts of the proposed program identified in the EIS.

Additional alternatives may be identified for inclusion in the EIS as project planning proceeds and as significant adverse impacts from the proposed program are identified.

I.9 CHAPTER 8: UNAVOIDABLE ADVERSE IMPACTS

The proposed program may result in significant or temporary adverse impacts that are unavoidable. These unavoidable significant adverse impacts will be summarized in this chapter.

I.10 CHAPTER 9: IRRETRIEVABLE AND IRREVERSIBLE COMMITMENT OF RESOURCES

The EIS will disclose the ir retrievable commitment of resources that the proposed program may require.

I.11 CHAPTER 10: TECHNICAL APPENDICES

A technical appendix to the EIS will be provided that includes necessary CEQR/SEQRA documentation.

I.12 GLOSSARY

The EIS will include a glossary of acronyms.

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***Water for the Future Program: Delaware Aqueduct Rondout-West Branch Tunnel
Repair DEIS Final Scope of Work
Appendix A: Response to Comments***

A. INTRODUCTION

This document summarizes and responds to all substantive oral and written comments received during the public review period on the Draft Scope of Work (Draft Scope) for the Water for the Future Program: Delaware Aqueduct Rondout-West Branch Tunnel (RWBT) Repair Environmental Impact Statement (EIS). Public review of the Draft Scope began on May 3, 2011, with the issuance by the New York City Department of Environmental Protection (DEP) of the Positive Declaration and Notice of Intent to Prepare a Draft EIS (DEIS) on the proposed program, in accordance with New York State Environmental Quality Review Act (SEQRA) and New York City Environmental Quality Review (CEQR) procedures. A Draft Scope, prepared in accordance with SEQRA and CEQR regulations and the guidance of New York City's *CEQR Technical Manual*, was also distributed on May 3, 2011, for public review and comment. Copies of the Draft Scope were made available for public review at the Town of Newburgh Town Hall, the Town of Wappinger Town Hall, and DEP offices in Queens, Valhalla, and Kingston, NY. The document was also made available for public review on DEP's website.

Public meetings on the Draft Scope were held on June 7, 2011, at the Town of Wappinger Town Hall, 20 Middlebush Road, Wappingers Falls, NY, and July 14, 2011, at Wappingers Junior High School, 30 Major McDonald Way, Wappingers Falls, NY; on June 9, 2011, at the Town of Newburgh Town Hall, 1496 Route 300, Newburgh, NY; and on June 14, 2011, at the Town of Wawarsing, Town Hall, 108 Canal Street, Ellenville, NY, to solicit public comments on the proposed program and, specifically, on the scope of the environmental analysis. Written comments were also accepted through the public comment period, which was extended and held open until July 29, 2011.

The Final Scope of Work (Final Scope) was issued on August 31, 2011. The Final Scope addresses comments received during the public review and finalizes changes to assessment methodologies that were made after the Draft Scope was published.

Section B below identifies the organizations and individuals that commented on the proposed program.

Section C summarizes and responds to each substantive comment. The comments are organized by subject area. Where multiple comments were made on the same subject matter, comments

have been grouped together. Following each comment is the name of the organization or individual that made the comment, as listed in Section B. Responses follow each comment.

B. ORGANIZATIONS AND INDIVIDUALS THAT COMMENTED

1. Eric Agostino, oral comments dated June 14, 2011 (Agostino)
2. Bridgette Anderson, oral comments dated June 7 and July 14, 2011, and written comments dated July 26, 2011 (Anderson)
3. Hank Bartosik, written comments dated June 20 and June 23, 2011 (Bartosik)
4. Terry Bernardo, District 1 representative (Towns of Marbletown, Rochester, and Wawarsing), Ulster County Legislature, oral comments dated June 14, 2011 (Bernardo)
5. Angela Bettina, oral comments dated June 7, 2011 (A. Bettina)
6. Vincent Bettina, Councilman, Ward 2, Town of Wappinger, oral comments dated June 7 and July 14, 2011 (V. Bettina)
7. Clifford W. Crouch, Assemblyman 107th District, New York State Assembly, written comments dated June 17, 2011 (Crouch)
8. Leonard Distel, Supervisor, Town of Wawarsing, oral comments dated June 14, 2011 (Distel)
9. William Emslie, Coastal Conservation Association, Hudson River Estuary Committee board member, oral comments dated June 7, 2011 (Emslie)
10. John Ewasutyn, Chairman of the Planning Board, Town of Newburgh, written comments dated July 27, 2011 (Ewasutyn)
11. Vic Fanuele, Chairman of the Planning Board, Town of Wappinger, oral comments dated June 7, 2011 (Fanuele)
12. Robert Gray, President of Morris Associates, Town of Wappinger Engineer, written comments dated July 29, 2011 (Gray)
13. Elizabeth Greene, member of Town Board, Town of Newburgh, oral comments dated June 9, 2011 (Greene)
14. Barbara Gutzler, oral comments dated July 14, 2011 (Gutzler)
15. Joseph Incoronato, District 15 representative (Towns of Poughkeepsie and Wappinger), Dutchess County Legislature, oral comments dated June 7, 2011 (Incoronato)
16. Hans Klingzahn, Chairman of the Planning Board, Village of Fishkill, oral comments dated June 7, 2011 (Klingzahn)
17. Ron Lafko, member of Conservation Board, Town of Wappinger, oral comments dated June 7, 2011 (Lafko)
18. Craig Lopez, oral comments dated June 14, 2011 (C. Lopez)

19. Peter D. Lopez, Assemblyman 127th District, New York State Assembly, written comments dated June 22, 2011 (P. Lopez)
20. Ron Plimley, written comments dated July 2, 2011 (Plimley)
21. Andrea Smith, oral comments dated June 14, 2011, and written comments dated June 23, 2011 (A. Smith)
22. Connie Smith, oral comments dated June 7, 2011 (C. Smith)
23. David H. Stolman, President, Michael A. Galante, Executive Vice President, and Evren Ulker-Kacar, Associate/Planning, Frederick P. Clark Associates, Inc., Town of Wappinger planning consultant, written comments dated June 6 and July 29, 2011, and oral comments dated July 14, 2011 (Stolman)
24. Diane Tharp, Executive Director, The North Delaware River Watershed Conservancy, written comments dated June 22, 2011 (Tharp)
25. Robert Valdati, member of the Planning Board, Town of Wappinger, oral comments dated June 7, 2011 (Valdati)
26. Kenneth Wersted, Project Manager (Town of Newburgh engineer), Creighton Manning Engineering, written comments dated July 29, 2011 (Wersted)
27. Daniel Whitehead, Deputy Regional Permit Administrator, New York State Department of Environmental Conservation, Division of Environmental Permits, Region 3, written comments dated June 23 and August 1, 2011 (Whitehead)

C. COMMENTS AND RESPONSES

Comment 1: The Town of Newburgh Planning Board and its consultants have reviewed the Delaware Aqueduct Rondout-West Branch Tunnel Repair program DEIS Draft Scope and have found it to be complete and do not have any comments at this time. (Ewasutyn)

Response: Comment noted.

ENVIRONMENTAL REVIEW PROCESS

Comment 2: The Draft Scope indicates that a “two-part” approach to the EIS is being considered, the “first” EIS will provide a detailed analysis of the proposed program’s Shaft and Bypass Tunnel Construction project (Project 1) and a “second” EIS providing details of the Water Supply System Augmentation and Improvement sub-project (Project 2A) and Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing sub-project (Project 2B). The use of the phrase “second” EIS is somewhat confusing and gives the impression of a “segmented” project. The New York State Department of Environmental Conservation (NYSDEC) understands that

the “second” EIS will in fact be a “supplement” to the “first” EIS and will provide a quantitative analysis of any significant adverse environment impacts that are qualitatively addressed in the draft of the “first” EIS. The use of the phrase “supplemental” will avoid any confusion regarding how DEP intends to conduct the SEQR process for the project. (Whitehead)

Response:

617.9(a)(7) states: “(i) The lead agency may require a supplemental EIS, limited to the specific significant adverse environmental impacts not addressed or inadequately addressed in the EIS that arise from:

(a) changes proposed for the project; or

(b) newly discovered information; or

(c) a change in circumstances related to the project.

(ii) The decision to require preparation of a supplemental EIS, in the case of newly discovered information, must be based upon the following criteria:

(a) the importance and relevance of the information; and

(b) the present state of the information in the EIS.

(iii) If a supplement is required, it will be subject to the full procedures of this Part.”

If one of these conditions occurs during the development of the second EIS DEP will determine whether it would warrant a change in nomenclature.

Comment 3:

We need a little more review in regards to the input we’re able to get, and I wish to take more time to study this situation. We should either adjourn or extend this period of public input until we’ve got all of the input that’s available from the citizens in the Town of Wappinger. (Lafko)

The public hearing should be closed. (V. Bettina)

I would like to request that we have an additional meeting and that neighbors be notified via registered mail so they can understand the significance and the impact to their homes and our neighborhood that this project is going to present. (Anderson)

Is this a hearing, a public meeting? What is the gathering today? (Emslie)

The Village of Fishkill and the Town of Fishkill should be notified as to comments. (Klingzahn)

Response: Public meetings on the Draft Scope were held on June 7, 2011, at the Town of Wappinger Town Hall, 20 Middlebush Road, Wappingers Falls, NY; on June 9, 2011, at the Town of Newburgh Town Hall, 1496 Route 300, Newburgh, NY; and on June 14, 2011, at the Town of Wawarsing, Town Hall, 108 Canal Street, Ellenville, NY, to solicit public comments on the proposed program and, specifically, on the scope of the environmental analysis. In response to public comments received at these meetings, DEP extended the public comment period 35 days from June 24, 2011 to July 29, 2011. In addition, a second scoping meeting was held at the Wappingers Junior High School, 30 Major McDonald Way, Wappingers Falls, NY on July 14, 2011. Notifications for the second Wappinger meeting included advertisements on the local cable TV station, published notices in three local newspapers, and certified letters to property owners adjacent to the Shaft 6 property and major travel routes anticipated for construction vehicles, as well as direct communication with the Town of Wappinger.

The notice for the second Wappinger meeting included a distribution list of the involved agencies and interested stakeholders, including any attendees who signed in to the public scoping meeting held in June. The Town of Fishkill was included in the distribution list. The Village of Fishkill has been added to the distribution list for the Final Scope and subsequent documents (i.e., the DEIS).

PROGRAM DESCRIPTION

Comment 4: You're putting in a secondary bypass and then going back to the original. Why don't you just build the secondary shaft to take care of the problem and not worry about replicating the original shaft? Is this feasible from an engineering standpoint, and if it's not, why not? (Incoronato)

Response: DEP plans to construct a new tunnel segment to bypass a leaking section of the existing tunnel; this new tunnel segment would be the bypass tunnel. It would be constructed between a site to be located west of the Hudson River in the Town of Newburgh, Orange County (called the west connection site) and a site east of the river on DEP's Shaft 6 property located in the Town of Wappinger, Dutchess County (called the east connection site). On completion of the proposed program, the bypassed section of the existing tunnel would be abandoned. Chapter 1, "Program Description," in the DEIS will provide a further description of the details of the design for the bypass tunnel.

Comment 5: Regarding the diagram of the bypass tunnel and the nature of the proposed “connections,” were they oblique to the present tunnel so as to reduce resistance to the flow of the water? (Bartosik)

Response: The angle of connections of the bypass tunnel to the existing RWBT will be determined by several factors, including geology, site constraints, constructability, facilitation of future and inspection maintenance activities, and hydraulics (i.e., flow resistance). While an oblique connection has some inherent hydraulic advantage over a perpendicular connection, the difference can be made negligible with proper design of the junction. The angle of connection will be determined in final design of the tunnel.

Comment 6: I don’t know how you can move forward with anything when you don’t even know where the new shaft is going. (Anderson)

Response: Chapter 1, “Program Description,” in the DEIS will present an overview of the proposed program and Chapter 2, “Probable Impacts of Project 1, Shaft and Bypass Tunnel Construction,” Section 2.1, “Description of the Project 1 Construction Program,” will include a detailed description of the proposed west and east connection sites. This will include site plans showing the proposed location of the shafts.

Comment 7: Where and how may I obtain information regarding the leaks at Roseton, such as the geology, condition of the region of the tunneled section, explanation for the “breakage” or failure of the tunnel, walls, results of dye tests, etc.? How are the characteristics of the leaks at Roseton similar to or different from those at the Wawarsing tunnel? (Bartosik)

Response: Sections C.2 and C.3 of the Final Scope include a discussion of the existing RWBT construction and geology and an overview of the condition of the RWBT. This information will also be included in Chapter 1, “Program Description,” of the DEIS.

Comment 8: From where all this water is starting to leach in, what would be involved in building a well to simply pump down the water table temporarily in the Wawarsing area? What kind of cost would that be? How large might the well have to be to drop the water level on average 10 feet and pump it into one of our local waterways? (Agostino)

Response: DEP, along with the U.S. Geological Survey (USGS), is investigating the conditions in the Wawarsing area over the RWBT. Following the investigation, causes of problems identified in the area will be better understood and will be able to inform possible solutions to these problems.

If pumping were identified as a solution, it is important to note that the exact nature of the ground conditions must be understood in order to ensure no harm (such as creating sinkholes, exacerbating the existing leaks in the Delaware Aqueduct, or interfering with well production) is done by pumping.

Comment 9:

In looking at “Purpose and Need,” I was really struck since it didn’t include anything about the Town of Wawarsing residents affected by this leaking tunnel. One of the great reasons and needs to fix this tunnel is so we stop flooding people in Wawarsing. I would like to see the 53 homeowners affected by this included in the Draft Scope because until you can fix these people’s homes this tunnel is not fixed. These people have suffered long enough. They want to hear how DEP is going to help them. You are experts at managing water. Just get it out of their homes, please. (Bernardo)

When are the homeowners going to be taken care of? I want that tunnel fixed. This area can’t go on the way it is, and these people can no longer wait. The impacts that the repairs of the Delaware Aqueduct are going to have on the people of Wawarsing need to be included in this analysis. Your neglect has polluted our wells, compromised our septics, caused mold to grow in our homes, and has compromised our foundations, not to mention the very ground we walk on. We do want and expect to be compensated for the neglect you have shown our community. (A. Smith)

If this happened anywhere near a metropolitan area, would they accept the U.S. Geological Service taking nearly three years for anything to happen and accepting a good-faith agreement supplying bottled water and sump pumps to pump their water out to have decent drinking water? (C. Lopez)

Response:

New York City has been supporting the residents of Wawarsing since 2008 by contracting with the Town to provide water disinfection systems, sump pumps, and in some cases, bottled water for those homeowners located in the USGS study area. The City also included funds for a stormwater drainage study and a recommended construction project. This support (\$650,000) has been provided to address the possibility that the leaking tunnel was affecting the aquifer to the extent to which homeowner’s properties were affected prior to receiving the results of the USGS study.

The City has also recently announced that it would enter into an agreement with Ulster County to match State funds up to \$3.7 million to purchase homes in the area that are experiencing water conditions that meet the

criteria of the State program. In this program, NYC will cover Ulster County's administrative expenses and provide an optional incentive payment to participating homeowners.

Comment 10: In the last couple of years, a lot of houses on Smith Road in Wawarsing flooded because of this problem. Is that what got you started moving finally to do the project? (C. Smith)

Response: DEP is responsible for ensuring the safe and reliable transmission of drinking water from the watershed to consumers in sufficient quantity to meet all present and future water demands. DEP regularly conducts ongoing monitoring of the RWBT and, since the 1990s, has been investigating the Roseton and Wawarsing crossings in particular. These two sections of the RWBT appear to be leaking a total of between 10 and 35 mgd of water from the aqueduct, depending on the amount of water the aqueduct is carrying. At this time, DEP has developed sufficient information from ongoing investigative studies of the leaks to determine that construction of a bypass tunnel is necessary to allow for repairs to the most significant leaking parts of the RWBT, which includes the portion of the tunnel in the Wawarsing crossing area. The construction of the bypass tunnel would minimize the time that the RWBT is taken out of service, thereby reducing the risk that the supply of water to DEP's water consumers would be interrupted.

Comment 11: Do you have an aqueduct east of the Hudson, and, if so, do you have the same kind of problems? Or are they only west of the Hudson, and why is that? Would you attribute that to poor maintenance or poor management?

Response: The Delaware Aqueduct RWBT extends approximately 45 miles from the Rondout Reservoir in the Town of Wawarsing west of the Hudson River to the West Branch Reservoir in the Town of Kent (Putnam County) east of the Hudson River (see Figure 3 in the Final Scope).

During construction of the RWBT, in zones where the rock was weak or disintegrated, heavy reinforcement and steel interlinings were installed in the tunnel to guard against rupture and excessive leakage and potential collapse. The heavily reinforced and steel-lined sections of the tunnel are known as the Roseton and Wawarsing crossings. As discussed in the Draft Scope, these two sections of the RWBT appear to be leaking a total of between 10 and 35 mgd of water from the aqueduct, depending on the amount of water the aqueduct is carrying.

DEP's years of comprehensive inspections, testing, and study indicate that cracking and leakage are occurring in the aqueduct where it passes through limestone (in the areas of Wawarsing and Roseton), a rock more susceptible to degradation than the sandstone, shale, gneiss, and granite through which the vast majority of the tunnel passes.

DEP is currently undertaking or planning several projects to learn more about the RWBT's condition and leakage, including continued monitoring of the surface expressions of the leakage at the Roseton and Wawarsing crossings, hydraulic monitoring, visual inspections of the tunnel interior, and engineering risk assessments of the tunnel's structural integrity.

Comment 12:

Flooding west of the Hudson River is of great concern. DEP is planning to dewater the Delaware Aqueduct for maintenance for 5 to 15 months beginning in 2015 as part of Project 2B of the proposed program. Without the ability to divert potential flood waters out of the Delaware watershed, my constituents endure greater risk of being washed out by major flooding. I encourage DEP to take protective measures by developing physical mechanisms to maximize the release capacity of the Cannonsville, Neversink, and Pepacton Reservoirs. The Final Scope should include language to commission the definite and permanent construction of additional release mechanisms on all three Delaware Reservoirs to minimize flooding from dewatering the RWBT. (Crouch)

Flooding in the Delaware watershed is of great concern to me. In 2004, 2005, and 2006, many of my constituents along the Delaware River experienced extreme flooding. DEP is planning to dewater the Delaware Aqueduct for 6 to 15 months to undertake the RWBT repairs. Without the ability to divert potential flood waters out of the Delaware watershed, residents suffer a greater risk of being impacted once again by major flooding. The Draft Scope states the possible construction of limited facilities to control the increased releases of water at one or more of the Delaware watershed reservoirs. I would instead urge DEP in the Final Scope to provide for the permanent construction of additional release mechanisms on all three reservoirs to ensure that the risk of flooding is mitigated entirely. (P. Lopez)

Increased releases during the 6 to 15-month shutdown of the Delaware Aqueduct may have a significant effect on the environment. Section 6-06 (a)(1) of CEQR specifically states that an action may have a significant effect on the environment if it can be expected to lead to the consequence

of flooding. We contend that the closure will lead to a greater possibility of flooding for these reasons:

- The closure of the aqueduct eliminates the 500 to 900 mgd of diversions normally taken by the City on a daily basis, adding this amount to the reservoirs.
- The maximum releases of the three Delaware Reservoirs collectively are only 1.5 billion gallons per day; yet at full capacity they collectively hold 270 billion gallons. It will take 36 days to collectively create a 20 percent void with these limited valves.
- One inch of run-off adds approximately 16 billion gallons of water to the watershed reservoirs. It will take 11 days to release this water at the maximum capacity available now.
- On average, the Delaware River reservoirs receive approximately 40 inches of rain per year.
- Spilling reservoirs increase flood crests as well as increasing the duration of these higher crests.

Each reservoir must have permanent and substantial modifications to significantly release more water during the shutdown. These modifications must parallel those that have been placed at the Gilboa Dam. (Tharp)

A generic discussion of the operational changes that would be required to accommodate the possible increase in flows through the Delaware system will be included in the DEIS. A detailed analysis of potential environmental impacts will be provided in the second EIS once further information is available. No actions related to Projects 2A or 2B would be taken prior to issuance of the second EIS.

Comment 13: I'm satisfied that you are going to be in touch with my supervisor the time frame of the shutdown because we are a municipality (Town of Newburgh) that depends on the aqueduct for our water supply. (Greene)

Response: Comment noted.

Comment 14: During the shutdown phase of the upstate tunnels, and when drawing from groundwater aquifers in Long Island, Staten Island, and/or New Jersey (i.e., Project 2A), there is the potential for saltwater intrusion. Will the pumped water be closely monitored for salinity? Will chlorinated New York City water be used to recharge the aquifers? Are there plans for financial restitution to individuals and communities for any

inconveniences to their normal water quality/supply? Will free distribution of bottled water be available? (Bartosik)

Response:

The first EIS will provide a project description for the Queens Groundwater Reactivation, New Jersey-New York City Interconnection, and Nassau County Interconnection projects (all part of Project 2A, Water Supply System Augmentation and Improvement). In addition, the first EIS will provide a generic assessment of the potential impacts from each of these projects. The issues raised in the comment will be evaluated as part of the second EIS and the design associated with all planned groundwater pumping. Currently, it is not anticipated that salt water intrusion would occur or that aquifer recharge would be necessary. All drinking water supplied by the various projects during the shutdown period would be treated, monitored and tested to ensure it meets all regulations and is safe for consumption.

Comment 15:

During the shutdown phase, there is the remote possibility that well water levels in and around the Hamlet of Wawarsing may drop, either reducing availability or causing an inflow of “new” water when the pressure gradient changes. Will these events be monitored and any damages remediated? (Bartosik)

If the leakage in the section of the tunnel is corrected and the leaked water no longer contributes to the present aquifer, will residents and/or businesses north of the Hamlet of Wawarsing (who have become dependent on the water) be compensated if they have to re-drill or deepen their wells? (Bartosik)

The DEIS should address risks to homeowners’ property, homes, and wells and restoration that would take place as mitigation. The DEIS should address pre-drill testing of adjacent wells, provision of a filtering system, and the monitoring of wells over time. (Stolman)

While drilling the 650-foot shafts on either side of the Hudson River, what happens if an underground spring is encountered? Is the water continually pumped out? Or is the flow plugged or stopped in some manner? Living nearby, I am concerned that such an event could possibly dry up my well water table. (Plimley)

Response:

The RWBT would be unwatered and the leaking portion of the tunnel inspected and repaired during Project 2B, Bypass Tunnel Connection and RWBT Inspection and Repair, including Wawarsing. Project 2B is in the preliminary stage of facility planning, and not enough information has been developed at this time to enable a complete environmental review.

The first EIS will provide a project description for Project 2B, a preliminary list of actions and approvals necessary, an estimated timeframe for when the project would be implemented, and a generic assessment of its potential impacts. Before the approval and implementation of Project 2B, additional environmental review as part of the second EIS will be undertaken to evaluate and disclose in detail the Project 2B potential environmental impacts, including the effects from stopping the flow of water through the RWBT.

Comment 16: The main concern is that you're not going to repair this (450-foot) section of tunnel (in the Town of Wawarsing) before 2019. The people of Wawarsing are going to continue to have more problems. We see that the ground is settling and the concern is that it's going to take 8 years before you even address the issue. What happens if we have a major problem? A tunnel goes under New York State Route 209. Has anybody addressed that issue if that tunnel collapses? (Distel)

Response: All water from the Delaware system flows through the RWBT, which provides approximately 50 percent of New York City's drinking water on an annual average basis. Because the tunnel is such a critical component of DEP's water supply system, and because it has been known to be leaking, DEP has undertaken a multitude of planning and design efforts to prepare for the repair of the RWBT as part of both its emergency and long-term planning. As part of these efforts, DEP has identified a number of improvements to the RWBT that would facilitate emergency or planned repair work. Some of these improvements have already been constructed or are under construction, others are planned, and others are being evaluated.

As discussed in Section C.3 of the Final Scope, DEP regularly conducts ongoing monitoring of the RWBT and, since the 1990s, has been investigating the Roseton and Wawarsing crossings in particular. DEP's monitoring efforts have been continuous and varied and have included visual inspections of the tunnel using an autonomous inspection device and tunnel leakage investigations to determine the amount and specific location of the leaks. These monitoring efforts serve as a baseline by which to assess any changes in the tunnel condition and to determine priorities for tunnel repair.

Monitoring to date has shown that the leakage rate is stable and has not increased, and that the areas of leakage are correlated with the tunnel's surrounding geology; specifically, DEP's years of comprehensive

inspections, testing, and study indicate that cracking and leakage are occurring in the aqueduct where it passes through limestone, a rock more susceptible to wear and tear than the sandstone, shale, gneiss and granite that form the vast majority of the tunnel.

DEP is currently undertaking or planning several projects to learn more about the RWBT's condition and leakage, including continued monitoring of the surface expressions of the leakage at the Roseton and Wawarsing crossings, hydraulic monitoring, visual inspections of the tunnel interior, and engineering risk assessments of the tunnel's structural integrity.

Comment 17: Project 2B will create a hazard to human health and safety unless certain actions related to the Delaware Watershed reservoirs and spillways are taken prior to the shutdown. Our concerns are:

- These are high hazard earthen dams over 50 years old. Dams are considered “installations containing dangerous forces” under International Humanitarian Law due to the massive impact of a possible destruction on the civilian population and environment.
- The principal vulnerability of an embankment dam is that it may be damaged or even destroyed if insufficient height or spillway capacity allows over topping and erosion of the dam or if uncontrolled seepage results in internal erosion of the embankment and its foundation.
- Water moving through the spillway of a dam contains a large amount of energy. This energy can cause erosion at the outlet, which can lead to instability of the spillway. Failure to properly design, install, or maintain a stilling basin could lead to problems such as undermining of the spillway and erosion of the outlet channel and/or embankment material. These problems can lead to failure of the spillway and ultimately the dam.
- Prior dam inspection reports from 2006 note internal cracking, beaching erosion, holes along the downstream face of the embankment, wet area at toe, seepage, erosion at several catch basins on the berms and maintenance deficiencies.
- Requests for dam inspection reports by the media and through the Freedom of Information Act have been denied.

Prior to commencement of Projects 2A and 2B, it must be a mandatory action that all Delaware Reservoirs undergo a comprehensive inspection by the U.S. Army Corps of Engineers for compliance with the revised New York State Dam Regulations as well as federal dam safety

regulations. Closing the aqueduct before deficiencies are corrected from thorough dam inspections using the most up-to-date technology is a hazard to human safety.

Emergency action plans (EAPs) for each reservoir must be updated and given to the communities that will be most affected for public comment and review. At past meetings, DEP has admitted that the EAPs need to be revised. In a 2006 Inspection Report, it was noted by NYSDEC that no EAP was available for the Neversink Dam.

Dam inspection reports must be provided to inform all stakeholders of the condition of the dams prior to aqueduct repair and closure. (Tharp)

Response:

DEP Delaware dams are in compliance with the revised New York State Dam Safety Regulations. The Merriman, Neversink, Downsville and Cannonsville dams were designed and built to safely pass the Probable Maximum Flood (PMF), which is defined by the Federal Emergency Management Agency (FEMA) as “the flood that may be expected from the most severe combination of critical meteorological and hydrologic conditions that are reasonably possible in the drainage basin under study” (FEMA-148, Glossary of Terms, April 2004). Engineering assessments completed by GZA GeoEnvironmental from 2003 to 2005 confirmed this.

The Delaware dams have never been “breached.” The Delaware dams undergo thorough and frequent safety inspections and safety observations by trained DEP supervisors and professional engineers. Any deficiencies noted during these inspections are logged and scheduled for correction under Regional maintenance programs or under capital construction projects. Regular and ongoing maintenance is performed at each dam.

NYSDEC conducts biennial dam safety inspections of the Delaware dams. The inspection reports are sent to the town supervisor of the town in which the dam is located. All four Delaware dams were inspected by NYSDEC in 2010. The latest NYSDEC inspection reports (based on the 2010 inspections) note that “...in general the dam[s] appear to be well maintained.”

Emergency action plans for the Delaware dams were updated and issued in August 2010 and distributed to downstream communities and emergency services personnel.

Comment 18:

Regarding the use of the water in the event that this is finally accomplished, what are the standards now and what are you doing as far

as the request by the NYSDEC and others to filter the water coming in?
(Lafko)

Response: Water delivered to consumers via the bypass tunnel currently complies and will continue to strictly comply with state and federal drinking water standards. The proposed program will not change the source of water supplied through the RWBT, how water in the system is treated or any water treatment needs.

Comment 19: Who is going to handle security? Is it going to be 24/7? (A. Bettina)

Response: The DEIS will include a discussion of security at the west and east connection sites in Section 2.1, "Description of Project 1 Construction Program."

Comment 20: Table 1, Potential Major Permits, Approvals, Consultation, and Coordination, on page 15 of the Draft Scope should be revised to include Town of Wappinger wetlands permit, floodplains development permit, and tree removal permit approvals. (Stolman)

Response: The Final Scope has been revised to include the Town of Wappinger's wetlands permit, floodplains development permit, and tree removal permit as potential approvals.

Comment 21: The above-mentioned table should include agencies such as MTA/Metro-North, from which approvals and/or coordination may be required. (Stolman)

Response: The Final Scope has been revised to include the other agencies identified at this time from which approvals and/or coordination may be required, including the Metropolitan Transportation Authority Metro-North Railroad.

Comment 22: We have a public health crisis in Chelsea. If you want to help alleviate some of these problems of (water) quantity and quality, we should have a tap into your system. I'd urge the town (Wappinger) and (Dutchess) county officials not to grant any permits to New York City unless we get that tap. (Incoronato)

No water, no permit. (C. Smith)

I will not be voting for any permits if there's no way to get water in that area. I'm going to direct our Planning Board and attorneys to work something out. We have a large apartment complex, which is Chelsea

Ridge, and another apartment complex (Montclair), and there is big demand. (V. Bettina)

Response: DEP met with the Town of Wappinger Town Board on July 25, 2011, at which time both parties agreed to negotiate an agreement for DEP to provide the town with a connection to the New York City water supply system. These conversations are ongoing. DEP is committed to reaching an agreement to provide the Town of Wappinger with water sourced from the Delaware Aqueduct on the completion of the proposed program.

DESCRIPTION OF PROJECT 1 CONSTRUCTION PROGRAM

See also "Transportation" and "Alternatives," below, for related comments

Comment 23: There's a big difference between 9 years and 6 to 15 months of construction. Which is it and what is the impact of that construction? (Anderson)

Response: Project 1, Shaft and Bypass Tunnel Construction is expected to start in 2013 and be complete by 2018. Once the bypass tunnel is complete and the water supply system and augmentation and improvement projects (Project 2A) to support the connection are in place, the existing tunnel would be taken out of service and excavation would begin to connect the bypass tunnel to the existing tunnel (Project 2B). It is anticipated that between 6 months and 15 months would be required to complete the bypass tunnel connection, inspection, and repair. Further details on the construction schedule will be provided in the DEIS. The first DEIS will include a detailed assessment of the potential construction impacts related to Project 1 as well as construction related to the connection of the bypass tunnel to the existing Delaware Aqueduct.

Comment 24: We need to know the hours of operation that hauling (of excavated materials) will take place. (Valdati)

The DEIS should address hours and days of operation throughout the process. (Stolman)

Response: The DEIS will include a detailed description of likely construction activities, including the anticipated hours of construction and an estimated timeline showing the major proposed activities in each stage of construction.

Comment 25: The DEIS should address the processing of materials on-site, such as the crushing of rock. (Stolman)

The DEIS should address the impacts of muck removal during construction of the Wappinger shaft and connector tunnel. (Gray)

Response: The DEIS will include a detailed description of likely construction activities related to the shaft and bypass tunnel construction, including the processing of materials on-site and the potential impacts related to muck removal.

Comment 26: The DEIS should address pre-blasting evaluations of homes and wells within an appropriate radius. (Stolman)

I ask that the pre-blast survey and videography of the homes be expanded beyond the normal scope to make it a little bit bigger area to take into consideration any damages that could be done. (V. Bettina)

Response: The DEIS will address measures to be taken in order to minimize effects from blasting, including a commitment to conduct pre-blast surveys and videography of the homes and businesses around the connection sites.

Comment 27: The DEIS should address worker safety. (Stolman)

Response: The DEIS will include a discussion of the health and safety measures that would be implemented during Project 1, such as health and safety plans (HASPs) that would be prepared for construction activities on the west and east connection sites.

Comment 28: To properly assess the potential impacts of the directional boring between the well shafts on the west and east connection sites, the DEIS should provide a description of the well shaft construction; a description of the dewatering operation, including an explanation of how the water will be discharged and treated prior to release to the Hudson River; and a description of depths of the bore. (Whitehead)

Response: A detailed description of the likely construction activities will be provided in the DEIS in Section 2.1, "Description of Project 1 Construction Program." A description of the anticipated dewatering operation and the potential impacts related to the dewatering of the shafts and bypass tunnel to surface waters will be provided in Section 2.8, "Natural Resources and Water Resources."

Comment 29: Would there be a concrete plant on-site? The DEIS should address that. (Stolman)

The DEIS should address impacts related to concrete delivery or on-site production during construction of the Wappinger shaft and connector tunnel. (Gray)

Response: As described in the Final Scope, the DEP is still evaluating various options to construct the bypass tunnel. A description of the proposed construction activities, including the possibility for a concrete plant on-site, will be addressed in the DEIS in Section 2.1, "Description of Project 1 Construction Program." In addition, Section 2.10, "Transportation," will include an analysis of any transportation demands related to Project 1 construction.

Comment 30: What are the various "liners" referred to in the Draft Scope to be composed of? (Bartosik) The DEIS should address impacts regarding the concrete lining of the bypass tunnel and shafts. (Stolman)

Response: The composition of the various liners will be addressed in the DEIS. The potential materials being considered include concrete cast-in-place liners and steel interliners. The DEIS will analyze the potential effects of the shaft and bypass tunnel construction, including the use of concrete as a liner.

LAND USE, ZONING, PUBLIC POLICY, AND OPEN SPACE

Comment 31: H.3.3.1, Existing Conditions, should include a discussion of any regulated buffer/screening requirements. (Stolman)

Response: Comment noted. Any applicable buffers or screening requirements will be identified in the DEIS.

Comment 32: H.3.3, Chapter 2.2: Land Use, Zoning, Public Policy, and Open Space, should include a discussion of the Metro-North Railroad as an existing adjacent land use and potential impacts of the project on their service, schedule, etc. (Stolman)

Response: Comment noted. The Metro-North Railroad will be identified as an existing adjacent land use in the DEIS. The DEIS will identify any potential impacts to Metro-North's service or schedule.

VISUAL CHARACTER

Comment 33: H.3.5, Chapter 2.3: Visual Character, should include a photographic inventory and an analysis of the appearance of the project site as seen, at a minimum, from the following locations:

a. The Hudson River;

- b. The Wheeler Historic District; and
- c. The surrounding roads and residences.

Potential impacts to visual character should be demonstrated with photo simulations of the site, as well as any other appropriate techniques. Simulations should depict the appearance of the site from, at a minimum, the above listed locations. Photo simulations should be provided for day and night conditions. (Stolman)

Response: Comment noted. DEP agrees to perform a photographic record of the current site conditions as requested above and to provide photographic renderings of the proposed project.

Comment 34: The visual impact of this project is substantial. The site is currently surrounded by old chain-link fences, a new gate that is inappropriate for its residential neighborhood location, and sound blankets that may be necessary but give the appearance of living next to a big brown bag. This facility has gone from one in which the grounds were constantly maintained to often being overgrown. The site has truly become an “ugly neighbor.” (Anderson)

Response: The DEIS will assess the potential for impacts on visual character from Project 1 in Section 2.4, “Visual Character.”

Comment 35: There should be a discussion regarding the use of up-lighting, particularly considering the number of years it will take to construct the shafts and bypass tunnel. Suggest that the selection of outdoor lighting be reviewed regarding the potential of light pollution and visual nighttime impacts. Designs should avoid up-lighting. The International Dark Sky Association (IDA) has a list of outdoor approved lighting that does not include up-lighting. (Whitehead)

Response: The DEIS will include a discussion of lighting in Section 2.4, “Visual Character.” The analysis will consider any local applicable codes, the most recent edition of the Illuminating Engineering Society Handbook, and the most recent edition of the American National Practice for Roadway Lighting (RP-8) approved by the American National Standards Institute (ANSI).

HISTORIC AND ARCHAEOLOGICAL RESOURCES

Comment 36: H.3.6, Chapter 2.5: Historic and Archaeological Resources, should provide detailed studies in accordance with the New York State Standards for Cultural Resource Investigations, including:

- a. Phase IA Literature Search and Sensitivity Study;
- b. Phase IB Field Investigation, if warranted by Phase IA study; and
- c. Phase II site evaluation, if warranted by Phase I studies. (Stolman)

Response: The DEIS will assess the potential for Project 1 to affect cultural resources through the preparation of a Phase 1A Literature Search and Sensitivity Study. Phase 1B investigations would be undertaken based on the recommendations of the Phase 1A studies. Phase 2 investigations would also be carried out if potentially significant resources are encountered during the Phase 1B investigations. All analysis will be completed in coordination with and based on the recommendations of the New York State Office of Parks Recreation and Historic Preservation (OPRHP), and follow the guidelines and standards of the New York Archaeological Council (NYAC), as adopted by the OPRHP (1994).

Comment 37: The DEIS should address working with the (Wappinger) school district and/or other entities if cultural artifacts are found. (Stolman)

Response: DEP will consult with OPRHP to locate an appropriate facility that would care for any recovered artifacts in perpetuity. The potential for the artifacts to be placed with the Wappingers Central School District and or other local entities will be determined in consultation with OPRHP.

SOCIOECONOMIC CONDITIONS

Comment 38: H.3.7, Chapter 2.6: Socioeconomic Conditions, should include a discussion of property values for those proposed acquisition sites, description of the acquisition process, and legislative action, if any. Potential impacts related to these matters should also be discussed under the mitigation chapter. (Stolman)

Response: DEP is in the process of acquiring the parcels that would make up the west connection site through willing negotiations with property owners. Acquisition of these properties underwent a separate environmental review, which demonstrated that no significant adverse impacts would occur due to acquisition and no mitigation is therefore required.

Comment 39: The fiscal impact analysis should address the impact of the project on property values, and consequently on the Town of Wappinger's tax base. (Stolman)

The DEIS should address the impact to the value of adjacent properties financially, and the purchase of homes by DEP as possible mitigation. (Stolman)

The impact to the value of the neighboring homes is substantial and one that will not begin to recover until completion of this project. The decline in the value of our home and those of our neighbors will affect our ability to sell, refinance, or potentially rent the properties. Going from having a view of the river to one of a massive construction project scheduled to go on for a number of years creates financial hardship for all those near this (east connection) site. (Anderson)

Response: The Shaft 6 site in Wappinger has been operating as a water supply facility since the 1930s; there would be no change in the operations of the facility once the project is complete. While it is recognized that the construction period will create localized impacts that will temporarily affect quality-of-life, it is not anticipated that these temporary impacts will have measurable long-term effects on property values. Effects of the construction of the project on the surrounding community will be evaluated as part of the neighborhood character and socioeconomic conditions analyses in the DEIS. These analyses will evaluate potential changes to the character of the community and the potential for secondary displacement, amongst other issues, resulting from the construction project.

Comment 40: Will financial consideration be made to the residents/communities above the bypass tunnel? (Residents in Wawarsing were given from \$100 to \$400 during the construction of the tunnel in the 1940s-1950s.) (Bartosik)

Response: DEP is still in the early stages of designing the tunnel alignment and therefore cannot respond definitively to this question. In all instances, however, if so required, just compensation will be paid under applicable law.

Comment 41: We're still waiting for the state to come down and appraise the (affected Wawarsing) homes. We've asked New York City to contribute or maybe match the state's funding because the \$4.5 million is not going to be anything to give to these people if you have 50 more homes. The water is moving north on the lower part of Route 209. (Distel)

Response: The City has also recently announced that it would enter into an agreement with Ulster County to match State funds up to \$3.7 Million to purchase homes in the area that are experiencing water conditions that meet the criteria of the State program. In this program, NYC will cover Ulster County's administrative expenses and provide an optional incentive payment to participating homeowners.

NATURAL RESOURCES AND WATER RESOURCES

Comment 42: Re: geology and soils, the DEIS should include a discussion of the geology, topography, and soils of the shaft sites and the tunnel route. (Stolman)

Response: Comment noted. The DEIS will include a discussion of the local geology, topography, and soils of the shaft sites and the tunnel route in Section 2.8, “Natural Resources and Water Resources.”

Comment 43: To properly assess potential impacts of tunnel dewatering (during connection of the bypass tunnel), the DEIS should provide a description of the dewatering operation; a wastewater characterization; a description of the wastewater treatment process and conveyances (note that pollutants, such as chlorine, will need to be quantified prior to release to avoid significant impacts to fish populations); the location of all discharge points; and a description of the quantity and velocity of water to be released to avoid channel scouring. For all discharges to ground and surface water, water quality standards, such as temperature, total dissolved solids, and pH, will need to be met. (Whitehead)

Response: The potential wastewater stream, peak flows, treatment process, and discharge points will be identified in the DEIS. The specifications for the treatment process required to ensure that the discharge effluent would meet the NYSDEC surface water quality standards based on the stream classification will be included in the DEIS.

Comment 44: To properly assess the potential impacts from the movement (by barge, rail, or truck) and storage of excavated material, the DEIS should provide: a description of how runoff will be treated and controlled during removal; an evaluation of the need for water-tight containers; a description of how excavated material will be stockpiled; a description of where the stockpiled material will be sent for disposal; and a description of how sediment-laden runoff will be prevented from entering roadside ditches and storm drains, thereby preventing runoff to water bodies such as the Hudson River and associated tributaries. (Whitehead)

Response: DEIS Section 2.1, “Description of Project 1 Construction Program,” will describe the proposed construction activities, including potential storage areas, potential staging and parking areas, truck routes, likely sequencing, any potential disposal sites identified, and techniques to minimize impacts during construction. Section 2.8, “Natural Resources and Water Resources,” will address the potential impacts related to the dewatering of

the shafts and bypass tunnel during construction activities. Dust control measures, such as those that will be required in contract specifications, will be described in the DEIS.

Comment 45: The rock debris from the tunneling may contain iron and sulfur bacteria. Disposal into surface pits or landfills may contaminate the surface and groundwater in addition to producing a foul smell for residents. What steps are being considered to test for and ameliorate these potential problems? (Bartosik)

Response: DEP is conducting both deep rock borings and surface/water table environmental borings to investigate the potential for contaminants. All contaminants will be treated according to environmental regulations. The DEIS will address the nature of rock to be excavated during tunnel construction, potential disposal options, and requirements to test and dispose of such material in accordance with all applicable laws and regulations.

Comment 46: Water from and during the tunneling was stated to be drained into the Hudson River. How will the water be treated so as to meet environmental standards? Who will conduct the necessary sampling/testing and certification? (Bartosik)

To properly assess potential impacts, the DEIS should provide a description of how potential pollutants in the groundwater will be assessed and treated prior to discharge. (Whitehead)

Response: The DEIS will provide a description of how water from and during the tunneling effort would be managed, including its treatment prior to disposal. The DEIS will also include an assessment of how potential pollutants in groundwater could affect water used in the construction process.

HAZARDOUS MATERIALS

Comment 47: Will tests be conducted for radon in the Roseton area and perhaps other radioactive elements/compounds especially introduced via fissures from volcanic origin? Will the ventilation system be monitored for contaminants, and, if present, how will contaminants be remediated? (Bartosik)

Response: While constructing the bypass tunnels or shaft, DEP would ensure the safety of all the workers, both in the tunnel and on the surface, and comply

with all environmental and OSHA regulations, including those for ventilation.

TRANSPORTATION

See also "Description of Project 1 Construction Program," above, and "Alternatives" and "Mitigation," below, for related comments

Comment 48: A discussion of a schedule of the disposal of excavated materials, i.e. will they be disposed daily, weekly, etc., should be included. The number of trucks at any one disposal time should be indicated as well as the anticipated disposal location. (Stolman)

Will you be able to specify how many trucks will be removing aggregate and what frequency during the course of the day, for how many days, and the hours of operation? We need to know how much traffic will be generated and what kind of impact there will be for the residents. (Valdati)

Response: Estimates of construction traffic and variability over time will be included in the DEIS.

Comment 49: River Road North was not constructed to withstand the quantity and weight of the construction vehicles that have been and will be required for the duration of this project. This is evident by the deterioration of the road since the initial phase of the project in 2008. A DEP representative said in 2008 that road damage was the responsibility of the Town of Wappinger to repair. (Anderson)

The DEIS should address restoration to road damage, if necessary. (Stolman)

Response: DEP will document the conditions at River Road before the start of construction activity for Project 1 and ensure that the roadway is restored to the same or better condition at the end of the project. These efforts will be coordinated with the Town of Wappinger.

Comment 50: The transportation analysis should include potential impacts from oversize and overweight vehicles used to transport materials and/or equipment to and from the shaft site (west connection site). Off-tracking at intersections and sharp curves should be evaluated as well as roadway, culvert, and bridge capacities for truck routes. (Wersted)

Response: These issues will be evaluated and addressed in the DEIS. The Final Scope has been revised to reflect these additional analyses.

Comment 51: Trucks are getting stuck across River Road, and I can't get up or down or out of my driveway. That needs to be addressed before some of this larger equipment is brought on-site (east connection site). River Road North lacks adequate turning access into the site. This is evident by the number of times the road has been closed due to delivery trucks not being able to make the turn into the site driveway and/or because they got stuck on the embankment in front of my home. During the delivery of equipment, the newly installed fence at the site entrance was knocked down by the trucks. There are no road shoulders or sidewalks to provide a safe route for the many walkers and bicyclists that use the road daily. (Anderson)

The 40 mph speed limit for River Road North should be examined due to the stopping distance required for the size of vehicles expected as a result of the project, especially as they descend the hill to the north of the site. Site distances for driveways need to be examined, again given the size and quantity of construction vehicles and increase of vehicles driven by laborers for the project. With trucks and tractor trailers, it's very difficult and unsafe getting out of many of those driveways. (Anderson)

We have to patrol the way truck traffic is going through the road (River Road). I see them jammed up, I see the trucks backed up, and people can't get out of their houses. (V. Bettina)

Maybe there has to be some sort of extra oversight that the Town of Wappinger has to provide to make sure traffic safety is observed. (Valdati)

Response: Truck traffic and operating conditions on River Road will be examined and evaluated in the DEIS. Consultations will be undertaken with the Town of Wappinger to discuss potential traffic management plans during construction. The DEIS will include information on potential impacts and traffic mitigation measures during construction.

Comment 52: We have heavy truckloads on Route 9D. You're going to have a giant parking lot in southern Dutchess County, and that should be considered. (Klingzahn)

Response: The traffic study in the DEIS will analyze impacts from potential construction worker and truck traffic from construction on New York State (NYS) Route 9D.

Comment 53: A review of the locations for the manual turning movement counts within the Town of Wappinger are appropriate assuming all site-related construction traffic will travel to and from Interstate 84. Although this may be the case for excavation material disposal, it may not address the

potential impacts related to construction workers traveling to and from Shaft 6 site within the Town of Wappinger. Therefore, the applicant should reassess the intersections and identify intersections to the north on NYS Route 9D. We recommend the intersections of NYS Route 9D at Old Hopewell Road and U.S. Route 9 at Old Hopewell Road should be included in this analysis. (Stolman)

Response: Comment noted. The intersections of NYS Route 9D at Old Hopewell Road and U.S. Route 9 at Old Hopewell Road will be included in the Final Scope and evaluated in the DEIS.

Comment 54: The intersection of Route 9W and Lattintown Road is an unsignalized intersection with existing capacity constraints, particularly for eastbound left-turn movements onto Route 9W north. For construction traffic, this connection provides a short route to Route 9W from the potential west connection site location. However, consideration should be given to including the Route 9W/Carter Avenue intersection in the study area, which provides signalized access to a north-south parallel to Route 9W. (Wersted)

Response: The Route 9W/Carter Avenue intersection will be considered in the traffic study of the DEIS, depending on the anticipated routes and impacts of construction worker and truck traffic to the west connection shaft.

Comment 55: The traffic volumes for each of the peak hours should be graphically illustrated for each of the intersections in the study area. (Stolman)

Response: Comment noted. Section 2.10, "Transportation" will graphically present the traffic volumes for each of the peak hours for each intersection in the study area.

Comment 56: The Draft Scope notes that automatic traffic recorders (ATRs) will be installed at two locations within the Town of Wappinger. It is recommended that an additional location be selected along NYS Route 9D between the town line with Fishkill to the south and Old Hopewell Road to the north. (Stolman)

Response: Comment noted. A determination of the need for an additional ATR in the suggested area will be considered for the DEIS.

Comment 57: The Draft Scope notes that observations for running speeds along NYS Route 9D will be conducted at the same time as the traffic counting program. We will recommend that the ATRs record not only traffic

volume by direction, by hour, and daily, but also identify the 85th percentile speed of vehicles traveling on these roads. (Stolman)

Response: Comment noted. Observations of general speeds and excessive speeds noted on Route 9D will be included in the DEIS.

Comment 58: The roadway capacity analysis is proposed to be conducted according to the 2000 *Highway Capacity Manual (HCM)*, using the latest Synchro analysis program. The Transportation Research Board has recently published the 2010 *HCM*, and it is likely that at the time of analysis for the project, the 2010 *HCM* will be adopted by the New York State Department of Transportation (NYSDOT) and in use. Consider amending the statement (in the Draft Scope) to include "...which will rely on the 2000 (or latest adopted) *Highway Capacity Manual...*" (Wersted)

The results of traffic analysis based on the 2000 *HCM* and the Synchro methodology should be provided in a table format identifying the results of the analyses for each intersection or lane group of approach, based on the type of traffic control. The results should include the level of service, volume to capacity ratio, average vehicle delay and results of the queuing analysis, all [of] which is provided as part of the Synchro analysis. (Stolman)

The data collection inventory of the study area roadways and intersection, which will include street widths, traffic flow directions, lane markings, parking regulations, and other appropriate information necessary to complete the analysis, should be provided in a graphic format to assist in the review by the town and others. (Stolman)

Traffic signal plans should be provided as part of the DEIS. These plans are available from the NYSDOT and/or Dutchess County. (Stolman)

Response: Comment noted. The analyses will employ the Synchro model that utilizes the 2000 *HCM*. An evaluation of the potential changes in conclusions between use of the 2000 and 2010 *HCM* for assessment of traffic impacts will be included in the DEIS.

The results of the 2000 *HCM* and the Synchro methodology will be provided in a table format based on the type of traffic control. The results will include the level of service, volume to capacity ratio, average vehicle delay, and results of the queuing analysis.

The Final Scope has been revised to show that the data collection inventory of the study area roadways and intersection, which will include

street widths, traffic flow directions, lane markings, parking regulations, and other appropriate information, will be provided in a graphic format.

Traffic signal plans will be provided as part of the DEIS.

Comment 59:

The applicant will need to identify the duration of construction activities and select an appropriate design year for the purpose of analyzing future conditions without the project traffic. The traffic volumes should be graphically illustrated for each of the intersections and time periods, including an appropriate growth rate and traffic related to any other planned developments. Any road improvements related to other developments should be included in this analysis. (Stolman)

The identification of site traffic generation for construction workers and construction vehicles should be identified. It should include the identification of truck routes, construction worker routes, and access points for each of the sites' parking locations. These matters should be graphically illustrated, as appropriate. (Stolman)

Intersections, specifically those that are in the Town of Wappinger, identified in the traffic counting program as to be potentially impacted by construction-related traffic should be included in the traffic analysis. (Stolman)

The DEIS should address traffic impacts during construction of the Wappinger shaft and connector tunnel. (Gray)

Response:

Comment noted. This information will be included in the traffic study in the DEIS. Section 2.10, "Transportation," will include a quantitative construction traffic impact analysis for Project 1, Shaft and Bypass Tunnel Construction. As part of this analysis, the number of construction workers and construction vehicles will be estimated. This analysis will also identify the relative duration of construction activities and will assess the potential effects of construction-related traffic at selected key study area intersections. Trip generation estimates of construction worker vehicle and truck trips will be developed. Traffic volumes will be graphically illustrated for each of the intersections and time periods. In addition, any road improvements related to other developments in the study area will be considered in this analysis.

Comment 60:

Site-generated traffic and the clear identification of truck traffic and other vehicle traffic related to construction of the bypass tunnel should be identified. The Draft Scope notes that the analysis will follow the procedures outlined in the *CEQR Technical Manual* as guidance. The

applicant should identify the criteria set forth in this manual to be applied to the town, county, and state roadways within the Town of Wappinger. (Stolman)

Response: Comment noted. The *CEQR Technical Manual* criteria will be identified in the DEIS.

Comment 61: The Draft Scope identifies the specific thresholds for identifying significant impacts based on the results of detailed capacity analyses following the Synchro program. The applicant may follow these guidelines; however, it must be determined if this criteria should apply to each of the intersections located within the Town of Wappinger. (Stolman)

Response: Comment noted.

Comment 62: I'm satisfied that you are going to be in touch with my supervisor concerning traffic. (Greene)

Response: Comment noted.

Comment 63: All existing transit availability and capacity of these routes, such as bus routes and train schedules, should be provided. (Stolman)

Response: All construction workers are expected to travel to and from the west and east connection sites by private auto. This will provide for a more conservative analysis in the DEIS. However, the DEIS will also identify all public transportation routes to and from the site, capacities (if available), and schedules.

Comment 64: Impacts to bus transit, rail, and/or pedestrians should be clearly identified as part of the results of the analysis. This information should be provided in detail and, if necessary, as a graphic illustration(s) in the DEIS. (Stolman)

Any impact on school bus transportation for children in the area on those small roads should be addressed in the DEIS. (Gutzler)

Response: No impacts on public transportation from increased ridership during Project 1 are expected, since all construction workers are assumed to travel to the west and east connection sites by private auto. Impacts to the school bus transportation routes and public transportation from increases in roadway traffic from construction vehicles will be addressed in the DEIS.

Comment 65: Parking conditions, parking facilities, and availability of on-street and off-street parking within reasonable walking distances to the potential work entrances should be graphically illustrated as part of the DEIS. (Stolman)

The DEIS should address impacts on parking for workers and site access during construction of the Wappinger shaft and tunnel connector. (Gray)

Response: It is expected that parking for all construction workers would be accommodated on either the west or east connection sites, as appropriate, and, therefore, no parking impacts are expected from construction workers. This will be evaluated as the design progresses, and the potential impacts from parking during construction will be addressed in the DEIS.

AIR QUALITY

Comment 66: I'm very concerned about the impact of dust, dirt, and all this activity and material being trucked out of this (east connection) site. The extent of excavation, blasting, and removal of debris from the shaft construction and tunnel work will generate a significant amount of dust blowing onto and into our homes and yards. The wind generally comes across the river from the west, carrying with it the dust and dirt from the site. (Anderson)

Vehicle and equipment exhaust will increase substantially, and it will impact the air quality of our neighborhood. (Anderson)

Response: The air quality analysis in the DEIS will include an assessment of on-site construction equipment as well as on-road construction-related vehicles, such as trucks. The analysis will include the anticipated emissions from shaft and tunnel construction activities. In addition, the DEIS will describe means and methods anticipated to be used to reduce the amount of dust generated by Project 1 construction.

NOISE

Comment 67: The NYSDEC policy "Assessing and Mitigating Noise Impacts," revised February 2, 2001, provides direction to department staff for the evaluation of sound levels and characteristics generated from a proposed facility. Other state and local agencies may choose to use relevant parts of this guide when serving as SEQR lead agency for a project subject to an EIS that includes a discussion of noise impacts. (Whitehead)

Response: The NYSDEC noise impact criteria is less stringent than the CEQR impact criteria that will be used for the analysis of the Project 1 in the DEIS.

Comment 68: The DEIS should address noise impacts related to construction of the Wappinger shaft and connector tunnel. (Gray)

Response: An analysis of noise associated with the construction of the shaft on the east connection site and the bypass tunnel will be included in Section 2.13, “Noise,” of the DEIS. An analysis of noise from construction activities on the west connection site will also be included in the DEIS.

Comment 69: Reese Park should be considered a location for potential spot noise monitoring. (Stolman)

Response: Comment noted. Reese Park has been added to the noise analysis as a sensitive receptor in the Final Scope, and noise measurements taken at this location will be included in the DEIS noise analysis.

Comment 70: I’ve got to believe a TBM is a 24/7 operation, which would significantly impact my neighbors and me trying to sleep. Noise monitoring sensors need to be put in our yards because even with my windows closed I can hear everything. (Anderson)

The echo effect allows even voice communication to be heard in my home. Back-up beepers on vehicles can be heard 24/7 during diving operations as well as regular working hours. Noise from blasting, drills, tunnel boring equipment, rock crushers, etc., which may be operating extended hours or around the clock, will be heard clearly in our home as well as throughout the neighborhood. (Anderson)

Response: Noise from construction activities during Project 1 construction will be addressed in the DEIS noise analysis. The noise analysis will examine potential noise impacts during both daytime and nighttime hours. Anticipated construction equipment operating at the east connection site will be included in the DEIS noise analysis.

Comment 71: Can the Shaft 6 enclosure, that large brick building, provide access from the working side of the building as opposed to the street side? Moving that driveway access would take care of a lot of the everyday 24/7 noise by having workers on the west side of the facility. (Anderson)

Site noise has increased significantly since 2008 when preparations began for the tunnel repair project. Although vehicle access is now primarily through the new site entrance, the only access to Shaft 6 is through the front of the building directly across from my home. The proposed new shaft site is visible from our home, and the extensive and ongoing noise generated by this project will be significant. (Anderson)

Response: Comment noted. The noise analysis in the DEIS will examine the effects of trucks and other vehicles accessing the east connection site and on-site construction equipment and activities.

The existing structure at Shaft 6 would not be used to support construction activities for the proposed project; therefore, there would be reduced noise emanating from the existing Shaft 6 building. Additionally, there is currently no significant access to the back of the building as an electrical substation was recently installed on this side of the building. This location was chosen so that the Shaft 6 building would screen the substation equipment, thereby reducing its visibility from surrounding residences.

INFRASTRUCTURE

Comment 72: In 2010, New York State enacted the State Smart Growth Public Infrastructure Policy Act. The Act's purpose is to: "augment the state's environmental policy by declaring a fiscally prudent state policy of maximizing the social, economic, and environmental benefits from public infrastructure development through minimizing unnecessary costs of sprawl development, including environmental degradation, disinvestment in urban and suburban communities, and loss of open space induced by sprawl facilitated by the funding or development of new or expanded transportation, sewer and waste water treatment, water, education, housing and other publicly supported infrastructure inconsistent with smart growth public infrastructure criteria." Under this act, no state infrastructure agency, including the NYSDEC, shall approve, undertake, support, or finance a public infrastructure project, unless, to the extent practicable, the public infrastructure project is consistent with 10 smart growth infrastructure criteria that are spelled out in the Act. This should be addressed in the EIS. (Whitehead)

Response: The Final Scope has been revised to include an assessment of the proposed program's consistency with the State Smart Growth Public Infrastructure Policy Act. This assessment will be included in the DEIS in Chapter 2, "Probable Impacts of Project 1, Bypass Tunnel and Shaft Construction," Section 2.2, "Land Use, Zoning, and Public Policy."

MITIGATION

See also "Transportation" for related comments

Comment 73: The Draft Scope should include a mitigation section for traffic-related impacts. This section should identify the results of analyses and identification of significant impacts to intersections within the Town of

Wappinger. Results of these analyses should be provided in a table format based on the results of the Synchro analysis. It should follow the same steps as noted above and include the same information (see Comment 58). The table should include a no-build section, a build section, results of analyses with existing roadway conditions, and a separate analysis of results of analyses based on a Synchro program, with appropriate mitigation. (Stolman)

Mitigation should be identified, such as modifications to traffic signal timing plans, additional travel lanes, temporary traffic control, or other means to mitigate impacts from the proposed construction-related traffic. (Stolman)

This section should identify the responsibility and a schedule to implement mitigation improvements. Whatever improvements are identified as part of the results of the analysis should be in place prior to the beginning of any construction-related activities at the Shaft 6 site. (Stolman)

Results of the analyses and the identification of any mitigation should be graphically illustrated in the DEIS. (Stolman)

Response: As discussed in the Final Scope, potential traffic mitigation for predicted significant adverse transportation impacts from Project 1 will be included in the DEIS in Section 2.18, "Mitigation." Responsibilities for such measures will also be included.

Comment 74: The Draft Scope should include the supply of water by the City of New York to the Town of Wappinger as a mitigation measure relative to the significant adverse environmental impacts to the town that cannot be avoided. (Stolman)

Response: DEP met with the Town of Wappinger Town Board on July 25, 2011, at which time both parties agreed to negotiate an agreement for DEP to provide the town with a connection to the New York City water supply system. Conversations are ongoing. DEP is committed to reaching an agreement to provide the Town of Wappinger with water sourced from the Delaware Aqueduct on the completion of the proposed program.

CUMULATIVE IMPACTS

Comment 75: The Draft Scope identifies that "the EIS will summarize the potential impacts from construction and operation of the proposed program." However, note that cumulative impacts can result from a single action or from a number of individually minor but collectively significant actions taking place over a period of time. Cumulative impacts do not have to all

be associated with one sponsor or applicant. They may include indirect or secondary impacts, long-term impacts, and synergistic effects.
(Whitehead)

Response: As described in the Final Scope, Chapter 6, “Cumulative Effects,” the DEIS will summarize the potential cumulative impacts from construction and operation of the proposed program.

OTHER IMPACTS

Comment 76: Growth-inducing and secondary impacts should also be included in the EIS. (Whitehead)

Response: Construction of Project 1 is not anticipated to have the potential to alter regional growth patterns, impact residential settlement patterns, or affect the growth in employment centers. Therefore, an analysis of growth inducement is not warranted. The DEIS will document this determination.

ALTERNATIVES

See also “Transportation,” above, for related comments

Comment 77: Is consideration being given to continuing the bypass tunnel in both directions in the future to enable a dual-tunnel system to serve the DEP water supply system? (Bartosik)

Response: DEP is not considering extending the bypass tunnel beyond the proposed connection sites.

Comment 78: What can we do besides just trucking the materials that’s got to be hauled out of the area to not impact some of the residences that are there? We have the rail bed there. (V. Bettina)

You’ve got to put this stuff in a barge, but where is it going to go? Where will the trucks go? How far are they going and dumping this stuff whether it’s on a barge or truck? (Fanuele)

The DEIS should address the evaluation of alternatives, for example, trucking vs. rail vs. barges on both the construction process and on the quality of life of the residents. (Stolman)

I would like to look at the excavated material being hauled down the river in a barge just like Trap Rock does. To impact the entire community, to potentially be hauling this waste from underneath the river, up a shaft, down Chelsea Road or River Road is bizarre. It will definitely take away from the impact that people are going through. Alternatives for the removal of debris from the site should be explored to minimize the truck

traffic on our roadways. Methods such as delivery and removal of materials by rail or barge should be examined. (Anderson)

Response:

As discussed in the Final Scope, Chapter 7, “Alternatives,” of the DEIS will include an assessment of various options for the disposal of excavated materials. At this time, it is expected that the DEIS will assume that such materials are removed from the TBM launch site (i.e., the west connection site) solely by truck. Therefore, the alternatives addressing the disposal of excavated materials are anticipated to include a barging alternative, in which excavated materials from shaft construction are removed from the east connection site by barge, and a rail alternative, in which excavated materials from shaft construction are removed from the east connection site via the Metro-North Railroad line adjacent to the east connection site property.

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