

**The City of New York  
Department of Environmental Protection**

**Emily Lloyd  
Commissioner**

**Bureau of Engineering, Design & Construction**



**ENVIRONMENTAL ASSESSMENT  
FOR THE DEL-185  
TUNNEL AND SHAFT REHABILITATION PROJECT**

**August 2006**

**Prepared by:**



# Table of Contents

<b>1.0</b>	<b>INTRODUCTION .....</b>	<b>1-1</b>
1.1	PURPOSE AND NEED .....	1-1
1.2	PROJECT DESCRIPTION .....	1-1
<b>2.0</b>	<b>FULL ENVIRONMENTAL ASSESSMENT FORM (EAF) .....</b>	<b>2-1</b>
2.1	STATE ENVIRONMENTAL QUALITY REVIEW ACT AND CITY ENVIRONMENTAL QUALITY REVIEW .....	2-1
<b>3.0</b>	<b>ENVIRONMENTAL ANALYSIS OF RONDOUT-WEST BRANCH TUNNEL AND SHAFT REHABILITATION LOCATIONS .....</b>	<b>3-1</b>
3.1	INTRODUCTION .....	3-1
3.2	LAND USE, ZONING, PUBLIC POLICY, NEIGHBORHOOD CHARACTER, AND OPEN SPACE .....	3-2
3.2.1	<i>REC and Shaft No. 1</i> .....	3-2
3.2.2	<i>Shaft No. 2A</i> .....	3-2
3.2.3	<i>Shaft No. 8</i> .....	3-3
3.2.4	<i>Shaft No. 4</i> .....	3-4
3.2.5	<i>Shaft No. 5A</i> .....	3-4
3.2.6	<i>Shaft No. 6</i> .....	3-5
3.3	SOCIOECONOMIC CONDITIONS .....	3-6
3.4	COMMUNITY FACILITIES .....	3-7
3.4.1	<i>REC and Shaft Nos. 1 &amp; 2A</i> .....	3-7
3.4.2	<i>Shaft No. 4</i> .....	3-8
3.4.3	<i>Shaft No. 5A</i> .....	3-8
3.4.4	<i>Shaft No. 6</i> .....	3-8
3.4.5	<i>Shaft No. 8</i> .....	3-9
3.5	CULTURAL AND HISTORIC RESOURCES .....	3-9
3.6	COASTAL ZONE MANAGEMENT .....	3-10
3.7	NATURAL RESOURCES .....	3-23
3.7.1	<i>Shaft No. 1</i> .....	3-24
3.7.2	<i>Shaft No. 2A</i> .....	3-31
3.7.3	<i>Shaft No. 4</i> .....	3-38
3.7.4	<i>Shaft No. 5A</i> .....	3-41
3.7.5	<i>Shaft No. 6</i> .....	3-44
3.7.6	<i>Shaft No. 8</i> .....	3-56
3.8	HAZARDOUS MATERIALS .....	3-69
3.8.1	<i>REC and Shaft No. 1</i> .....	3-71
3.8.2	<i>Shaft No. 2A</i> .....	3-72
3.8.3	<i>Shaft No. 4</i> .....	3-72
3.8.4	<i>Shaft No. 5A</i> .....	3-73
3.8.5	<i>Shaft No. 6</i> .....	3-74
3.8.6	<i>Shaft No. 8</i> .....	3-80
3.9	ENERGY .....	3-81
3.9.1	<i>Shaft Nos. 1 &amp; 2A</i> .....	3-81
3.9.2	<i>REC and Shaft Nos. 4 &amp; 5A</i> .....	3-81
3.9.3	<i>Shaft No. 6</i> .....	3-82
3.9.4	<i>Shaft No. 8</i> .....	3-82
3.10	TRAFFIC AND PARKING .....	3-83
3.10.1	<i>REC and Shaft No. 1</i> .....	3-83
3.10.2	<i>Shaft No. 2A</i> .....	3-83
3.10.3	<i>Shaft No. 4</i> .....	3-83
3.10.4	<i>Shaft No. 5A</i> .....	3-83
3.10.5	<i>Shaft No. 8</i> .....	3-84
3.10.6	<i>Shaft No. 6</i> .....	3-85
3.11	NOISE .....	3-89
3.11.1	<i>Introduction</i> .....	3-89



3.11.2	<i>Characteristics of Noise</i> .....	3-89
3.11.3	<i>Applicable Noise Standards</i> .....	3-91
3.11.4	<i>Noise Methodology</i> .....	3-92
3.11.5	<i>Existing Conditions</i> .....	3-94
3.11.6	<i>Potential Noise Impacts</i> .....	3-95
3.11.7	<i>Impact Reduction Measures</i> .....	3-98
3.12	AIR QUALITY.....	3-98
3.12.1	<i>Existing Conditions</i> .....	3-98
3.12.2	<i>Mobile Source Analysis Impact Evaluation</i> .....	3-102
3.12.3	<i>Stationary Source Analysis Impact Evaluation</i> .....	3-105
3.13	VISUAL RESOURCES.....	3-108
3.13.1	<i>REC &amp; Shaft Nos. 1, 2A &amp; 8</i> .....	3-108
3.13.2	<i>Shaft Nos. 4 &amp; 5A</i> .....	3-109
3.13.3	<i>Shaft No. 6</i> .....	3-109
3.14	PUBLIC HEALTH.....	3-112

## LIST OF TABLES

<u>TABLE</u>	<u>TITLE</u>	<u>FOLLOWING PAGE</u>
1-1	SUMMARY OF SITE WORK AT SHAFT SITES	1-4
3-1	SUMMARY OF SHAFT SITES PROJECT AREAS	3-23
3-2	TREE SURVEY RESULTS AT SHAFT NO. 1	3-26
3-3	AVIAN SPECIES POTENTIALLY OCCURRING IN THE VICINITY OF SHAFT NO. 1	3-27
3-4	TREE SURVEY RESULTS AT SHAFT NO. 2A	3-32
3-5	AVIAN SPECIES POTENTIALLY OCCURRING IN THE VICINITY OF SHAFT NO. 2A	3-34
3-6	AVIAN SPECIES POTENTIALLY OCCURRING IN THE VICINITY OF SHAFT NO. 4	3-38
3-7	AVIAN SPECIES POTENTIALLY OCCURRING IN THE VICINITY OF SHAFT NO. 5A	3-42
3-8	AVIAN SPECIES POTENTIALLY OCCURRING IN THE VICINITY OF SHAFT NO. 6	3-47
3-9	TREE SURVEY RESULTS AT SHAFT NO. 8	3-59
3-10	AVIAN SPECIES POTENTIALLY OCCURRING IN THE VICINITY OF SHAFT NO. 8	3-66
3-11	CONTAMINANTS OF CONCERN DETECTED IN SHAFT NO. 6 WORK AREAS	3-77
3-12	CONSTRUCTION ESTIMATES SHAFT NOS. 1, 2A, 4, 5A, AND 8	3-84
3-13	CONSTRUCTION ESTIMATES SHAFT NO. 6	3-87
3-14	NOISE LEVELS OF COMMON SOURCES	3-89
3-15	AVERAGE ABILITY TO PERCEIVE CHANGES IN NOISE LEVELS	3-90
3-16	CONSTRUCTION STAGES	3-93
3-17	BASELINE AMBIENT NOISE MONITORING RESULTS FOR SHAFT NO. 6	3-94
3-18	SHAFT CONSTRUCTION STAGE RECEPTOR LOCATION EQUIVALENT NOISE LEVELS	3-96
3-19	NATIONAL AND NEW YORK STATE AMBIENT AIR QUALITY STANDARDS	3-100
3-20	SUMMARY OF SELECTED AMBIENT AIR MONITORING DATA	3-101

## LIST OF APPENDICES

<u>APPENDIX</u>	<u>TITLE</u>
A	FIGURES
B	AGENCY RESPONSE LETTERS
C	NEW YORK STATE DEPARTMENT OF STATE COASTAL ZONE MANAGEMENT PROGRAM FEDERAL CONSISTENCY ASSESSMENT FORM



## 1.0 INTRODUCTION

### 1.1 PURPOSE AND NEED

The New York City Department of Environmental Protection (NYCDEP) is proposing to perform maintenance and rehabilitation work at six shaft locations along the Rondout-West Branch (RWB) Tunnel of the Delaware Aqueduct (Aqueduct and/or Tunnel). The DEL-185 Tunnel and Shaft Rehabilitation Project (Project or DEL-185 Project) is being proposed in order to prepare the Tunnel for maintenance and rehabilitation to extend the useable life of the Delaware Aqueduct and ensure the safe and reliable transmission of water from the watershed for years into the future. The Delaware Aqueduct is an 85-mile, concrete-lined, pressure conduit that is operated and maintained by the NYCDEP Bureau of Water Supply (BWS). The Aqueduct consists of a series of tunnels connecting the Rondout, West Branch, Kensico, and Hillview Reservoirs. The Delaware Water System provides approximately 50 percent of the water supply to New York City (NYC or City) on an annual average basis. The RWB Tunnel is a 45-mile segment of the Aqueduct constructed between 1937 and 1944. All water from the Delaware Water System flows through the RWB Tunnel (see Figure 1.1-1 in Appendix A).

Diagnostic investigations to date have confirmed that the RWB Tunnel is leaking and would ultimately need to be repaired. The cause of the leak is currently being investigated as part of an ongoing tunnel analysis conducted by the NYCDEP and Malcolm Pirnie, Inc. (MPI). Currently, there is not sufficient supplemental water supply to NYC to allow any portion of the 85-mile Delaware Aqueduct to be taken out-of-service for an extended time period to perform rehabilitation work. Alternative water supply sources are being developed as part of the NYCDEP's proposed "dependability" projects; however, these sources would not be available for a minimum of eight to ten years. Based on the above, the NYCDEP decided that it is essential and necessary to implement a Tunnel and shaft rehabilitation project, which would include site improvements to six active shafts in order to prepare for the repair of the Tunnel.

The proposed activities under the Project are required to prepare for a planned Tunnel repair and to be ready to respond to a Tunnel emergency condition. The Tunnel repair is not included in this environmental review, since no repair work to the Tunnel is planned under the Project. Any future Tunnel repair work would be included in a separate independent environmental review.

### 1.2 PROJECT DESCRIPTION

The RWB Tunnel originates at the Rondout Effluent Chamber (REC) and was constructed with eleven shafts. Following its completion, four of these construction shafts were permanently sealed with concrete. Of the remaining seven active shafts:

- three are vent shafts open to atmospheric conditions (Shaft Numbers [Nos.] 1, 2A, and 8);
- two are capped, pressurized shafts (Shaft Nos. 4 and 5A);
- one serves as a tunnel unwatering/access shaft (Shaft No. 6); and,
- one serves as the uptake shaft to West Branch Reservoir (Shaft No. 9).

The sites for which work would be performed under the Project are located in the following municipalities:

- REC and Shaft Nos. 1 and 2A – Town of Wawarsing
- Shaft No. 4 – Town of Gardiner
- Shaft No. 5A – Town of Newburgh
- Shaft No. 6 – Town of Wappinger
- Shaft No. 8 – Town of Putnam Valley

The following shafts would be utilized for their respective purposes to execute the future RWB Tunnel repair work:

- Shaft Nos. 1 and 9: Ventilation
- Shaft Nos. 2A and 8: Personnel, material, and equipment access
- Shaft No. 6: Tunnel unwatering system and personnel access

Site improvements that are required to respond to a Tunnel emergency or for the planned Tunnel repair would be performed at the REC and Shaft Nos. 1, 2A, 4, 5A, 6, and 8, and would be confined to the boundaries of NYCDEP-owned properties. Site improvement work would consist of the following:

### **REC**

- Construction duration to last approximately 6 months
- Maximum of 15 personnel anticipated to be present at the REC at any given time during a typical workday
- All work activities to be completed within the confines of the existing building
- Interior construction of new Low-Flow-Delivery (LFD) piping and valves

### **Shaft No. 1**

- Construction duration to last approximately 6 months
- Maximum of 20 personnel anticipated to be present at the shaft site at any given time during a typical workday
- Soil excavation and the removal and replacement of existing earth berm above the shaft cap
- Grading, widening, and placement of gravel along the existing shaft access road and entrance way
- Removal of existing fencing and installation of new perimeter fencing

- Routing of electrical service to the shaft site from existing power utility pole
- Resurfacing of a portion of the area around the shaft site with crushed stone
- Installation of hook-ups at the shaft site for future stand-by power
- Installation of hydraulic grade line (HGL) monitoring equipment, which would include pressure instrumentation installed within the shaft, and a data acquisition system that would be installed outside the shaft to transmit pressure reading from the Tunnel

#### **Shaft No. 2A**

- Construction duration to last approximately 6 months
- Maximum of 20 personnel anticipated to be present at the shaft site at any given time during a typical day
- Removal and replacement of existing earth berm above the shaft cap
- Construction of the foundation for head frame supports
- Grading and placement of gravel along the existing shaft access road and entrance way
- Removal of existing fencing and installation of new perimeter fencing
- Routing of electrical service to the shaft site from existing power utility pole
- Resurfacing of a portion of the area around the shaft site with crushed stone
- Installation of hook-ups at the shaft site for stand-by power
- Installation of HGL monitoring equipment, which would include pressure instrumentation installed within the shaft, and a data acquisition system that would be installed outside the shaft to transmit pressure reading from the Tunnel

#### **Shaft No. 4**

- Construction duration to last approximately 6 months
- Maximum of 5 personnel anticipated to be present at the shaft site at any given time during a typical workday
- Installation of HGL monitoring equipment, which would include pressure instrumentation installed within the shaft, and a data acquisition system that would be installed outside the shaft to transmit pressure reading from the Tunnel

#### **Shaft No. 5A**

- Construction duration to last approximately 6 months
- Maximum of 5 personnel anticipated to be present at the shaft site at any given time during a typical workday
- Installation of HGL monitoring equipment, which would include pressure instrumentation installed within the shaft, and a data acquisition system that would be installed outside the shaft to transmit pressure reading from the Tunnel

### **Shaft No. 6**

- Construction duration to last approximately 48 months
- Maximum of 70 personnel anticipated to be present at the shaft site at any given time during a typical workday

#### Exterior Site Improvements

- Provision of a new construction entrance way with new gates and security guardhouse
- Soil excavation, grading, and placement of crushed stone along a new construction access road and future stand-by generator area
- Provision of a new parking area, composed of crushed stone
- Soil excavation, grading, re-paving and drainage modifications to the existing shaft site entrance way
- Provision of a new access gate at the existing shaft site entrance way
- Provision of a temporary Resident Engineer's field office trailer
- Modification to the existing outfall by excavating 186 cubic yards of sediment and placing filter fabric and stone in the Hudson River
- Routing of new electrical service from the Hudson River Pumping Station electrical substation to the Shaft No. 6 superstructure
- Provision of a new electrical feed from Central Hudson Gas & Electrical
- Installation of HGL monitoring equipment, which would include pressure instrumentation installed within the shaft, and a data acquisition system that would be installed outside the shaft to transmit pressure reading from the Tunnel
- Installation of two electrical substations to support a new Shaft No. 6 tunnel unwatering system. One substation would be fed from the existing Hudson River Pumping Station substation. The other substation would be fed from the new utility service. This substation would be located on the site of the existing substation once the existing equipment is removed.
- Installation of hook-ups for future stand-by power
- Limited clearing of brush areas
- Installation of new perimeter fencing
- Draining of tunnel water to Hudson River

Interior improvements to the Shaft No. 6 Tunnel Unwatering System would include the installation of new unwatering pumps.

### **Shaft No. 8**

- Construction duration to last approximately 6 months
- Maximum of 20 personnel anticipated to be present at the shaft site at any given time during a typical workday
- Removal and replacement of existing earth berm above the shaft cap
- Construction of the foundation for head frame supports

- Grading and placement of gravel along the existing shaft access road and entrance way
- Removal of existing fencing and installation of new perimeter fencing
- Routing of electrical service to the shaft site from existing power utility pole
- Resurfacing of a portion of the area around the shaft with crushed stone
- Installation of hook-ups for future stand-by power
- Installation of HGL monitoring equipment, which would include pressure instrumentation installed within the shaft, and a data acquisition system that would be installed outside the shaft to transmit pressure reading from the Tunnel

**TABLE 1-1  
SUMMARY OF CONSTRUCTION INFORMATION AND FUTURE SITE  
USAGE**

Work Location / Shaft No.	Town	Construction Duration & Hours	Maximum Number of Personnel <sup>1</sup>	Usage for Execution of Future Tunnel Repair Work
REC	Wawarsing	6 months (7am-3:30pm, M-F)	15	Tunnel refilling
1	Wawarsing	6 months (7am-3:30pm, M-F)	20	Ventilation
2A	Wawarsing	6 months (7am-3:30pm, M-F)	20	Personnel, material, and equipment access
4	Gardiner	6 months (7am-3:30pm, M-F)	5	HGL Monitoring Equipment
5A	Newburgh	6 months (7am-3:30pm, M-F)	5	HGL Monitoring Equipment
6	Wappinger	48 months (see Table 3-13)	70	Tunnel unwatering system and personnel access
8	Putnam Valley	6 months (7am-3:30pm, M-F)	20	Personnel, material, and equipment access

<sup>1</sup> The values listed represent the maximum number of construction workers anticipated to be present at the shaft sites at any given time.

Note: It is assumed that work conducted at the shaft sites may be done simultaneously; however, this would ultimately be determined by the contractor and approved by NYCDEP.



## 2.0 FULL ENVIRONMENTAL ASSESSMENT FORM (EAF)

### 2.1 STATE ENVIRONMENTAL QUALITY REVIEW ACT AND CITY ENVIRONMENTAL QUALITY REVIEW

The Project is subject to an environmental review pursuant to New York State Environmental Quality Review Act (SEQRA). Any proposed action funded by an agency or directly undertaken by a state or local agency must comply with the provisions of the SEQRA regulations (6NYCRR 617). Since the Project is being undertaken by a NYC agency, the Project is also subject to NYC's City Environmental Quality Review (CEQR) process as set forth in Executive Order 91 of 1977 and its amendments.

Project activities associated with the proposed action require preparation of a full Environmental Assessment Form (EAF) and supplemental environmental documents necessary to fulfill the requirements of SEQRA and CEQR. Section 2.0 of this Environmental Assessment includes Parts 1, 2, and 3 of the EAF. The EAF comprises of three parts:

Part 1: Provides objective data and information about the Project.

Part 2: Focuses on the range of possible impacts that may occur from the Project.

Part 3: Provides an evaluation of the importance of an impact.

Section 3.0 of this assessment includes the technical environmental analysis, focused mainly on the construction activities of the proposed Project, to supplement Part 3 of the EAF. As stated in Section 3.0, with the exception of the Hudson River discharge operations at Shaft No. 6, there would be no operational impacts associated with the proposed Project. The potential for an impact as a result of the interior improvements at Shaft No. 6 would be nonexistent or minimal because the work would occur inside the existing building and below-grade in the shaft and not affect any of the categories evaluated in the EAF. The existing building is not proposed for demolition and therefore, structural building components would not impact the surrounding natural environment. Therefore, the environmental analysis focuses on impacts associated with the exterior shaft and site improvements at Shaft No. 6. As will be discussed in Section 3.8.5, a hazardous materials investigation was conducted for building surfaces at the shaft site to determine the presence of asbestos, lead paint, mercury, and Polychlorinated Biphenyls (PCB)-containing materials. The contractor responsible for the proposed rehabilitation work at this site would be charged with developing a site-specific health and safety plan (HASP), for approval by the NYCDEP, to eliminate the potential risk posed by these materials to the safety of its workers and to the surrounding natural environment.

For purposes of the proposed Project, technical evaluations for the following categories were addressed in Section 3.0 of the Environmental Assessment:

- Land Use, Zoning, Public Policy, Neighborhood Character, and Open Space

- Socioeconomic Conditions
- Community Facilities
- Cultural and Historic Resources
- Coastal Zone Management
- Natural Resources
- Hazardous Materials
- Energy
- Traffic and Parking
- Noise
- Air Quality
- Public Health

The following EAF attached in Section 2.0 was prepared for the proposed actions at the REC and Shaft Nos. 1, 2A, 4, 5A, 6, and 8 in accordance with SEQRA and CEQR requirements, and in preparation for work required as part of a future project and contract. Completion of the EAF would also satisfy the local municipal environmental quality review requirements. This analysis identifies potential environmental issues and regulatory compliance requirements associated with the Project. Environmental review and regulatory agency approvals and permits for the planned Tunnel unwatering and rehabilitation project and contract would occur at a future date.

**617.20**  
**Appendix A**  
**State Environmental Quality Review**  
**FULL ENVIRONMENTAL ASSESSMENT FORM**

**Purpose:** The full EAF is designed to help applicants and agencies determine, in an orderly manner, whether a project or action may be significant. The question of whether an action may be significant is not always easy to answer. Frequently, there are aspects of a project that are subjective or unmeasurable. It is also understood that those who determine significance may have little or no formal knowledge of the environment or may not be technically expert in environmental analysis. In addition, many who have knowledge in one particular area may not be aware of the broader concerns affecting the question of significance.

The full EAF is intended to provide a method whereby applicants and agencies can be assured that the determination process has been orderly, comprehensive in nature, yet flexible enough to allow introduction of information to fit a project or action.

**Full EAF Components:** The full EAF is comprised of three parts:

- Part 1:** Provides objective data and information about a given project and its site. By identifying basic project data, it assists a reviewer in the analysis that takes place in Parts 2 and 3.
- Part 2:** Focuses on identifying the range of possible impacts that may occur from a project or action. It provides guidance as to whether an impact is likely to be considered small to moderate or whether it is a potentially-large impact. The form also identifies whether an impact can be mitigated or reduced.
- Part 3:** If any impact in Part 2 is identified as potentially-large, then Part 3 is used to evaluate whether or not the impact is actually important.

---

**THIS AREA FOR LEAD AGENCY USE ONLY**

**DETERMINATION OF SIGNIFICANCE -- Type 1 and Unlisted Actions**

**Identify the Portions of EAF completed for this project:**



Part 1



Part 2



Part 3

Upon review of the information recorded on this EAF (Parts 1 and 2 and 3 if appropriate), and any other supporting information, and considering both the magnitude and importance of each impact, it is reasonably determined by the lead agency that:

- A. The project will not result in any large and important impact(s) and, therefore, is one which **will not** have a significant impact on the environment, therefore **a negative declaration will be prepared.**
- B. Although the project could have a significant effect on the environment, there will not be a significant effect for this Unlisted Action because the mitigation measures described in PART 3 have been required, therefore **a CONDITIONED negative declaration will be prepared.\***
- C. The project may result in one or more large and important impacts that may have a significant impact on the environment, therefore **a positive declaration will be prepared.**

\*A Conditioned Negative Declaration is only valid for Unlisted Actions

DEL-185 Tunnel and Shaft Rehabilitation Project

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Name of Action

New York City Department of Environmental Protection

---

Name of Lead Agency

Angela Licata

---

Print or Type Name of Responsible Officer in Lead Agency

Deputy Commissioner, Bureau of Environmental Planning and Assessment

---

Title of Responsible Officer

---

Signature of Responsible Officer in Lead Agency

---

Signature of Preparer (if different from responsible officer)

August 11, 2006

---

Date

## PART 1--PROJECT INFORMATION

### Prepared by Project Sponsor

NOTICE: This document is designed to assist in determining whether the action proposed may have a significant effect on the environment. Please complete the entire form, Parts A through E. Answers to these questions will be considered as part of the application for approval and may be subject to further verification and public review. Provide any additional information you believe will be needed to complete Parts 2 and 3.

It is expected that completion of the full EAF will be dependent on information currently available and will not involve new studies, research or investigation. If information requiring such additional work is unavailable, so indicate and specify each instance.

Name of Action

Location of Action (include Street Address, Municipality and County)

Name of Applicant/Sponsor

Address

City / PO

State

Zip Code

Business Telephone

Name of Owner (if different)

Address

City / PO

State

Zip Code

Business Telephone

Description of Action:

**Please Complete Each Question--Indicate N.A. if not applicable**

**A. SITE DESCRIPTION**

Physical setting of overall project, both developed and undeveloped areas.

1. Present Land Use:      Urban                  Industrial                  Commercial                  Residential (suburban)                  Rural (non-farm)  
    Forest                  Agriculture                  Other

2. Total acreage of project area:                  acres.                  For information regarding all shaft sites, see Part 3 of this EAF.

APPROXIMATE ACREAGE	PRESENTLY	AFTER COMPLETION
Meadow or Brushland (Non-agricultural)	acres	acres
Forested	acres	acres
Agricultural (Includes orchards, cropland, pasture, etc.)	acres	acres
Wetland (Freshwater or tidal as per Articles 24,25 of ECL)	acres	acres
Water Surface Area	acres	acres
Unvegetated (Rock, earth or fill)	acres	acres
Roads, buildings and other paved surfaces	acres	acres
Other (Indicate type)	acres	acres

3. What is predominant soil type(s) on project site?      See Part 3 of this EAF.

- a. Soil drainage:                  Well drained                  % of site                  Moderately well drained                  % of site.  
    Poorly drained                  % of site      See Part 3 of this EAF

- b. If any agricultural land is involved, how many acres of soil are classified within soil group 1 through 4 of the NYS Land Classification System?                  acres (see 1 NYCRR 370).

4. Are there bedrock outcroppings on project site?                  Yes                  No

- a. What is depth to bedrock                  (in feet)      See Part 3 of this EAF

5. Approximate percentage of proposed project site with slopes:                  For information regarding all shaft sites, see Part 3 of this EAF.

0-10%      %      10- 15%      %      15% or greater      %

6. Is project substantially contiguous to, or contain a building, site, or district, listed on the State or National Registers of Historic Places?                  Yes                  No

7. Is project substantially contiguous to a site listed on the Register of National Natural Landmarks?                  Yes                  No

8. What is the depth of the water table?                  (in feet)      See Part 3 of this EAF

9. Is site located over a primary, principal, or sole source aquifer?                  Yes                  No

10. Do hunting, fishing or shell fishing opportunities presently exist in the project area?                  Yes                  No

11. Does project site contain any species of plant or animal life that is identified as threatened or endangered? Yes No

According to:

Identify each species:

12. Are there any unique or unusual land forms on the project site? (i.e., cliffs, dunes, other geological formations?)

Yes No

Describe:

13. Is the project site presently used by the community or neighborhood as an open space or recreation area?

Yes No

If yes, explain:

14. Does the present site include scenic views known to be important to the community? Yes No

15. Streams within or contiguous to project area:

a. Name of Stream and name of River to which it is tributary

16. Lakes, ponds, wetland areas within or contiguous to project area:

b. Size (in acres):

17. Is the site served by existing public utilities?                      Yes                      No                      See Part 3 of this EAF.
- a. If **YES**, does sufficient capacity exist to allow connection?                      Yes                      No
- b. If **YES**, will improvements be necessary to allow connection?                      Yes                      No
18. Is the site located in an agricultural district certified pursuant to Agriculture and Markets Law, Article 25-AA, Section 303 and 304?                      Yes                      No
19. Is the site located in or substantially contiguous to a Critical Environmental Area designated pursuant to Article 8 of the ECL, and 6 NYCRR 617?                      Yes                      No

20. Has the site ever been used for the disposal of solid or hazardous wastes?                      Yes                      No

**B. Project Description**                      See Part 3 of this EAF

1. Physical dimensions and scale of project (fill in dimensions as appropriate).
- a. Total contiguous acreage owned or controlled by project sponsor:                      acres.
- b. Project acreage to be developed:                      acres initially;                      acres ultimately.
- c. Project acreage to remain undeveloped:                      acres.
- d. Length of project, in miles:                      (if appropriate)
- e. If the project is an expansion, indicate percent of expansion proposed.                      %
- f. Number of off-street parking spaces existing                      ;                      proposed                      See Part 3 of this EAF.
- g. Maximum vehicular trips generated per hour:                      (upon completion of project)?
- h. If residential: Number and type of housing units: **NA**
- |            | One Family | Two Family | Multiple Family | Condominium |
|------------|------------|------------|-----------------|-------------|
| Initially  |            |            |                 |             |
| Ultimately |            |            |                 |             |
- i. Dimensions (in feet) of largest proposed structure:                      height;                      width;                      length.
- j. Linear feet of frontage along a public thoroughfare project will occupy is?                      See Part 3 of this EAF.
2. How much natural material (i.e. rock, earth, etc.) will be removed from the site?                      Varies                      cubic yards.                      See Part 3 of this EAF
3. Will disturbed areas be reclaimed                      Yes                      No                      N/A
- a. If yes, for what intended purpose is the site being reclaimed?
- Soils excavated from the shaft sites may be reused for regrading and for creating security berm.
- b. Will topsoil be stockpiled for reclamation?                      Yes                      No
- c. Will upper subsoil be stockpiled for reclamation?                      Yes                      No
4. How many acres of vegetation (trees, shrubs, ground covers) will be removed from site?                      See Part 3 of this EAF  
acres.

5. Will any mature forest (over 100 years old) or other locally-important vegetation be removed by this project?

Yes No

6. If single phase project: Anticipated period of construction: varies months See Part 3 of this EAF

7. If multi-phased: NA

a. Total number of phases anticipated (number)

b. Anticipated date of commencement phase 1: month year

c. Approximate completion date of final phase: month year.

d. Is phase 1 functionally dependent on subsequent phases? Yes No

8. Will blasting occur during construction? Yes No

9. Number of jobs generated: during construction ; after project is complete 0 See Part 3 of this EAF

10. Number of jobs eliminated by this project .

11. Will project require relocation of any projects or facilities? Yes No

If yes, explain:

12. Is surface liquid waste disposal involved? Yes No See Part 3 of this EAF.

a. If yes, indicate type of waste (sewage, industrial, etc) and amount Delaware Aqueduct Drinking Water approx. 80-160 mgd at Shaft No. 6

b. Name of water body into which effluent will be discharged

13. Is subsurface liquid waste disposal involved? Yes No Type

14. Will surface area of an existing water body increase or decrease by proposal? Yes No

If yes, explain:

15. Is project or any portion of project located in a 100 year flood plain? Yes No See Part 3 of this EAF (Shaft No. 6 only).

16. Will the project generate solid waste? Yes No See Part 3 of this EAF.

a. If yes, what is the amount per month? tons

b. If yes, will an existing solid waste facility be used? Yes No

c. If yes, give name To be determined ; location To be determined

d. Will any wastes not go into a sewage disposal system or into a sanitary landfill? Yes No

e. If yes, explain:

17. Will the project involve the disposal of solid waste?      Yes      No
- a. If yes, what is the anticipated rate of disposal?      cu.yd. (total)
- b. If yes, what is the anticipated site life?      years.
18. Will project use herbicides or pesticides?      Yes      No
19. Will project routinely produce odors (more than one hour per day)?      Yes      No
20. Will project produce operating noise exceeding the local ambient noise levels?      Yes      No
21. Will project result in an increase in energy use?      Yes      No
- If yes, indicate type(s) See Part 3 of this EAF
- |                      |                          |
|----------------------|--------------------------|
| Shaft No. 1 :        | 700 cubic-yards soil     |
| Shaft No. 2A :       | 0 cubic-yards soil       |
| Shaft No. 4:         | 0 cubic-yards soil       |
| Shaft No. 5A:        | 0 cubic-yards soil       |
| Shaft No. 6:         | 30 cubic-yards soil      |
| Shaft No. 6 outfall: | 186 cubic-yards sediment |
| Shaft No. 8:         | 80 cubic-yards soil      |

22. If water supply is from wells, indicate pumping capacity      gallons/minute.

23. Total anticipated water usage per day      gallons/day.

24. Does project involve Local, State or Federal funding?      Yes      No

If yes, explain:

**25. Approvals Required:**

Type

Submittal Date

City, Town, Village Board                      Yes              No

City, Town, Village Planning Board              Yes              No

City, Town Zoning Board                      Yes              No

City, County Health Department              Yes              No

Other Local Agencies                      Yes              No

Other Regional Agencies                      Yes              No

State Agencies                      Yes              No

Shaft No. 6 (Protection of Waters & CZM)

Shaft No. 8 Freshwater Wetlands

Federal Agencies                      Yes              No

**C. Zoning and Planning Information**

1. Does proposed action involve a planning or zoning decision?      Yes              No

If Yes, indicate decision required:

Zoning amendment

Zoning variance

New/revision of master plan

Subdivision

Site plan      Shaft Nos. 6 & 8  
only

Special use permit

Resource management plan

Other

2. What is the zoning classification(s) of the site?

See Part 3 of this EAF.

3. What is the maximum potential development of the site if developed as permitted by the present zoning?

The maximum allowable building height for Shaft No. 6 in an R-80 zoning district is 2.5 stories or 35 feet. The maximum allowable lot coverage is 10%. The maximum allowable floor area ratio is 0.1. For the R-80 zoning district, there is no maximum for the allowable density of units per acre.

4. What is the proposed zoning of the site?

5. What is the maximum potential development of the site if developed as permitted by the proposed zoning?

6. Is the proposed action consistent with the recommended uses in adopted local land use plans? Yes  No

7. What are the predominant land use(s) and zoning classifications within a ¼ mile radius of proposed action?

--	--	--

8. Is the proposed action compatible with adjoining/surrounding land uses with a ¼ mile? Yes  No

9. If the proposed action is the subdivision of land, how many lots are proposed?

a. What is the minimum lot size proposed?

10. Will proposed action require any authorization(s) for the formation of sewer or water districts?  Yes  No

NA

11. Will the proposed action create a demand for any community provided services (recreation, education, police, fire protection)?

Yes  No

a. If yes, is existing capacity sufficient to handle projected demand?  Yes  No

NA

12. Will the proposed action result in the generation of traffic significantly above present levels?  Yes  No

a. If yes, is the existing road network adequate to handle the additional traffic.  Yes  No

NA

**D. Informational Details**

Attach any additional information as may be needed to clarify your project. If there are or may be any adverse impacts associated with your proposal, please discuss such impacts and the measures which you propose to mitigate or avoid them.

**E. Verification**

I certify that the information provided above is true to the best of my knowledge.

Applicant/Sponsor Name William Meakin, P.E. Date 8/9/06

Signature 

Title Chief, Facilities Improvement, Bureau of Engineering Design and Construction  
New York City Department of Environmental Protection

If the action is in the Coastal Area, and you are a state agency, complete the Coastal Assessment Form before proceeding with this assessment.

## PART 2 - PROJECT IMPACTS AND THEIR MAGNITUDE

### Responsibility of Lead Agency

**General Information** (Read Carefully)

- ! In completing the form the reviewer should be guided by the question: Have my responses and determinations been **reasonable**? The reviewer is not expected to be an expert environmental analyst.
- ! The **Examples** provided are to assist the reviewer by showing types of impacts and wherever possible the threshold of magnitude that would trigger a response in column 2. The examples are generally applicable throughout the State and for most situations. But, for any specific project or site other examples and/or lower thresholds may be appropriate for a Potential Large Impact response, thus requiring evaluation in Part 3.
- ! The impacts of each project, on each site, in each locality, will vary. Therefore, the examples are illustrative and have been offered as guidance. They do not constitute an exhaustive list of impacts and thresholds to answer each question.
- ! The number of examples per question does not indicate the importance of each question.
- ! In identifying impacts, consider long term, short term and cumulative effects.

**Instructions** (Read carefully)

- a. Answer each of the 20 questions in PART 2. Answer **Yes** if there will be **any** impact.
- b. **Maybe** answers should be considered as **Yes** answers.
- c. If answering **Yes** to a question then check the appropriate box(column 1 or 2)to indicate the potential size of the impact. If impact threshold equals or exceeds any example provided, check column 2. If impact will occur but threshold is lower than example, check column 1.
- d. Identifying that an Impact will be potentially large (column 2) does not mean that it is also necessarily **significant**. Any large impact must be evaluated in PART 3 to determine significance. Identifying an impact in column 2 simply asks that it be looked at further.
- e. If reviewer has doubt about size of the impact then consider the impact as potentially large and proceed to PART 3.
- f. If a potentially large impact checked in column 2 can be mitigated by change(s) in the project to a small to moderate impact, also check the **Yes** box in column 3. A **No** response indicates that such a reduction is not possible. This must be explained in Part 3.

1	2	3
Small to Moderate Impact	Potential Large Impact	Can Impact Be Mitigated by Project Change

### Impact on Land

1. Will the Proposed Action result in a physical change to the project site?

NO                      YES

**Examples** that would apply to column 2

		Yes	No
C	Any construction on slopes of 15% or greater, (15 foot rise per 100 foot of length), or where the general slopes in the project area exceed 10%.	Yes	No
C	Construction on land where the depth to the water table is less than 3 feet.	Yes	No
C	Construction of paved parking area for 1,000 or more vehicles.	Yes	No
C	Construction on land where bedrock is exposed or generally within 3 feet of existing ground surface.	Yes	No
C	Construction that will continue for more than 1 year or involve more than one phase or stage. See Part 3 of this <input type="checkbox"/> EAF	Yes	No
C	Excavation for mining purposes that would remove more than 1,000 tons of natural material (i.e., rock or soil) per year.	Yes	No

1	2	3
Small to Moderate Impact	Potential Large Impact	Can Impact Be Mitigated by Project Change

- |  |   |     |    |
|--|---|-----|----|
|  | C Construction or expansion of a sanitary landfill. | Yes | No |
|  | C Construction in a designated floodway.            | Yes | No |
|  | C Other impacts:                                    | Yes | No |

2. Will there be an effect to any unique or unusual land forms found on the site? (i.e., cliffs, dunes, geological formations, etc.)

NO                      YES

- |  |                        |     |    |
|--|------------------------|-----|----|
|  | C Specific land forms: | Yes | No |
|--|------------------------|-----|----|

**Impact on Water**

3. Will Proposed Action affect any water body designated as protected? (Under Articles 15, 24, 25 of the Environmental Conservation Law, ECL)

NO                      YES

**Examples** that would apply to column 2

- |  |  |     |    |
|--|--|-----|----|
|  | C Developable area of site contains a protected water body.                          | Yes | No |
|  | C Dredging more than 100 cubic yards of material from channel of a protected stream. | Yes | No |
|  | C Extension of utility distribution facilities through a protected water body.       | Yes | No |
|  | C Construction in a designated freshwater or tidal wetland.                          | Yes | No |
|  | C Other impacts:<br>See Part 3 of this EAF.  | Yes | No |

4. Will Proposed Action affect any non-protected existing or new body of water?

NO                      YES

**Examples** that would apply to column 2

- |  |  |     |    |
|--|--|-----|----|
|  | C A 10% increase or decrease in the surface area of any body of water or more than a 10 acre increase or decrease. | Yes | No |
|  | C Construction of a body of water that exceeds 10 acres of surface area.   | Yes | No |
|  | C Other impacts:   | Yes | No |



1	2	3
Small to Moderate Impact	Potential Large Impact	Can Impact Be Mitigated by Project Change

6. Will Proposed Action alter drainage flow or patterns, or surface water runoff?

NO YES

**Examples** that would apply to column 2

C	Proposed Action would change flood water flows	Yes	No
C	Proposed Action may cause substantial erosion.	Yes	No
C	Proposed Action is incompatible with existing drainage patterns.	Yes	No
C	Proposed Action will allow development in a designated floodway.	Yes	No
C	Other impacts:	Yes	No

Minor topographic changes would occur as a result of site improvements. A Stormwater Pollution Prevention Plan, including Soil Erosion and Sediment Control, would be implemented during these site activities. The plans would be implemented in accordance with the NYCDEP watershed rules and regulations.

**IMPACT ON AIR**

7. Will Proposed Action affect air quality?

NO YES

**Examples** that would apply to column 2

C	Proposed Action will induce 1,000 or more vehicle trips in any given hour.	Yes	No
C	Proposed Action will result in the incineration of more than 1 ton of refuse per hour.	Yes	No
C	Emission rate of total contaminants will exceed 5 lbs. per hour or a heat source producing more than 10 million BTU's per hour.	Yes	No
C	Proposed Action will allow an increase in the amount of land committed to industrial use.	Yes	No
C	Proposed Action will allow an increase in the density of industrial development within existing industrial areas.	Yes	No
C	Other impacts:	Yes	No

**IMPACT ON PLANTS AND ANIMALS**

8. Will Proposed Action affect any threatened or endangered species?

NO YES

**Examples** that would apply to column 2

C	Reduction of one or more species listed on the New York or Federal list, using the site, over or near the site, or found on the site.	Yes	No
---	---	-----	----

	1 Small to Moderate Impact	2 Potential Large Impact	3 Can Impact Be Mitigated by Project Change	
--	-------------------------------------	-----------------------------------	--	--

- |   |   |  |  |     |    |
|---|---|--|--|-----|----|
| C | Removal of any portion of a critical or significant wildlife habitat.                               |  |  | Yes | No |
| C | Application of pesticide or herbicide more than twice a year, other than for agricultural purposes. |  |  | Yes | No |
| C | Other impacts:  |  |  | Yes | No |

9. Will Proposed Action substantially affect non-threatened or non-endangered species?  
 NO YES This information pertains to Shaft No. 8 only.

**Examples** that would apply to column 2

- |   |  |  |  |     |    |
|---|--|--|--|-----|----|
| C | Proposed Action would substantially interfere with any resident or migratory fish, shellfish or wildlife species.                          |  |  | Yes | No |
| C | Proposed Action requires the removal of more than 10 acres of mature forest (over 100 years of age) or other locally important vegetation. |  |  | Yes | No |
| C | Other impacts:   |  |  | Yes | No |

**IMPACT ON AGRICULTURAL LAND RESOURCES**

10. Will Proposed Action affect agricultural land resources?  
 NO YES

**Examples** that would apply to column 2

- |   |  |  |  |     |    |
|---|--|--|--|-----|----|
| C | The Proposed Action would sever, cross or limit access to agricultural land (includes cropland, hayfields, pasture, vineyard, orchard, etc.)                                 |  |  | Yes | No |
| C | Construction activity would excavate or compact the soil profile of agricultural land.   |  |  | Yes | No |
| C | The Proposed Action would irreversibly convert more than 10 acres of agricultural land or, if located in an Agricultural District, more than 2.5 acres of agricultural land. |  |  | Yes | No |

	1 Small to Moderate Impact	2 Potential Large Impact	3 Can Impact Be Mitigated by Project Change	
			Yes	No
C The Proposed Action would disrupt or prevent installation of agricultural land management systems (e.g., subsurface drain lines, outlet ditches, strip cropping); or create a need for such measures (e.g. cause a farm field to drain poorly due to increased runoff).			Yes	No
C Other impacts:			Yes	No

### IMPACT ON AESTHETIC RESOURCES

11. Will Proposed Action affect aesthetic resources? (If necessary, use the Visual EAF Addendum in Section 617.20, Appendix B.)  
 NO YES

**Examples** that would apply to column 2

C Proposed land uses, or project components obviously different from or in sharp contrast to current surrounding land use patterns, whether man-made or natural.			Yes	No
C Proposed land uses, or project components visible to users of aesthetic resources which will eliminate or significantly reduce their enjoyment of the aesthetic qualities of that resource.			Yes	No
C Project components that will result in the elimination or significant screening of scenic views known to be important to the area.			Yes	No
C Other impacts:			Yes	No

### IMPACT ON HISTORIC AND ARCHAEOLOGICAL RESOURCES

12. Will Proposed Action impact any site or structure of historic, prehistoric or paleontological importance?  
 NO YES

**Examples** that would apply to column 2

C Proposed Action occurring wholly or partially within or substantially contiguous to any facility or site listed on the State or National Register of historic places.			Yes	No
C Any impact to an archaeological site or fossil bed located within the project site.			Yes	No
C Proposed Action will occur in an area designated as sensitive for archaeological sites on the NYS Site Inventory.			Yes	No

	1 Small to Moderate Impact	2 Potential Large Impact	3 Can Impact Be Mitigated by Project Change	
			Yes	No

c Other impacts:

**IMPACT ON OPEN SPACE AND RECREATION**

13. Will proposed Action affect the quantity or quality of existing or future open spaces or recreational opportunities?

NO YES

**Examples** that would apply to column 2

c The permanent foreclosure of a future recreational opportunity. Yes No

c A major reduction of an open space important to the community. Yes No

c Other impacts: Yes No

**IMPACT ON CRITICAL ENVIRONMENTAL AREAS**

14. Will Proposed Action impact the exceptional or unique characteristics of a critical environmental area (CEA) established pursuant to subdivision 6NYCRR 617.14(g)?

NO YES

List the environmental characteristics that caused the designation of the CEA.

**Examples** that would apply to column 2

c Proposed Action to locate within the CEA? Yes No

c Proposed Action will result in a reduction in the quantity of the resource? Yes No

c Proposed Action will result in a reduction in the quality of the resource? Yes No

c Proposed Action will impact the use, function or enjoyment of the resource? Yes No

c Other impacts: Yes No

1	2	3
Small to Moderate Impact	Potential Large Impact	Can Impact Be Mitigated by Project Change

**IMPACT ON TRANSPORTATION**

15. Will there be an effect to existing transportation systems?  
 NO YES

**Examples** that would apply to column 2

- |   |  |     |    |
|---|--|-----|----|
| C | Alteration of present patterns of movement of people and/or goods. | Yes | No |
| C | Proposed Action will result in major traffic problems.             | Yes | No |
| C | Other impacts:   | Yes | No |

**IMPACT ON ENERGY**

16. Will Proposed Action affect the community's sources of fuel or energy supply?  
 NO YES

**Examples** that would apply to column 2

- |   |   |     |    |
|---|---|-----|----|
| C | Proposed Action will cause a greater than 5% increase in the use of any form of energy in the municipality.   | Yes | No |
| C | Proposed Action will require the creation or extension of an energy transmission or supply system to serve more than 50 single or two family residences or to serve a major commercial or industrial use. | Yes | No |
| C | Other impacts:  | Yes | No |

**NOISE AND ODOR IMPACT**

17. Will there be objectionable odors, noise, or vibration as a result of the Proposed Action?  
 NO YES This information pertains to Shaft No. 6  only.

**Examples** that would apply to column 2

- |   |  |     |    |
|---|--|-----|----|
| C | Blasting within 1,500 feet of a hospital, school or other sensitive facility.  | Yes | No |
| C | Odors will occur routinely (more than one hour per day).   | Yes | No |
| C | Proposed Action will produce operating noise exceeding the local ambient noise levels for noise outside of structures. | Yes | No |
| C | Proposed Action will remove natural barriers that would act as a noise screen.   | Yes | No |
| C | Other impacts:   | Yes | No |

1	2	3
Small to Moderate Impact	Potential Large Impact	Can Impact Be Mitigated by Project Change

**IMPACT ON PUBLIC HEALTH**

18. Will Proposed Action affect public health and safety?  
           NO                  YES

- |   |     |    |
|---|-----|----|
| <p>C Proposed Action may cause a risk of explosion or release of hazardous substances (i.e. oil, pesticides, chemicals, radiation, etc.) in the event of accident or upset conditions, or there may be a chronic low level discharge or emission.</p> | Yes | No |
| <p>C Proposed Action may result in the burial of "hazardous wastes" in any form (i.e. toxic, poisonous, highly reactive, radioactive, irritating, infectious, etc.)</p>   | Yes | No |
| <p>C Storage facilities for one million or more gallons of liquefied natural gas or other flammable liquids.</p>  | Yes | No |
| <p>C Proposed Action may result in the excavation or other disturbance within 2,000 feet of a site used for the disposal of solid or hazardous waste.</p>   | Yes | No |
| <p>C Other impacts:</p>   | Yes | No |

**IMPACT ON GROWTH AND CHARACTER  
OF COMMUNITY OR NEIGHBORHOOD**

19. Will Proposed Action affect the character of the existing community?  
           NO                  YES

**Examples** that would apply to column 2

- |  |     |    |
|--|-----|----|
| <p>C The permanent population of the city, town or village in which the project is located is likely to grow by more than 5%.</p>                | Yes | No |
| <p>C The municipal budget for capital expenditures or operating services will increase by more than 5% per year as a result of this project.</p> | Yes | No |
| <p>C Proposed Action will conflict with officially adopted plans or goals.</p>   | Yes | No |
| <p>C Proposed Action will cause a change in the density of land use.</p>   | Yes | No |
| <p>C Proposed Action will replace or eliminate existing facilities, structures or areas of historic importance to the community.</p>             | Yes | No |
| <p>C Development will create a demand for additional community services (e.g. schools, police and fire, etc.)</p>                                | Yes | No |

	1	2	3	
	Small to Moderate Impact	Potential Large Impact	Can Impact Be Mitigated by Project Change	

- |   |  |  |     |    |
|---|--|--|-----|----|
| C | Proposed Action will set an important precedent for future projects. |  | Yes | No |
| C | Proposed Action will create or eliminate employment.                 |  | Yes | No |
| C | Other impacts:   |  | Yes | No |

20. Is there, or is there likely to be, public controversy related to potential adverse environment impacts?  
 NO                      YES

**If Any Action in Part 2 Is Identified as a Potential Large Impact or If you Cannot Determine the Magnitude of Impact, Proceed to Part 3**

## Part 3 - EVALUATION OF THE IMPORTANCE OF IMPACTS

### Responsibility of Lead Agency

Part 3 must be prepared if one or more impact(s) is considered to be potentially large, even if the impact(s) may be mitigated.

**Instructions** (If you need more space, attach additional sheets)

Discuss the following for each impact identified in Column 2 of Part 2:

1. Briefly describe the impact.
2. Describe (if applicable) how the impact could be mitigated or reduced to a small to moderate impact by project change(s).
3. Based on the information available, decide if it is reasonable to conclude that this impact is **important**.

To answer the question of importance, consider:

- ! The probability of the impact occurring
- ! The duration of the impact
- ! Its irreversibility, including permanently lost resources of value
- ! Whether the impact can or will be controlled
- ! The regional consequence of the impact
- ! Its potential divergence from local needs and goals
- ! Whether known objections to the project relate to this impact.

### **3.0 ENVIRONMENTAL ANALYSIS OF RONDOUT-WEST BRANCH TUNNEL AND SHAFT REHABILITATION LOCATIONS**

#### **3.1 INTRODUCTION**

This section describes the existing conditions, the potential for impacts, and the measures to reduce impacts as a result of the proposed Project. In order to ensure adequate performance and maintenance of future in-Tunnel rehabilitation and inspection work, shaft site improvements are required at specific shaft site locations for construction access, ventilation, and inspection. The environmental analysis in this section focuses on the interior process mechanical improvements at the REC and shaft site improvements at Shaft Nos. 1, 2A, 4, 5A, 6, and 8. No exterior site work would be performed at the REC, and all work activities would take place entirely within the confines of the existing building. Therefore, while the REC is addressed in this EAF, the focus of environmental assessment or analyses is on the other shaft locations.

The study area defined for this environmental assessment or analysis includes the shaft site and a 1,500-foot radius around each shaft site. For Shaft No. 6, this study area includes the location of the outfall in the Hudson River. The shaft site is defined as the property owned and maintained by NYCDEP; where the shaft, shaft cap, and access road are located.

Field work was conducted to identify conditions that presently exist at each shaft site and within each shaft site study area. Existing conditions are discussed with regard to each impact category as referenced in Section 2.0. A review of the proposed action at each shaft site for its potential to cause a significant adverse impact in each impact category is detailed throughout this assessment. Potential environmental impacts associated with the proposed action are discussed below. The use of the term “impact” in this context is recognition of the effects of the proposed action that need to be considered. These impacts are not necessarily harmful or even significant. However, a detailed impact analysis of each technical category was not deemed necessary at each shaft site due to the temporary nature and nominal permanent modifications proposed as part of this proposed action. The logic supporting this conclusion is presented under each impact category. Where ground disturbance is necessary to access the shaft, a discussion of the disturbance and the potential for lasting effects is provided. Measures instituted to reduce the level of impact at the shaft sites from such disturbance are also discussed. It is anticipated that the scope of these shaft rehabilitation work and the nature of site improvements at the shaft site locations would be nominal and transitory, occurring only during the construction period. The technical and environmental analyses for each of the shaft locations were organized in a manner such that those with similar impacts were grouped together.

## 3.2 LAND USE, ZONING, PUBLIC POLICY, NEIGHBORHOOD CHARACTER, AND OPEN SPACE

### 3.2.1 REC and Shaft No. 1

The REC is located on the southeast portion of the Rondout Reservoir in the Town of Wawarsing, Ulster County, New York on approximately 13,700-square feet of the overall 23.8-acres owned and maintained by the NYCDEP. Four vertical intake channels distribute water to the interior of the chamber structure where it is either diverted into the Delaware Aqueduct or released to the Rondout Creek. The REC may generally be accessed from New York State (NYS) Route 55, using a paved access road, and is bordered by the reservoir to the northeast. A low density residential area exists over 1,000-feet to the south of the REC, adjacent to land of unknown designation. The REC is located on lands designated for Water Supply and immediately adjacent to vacant land, as shown on Figure 3.2-1 in Appendix A.

Shaft No. 1 is located in a rural area characterized by rugged landscapes within the Town of Wawarsing, Ulster County, New York, on approximately 30,800-square feet (0.7-acres) of the overall 23.8-acres owned and maintained by the NYCDEP. The shaft site is located in the northeast portion of the Town of Wawarsing and may generally be accessed via NYS Route 55. A low density residential area exists about 1,000-feet to the south, vacant land lies to the south and west, and land of unknown designation lies to the west of the shaft site. The shaft site is located on lands designated for Water Supply and immediately adjacent to vacant land, as shown on Figure 3.2-1 in Appendix A. Over one-half of the study area is owned by the City, including the land between the Rondout Reservoir and NYS Route 55 to the north of the shaft site. NYS Route 55 runs southeast to northwest along the Rondout Reservoir.

The REC and Shaft No. 1 and study area are zoned Residential-Conservation (R/C-40), as shown on Figure 3.2-2 in Appendix A, where permitted principal uses include single- and two-family dwellings, timber harvesting, saw mill, farm use and greenhouses, church, synagogues and cemeteries, public, private and parochial schools, governmental use, residential uses, public and private park and common facilities and/or public and private water supply and sewage disposal systems.

### 3.2.2 Shaft No. 2A

Shaft No. 2A is located in a rural area characterized by rugged landscapes within the Town of Wawarsing, Ulster County, New York on approximately 30,300- square feet (0.7-acres) of the overall 0.91-acres owned and maintained by the NYCDEP. The shaft is located in the eastern portion of the Town of Wawarsing, on an access road comprised of crushed stone, and may generally be accessed via Routes 55, 209, 44 and 299. The shaft site is located on land designated as Water Supply, and is immediately bordered by vacant land and open space with an abandoned mine pit to the north, west, and south of

the shaft site. The site is surrounded by low density residential, open space, and vacant land, as shown on Figure 3.2-3 in Appendix A.

The shaft site and study area is zoned Residential-Conservation (R/C-40), as shown on Figure 3.2-4 in Appendix A, where permitted principal uses include single- and two-family dwellings, timber harvesting, saw mill, farm use and greenhouses, church, synagogues and cemeteries, public, private and parochial schools, governmental use, residential uses, public and private park and common facilities and/or public and private water supply and sewage disposal systems.

### 3.2.3 Shaft No. 8

Shaft No. 8 is located in a rural area within the Town of Putnam Valley, Putnam County, New York on approximately 33,800-square feet (0.8-acres) of the overall 0.92-acres of NYCDEP-owned property. The shaft site is located in the northeast portion of the Town of Putnam Valley, on an unmarked dirt and gravel access road, and may generally be accessed via County Road 301. There are a number of large boulders that have been placed at the entrance to the shaft site and an existing chain link fence that surrounds the shaft cap within the NYCDEP property. However, the entrance to the access road remains open at the intersection with County Road 301 in order to allow access to the adjacent land owner's property. The shaft site is located on land designated as Water Supply and is immediately bordered by vacant land to the north, south, east, and west. A low density residential area exists about 1,000-feet to the east and northwest. Vacant lands, low and high density residential areas, and institutional / government uses are located within the study area, as shown on Figure 3.2-5 in Appendix A.

The Shaft No. 8 site is zoned as a Planned Commercial Park (PC) District as shown on Figure 3.2-6 in Appendix A. In addition, the parcel is located in the Ground and Surface Water Protection (WP) Overlay District, the Wetlands and Watercourse (W) Overlay District, and the Hillside Management Overlay District. The PC District generally allows for employment locations characterized by office and compatible research, laboratory (dry lab) and prototype development functions. Uses allowed in the PC zoning district include libraries or museums, municipal buildings, regional utility facilities, administrative or business offices, catering establishments, conference centers, hotels, motels or motor inns, medical offices, centers or complexes, restaurants, agricultural/farm sales and services and convenience storage facilities. Other uses are allowed by Special Permit and include clubhouses or lodges, business or trade schools, local utility services, photography studios, printing establishments, athletic clubs, health clubs and health spas, communication towers, construction material sales, bio-technical research, forestry management / timber harvesting, sawmilling operations, automotive gas stations, automotive sales or rentals and research laboratories.

Shaft No. 8 site improvements would take place on NYCDEP property and would not require modification to land use, zoning or public policy, as the work would continue the present water supply use of the sites. Similarly, no changes in neighborhood character and no effect on community open space are anticipated. The work is completely within

the water supply lands and would not displace or alter an open space resource, nor would it increase local demand on open space. Therefore, no potential significant adverse impacts to land use, zoning, public policy, neighborhood character, or open space would occur as a result of the site and shaft rehabilitation work.

#### **3.2.4 Shaft No. 4**

Shaft No. 4 located in a rural area in the Town of Gardiner, Ulster County, New York and is housed within an above-grade structure, located on approximately 31.68-acres owned and maintained by the NYCDEP. The shaft site is located in the eastern portion of the Town of Gardiner, on an unmarked pavement and concrete access road, and may generally be accessed via Route 208. The shaft site is designated for Water Supply use and is immediately bounded to the west by vacant land and to the south by land designated for agriculture. A public easement exists adjacent to the shaft site to the south. The study area includes land designated as Water Supply, vacant, low density residential, high density residential, and agricultural, as shown on Figure 3.2-7 in Appendix A. Route 208 runs in a north-south direction to the west of the study area. Two additional public easements are located to the north of the shaft site, within the study area.

The shaft site and study area are zoned as predominantly Agricultural-Residential (AR-80), as shown on Figure 3.2-8 in Appendix A, where permitted principal uses include farming, public parks and playgrounds, government buildings, and single- and two-family dwellings.

#### **3.2.5 Shaft No. 5A**

Shaft No. 5A is located in a region that is generally rural in character within the Town of Newburgh, Orange County, New York on approximately 1.81-acres owned and maintained by the NYCDEP. The shaft site is designated for Water Supply use and is immediately bounded by agricultural use to the southwest and vacant lands to the north and east. A public right-of-way easement exists adjacent to the shaft site to the west, as shown on Figure 3.2-9 in Appendix A. There is an existing locked chain link fence that surrounds the shaft within the NYCDEP property. The study area includes land areas designated as Water Supply, vacant land, industrial uses, low density residential uses, and unknown.

Shaft No. 5A and study area are zoned Agricultural Residential (AG), as shown on Figure 3.2-10 in Appendix A, where permitted principal uses include single-, two-family, and semidetached dwellings, membership clubs providing outdoor recreational facilities, agricultural operations (growing of field, greenhouse, and garden crops, orchards and nurseries), places of worship, nursery schools for preschool children, schools for general education, hospitals and nursing facilities for general healthcare, veterinarians offices, and community residences for the disabled.

Shaft Nos. 4 and 5A would be used solely for HGL monitoring during tunnel rehabilitation. No significant change to the shaft site would occur as a result of site improvements proposed at this site. Shaft site rehabilitation work would take place on NYCDEP property and would not require modification to land use, zoning or public policy, as the work would continue the present water supply use of the sites. Similarly, no changes in neighborhood character and no effect on community open space are anticipated. The work is completely within the water supply lands and would not displace or alter an open space resource, nor would it increase local demand on open space. Therefore, no potential significant adverse impacts to land use, zoning, public policy, neighborhood character, or open space would occur as a result of the site and shaft rehabilitation work.

### 3.2.6 Shaft No. 6

Shaft No. 6 is located in a suburban or semi-rural area near the Hudson River in the Hamlet of Chelsea, in the Town of Wappinger, Dutchess County, New York. The shaft site is located on Water Supply Land predominately surrounded by low and high density residences and industrial uses. Shaft No. 6 is located on approximately 19.9-acres of NYCDEP-owned property that also includes the Hudson River Pumping Station (HRPS), two electrical substations, the Shaft No. 6 building, and a storage building. The NYCDEP property is bordered by the New York State Power Authority to the north and northeast, residences to the east and south, and a Conrail Metro North rail line to the west, as shown on Figure 3.2-11 in Appendix A. Single-family residences are between 25 and 50-feet from the shaft site.

The study area includes a large tract of land to the north of the shaft site designated as Institutional / Government and is owned by the Town of Wappinger. A Conrail-Metro North rail line runs north-south along the Hudson River, immediately west of the shaft site. A Central Hudson Gas and Electric Company substation is situated on a seven-acre lot immediately adjacent to the shaft site. A lumber yard is located on the eastern shoreline of the Hudson River southwest of the shaft site.

The shaft site is zoned Single Family Residential (R-80), as shown on Figure 3.2-12 in Appendix A. According to the Town of Wappinger's zoning ordinance, areas designated R-80 are sensitive areas due to their scenic values, slopes or wetlands. Floodplain complexes are to be developed only at low densities and without sewers. Uses allowed in the R-80 district include single-family detached dwellings, buildings, structures, and uses owned or operated by a governmental entity or districts, and public schools. Other uses are allowed by Special permit of the Planning Board and include places of worship, farm and/or nursery uses, nursing and/or convalescent homes, riding academics and stables on lots of 10-acres or more, mobile home parks, sewage treatment plants or water supply facilities (subject to Town Board approval), landfilling (subject to Town Board approval), public utilities (including transmission and distribution lines), recreation use development, professional offices in residences, camps, and family day care homes.

The maximum allowable building height within the R-80 Zoning District is 2.5 stories, or 35-feet. The maximum allowable lot coverage is 10 percent, and the maximum allowable floor area ratio is 0.1. According to the Schedule of Dimensional Regulations for Residential Districts in the Town of Wappinger, there is no maximum for the allowable density of units per acre within this zoning district.

The Shaft No. 6 exterior site improvements described above would be performed on NYCDEP-owned property classified as Water Supply Land. Shaft No. 6 site rehabilitation work would take place on NYCDEP property and would not require modification to land use, zoning or public policy, as the work would continue the present water supply use of the sites. Similarly, no changes in neighborhood character are anticipated. Site plan approval for the construction of the new substation would be requested from the Town of Wappinger. Interior site work would be performed entirely within the Shaft No. 6 superstructure. The site and shaft rehabilitation work would have no effect on community open space. The work is completely within the water supply lands and would not displace or alter an open space resource, nor would it increase local demand on open space. Since the dimensions of the new electrical substation (40-feet by 70-feet by 7.5-feet) do not exceed the bulk regulations of the Town of Wappinger, a Special Permit or variance from the Planning Board would not be required. Single family residences located on lots to the north, south, and east of the shaft site would not be displaced as a result of the site and shaft rehabilitation work. Upgrades to the shaft site would be consistent with the current use of the property and the existing Shaft No. 6 facility which has been in operation for over 40 years. Therefore, no potential significant adverse impacts to land use, zoning, public policy, neighborhood character, or open space would occur as a result of the Project.

### 3.3 SOCIOECONOMIC CONDITIONS

According to the *CEQR Technical Manual*, it is necessary to conduct a socioeconomic assessment if an action may be reasonably expected to create substantial socioeconomic changes within the area affected by the proposed action that would not be expected to occur without the proposed action. An assessment would typically be required if there would be any direct displacement of residential populations to the extent that the socioeconomic profile of the neighborhood would be significantly altered; the direct displacement of substantial numbers of businesses or employees, or of a business or institution that is unusually important within the community; or if the action would result in substantial new development that is distinctly different from existing uses, development, and activities within the neighborhood and therefore could lead to indirect displacement.

No permanent increase in population or displacement of residents or businesses within the study area are anticipated to result from the proposed action since the proposed Project would be undertaken on existing NYCDEP-owned lands. In addition, no permanent increase in employment is expected to occur resulting from the Project. Therefore, this analysis would focus on temporary construction-related impacts that may

occur to residential populations and businesses located in close proximity to the individual shaft sites.

The maximum number of construction workers anticipated to be present at the shaft sites during the active construction period of the Project is shown in Table 1-1. The values presented in the table were estimated based on the engineering design for the work proposed at the REC and each shaft site.

Assuming that some of the construction workers would be drawn from the local work force, taxes based on the hourly labor rate of the individual workers would be paid to the State. In addition to tax on their hourly rates, construction workers would likely contribute money to the local economy through visits to local business for meals, lodging, and other purposes. The potential economic impacts, however, are anticipated to be minor and short-term based on the construction duration and the number of construction workers at each shaft site.

No resulting employment opportunities are anticipated to be created for community residents upon completion of the Project. The shaft sites would not generate any revenue; therefore, no additional money in taxes would be generated for the affected towns.

Based on the above factors, the socioeconomic impacts associated with the Project are not anticipated to be significant.

### **3.4 COMMUNITY FACILITIES**

#### **3.4.1 REC and Shaft Nos. 1 & 2A**

The Town of Wawarsing relies on the Ulster County Sheriff, New York State Police, Ellenville Police Department, Kimble Hose, Pioneer Engine Co., and Scoresby Hose Hook & Ladder Co. Inc. to provide police and fire services. It is assumed that these entities have cooperative agreements established with neighboring police and fire services departments in the event that assistance is required during emergencies. The Ulster County Sheriff's Head Quarters is located in the City of Kingston. Troop F, in Zone 3, of the New York State Police is located on NYS Route 209 in Ellenville. Both Ellenville Community Hospital and First Aid and Rescue Squad provide medical services to the shaft site. Ellenville Community Hospital is considered a short-term hospital and has a total of 51 beds. In the event of a major emergency, workers would be sent to Horton Medical Center, located in Middletown, NY, approximately 35 miles from Shaft Nos. 1 and 2A. This facility has a total of 169 beds. In addition, to local police and fire departments, the NYCDEP Police also have jurisdiction over the shaft site location and would be a first responder in case of an emergency.

### 3.4.2 Shaft No. 4

The Town of Gardiner relies on New York State Police and the Ulster County Sheriff for police protection. New York State Police troops have a satellite substation located in the Hamlet of Gardiner at the Gardiner Fire Department. The Ulster County Sheriff's office is located at Golden Hill Drive in Kingston. Gardiner is served by the Gardiner and Shawangunk Valley Fire Departments, which provide volunteer fire and ambulance services. Emergency first aid, rescue and ambulance services are provided by local volunteer fire departments. In critical cases, fire department emergency medical technicians may request assistance from commercial paramedic and intensive care ambulance services. There are no medical or health facilities located within the Town of Gardiner. The St. Francis and Vassar Brothers Hospitals, located in Poughkeepsie, are the nearest medical facilities to the shaft site and have a total of 365 and 296 beds, respectively. In addition, to local police and fire departments, the NYCDEP Police also have jurisdiction over the shaft site location and would be a first responder in case of an emergency.

### 3.4.3 Shaft No. 5A

The Town of Newburgh relies on the New York State Police, the Orange County Sheriff, the Town of Newburgh Police Department, Dan Leghorn Engine Co. #1, Middle Hope Fire Department, and the City of Newburgh Fire Department to provide police and fire services. New York State Police Troop F is headquartered in Middletown, with a Zone 2 substation for Newburgh located in New Windsor. The Orange County Sheriff's Department is located in Goshen. It is assumed that these entities have cooperative agreements established with neighboring Departments in the event that assistance is required during emergencies. Emergency first aid, rescue and ambulance service is provided by local volunteer fire departments and the Town of Newburgh Volunteer Ambulance Corp. Inc. There are no medical or health facilities located within the Town of Newburgh. The closest medical facility to the shaft site is St. Luke's Cornwall Hospital, located in the City of Newburgh that has a total of 242 beds. In addition, to local police and fire departments, the NYCDEP Police also have jurisdiction over the shaft site location and would be a first responder in case of an emergency.

### 3.4.4 Shaft No. 6

The Town of Wappinger relies on the New York State Police, the Dutchess County Sheriff, and the Chelsea Fire Department to provide police and fire services to the project area. It is assumed that these entities have cooperative agreements established with neighboring Departments in the event that assistance is required during emergencies. New York State Police Troop K Headquarters is located in Poughkeepsie, with a Zone 2 substation located in Wappingers Falls. The Dutchess County Sheriff headquarters is also located in Poughkeepsie. The Town of Wappinger Emergency Service, the Village of Fishkill Fire Department St. 1, Alamo Ambulance Service (located in Poughkeepsie), and Rombout Fire Company emergency medical service unit would provide paramedic

assistance to the shaft site in the event of an emergency. There are no medical or health facilities located within the Town of Wappinger. The nearest medical facilities to the shaft site are the St. Francis and Vassar Brothers Hospitals in Poughkeepsie which have a total of 365 and 296 beds, respectively, and a Veterans Administration Hospital located in Fishkill. In addition, the NYCDEP Police would respond to an emergency at the site.

### **3.4.5 Shaft No. 8**

The Town of Putnam Valley relies on the Putnam County Sheriff, the New York State Police, and the Putnam Valley Fire Department to provide police and fire services. The Putnam Valley Fire Department is comprised entirely of volunteers. It is assumed that these entities have cooperative agreements established with neighboring Departments in the event that assistance is required during emergencies. The headquarters of the Putnam County Sheriff is located in the Town of Carmel, and the New York State Police Troop K headquarters is located in Poughkeepsie. The Town of Putnam Valley emergency medical service is provided by the town Ambulance Corps. There are no medical or health facilities located within the Town of Putnam Valley. The nearest medical facility to the shaft site is the Putnam Hospital Center located in the Town of Carmel. This acute care hospital consists of 164 beds; and of those beds, 110 are medical/surgical beds.

Actions proposed at Shaft No. 8 are not expected to have a significant impact on existing community facilities. It is possible that additional fire fighting equipment may be necessary to address emergencies at the shaft site. The police and fire departments described above would provide services to the shaft site. In addition, to local police and fire departments, the NYCDEP Police also have jurisdiction over the shaft site location and would be a first responder in case of an emergency. Therefore, it is not anticipated that the Project would have a significant impact on community facilities.

## **3.5 CULTURAL AND HISTORIC RESOURCES**

A review of historic maps of the REC and Shaft Nos. 1, 2A, 4, 5A, 6 and 8 indicate that large areas of natural material were disturbed from construction of the RWB Tunnel and Shafts. It is expected that any sensitive archeological sites would have been eradicated and disturbed during construction of the tunnel shafts. Actions proposed for this Project include placement of gravel along the entrance roads to improve roadway access and excavating and grading the area immediately around the shaft cap at each shaft site. Site improvements are not expected to disturb new areas around the shaft site; only areas that were previously disturbed during construction of the shaft. Work conducted at the REC would be entirely within the confines of the existing building and no ground disturbance or exterior site work is proposed.

A search of the National Parks Service National Register of Historic Places database was conducted to determine if historic and archaeological resources exist in proximity to the shaft sites. The National Parks Service database was also searched for sensitive landmarks listed as National Natural Landmarks. According to the National Parks

Service database search, there are no sites listed on the Register of National Natural Landmarks substantially contiguous to the shaft site study areas. Likewise, there are no sites listed on the National Register of Historic Places located within the Shaft Nos. 1, 2A, 4, 5A, and 8 study areas. However, this database identified that the historic Wheeler Hill district extends onto a small section of the northern portion of the NYCDEP-owned Shaft No. 6 property where no site rehabilitation work would occur.

The Project was reviewed by the New York State Office of Parks, Recreation, and Historic Preservation (OPRHP), in accordance with the New York State Parks, Recreation and Historic Preservation Law, Section 14.09. Pursuant to OPRHP's letter dated July, 25, 2005, in Appendix B, OPRHP has determined that the Project would have no impact upon cultural resources in or eligible for inclusion in the State and National Registers of Historic Places.

Therefore, it is not anticipated that the Project would have a significant impact on cultural and historic resources.

### **3.6 COASTAL ZONE MANAGEMENT**

Shaft Nos. 5A and 6 are within the New York State Coastal Area Boundary detailed in the New York State Department of State (NYS DOS) Coastal Atlas. Rehabilitation activities performed at Shaft No. 5A would be consistent with the policies of the Coastal Zone Management Program (CZMP) as work performed at the shaft site would only involve the installation of hydraulic grade line monitoring equipment within the existing shaft. Therefore, analysis of the CZMP policies were evaluated for the Shaft No. 6 site located along the Hudson River since work to be performed at this site is extensive and is both land- and water-based.

The NYSDOS has established coastal zone boundaries within which all discretionary actions must be reviewed for consistency with New York State's coastal management policies. The coastal zone is defined as the geographical areas of coastal water and shore lands that have a significant effect on coastal waters. The entire Shaft No. 6 Project site, including the outfall to the Hudson River, the Hudson River pump station, and the Shaft No. 6 superstructure, is located in a designated coastal zone, which requires that projects be consistent with the State's coastal policies. Construction activities within the coastal zone boundary require a coastal consistency review process and approval by the NYSDOS. The objective of the CZMP policies is "...to achieve a balance between economic development and preservation that would permit the beneficial use of coastal resources while preventing the loss of marine resource and wildlife, diminution of open space areas or public access to the waterfront, shoreline erosion, impairment of scenic beauty, or permanent adverse changes to ecological systems".

The NYSDOS administers the State's CZMP as approved by the U.S. Department of Commerce in September 1982. The program is a response to local, state, and federal concerns about the deterioration and inappropriate use of the waterfront. The program

consists of 44 statewide policies for protection and improvement of the waterfront. These policies establish a framework for managing waterfront resources in the public interest.

This section lists applicable policies and discusses the consistency or inconsistency of the proposed Shaft No. 6 outfall riprap apron, the outfall blow-off discharge associated with the outfall rehabilitation project, and other exterior and interior improvements (described in Section 1.2) with each relevant policy. During construction of the new Shaft No. 6 pumping system, there would be a number of needs to depressurize the RWB Tunnel and drain a portion of the water from the tunnel to the Hudson River at Shaft No. 6. This process is referred to as tunnel unwatering or “tunnel blow-off”. This process is anticipated to occur approximately six (6) times between 2006 and 2008 and would also need to occur during pump testing. Each time the tunnel is blown-off, approximately 23 million gallons of water would be discharged to the Hudson River. This discharge would occur over a period of approximately thirty hours. In general, the proposed Project would be consistent with the goals of the CZMP. The proposed Project would also include various supplemental land-based exterior improvements to the shaft site including improvements to the site’s roads and parking lots, installation of a security guardhouse and gate, enhancement of existing structures, installation of monitoring equipment, and improvements to the electrical infrastructure of the site which includes the installation of two electrical substations. A complete Federal Consistency Assessment Form is included in Appendix C.

**Policy 1:**      *Restore, revitalize, and redevelop deteriorated and under utilized waterfront areas for commercial, industrial, cultural, recreational and other compatible uses.*

The proposed Project would require dredging approximately 186-cubic yards of large diameter stones and/or coarse material over an area encompassing 215-square yard of Hudson River shoreline for the purpose of installing a riprap apron. The new riprap apron is required pursuant to New York State Department of Environmental Conservation (NYSDEC) outfall engineering design guidelines. The installation of the riprap apron is a preventative measure against scouring the Hudson River intertidal bottom area in the vicinity of the existing Shaft No. 6 outfall during for the use of the proposed new Shaft No. 6 tunnel unwatering system. By providing the required stabilization and protection of Hudson River intertidal bottom area (the area of the Hudson River bottom that is both exposed and inundated based upon the daily tidal cycle), the proposed Project would be compatible with this policy by not inhibiting any potential future commercial, industrial, cultural, recreational or other compatible uses of the waterfront. Similarly, the proposed land-based exterior improvements to the Shaft No. 6 site, previously described in Section 1.2, would not hinder restoration or redevelopment of surrounding under utilized waterfront areas.

This site is already developed in accordance with its designated use as Water Supply Land. There would be no development, as part of the proposed Project, which would not be compatible with this designated use.



**Policy 2:** *Facilitate the siting of water dependent uses and facilities on or adjacent to coastal waters.*

As described under Policy 1, the new riprap apron is required according to NYSDEC outfall engineering design guidelines as a preventative measure against scouring Hudson River intertidal bottom area in the vicinity of the existing Shaft No. 6 outfall. Since this apron is considered to be a structure, its purpose as an engineered means to prevent erosion is consistent with the goals of this policy.

The site upon which the water dependent uses and facilities would be located is designated as Water Supply Land and is situated adjacent to the Hudson River.

**Policy 3:** *Promote the development and use of the State's major ports of Albany, Buffalo, New York, Ogdensburg and Oswego as centers of commerce and industry, and encourage the siting, in these port areas, including those under the jurisdiction of State public authorities, of land use and development which is essential to or in support of the waterborne transportation of cargo and people.*

Not applicable. This area of the Hudson River is not a major port of New York State.

**Policy 4:** *Strengthen the economic base of smaller harbor areas by encouraging the development and enhancement of those traditional uses and activities which have provided such areas with their unique maritime identity.*

The proposed riprap apron and other land-based exterior/interior site improvements would not impact smaller harbor areas as described in this policy. Therefore, the proposed Project is consistent with the goals of this policy.

**Policy 5:** *Encourage the location of development in areas where public services and facilities essential to such development are adequate.*

The proposed riprap apron at Shaft No. 6 is part of the Project upgrade as required by NYSDEC regulations. Other land-based exterior/interior site improvements fall within the coastal zone, however, none of these improvements would trigger the need to obtain permits from NYCDEC or from the United States Army Corp of Engineers (USACE). Permits required for the riprap apron would be applied for and obtained prior to the commencement of site improvements. This proposed Project meets policy requirements as a result of being part of New York City's water supply system and therefore is consistent with its goals.

**Policy 6:** *Expedite existing permit procedures in order to facilitate the siting of*

*development activities at suitable locations.*

Applicable permits from USACE, NYSDEC and the Town of Wappinger would be applied for and obtained prior to initiation of the proposed riprap apron installation and other land-based exterior/interior site improvements. The proposed Project is consistent with this policy as provisions in the permits and/or authorizations would make every effort to coordinate and synchronize existing permit procedures and regulatory programs, as long as the integrity of the regulations objectives is not jeopardized.

**Policy 7:**      *Significant coastal fish and wildlife habitats will be protected, preserved, and, where practical, restored so as to maintain their viability as habitats.*

The closest coastal fish and wildlife habitat within the Hudson River in the vicinity of the proposed riprap apron designated as Significant Coastal Fish and Wildlife Habitats is “Wappinger Creek”, located on the eastern shore of the Hudson River approximately 9,000-feet to the north. The Wappinger Creek fish and wildlife habitat is an approximate two mile segment of freshwater tributary that extends from its mouth on the Hudson River to the first dam upstream which separates the Creek from Wappinger Lake. Appropriate measures and best management practices, such as the prohibition of dredging between April 1 and August 31, placement of dredge spoils at an upland site, and conducting the operation in a manner that results in a minimal disturbance to the sediment to minimize impacts to biota at the site, would be utilized during construction to prevent or minimize impacts to biota inhabiting the Hudson River within the outfall vicinity and surrounding tidal areas. None of this work would be close to or affect significant coastal fish and wildlife habitats.

The majority of the property at Shaft No. 6 is regularly mowed, maintained lawn with the exception of two forested areas comprised of mixed hardwoods. Since the area is regularly mowed, and therefore, is periodically disturbed, it is not an area that contains significant wildlife habitats. The surrounding forested areas would not be disturbed as a result of the proposed Project. Therefore, the proposed Project land-based exterior and interior site work would be consistent with the goals of this policy.

**Policy 8:**      *Protect fish and wildlife resources in the coastal area from the introduction of hazardous wastes and other pollutants which bio-accumulate in the food chain or which cause significant sublethal or lethal effect on those resources.*

No hazardous materials or other pollutants would be introduced into the Hudson River as a result of the proposed riprap apron. The blow-off and pump testing discharges would be high-quality, non-chlorinated drinking water originating from the Rondout Reservoir and would therefore be expected to be free of contaminants and hazardous wastes. Likewise, there would be no introduction of hazardous wastes resulting from land-based exterior and interior site work. Fish and wildlife resources in the coastal area therefore would not experience bioaccumulation in the food chain or sublethal or lethal effects

from hazardous materials or other pollutants. The proposed Project would therefore be consistent with the goals of this policy.

**Policy 9:** *Expand recreational use of fish and wildlife resources in coastal areas by increasing access to existing resources, supplementing existing stocks, and developing new resources.*

Not applicable. The proposed riprap apron and land-based exterior/interior site improvements would most likely not expand recreational use of fish and wildlife in this segment of the Hudson River.

**Policy 10:** *Further develop commercial finfish, shellfish and crustacean resources in the coastal area by encouraging the construction of new, or improvement of existing on-shore commercial fishing facilities, increasing marketing of the State's seafood products, maintaining adequate stocks, and expanding aquaculture facilities.*

Not applicable. No commercial fishing facilities are available at the site, nor are any planned as part of the proposed riprap apron or land-based exterior/interior site improvements.

**Policy 11:** *Buildings and other structures will be sited in the coastal area so as to minimize damage to property and the endangering of human lives caused by flooding and erosion.*

The proposed riprap apron is located within a 100-year floodplain. The daily flooding of this intertidal area requires a design not to be damaged in a 100-year flood and flood-proofed in accordance with New York State regulations. Consistent with this policy, the riprap apron and land-based exterior/interior site improvements would be designed in accordance with these regulations and not increase the potential for property damage or endangerment of human life due to flooding and erosion.

There would be no new buildings constructed and the only new structure constructed as part of the land-based site work at Shaft No. 6 would be a substation located outside of the 500-year floodplain.

**Policy 12:** *Activities or development in the coastal area will be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands and bluffs.*

Not applicable. No such features exist on-site.

**Policy 13:** *The construction or reconstruction of erosion protection structures shall be undertaken only if they have a reasonable probability of controlling erosion for at least thirty years as demonstrated in design and construction standards and/or assured maintenance or replacement programs.*

The new riprap apron is required according to NYSDEC outfall engineering design guidelines as a preventative measure against scouring Hudson River intertidal bottom area in the vicinity of the existing Shaft No. 6 outfall. The requirements for the size and/or type of stone would meet these design guidelines to prevent erosion for at a minimum, the duration required that would be consistent with the goals of this policy.

A Soil Erosion and Sediment Control (SESC) plan would be prepared to control stormwater runoff and prevent soil from leaving the shaft site as a result of the proposed land-based exterior and interior site improvements. Appropriately designed catch-basins would be installed to control stormwater runoff associated with improvements to the site's access roads and parking lots.

**Policy 14:** *The activities and development including the construction or reconstruction of erosion protection structures, shall be undertaken so that there will be no measurable increase in erosion nor flooding at the site of such activities or development at other locations.*

The new riprap apron is required according to NYSDEC outfall engineering design guidelines as a preventative measure against scouring Hudson River intertidal bottom area in the vicinity of the existing Shaft No. 6 outfall. Replacement of existing bottom which is comprised of large diameter stones and/or coarse material with this riprap apron would not increase flooding, and possibly decrease the likelihood of erosion. Therefore, the proposed Project is consistent with the goals of this policy.

An SESC plan would be prepared to control stormwater runoff and prevent soil from leaving the shaft site as a result of the proposed land-based exterior and interior site improvements. Appropriately designed catch-basins would be installed to control stormwater runoff associated with improvements to the site's access roads and parking lots.

**Policy 15:** *Mining, excavation, or dredging in coastal waters shall not significantly interfere with the natural coastal processes which supply beach materials to land adjacent to such waters and shall be undertaken in a manner which will not cause an increase in erosion of such lands.*

The proposed Project would require dredging approximately 186-cubic yards of large diameter stones and/or coarse material over an area encompassing 215-square yard of Hudson River intertidal bottom area for the purpose of installing a riprap apron. Due to the similar nature and characteristic of bottom material existing versus what is proposed,

this Project would not significantly interfere with any natural coastal processes involving beach materials supply nor would the action increase erosion of such lands. The SESC plan would control stormwater runoff and soil erosion during the proposed land-based exterior and interior site improvements would ensure that coastal sediment deposition processes would not be impacted by the Project. In addition, appropriately designed catch-basins would be installed to control stormwater runoff associated with improvements to the site's access roads and parking lots.

**Policy 16:** *Public funds shall be expended for activities and development, including the construction or reconstruction of erosion control structures, only where the public benefits clearly outweigh their long term monetary and other costs including their potential for increasing erosion and their adverse effects on natural protective features.*

Public funds would be used for the proposed riprap apron and other land-based exterior/interior improvements. The proposed riprap apron and land-based exterior/interior site improvements at Shaft No. 6 is part of the Project, a NYCDEP water supply project. This proposed Project meets policy requirements since the continual benefit of providing potable water to the service population, well into the future, is consistent with the goals of public benefits clearly outweighing long term monetary and other costs.

**Policy 17:** *Non-structural measures to minimize damage to natural resources and property from flooding and erosion shall be used whenever possible.*

The proposed riprap apron is designed to replace an area of intertidal habitat that is comprised of large diameter stones and/or coarse material. In order to meet the NYSDEC outfall engineering guidelines, non-structural measures as they are defined for this policy are not applicable to this proposed Project.

The SESC plan would be prepared to control stormwater runoff and prevent soil from leaving the shaft site as a result of other land-based activities associated with exterior and interior site improvements. Appropriately designed catch-basins would be installed to control stormwater runoff associated with improvements to the site's access roads and parking lots. However, damage to natural resources and property from flooding and erosion are not anticipated as a result of this proposed Project.

**Policy 18:** *To safeguard the vital interest of the State of New York and of its citizens in the waters and other valuable resources of the state's coastal area, all practicable steps shall be taken to ensure that such interests are accorded full consideration in the deliberations, decisions and actions of state and federal bodies with authority over those waters and resources.*



The proposed riprap apron, outfall operations, and land-based exterior/interior site improvements would not impair coastal waters or resources, nor prevent future protection of those waters or resources. The Project's goals with respect to this policy would be achieved by a review of SEQR policies regarding the proposed Project.

**Policy 19:** *Protect, maintain and increase the level and types of access to public water-related recreation resources.*

Not applicable. Shaft No. 6, (including the proposed riprap apron, outfall location, and shaft site) is, for safety reasons, located within an area that is not legally accessible to the public due to the presence of an active Conrail railroad line and privately owned lands adjacent to Conrail.

**Policy 20:** *Access to the publicly owned foreshore or water's edge and to the publicly owned lands immediately adjacent to these areas shall be provided, and it shall be provided in a manner compatible with the adjoining uses. To ensure that such lands remain available for public use, they will be retained in public ownership.*

Shaft No. 6, (including the proposed riprap apron, outfall location, and shaft site) is located within an area that is not legally accessible to the public for safety reasons due to the location of an active railroad line, as well as private ownership of this line and lands immediately adjacent to Conrail. However, the proposed Project would be compatible with adjoining land uses.

**Policy 21:** *Water dependent and water enhanced recreation will be encouraged and facilitated, and will be given priority over nonwater related uses along the coast.*

Not applicable. Work conducted at Shaft No. 6, (including the proposed riprap apron, outfall location, and shaft site) would not encourage, facilitate nor impact water dependent and water enhanced recreation.

**Policy 22:** *Development when located adjacent to the shore will provide for water-related recreational activities whenever such recreational use is appropriate in light of reasonably anticipated demand for such activities, and the primary purpose of the development.*

Not applicable. Work conducted at Shaft No. 6, (including the proposed riprap apron, outfall location, and shaft site) would not provide for, nor impact water-related recreational activities in the Hudson River.

**Policy 23:** *Protect, enhance and restore structures, districts, areas or sites that are of significance in the history, architecture, archeology or culture of the state, its communities, or the nation.*

A search of the National Register of Historic Places database was conducted in April 2005 to determine if historic and archaeological resources exist in proximity to the Shaft No. 6 site.

Although an historic district identified as Wheeler Hill extends onto a small section of the northern portion of the study area, known historic resources do not exist on the Shaft No. 6 site and no work associated with the land-based exterior and interior site improvements would occur within the Wheeler Hill district.

The proposed riprap apron and outfall location is situated entirely within the intertidal area of the Hudson River. This area of shoreline has been previously disturbed as a result of the construction of the rail line and the original construction of the Shaft No. 6 outfall and therefore, no impacts to structures, districts, areas or sites that are of significance in the history, architecture, archeology or culture of the state, its communities, or the nation would occur as a result of the proposed work. Therefore, the proposed Project as designed would be consistent with the goals of this policy.

**Policy 24:** *Prevent impairment of scenic resources of statewide significance.*

The proposed riprap apron would be installed in an intertidal area of the Hudson River, an American Heritage River. Due to the riprap apron being placed generally at the same grade level as the surrounding areas of the River bottom comprised of large diameter stones and/or coarse material, impairment of scenic resources of statewide significance would be prevented.

In addition, Shaft No. 6 is not located within a Scenic Area of Statewide Significance (SASS) and land-based exterior/interior site improvements would not alter the view shed from that which exists currently.

**Policy 25:** *Protect, restore and enhance the natural and man-made resources which are not identified as being of statewide significance but which contribute to the overall scenic quality of coastal area.*

There are a number of non-state-designated resources that occur which contribute to the overall scenic quality of the Hudson River shoreline, (i.e., abandoned agricultural and recreational open spaces). However, as previously stated in Policy 24, the riprap apron would be placed generally at the same grade level as the surrounding areas of the River bottom which is comprised of large diameter stones and/or coarse material.

In addition, land-based exterior/interior site improvements would not alter the view shed from that which exists currently. As a result of this design, the proposed Project would not be incompatible with this policy.

**Policy 26:** *Conserve and protect agricultural lands in the state's coastal area.*

Not applicable. No agricultural lands exist at, or adjacent to the proposed riprap apron at the Shaft No. 6 outfall nor do they exist at the shaft site location.

**Policy 27:** *Decisions on the siting and construction of major energy facilities in the coastal area will be based on public energy needs, compatibility of such facilities with the environment and the facility's need for a shorefront location.*

Not applicable. No energy facilities are proposed for this Project.

**Policy 28:** *Ice management practices shall not damage significant fish and wildlife and their habitats, increase shoreline erosion or flooding or interfere with the production of hydroelectric power.*

Not applicable. No ice management is planned as part of the proposed riprap apron, outfall operations, or land-based exterior/interior site improvements.

**Policy 29:** *Encourage the development of energy resources on the outer continental shelf (OCS) and in other water bodies and ensure the environmental safety of such activities.*

Not applicable. This Project does not involve development of energy resources.

**Policy 30:** *Municipal, industrial and commercial discharge of pollutants, including but not limited to, toxic and hazardous substances, into coastal waters will conform to state water quality standards.*

In order to comply with Hudson River water quality standards, pH adjustment would be performed before discharge from the Shaft. Since the blow-off and pump testing discharges would be high-quality, non-chlorinated drinking water, originating from the Rondout Reservoir, this water would be expected to be free of contaminants of concern.

No discharge of pollutants would take place as a result of the proposed riprap apron or land-based exterior/interior site improvements. Therefore, all discharges into coastal water would conform to state water quality standards.

**Policy 31:** *State coastal area policies and management objectives of approved local waterfront revitalization programs will be considered while reviewing coastal water classifications and while modifying water quality standards; however, those waters already over-burdened with contaminants will be recognized as being a development constraint.*

Not applicable. This Project does not involve review or modification of water classifications or standards. The Hudson River is classified as “A” in the general area of Chelsea, NY according to the NYSDEC. The proposed riprap apron, blow-off operations, and land-based exterior/interior site improvements would not lead to a reduction or alteration of this classification and, therefore, would be in accordance with this policy.

**Policy 32:** *Encourage the use of alternative or innovative sanitary waste systems in smaller communities where the costs of conventional facilities are unreasonable high, given the size of the existing tax base of these communities.*

Not applicable. This Project does not involve sanitary waste systems.

**Policy 33:** *Best management practices will be used to ensure the control of stormwater runoff and combined sewer overflows draining into coastal waters.*

The proposed riprap apron and blow-off operations in the Hudson River intertidal bottom area would not generate stormwater runoff and/or combined sewer overflows.

The SESC plan would be prepared to control stormwater runoff and prevent soil from leaving the shaft site as a result of land-based exterior/interior site improvements. Appropriately designed catch-basins would be installed to control stormwater runoff associated with improvements to the site’s access roads and parking lots.

**Policy 34:** *Discharge of waste material into coastal waters from vessels under the state's jurisdiction will be limited so as to protect significant fish and wildlife habitats, recreational areas and water supply areas.*

Not applicable. The proposed riprap apron in the Hudson River intertidal bottom area would not generate discharge of waste material into coastal waters from vessels. In addition, dredging activities and land-based exterior/interior improvements to the shaft site would not discharge wastes into the Hudson River from vessels.

**Policy 35:** *Dredging and dredge spoil disposal in coastal waters will be undertaken in*

*a manner that meets existing state dredging permit requirements and protects significant fish and wildlife habitats, aesthetic resources, natural protective features, important agricultural lands and wetlands.*

Approximately 186-cubic yards of large diameter stones and/or coarse material over an area encompassing 215-square yard of bottom for the purpose of installing a riprap apron would be dredged. The new riprap apron is required according to NYSDEC outfall engineering design guidelines as a preventative measure against scouring Hudson River intertidal bottom area in the vicinity of the existing Shaft No. 6 outfall. None of the dredged material would be disposed of in coastal waters. Dredge material would be disposed of at an upland regulated disposal facility. The land-based exterior/interior site improvements would not involve dredging or the disposal of dredge spoils into coastal waters. Therefore, the proposed Project is consistent with the goals of this policy.

**Policy 36:** *Activities related to the shipment and storage of petroleum and other hazardous materials will be conducted in a manner that will prevent or at least minimize spills into coastal waters; all practicable efforts will be undertaken to expedite the cleanup of such discharges; and restitution for damages will be required when these spills occur.*

Not applicable. No shipment or storage of petroleum or other hazardous materials would take place as a result of this Project.

**Policy 37:** *Best management practices will be utilized to minimize the non-point discharge of excess nutrients, organics and eroded soils into coastal waters.*

Since the new riprap apron would meet NYSDEC outfall engineering guidelines and is considered to be a structure, non-point source discharge of excess nutrients, organics and eroded soils would not occur.

The SESC plan would be prepared to control stormwater runoff and prevent soil from leaving the shaft site as a result of land-based activities. Appropriately designed catch-basins would be installed to control stormwater runoff associated with improvements to the site's access roads and parking lots. Therefore, the proposed Project is consistent with the goals of this policy.

**Policy 38:** *The quality and quantity of surface water and groundwater supplies will be conserved and protected particularly where such waters constitute the primary sole source of water supply.*

No impacts to surface water or groundwater are anticipated as a result of the proposed riprap apron or blow-off operations. The SESC plan would be prepared to control stormwater runoff and prevent soil from leaving the shaft site as a result of land-based exterior/interior site improvements. In addition, appropriately designed catch-basins

would be installed to control stormwater runoff associated with improvements to the site's access roads and parking lots. The proposed Project is therefore consistent with the goals of this policy.

**Policy 39:** *The transport, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within coastal areas will be conducted in such a manner so as to protect groundwater and surface water supplies, significant fish and wildlife habitats, recreation areas, important agricultural lands and scenic resources.*

Not applicable. There would be no transport, storage, treatment or disposal of solid or hazardous wastes within the coastal area.

**Policy 40:** *Effluent discharged from major steam electric generating and industrial facilities into coastal waters will not be unduly injurious to fish and wildlife and will conform to state water quality standards.*

Not applicable. No effluent discharged from major steam electric generating and industrial facilities would take place as a result of this Project.

**Policy 41:** *Land use or development in the coastal area will not cause national or state air quality standards to be violated.*

There would be no air quality impacts from dredging or installing the proposed rip rap apron or the land-based exterior/interior site improvements. The proposed Project is consistent with the goals of this policy.

**Policy 42:** *Coastal management policies will be considered if the state reclassifies land areas pursuant to the prevention of significant deterioration regulations of the federal Clean Air Act.*

Not applicable. The proposed Project does not involve land area reclassification under the federal Clean Air Act.

**Policy 43:** *Land use or development in the coastal area must not cause the generation of significant amounts of the acid rain precursors: nitrates and sulfates.*

Not applicable. The proposed riprap apron, outfall discharge, and land-based exterior site improvements would not cause the generation of significant amounts of the acid rain precursors.

**Policy 44:** *Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.*

The proposed Project would require dredging approximately 186-cubic yards of large diameter stones and/or coarse material over an area encompassing 215-square yard of bottom for the purpose of installing a riprap apron. The new riprap apron is required according to NYSDEC outfall engineering design guidelines as a preventative measure against scouring Hudson River intertidal bottom area in the vicinity of the existing Shaft No. 6 outfall. By replacing a similar coarse substrate in comparison to the original, in conjunction with providing the required stabilization and protection of Hudson River intertidal bottom area, the goal of this Project is to preserve and protect the value and function of this wetland area. As a result, the proposed Project would be consistent with the goals of this policy.

Therefore, it is anticipated that the Project would be consistent with the policies of the CZMP.

### 3.7 NATURAL RESOURCES

The impacts to resident wildlife within the study area would vary depending upon the nature of work proposed and a variety of environmental factors. Such factors include the availability of adjacent lands with suitable habitat for feeding and breeding, which include the resources identified in this section (i.e. soils, groundwater, surface waters, wetlands, floodplains, terrestrial habitat, and critical environmental areas). Whether displaced individuals or populations can or cannot be accommodated by surrounding areas is a function of carrying capacity; carrying capacity being ecologically defined as the number or biomass or organisms that a given habitat can support. Two levels of carrying capacity are typically recognized: the maximum or subsistence density (the maximum number of organisms that can survive in the habitat) and the optimum or safe density (a lower than maximum density or organisms whose population is more secure in terms of available food supply, resistance to predators, and periodic natural fluctuations in the resource base). From observations of the shaft sites and adjoining lands, signs of stressed populations or subsistence densities are not apparent. This suggests that the present carrying capacity is somewhere below its maximum level and that at least some assimilation is reasonable to assume over the construction period; the displacement of larger mammals and birds, for example, which can move in response to their level of tolerance for disturbance. Certainly however, small mammals and herpetiles with relatively small home ranges or limited emigration ability would most likely lose individuals as a result of construction. The potential loss of a few individuals or even an extremely small localized population is not expected to result in a significant impact to either area populations or the broader geographic range. Table 3-1 identifies the locations of the work to be performed and the Project areas relative to the overall NYCDEP-owned properties. Since the work at the REC would be performed solely within the confines of the existing building, and since vehicle and personnel access to the

building would be made via an existing paved access road, no impact to natural resources is anticipated.

**TABLE 3-1**  
**SUMMARY OF REC AND SHAFT SITES PROJECT AREAS**

<b>Work Location / Shaft No.</b>	<b>Town</b>	<b>County</b>	<b>USGS Quadrangle</b>	<b>NYCDEP Owned / Project Area (Acres)</b>
<b>REC</b>	Wawarsing	Ulster	Rondout Reservoir	23.8 / 0.5
<b>1</b>	Wawarsing	Ulster	Rondout Reservoir	23.8 / 0.7
<b>2A</b>	Wawarsing	Ulster	Napanoch	0.91 / 0.91
<b>4</b>	Gardiner	Ulster	Gardiner	31.63 / NA
<b>5A</b>	Newburgh	Orange	Newburgh	1.81 / NA
<b>6</b>	Wappinger	Dutchess	Wappingers Falls	19.9 / 7.5*
<b>8</b>	Putnam Valley	Putnam	Oscawana Lake	0.92 / 0.92

Note: Shaft Nos. 4 and 5A would be used solely for hydraulic grade line monitoring. Therefore, there is no site disturbance proposed at these shaft sites and acreage utilized for site work is negligible at these shaft locations.

\*Approximately 1.36-acres of site disturbance.

### **3.7.1 Shaft No. 1**

#### **3.7.1.1 Soils and Groundwater**

Shaft No. 1 is located on approximately 30,800-square feet (0.7-acres) of the overall 23.8-acres of property owned and maintained by the NYCDEP. This property is relatively flat with gentle slopes immediately adjacent to the shaft site and increasingly steep slopes in the surrounding area. Soils at the shaft site are classified as very bouldery, deep and moderately well-drained, and moderately permeable. Soils are brown, very bouldery loam at the surface layer, which is typically around 6-inches thick. The upper layer of the subsoil is a friable, brown gravelly sandy loam, which extends to a depth of about 12-inches. A seasonal high water table is typically perched above the slowly permeable lower subsoil layer in late fall, winter, and early spring (Ulster County Soil Survey, 1979). According to historic tunnel records, at the time of construction of Shaft No. 1, bedrock was encountered at approximately 9.5-feet below the surface and groundwater was encountered at approximately 240-feet below the surface (NYCDEP, 2004) however, this may not be representative of the below-grade depth to the surface of the water table. No site specific information was available regarding the below-grade

depth to the surface of the water table at Shaft No. 1. Area depths to the water table and to bedrock would vary with ground surface elevations and would be much greater in high-lying areas that contain a large amount of fill material placed on the site during tunnel construction.

Disturbance of soils during site work may result in mobilization of fine grain sediments during storm events. Stormwater runoff practices and SESC techniques would be implemented to control stormwater runoff and prevent soil from leaving the shaft site. The proposed Project would not require the use of groundwater. There would be some grading and excavation of soil around the shaft site. The depth of excavation at the site is not anticipated to exceed 4-feet and excavated soils may be reused for regrading and for creating security berm at the shaft site. Therefore, it is not anticipated that groundwater would be encountered during site work and the proposed Project would not have a significant adverse impact on soils or groundwater quantity or quality.

### 3.7.1.2 Surface Waters, Wetlands, and Floodplains

Rondout Reservoir spills over into a perennial stream, Rondout Creek, within the study area to the north of Shaft No. 1. Rondout Reservoir is classified as an AA surface water and Rondout Creek is classified as a C(TS) surface water. The best usage identified for Class AA waters are a source of water supply for drinking, culinary or food processing purposes; primary and secondary contact recreation; and fishing. The waters shall be suitable for fish propagation and survival. The best usage identified for Class C waters is fishing. The TS designation refers to trout spawning waters. These waters should also be suitable for fish propagation and survival. Class C water quality should be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes. An unnamed tributary eventually flows into Brandy Brook which represents a segment of the Rondout Creek tributary system to the south of Shaft No. 1 and beyond the limits of the NYCDEP property. Both the unnamed tributary and Brandy Brook are classified as B(T) surface waters where best usage for such waters are primary and secondary contact recreation and fishing. The T designation refers to trout waters. These waters shall be suitable for fish propagation and survival.

One federally designated wetland and four wetland areas delineated by Habitat Management & Design, Inc. in 2003 were identified within the study area of Shaft No. 1. Two of the four delineated wetlands are located to the north of Shaft No. 1, adjacent to Rondout Creek. The remaining two delineated wetlands are located to the south of Shaft No. 1 and beyond the limits of NYCDEP property. The federal wetland identified from National Wetlands Inventory (NWI) mapping is designated as Freshwater Emergent Wetland. The closest identified wetland to the NYCDEP property is a delineated wetland located approximately 65-feet to the south of this property line. Rondout Reservoir, Rondout Creek and their shoreline areas fall within the Federal Emergency Management Agency (FEMA) 100-year flood zone.

There would be no impacts to surface waters, wetlands or floodplains since rehabilitation work at Shaft No. 1 would not occur within, or in the vicinity of any of these resources.

The closest wetland to Shaft No. 1 is beyond the NYCDEP property and therefore not be impacted as a result of the proposed Project.

### 3.7.1.3 Dominant Vegetation

The Shaft No. 1 access road is comprised of gravel and compacted soil. The shaft site consists of a regularly mowed, maintained lawn. Both the access road and shaft site are surrounded by mature forest comprised of mixed hardwoods. Vegetative species found within the maintained lawn included common dandelion (*Taraxacum officinale*), common cinquefoil (*Potentilla simplex*), white clover (*Trifolium repens*), English plantain (*Plantago lanceolata*), bluets (*Houstonia caerulea*), moth mullein (*Verbascum blattaria*), Indian strawberry (*Duchesnea indica*), mayweed (*Anthemis cotula*), and unidentified grass species.

Dominant tree species in the surrounding forest area include white oak (*Quercus alba*), red oak (*Quercus rubra*), black birch (*Betula lenta*), gray birch (*Betula populifolia*), paper birch (*Betula papyrifera*), American beech (*Fagus grandifolia*), white ash (*Fraxinus americana*), shagbark hickory (*Carya ovata*), quaking aspen (*Populus tremuloides*), sugar maple (*Acer saccharum*), red maple (*Acer rubrum*), cottonwood (*Populus deltoides*), eastern red cedar (*Juniperus virginiana*) and white pine (*Pinus strobus*), with shrub species witch hazel (*Hamamelis virginiana*) and lowbush blueberry (*Vaccinium angustifolium*) also present. A tree survey completed on August 16, 2005 in the vicinity of the proposed shaft site perimeter fence and electrical service areas resulted in a total of 11 trees meeting the minimum measurement requirements of 8-inch diameter breast height (dbh). Trees with a minimum requirement of 8-inch dbh were surveyed after a telephone consultation with NYCDEP Natural Resource staff since the Town of Warwasing did not stipulate any requirements for tree protection. Trees were also analyzed based upon whether or not they were split into separate branches stemming from a common trunk in order to present an accurate representation of their condition at the time of the survey, their dominance with respect to aerial coverage and potential wildlife usage resulting from this growth pattern. A summary of these trees is provided in Table 3-2. Most of the 11 trees surveyed are in good health.

**TABLE 3-2  
SHAFT NO. 1 TREE SURVEY  
COMPLETED AUGUST 16, 2005**

Tag Number	dbh (inches)	Split*	Common Name	Species	Comments
101	35.1	No	Cottonwood	<i>Populus deltoides</i>	Fair Health
102	9.0	No	White Pine	<i>Pinus strobus</i>	Good Health
103	11.6	No	Red Maple	<i>Acer rubrum</i>	Good Health
104	14.0	No	Paper Birch	<i>Betula papyrifera</i>	Good Health
105	8.3	No	White Pine	<i>Pinus strobus</i>	Good Health
106	9.0	No	White Pine	<i>Pinus strobus</i>	Good Health
107	13.5	No	White Pine	<i>Pinus strobus</i>	Good Health
108	25.5	No	Sugar Maple	<i>Acer saccharum</i>	Trunk badly damaged, 30% gutted to approx. 4' above ground
109	17.0	No	Red Maple	<i>Acer rubrum</i>	Good Health
110	9.7	No	Sugar Maple	<i>Acer saccharum</i>	Good Health
111	17.4	No	Sugar Maple	<i>Acer saccharum</i>	Good Health

\* Trees were analyzed based upon whether or not they were split into separate branches, stemming from a common trunk to present an accurate representation of their condition at the time of the survey, their dominance with respect to aerial coverage and potential wildlife usage resulting from this growth pattern.

Disturbance of 0.7-acres of isolated areas of maintained lawn would be expected to occur during site work as a result of the following; removal of earthen berm to access the shaft, installation of a new perimeter fence, routing of electrical service to the shaft site from existing power utility pole, and resurfacing an area of the shaft with crushed stone. All earthen materials would be replaced in the same location from which they were removed. At this time, it is not anticipated that tree removal would be required as part of this work. However, overhead clearance pruning along the existing access road may be necessary for vehicle access and utilities service. The tree survey was completed in the event that individual trees would need to be removed in order to complete this proposed action. Therefore, as a result of site work at Shaft No. 1, impacts to unique plant species or sensitive habitats are not anticipated to occur.

#### 3.7.1.4 Wildlife Resources

Birds observed by volunteers as part of the NYSDEC Breeding Bird Survey from 2000 through 2004 in the vicinity of the study area are listed in Table 3-3 (NYSDEC Breeding Bird Atlas, 2005). The red shouldered hawk (*Buteo lineatus*), a NYSDEC species of special concern, was listed in the Atlas as observed in the NYSDEC defined study block that encompasses Shaft No. 1. Each study block defined by NYSDEC is approximately 6,020-acres in size. Species of special concern are considered to be at risk of becoming either endangered or threatened, but are not given any legal protection at this time. As this species was not listed by the NYSDEC Natural Heritage Program as

occurring in the vicinity of Shaft No. 1, the NYSDEC Breeding Bird Atlas entry specifically referred to a “possible breeding” encounter where the species was observed in possible nesting habitat, but no other indication of breeding was noted. According to breeding season dates for red-shouldered hawk as identified on the NYSDEC website, egg dates for red-shouldered hawk fall between March 25 and May 26. The incubation period is 23 to 25 days and unfledged juveniles occur between May 5 and July 5. The Shaft No. 1 site was visited by MPI on May 4, 2005 and August 16, 2005. Individual red-shouldered hawks or remnants of a red-shouldered hawk nests were not observed during either of these site visits.

**TABLE 3-3**  
**AVIAN SPECIES POTENTIALLY OCCURRING IN THE VICINITY OF**  
**SHAFT NO. 1**  
**As observed between 2000 and 2004**

Common Name	Scientific Name	Common Name	Scientific Name
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Eastern Bluebird	<i>Sialia sialis</i>
Great Blue Heron	<i>Ardea herodias</i>	Veery	<i>Catharus fuscescens</i>
Red-shouldered Hawk	<i>Buteo lineatus</i>	Hermit Thrush	<i>Catharus guttatus</i>
Turkey Vulture	<i>Cathartes aura</i>	Wood Thrush	<i>Hylocichla mustelina</i>
Broad-winged Hawk	<i>Buteo platypterus</i>	American Robin	<i>Turdus migratorius</i>
American Kestrel	<i>Falco sparverius</i>	Gray Catbird	<i>Dumetella carolinensis</i>
Ruffed Grouse	<i>Bonasa umbellus</i>	Northern Mockingbird	<i>Mimus polyglottos</i>
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>	European Starling	<i>Sturnus vulgaris</i>
Ruby-throated Hummingbird	<i>Archilochus colubris</i>	Cedar Waxwing	<i>Bombycilla cedrorum</i>
Yellow-bellied Sapsucker	<i>Sphyrapicus varius</i>	Yellow Warbler	<i>Dendroica petechia</i>
Downy Woodpecker	<i>Picoides pubescens</i>	Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>
Hairy Woodpecker	<i>Picoides villosus</i>	Black-throated Blue Warbler	<i>Dendroica caerulescens</i>
Northern Flicker	<i>Colaptes auratus</i>	Yellow-rumped Warbler	<i>Dendroica coronata</i>
Pileated Woodpecker	<i>Dryocopus pileatus</i>	Black-throated Green Warbler	<i>Dendroica virens</i>
Eastern Wood-Pewee	<i>Contopus virens</i>	Blackburian Warbler	<i>Dendroica fusca</i>
Least Flycatcher	<i>Empidonax minimus</i>	Black- and -white Warbler	<i>Mniotilta varia</i>



**TABLE 3-3  
AVIAN SPECIES POTENTIALLY OCCURRING IN THE VICINITY OF  
SHAFT NO. 1  
As observed between 2000 and 2004**

Common Name	Scientific Name	Common Name	Scientific Name
Eastern Phoebe	<i>Sayornis phoebe</i>	American Redstart	<i>Setophaga ruticilla</i>
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	Ovenbird	<i>Seiurus aurocapilla</i>
Eastern Kingbird	<i>Tyrannus tyrannus</i>	Louisiana Waterthrush	<i>Seiurus motacilla</i>
Warbling Vireo	<i>Vireo gilvus</i>	Common Yellowthroat	<i>Geothlypis trichas</i>
Red-eyed Vireo	<i>Vireo olivaceus</i>	Scarlet Tanager	<i>Piranga olivacea</i>
Blue Jay	<i>Cyanocitta cristata</i>	Eastern Towhee	<i>Pipilo erythrophthalmus</i>
American Crow	<i>Corvus brachyrhynchos</i>	Chipping Sparrow	<i>Spizella passerina</i>
Tree Swallow	<i>Tachycineta bicolor</i>	Field Sparrow	<i>Spizella pusilla</i>
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	Song Sparrow	<i>Melospiza melodia</i>
Barn Sallow	<i>Hirundo rustica</i>	White-throated Sparrow	<i>Zonotrichia albicollis</i>
Black-capped Chickadee	<i>Poecile atricapillus</i>	Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>
Tufted Titmouse	<i>Baeolophus bicolor</i>	Indigo Bunting	<i>Passerina cyanea</i>
Red-breasted Nuthatch	<i>Sitta canadensis</i>	Red-winged Blackbird	<i>Agelaius phoeniceus</i>
White-breasted Nuthatch	<i>Sitta carolinensis</i>	Common Grackle	<i>Quiscalus quiscula</i>
Brown Creeper	<i>Certhia americana</i>	Brown-headed Cowbird	<i>Molothrus ater</i>
House Wren	<i>Troglodytes aedon</i>	Baltimore Oriole	<i>Icterus galbula</i>
Blue-grey Gnatcatcher	<i>Polioptila caerulea</i>	Purple Finch	<i>Carpodacus purpureus</i>
American Goldfinch	<i>Carduelis tristis</i>	-----	-----

Source: New York State Breeding Bird Atlas, NYSDEC.

Additionally, mammals identified by New York State that could be found in the vicinity of Shaft No. 1 would typically include: white-tailed deer (*Odocoileus virginianus*), gray squirrel (*Sciurus carolinensis*), raccoon (*Procyon lotor*), porcupine (*Erethizon corsatum*), striped skunk (*Mephitis mephitis*), coyote (*Canis latrans*), Virginia opossum (*Didelphis virginiana*), and white-footed mouse (*Peromyscus leucopus*).



Herptiles that exist within the NYSDEC study block which encompasses Shaft No. 1 could potentially include Eastern American toad (*Bufo americanus*), eastern red-backed salamander (*Plethodon cinereus*), wood frog (*Rana sylvatica*), eastern Box turtle (*Terrapene carolina*), timber rattlesnake (*Crotalus horridus*), and wood turtle (*Clemmys insculpta*). The study block defined by NYSDEC is approximately 33,804-acres in size.

During site work, as a result of removal of earthen berm to access the shaft, installation of a new perimeter fence, routing of electrical service to the shaft site and resurfacing an area of the shaft with crushed stone, it is possible that certain individuals may be threatened, disturbed, or displaced. However, given the limited scope and duration of the work at this shaft, it is not anticipated that significant impacts to wildlife communities in general would occur.

### 3.7.1.5 Protected Species and Critical Environmental Areas

According to the NYSDEC's Natural Heritage Program, the bald eagle (*Haliaeetus leucocephalis*) and the timber rattlesnake (*Crotalus horridus*) are known to occur in the vicinity of Shaft No. 1. Supporting documentation is enclosed in Appendix B. Communication with a representative from the United States Fish and Wildlife Service (USFWS) confirmed that the bald eagle is known to occur within the vicinity of Shaft No. 1. Both species are currently listed as "Threatened" by New York State. The bald eagle is also currently listed as "Threatened" by the federal government; the timber rattlesnake is currently not federally listed. The Natural Heritage database lists Brandy Brook Cedar Swamp, a Spruce-fir swamp occurring in the vicinity of Shaft No. 1 as a significant natural community and has classified Brandy Brook Cedar Swamp as "S3", i.e., rare or uncommon.

Timber rattlesnakes are generally found in deciduous forests in rugged terrain. In the summer, gravid females seem to prefer open, rocky ledges where temperatures are higher, while males and non-gravid females seem to prefer cooler, thicker woods where forest canopy is more closed. Timber rattlesnakes are active from late April until mid-October, although in northern New York they may not emerge until mid-May. Little feeding occurs early in the spring. The Shaft No. 1 site was visited by MPI on May 4, 2005 and August 16, 2005. The site is periodically mowed and surrounded by mature forest. It is possible that immediately adjacent to the shaft site timber rattlesnake could be found since preferred habitat does exist. However, the shaft site itself does not resemble the preferred habitat. Therefore, if an individual is encountered, it is likely to be transitory. This did not occur during MPI's two site visits.

Bald eagles were observed within the NYSDEC breeding bird survey defined study block that encompasses Shaft No. 1. The NYSDEC Breeding Bird Atlas entry specifically referred to a "confirmed breeding" encounter where the species was observed nesting with young. According to breeding season dates for bald eagle as identified on the NYSDEC website, egg dates for the bald eagle fall between March 16 and May 14. The incubation period is 28 to 46 days and unfledged juveniles occur between April 11 and June 30. The Shaft No. 1 site was visited by MPI on May 4, 2005 and again on August

16, 2005. Individual bald eagles or remnants of a bald eagle nest were not observed during either of these site visits.

The eastern box turtle (*Terrapene carolina*), which is known to occur in the general vicinity of Shaft No. 1 (NYSDEC Herp Atlas Project) is currently listed by NYSDEC as a species of special concern. Species of special concern are considered to be at risk of becoming either endangered or threatened, but are not given any legal protection at this time.

According to the NYSDEC Division of Environmental Permits' letter dated May 19, 2005 (enclosed in Appendix B), there are no Critical Environmental Areas (CEAs) located at, or near to, Shaft No. 1.

Therefore, overall, it is not anticipated that the proposed work would result in a significant adverse impact to natural resources at Shaft No. 1, or in the vicinity.

### **3.7.2 Shaft No. 2A**

#### **3.7.2.1 Soils and Groundwater**

Shaft No. 2A is located on approximately 0.91-acres which is owned and maintained by the NYCDEP and is flat, but slopes adjacent to the shaft site are relatively steep. Soils at the shaft site are a combination of extremely bouldery loam, extremely bouldery silt loam, rock outcrops and other soils. Subsoils are directly below forest litter and humus. Soils are extremely well to moderately drained and moderately permeable. These types of soils often have free water above bedrock for brief periods in spring or after heavy rain (Ulster County Soil Survey, 1979). According to historic tunnel records, at the time of construction of Shaft No. 2A, bedrock was encountered at approximately 16-feet below the surface and groundwater was encountered at approximately 39-feet below the surface (NYCDEP, 2004) however, this may not be representative of the below-grade depth to the surface of the water table. No site specific information was available regarding the below-grade depth to the surface of the water table at Shaft No. 2A. Area depths to the water table and to bedrock would vary with ground surface elevations and would be much greater in high-lying areas that contain a large amount of fill material placed on the site during tunnel construction.

Disturbance of soils during site work may result in mobilization of fine grain sediments during storm events. Stormwater runoff practices and SESC techniques would be implemented to control stormwater runoff and prevent soil from leaving the shaft site. The proposed Project would not require the use of groundwater. It is anticipated that little or no excavation would be required at the shaft site. Therefore, it is not anticipated that groundwater would be encountered during site work and the proposed Project would not have a significant adverse impact on soils or groundwater quantity or quality.

### 3.7.2.2 Surface Waters, Wetlands, and Floodplains

Stony Kill flows in a northerly direction as a perennial stream within the study area to the south and east of Shaft No. 2A. In addition, an unnamed tributary flows into Stony Kill to the south. Both Stony Kill and the unnamed tributary are classified as AA(T) surface waters. Both of these surface waters are beyond the limits of Shaft No. 2A site with the closest segment of Stony Kill located approximately 500-feet to the east of the NYCDEP property.

Five wetland areas delineated by Habitat Management & Design, Inc. in 2003 were identified within the study area of Shaft No. 2A. The two closest of the five delineated wetlands are located just to the west of the site access road (Karpaty Road), while the remaining three wetlands are located east of this road and appear to be part of/adjacent to the Stony Kill. The nearest wetland is located approximately 40-feet to the west of Shaft No. 2A, but still within NYCDEP property. The next closest wetland is beyond the NYCDEP property approximately 221-feet from Shaft No. 2A. There are no areas identified within the study area that fall within FEMA flood zones.

There would be no impact to surface waters, wetlands or floodplains since site preparation and modification at Shaft No. 2A would not occur within or adjacent to any of the resources. The closest wetland approximately 40-feet to the west of Shaft No. 2A would be avoided during site and shaft preparation work and therefore not be impacted (i.e. dredged or filled) as a result of the proposed Project.

### 3.7.2.3 Dominant Vegetation

The Shaft No. 2A access road is comprised of exposed and crushed shale and slate. The shaft site is located within an area that has been impacted by mining activities so that the surface substrate primarily consists of broken shale and slate and unearthed bedrock. The two wetland areas to the west of the site access road did contain a soil and organics substrate where wetland vegetation grew. A mature forest community exists to either side of the site access road and upslope to the west of the shaft site.

Vegetative species found sparsely growing on the crushed shale and slate substrate included common cinquefoil (*Potentilla simplex*), bluets (*Houstonia caerulea*), Indian strawberry (*Duchesnea indica*), moth mullein (*Verbascum blattaria*), field garlic (*Allium vineale*), common milkweed (*Asclepias syriaca*), spotted knapweed (*Centaurea maculosa*) and Queen Anne's lace (*Daucus carota*) as forbs, with quaking aspen (*Populus tremuloides*) and Russian olive (*Elaeagnus angustifolia*) representing the shrub layer. Vegetation in wetland areas consisted of steeplebush (*Spirea tomentosa*), meadowsweet (*Spirea latifolia*), rush species (*Juncus sp.*), willow species (*Salix sp.*), wood sage (*Teucrium Canadensis*), and sphagnum moss (*Sphagnum sp.*).

Trees within the mature forest community included red maple (*Acer rubrum*), paper birch (*Betula papyrifera*), black birch (*Betula lenta*), yellow birch (*Betula alleghaniensis*),

white ash (*Fraxinus americana*), black cherry (*Prunus serotina*), black oak (*Quercus velutina*), and red oak (*Quercus rubra*) with shrubs species Japanese barberry (*Berberis thunbergii*) and mountain laurel (*Kalmia latifolia*) also present. A tree survey completed on August 16, 2005 in the vicinity of the proposed shaft site perimeter fence and electrical service areas resulted in a total of 15 trees meeting the minimum measurement requirement of 8-inch dbh. Trees with a minimum requirement of 8-inch dbh were surveyed after a telephone consultation with NYCDEP Natural Resource staff since the Town of Warwasing did not stipulate any requirements for tree protection. A summary of these trees is provided in Table 3-4, below.

**TABLE 3-4**  
**SHAFT NO. 2A TREE SURVEY**  
**COMPLETED AUGUST 16, 2005**

<b>Tag Number</b>	<b>dbh (inches)</b>	<b>Split*</b>	<b>Common Name</b>	<b>Species</b>	<b>Comments</b>
112	13.9	No	White Ash	<i>Fraxinus Americana</i>	Good Health
113	9.0	No	Yellow Birch	<i>Betula alleghaniensis</i>	Good Health
114	15	No	Red Maple	<i>Acer rubrum</i>	Good Health; Split at approx. 12' above ground, split not measured
115	11.7	No	Red Maple	<i>Acer rubrum</i>	Good Health
116	11.5	No	Paper Birch	<i>Betula papyrifera</i>	Good Health
117	15	No	Quaking Aspen	<i>Populus tremuloides</i>	Good Health
118	12.2	No	Quaking Aspen	<i>Populus tremuloides</i>	Good Health
119	13.7	No	Sweet Birch	<i>B. lenta</i>	Good Health
120	8.7	No		Unidentified	Good Health
121	9.5	No	Sweet Birch	<i>Betula lenta</i>	Good Health
122	8.6	No	Red Maple	<i>Acer rubrum</i>	Good Health
123	6.2, 8.6, 9.8, 4.7 & 6.2	Yes	Sweet Birch	<i>Betula lenta</i>	Good Health
124	8.3	No	Crab Apple	<i>Malus sp.</i>	Good Health
125	10.3	No	Quaking Aspen	<i>Populus tremuloides</i>	Good Health

\* Trees were analyzed based upon whether or not they were split into separate branches, stemming from a common trunk to present an accurate representation of their condition at the time of the survey, their dominance with respect to aerial coverage and potential wildlife usage resulting from this growth pattern.



**TABLE 3-4  
SHAFT NO. 2A TREE SURVEY  
COMPLETED AUGUST 16, 2005**

Tag Number	dbh (inches)	Split*	Common Name	Species	Comments
126	11.8	No	Quaking Aspen	<i>Populus tremuloides</i>	Good Health

Disturbance of 0.91-acres of isolated areas of vegetation, comprised of all herbaceous species, growing on the shale and slate substrate would be expected to occur during site work as a result of the following: removal of earthen berm to access the shaft, construction of the foundation for head frame support, installation of a new perimeter fence, routing of electrical service to the site from existing power utility pole and resurfacing an area of the shaft with crushed stone. At this time it is not anticipated that tree removal would be required as part of this work. However, overhead clearance pruning along the existing access road may be necessary for vehicle access and utilities service. If tree removal is required, the maximum number of individuals is not expected to exceed the 15 trees identified in Table 3-4. Therefore, as a result of site work at Shaft No. 2A, even if these common species of trees were removed, impacts to unique plant species or sensitive habitats still are not anticipated to occur.

#### 3.7.2.4 Wildlife Resources

Birds observed by volunteers as part of the NYSDEC Breeding Bird Survey from 2000 through 2004 in the vicinity of the study area are listed in Table 3-5 (NYSDEC Breeding Bird Atlas, 2005). The cooper's hawk (*Accipiter cooperii*), a NYSDEC species of special concern, was listed in the Atlas as observed in the NYSDEC defined study block that encompasses Shaft No. 2A. Each study block defined by NYSDEC is approximately 6,020-acres in size. Species of special concern are considered to be at risk of becoming either endangered or threatened, but are not given any legal protection at this time. As this species was not listed by the NYSDEC Natural Heritage Program as occurring in the vicinity of Shaft No. 2A, the NYSDEC Breeding Bird Atlas entry specifically referred to a "possible breeding" encounter where the species was observed in possible nesting habitat, but no other indication of breeding was noted. According to breeding season dates for cooper's hawk as identified on the NYSDEC website, egg dates for cooper's hawk fall between April 20 and June 16. The incubation period is 21 to 36 days and unfledged juveniles occur between June 2 and July 2. The Shaft No. 2A site was visited by MPI on May 4, 2005 and August 16, 2005. Individual Copper's hawks or remnants of a cooper's hawk's nests were not observed during either of these site visits.



**TABLE 3-5**  
**AVIAN SPECIES POTENTIALLY OCCURRING IN THE VICINITY OF**  
**SHAFT NO. 2A**  
**As observed between 2000 and 2004**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>
Green Heron	<i>Butorides virescens</i>	Eastern Bluebird	<i>Sialia sialis</i>
Great Blue Heron	<i>Ardea herodias</i>	Veery	<i>Catharus fuscescens</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Hermit Thrush	<i>Catharus guttatus</i>
Wild Turkey	<i>Meleagris gallopavo</i>	Killdeer	<i>Charadrius vociferus</i>
Spotted Sandpiper	<i>Actitis macularia</i>	Rock Pigeon	<i>Columba livia</i>
Wood Duck	<i>Aix sponsa</i>	Canada Goose	<i>Branta canadensis</i>
Common Merganser	<i>Mergus merganser</i>	Cooper's Hawk	<i>Accipiter cooperii</i>
Turkey Vulture	<i>Cathartes aura</i>	Wood Thrush	<i>Hylocichla mustelina</i>
Broad-winged Hawk	<i>Buteo platypterus</i>	American Robin	<i>Turdus migratorius</i>
American Kestrel	<i>Falco sparverius</i>	Gray Catbird	<i>Dumetella carolinensis</i>
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Northern Mockingbird	<i>Mimus polyglottos</i>
Northern Flicker	<i>Colaptes auratus</i>	Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>
Pileated Woodpecker	<i>Dryocopus pileatus</i>	European Starling	<i>Sturnus vulgaris</i>
Eastern Wood-Pewee	<i>Contopus virens</i>	Chimney Swift	<i>Chaetura pelagica</i>
Least Flycatcher	<i>Empidonax minimus</i>	Cedar Waxwing	<i>Bombycilla cedrorum</i>
Willow Flycatcher	<i>Empidonax traillii</i>	Yellow Warbler	<i>Dendroica petechia</i>
Eastern Phoebe	<i>Sayornis phoebe</i>	Chestnut-sided Warbler	<i>Dendroica pensylvanica</i>
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	Black-throated Blue Warbler	<i>Dendroica caerulescens</i>
Eastern Kingbird	<i>Tyrannus tyrannus</i>	Blackburian Warbler	<i>Dendroica fusca</i>
Warbling Vireo	<i>Vireo gilvus</i>	Black- and -white Warbler	<i>Mniotilta varia</i>
Red-eyed Vireo	<i>Vireo olivaceus</i>	American Redstart	<i>Setophaga ruticilla</i>
Yellow-throated Vireo	<i>Vireo flavifrons</i>	Ovenbird	<i>Seiurus aurocapilla</i>
Blue Jay	<i>Cyanocitta cristata</i>	Louisiana Waterthrush	<i>Seiurus motacilla</i>
American Crow	<i>Corvus</i>	Common	<i>Geothlypis trichas</i>

**TABLE 3-5  
AVIAN SPECIES POTENTIALLY OCCURRING IN THE VICINITY OF  
SHAFT NO. 2A  
As observed between 2000 and 2004**

Common Name	Scientific Name	Common Name	Scientific Name
	<i>brachyrhynchos</i>	Yellowthroat	
Tree Swallow	<i>Tachycineta bicolor</i>	Scarlet Tanager	<i>Piranga olivacea</i>
Barn Swallow	<i>Hirundo rustica</i>	Brown Thrasher	<i>Toxostoma rufum</i>
Black-capped Chickadee	<i>Poecile atricapillus</i>	Eastern Towhee	Pipilo <i>erythrophthalmus</i>
Tufted Titmouse	<i>Baeolophus bicolor</i>	Chipping Sparrow	<i>Spizella passerina</i>
Red-breasted Nuthatch	<i>Sitta canadensis</i>	Field Sparrow	<i>Spizella pusilla</i>
White-breasted Nuthatch	<i>Sitta carolinensis</i>	Song Sparrow	<i>Melospiza melodia</i>
Brown Creeper	<i>Certhia americana</i>	Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>
House Wren	<i>Troglodytes aedon</i>	Indigo Bunting	<i>Passerina cyanea</i>
Winter Wren	<i>Troglodytes troglodytes</i>	Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Carolina Wren	<i>Thryothorus ludovicianus</i>	Common Grackle	<i>Quiscalus quiscula</i>
Pine Warbler	<i>Dendroica pinus</i>	Brown-headed Cowbird	<i>Molothrus ater</i>
American Goldfinch	<i>Carduelis tristis</i>	Baltimore Oriole	<i>Icterus galbula</i>
Northern Cardinal	<i>Cardinalis cardinalis</i>	Orchard Oriole	<i>Icterus spurius</i>
Blue-winged Warbler	<i>Vermivora pinus</i>	Hooded Warbler	<i>Wilsonia citrina</i>
Purple Finch	<i>Carpodacus purpureus</i>	House Sparrow	<i>Passer domesticus</i>
Prairie Warbler	<i>Dendroica discolor</i>	-----	-----

Source: New York State Breeding Bird Atlas, NYSDEC.

Additionally, mammals identified in New York State that could be found in the vicinity of Shaft No. 2A would typically include: white-tailed deer (*Odocoileus virginianus*), eastern chipmunk (*Tamias striatus*), raccoon (*Procyon lotor*), porcupine (*Erethizon corsatum*), eastern cottontail (*Sylvilagus floridanus*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), and white-footed mouse (*Peromyscus leucopus*).

Herptiles that exist within the NYSDEC study block which encompasses Shaft No. 2A could potentially include Eastern American toad (*Bufo americanus*), eastern red-backed salamander (*Plethodon cinereus*), wood frog (*Rana sylvatica*), timber rattlesnake (*Crotalus horridus*), and wood turtle (*Clemmys insculpta*). The study block defined by NYSDEC is approximately 33,804-acres in size.



During site work, as a result of removal of earthen berm to access the shaft, construction of the foundation for head frame support, installation of a new perimeter fence, routing of electrical service to the shaft site and resurfacing an area of the shaft with crushed stone, it is possible that certain individuals may be threatened, disturbed, or displaced. However, given the limited scope and duration of the work at this shaft, it is not anticipated that significant impacts to wildlife communities in general would occur.

### 3.7.2.5 Protected Species and Critical Environmental Areas

According to the NYSDEC's Natural Heritage Program, the timber rattlesnake (*Crotalus horridus*) is known to occur within the study area of Shaft No. 2A. Supporting documentation is enclosed in Appendix B. This species is currently listed as "Threatened" by New York State; the timber rattlesnake is currently not federally listed. The Natural Heritage database also lists the wetland shrub rhodora (*Rhododendron canadense*) as occurring in the Shawagunk Mountains proximal to Shaft No. 2A and has classified *Rhododendron canadense* as a threatened species. NYSDEC also lists pitch-pine-oak-heath rock summit habitat and chestnut oak forest, both significant natural communities, as occurring in the Shawagunk Mountains.

Timber rattlesnakes are generally found in deciduous forests in rugged terrain. In the summer, gravid females seem to prefer open, rocky ledges where temperatures are higher, while males and non-gravid females seem to prefer cooler, thicker woods where forest canopy is more closed. Timber rattlesnakes are active from late April until mid-October, although in northern New York they may not emerge until mid-May. Little feeding occurs early in the spring. The Shaft No. 2A site was visited by MPI on May 4, 2005 and August 16, 2005. The site characteristics are indicative of an area that has been historically mined with an abandoned mine pit, unearthened bedrock and a shale/slate substrate which is surrounded by mature forest. It is possible that immediately adjacent to the shaft site timber rattlesnake could be found since preferred habitat does exist. However, the shaft site itself does not resemble the preferred habitat. Therefore, if an individual is encountered, it is likely to be transitory. This did not occur during MPI's two site visits.

Communication with a representative from the USFWS confirmed that the Indiana bat (*Myotis lucifugus*) is known to occur within the vicinity of Shaft No. 2A. The Indiana bat is a Federal and State-listed endangered specie.

The wood turtle (*Clemmys insculpta*), which is known to occur in the vicinity of Shaft No. 2A (NYSDEC Herp. Atlas Project), is currently listed by NYSDEC as a species of special concern. Species of special concern are considered to be at risk of becoming either endangered or threatened, but are not given any legal protection at this time.

According to the NYSDEC Division of Environmental Permits' letter dated May, 19, 2005 (enclosed in Appendix B), there are no CEAs located at, or near to, Shaft No. 2A.

Therefore, overall, it is not anticipated that the proposed work would result in a significant adverse impact to natural resources at Shaft No. 2A or in the vicinity.

### 3.7.3 Shaft No. 4

#### 3.7.3.1 Soils and Groundwater

Shaft No. 4 is located on approximately 31.68-acres owned and maintained by the NYCDEP. The area immediately surrounding Shaft No. 4 is relatively flat, but the shaft building itself was constructed on a slight topographical rise that runs longitudinally along the shaft site. Soils at the shaft site generally consist of a dark brown gravelly loam. The soil is excessively well drained, and permeability is moderately rapid in the surface layer and subsoil. Precipitation runoff is medium to rapid, and available water capacity is generally low (Ulster County Soil Survey, 1979). According to historic tunnel record drawings, at the time of construction of Shaft No. 4, groundwater was encountered at approximately 8.5-feet below the surface (NYCDEP, 2004). However, this may not be representative of the below-grade depth to the surface of the water table. No site specific information was available regarding the below-grade depth to the surface of the water table at Shaft No. 4. Shaft No. 4 is partially built within the surrounding bedrock. The shaft chamber floor is approximately 7-feet in elevation below the top of bedrock (NYCDEP, 2004). Area depths to the water table and to bedrock would vary with ground surface elevations and would be much greater in high-lying areas that contain a large amount of fill material placed on the site during tunnel construction.

The proposed Project would not have a significant adverse impact on soils or groundwater quantity or quality since there is no site disturbance proposed at Shaft No. 4.

#### 3.7.3.2 Surface Waters, Wetlands, and Floodplains

There are no surface waters, wetlands or FEMA-flood zones identified within Shaft No. 4 study area.

Since no surface waters, wetlands or flood zones were identified, installation of HGL monitoring equipment at Shaft No. 4 would not impact these resources.

#### 3.7.3.3 Dominant Vegetation

The shaft site access road consists of predominantly pavement with some areas of concrete. A rectangular shaped, periodically mowed area is the predominant vegetative cover type at Shaft No. 4. At the edges of the periodically mowed areas, a mature forest community exists. Vegetative species found within mowed areas included common dandelion (*Taraxcum officinale*), common cinqfoil (*Potentilla simplex*), Indian strawberry (*Duchesnea indica*), mayweed (*Anthemis cotula*), garlic mustard (*Alliaria petiolata*), fragrant bedstraw (*Galium triflorum*), common blue violet (*Viola*

*papilionacea*), poison ivy (*Toxicodendron radicans*), Virginia creeper (*Parthenocissus quinquefolia*), multiflora rose (*Rosa multiflora*) and sheep fescue (*Festuca ovina*).

Tree species found in the mature forest community consisted of box elder (*Acer negundo*), Norway spruce (*Picea abies*), American elm (*Ulmus americana*), black cherry (*Prunus serotina*), eastern white pine (*Pinus strobes*), sugar maple (*Acer saccharum*) and one shrub species arrow-wood (*Viburnum dentatum*) was also present.

There would be no impacts to vegetation since only installation of HGL monitoring equipment would occur at Shaft No. 4.

### 3.7.3.4 Wildlife Resources

Birds observed by volunteers as part of the NYSDEC Breeding Bird Survey from 2000 through 2004 in the vicinity of the Project area are listed in Table 3-6 (NYSDEC Breeding Bird Atlas, 2005).

<b>TABLE 3-6 AVIAN SPECIES POTENTIALLY OCCURRING IN THE VICINITY OF SHAFT NO. 4 As observed between 2000 and 2004</b>			
<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>
American Kestrel	<i>Falco sparverius</i>	Killdeer	<i>Charadrius vociferus</i>
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	Northern Flicker	<i>Colaptes auratus</i>
Eastern Phoebe	<i>Sayornis phoebe</i>	Great Crested Flycatcher	<i>Myiarchus crinitus</i>
Blue Jay	<i>Cyanocitta cristata</i>	Barn Swallow	<i>Hirundo rustica</i>
American Robin	<i>Turdus migratorius</i>	Gray Catbird	<i>Dumetella carolinensis</i>
Brown Thrasher	<i>Toxostoma rufum</i>	European Starling	<i>Sturnus vulgaris</i>
Yellow Warbler	<i>Dendroica petechia</i>	American Redstart	<i>Setophaga ruticilla</i>
Northern Cardinal	<i>Cardinalis cardinalis</i>	Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>
Baltimore Oriole	<i>Icterus galbula</i>	House Sparrow	<i>Passer domesticus</i>

Source: New York State Breeding Bird Atlas, NYSDEC.

Additionally, mammals identified in New York State that could be found in the vicinity of Shaft No. 4 would typically include: white-tailed deer (*Odocoileus virginianus*), gray squirrel (*Sciurus carolinensis*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), woodchuck (*Marmota monax*), Virginia opossum (*Didelphis virginiana*), and white-footed mouse (*Peromyscus leucopus*).

Herptiles that exist within the NYSDEC study block which encompasses Shaft No. 4 could potentially include Eastern American toad (*Bufo americanus*), eastern red-backed



salamander (*Plethodon cinereus*), wood frog (*Rana sylvatica*), eastern box turtle (*Terrapene carolina*), eastern gartersnake (*Thamnophis brachystoma*), and wood turtle (*Clemmys insculpta*). The study block defined by NYSDEC is approximately 33,804-acres in size.

There would be no significant impacts to wildlife, since only installation of HGL monitoring equipment would occur at Shaft No. 4.

### 3.7.3.5 Protected Species and Critical Environmental Areas

According to the NYSDEC's Natural Heritage Program, the northern harrier (*Circus cyaneus*) is known to occur in the grasslands in the vicinity of Shaft No. 4. Supporting documentation is enclosed in Appendix B. This species is currently listed as "Threatened" by New York State; the northern harrier is currently not federally listed. Natural Heritage has classified rhodora (*Rhododendron canadense*) as an "S3", species, i.e., "rare or uncommon".

Northern harrier was not listed in the NYSDEC Breeding Bird Atlas study block which is approximately 6,020-acres in size and encompasses Shaft No. 4. According to Breeding Season dates for northern harrier identified on the NYSDEC website, egg dates for northern harrier fall between April 20 and June 25. The incubation period is 21 to 36 days and unfledged juveniles occur between May 30 and July 18. The Shaft No. 4 site was visited by MPI on May 10, 2005. Individual northern harriers or remnants of a northern harrier nest were not observed during this site visit.

The eastern box turtle (*Terrapene carolina*) and wood turtle (*Clemmys insculpta*), which are known to occur in the general vicinity (NYSDEC Herp Atlas Project), could occur in the Project area, and are currently listed by NYSDEC as species of special concern. Species of Special Concern are considered to be at risk of becoming either endangered or threatened, but are not given any legal protection at this time.

Communication with a representative from the USFWS confirmed that the bog turtle (*Clemmys muhlenbergii*) may occur within the vicinity of Shaft No. 4. The bog turtle is a New York State listed endangered specie and a federally listed threatened specie.

The proposed Project would not have a significant adverse impact on these protected species since only installation of HGL monitoring equipment would occur at Shaft No. 4. If any of these species are encountered during HGL Monitoring installation, a NYCDEP Wildlife Biologist would be notified to assess the situation.

According to the NYSDEC Division of Environmental Permits' letter dated May, 19, 2005 (enclosed in Appendix B), there are no CEAs located at, or near to, Shaft No. 4.

Therefore, overall, it is not anticipated that the proposed work would result in a significant adverse impact to natural resources at Shaft No. 4 or in the vicinity.

### 3.7.4 Shaft No. 5A

#### 3.7.4.1 Soils and Groundwater

Shaft No. 5A is located on approximately 1.81-acres owned and maintained by the NYCDEP. The area immediately surrounding Shaft No. 5A is relatively flat, although the terrain to the north, east and south of shaft site perimeter slope gently down in varying degree. The area to the west of the site has a relatively steep slope. Soils at the shaft site are a complex of dark brown shaly silty loam, dark grayish brown shaly silty loam and other soils. The surface layer of this complex typically contains between 15-35 percent shale fragments; natural organic content of such soils is relatively low. Surface permeability is moderate, and runoff is slow to medium (Orange County Soil Survey, 1981). According to historic tunnel records, pre-construction of Shaft No. 5A, bedrock was encountered at approximately 4-feet below the surface (Pennsylvania Drilling Co., 1936) and during construction, groundwater was encountered at approximately 6-feet below the surface (NYCDEP, 2004) however, this may not be representative of the below-grade depth to the surface of the water table. No site specific information was available regarding the below-grade depth to the surface of the water table at Shaft No. 5A. Area depths to the water table and to bedrock would vary with ground surface elevations and would be much greater in high-lying areas that contain a large amount of fill material placed on the site during tunnel construction.

The proposed Project would not have a significant adverse impact on soils or groundwater quantity or quality since there is no site disturbance proposed at Shaft No. 5A as a result of installing HGL monitoring equipment.

#### 3.7.4.2 Surface Waters, Wetlands, and Floodplains

An unnamed tributary flows in a southeasterly direction within the study area from the north to the southeast of Shaft No. 5A. Just prior to crossing the study area, a second unnamed tributary from the north flows into this aforementioned unnamed tributary. From this point, flow continues in a southeasterly direction until reaching a third unnamed tributary beyond the study area. Surface flow from this collection of unnamed tributaries eventually reaches Lattintown Creek, in the vicinity of where the Creek discharges to the Hudson River within Ulster County. All of these unnamed tributaries are classified as C surface waters and are situated beyond the limits of NYCDEP property, with the closest segment of unnamed tributary located approximately 125-feet to the east of this property line.

Nine federally designated and one state designated wetland areas were identified within the study area of Shaft No. 5A, but none are located within the limits of NYCDEP property. Of the nine federal wetlands identified from NWI mapping, six are designated freshwater pond, two as freshwater forested/shrub wetland, and the last as freshwater emergent wetland. The wetland identified from NYSDEC Freshwater wetlands mapping is designated as a Class III wetland. The closest identified wetland to the shaft site is

federally designated as a freshwater pond located approximately 42-feet to the east of this NYCDEP property line.

There are no areas identified within the study area of Shaft No. 5A that fall within FEMA flood zones.

As a result of no surface waters, wetlands or flood zones being identified on the shaft site, installation of HGL monitoring equipment at Shaft No. 5A is not anticipated to impact these resources.

#### 3.7.4.3 Dominant Vegetation

The entire facility at Shaft No. 5A is square shaped and enclosed within a locked, chain-link perimeter fence. The ground cover within this fence line consists of either paved driveways or regularly mowed, maintained lawn. The shaft site access road consists of pavement. In evaluating what species could potentially grow within the fence line, if regular mowing were not to occur, an inventory of herbaceous species that remained inadvertently unmowed at the fence boundary were recorded. In addition, beyond the fence line, remaining NYCDEP property consists of open field habitat transitioning to dense shrubs beyond the property to the east, south and north (Lattintown road is to the west). Identified herbaceous species at both the fence line and in open field areas were similar and included common dandelion (*Taraxcum officinale*), mayweed (*Anthemis cotula*), fragrant bedstraw (*Galium triflorum*), English plantain (*Plantago lanceolata*), common blue violet (*Viola papilionacea*), white clover (*Trifolium repens*), common plantain (*Plantago major*), common burdock (*Arctium minus*) and crown vetch (*Coronilla varia*).

Species found in the dense shrub community consisted of multiflora rose (*Rosa multiflora*), fireweed (*Epilobium angustifolia*), staghorn sumac (*Rhus typhina*) and pin cherry (*Prunus pensylvanica*).

Since no site work is proposed other than the installation of HGL monitoring equipment, there no impacts to vegetation are anticipated at Shaft No. 5A.

#### 3.7.4.4 Wildlife Resources

Birds observed by volunteers as part of the NYSDEC Breeding Bird Survey from 2000 through 2004 in the vicinity of the study area are listed in Table 3-7 (NYSDEC Breeding Bird Atlas, 2005). The peregrine falcon (*Falco peregrinus*) a NYSDEC endangered species, was listed in the Atlas as observed in the NYSDEC defined study block that encompasses Shaft No. 5A. Each study block defined by NYSDEC is approximately 6,020-acres in size. As this species was not listed by the NYSDEC Natural Heritage Program as occurring in this vicinity, the NYSDEC Breeding Bird Atlas entry specifically referred to a “confirmed breeding” encounter where the species was observed with recently fledged young. According to Breeding Season dates for the peregrine falcon as identified on the NYSDEC website, egg dates for the peregrine falcon

fall between March 2 and May 31. The incubation period is 28 to 29 days and unfledged juveniles occur between April 19 and July 10. The Shaft No. 5A site was visited by MPI on May 10, 2005. Individual peregrine falcons or remnants of a peregrine falcon nest were not observed during the site visit.

**TABLE 3-7  
AVIAN SPECIES POTENTIALLY OCCURRING IN THE VICINITY OF  
SHAFT NO. 5A  
As observed between 2000 and 2004**

Common Name	Scientific Name	Common Name	Scientific Name
Turkey Vulture	<i>Cathartes aura</i>	Mallard	<i>Anas platyrhynchos</i>
Peregrine Falcon	<i>Falco peregrinus</i>	Mourning Dove	<i>Zenaida macroura</i>
Chimney Swift	<i>Chaetura pelagica</i>	Downy Woodpecker	<i>Picoides pubescens</i>
Blue Jay	<i>Cyanocitta cristata</i>	Barn Swallow	<i>Hirundo rustica</i>
American Robin	<i>Turdus migratorius</i>	American Crow	<i>Corvus brachyrhynchos</i>
House Wren	<i>Troglodytes aedon</i>	Wood Thrush	<i>Hylocichla mustelina</i>
American Robin	<i>Turdus migratorius</i>	Northern Mockingbird	<i>Mimus polyglottos</i>
European Starling	<i>Sturnus vulgaris</i>	Song Sparrow	<i>Melospiza melodia</i>
Common Grackle	<i>Quiscalus quiscula</i>	Brown-headed Cowbird	<i>Molothrus ater</i>
Baltimore Oriole	<i>Icterus galbula</i>	House Sparrow	<i>Passer domesticus</i>

Source: New York State Breeding Bird Atlas, NYSDEC.

Mammals identified in New York State that could be found in the vicinity of Shaft No. 5A would typically include: white-tailed deer (*Odocoileus virginianus*), gray squirrel (*Sciurus carolinensis*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), woodchuck (*Marmota monax*), Virginia opossum (*Didelphis virginiana*), coyote (*Canis latrans*) and red fox (*Vulpes vulpes*).

Herpetiles that exist within the NYSDEC study block which encompasses Shaft No. 5A could potentially include the spotted salamander (*Ambystoma maculatum*), Fowler's toad (*Bufo fowleri*), red-backed salamander (*Plethodon cinereus*), pickerel frog (*Rana palustris*), eastern box turtle (*Terrapene carolina*), eastern gartersnake (*Thamnophis brachystoma*), and northern brown snake (*Storeria dekayi dekayi*). The study block defined by NYSDEC is approximately 33,804-acres in size.

There would be no significant impacts to wildlife since only installation of HGL monitoring equipment would occur at Shaft No. 5A.

### 3.7.4.5 Protected Species and Critical Environmental Areas

The NYSDEC's Natural Heritage Program currently has no record of threatened or endangered species or critical environmental areas in the vicinity of Shaft No. 5A. The eastern box turtle (*Terrapene carolina*), which is known to occur in the general vicinity (NYSDEC Herp. Atlas Project), could occur in the Project area, and is currently listed by NYSDEC as a species of special concern. Species of Special Concern are considered to be at risk of becoming either endangered or threatened, but are not given any legal protection at this time.

The proposed Project would not have a significant adverse impact on these protected species since only installation of HGL monitoring equipment would occur at Shaft No. 5A. If any of these species are encountered during HGL Monitoring installation, a NYCDEP Wildlife Biologist would be notified to assess the situation.

According to the NYSDEC Division of Environmental Permits' letter dated May, 19, 2005 (enclosed in Appendix B), there are no CEAs located at, or near to, Shaft No. 5A. Therefore, it is not anticipated that the proposed work would result in a significant adverse impact to natural resources at Shaft No. 5A or in the vicinity.

## 3.7.5 Shaft No. 6

### 3.7.5.1 Soils and Groundwater

Shaft No. 6 is located on approximately 19.9-acres of NYCDEP-owned property. The Project area constitutes approximately 7.5-acres. The area immediately surrounding the Shaft No. 6 building and proposed work sites are relatively flat, although the terrain to the west slopes downward toward the Hudson River. The outfall is located on the shore of the Hudson River. Soils at the shaft site are dark brown sandy loam, with low gravel content. These soils are well drained and acidic. Substrates at the outfall site are mostly hard, gravelly sand (Dutchess County Soil Survey, 1955). Pre-construction historic tunnel records show that at Shaft No. 6, bedrock was encountered at approximately 22-feet below the surface (Pennsylvania Drilling Co., 1936) and historic tunnel records show that during construction, groundwater was encountered at approximately 6-feet below the surface (NYCDEP, 2004), however this may not be representative of the below-grade depth to the surface of the water table. No site specific information was available regarding the below-grade depth to the surface of the water table at Shaft No. 6. Area depths to the water table would vary with ground surface elevations and would be much greater in high-lying areas that contain a large amount of fill material placed on the site during tunnel construction.

Disturbance of approximately 1.36-acres of soils during site work may result in mobilization of fine grain sediments during storm events. Stormwater runoff practices, including a Stormwater Pollution Prevention Plan (SWPPP) and SESC techniques and are being developed and would be implemented to control stormwater runoff and prevent

soil from leaving the shaft site. The proposed Project would not require the use of groundwater. There would be some grading and excavation of soil around the shaft site. The depth of excavation is anticipated to be approximately 5-feet in isolated areas of the property but would not exceed 4-feet in most cases. However, the installation of electrical manholes in seven locations throughout the property would require excavation up to 12-feet. It is not anticipated, however, that groundwater would be encountered during excavation activities. Excavated soils may be reused for regrading and for creating security berm at the shaft site. Therefore, it is not anticipated that the proposed Project would have a significant adverse impact on soils or groundwater quantity or quality.

### 3.7.5.2 Surface Waters, Wetlands, and Floodplains

An unnamed tributary flows in a westerly direction into an unnamed pond within the study area to the south and east of Shaft No. 6. A second unnamed tributary located to the south of Shaft No. 6 flows in a northerly direction into this same pond. The outlet from this pond flows in a northwesterly direction through another unnamed tributary until reaching the Hudson River. All of these unnamed tributaries and unnamed pond are classified as C surface waters and situated beyond the limits of NYCDEP property, with the closest segment of unnamed tributary located approximately 520-feet to the south of the property. The best usage identified for Class C waters is fishing. The Hudson River is classified as Class A surface water and located approximately 100-feet to the west of the NYCDEP property. The best usages identified for Class A waters are a source of water supply for drinking, culinary or food processing purposes, primary and secondary contact recreation, and fishing. These waters shall be suitable for fish propagation and survival.

Six federally designated wetland areas and one area of Hudson River shoreline delineated by Habitat Management & Design, Inc. in 2003 were identified within the study area of Shaft No. 6. Of the six federal wetlands identified from NWI mapping, two are designated freshwater pond, two as freshwater forested/shrub wetland, one as freshwater emergent wetland and the Hudson River as estuarine wetland. The closest of these wetlands represents the shoreline of the Hudson River located approximately 100-feet to the west of the NYCDEP property.

The unnamed tributary to the south and east of Shaft No. 6 falls within the FEMA 500-year flood zone. The remaining tributaries, pond and Hudson River fall within the FEMA 100-year flood zone.

Site work that could affect surface waters, wetlands and floodplains are the activities associated with the outfall at Shaft No. 6. The Shaft No. 6 outfall would be modified by excavating sediment and placing filter fabric and stone adjacent to the existing outfall in the Hudson River to protect the area proximal to the outfall from possible scouring. Installation of this new riprap apron would occupy a 215-square yard area and require removal of up to 186-cubic yards of existing coarse bottom sediments comprised of large stones, cobble, pebbles and some coarse sand. Riprap would be composed of a well graded mixture of stone-size such that 50 percent of the pieces, by weight, would be

larger than 18-inches. A well graded mixture is defined as a mixture composed primarily of larger stone sizes but with a sufficient mixture of other sizes to fill the smaller voids between the stones. The diameter of the largest stone size in such a mixture would be 27-inches. The stone for the riprap would consist of field stone or rough unhewn quarry stone. The stone would be hard, angular, and highly resistant to weathering. Since the coarse substrate supporting hard bottom biological habitat would not be permanently altered but only temporarily disturbed during construction (i.e. dredging and filling), permanent impacts to surface waters, wetlands and floodplains would not occur. During construction, best management practices as directed by the USACE and NYSDEC permits would be implemented to minimize water quality impacts to the Hudson River.

During the DEL-185 Project, there would be number of needs to discharge water to the Hudson River, as follows:

- Tunnel de-pressurization (“blow-off”). In order to allow safe construction of certain components within Shaft No. 6, water from the tunnel would need to be discharged in order to de-pressurize the tunnel.
- Shaft dewatering. In order to construct systems within Shaft No. 6, water that is currently in the shaft would need to be discharged.
- Pump testing. Water from the shaft and tunnel would be discharged during testing of new pumps.

Approximately two years ago, water that currently sits at the bottom of Shaft No. 6 (and remains there currently) was analyzed and no contaminants of concern were identified. However, the pH results were greater than 10 due to years of stagnation in the shaft and the leaching of concrete. Therefore in order to comply with Hudson River water quality standards, pH adjustment would be performed before water from the shaft is discharged to the Hudson River. In addition, since the blow-off and pump testing discharges would be high-quality, non-chlorinated drinking water originating from the Rondout Reservoir, this water would be expected to be free of contaminants of concern.

In reviewing the USGS Hudson River flow data collected about two miles south of Poughkeepsie, the estimated maximum discharge of 42,000-gpm (rate at the beginning of the tunnel blow-off) was compared to the average and minimum flows. The maximum discharge would represent less than 1 percent of the average River flow. During periods of lower River flows, the percentage of flow from the discharge would represent a maximum of 2.2 percent. These small percentages only represent intermittent, non-chlorinated drinking water discharge events via operation of the Shaft No. 6 outfall. Since the Shaft No. 6 outfall would not be operating for the majority of time during the Project activities, the percentage of flow from the discharge would obviously be zero for this duration. As a result of both low flow discharge percentages during intermittent operation, and the infrequent nature of discharges, impacts to water quality, water fluctuation, current patterns and water circulation would not occur.

### 3.7.5.3 Dominant Vegetation

The Shaft No. 6 access road consists of pavement. The majority of the property is regularly mowed, maintained lawn with the exception of two forested areas comprised of mixed hardwoods at the northern and northeastern borders. The Hudson River shoreline, as indicated in the previous section, is comprised of coarse material and is non-vegetated in the immediate vicinity of the Shaft No. 6 outfall. The embankment leading from the railroad tracks to the shoreline is vegetated with a mix of herbaceous and shrub species.

Vegetative species found on maintained lawn areas included common dandelion (*Taraxcum officinale*), English plantain (*Plantago lanceolata*), Common plantain *Plantago major*, white clover (*Trifolium repens*), fragrant bedstraw *Galium triflorum*, common blue violet (*Viola papilionacea*) and unidentified grass species. Tree species identified in forested areas included northern red oak (*Quercus rubra*), white oak (*Quercus alba*), black oak (*Quercus velutina*), sugar maple (*Acer saccharum*), shagbark hickory (*Carya ovata*), sweet birch (*Betula lenta*), American beech (*Fagus grandifolia*), American Hophornbeam (*Ostrya virginiana*), mulberry (*Morus sp.*), black cherry *Prunus serotina* and honey locust (*Gleditsia triacanthus*).

The embankment area upslope of the Hudson River shoreline contained some trees species which included eastern red cedar (*Juniperus virginiana*), pin oak (*Quercus palustris*) and tree-of-heaven (*Ailanthus altissima*). The lone shrub identified was black chokeberry (*Aronia melanocarpa*) with the remaining herbaceous species comprised of evening primrose (*Oenothera biennis*), common mullein (*Verbascum thapsus*), foxtail (*Alopecurus sp.*), goldenrod (*Solidago sp.*) and black knapweed (*Centaurea nigra*).

Disturbance of 1.36-acres of vegetation, such as those detailed above, growing in regularly mowed, maintained areas would be expected to occur during site work as a result of grading and placing of crushed stone to accommodate truck traffic and future stand-by generators, routing of new electrical service to the site to provide redundant electrical service as well as storage of equipment in designated contractor lay down areas. It is not anticipated that tree removal would be required as part of this work. In addition, no impacts to vegetation would occur due to its absence along the Hudson River shoreline. Therefore impacts to unique plant species or sensitive habitats are not anticipated to occur as a result of site work at Shaft No. 6.

### 3.7.5.4 Wildlife Resources

Birds observed by volunteers as part of the NYSDEC Breeding Bird Survey from 2000 through 2004 in the vicinity of the study area are listed in Table 3-8 (NYSDEC Breeding Bird Atlas, 2005). The bald eagle (*Haliaeetus leucocephalis*) listed by NYSDEC as a threatened species, and cooper's hawk (*Accipiter cooperii*), a NYSDEC species of special concern were listed in the Atlas as observed in the vicinity of Shaft No. 6.

The Bald eagle was also included as part of the breeding bird survey as observed in the NYSDEC defined study block that encompasses Shaft No. 6. Each study block defined by NYSDEC is approximately 6,020-acres in size. As this species was not listed by the NYSDEC Natural Heritage Program as occurring in this vicinity, the NYSDEC Breeding Bird Atlas entry specifically referred to a “confirmed breeding” encounter where the species was observed nesting with young. According to Breeding Season dates for bald eagle as identified on the NYSDEC website, egg dates for bald eagle fall between March 16 and May 14. The incubation period is 28 to 46 days and unfledged juveniles occur between April 11 and June 30. The Shaft No. 6 site was visited by MPI on April 29, 2005. Individual bald eagles or remnants of a bald eagle nest were not observed during the site visit.

It is worth noting that cooper’s hawk (*Accipiter cooperii*), a NYSDEC species of special concern, was listed in the Atlas as observed in the NYSDEC defined study block that encompasses Shaft No. 6. Each study block defined by NYSDEC is approximately 6,020-acres in size. Species of Special Concern are considered to be at risk of becoming either endangered or threatened, but are not given any legal protection at this time. As this species was not listed by the NYSDEC Natural Heritage Program as occurring in this vicinity, the NYSDEC Breeding Bird Atlas entry specifically referred to a “possible breeding” encounter where the species was observed in possible nesting habitat, but no other indication of breeding was noted. According to breeding season dates for cooper’s hawk as identified on the NYSDEC website, egg dates for cooper’s hawk fall between April 20 and June 16. The incubation period is 21 to 36 days and unfledged juveniles occur between June 2 and July 2. The Shaft No. 6 site was visited by MPI on April 29, 2005. Individual cooper’s hawks or remnants of a cooper’s hawks nests were not observed during of the site visit.

**TABLE 3-8**  
**AVIAN SPECIES POTENTIALLY OCCURRING IN THE VICINITY OF**  
**SHAFT NO. 6**  
**As observed between 2000 and 2004**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>
Mallard	<i>Anas platyrhynchos</i>	Eastern Bluebird	<i>Sialia sialis</i>
Black-crowned Night-Heron	<i>Nycticorax nycticorax</i>	Veery	<i>Catharus fuscescens</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Mute Swan	<i>Cygnus olor</i>
Wild Turkey	<i>Meleagris gallopavo</i>	Mourning Dove	<i>Zenaida macroura</i>
Wood Duck	<i>Aix sponsa</i>	Blue-headed Vireo	<i>Vireo solitarius</i>
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Canada Goose	<i>Branta canadensis</i>
Sharp-shinned Hawk	<i>Accipiter striatus</i>	Cooper’s Hawk	<i>Accipiter cooperii</i>
Chimney Swift	<i>Chaetura pelagica</i>	Wood Thrush	<i>Hylocichla mustelina</i>
Alder Flycatcher	<i>Empidonax alnorum</i>	American Robin	<i>Turdus migratorius</i>
House Finch	<i>Carpodacus</i>	Gray Catbird	<i>Dumetella</i>



**TABLE 3-8**  
**AVIAN SPECIES POTENTIALLY OCCURRING IN THE VICINITY OF**  
**SHAFT NO. 6**  
**As observed between 2000 and 2004**

Common Name	Scientific Name	Common Name	Scientific Name
	<i>mexicanus</i>		<i>carolinensis</i>
Least Flycatcher	<i>Empidonax minimus</i>	Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>
Northern Mockingbird	<i>Mimus polyglottos</i>	Brown Thrasher	<i>Toxostoma rufum</i>
Pileated Woodpecker	<i>Dryocopus pileatus</i>	Cedar Waxwing	<i>Bombycilla cedrorum</i>
European Starling	<i>Sturnus vulgaris</i>	Yellow Warbler	<i>Dendroica petechia</i>
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	Blue-winged Warbler	<i>Vermivora pinus</i>
Downy Woodpecker	<i>Picoides pubescens</i>	American Redstart	<i>Setophaga ruticilla</i>
Eastern Phoebe	<i>Sayornis phoebe</i>	Ovenbird	<i>Seiurus aurocapilla</i>
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	Louisiana Waterthrush	<i>Seiurus motacilla</i>
Eastern Kingbird	<i>Tyrannus tyrannus</i>	Common Yellowthroat	<i>Geothlypis trichas</i>
Warbling Vireo	<i>Vireo gilvus</i>	Scarlet Tanager	<i>Piranga olivacea</i>
Red-eyed Vireo	<i>Vireo olivaceus</i>	Eastern Towhee	Pipilo <i>erythrophthalmus</i>
Yellow-throated Vireo	<i>Vireo flavifrons</i>	Chipping Sparrow	<i>Spizella passerina</i>
Blue Jay	<i>Cyanocitta cristata</i>	Song Sparrow	<i>Melospiza melodia</i>
American Crow	<i>Corvus brachyrhynchos</i>	Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>
Barn Swallow	<i>Hirundo rustica</i>	Indigo Bunting	<i>Passerina cyanea</i>
Black-capped Chickadee	<i>Poecile atricapillus</i>	Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Tufted Titmouse	<i>Baeolophus bicolor</i>	Common Grackle	<i>Quiscalus quiscula</i>
White-breasted Nuthatch	<i>Sitta carolinensis</i>	House Sparrow	<i>Passer domesticus</i>
House Wren	<i>Troglodytes aedon</i>	Baltimore Oriole	<i>Icterus galbula</i>
Carolina Wren	<i>Thryothorus ludovicianus</i>	American Goldfinch	<i>Carduelis tristis</i>
Northern Cardinal	<i>Cardinalis cardinalis</i>	Prairie Warbler	<i>Dendroica discolor</i>

Source: New York State Breeding Bird Atlas, NYSDEC.

Mammals identified in New York State that could be found in the vicinity of Shaft No. 6 would typically include: white-tailed deer (*Odocoileus virginianus*), gray squirrel



(*Sciurus carolinensis*), raccoon (*Procyon lotor*) and eastern cottontail (*Sylvilagus floridanus*).

Herpetiles that exist within the NYSDEC study block which encompasses Shaft No. 6 could potentially include the Eastern American toad (*Bufo americanus*), red-backed salamander (*Plethodon cinereus*), green frog (*Rana damitans melanota*), painted turtle (*Chrysemys picata*), eastern milk snake (*Lampropeltis triangulum*), and northern water snake (*Nerodia sipedon*). The study block defined by NYSDEC is approximately 33,804-acres in size.

Impacts to wildlife individuals unable to escape or flee the path of automobiles, heavy machinery, or excavating equipment could occur during site preparation and modification as a result of grading and placing of crushed stone to accommodate truck traffic and future stand-by generators, routing of new electrical service to the site to provide redundant electrical service, as well as storage of equipment in designated contractor lay down areas. Such activities would make it likely that wildlife individuals would not utilize affected areas for the duration of active work and a significant disruption to species population numbers or to the balance of wildlife communities is not anticipated to occur. Impacts are anticipated to be limited in scope and duration. Potential impacts on wildlife and wildlife habitat would be avoided and/or minimized through area layout, design, selection, and use of best management practices, and appropriate construction methods. These would include minimizing the area of disturbance, preserving, to the maximum extent practicable, the integrity of adjacent ecological communities.

### 3.7.5.5 Protected Species, Critical Environmental Areas, and Aquatic Ecology

According to the NYSDEC's Natural Heritage Program, the shortnose sturgeon (*Acipenser brevirostrum*) is known to occur in the Hudson River in the vicinity of Shaft No. 6. Supporting documentation is enclosed in Appendix B. This species is currently listed as "Endangered" by New York State and by the federal government.

Shaft No. 6 outfall is located in the Hudson River at River Mile (RM) 68 in Dutchess County, New York. The Hudson River is an estuary between its mouth at New York Harbor (RM 0) and Troy, NY (RM 153), i.e., connected to the ocean and subject to tidal effects.

Salinity is determined by an interaction of factors, such as tidal cycle and local precipitation; river reaches proximal to the outfall typically exhibit low salinity. Weekly mean salinity as measured during 1997 (March – October) in Cornwall, New York (RM 57) ranged from 0.1 to 2.0 parts per thousand (ppt); as Cornwall is downstream from the Project vicinity, it is likely to assume that salinity at the outfall does not typically exceed this range, though under unusual conditions (e.g., severe drought), salinity as high as 5.5 ppt has been observed in the area near the outfall.

The Hudson River ecosystem supports a dynamic and complex food web featuring many interrelated strata of biota. This varied aquatic community features a range of producers and consumers potentially found in the vicinity of the outfall, including fish,

phytoplankton, zooplankton, invertebrates (aquatic and benthic), and macrophytes. The salinity range observed in the in the area of the outfall (0.1 – 5.5 ppt) effectively limits significant use of the local habit to freshwater, estuarine, and diadromous species, as discussed below.

### Fish Species

The Hudson River contains fish species that are important from commercial, recreational, and ecological standpoints. Fish commonly found in the Hudson River within the vicinity of the outfall can be classified according to aquatic habitats. Diadromous species move freely between freshwater and marine habitats, and are further classified as either anadromous species, which typically live in salt water but migrate into freshwater to spawn, and catadromous species, which are usually found in freshwater but migrate into saline water to spawn. The American eel (*Anguilla rostrata*) is the only catadromous species common to the Hudson River. Some researchers consider the term anadromous to include fish that migrate upstream or inshore to spawn. Estuarine species are those capable of spending prolonged periods of time in either freshwater or saltwater. Freshwater species are fish usually restricted to areas with a salinity of <5.0 ppt.

Approximately 80 percent of the adult fish (by number of individuals) typically found near the outfall in the Hudson River belong to one of three anadromous species: American shad (*Alosa sapidissima*), striped bass (*Morone saxatilis*), and blueback herring (*Alosa aestivalis*). Juveniles of these and other anadromous species are especially numerous in the area of the outfall in late summer and fall (Applied Science Associates, 1999). While chemical contamination has led to bans on the commercial exploitation of fish such as the striped bass, the American shad remains a commercially important species. Additional anadromous species, such as rainbow smelt (*Osmerus mordax*) and alewives (*Alosa pseudoharengus*) can also be found in the vicinity of the outfall but are not commercially exploited.

Freshwater species common to the area of the outfall include spottail shiner (*Notropis hudsonius*), tessellated darter (*Etheostoma olmstedii*), largemouth bass (*Micropterus salmoides*), and smallmouth bass (*Micropterus dolomieu*). The estuarine species white perch (*Morone americana*) is also found in this reach of the river.

Although this region of the Hudson River is very important for numerous fisheries, the presence and persistence of polychlorinated biphenyls (PCBs), an industrial pollutant, and their importance from a human health perspective are a noteworthy concern. The New York State Department of Health (NYSDOH) 2005-2006 “Chemicals in Sportfish and Game Health Advisories” recommends that, because of possible PCB contamination, no channel catfish (*Ictalurus punctatus*), gizzard shad (*Dorosoma cepedianum*), and white catfish (*Ictalurus catus*) caught between the Bridge at Catskill to the Upper Bay of New York Harbor (a region that includes the area of the outfall) be eaten, and that American eel, Atlantic needlefish (*Strongylura marina*), bluefish (*Pomatomus saltatrix*), brown bullhead (*Ictalurus nebulosus*), carp (*Cyprinus carpio*), goldfish (*Carassius auratus*), largemouth bass, smallmouth bass, rainbow smelt, striped bass, walleye (*Stizostedion vitreum*), and white perch should be consumed no more than once per month, and that no

more than six blue crab (*Callinectes sapidus*) should be consumed per week. NYSDOH also recommends that infants, children under the age of 15, and women of childbearing age not eat any fish from this area (NYSDOH, 2006). New York State has banned commercial fishing for striped bass since 1976; however, recent NYSDEC studies indicate that PCB levels have declined in fish caught south of Poughkeepsie, New York. As a result, state officials have considered reopening the commercial fishery (*New York Times*, 1999). Despite the commercial ban, striped bass have remained popular as a recreational game fish on the Hudson River.

As previously mentioned, the area of the outfall is within the habitat range of shortnose sturgeon (*Acipenser brevirostrum*), which is listed both federally and by the NYSDEC as an endangered species. The shortnose sturgeon is the only currently protected aquatic species known to have a potential habitat, or occur as a transient, in the outfall area. The shortnose sturgeon is found in the Hudson River from the river mouth (RM 0) to the Federal dam Troy, NY (RM 152), mainly utilizing the brackish and freshwater zones of the River, and less frequently, marine waters. This species uses the river north of Coxsackie (RM 123) as a spawning ground (Bain, 1997). Little information is currently available on the distribution of early life stages of shortnose sturgeon in the Hudson, but some data indicates that larvae/early juveniles concentrate during May in the area between RM 120 – RM 150 (ASA 2001). Juveniles are thought to summer between RM 67-86, and to a lesser extent, RM 42-56. Between late fall and early winter most juveniles are thought to move to the area between RM 34-39 (Bain, 1997).

Atlantic Sturgeons are currently a federal species of concern (National Oceanic and Atmospheric Administration (NOAA) Office of Protected Resources Website). The federal government has instituted a ban on Atlantic Sturgeon fishing in the U.S. Exclusive Economic Zone (EEZ). The Atlantic Sturgeon fishery is closed year-round in New York State, and possession of the species is illegal in New York (NYSDEC Website, 2004). Atlantic sturgeons are anadromous, spending most of their life in marine waters, entering freshwaters to reproduce. Spawning males enter the Hudson River in early April; spawning females enter the River a few weeks later. Spawning occurs in the period May-June throughout RM 70-114, especially in the areas immediately south of Poughkeepsie (RM 75) and around RM 80 (north of Poughkeepsie/south of Kingston).

Larvae are thought to utilize the bottom of the River in deep channels between RM 43 – 100 as habitat from mid-May through mid-July, dispersed over the area, rather than concentrated in a few small locations. Juveniles are distributed over much of the Hudson River from July through September, though high numbers have been observed in one section of the River (RM 43-48). Later in the year, as water temperatures drop, overwintering juveniles congregate in deep waters between the George Washington Bridge and the Bear Mountain Bridge. Juveniles leave the estuary after 2-6 years, migrating to marine waters (ASA, 2001).

## Primary Producers

Phytoplankton, Submerged Aquatic Vegetation (SAV), and benthic macroalgae are primary producers that often form the basis of the food web in the aquatic environment. phytoplanktons are defined as microscopic plants (e.g., algae) whose movements within a system are largely driven by prevailing currents. Several species attain larger sizes as chains or in colonial forms. SAV are rooted vascular plants that are often found in shallow areas of estuaries. Benthic macroalgae are large, multicellular algae that can be important primary producers in estuarine, marine, and near shore environments. Since primary producers require sunlight as their primary energy source, their productivity, biomass, and depth distribution are limited by such factors as light penetration, nutrients, and turbidity.

Throughout most of the year, diatoms are the dominant algal group in the fresh and brackish water zones of the Hudson River. Diatoms are especially abundant in spring and fall, when temperatures are lower and river flow usually increases. Green algae, most numerous in typical summer conditions of high temperate and low river flow, are common in the lower, more saline reaches of the estuary. A third algal group, cyanobacteria, becomes abundant only in late summer and early fall (Applied Science Associates, 1999). Other algal groups found in the freshwater zone of the Hudson River are euglenoids, chrytomonads, and dinoflagellates. Freshwater Hudson River phytoplankton biomass has decreased significantly in the last few years. Some researchers speculate that this reduction may be caused by the filter-feeding zebra mussel (*Dreissena polymorpha*), which, beginning in 1991, has established itself in great numbers in the estuary (Applied Science Associates, 1999).

The generally turbid nature of the Hudson River limits potential macrophytic plant habitat to shallow, nearshore areas. The exotic, or introduced species, water chestnut (*Trapa natans*), is the estuary's dominant aquatic macrophyte upstream of Constitution Island (Applied Science Associates, 1999).

## Zooplankton

Zooplanktons are an integral component of aquatic food webs. Zooplanktons are primary grazers on phytoplankton and detritus, and are consumed by organisms of higher trophic levels as food. The higher level consumers of zooplankton typically include forage fish species and early life stages of commercially and recreationally important species, such as striped bass and white perch.

Zooplankton can be classified according to size. Microzooplankton refers to the smallest organisms, such as rotifers, tintinnids, and copepod nauplii. Mesozooplankton refer to those organisms retained on 200-micron\* nets and include copepod adults and copepodites, cladocerans, decapod larvae, barnacle nauplii, and polychaete nauplii.

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\* A micron ( $\mu$ ) is equal to one-millionth ( $1/1,000,000$ ) of a meter.

Macrozooplankton refer to those organisms retained on 505-micron mesh nets and commonly include amphipods, mysids, decapods, and cumaceans.

The freshwater invertebrate zooplankton community of the Hudson River is typically dominated by copepods (e.g., *Diacyclops bicuspidatus thomasi*), cladocerans (*Bosmina longirostris*), and rotifers (*Polyarthra* spp.). Certain Hudson River invertebrate zooplankton populations have decreased in the last decade; though some researchers attribute this to the recent rise in zebra mussel populations, others claim that the observed decline in abundance predates this, and that the underlying cause is yet to be determined (Applied Science Associates, 1999).

### **Benthic Invertebrates**

Organisms that inhabit the sediments and surfaces of submerged objects such as rock, pilings, or debris are commonly referred to as benthic invertebrates. These organisms are important in the energy flow of the ecosystem. Some use detrital and suspended organic material as food sources and, in turn, are important in the diet of ecologically and commercially important fish species and waterfowl. Benthic macroinvertebrates are generally grouped into two categories: epifauna (species living on top of the substratum) and infauna (species living in the substratum). Additionally, invertebrates are grouped according to the type of equipment used to sample them.

Benthic invertebrate community composition in the vicinity of the outfall is greatly influenced by sediment type. Sediments in the river's main channel consist of silt, detritus, and fine sand at Hudson, NY (Simpson et al., 1985), conditions typically associated with deposit feeding, rather than filter feeding organisms.

Macrobenthic invertebrates commonly found in the freshwater zone of the Hudson include oligochaete tubificid worms (*Limnodrilus hoffmeisteri*), chironomids (*Tanytarsus guerlus*), amphipods (*Gammarus* species), isopods (*Cyathura polita*), and bivalves (*Pisidium casertanum*), all fairly typical freshwater forms (Simpson et al., 1985).

The zebra mussel (*Dreissena polymorpha*), indigenous to Central Europe, was accidentally introduced into the Great Lakes in the 1980's, and has subsequently spread throughout areas of the Northeastern and Midwestern United States, including the Hudson River. This organism has since increased in number dramatically, and come to dominate benthic communities in many locations (Strayer et al, 1999).

Dredging and installation of the riprap apron adjacent to the Shaft No. 6 outfall would involve the removal of 186-cubic yards of sediment. Dredging purposely changes the bathymetry of the affected area, but the targeted amount of sediment to be removed would limit the impacted bottom to a relatively small area (215-square yards). Other impacts would include removal of sediment and sedentary members of the current benthic community; most of these organisms would be invertebrates, although the eggs and/or larval stages of some fish species could also possibly be affected. Such impacts would be short in duration and limited in area. The potentially impacted species may be capable of exploiting the extensive habitat available in the greater, unaffected portion of

the estuary during the short period of time that any disturbances resulting from the Project may occur. The relatively small, affected area of river bottom would likely be re-colonized by benthic invertebrates from the surrounding area in the spring or fall following completion of dredging, depending on the timing of completion (Schaffner et al, 2002). In addition, replacement of the existing bottom which is comprised of large diameter stones and/or coarse material with a riprap apron would not result in a significant change to the existing habitat type.

Fish residing in Hudson River thermal plume areas from continuously operating outfalls (i.e., power plants) may become metabolically acclimated to the warmer temperatures in winter. In the event of an emergency shutdown where the heated discharge is interrupted for a prolonged period of time, the potential exists for fish to be cold-shocked upon being exposed to cooler ambient temperatures in a relatively short period of time.

Since the Shaft No. 6 outfall does not produce a heated discharge, and is not continuously operating, a thermal plume area would not occur. In addition, the temperature of discharged non-chlorinated drinking water that has passed through the tunnel in winter would likely be similar to the ambient temperatures of the Hudson River. Thus, because tunnel blow-off and pump testing operations would result in the discharge of Rondout-West Branch Tunnel water to the Hudson River, there should not be any issues related to the temperature of these discharges.

Water in the shaft is approximately 45°F year-round. Thus, if the shaft is dewatered during winter, this discharge would not result in the formation of a thermal plume. During warmer months, fish exposed to cooler temperatures within the area of influence resulting from a discharge would not be impacted because they can avoid this relatively small cooler area by moving to a much larger, more thermally stable aquatic environment within the Hudson River.

There would be no impingement or entrainment impacts to fish or ichthyoplankton respectively, since the intake at the HRPS would not be operational during Shaft No. 6 shaft dewatering, blow-off, or pump testing operations.

There is a relatively small, linear mapped SAV bed at the shoreline near the outfall. The installation of a riprap apron within the zone of influence at the Shaft No. 6 outfall discharge area would comply with NYSDEC outfall engineering guidelines, and is required by NYSDEC as a preventative measure against scouring Hudson River intertidal bottom during blow off operations.

Minimizing impacts to SAV beds as result of dredging can be accomplished by scheduling the dredge event during seasonal and/or daily periods that would result in a reduction of exposure to disturbed sediments. Dredging should occur when vegetation is dormant outside of the growing season so as not to impact live plants. The dredging operation should be conducted in a manner that results in a minimal disturbance of the sediment to minimize turbidity impacts. One method which may be employed to achieve this goal would be conducting the dredge operation at lower tidal cycles since the

majority of the proposed riprap apron area is exposed during these segments of the tidal cycle.

Implementation of measures included in the SESC plan, and adherence to conditions of the USACE and NYSDEC permits, and best management practices (BMPs) would further minimize adverse effects to aquatic species. BMPs, in this case, would include the following:

- Dredging is prohibited between April 1 and August 31;
- Dredge spoil is to be placed at an upland site;
- If a bucket dredge is employed, a closed bucket dredge must be used;
- The dredging operation shall be conducted in a manner that results in a minimal disturbance of the sediment to minimize impacts to biota at the site (to be achieved by dredging at low tide since much of the proposed riprap apron area is exposed during this segment of the tidal cycle);
- If dredged material is stockpiled on land, there shall be no runoff back into the Hudson River;
- No barge overflow is allowed during dredging (if a barge is used);
- Once the barge is full, the dredge material shall be allowed to settle. Only after settling would overlying water be allowed to be pumped back into the river;
- No hosing down or rinsing of sediments off the sides and gunwales of the barge is permitted;
- If any fish kills are observed during the dredging operation, dredging shall cease and notification shall be provided to the appropriate Region 3 NYSDEC office.

In addition, silt curtains and silt fencing would be used to minimize the transport of fine particulates from construction work zones to the River.

According to the NYSDEC Division of Environmental Permits' letter dated May, 19, 2005 (enclosed in Appendix B), there are no CEAs located at, or near to, Shaft No. 6.

Therefore, overall, it is not anticipated that the proposed work would result in a significant adverse impact to natural resources at Shaft No. 6 or in the vicinity.

### **3.7.6 Shaft No. 8**

#### **3.7.6.1 Soils and Groundwater**

Shaft No. 8 is located on approximately 0.92-acres of NYCDEP-owned property. The area immediately surrounding the Shaft No. 8 and proposed work site is relatively flat, although the surrounding terrain is moderately to steeply sloped. Slopes range from 2 to 20 percent. Soils at the site are moderately to well drained. These soils have alternating layers which can range from sand to silt to loam, and variable amounts of rock fragments (Putnam County Soil Survey, 1994). According to the United States Department of Agriculture (USDA), the depth to the water table within the general area of the site is 1.64 to 3.28-feet and the depth to bedrock at the site is 3.33 to 5-feet below

the surface. No site specific information was available regarding depth to groundwater during the construction of Shaft No. 8. In addition, no site specific information was available regarding the below-grade depth to the surface of the water table at Shaft No. 8. Area depths to the water table and to bedrock would vary with ground surface elevations and would be much greater in high-lying areas that contain a large amount of fill material placed on the site during tunnel construction.

Disturbance of approximately 0.8-acres of soils during site work may result in mobilization of fine grain sediments during storm events. Stormwater runoff practices and SESC techniques would be implemented to control stormwater runoff and prevent soil from leaving the shaft site. The proposed Project would not require the use of groundwater. There would be some grading and excavation of soil around the shaft site. The depth of excavation at the site is not anticipated to exceed 2.5-feet for the purpose of roadway grading and utility installation, except where three handholes would be installed along each of the utility encasements (electric and telephone), for a total of six handholes along the entire length of the NYCDEP access easement. Installation of these handholes would require excavation of approximately six feet of soil at each handhole location. Excavated soils may be reused for regrading at the shaft site. Therefore, it is not anticipated that groundwater would be encountered during excavation activities, except at the handhole installation locations. If groundwater is encountered, it would be dewatered, tested and removed from site in accordance with all applicable regulations. Therefore, the proposed Project would not have a significant adverse impact on soils or groundwater quantity or quality.

### 3.7.6.2 Surface Waters, Wetlands, and Floodplains

Three unnamed tributaries meet just to the north of Route 301 with surface flow continuing in a southeasterly direction through another unnamed tributary to a wetland area southeast of Shaft No. 8. Flows from all three tributaries originate from a water source beyond the study area. One tributary from the northwest and one from the southwest originate from two separate wetland areas while the third tributary originates from an unnamed pond. The nearest segment of this tributary system is approximately 415-feet to the north of the shaft site. Surface flow from this collection of unnamed tributaries eventually reaches Sagamore Lake. All tributaries within the study area are classified as Class C surface waters. The best usage identified for Class C waters is fishing.

Ten federally designated, two state designated wetland areas, as well as eight delineated wetlands by Habitat Management & Design, Inc. in 2003 were identified within the study area. Of the ten federally designated wetlands identified from NWI mapping, five are designated as freshwater forested/shrub wetland, three as freshwater pond, and two as freshwater emergent wetland. A relatively small segment of a mapped Class II NYSDEC Freshwater wetland (Wetland OL-9) falls just within the study area to the southeast of Shaft No. 8. The closest wetland to the Shaft No. 8 site is a NYSDEC Freshwater wetland (Wetland OL-58) which was also delineated by Habitat Management & Design, Inc. and located approximately 125-feet to the northwest. There are no areas identified within the study area of Shaft No. 8 that fall within FEMA flood zones.

No surface waters, wetlands or flood zones were identified on the Shaft No. 8 site. The nearest delineated wetland edge to the proposed route of electrical service to the shaft site from an existing power utility pole is approximately 30-feet beyond the site but still within a segment of NYCDEP property. Since site preparation and modification activities would avoid this delineated wetland as well as not occur within any of the resources identified in this section, impacts to these resources would not occur. However, the proposed site preparation and modification activities occurring on the site access road, specifically the installation of a gravel surface to minimize trafficable mud, would be located within 100-foot buffer of Wetland OL-58 which is regulated by New York State and the Town of Putnam Valley. Pursuant to Article 24 of the NYS Environmental Conservation Law and Chapter 144 of the Code of the Town of Putnam Valley, any activity, including grading and deposition of any soil, stones, sand, or gravel, located within 100-feet of a freshwater wetland would require a freshwater wetlands permit from both of these agencies. Permit applications would be submitted to the NYSDEC and the Code Enforcement Officer of the Town of Putnam Valley and describe the location of the proposed activity relative to designated wetlands, estimated quantities of material of excavation or fill required for the Project, mitigation measures to minimize impacts to freshwater wetlands and its transition area, and contain all other pertinent and required Project information. Disturbance to the subject wetland would be minimized by the implementation of a site-specific erosion and sediment control plan that stipulates the use of various protection measures including:

- The installation of silt fencing around any soil stockpiles and down gradient from all disturbed areas,
- The use of a temporary construction entrance to reduce the tracking of sediment from the Project site,
- The installation of 2-foot high protective fencing around trees not marked for removal,
- Sprinkling of access roads and other surfaces to prevent dust generation, and
- Planting of a vegetative buffer strip along the western side of the access roadway to filter sediments from runoff and reduce sediment transport to the wetlands.
- In addition to these measures, all specified permit conditions elaborated in either the NYSDEC Freshwater Wetlands Permit or Town of Putnam Valley permit to minimize temporary and permanent impacts to these wetland buffer areas will also be followed.

### 3.7.6.3 Dominant Vegetation

The Shaft No. 8 access road is comprised of compacted soil and gravel. The shaft site is located within an area that has been impacted by historical activities so that the surface substrate primarily consists of small stones and pebbles and unearthened bedrock. The earthen berm over the shaft cap is located within a square-shaped perimeter and is periodically mowed. Beyond the limits of impacted area, an area of successional trees transitions to a mature forest community comprised of mixed hardwoods surrounding the NYCDEP Shaft No. 8 site.

Vegetative species found sparsely growing on the stones/pebbles and unearthed bedrock included common cinqfoil (*Potentilla simplex*), moth mullein (*Verbascum blattaria*) and mayweed (*Anthemis cotula*). In addition to these three species, growing within the fenced shaft site were common mullein (*Verbascum thapsus*), common dandelion (*Taraxcum officinale*), poison ivy (*Toxicodendron radicans*), quaking aspen (*Populus tremuloides*) seedlings, garlic mustard (*Alliara petiolata*), Virginia creeper (*Parthenocissus quinquefolia*), and fragrant bedstraw *Galium triflorum*.

Successional tree species in the vicinity of the shaft site included quaking aspen (*Populus tremuloides*), eastern red cedar (*Juniperus virginiana*) and gray birch (*Betula populifolia*) mixed with shrubs consisting of multiflora rose (*Rosa multiflora*) and Japanese barberry (*Berberis thunbergii*). The mixed hardwood forest community was comprised of several tree species that included sweet birch (*Betula lenta*), shag bark hickory (*Carya ovata*), American beech (*Fagus grandifolia*), red oak (*Quercus rubra*), white oak (*Quercus alba*), mistletoe (*Phoradendron serotina*), white ash (*Fraxinus Americana*), chestnut oak (*Quercus prinus*), striped maple (*Acer pensylvanicum*), yellow birch (*Betula alleghaniensis*) and tulip tree (*Liriodendron tulipifera*). Shrub species within this forest community consisted of mountain laurel (*Kalmia latifolia*) and witch hazel (*Hamamelis virginiana*). A tree survey completed on August 17, 2005 and November 2, 2005 inventoried 120 trees in order to appropriately characterize the surrounding environment and to determine the number of trees to be removed in order to allow for alternative access and egress methods to the site. Of these 120 trees with a dbh  $\geq$ 6-inches, 55 trees may be removed to complete the proposed work. Trees in the immediate vicinity of the proposed perimeter fence line may be removed as NYCDEP Police and security personnel have indicated that such trees pose an unacceptable security risk. Further, to prepare the Shaft No. 8 site for its intended uses, certain portions of the site require significant regrading. Where regrading is proposed, trees may be removed to allow for unobstructed use of those areas. Finally, trees located outside of the perimeter fence line at Shaft No. 8, but within the existing NYCDEP easement leading from Route 301 to the Shaft No. 8 site, may be removed in order to perform necessary roadway improvements. Trees with a minimum requirement of 6-inch dbh were surveyed for Shaft No. 8, since the Putnam Valley Town Code, Part II General Legislation, Chapter 161-3 Tree Cutting, defines a tree as follows: "A woody perennial, either deciduous or coniferous, having a diameter six inches or greater measured 4.5-feet above ground level (dbh thereafter), but excepting the following species: Poison Sumac (*Rhus vernix*), Shining Sumac (*Rhus copallina*), Smooth Sumac (*Rhus glabra*), Staghorn Sumac (*Rhus typhina*), and Japanese Lacquer-Tree (*Rhus verniflora*). A summary of these trees is provided in Table 3-9 below.

**TABLE 3-9  
SHAFT NO. 8 TREE SURVEY  
COMPLETED AUGUST 17 AND NOVEMBER 2, 2005**

<b>Tag Number</b>	<b>dbh (inches)</b>	<b>Split*</b>	<b>Common Name</b>	<b>Species</b>	<b>Comments</b>
45	6.7	No	<i>White Ash</i>	<i>Fraxinus Americana</i>	Good Health
46	7.7	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
47	7.4	No		Unidentified	Good Health
48	7.2	No	<i>White Ash</i>	<i>Fraxinus Americana</i>	Good Health
49	6.6	No	<i>White Ash</i>	<i>Fraxinus Americana</i>	Good Health
50	7.4	No	<i>White Ash</i>	<i>Fraxinus Americana</i>	Good Health
51	6.2 & 4.9	Yes	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
52	6.7	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
53	6.4	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
54	6.7	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
55	6.0	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
56	7.9	No	<i>Black Locust</i>	<i>Robinia pseudoacacia</i>	Good Health
57	6.0	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
58	7.0	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
59	6.8	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
60	6.6	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
61	7.3	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
62	6.7	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
63	6.8	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
64	6.5	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
65	7.8	No	<i>Quaking Aspen</i>	<i>Populus</i>	Good Health

**TABLE 3-9  
SHAFT NO. 8 TREE SURVEY  
COMPLETED AUGUST 17 AND NOVEMBER 2, 2005**

Tag Number	dbh (inches)	Split*	Common Name	Species	Comments
				<i>tremuloides</i>	
66	7.3	No	<i>Black Birch</i>	<i>Betula lenta</i>	Good Health
67	7.6	No	<i>Black Birch</i>	<i>Betula lenta</i>	Good Health
68	7.0	No	<i>Yellow-poplar</i>	<i>Liriodendron tulipifera</i>	Good Health
69	7.0	No	<i>Black Birch</i>	<i>Betula lenta</i>	Good Health
70	6.5	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
71	6.8	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
72	6.3 & 5.4	Yes	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
73	6.6	No	<i>Black Birch</i>	<i>Betula lenta</i>	Good Health
127	13.5	No	<i>Sycamore</i>	<i>Platanus occidentalis</i>	Good Health
128	10.6	No	<i>Yellow-poplar</i>	<i>Liriodendron tulipifera</i>	Good Health
129	14.8	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
130	8.0	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
131	11.2	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
132	11.0	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
133	12.1	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
134	10.7	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
135	12.7	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Poor Health
136	10.9	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Poor Health
137	8.9	No	<i>Black Locust</i>	<i>Robinia pseudoacacia</i>	Good Health
138	14.8	No	<i>Eastern Cottonwood</i>	<i>Populus deltoides</i>	Good Health
139	9.0	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
140	8.0	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health



**TABLE 3-9  
SHAFT NO. 8 TREE SURVEY  
COMPLETED AUGUST 17 AND NOVEMBER 2, 2005**

<b>Tag Number</b>	<b>dbh (inches)</b>	<b>Split*</b>	<b>Common Name</b>	<b>Species</b>	<b>Comments</b>
141	9.1	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
142	10.1	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
143	9.0	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
144	9.1	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
145	10.0	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
146	14.1	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
147	8.8	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
148	10.8	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
149	8.0	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
150	10.7	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
151	8.0	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
152	8.0	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
153	15.3	No	<i>Eastern Cottonwood</i>	<i>Populus deltoides</i>	Good Health
154	11.4	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
155	9.7, 10.5 & 9.5	Yes	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
156	12.2	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
157	12.4	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
158	9.0	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
159	8.3	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
160	8.3	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
161	10.0	No	<i>Quaking Aspen</i>	<i>Populus</i>	Poor Health



**TABLE 3-9  
SHAFT NO. 8 TREE SURVEY  
COMPLETED AUGUST 17 AND NOVEMBER 2, 2005**

Tag Number	dbh (inches)	Split*	Common Name	Species	Comments
				<i>tremuloides</i>	
162	9.1	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
163	8.8	No	<i>White Ash</i>	<i>Fraxinus americana</i>	Good Health
164	8.6	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
165	9.5	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
166	11.7	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
167	9.8	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
168	14.5	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
169	12.7	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
170	10.4	No	<i>Yellow-poplar</i>	<i>Liriodendron tulipifera</i>	Good Health
171	11.1	No	<i>Yellow-poplar</i>	<i>Liriodendron tulipifera</i>	Good Health
172	16.0	No	<i>Eastern Cottonwood</i>	<i>Populus deltoides</i>	Good Health
173	8.8 & 6.3	Yes	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
174	14.3	No	<i>Eastern Cottonwood</i>	<i>Populus deltoides</i>	Good Health
175	9.0	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
176	8.1	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
177	9.6	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
178	8.1	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Fair Health
179	10.7	No	<i>Sugar Maple</i>	<i>Acer saccharum</i>	Good Health
180	9.6	No	<i>Sweet Birch</i>	<i>Betula lenta</i>	Good Health
181	16.5	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Poor Health, trunk partially hollow



**TABLE 3-9  
SHAFT NO. 8 TREE SURVEY  
COMPLETED AUGUST 17 AND NOVEMBER 2, 2005**

<b>Tag Number</b>	<b>dbh (inches)</b>	<b>Split*</b>	<b>Common Name</b>	<b>Species</b>	<b>Comments</b>
182	9.5	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
183	10.8	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
184	10.2	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
<b>Trees below are associated with possible easement / road change</b>					
74	9.8	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
75	6.6 & 6.1	Yes	<i>Black Birch</i>	<i>Betula lenta</i>	Good Health
76	6.4	No	<i>Black Birch</i>	<i>Betula lenta</i>	Good Health
77	12.4	No	<i>Black Birch</i>	<i>Betula lenta</i>	Good Health
78	9.8	No	<i>Black Birch</i>	<i>Betula lenta</i>	Good Health
79	6.3	No	<i>Black Birch</i>	<i>Betula lenta</i>	Good Health
80	13.9	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
650	6.1	No	<i>Black Locust</i>	<i>Robinia pseudoacacia</i>	Good Health
651	15.3	Yes	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health (split dead)
652	9.8	No	<i>Black Birch</i>	<i>Betula lenta</i>	Good Health
653	6.7	No	<i>Yellow-poplar</i>	<i>Liriodendron tulipifera</i>	Good Health
654	6.9	No	<i>Sugar Maple</i>	<i>Acer saccharum</i>	Good Health
655	13.1	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
656	10.5	No	<i>Yellow-poplar</i>	<i>Liriodendron tulipifera</i>	Good Health
657	7.5	No	<i>Gray Birch</i>	<i>Betula populifolia</i>	Good Health
658	9.4	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
659	10.6	No	<i>Yellow-poplar</i>	<i>Liriodendron tulipifera</i>	Good Health
660	7.0	No	<i>American Elm</i>	<i>Ulmus americana</i>	Good Health
661	8.5	No	<i>Yellow-poplar</i>	<i>Liriodendron tulipifera</i>	Good Health
662	6.4	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health



**TABLE 3-9  
SHAFT NO. 8 TREE SURVEY  
COMPLETED AUGUST 17 AND NOVEMBER 2, 2005**

<b>Tag Number</b>	<b>dbh (inches)</b>	<b>Split*</b>	<b>Common Name</b>	<b>Species</b>	<b>Comments</b>
663	12.4	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
664	9.4	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
665	6.3	No	<i>Sugar Maple</i>	<i>Acer saccharum</i>	Good Health
666	6.0	No	<i>Gray Birch</i>	<i>Betula populifolia</i>	Good Health
667	8.8	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
668	8.1	No	<i>Red Oak</i>	<i>Quercus rubra</i>	Good Health
669	7.2	No	<i>Sugar Maple</i>	<i>Acer saccharum</i>	Good Health
670	10.1	No	<i>Sugar Maple</i>	<i>Acer saccharum</i>	Good Health
671	6.0	No	<i>Sugar Maple</i>	<i>Acer saccharum</i>	Good Health
672	9.8	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Good Health
673	8.7	No	<i>Quaking Aspen</i>	<i>Populus tremuloides</i>	Poor Health
674	11.8	No	<i>Black Birch</i>	<i>Betula lenta</i>	Good Health
675	10.3	No	<i>Black Birch</i>	<i>Betula lenta</i>	Good Health

\* Trees were analyzed based upon whether or not they were split into separate branches, stemming from a common trunk to present an accurate representation of their condition at the time of the survey, their dominance with respect to aerial coverage and potential wildlife usage resulting from this growth pattern.

Disturbance of 0.79-acres of mowed vegetation growing within the shaft site’s perimeter fence would be expected to occur during site preparation and modification associated with the removal of the earthen berm to access the shaft, construction of a foundation for head frame support, installation of a new perimeter fence, routing of electrical service to the site from an existing power utility pole, improving the access roadway and resurfacing an area of the shaft with crushed stone. It is likely that some tree removal would be required to complete these proposed activities. The number of trees removed would not exceed 55 of the 120 trees identified in Table 3-9. The removal of trees located within 20 ft of a parcel’s property boundary requires a tree-clearing permit pursuant to Chapter 161 of the code of the Town of Putnam Valley. A permit application would be submitted to the Code Enforcement Officer of the Town of Putnam Valley and would include descriptions of the size, number, location and type of trees to be removed, plans for removal of cut trees from the site, and all other pertinent and required information.



The trees that may be removed during the proposed Project are typical of successional northern hardwoods forest communities (New York Natural Heritage Program, 2002) which re-colonize lands after historical disturbance. Successional northern hardwoods, often dominated by *Populus tremuloides*, exhibit a different species composition than the more mature mixed hardwood forest community found in areas surrounding the shaft site. These mixed hardwood forests are characterized by red maple hardwood swamp communities in low lying areas and Appalachian oak-hickory forest communities in the uplands. The surrounding NYCDEP-owned Water Supply lands are comprised of approximately 555-acres of forested areas consisting largely of mature mixed hardwood forests. The Shaft No. 8 site, located on 0.91-acres, is not entirely forested due to the presence of the shaft cap, which is entirely void of trees, and is not covered by the adjacent forest canopy. The land area at the shaft site to be cleared of trees is small (0.91 acres relative to 555 acres of surrounding forest on NYCDEP property) and is not considered a significant impact to the surrounding forested area. The trees located in this area are largely early-successional species and are both young and small (less than 16 inches in dbh). As a result, the proposed clearing of this recently re-colonized forest edge would not result in significant negative impacts to unique plant species or sensitive habitats or to the ecological functions provided by the surrounding mature forest such as the forest's gross primary productivity, the forest's contribution to nutrient and water cycling, and the use of the forest as habitat for wildlife. The percent of trees removed would not result in a significant loss of the overall habitat quality of the surrounding forest. Due to security reasons no trees within the shaft site will be replanted.

#### 3.7.6.4 Wildlife Resources

Birds observed by volunteers as part of the NYSDEC Breeding Bird Survey from 2000 through 2004 in the vicinity of the Project area are listed in Table 3-10 (NYSDEC Breeding Bird Atlas, 2005). It is worth noting that the red shouldered hawk (*Buteo lineatus*), a NYSDEC Species of Special Concern, was listed in the Atlas as observed in the NYSDEC defined study block that encompasses Shaft No. 8. Each study block defined by NYSDEC is approximately 6,020-acres in size. Species of Special Concern are considered to be at risk of becoming either endangered or threatened, but are not given any legal protection at this time. As this species was not listed by the NYSDEC Natural Heritage Program as occurring in this vicinity, the NYSDEC Breeding Bird Atlas entry specifically referred to a "possible breeding" encounter where the species was observed in possible nesting habitat, but no other indication of breeding was noted. According to Breeding Season dates for red-shouldered hawk as identified on the NYSDEC website, egg dates for red-shouldered hawk fall between March 25 and May 26. The incubation period is 23 to 25 days and unfledged juveniles occur between May 5 and July 5. The Shaft No. 8 site was visited by MPI on May 5, 2005, August 17, 2005 and again on November 2, 2005. Individual red-shouldered hawks or remnants of a red-shouldered hawk nest were not observed during any of these site visits.

**TABLE 3-10**  
**AVIAN SPECIES POTENTIALLY OCCURRING IN THE VICINITY OF**  
**SHAFT NO. 8**  
**As observed between 2000 and 2004**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Common Name</b>	<b>Scientific Name</b>
Mallard	<i>Anas platyrhynchos</i>	Eastern Bluebird	<i>Sialia sialis</i>
Red-shouldered Hawk	<i>Buteo lineatus</i>	Veery	<i>Catharus fuscescens</i>
Red-tailed Hawk	<i>Buteo jamaicensis</i>	Hermit Thrush	<i>Catharus guttatus</i>
Wild Turkey	<i>Meleagris gallopavo</i>	Mourning Dove	<i>Zenaida macroura</i>
Belted Kingfisher	<i>Ceryle alcyon</i>	Blue-headed Vireo	<i>Vireo solitarius</i>
Blue-grey Gnatcatcher	<i>Poliophtila caerulea</i>	Canada Goose	<i>Branta canadensis</i>
Black-throated Green Warbler	<i>Dendroica virens</i>	Northern Waterthrush	<i>Seiurus noveboracensis</i>
Turkey Vulture	<i>Cathartes aura</i>	Wood Thrush	<i>Hylocichla mustelina</i>
Canadian Warbler	<i>Wilsonia canadensis</i>	American Robin	<i>Turdus migratorius</i>
House Finch	<i>Carpodacus mexicanus</i>	Gray Catbird	<i>Dumetella carolinensis</i>
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>
Northern Flicker	<i>Colaptes auratus</i>	Hairy Woodpecker	<i>Picoides villosus</i>
Pileated Woodpecker	<i>Dryocopus pileatus</i>	Cedar Waxwing	<i>Bombycilla cedrorum</i>
Eastern Wood-Pewee	<i>Contopus virens</i>	Yellow Warbler	<i>Dendroica petechia</i>
Red-bellied Woodpecker	<i>Melanerpes carolinus</i>	Black- and -white Warbler	<i>Mniotilta varia</i>
Downy Woodpecker	<i>Picoides pubescens</i>	American Redstart	<i>Setophaga ruticilla</i>
Eastern Phoebe	<i>Sayornis phoebe</i>	Ovenbird	<i>Seiurus aurocapilla</i>
Great Crested Flycatcher	<i>Myiarchus crinitus</i>	Louisiana Waterthrush	<i>Seiurus motacilla</i>
Eastern Kingbird	<i>Tyrannus tyrannus</i>	Common Yellowthroat	<i>Geothlypis trichas</i>
Warbling Vireo	<i>Vireo gilvus</i>	Scarlet Tanager	<i>Piranga olivacea</i>
Red-eyed Vireo	<i>Vireo olivaceus</i>	Eastern Towhee	Pipilo <i>erythrophthalmus</i>
Yellow-throated Vireo	<i>Vireo flavifrons</i>	Chipping Sparrow	<i>Spizella passerina</i>
Blue Jay	<i>Cyanocitta cristata</i>	Song Sparrow	<i>Melospiza melodia</i>
American Crow	<i>Corvus brachyrhynchos</i>	Rose-breasted Grosbeak	<i>Pheucticus ludovicianus</i>
Barn Swallow	<i>Hirundo rustica</i>	Indigo Bunting	<i>Passerina cyanea</i>

**TABLE 3-10**  
**AVIAN SPECIES POTENTIALLY OCCURRING IN THE VICINITY OF**  
**SHAFT NO. 8**  
**As observed between 2000 and 2004**

Common Name	Scientific Name	Common Name	Scientific Name
Black-capped Chickadee	<i>Poecile atricapillus</i>	Red-winged Blackbird	<i>Agelaius phoeniceus</i>
Tufted Titmouse	<i>Baeolophus bicolor</i>	Common Grackle	<i>Quiscalus quiscula</i>
White-breasted Nuthatch	<i>Sitta carolinensis</i>	Brown-headed Cowbird	<i>Molothrus ater</i>
House Wren	<i>Troglodytes aedon</i>	Baltimore Oriole	<i>Icterus galbula</i>
Carolina Wren	<i>Thryothorus ludovicianus</i>	American Goldfinch	<i>Carduelis tristis</i>
Northern Cardinal	<i>Cardinalis cardinalis</i>	Prairie Warbler	<i>Dendroica discolor</i>

Source: New York State Breeding Bird Atlas, NYSDEC.

Mammals identified in New York State that could be found in the vicinity of Shaft No. 8 would typically include: white-tailed deer (*Odocoileus virginianus*), gray squirrel (*Sciurus carolinensis*), raccoon (*Procyon lotor*) and striped skunk (*Mephitis mephitis*).

Herpetiles that exist within the NYSDEC study block which encompasses Shaft No. 8 could potentially include Fowler’s toad (*Bufo fowleri*), Northern two-lined salamander (*Eurycea bislineata*), gray tree frog (*Hyla versicolor*), wood turtle (*Clemmys insculpta*), black rat snake (*Elaphe obsoleta obsoleta*), and northern ring neck snake (*Diadophis punctatus edwardsii*). The study block defined by NYSDEC is approximately 33,804-acres in size.

Impacts to wildlife individuals unable to escape or flee the path of automobiles, heavy machinery, or excavating equipment could occur during site preparation and modification as a result of removal of earthen berm to access the shaft, construction of the foundation for head frame support, installation of a new perimeter fence, routing of electrical service to the site, improvement of the access roadway and resurfacing an area of the shaft with crushed stone. At this time it is likely that some tree removal would be required to complete the proposed work. Such impacts are anticipated to be limited in scope and duration. Potential impacts on wildlife and wildlife habitat would be avoided and/or minimized through area layout, design, selection, and use of best management practices, and appropriate construction methods. These would include minimizing the area of disturbance, preserving, to the maximum extent practicable, the integrity of adjacent ecological communities.

### 3.7.6.5 Protected Species and Critical Environmental Areas

According to the NYSDEC’s Natural Heritage Program, a Hemlock-northern hardwood forest and a Chestnut oak forest are known to occur at Round Hill and associated ridges proximal to Shaft No. 8. Supporting documentation is enclosed in Appendix B. Natural Heritage has classified both communities as S4, i.e., “abundant and



apparently secure” in New York State. Approximately 55 trees are to be removed from the shaft site. The State classifies the S4 communities as abundant and secure, it is unlikely that removal of these trees would have a significant adverse impact to these communities.

The wood turtle (*Clemmys insculpta*), which is known to occur in the vicinity of Shaft No. 8 (NYSDEC Herp Atlas Project) is currently listed by NYSDEC as a species of special concern. Species of special concern are considered to be at risk of becoming either endangered or threatened, but are not given any legal protection at this time.

According to the NYSDEC Division of Environmental Permits’ letter dated May, 19, 2005 (enclosed in Appendix B), there are no CEAs located at, or near to, Shaft No. 8. Therefore, it is not anticipated that the proposed work would result in a significant adverse impact to natural resources at Shaft No. 8 or in the vicinity.

### 3.8 HAZARDOUS MATERIALS

A hazardous waste and contaminated materials screening was conducted to identify properties within the study area or directly adjacent to the shaft site that could potentially contain or function as a source of hazardous wastes or contaminated materials. The screening included site visits, a search of various environmental regulatory databases, a search of the NYCDEP BWS database, and other sources as described below.

An environmental database search was conducted within the study area using software provided by First Search Technology Corporation and in accordance with ASTM guidelines. The environmental regulatory databases included in the FirstSearch data report search are described below:

- The National Priority List (NPL) database is a subset of the Comprehensive Environmental Response, Compensation and Liability Information System (CERCLIS) database and identifies over 1,200 sites for priority cleanup under the Superfund program. The source of the NPL database is the United States Environmental Protection Agency (USEPA).
- The CERCLIS database contains data on potential hazardous waste sites that have been reported to the USEPA by states, municipalities, private companies and private persons, pursuant to Section 103 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). The source of the CERCLIS database is the USEPA. CERCLIS sites are further classified as FINAL (on NPL), NOT PROPOSED (for NPL yet) or no further remedial action planned (NFRAP).
- The Resource Conservation and Recovery Act Information System (RCRIS) database includes selected information on sites that generate, store, treat, or dispose of hazardous waste as defined by RCRA. The database identifies sites as

Treatment, Storage, Disposal Facilities (TSDFs), Large Quantity Generators (LQGs), Small Quantity Generators (SQGs), and/or Conditional Exempt Small Quantity Generator (CEG). The source of the RCRIS database is the USEPA.

- The Resource Conservation and Recovery Act Generator (RCRAGN) database contains information on hazardous waste generators listed under the Resource Conservation and Recovery Act (RCRA). The source of the RCRAGN database is the USEPA.
- The Emergency Response Notification System (ERNS) records and stores information on reported releases of oil and hazardous substances. The source of this database is the USEPA.
- The Facility Index System (FINDS) database contains both facility information and “pointers” to other sources of information that contain more detail. The source of the FINDS database is the USEPA/National Technical Information System (NTIS).
- PCB Activity Database (PADS) identifies generators, transporters, commercial storers and/or brokers, and disposers of PCBs who are required to notify the USEPA of such activities. The source of the PADS database is the USEPA.
- The STATE SITES database is a compilation of known or potential hazardous waste sites within a state.
- The SPILLS database (Oil & Chemical Spill Database) provides data on oil and chemical spills in the state of New York. Local state agencies are the source of this database.
- Solid Waste Landfills (SWL) database lists solid waste landfills. Local state agencies such as the NYSDEC are the source of this database.
- The Leaking Underground Storage Tank (LUST) database contains LUSTs registered in New York State. The sources of the LUST databases are the NYSDEC.
- The Underground Storage Tank (UST) database contains USTs registered in New York State, which are regulated under Subtitle I of RCRA. The sources of the UST databases are the NYSDEC.
- Historic/Landmark lists locations on the National Register of Historic Places.

Additional information was obtained from NYCDEP concerning sampling at the shafts conducted under the Legacy program.

### 3.8.1 REC and Shaft No. 1

Results of the database search for the REC indicated that there were no identifiable hazardous materials, hazardous, and non-hazardous treatment and storage facilities, and/or air and wastewater discharges directly on the Project site or within a ¼-mile of the REC. Some minor interior modifications would be made to the existing structure in order to construct and install the new LFD piping and valves. However, it is anticipated that there would be no potential significant adverse hazardous materials impacts as a result of the proposed Project at the REC.

A site visit of Shaft No. 1 was conducted on May 4, 2005. The shaft site and surrounding area is largely undeveloped. The area immediately around the shaft site is maintained lawn. The surrounding area is largely wooded.

The RCRAIN database search identified one “small” hazardous waste generator present within 1/8-mile of the shaft site; small generators are producers of 100 to 1,000 kilograms (kg) of hazardous waste per year. The generator is a conditionally exempt small quantity generator, since it is one that generates less than 100 kg/month of hazardous waste and is located down gradient from the shaft site. However, the exact source of the waste generation is not known at the present time.

The SPILLS 1990 database details spill incidents reported between the year 1990 and the present. This database search revealed two reported spills within 1/8-mile of the shaft site. The site of these spills is approximately 40-feet lower in elevation than the shaft site. One spill, which was attributed to ‘equipment failure’, occurred on February 9, 2001 and involved 1 gram of mercury. The second incident, reported as occurring on May 10, 2001, involved 1 liter of mercury. Both spills occurred on land located approximately 40 feet lower in elevation than the shaft site, and both incidents were reported as ‘closed’.

Site work at Shaft No. 1 is comprised of 4 feet of soil excavation, including the removal of the earthen berm to access the shaft. Approximately 700 cubic yards of soil would be removed from the shaft site, in accordance with applicable state regulations. Excavated soil would be sampled for characterization and disposal purposes. If excavated soil exhibits elevated levels of hazardous materials, a Construction Health and Safety Plan (CHASP) would be prepared and submitted for NYCDEP for approval. Preventative measures would include development of a site-specific health and safety plan by the contractors responsible for the proposed rehabilitation work at this site to eliminate the potential risk posed by these materials to the safety of its workers, and to the surrounding natural environment. This health and safety plan must be submitted to and approved by the NYCDEP. There are no other reported incidents of hazardous materials, hazardous and non-hazardous treatment and storage facilities, and air and wastewater discharges directly in the Shaft No. 1 study area. There is no available documentation or initial indication of current contamination at the shaft site or from surrounding properties, as this site is not included in the scope of the NYCDEP Legacy program to identify risk posed to employees due to chemical exposure. Therefore, no potential significant

adverse hazardous materials impacts are expected to occur as a result of the proposed Project at Shaft No. 1.

### 3.8.2 Shaft No. 2A

A site visit was conducted on May 4, 2005. The shaft site and surrounding area is largely undeveloped. The Shaft No. 2A access road is comprised of crushed and exposed shale and slate. The shaft site is located within an area that has been impacted by mining activities so that the surface substrate primarily consists of broken shale and slate and unearthed bedrock. The area immediately around the shaft site is sparsely vegetated with herbaceous species. The surrounding area beyond the impacts associated with mining is largely wooded.

Site work at Shaft No. 2A includes removal of the earthen berm to access the shaft. No soil would be removed from the shaft site. Database search results found that there was no presence of identifiable hazardous materials, hazardous and non-hazardous treatment and storage facilities, and/or air and wastewater discharges in the Shaft No. 2A study area. There is no available documentation or initial indication of current contamination at the shaft site or from surrounding properties, as this site is not included in the scope of the NYCDEP Legacy program to identify risks posed to employees due to chemical exposure. Therefore, no potential significant adverse hazardous materials impacts are expected to occur as a result of the proposed Project at Shaft No. 2A.

### 3.8.3 Shaft No. 4

A site visit was conducted on May 10, 2005. The shaft site access road consists of predominantly pavement with some areas of concrete. The site at Shaft No. 4 includes an above-grade structure and a rectangular shaped, periodically mowed area is the predominant vegetative cover type at Shaft No. 4. At the edges of the periodically mowed areas, a mature forest community exists. The surrounding area is a mix of residential and agricultural properties. This report presents the results of field investigations and laboratory analyses of potential Asbestos-Containing Materials (ACM), Lead-Containing Paint (LCP) / Lead-Based Paint (LBP), arsenic, mercury, and PCB-containing materials. This report would provide guidance for locating potentially hazardous materials for proper disposal prior to or during any necessary renovation activities.

The RCRAIN database search found that one “small” hazardous waste generator is present within 1/8-mile of the shaft site; small generators are producers of 100 to 1,000 kg of hazardous waste per year. The generator is a conditionally exempt small quantity generator, since it is one that generates less than 100 kg/month of hazardous waste and is located at approximately the same elevation as the shaft site. However, the exact source of the waste generation is not known at the present time.

The RELEASES database of air and surface water releases, maintained by the USEPA Emergency Response Notification System, revealed a reported spill within 1/8-mile of

the shaft site. The incident, reported as occurring on June 18, 2001, involved 2 pounds of mercury located at approximately the same elevation as the shaft site. The spill entered groundwater in the Shaft No. 4 building. The building sump pump was taken off line and the spill was remediated on June 19, 2001.

The LUST reported a spill of No. 2 Fuel Oil that occurred on October 29, 1996. The spill, which occurred at 815 Route 208 (within ½-mile of the shaft site), was noticed as storage tanks were being removed. The site of this spill is located approximately 15 feet higher in elevation than the shaft site. The spill was reported as ‘cleaned up’ on October 7, 1997.

The BWS sampling program that monitors potentially contaminated liquids and solids detected mercury, arsenic, selenium and lead in sump water at concentrations exceeding NYSDEC action limits. The sump at this shaft location is currently not permitted to discharge sump water.

Shaft rehabilitation work at Shaft No. 4 would include installation of HGL monitoring equipment. No ground disturbance or subsurface investigation would occur. There are no other reported incidents of hazardous materials, hazardous and non-hazardous treatment and storage facilities, and air and wastewater discharges in the Shaft No. 4 study area. There is no available documentation or initial indication of current contamination at the shaft site or from surrounding properties. Additionally, access to this shaft is currently restricted due to mercury vapor issues. Mercury vapor remediation would be completed prior to the commencement of work, and therefore, no vapor exposure is anticipated to either the public or to personnel onsite. The planned hazardous materials investigation, to be completed in the summer of 2006, will determine the remediation measures to be undertaken at the site and provide guidance for the development of a health and safety plan, including potential confined space entry requirements, for use by workers at the site. The health and safety plan will be submitted for approval to the NYCDEP BWS Environmental Health and Safety. Upon completion of site remediation, no potential significant adverse hazardous materials impacts are expected to occur as a result of the work proposed at Shaft No. 4.

#### **3.8.4 Shaft No. 5A**

A site visit was conducted on May 10, 2005. The shaft site access road consists of pavement. A square shaped, regularly mowed area is the predominant vegetative cover type within the fence line of Shaft No. 5A. Beyond the fence line, the remaining NYCDEP property consists of open field habitat transitioning to dense shrubs beyond the property to the east, south, and north.

Shaft rehabilitation work at Shaft No. 5A would include installation of HGL monitoring equipment. No ground disturbance or subsurface investigation would occur. Database search results found that there were no other identifiable hazardous materials, hazardous and non-hazardous treatment and storage facilities, and/or air and wastewater discharges directly in the Shaft No. 5A study area. There is no available documentation or initial

indication of current contamination at the shaft site or from surrounding properties. It is therefore not necessary to conduct further testing and no special preventative measures are required. Therefore, no potential significant adverse hazardous materials impacts are expected to occur as a result of the proposed Project at Shaft No. 5A.

### 3.8.5 Shaft No. 6

In addition to the databases listed above, a report prepared by MPI regarding hazardous material found in the Shaft No. 6 building in October 2004 was also utilized in order to conduct the following analysis.

A site visit was conducted on April 29, 2005. The site is primarily surrounded by single family residential homes to the north, south, and east with a lumber yard, located several hundred feet to the south, and the Hudson River and Metro North and Conrail railroad tracks to the west. Currently, the NYCDEP-owned land includes the Shaft No. 6 building, the HRPS, an electrical substation, and a storage building.

The majority of the property is regularly mowed, maintained lawn with the exception of two forested areas comprised of mixed hardwoods at the northern and northeastern borders. The Hudson River shoreline is comprised of coarse material and is non-vegetated in the vicinity of the Shaft No. 6 outfall.

The steel and masonry, clear-span Shaft No. 6 building is approximately 68-feet wide by 112-feet long by 44-feet high. The building is used to house the equipment needed to unwater the RWB Tunnel for repair and inspection purposes. The existing building would remain, but the equipment used for unwatering the RWB tunnel would be replaced. Interior building modifications would be required to support the new tunnel unwatering system.

Currently, the existing HRPS's primary function is as a standby water supply source for drought emergency situations. When in operation, approximately six employees are present at the site. No modifications to the HRPS are included as part of this Project.

#### **Database Searches**

According to the First Search Database, the HRPS is listed as a RCRA CEG site. The HRPS is a conditionally exempt small quantity generator, i.e., one that generates less than 100-kg/month of hazardous waste and is located on the same property (approximately 300 feet to the northwest) as the shaft site. The HRPS is located down gradient from the shaft site.

The SPILLS 1990 database search revealed eight reported spills within 1/8-mile of the shaft site. The following incidents occurred on the shaft property, either at the HRPS or at the shaft site itself.

- A tank overflow involving No. 2 Fuel Oil that occurred on September 4, 1996 at the HRPS, down gradient from the shaft site. Approximately 100 yards of soil were affected. Further soil contamination was observed when two fuel tanks were subsequently removed on September 26, 1996. The incident was reported closed on February 20, 2001.
- An equipment failure occurring on February 6, 1997 at the HRPS, down gradient from the shaft site, caused a spill of a small amount of transformer oil. The clean-up was reported as complete on February 14, 1997.
- One spill, involving 70 grams of hydraulic oil, occurred on July 1, 1998 at the HRPS, down gradient from the shaft site. The spill occurred on land; all 70 grams were reportedly recovered and the incident was closed on the same day.
- A small amount (<1 ounce) of mercury was spilled on May 26, 1999 at grade with the shaft site. The spill was cleaned up by an “in-house NYCDEP Hazardous Materials Team”; the incident was reported closed on April 20, 2000.
- A small amount of mercury was spilled on June 19, 2000 at grade with the shaft site. The volume was described as similar to that typically contained in a thermometer. The mercury was cleaned up and the incident was reported closed on June 20, 2000.
- A “pin-head” sized drop of mercury (estimated at 1 gram) was found during a routine valve repair on January 18, 2001, at grade with the shaft site; the observed mercury was ‘recovered’ and the incident was closed on March 29, 2001.
- The SPILLS database contained a December 21, 2001 incident where a strong chlorine odor was reported in the area of the site and within 0.05 miles of the site.
- A spill involving 10 gallons of Number 2 Fuel Oil occurred on October 8, 1994, at grade with the shaft site, due to equipment failure at an off-site private dwelling located less than 0.25 miles from the shaft site. The spill has not been reported closed.

The NYCDEP-BWS sampling program that monitors potentially contaminated liquids and solids detected liquid PCB 1254 concentrations in samples from the Main Sump, located in the basement of the Shaft No. 6 building, at 0.24 ppm (parts per million) and liquid arsenic concentrations in Main Sump samples of 0.078 ppm. These levels exceeded the NYCDEP Action Levels, pursuant to the NYCDEP’s current consent order with the NYSDEC, for sump and drain water in the infrastructure of the NYC water supply of 0.001 ppm for PCBs and 0.050 ppm for arsenic. As a result, the sump at the shaft site is closed and sump waters are removed from the sump on a routine basis. The sump would remain closed until both the sump and the shaft site are remediated. A facility-specific assessment report for Shaft No. 6, prepared by URS Corp., did not find PCB concentrations that exceeded that of the NYCDEP Action Levels in the sump

located in the southern drainage area. The contractor responsible for the proposed shaft site rehabilitation would be required to remediate the sump area prior to commencing any work in the area or discharge of water into the sump; thereby eliminating the potential for discharge of hazardous materials into the water supply for NYC.

Approximately 1,300 cubic yards of soil would be excavated resulting from miscellaneous site work, and from excavation for electrical manholes and the placing of conduit. Of these 1300 cubic yards, approximately 725 cubic yards would be reused as fill for regrading the parking area and for creating the security berm. Therefore, site work at Shaft No. 6 would include the removal of approximately 575 cubic yards of soil from the shaft site. An SWPPP is being developed and would be implemented to prevent stormwater pollution in the vicinity of the shaft site.

### **Shaft No. 6 Site Investigations**

MPI prepared a Hazardous Materials Report for the Shaft No. 6 building in October, 2004. The report presented the results of field investigations and laboratory analyses of potential Asbestos-Containing Materials (ACM), Lead-Containing Paint / Lead-Based Paint (LCP / LBP), arsenic, mercury, and PCB-containing materials located in Shaft No. 6. A summary of the Hazardous Materials Report is provided below.

#### **Asbestos Investigation**

Bulk samples found to contain greater than 1 percent asbestos are considered ACM under federal, state and local regulations. Suspect buildings materials sampled during this investigation included the following:

- Gray interior window caulking on the 3rd floor; three samples, examined by the Polarized Light Microscopy (PLM) method, were found to contain 1.5 percent Chrysotile (a form of asbestos).
- Black tar/sealant (on piping) in the basement at the drainage chamber; asbestos was not detected via the PLM method, but nine samples were found that contained 8.6 percent Chrysotile when analyzed via the Transmission Electron Microscopy (TLM) method.
- Black/tar sealant with canvas material (on piping) in the basement at the drainage chamber; three samples were found containing 31.9 percent Chrysotile (PLM method).
- Gray exterior window caulking in the basement at the drainage chamber; three samples were found containing 3.3 percent Chrysotile. (PLM method).

#### **Lead Paint Investigation**

The lead paint investigation was performed via X-Ray Fluorescence (XRF) Analyzer as a LCP/LBP screening tool. A total of 151 XRF readings were collected. A total of 82

readings indicated the presence of LCP; 25 readings indicated the presence of LBP at or above the 1.0 milligrams per square centimeter ( $\text{mg}/\text{cm}^2$ ) Department of Housing and Urban Development (HUD) Action Level.

The locations sampled included the first floor, first floor-office, first floor-bathroom, basement-boiler room, basement-drainage chamber, stairwell No. 1, second floor, second floor-office, third floor and building exterior. Of the 25 readings that exceeded the HUD Action level, ten were on the first floor, one was on the first floor-office, and three were in the basement-drainage chamber, two at stairwell No. 1 and nine on the third floor.

### **Mercury and PCB-Containing Materials Investigation**

An inventory of building and office materials that may contain mercury and/or PCBs was conducted at Shaft No. 6 for the basement-ash storage room, basement-boiler room, basement-drainage chamber, first floor, first floor-office, first floor-bathroom, second floor, second floor-office and third floor. The results of this inventory may be used to assist contractors in identifying and locating these materials for proper disposal prior to or during any necessary demolition or renovation activities. This inventory found that mercury and possibly PCBs were contained within thermostats, switches, fluorescent light fixtures and vapor lamps located in the basement (ash storage room, boiler room, and drainage chamber), first floor, first floor office, first floor bathroom, second floor, second floor office, and third floor.

### **Arsenic, Lead, Mercury, and PCB Wipe Sampling Investigation**

Analysis of arsenic, lead, mercury and PCB were conducted on wipe samples collected in the basement-boiler room, basement-drainage chamber, basement-ash storage room, first floor, first floor-office, second floor, third floor and third floor-stairwell. The following locations contained arsenic, lead, mercury and/or PCBs:

- The first floor, samples of the brick wall yielded positive results for arsenic and lead.
- The first floor, samples of the concrete floor yielded positive results for arsenic, lead, mercury and PCBs.
- Surface samples of a metal hydraulic oil tank yielded positive results for lead and mercury.
- The second floor, samples of the brick wall yielded positive results for arsenic and lead.
- The second floor, samples of the concrete floor yielded positive results for arsenic, lead and mercury.

- The third floor, samples of the brick wall yielded positive results for arsenic, lead and mercury.
- The third floor, samples of the concrete floor yielded positive results for arsenic, lead and mercury.
- The basement-drainage chamber: samples of the metal valve and concrete floor yielded positive results for arsenic, lead, mercury and PCBs. The concrete wall contained lead, mercury and PCBs.
- The basement-boiler room and ash storage room: the concrete floor yielded positive results for arsenic, lead and mercury. The concrete wall yielded positive results for lead and mercury.

Since destructive sampling techniques were not used in any of the hazardous materials investigations, there may be additional, undetected ACM, LCP/LBP, arsenic, lead, mercury and PCBs at Shaft No. 6. However, asbestos and lead paint abatement has occurred at Shaft No. 6 since the completion of the Hazardous Materials Investigation.

In April and June 2005, the NYCDEP conducted an assessment of the possible presence of Contaminants of Concern (COCs), as part of the Legacy Program at the NYCDEP Delaware Shaft No. 6 facility (NYCDEP, 2005). Samples were collected and analyzed for asbestos, lead, mercury and PCBs. When these substances were detected, they were compared to specific NYCDEP criteria; there was no specific numerical standard for asbestos, which was evaluated by a presence/absence criterion.

Detected COCs that exceeded NYCDEP criteria and were present in areas that could be affected by rehabilitation work are presented in Table 3-11 and discussed briefly below.

<b>TABLE 3-11</b>			
<b>CONTAMINANTS OF CONCERN (COC) DETECTED IN INTERIOR SHAFT NO. 6 WORK AREAS</b>			
<b>COC</b>	<b>Shaft Interior Area</b>	<b>Concentration</b>	<b>NYCDEP Criterion for Facility Assessment Contract or “Legacy Contract”</b>
ACM <sup>1</sup>	Area 7	27.3%	Presence/Absence
ACM	Area 1	33%	Presence/Absence
ACM	Area 8	39.5%	Presence/Absence
LCP <sup>2</sup>	Area 1	5.96%	0.5%
Mercury (wipe)	Area 8	6.61 µg/100cm <sup>2</sup>	5.0 µg/100cm <sup>2</sup>
Mercury (paint)	Area 8	2.45 mg/kg	2.0 mg/kg
PCBs (wipe)	Area 8	19.6 µg/100cm <sup>2</sup>	10.0 µg/100cm <sup>2</sup>
PCBs (wipe)	Area 8	20.1 µg/100cm <sup>2</sup>	10.0 µg/100cm <sup>2</sup>



Notes: <sup>1</sup> – Asbestos Containing Material; <sup>2</sup> – Lead Containing Paint  
mg/kg – milligrams per kilogram;  $\mu\text{g}/\text{cm}^2$  - micrograms per square centimeter

### **Asbestos Investigation**

ACM was detected in tar present on a steel beam in the hoist balcony area in Area 7, in the electrical panels in Area 1 and in the flange gasket on the 2 ft piping on the elevated grated platform in Area 8.

### **Lead Paint Investigation**

LCP concentrations that exceeded NYCDEP criteria were detected in yellow/silver paint on a railing in Area 1. Similar paint was observed (but not analyzed) on railings in Area 5 (lower balcony), Area 7 (hoist balcony), Area 8 (elevated grated platform), Area 9 (southern drainage chamber) and Area 12 (lower level stair well).

### **Mercury and PCB-Containing Materials Investigation**

All contractors responsible for the proposed rehabilitation work at these sites would be charged with developing a site-specific health and safety plan for use by its workers at the site. Health and safety plans must be submitted for NYCDEP approval and should include a written Hazard Communication Program, identify potential or actual hazards to workers, and describe engineering controls, work practices, and personal protective equipment to be utilized to minimize or eliminate worker exposure to hazards. Contractors would be responsible for designating their own site safety officers, providing documentation that their employees have been health and safety trained in accordance with applicable federal, state and local regulations, and providing evidence of medical surveillance and medical approvals for their employees. Through adherence to approved health and safety plans and by proper remediation and disposal of potentially hazardous materials, the risk of the proposed Project to public health would be eliminated.

PCB concentrations that exceeded NYCDEP criteria were detected in Area 8 in the cone valve and gate valve, both of which are located on the lower level elevated grated platform. COCs detected in areas that would be affected by shaft rehabilitation work would be remediated prior to commencement of construction activities. COCs detected in areas not affected by shaft rehabilitation work (not discussed here) would be remediated after completion of the rehabilitation.

If construction and/or demolition activities at Shaft No. 6 result in the disturbance or removal of arsenic, asbestos, lead-based paint, mercury and/or PCB-containing materials or contaminated surfaces, monitoring for contamination and appropriate disposal of these wastes and residues would be required. The handling and management of these materials would follow applicable federal, state, and local regulations.

The below-grade portions of the shaft at the Shaft No. 6 building are currently flooded due to the inoperation of the HRPS and therefore, it is impossible for employees to enter the shaft at the present time. When it becomes necessary for workers to perform

rehabilitation activities within the shaft, the selected contractor would complete a required health and safety plan for the work to be performed. The HASP would be submitted to NYCDEP for review and approval before commencing work.

It is expected that no potential significant adverse hazardous materials impacts would occur as a result of the proposed Project at Shaft No. 6, since COCs detected in areas that would be affected by the shaft rehabilitation work would be remediated prior to commencement of construction activities and past releases of hazardous materials are currently considered closed by regulatory authorities.

### **Outfall Investigation**

The results of the sieve analyses for the sediment sample collected from the planned dredge area adjacent to the Shaft No. 6 Outfall Structure indicate that 0.2 percent of the sample passed the number 200 sieve and that the sample consists primarily of sand and gravel. A Total Organic Carbon (TOC) sample, and a duplicate, was also submitted for analysis. The sample "SB-1" result was 5,100 mg/Kg TOC, or 0.51 percent; and the blind-duplicate sample "SB-DUP" result was 4,900 mg/Kg TOC, or 0.49 percent. It was requested that NYSDEC review these analytical results and grant the NYCDEP an exemption from further chemical analysis of the sediment sample, based on the NYSDEC letter dated July 27, 2005 to NYCDEP regarding the NYSDEC Requirements for Upland Disposal / Management of Dredged Sediments. These requirements indicate that chemical analysis of removed sediments may be waived if material in the dredge area consists primarily of sand and gravel. The NYSDEC further clarifies this condition as, in general, containing less than 10 percent of particles passing the number 200 sieve, and containing less than 0.5 percent TOC. The sediment sample collected from the proposed dredge area meets these requirements.

Based on extensive investigations within the Hudson River, and other research, the NYSDEC has established their analytical requirements for dredged sediments based on the presence of materials that are likely to contain contaminants of potential concern, such as fine grained sediments. Coarser materials, such as sands and gravels, are not typically associated with contamination in depositional sediments. TOC may reveal the presence of materials that may also contain contamination, and therefore NYSDEC has established a guidance limit for evaluating the need for possible further analysis. The sediment sample collected from the proposed dredge area indicates that further analysis should not be required.

### **3.8.6 Shaft No. 8**

A site visit was conducted on May 5, 2005. The shaft site is located within an area that has been impacted by historical activities, so that the surface substrate primarily consists of small stones/pebbles and unearthed bedrock. The earthen berm over the fenced in shaft site contains a soil substrate in a square shaped area where periodically mowed vegetation has grown. Beyond the limits of impacted area, an area of successional trees transitions to a mature forest community.

The SPILLS 1990 database search revealed an incident within a ¼-mile of the shaft site. On May 23, 1995 approximately 2 gallons of No. 2 Fuel Oil leaked from an underground storage tank from a private residence located at 1965 Route 301. This spill site is located down gradient from the shaft site. The leaking tank and contaminated soil were removed from the resident's site. The incident was reported closed on June 16, 1995.

Database search results found that there were no other known identifiable hazardous materials, hazardous and non-hazardous treatment and storage facilities, and/or air and wastewater discharges directly in the study area. Therefore, it has been determined that it would not be necessary to perform further testing or to impose special preventative measures at the site. Site work at Shaft No. 8 is comprised of soil excavation, including the removal of the earthen berm to access the shaft. Approximately 80 cubic yards of soil would be removed from the shaft site, in accordance with applicable regulations. Excavated soil would be sampled for characterization and disposal purposes. If excavated soil exhibits elevated levels of hazardous materials, a subsurface investigation and preventative measures for the shaft site would be undertaken. There are no other reported incidents of hazardous materials, hazardous and non-hazardous treatment and storage facilities, and air and wastewater discharges directly in the Shaft No. 8 study area. There is no available documentation or initial indication of current contamination at the shaft site or from surrounding properties. Therefore, no potential significant adverse hazardous materials impacts are expected to occur as a result of the proposed Project at Shaft No. 8.

### **3.9 ENERGY**

#### **3.9.1 Shaft Nos. 1 & 2A**

The provider of electrical service in the vicinity of Shaft Nos. 1 and 2A is Central Hudson Gas & Electric (CHG&E). A new electrical service feed for future tunnel repair activities would be routed above-ground to the shaft sites from an existing power utility poles located off NYS Route 55 (Shaft No. 1) and Shaft 2A Road (Shaft No. 2A). The electrical requirement for construction at these shaft sites would be minimal, as the majority of the work consists of site improvements. The equipment that would be used for the site work would not draw power from the existing system; therefore, construction at Shaft Nos. 1 and 2A is not anticipated to have a negative impact on the local energy supply. Therefore, no potential significant adverse energy demands would occur as a result of the proposed Project.

#### **3.9.2 REC and Shaft Nos. 4 & 5A**

The provider of electrical service in the areas of the REC and the shaft sites is CHG&E. The existing power utility service would be used to power the LFD equipment at the REC and the HGL monitoring equipment that would be installed at Shaft Nos. 4 and 5A. No new service would be provided to these sites, and the existing service would

be sufficient to support any energy demand at these sites. Therefore, no potential significant adverse energy demands would occur as a result of the proposed Project.

### 3.9.3 Shaft No. 6

The existing electrical substations on-site provide power for the existing pumps at the HRPS and for the existing Shaft No. 6 pumps. Existing electrical service is provided by CHG&E to an existing service substation connection along River Road. Shaft No. 6 would ultimately have three separate means of energy supply. The first is a service routed from the existing HRPS electrical substation. This substation currently provides power for the existing pumps at the HRPS. The pumps at the HRPS would not be in use when the tunnel unwatering pumps at Shaft No. 6 are being used.

Due to the critical nature of the Shaft No. 6 tunnel unwatering system and the large electrical demand, a redundant electrical feed would be provided through a service routed overhead along River Road from a CHG&E substation. A new on-site substation would be constructed to provide power to the new pumps, which would use 4160V service. While the proposed Project would result in a future increase in energy use, this increase would be short in duration. During future tunnel rehabilitation operations, the pumps would be operated continuously for a period not expected to exceed two years. Thus, there would be long periods of time when the pumps remain idle with no impact to energy usage, except for limited periods of pump exercise.

The last means of power supply for the Shaft No. 6 site is a capability for use of standby generators. The actual generators would not be provided under this Project, but under a future project for the tunnel repair. Under the current Project, only space in the motor starter for connection to the future generators and space on the site itself for the future generators would be provided.

Drawing power from the existing HRPS electrical substation would not have a negative impact on the local energy grid, since the existing pumps at the HRPS would not be in use when the tunnel unwatering pumps at Shaft No. 6 are in use.

The additional service routed from the existing CHG&E substation is also not anticipated to have an impact on the local energy grid, since the existing service has adequate power. Therefore, no potential significant adverse impacts to energy usage would occur as a result of the proposed Project.

### 3.9.4 Shaft No. 8

The provider of electrical service in the area of the shaft site is New York State Electric & Gas (NYSEG). A new permanent electrical service feed for future tunnel repair activities would be routed to the shaft site below-ground and would be located in the vicinity of the shaft site. The energy requirement for construction at this shaft site would be minimal, as the majority of the proposed work at Shaft No. 8 involves site improvements to be performed by mobile construction vehicles. Any draw of power

from the existing system during construction is anticipated to be small and thus not to have a negative impact on the supply.

### **3.10 TRAFFIC AND PARKING**

#### **3.10.1 REC and Shaft No. 1**

The REC is accessible from NYS Route 55 via a paved access road approximately 1,000 feet to the west of Porter Road in the Town of Wawarsing, Ulster County, New York. Shaft No. 1 is accessible from NYS Route 55 via a gravel and compacted soil access road a few hundred feet east of Porter Road in the Town of Wawarsing, Ulster County, New York. Route 55 is a two-lane arterial or collector road which carries traffic between communities. Personnel visit the REC on an as needed basis in order to monitor or modify reservoir operations. No personnel visit the Shaft No. 1 site regularly. New York State Department of Transportation (NYSDOT) collects average annual daily traffic (AADT) counts for State Routes. The AADT available for NYS Route 55 indicated that 969 vehicles traveled the portion of Route 55 between the Sullivan County line and Route 55A - Lackawack in 2001.

#### **3.10.2 Shaft No. 2A**

Shaft No. 2A is accessible from a crushed shale and slate access road labeled as Shaft No. 2A Road off of Rockhaven Road via NYS Route 55 in the Town of Warwarsing, Ulster County, New York. Route 55 is a two-lane arterial or collector road which carries traffic between communities. No personnel visit the Shaft No. 2A site regularly. The AADT available for Route 55 indicated that 2,750 vehicles traveled the portion of Route 55 between the end of Route 209 (at the start of Route 44) and Route 299 in 2002.

#### **3.10.3 Shaft No. 4**

Shaft No. 4 is accessible from NYS Route 208 via an unmarked pavement and concrete access road in the Town of Gardiner, Ulster County, New York. Route 208 is a two-lane arterial or collector road which carries traffic between communities. No personnel visit the Shaft No. 4 site regularly. The AADT available for Route 208 indicated that 5,339 vehicles traveled the portion of Route 208 between Route 300 and Routes 44 and 55 in 2002.

#### **3.10.4 Shaft No. 5A**

Shaft No. 5A is accessible from US Route 9W via Lattintown Road in the Town of Newburgh, Orange County, New York. Route 9W is a two-lane arterial or collector road which carries traffic between communities. No personnel visit the Shaft No. 5A site

regularly. The AADT available for Route 9W indicated that 17,439 vehicles traveled the portion of Route 9W between Middlehope and the Ulster County line in 2000.

### 3.10.5 Shaft No. 8

Shaft No. 8 is accessible from Route 301 via an unmarked dirt and gravel access road (NYCDEP access easement) in the Town of Putnam Valley, Putnam County, New York. Route 301 is a two-lane arterial or collector road which carries traffic between communities. No personnel visit the Shaft No. 8 site regularly. The AADT available for Route 301 indicated that 1,380 vehicles traveled the portion of Route 301 between the Taconic State Parkway and CR-42 (Farmers Mill Road) in 2003.

Table 3-12 details the construction work hours, construction duration, number of personnel, and number of trucks proposed for site improvements at Shaft Nos. 1, 2A, 4, 5A, and 8. Construction access to Shaft Nos. 1, 2A, 4, 5A, and 8 would generally be State Highways during the 6-months of construction activities. It is envisioned that an estimate of 20 workers would typically be employed during the construction period at Shaft Nos. 1, 2A, and 8 and 5 workers at Shaft Nos. 4 and 5A daily. Construction workers typically arrive on-site between 6:30 and 7:00am and depart between 3:00 and 4:00pm. Although some carpooling may occur, most construction workers would presumably travel to and from the shaft sites in their own vehicles. For security reasons, no Contractor's personal vehicles would be permitted on site. However, on occasion, NYCDEP personnel vehicles may be permitted to access the site. All other vehicles would be provided off-site parking at a location to be determined by the Contractor.

Construction activities could generate a peak of about 16 truck-trips per day (including departure and return) at Shaft Nos. 2A and 8, a peak of about 10 truck-trips per day at Shaft No. 1, and a peak of about 3 truck-trips per day at Shaft Nos. 4 and 5A. These trips would be spread relatively uniformly throughout the day. Peak hour truck trips are estimated to be 2 trucks per hour for Shaft Nos. 1, 2A, and 8 and 1 truck per hour for Shaft Nos. 4 and 5A.

There are sensitive receptors located adjacent to the shaft sites that could be potentially impacted by the traffic. Impacts during the construction period would consist of additional demands on the local roadways generated by construction workers and trucks traveling to and from Shaft Nos. 1, 2A, 4, 5A, and 8. However, given the minimal number of trucks and worker cars anticipated during the construction period, it is anticipated that the impacts would be minimal. There may be negligible additional demand on transit or pedestrian facilities (if any) associated with the construction activities at the shaft sites.

No significant increase in the number of vehicle trips is anticipated as part of the Project. The work would be completely within NYCDEP water supply lands and would not directly affect transit or pedestrian infrastructure. The additional construction traffic is not expected to affect traffic patterns or cause a significant deterioration in local traffic flow. The proposed Project is not expected to generate a significant amount of traffic in

the study area. No potential significant adverse impacts to area transit facilities or pedestrian movement would occur as a result of the Project Shaft Nos. 1, 2A, 4, 5A, and 8.

Construction duration is expected to be temporary and short-term in nature (6 months); therefore, construction impacts at these shaft sites would be considered minimal. No potential significant adverse impacts to area traffic or parking would occur as a result of the rehabilitation at Shaft Nos. 1, 2A, 4, 5A, and 8, accordingly, a detailed analysis of potential traffic impacts for this activity is not warranted.

**TABLE 3-12**  
**CONSTRUCTION TRAFFIC ESTIMATES**  
**REC AND SHAFT NOS. 1, 2A, 4, 5A, AND 8**

Shaft No.	Work hours	Construction Duration (months)	Max. No. of Personnel (per day)	No. of Trucks (per day) (Average)	No. of Trucks (per day) (Peak)	No. of Trucks (peak hour)
REC	7:00am to 3:30pm M-F	6	15	2 / 3	2 / 3	2
1	7:00am to 3:30pm M- F	6	20	6 / 10	6 / 10	2
2A	7:00am to 3:30pm M- F	6	20	8 / 16	8 / 16	2
4	7:00am to 3:30pm M- F	6	5	2 / 3	2 / 3	1
5A	7:00am to 3:30pm M- F	6	5	2 / 3	2 / 3	1
8	7:00am to 3:30pm M- F	6	20	8 / 16	8 / 16	2

### 3.10.6 Shaft No. 6

Shaft No. 6 of the RWB Tunnel is accessible from NYS Route 9D via River Road (County Road 32) in the Town of Wappinger, Dutchess County, New York. Alternate access is provided through I-84 from the south via Chelsea Road (County Road 92). The following is a description of those roadways that could potentially be used to access the site:

NYS Route 9D is a major north-south State roadway that originates in the vicinity of the Westchester-Putnam County border and continues north paralleling the Hudson River and into Dutchess County. The roadway intersects with NYS Interstate-84 and NYS Route 52 at a full movement interchange (about 2.75 miles south of the Shaft No. 6 site) and continues north past the study area before intersecting with another major north-south



highway, State Route 9 in Poughkeepsie, just slightly north of the Village of Wappingers Falls. NYS Route 9D is primarily a two-lane road between I-84 and River Road. A dedicated left-turn lane is provided for northbound and southbound vehicles on Route 9D at the signalized intersection with CR-92.

River Road is a two-lane Town road that originates at a “stop” sign controlled “T” intersection with Reeves By-Pass Road. The roadway transverses in an east-west direction in the immediate vicinity of the site and continues in the southwesterly direction, providing access to a lumber yard and several residences before terminating in the Hamlet of Chelsea. The paved section of the roadway in the vicinity of the Shaft No. 6 site is about 23-feet wide and the posted speed limit is 40 miles per hour (mph).

Chelsea Road (CR-92) is a county roadway which originates at Route 9D opposite Baxtertown Road (CR-34). The roadway continues in a westerly direction, providing access to several residential areas before terminating in the Hamlet of Chelsea. The alignment of Chelsea Road consists of several short vertical and horizontal curves which limit operating speeds along the section. The posted speed limit is 45-mph but is reduced to 35-mph at various locations due to the vertical/horizontal geometry.

Reeves By-Pass Road is a two-lane local street that intersects with River Road at the “stop” sign controlled “T” intersection. The roadway originates at a “stop” sign controlled “T” intersection with Route 9D about 2,000-feet southeast of the intersection with River Road.

The AADT available for Route 9D indicated that 19,417 vehicles traveled the portion of Route 9D between the intersection of I-84 and Route 52 and CR-28 (Old Hopewell Road) in 2003. Dutchess County Department of Public Works and Poughkeepsie-Dutchess County Transportation Council also collected AADTs for local roadways. The AADT available for Chelsea Road (CR-92) indicated that 2,721 vehicles traveled the portion of the roadway between Chelsea Ridge Apartments and Route 9D in 2001.

Table 3-13 details the construction work hours, construction duration, number of personnel, and number of trucks proposed for site improvements during each stage of work at Shaft No. 6. The duration of construction at Shaft No. 6 is anticipated to last 48 months. Construction access to Shaft No. 6 would generally be State Highways during the 48 months of construction activities. It is envisioned that a maximum of 70 workers would be employed at any one time at Shaft No. 6 and there is not anticipated to be any overlap of stages. Typical working hours during construction would result in most of the workers traveling on the roadways before morning and evening peak traffic periods. Construction workers typically arrive on-site between 6:30 and 7:00am and depart between 3:00 and 4:00pm. All work conducted throughout the course of a 24-hour work day would occur inside the superstructure. Any and all work to be performed outside would occur over normal working hours. Although some carpooling may occur, most workers would presumably travel to and from the site in their own vehicles. Construction worker traffic would likely be absorbed into local peak traffic period patterns since Shaft No. 6 is located in close vicinity to State highways.

Although there would be an increase in the number of personal vehicles in the area surrounding the Shaft No. 6 site, parking would not be significantly impacted. A dedicated parking facility constructed during Stage 1 for NYCDEP employees as well as construction workers would be provided at the Shaft No. 6 site. The lot would have approximately 50 parking spaces. Construction during Stage 1 at the Shaft No. 6 is expected to minimally affect existing traffic conditions. Construction related parking and deliveries would require staging on the shaft site itself, with some parking requirements during limited peak periods accommodated by nearby parking areas. Therefore, no significant adverse parking impacts are anticipated. In addition, roadway and parking area lighting would be provided and would be minimized to the extent possible in consideration of safety and security at the shaft site.

Construction activities could generate a peak of about 20 truck-trips per day (including departure and return) at Shaft No. 6 during Stage 1. These trips would be spread relatively uniformly throughout the day. Peak hour truck trips are estimated to be 3 trucks per hour for Shaft No. 6 during all stages of work. Construction traveling routes would be limited to State roads which include I-84 and Route 9D to minimize construction traffic traveling from adjacent local areas to use local streets.

There are sensitive receptors located adjacent to the shaft sites that could be potentially impacted by the traffic. Impacts during the construction period would consist of additional demands on the local roadways generated by construction workers and trucks traveling to and from Shaft No. 6. However, the use of local roads would be minimized to the extent possible by maximizing the use of state roads and federal highways. The effect of truck traffic to and from the site would be intermittent, but over four years. Due to the intermittent nature of truck traffic, the impact to the area is not considered significant.

There may be negligible additional demand on transit or pedestrian facilities (if any) associated with the construction activities at the shaft sites. The work would be completely within NYCDEP water supply lands and would not directly affect transit or pedestrian infrastructure. The additional construction traffic is not expected to affect traffic patterns or cause deterioration to local traffic flow. The proposed Project is not expected to generate a significant amount of traffic in the study area. No potential significant adverse impacts to area transit facilities or pedestrian movement would occur as a result of the rehabilitation at Shaft No. 6.

Although the duration of the truck traffic at Shaft No. 6 would be considered long-term (48 months) and continuous in frequency, no significant increase in the number of vehicle trips is anticipated as part of the Project. No potential significant adverse impacts to area traffic or parking would occur as a result of the rehabilitation at Shaft No. 6; accordingly, a detailed analysis of potential traffic impacts for this activity is not warranted.

In addition, the Town of Wappinger has indicated that, for safety reasons, it is not acceptable to make a left-turn from the Shaft No. 6 site, onto River Road. Therefore, a two-way traffic control device would be installed on River Road, just north of the proposed Shaft No. 6 construction entrance. The traffic control device on River Road

would allow vehicles to safely make a left turn when exiting the Shaft No. 6 site. The location of the traffic control device would be coordinated with the Town Highway Superintendent and installed in accordance with Chapter 230 of the Town Code of Wappinger, NY – Vehicles and Traffic.

The NYCDEP would place the traffic control device, conforming to the state manual and specifications, as deemed necessary to indicate and carry out the provisions of the local traffic ordinances, orders, rules or regulations or to regulate, warn, or guide traffic. A warning light, placed to the north of the Shaft No. 6 construction entrance that would flash yellow to indicate that the traffic control device ahead is turning “red”, in addition to warning signs, would be posted along River Road to alert oncoming traffic that there is a traffic signal ahead.

The traffic control device would be active (red, yellow, green) one hour before construction work hours and half an hour after construction work hours for a period from 6:00AM – 4:00PM during construction Stages 1, 2, and 5 and would be inactive (flashing yellow) during non-working hours from 4:00PM – 6:00AM. During Construction Stages 3 and 4, traffic control would be actively operating 24 hours a day, seven days a week.

**TABLE 3-13**  
**CONSTRUCTION TRAFFIC ESTIMATES**  
**SHAFT NO. 6**

<b>Construction Stage</b>	<b>Work Location</b>	<b>Work hours</b>	<b>Construction Duration (months)</b>	<b>Maximum No. of Personnel (per day)</b>	<b>No. of Trucks (per day) (Average/peak)</b>	<b>No. of Trucks (peak hour)</b>
1	Outside / Inside <sup>1</sup> Shaft No. 6 Superstructure	7:00am to 3:30pm M- F	7	55	8 / 20	3
2	Outside / Inside Shaft No. 6 Superstructure	7:00am to 3:30pm M- F	8	70	3 / 5	
3	Inside Shaft No. 6 Superstructure	3 Separate Shifts 5 days/week	12	50*	3 / 5	
4	Inside Shaft No. 6 Superstructure	3 Separate Shifts 5 days/week	16	125*	3 / 5	
5	Outside / Inside Shaft No. 6 Superstructure	7:00am to 3:30pm M- F	5	50	3 / 5	

<sup>1</sup> Limited dive work under this stage occurring 24 hours per day, 7 days per week.

\* This number represents the Maximum Number of Personnel at the shaft site per day. However, it is important to note that site work during these stages occurs over the course of 3 separate shifts each day. During the day shift, approximately ½ of the Maximum Number of Personnel per day will be on site. Approximately ¼ of the Maximum Number of Personnel per day will be on site during each of the remaining 2 shifts.



The assumed Construction Sequence is as follows:

- Stage 1: Mobilization and begin site preparation.
- Stage 2: Site preparation work and dive work in the Shaft No. 6 building.
- Stage 3: Installation of the new access drift bulkhead.
- Stage 4: Installation of the pumping system inside the Shaft No. 6 building.
- Stage 5: Testing and final site improvements and clean-up.

### **3.11 NOISE**

#### **3.11.1 Introduction**

This section of the assessment evaluates potential impacts that the proposed Project would have on ambient noise conditions at noise-sensitive receptors (receptors) around each shaft site. Receptors are typically defined as locations where human activities may be adversely affected when noise levels exceed a predefined threshold of acceptability or when noise levels increase by an amount exceeding a predefined threshold of change. Receptor locations can be either indoor or outdoor. Examples would include, but are not limited to, residences, schools, churches, hospitals, and court houses as well as parks, beaches, campgrounds, and golf courses.

Noise impacts can be generated from both stationary noise sources, such as mechanical equipment, and construction equipment, and mobile noise sources, such as cars, airplanes, trucks, buses, trains, and construction-related vehicles. This analysis considers both types of noise sources to determine the potential for significant adverse temporary or permanent impacts that could affect the existing ambient noise conditions surrounding each shaft site as a result of implementation of the proposed Project. Since no significant noise generating facilities are being constructed, and future facility operations would remain relatively the same following completion of the planned work, this analysis primarily focuses on noise impacts during construction activities.

#### **3.11.2 Characteristics of Noise**

##### **3.11.2.1 Perception of Noise**

Noise is defined as any loud, discordant or disagreeable sound or sounds. More commonly, in an environmental context, noise is defined simply as unwanted sound. Certain activities inherently produce sound levels or sound characteristics that have the potential to create noise. Numerous environmental factors determine the level or perceptibility of sound at a given point of reception. These factors include: distance from

the source of sound to receptor; surrounding terrain; ambient sound level; time of day; wind direction; temperature gradient; and relative humidity. The characteristics of a sound are also important determining factors for considering it as noise. The amplitude (loudness), frequency (pitch), impulse patterns and duration of sound all affect the potential for a sound to be a noise. The combination of sound characteristics, environmental factors and the physical and mental sensitivity of a receptor to a sound determine whether or not a sound would be perceived as a noise.

Noise levels are measured in units called decibels. These measurements are adjusted or weighted to correspond to the frequency response of the human ear. The “A-weighted sound level” or “dBA,” is used in view of its widespread recognition and its close correlation with human perception of noise. Table 3-14 lists noise levels from common sources in the built environment.

The average ability of an individual to perceive changes in noise levels is well documented in technical noise literature and is listed in Table 3-15. Generally, most people cannot perceive changes in noise levels less than 2 to 3 dBA, a change of 5 dBA is readily noticeable, a change in 10 dBA is normally perceived as doubling (or halving) of loudness, and a change of 20 dBA is a dramatic change in sound. These noise level increments permit a direct estimation of an individual’s probable perception of noise. Within the context of CEQR these noise level changes enable a determination of whether noise levels pose a potentially significant impact or not.

**TABLE 3-14**  
**NOISE LEVELS OF COMMON SOURCES**

<i>Sound Source</i>	<i>Sound Pressure Level dB(A)</i>
Air Raid Siren at 50 feet	120
Maximum Levels at Rock Concerts (Rear Seats)	110
On Platform by Passing Subway Train	100
On Sidewalk by Passing Heavy Truck or Bus	90
On Sidewalk by Typical Highway	80
On sidewalk by Passing Automobile with Mufflers	70
Typical Urban Area	60-70
Typical Suburban Area	50-60
Quiet Suburban Area at Night	40-50
Typical Rural Area at Night	30-40
Isolated Broadcast Studio	20
Audiometric (Hearing Testing) Booth	10
Threshold of Hearing	0

Notes: A change in 3 dB(A) is a just noticeable change in SPL. A change in 10 dB(A) is perceived as a doubling or halving in SPL.  
Source: NYCDEP City Environmental Quality Review (CEQR) Technical Manual, Table 3R-1, October 2001.



**TABLE 3-15  
AVERAGE ABILITY TO PERCEIVE CHANGES IN NOISE LEVELS**

<i>Change</i>	<i>Human Perception of Sound</i>
2-3	Barely perceptible
5	Readily noticeable
10	A doubling or “halving” of the loudness of sound
20	A “dramatic change”
40	Difference between a faintly audible sound and a very loud sound

Source: Bolt, Beranek and Newman, Inc., Fundamentals and Abatement of Highway Traffic Noise, Report No. PB-222-703. Prepared for the Federal Highway Administration, June 1973.

### 3.11.2.2 Noise Descriptors

In order to describe fluctuating noise over a specific period of time, statistical noise descriptors are used. The  $L_{eq}$  is the equivalent steady-state noise level that, in a stated period of time, contains the same acoustic energy as the time-varying sound level during the same time period; it accounts for both the duration and the magnitude of a noise. The equivalent sound level ( $L_{eq}$ ) noise descriptor also most accurately evaluates stationary sources of noise which is the primary component of noise during construction activities at the shaft sites. For this Project, the one-hour minimum sound level, referenced as  $L_{eq(1)}$ , was selected.

### 3.11.3 Applicable Noise Standards

New York City adopted the City Environmental Protection Order- CEQR noise standards for environmental impact review in 1983 (later amended in 2001). The noise standards are published in the *CEQR Technical Manual*, which provides detailed methodologies for assessing noise impacts for various projects within New York City limits or where projects are being performed on property owned by NYCDEP outside the New York City limits.

Noise impact thresholds for daytime and nighttime periods have been developed to assess construction noise impacts for projects under CEQR review. During daytime hours (7 am to 10 pm), a noise level of 65 dBA  $L_{eq(1)}$  should not be significantly exceeded. For example, if the existing (ambient) noise level is 60 dBA  $L_{eq(1)}$  or less, a 5 dBA or greater change would be considered significant. If the existing noise level is 62 dBA  $L_{eq(1)}$  or more, a 3 dBA change should be considered significant. During night time hours (10 pm to 7 am), an incremental increase of 3 dBA compared against the existing noise level should not be exceeded.



### 3.11.4 Noise Methodology

#### 3.11.4.1 Existing Conditions

In order to evaluate potential noise impacts, the baseline ambient noise conditions in the vicinity of each shaft site were established. For the REC and Shaft Nos. 1, 2A, 4, 5A, and 8, the baseline ambient noise conditions were assessed based on visual inspection of the shaft sites and surrounding land uses. For Shaft No. 6, ambient noise monitoring was performed at four locations surrounding the site. The four monitoring locations were selected to represent the closest receptors (residences) to the planned construction activities surrounding the shaft site. It should be noted that the noise survey locations were typically within 25 to 75-feet of the receptor locations due to private property access limitations. A description of each noise survey locations is provided below:

- Location 1:** North property line of site on fence adjacent to residence #217 River Road North;
- Location 2:** Northeast property line of site on fence across street from residence #212 River Road North;
- Location 3:** South property line of site on fence adjacent to residence #191 River Road North; and
- Location 4:** South property line of site on fence adjacent to backyard pool/picnic area of residence #191 River Road North.

Ambient noise monitoring at the four survey locations occurred during both the weekday and weekend time periods from September 22, 2005 to September 26, 2005. Hourly noise levels were logged continuously with Bruel & Kjaer 2236/2238 automated sound level meters. The data was downloaded from the sound level meters and the one-hour Leq noise levels were plotted to identify the minimum hourly Leq sound levels for the daytime (7 am to 10 pm) and nighttime (10 pm to 7 am) conditions. The monitors were calibrated at the start and finish of the monitoring event. Meteorological data was also recorded to assure that wind speeds greater than 12 mph did not significantly affect the noise measurement data.

#### 3.11.4.2 Future with the Project

The CEQR manual provides screening methodologies to determine the need for a detailed noise analysis for the construction and operation of new projects. The methodologies are categorized by mobile, stationary, and construction noise sources.

For the REC and each shaft site, a stationary source noise analysis is not required since the planned equipment would be either subsurface, enclosed within the existing facility structures, or is not expected to generate additional noise. Additionally, a mobile source noise analysis is not required since the shaft facilities would require limited additional personnel (primarily for maintenance) as a result of the Project.

For construction noise sources, the *CEQR Technical Manual* states that a detailed noise analysis is warranted if a proposed action would cause construction equipment to be operating within 1,500 feet of a receptor for an extended period of time (greater than 2 years). Otherwise, a qualitative analysis is sufficient.

A qualitative noise impact evaluation was performed for the REC and Shafts 1, 2A, 4, 5A, and 8 where construction activities were limited in scope, short in duration (approximately 6 months), and limited (if any) receptors were located proximal to the site locations. This evaluation included identifying noise generating equipment during construction and operation, determining the maximum amount of noise created for the proposed Project, and assessing the sound levels at the closest receptors using the “addition of sound levels” and “inverse square law” noise methodologies.

Additionally, a mobile source noise impact assessment for construction is not required since construction related traffic at the REC and the shaft sites would be minimal and not double the existing traffic conditions near these sites. It is expected that only 20 personnel vehicles per day and 2 truck deliveries during the peak hour are expected.

At Shaft No. 6, a detailed noise analysis was performed based on the long-term construction schedule (4 years), anticipated types of construction activities, and the close proximity of receptors to the planned construction activities. For this analysis, a spreadsheet noise model was employed using the “addition of sound levels” and “inverse square law” noise methodologies. Construction noise impacts were estimated using construction equipment field data published for the Boston Central Artery/Tunnel (CA/T) project in the *Noise Control Engineering Journal*, dated September-October 2000. As provided in Table 3-16, the construction schedule was divided into five stages. Seven construction areas were also identified where equipment or construction activities would be concentrated. For each stage, an equipment usage factor was assigned to each piece of equipment expected at each construction area on-site, based on engineer’s estimates. The equipment usage factor represents the amount of time each piece of equipment would be operating onsite. An acoustic usage factor was also assigned to each piece of equipment as specified in the CA/T report. The acoustic usage factor represents the percentage of time each piece of equipment operates at maximum load when active. The adjusted equipment maximum noise levels (at 50 feet) were attenuated over distance from the construction areas to the receptor location and then logarithmically added to determine the estimated cumulative construction equipment noise level. This calculation was performed for the four receptor locations (along the north, south, and east property line) for the first two stages (Stages 1 and 2) of construction when construction activities are planned to be the greatest, with the largest amount of equipment on-site only. For the remaining three stages (Stages 3, 4, and 5) of construction, the primary construction activities would be located within the shaft or shaft building structure with limited exterior noise generating equipment/activities. As a result, spreadsheet noise modeling was not performed for these stages.

Similar to the other shaft sites, a mobile source noise impact assessment for construction activities is not required at the shaft site since only a limited number of Project related

vehicles are expected to access the site daily (50 personnel vehicles per day and 3 truck deliveries during the peak hour). These increases in traffic are not considered significant and would not result in a mobile source noise impact.

**TABLE 3-16  
CONSTRUCTION STAGES**

<i>Stage</i>	<i>Construction Activities</i>
1	The Contractor would mobilize and begin preparation of the site for construction and dive work inside the shaft (7 months).
2	The Contractor would perform the site work as well as the work in the Superstructure (8 months).
3	The installation of the new access drive bulkhead would be performed (12 months).
4	The Contractor would construct the improvements to the shaft and the tunnel unwatering system (16 months).
5	The Contractor would test the pumps installed under Stage 4, perform improvements to the front entrance, and cleanup the site (5 months).

### 3.11.5 Existing Conditions

The ambient noise conditions at the REC and Shaft Nos. 1, 2A, 4, 5A, and 8 are typical of a rural farmland setting. The REC and Shaft Nos. 1 and 2A are located in the Town of Wawarsing, Ulster County, Shaft No. 4 is located in the Town of Gardiner, Ulster County, Shaft No. 5A is located in the Town of Newburgh, Orange County, and Shaft No. 8 is located in the Town of Putnam Valley, Putnam County. In general, each site was located in areas with large open space, limited development, minimal traffic, and a limited number of nearby sensitive receptors (i.e., residences, schools, churches, etc.).

Shaft No. 6 is located on River Road North in the Town of Wappinger, Dutchess County, New York. Across the Hudson River, on the western shoreline, additional railroad lines and two electric generating power plants are located. To the east River Road North single family residential homes border the shaft site. River Road North is a two lane secondary road that provides local access to the hamlet of Chelsea from NYS Route 9D.

Ambient noise monitoring was performed at the four monitoring locations between September 22 and 26, 2005. In general, the principal sources at the monitoring locations included vehicular traffic on River Road North and rail activity along the Hudson River rail lines. Other periodic noise generating activities were also observed from the power plants across the river, particularly the short-term (approximate 1-hour long) blow-off valve operations. The minimum hourly  $Leq_{(1)}$  noise levels at each noise monitoring location for both the daytime (7 am to 10 pm) and nighttime (10 pm to 7 am) time periods for the weekday and weekend conditions are provided in Table 3-17.

In general, the ambient noise conditions remained relatively consistent between the both the weekday and weekend conditions, as well as between the daytime and nighttime time periods. The minimum hourly  $Leq_{(1)}$  noise levels at any of the four ambient noise



monitoring locations varied between 0 to 3 dBA for all time periods and conditions. As stated previously, most people generally cannot perceive changes in noise levels less than 2 to 3 dBA. These relatively constant noise levels reflect the remote setting of the neighborhood surrounding the shaft site. For noise monitoring locations #1 and #3, minimum hourly  $Leq_{(1)}$  noise levels were consistently between 47 and 50 dBA. These noise monitoring locations were located approximately 200 ft from River Road North on the north and south property line of the shaft site. Noise monitoring location #2, which was located approximately 25 ft from the center line of River Road North and had minimum hourly  $Leq_{(1)}$  noise levels consistently between 53 and 56 dBA. The slightly higher noise levels recorded at this location were likely a result of the close proximity of the vehicular traffic on River Road North to the sound level meter. Noise monitoring location #4, which was the furthest removed locations from River Road North, but the closest location to the rail lines along the Hudson River, had minimum hourly  $Leq_{(1)}$  noise levels consistently between 50 and 53 dBA and were primarily influenced by the railroad activity. In general, the ambient noise levels measured around the perimeter of the shaft site are consistently below 65 dBA  $Leq_{(1)}$ , the CEQR threshold of acceptability, during both the daytime and nighttime hours.

**TABLE 3-17**  
**BASELINE AMBIENT NOISE MONITORING RESULTS**  
**FOR SHAFT NO. 6**

<i>Noise Monitoring Locations</i>		<i>Daytime (7am to 10pm) Minimum <math>L_{eq}</math> (dBA)</i>	<i>Nighttime (10pm to 7am) Minimum <math>L_{eq}</math> (dBA)</i>
Location 1: North fence of NYCDEP property line adjacent to residence #217 River Road North.	Weekday	48	50
	Weekend	47	48
Location 2: Northeast fence of NYCDEP property line across street from residence #212 River Road North	Weekday	56	54
	Weekend	56	53
Location 3: South fence of NYCDEP property line adjacent to residence #191 River Road North	Weekday	48	49
	Weekend	47	47
Location 4: South fence of NYCDEP property line adjacent to backyard pool/picnic area of residence #191 River Road North.	Weekday	50	53
	Weekend	51	50

### 3.11.6 Potential Noise Impacts

#### 3.11.6.1 Operational Noise Impacts

As stated previously, a stationary source noise analysis for operations at each shaft site is not required since the planned equipment would be either subsurface, enclosed within the existing facility structures, or is not expected to generate additional noise. Additionally, a mobile source noise analysis is not required as well since the shaft



facilities would require limited additional personnel (primarily for maintenance) as a result of the Project.

### 3.11.6.2 Potential Construction Noise Impacts

At Shaft Nos. 1, 2A, and 8, construction activities would be limited and primarily include earthwork, foundation work, equipment installation, and access road and security fence improvements. These activities are expected to occur over a 6-month period and include the use of a front end loader, a bulldozer, a roller, an excavator, and a light duty truck. At Shaft Nos. 1 and 2A, receptors are located in excess of 1,000 feet of each shaft with an adequate attenuation distance to prevent significant construction noise impacts. The nearest receptor to Shaft No. 8 is located approximately 200 feet to the north of the shaft site. At the REC, equipment installation construction activities are planned over a 6-month period, and require the use of light duty trucks. All work activities at the REC would be conducted within the confines of the existing building and any receptors are located in excess of 1,000 feet from the site. It is expected that the Contractor will have a trailer outside of the existing building during the construction period. For Shafts 4 and 5A, equipment installation construction activities are only planned over a 6-month period requiring the use of light duty trucks. At these two shaft sites, several receptors are located 400 to 1,000 feet away. Due to the limited construction activities, no significant construction noise impacts are expected to occur at these sites.

At Shaft No. 6, Stages 1 and 2 of construction are expected to generate the highest noise impacts as a result of the large amount equipment required on-site for each stage. These construction activities would only be performed during the weekday daytime periods. Construction activities during Stages 3, 4, and 5 are expected to primarily be inside the shaft and shaft building with limited exterior construction equipment/activities. Certain construction activities during these three construction stages are planned to occur during the weekend and nighttime time periods but would be confined within the shaft and the Shaft No. 6 building structure. Potential noise impacts at the residential receptors surrounding the site for Stages 1 and 2 during the weekday conditions are illustrated in Table 3-18. The table shows the No Build, Construction, and Combined noise conditions for each of the four receptor locations. The resulting incremental increases between the Combined and No Build conditions are also provided. The calculated noise impacts account for noise attenuation effects from 12-foot high noise barrier walls along the north perimeter and interior parts of the site surrounding the construction areas that will be in place throughout the construction period.

<b>TABLE 3-18</b>				
<b>SHAFT CONSTRUCTION STAGE RECEPTOR LOCATION EQUIVALENT NOISE LEVELS</b>				
<i>Stage 1 Construction Activities</i>				
<i>Duration 7 Months</i>				
<i>Receptor</i>	<i>Weekday</i>			
	<i>No Build dBA</i>	<i>Construction dBA</i>	<i>Combined dBA</i>	<i>Increment dBA</i>
1	49	63	64	15
2	57	60	62	5
3	49	56	57	8
4	51	54	56	5
<i>Stage 2 Construction Activities</i>				
<i>Duration 8 Months</i>				
<i>Receptor</i>	<i>Weekday</i>			
	<i>No Build dBA</i>	<i>Construction dBA</i>	<i>Combined dBA</i>	<i>Increment dBA</i>
1	49	55	56	7
2	57	56	60	3
3	49	57	58	9
4	51	53	55	4

As shown above, the noise analysis indicates that Stage 1 construction activities would be expected to produce equivalent noise levels ranging from 54 to 63 dBA at the four receptor locations surrounding the site. The combined noise levels (construction source plus no build condition) would range from 56 to 64 dBA and would result in an incremental increase of 5 to 15 dBA over the no build conditions. This stage of construction would last approximately seven months, however the majority of the noise producing activities is expected to last only three months during the construction of the new crushed stone roadways and parking lots.

Stage 2 construction activities would be expected to produce equivalent noise levels ranging from 53 to 57 dBA at the four receptor locations. The combined noise levels (construction source plus no build conditions) would range from 55 to 60 dBA and increase existing ambient noise levels by 3 to 9 dBA. This stage of construction would last approximately eight months, however the majority of the noise producing activities is expected to last only four months during installation of the new electrical work and substations.

During both construction phases, estimated construction related noise levels at the four receptor locations for each construction phase are expected to be below the CEQR noise criteria (for non-industrial settings) of 65 dBA. Incremental noise increases above the No



Build condition for the four receptor locations are expected to range from 3 to 15 dBA. These noise level increases would be noticeable and are attributed from the relatively low (quiet) existing ambient noise conditions and relatively close proximity of the construction activities to the adjacent receptor locations (as close as 100 ft). Construction noise levels during Stages 3 to 5 would be well below the NYSDEC 65 dBA criteria and would generally not be noticeable since most construction activities would be within the shaft and Shaft No. 6 building with a limited amount of exterior equipment required on-site.

### **3.11.7 Impact Reduction Measures**

In order to minimize noise impacts from construction activities at Shaft No. 6, a 12-foot high noise attenuating fence would be built along the north site property line and around the interior construction areas. Installation of the noise attenuating fence would provide approximately 4 to 9 dBA of construction noise attenuation for the nearby residences. Despite these reductions, construction noise impacts would be noticeable due to the close distance of the nearby residences and the relatively quiet existing conditions. However, given the short duration of the elevated noise levels, it is not anticipated that these noise levels would result in significant noise impacts to the nearby sensitive receptors.

## **3.12 AIR QUALITY**

This air quality section discusses potential emission sources associated with the rehabilitation of the shaft sites and the potential for air quality impacts due to these emissions. A discussion of the existing conditions including the climatology and meteorology in the vicinity of the shaft sites and a description of the baseline air quality is also included.

### **3.12.1 Existing Conditions**

The existing conditions section considers the climatology, meteorology, and background ambient air monitoring stations in the vicinity of the REC and each of the shaft sites.

#### **3.12.1.1 Climate and Meteorology**

The REC and each of the shaft locations is situated within the Hudson Valley region of New York State. The REC and Shaft Nos. 1 and 2A are in the Town of Wawarsing, Ulster County, New York. Shaft No. 4 is in the Town of Gardiner, Ulster County, New York. Ulster County is located in the southwest section of New York. Shaft No. 5A is in the Town of Newburgh, Orange County, New York. Orange County is located in southeastern New York State, directly north of the New Jersey-New York border, west of the Hudson River, and northwest of New York City. Shaft No. 6 is in the Town of Wappinger, Dutchess County, New York. Dutchess County is located in eastern

New York State, between the Hudson River on its west and the New York-Connecticut border on its east. Shaft No. 8 is in the Town of Putnam Valley, Putnam County, New York. Putnam County is located in southeastern New York State, between the Hudson River on its west and the New York-Connecticut border on its east.

The climate in the Hudson Valley region is broadly representative of that which prevails in the northeastern United States, which is the humid continental type. The continental characteristics of the climate are due to the variety of air masses across the region. Cold winter weather prevails whenever Arctic air masses push south from central Canada. Warm, humid air is transported into the region by winds from the south and southwest. Storms and frontal systems often approach from the west or south along the Atlantic seaboard. Locally, the weather and climate in the Hudson Valley region is influenced by both the Hudson River and valley wind flows. The Hudson River helps keep the climate temperate, and the valley serves as a conduit for maritime breezes from the south.

The prevailing wind is generally from the west in New York State. A southwest component becomes evident in winds during the warmer months while a northwest component is characteristic of the colder one-half of the year. Occasionally, well-developed storm systems moving across the continent or along the Atlantic Coast are accompanied by very strong winds.

### 3.12.1.2 Ambient Air Quality Standards

As required by the Clean Air Act and its amendments, the USEPA has established primary and secondary National Ambient Air Quality Standards (NAAQS) for seven principal air pollutants, which are called “criteria” pollutants. These include carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), respirable particulate matter (particulate matter with an aerodynamic diameter below 10 μm, PM<sub>10</sub>, and particulate matter with an aerodynamic diameter below 2.5 μm, PM<sub>2.5</sub>), sulfur dioxide (SO<sub>2</sub>), and lead (Pb). Primary standards set limits to protect public health, including the health of “sensitive” populations such as asthmatics, children, and the elderly. The primary standards represent levels at which there are no known significant effects on human health. Secondary standards are intended to protect public welfare, including protection against visibility impairment and damage to animals, crops, vegetation, and buildings. New York State has adopted these standards as the New York State Ambient Air Quality Standards (NYSAAQS). In addition, New York State regulates ambient air concentrations of hydrogen sulfide (H<sub>2</sub>S), beryllium, fluorides, and total suspended particulates (TSP). The National and New York State Ambient Air Quality Standards for each pollutant and averaging time period are shown in Table 3-19.

### 3.12.1.3 Background Ambient Air Quality

The REC and the shaft sites are located within USEPA Region 2 and the NYSDEC Region 3. The fundamental mechanism by which the USEPA and the NYSDEC track compliance with the ambient air quality standards is by monitoring and designating areas as either in “attainment” or “non-attainment” for a particular pollutant

and standard. The sites are located in the Hudson Valley Air Quality Control Region (AQCR), which is an area that is in attainment of the NAAQS for all criteria pollutants except for ozone. The 1990 Clean Air Act Amendments designated New York and 11 other northeastern states as the Northeast Ozone Transport Region (OTR). As a result, the USEPA considers the OTR as non-attainment for ozone. Therefore, the Hudson Valley AQCR is defined as moderate non-attainment for ozone.

Air quality in the region is established by the NYSDEC at a number of air monitoring stations located throughout New York State to monitor ambient levels of criteria pollutants. Each of the NYSDEC air monitoring stations monitors one or more regulated air pollutants. There are several monitoring stations within the Hudson Valley region from which background concentration data can be obtained, including Belleayre Mountain in Ulster County and Mt. Ninham in Putnam County. The existing background air quality data from each of the monitoring stations were based on five years of the latest available monitoring data, 2000 through 2004. Table 3-20 presents a summary of the ambient air concentrations for each of the monitored pollutants. A comparison of the monitored ambient levels in this table with the corresponding standards reveals that there were no exceedances of federal or state standards during the monitoring period.

**TABLE 3-19**  
**NATIONAL AND NEW YORK STATE AMBIENT AIR QUALITY STANDARDS**

<b>Pollutant</b>	<b>Averaging Time<sup>a</sup></b>	<b>NYSAAQS</b>	<b>NAAQS Primary</b>	<b>NAAQS Secondary</b>
<b>Carbon monoxide (CO)</b>	8-hour	9 ppm (10,000 µg/m <sup>3</sup> )	9 ppm (10,000 µg/m <sup>3</sup> )	9 ppm (10,000 µg/m <sup>3</sup> )
	1-hour	35 ppm (40,000 µg/m <sup>3</sup> )	35 ppm (40,000 µg/m <sup>3</sup> )	35 ppm (40,000 µg/m <sup>3</sup> )
<b>Nitrogen dioxide (NO<sub>2</sub>)</b>	Annual	0.05 ppm (100 µg/m <sup>3</sup> )	0.05 ppm (100 µg/m <sup>3</sup> )	0.05 ppm (100 µg/m <sup>3</sup> )
<b>Sulfur dioxide (SO<sub>2</sub>)</b>	Annual	0.03 ppm (80 µg/m <sup>3</sup> )	0.03 ppm (80 µg/m <sup>3</sup> )	--
	24-hour	0.14 ppm (365 µg/m <sup>3</sup> )	0.14 ppm (365 µg/m <sup>3</sup> )	--
	3-hour	0.50 ppm (1300 µg/m <sup>3</sup> )	--	0.50 ppm (1300 µg/m <sup>3</sup> )
<b>Inhalable Particulates (PM<sub>10</sub>)*</b>	Annual	--	50 µg/m <sup>3</sup>	50 µg/m <sup>3</sup>
	24-hour	--	150 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>
<b>Fine Particulate Matter (PM<sub>2.5</sub>)*</b>	Annual	--	15 µg/m <sup>3</sup>	15 µg/m <sup>3</sup>
	24-hour	--	65 µg/m <sup>3</sup>	65 µg/m <sup>3</sup>
<b>Ozone (O<sub>3</sub>)</b>	1-hour <sup>b</sup>	0.12 ppm (235 µg/m <sup>3</sup> )	0.12 ppm (235 µg/m <sup>3</sup> )	0.12 ppm (235 µg/m <sup>3</sup> )
	8-hour	0.08 ppm (157 µg/m <sup>3</sup> )	0.08 ppm (157 µg/m <sup>3</sup> )	0.08 ppm (157 µg/m <sup>3</sup> )
<b>Lead (Pb)</b>	3-month	--	1.5 µg/m <sup>3</sup>	--
<b>Hydrogen Sulfide (H<sub>2</sub>S)</b>	1-hour	0.01 ppm	--	--
<b>Beryllium</b>	1-month	0.01 µg/m <sup>3</sup>	--	--
<b>Fluorides</b>	24-hour	2.85 µg/m <sup>3</sup>	--	--
<b>Total Suspended Particles (TSP)</b>	Annual	75 µg/m <sup>3</sup>	--	--
	24-hour	250 µg/m <sup>3</sup>	--	--

**Notes:** ppm = parts per million µg/m<sup>3</sup> = micrograms per cubic meter

\* NAAQS as PM<sub>10</sub> less than or equal to 10 microns, PM<sub>2.5</sub> less than or equal to 2.5 microns.

<sup>a</sup> All short-term (24-hour or less) standards are not to be exceeded more than once per year, except for 24-hour PM<sub>10</sub> which is met when the 99<sup>th</sup> percentile is less than or equal the standard. All long-term standards are not to be exceeded, except for annual PM<sub>10</sub> which is not to be exceeded by the arithmetic average of the annual arithmetic averages from three successive years. Fluorides, beryllium, and hydrogen sulfide standards are not to be exceeded.

<sup>b</sup> 1-hour ozone standard applies only to areas that were designated non-attainment when the 8-hour ozone standard was adopted in July 1997.

Sources: 40 CFR 50.4-50.12 National Primary and Secondary Ambient Air Quality Standards  
6 NYCRR Part 257 New York Ambient Air Quality Standards



**TABLE 3-20**  
**SUMMARY OF SELECTED AMBIENT AIR MONITORING DATA**

Pollutant	Monitoring Station	Averaging Time <sup>b</sup>	Units	2000	2001	2002	2003	2004	NAAQS
CO <sup>a</sup>	Schenectady	1-hour	ppm ug/m <sup>3</sup>	5.2 5,954	3.6 4,122	4.3 4,924	3.6 4,122	2.9 3,321	35 40,000
		8-hour	ppm ug/m <sup>3</sup>	2.8 3,206	2.4 2,748	3.4 3,893	2.6 2,977	2.1 2,405	9 10,000
NO <sub>2</sub> <sup>a</sup>	Buffalo	Annual	ppm ug/m <sup>3</sup>	0.022 41	0.021 39	0.02 38	0.02 38	0.018 34	0.05 100
			ppm ug/m <sup>3</sup>	0.025 64	0.032 84	0.035 93	0.027 70	0.039 102	0.5 1300
SO <sub>2</sub>	Mt. Ninham (Putnam County)	3-hour	ppm ug/m <sup>3</sup>	0.015 39	0.014 37	0.013 34	0.017 43	0.014 36	0.14 365
		Annual	ppm ug/m <sup>3</sup>	0.002 6	0.003 7	0.002 6	0.002 6	0.002 6	0.03 80
			ppm ug/m <sup>3</sup>	0.018 46	0.018 47	0.016 41	0.020 53	0.018 48	0.5 1300
	Belleayre Mtn (Ulster County)	24-hour	ppm ug/m <sup>3</sup>	0.009 22	0.009 24	0.010 25	0.014 36	0.008 21	0.14 365
		Annual	ppm ug/m <sup>3</sup>	0.002 4	0.002 5	0.002 4	0.002 4	0.001 3	0.03 80
			ppm ug/m <sup>3</sup>	0.018 46	0.018 47	0.016 41	0.020 53	0.018 48	0.5 1300
PM <sub>10</sub>	Belleayre Mtn (Ulster County)	24-hour	ug/m <sup>3</sup>	29	34	41	34	37	150
		Annual	ug/m <sup>3</sup>	10	10	11	13	11	50
PM <sub>2.5</sub>	Newburgh	24-hour	ug/m <sup>3</sup>	30	31	32	40	36	65
		Annual	ug/m <sup>3</sup>	12	12	11	12	10	15
O <sub>3</sub>	Belleayre Mtn (Ulster County)	1-hour	ppm	0.094	0.094	0.098	0.099	0.089	0.12
		8-hour <sup>c</sup>	ppm	0.077	0.084	0.084	0.082	0.076	0.08
Lead	Wallkill (Hudson Valley)	3-month	ug/m <sup>3</sup>	0.13	0.11	0.10	0.11	0.13	1.5

**Notes:**

<sup>a</sup> NYSDEC Region 3 does not monitor for CO or NO<sub>2</sub>. The nearest available monitoring stations (Region 4 for CO and Region 9 for NO<sub>2</sub>) were selected to obtain background concentration data.

<sup>b</sup> Maximum concentrations (2000–2004) are reported for annual averages; maximum second highest concentrations (2000-2004) are reported for all other averaging periods.

<sup>c</sup> The ozone 8-hour standard is not exceeded unless the 3 year average of the 8-hour average is greater than 0.084 ppm.

**Source:** NYSDEC, Air Quality Reports for Calendar Years 2000 to 2004.

### 3.12.2 Mobile Source Analysis Impact Evaluation

The impact due to cars and trucks generated by the construction activities at each of the shaft sites was evaluated. An initial screening analysis was conducted to determine if there was a need for a detailed air quality impact analysis related to such mobile sources. The *CEQR Technical Manual* (NYCDEP, 2001) requires a detailed air quality analysis for any action that would generate 100 or more peak-hour vehicle trips. CEQR is utilized in this study due to its more stringent regulations than those employed through SEQRA. In addition, NYCDEP developed a mobile source screening threshold at a truck trip volume of 21 truck trips during the peak hour. Below this trip volume, the maximum annual PM<sub>2.5</sub> concentrations would be well below the 0.1ug/m<sup>3</sup> *de minimis* value that would indicate the need for further detailed analysis. Therefore, according to this screening procedure, incremental impacts related to PM<sub>2.5</sub> from 21 truck trips or fewer per hour would be insignificant. Each of the shaft sites was evaluated using these two screening approaches.

NYSDEC has instituted anti-idling regulations that prohibit idling by heavy-duty on-road vehicles above 8,500 pounds, including buses and trucks, for more than five consecutive minutes. [Practical exceptions to this rule may occur on construction sites where the



engine is being used to provide power for an auxiliary purpose, while stopped in traffic, and in cold weather conditions below 25°F (NYCDDC, 2004).] Limiting the idling time helps to minimize any potential accumulation of exhaust in the vicinity of the vehicle, and will be applied as one of the best management practices during the construction at the shaft sites.

### **3.12.2.1. REC**

During the construction activities at the REC, a maximum of three trucks would travel to the site per day. During the peak hour, a maximum of two trucks would be generated by the construction activities at the site, resulting in a maximum of four trip ends to the site during the peak hour. This number of truck trips is below the PM<sub>2.5</sub> increment criterion requiring more detailed analysis. In addition, as described under Section 3.10 for Traffic and Parking, no significant increase in construction worker vehicle trips is anticipated as a result of construction activities at the REC. At this site, a maximum of 15 passenger vehicle trips per day would be generated during the construction period. Conservatively assuming that these construction-related vehicle trips occur during the peak hour, this would be below the CEQR significant threshold of an additional 100 peak hour vehicle trips requiring a detailed air quality analysis.

### **3.12.2.2. Shaft No. 1**

During the construction activities at Shaft No. 1, a maximum of ten trucks would travel to the site per day. During the peak hour, a maximum of two trucks would be generated by the construction activities at the shaft site, resulting in a maximum of four trip ends to the site during the peak hour. This number of truck trips is below the PM<sub>2.5</sub> increment criterion requiring more detailed analysis. In addition, as described under Section 3.10 for Traffic and Parking, no significant increase in construction worker vehicle trips is anticipated as a result of construction activities for the Project. At this site, a maximum of 20 passenger vehicle trips per day would be generated during the construction period. Conservatively assuming that these construction-related vehicle trips occur during the peak hour, this would be below the CEQR significant threshold of an additional 100 peak hour vehicle trips requiring a detailed air quality analysis.

### **3.12.2.3. Shaft No. 2A**

During the construction activities at Shaft No. 2A, a maximum of sixteen trucks would travel to the site per day. During the peak hour, a maximum of two trucks would be generated by construction activities at the site, resulting in a maximum of four trip ends to the site during the peak hour. A trip end is defined as a vehicle entering and/or leaving the site. This number of truck trips is below the PM<sub>2.5</sub> increment criterion requiring more detailed analysis. In addition, as described under Section 3.10 for Traffic and Parking, no significant increase in construction worker vehicle trips is anticipated as a result of construction activities for the Shaft No. 2A Project. At this site, a maximum of 20 passenger vehicle trips per day would be generated during the construction period. Conservatively assuming that these construction-related vehicle trips occur during the

peak hour, this would be below the CEQR significant threshold of an additional 100 peak hour vehicle trips requiring a detailed air quality analysis.

#### **3.12.2.4. Shaft Nos. 4 & 5A**

During the construction activities at Shaft Nos. 4 and 5A, a maximum of three trucks would travel to the site per day. During the peak hour, a maximum of one truck would be generated by the construction activities at the site, resulting in a maximum of two trip ends to the site during the peak hour. This number of truck trips is below the  $PM_{2.5}$  increment criterion requiring more detailed analysis. In addition, as described under Section 3.10 for Traffic and Parking, no significant increase in construction worker vehicle trips is anticipated as a result of construction activities for the Shaft Nos. 4 and 5A rehabilitation project. At this site, a maximum of five passenger vehicle trips per day would be generated during the construction period. Conservatively assuming that these construction-related vehicle trips occur during the peak hour, this would be below the CEQR significant threshold of an additional 100 peak hour vehicle trips requiring a detailed air quality analysis.

#### **3.12.2.5. Shaft No. 6**

During the construction activities at Shaft No. 6, a maximum of twenty trucks would travel to the site per day. During the peak hour, there would be a maximum of eight trucks generated by the construction activities at the site, resulting in a maximum of sixteen trip ends to the site during the peak hour. This number of truck trips is below the  $PM_{2.5}$  increment criterion requiring more detailed analysis. In addition, no significant increase in construction worker vehicle trips is anticipated as a result of construction activities for the Shaft No. 6 rehabilitation project. There would be 50 passenger vehicle trips generated to the site during the peak hour (due to limited onsite parking). This would be below the CEQR significant threshold of an additional 100 peak hour vehicle trips. Best management practices will be applied during the construction in order to minimize the generation of fugitive dust, including reduced onsite travel speed and dust suppression when necessary.

Once construction at the shaft site is completed, daily site operations would involve approximately six employee vehicles and one truck delivery. These activities during site operation would not generate enough vehicular traffic to exceed CEQR thresholds of significance that would require a detailed analysis.

#### **3.12.2.6. Shaft No. 8**

During the construction activities at Shaft No. 8, a maximum of sixteen trucks would travel to the site per day. During the peak hour, a maximum of two trucks would be generated by the construction activities at the site, resulting in a maximum of four trip ends to the site during the peak hour. This number of truck trips is below the  $PM_{2.5}$  increment criterion requiring more detailed analysis. In addition, as described under Section 3.10 for Traffic and Parking, no significant increase in construction worker

vehicle trips is anticipated as a result of construction activities for the Shaft No. 8 rehabilitation project. At this site, a maximum of 20 passenger vehicle trips per day would be generated during the construction period. Conservatively assuming that these construction-related vehicle trips occur during the peak hour, this would be below the CEQR significant threshold of an additional 100 peak hour vehicle trips requiring a detailed air quality analysis.

### **3.12.2.7. Mobile Source Impact Evaluation Summary**

The traffic volumes anticipated at the REC and at Shaft Nos. 1, 2A, 4, 5A, 6, or 8 were below the CEQR thresholds for traffic and trucks during construction and operation. In addition, there would be no traffic diversions or lane closures anticipated during the construction activities at any of the shaft sites. Once construction at the Shaft Nos. 1, 2A, 4, 5A, and 8 is completed, no personnel would visit the shaft site on a routine basis, and at the REC, traffic would resume to normal conditions with personnel visiting the site on an as needed basis; therefore, there would be no increase in traffic or mobile source emissions. At most, the REC and the shaft sites might add a single guard at the front gate. In the case of Shaft No. 6, the limited traffic associated with its operation is well below the CEQR significance thresholds. Therefore, detailed analyses of the potential effects from mobile sources on air quality is not proposed for the REC or for Shaft Nos. 1, 2A, 4, 5A, 6, and 8 and no potential significant adverse air quality impacts due to mobile sources are anticipated either during construction or operation.

### **3.12.3 Stationary Source Analysis Impact Evaluation**

The Project consists of site improvements in order to prepare for the eventual repair of the tunnel. Stationary sources associated with the rehabilitation activities include emissions from non-road construction equipment and trucks on-site at each of the shaft site locations. The potential for air quality impacts from these stationary source emissions was evaluated by reviewing the construction duration at the REC and each shaft location, the construction activity and equipment at each location, and the proximity of sensitive receptors (such as residences, schools, churches, and parks) to each of the sites.

New York City Local Law 77 requires the use of ultra low sulfur diesel fuel (ULSDF) with a sulfur content no greater than 15 ppm and application of best available technology (BAT) for nonroad diesel-powered construction equipment above 50 horsepower on all construction contracts funded by New York City. The heavy-duty diesel-powered construction equipment to be used at all the shaft sites will be fueled by ULSDF and will have BAT applied in order to minimize emissions. In addition, state anti-idling regulations will be applied to onsite truck traffic. Best management practices will be applied at all sites in order to minimize the generation of fugitive dust from the construction activities, including dust suppression, as needed.

### 3.12.3.1. Shaft No. 1

The on-site construction activities at Shaft No. 1 would require a loader, a bulldozer, a roller, and an excavator over the course of a single eight-hour shift. The duration of the construction period would last 180 days; therefore use of the on-site equipment would be intermittent and short-term. Sensitive receptor uses within the vicinity of the shaft site include the Catskill State Park which is located a distance of approximately 1,500 feet from Shaft No. 1.

### 3.12.3.2. Shaft No. 2A

The on-site construction activities at Shaft No. 2A would require a loader, a bulldozer, a roller, and an excavator over the course of a single eight-hour shift. The duration of the construction period would last 180 days; therefore use of the on-site equipment would be intermittent and short-term. Sensitive receptor uses within the vicinity of the shaft site include Minnewaska State Park which is located a distance of approximately 1,000 feet from the shaft site.

### 3.12.3.3. REC & Shaft No. 4

Minimal construction equipment is anticipated on-site for both the REC and Shaft No. 4. Only a light duty truck would be required during the construction over the course of a single eight-hour shift. The duration of the construction period would last 180 days; therefore use of the light duty truck would be intermittent and short-term.

### 3.12.3.4. Shaft No. 5A

Minimal construction equipment is anticipated on-site for Shaft No. 5A. Only a light duty truck would be required during the construction over the course of a single eight hour shift. The duration of the construction period would last 180 days; therefore use of the light duty truck would be intermittent and short-term. Sensitive receptor uses within the vicinity of the shaft site include the Amity Foundation (a religious establishment) which is located a distance of approximately 1,700 feet from the shaft site. No sensitive receptors are located adjacent to the site.

### 3.12.3.5. Shaft No. 6

The construction activities at Shaft No. 6 would involve the use of various types of construction equipment operated alternatively over five stages of construction. The overall construction involves the use of a crane, compressor, welders, loader, and backhoe, a stand-by generator, and supply delivery trucks (one fuel truck, one concrete truck, three dump trucks, and two pickup trucks). As noted above, the construction equipment used at the shaft sites will combust ULSDF, and will be equipped with BAT in order to minimize the emissions of pollutants, in particular, diesel particulate matter. In

addition, best management practices will be applied during the construction in order to minimize the generation of fugitive dust, including reduced onsite travel speed and dust suppression when necessary.

While the duration of the overall construction at Shaft No. 6 is anticipated to last a little over four years, the construction itself will be performed in five stages, and not all equipment will be operated in every stage. In addition, construction activity will occur at different locations around the site depending upon the stage. Therefore, the use of the construction equipment during each stage is anticipated to be temporary and transient. Sensitive land uses in the vicinity of the shaft site include several residences, ranging from 120 feet to 480 feet from the various onsite construction areas. Due to the planned emissions control techniques, such as the use of ULSD and application of BAT on the construction equipment, the implementation of dust control measures and other best management practices (including restricted idling time for the trucks), and the relatively transient and temporary nature of the construction operations within the stages, the potential for stationary source impacts from the construction equipment on the residential receptors is anticipated to be insignificant.

#### **3.12.3.6. Shaft No. 8**

The on-site construction activities at Shaft No. 8 would require a loader, a dozer, a roller, and an excavator over the course of a single eight-hour shift. The duration of the construction period would last 180 days; therefore use of the on-site equipment would be intermittent and short-term. Sensitive receptor uses within the vicinity of the shaft site include the Buddhist Association of the United States which is located a distance of approximately 600-feet from the shaft site and Fahnestock State Park which is located a distance of 1,700-feet from the shaft site.

#### **3.12.3.7. Stationary Source Impact Evaluation Summary**

Construction equipment to be used at each of the shaft sites will be subject to Local Law 77 requirements to use ULSD and to apply BAT. NYSDEC anti-idling regulations will be applied to the heavy duty trucks onsite. In addition, measures will be taken to minimize generation of fugitive dust during the construction activities.

The duration of the construction periods for the REC and Shaft Nos. 1, 2A, 4, 5A, and 8 is approximately 180 days. The construction period at these locations are not anticipated to present a potential for significant adverse air quality impacts because the construction period and construction activities are intermittent and short-term. In addition, there are no nearby sensitive receptors at these sites. Once construction is completed, operation of the REC and the shafts would not require any combustion sources or additional stationary sources and there are currently no existing air emission sources at the sites. Therefore, a detailed analysis of the potential effects from stationary sources on air quality during construction or from operation of the REC and Shaft Nos. 1, 2A, 4, 5A, and 8 is not required and no potential significant adverse air quality impacts are anticipated.

The construction activities at Shaft No. 6 are anticipated to last for a little more than four years; however, the construction will occur in stages at different locations on the site, and not all equipment will be used in every stage. As noted above, the construction equipment used at the shaft sites will combust ULSD, and will be equipped with BAT in order to minimize the emissions of pollutants, in particular, diesel particulate matter. In addition, best management practices will be applied during the construction in order to minimize the generation of fugitive dust, including reduced onsite travel speed and dust suppression when necessary. Once construction is completed, operation of Shaft No. 6 would not require any new combustion sources or additional stationary sources and there are currently no existing air emission sources at this shaft site. Given the planned emission control measures to be applied during the construction, and staging of the construction, a detailed analysis of air quality impacts from the stationary sources at Shaft No. 6 is not required and no potential significant adverse air quality impacts are anticipated from either the construction or operation of this site.

### 3.13 VISUAL RESOURCES

In general, all shaft sites, with the exception of Shaft Nos. 4, 5A, and 6 are located in rural areas, surrounded by dense forests. Views of the shaft sites are obstructed by densely wooded and vegetated areas. Construction activities at Shaft Nos. 4, 5A, and 6 and the chain link fences surrounding the Shaft No. 5A and 6 sites would be visible from the public thoroughfares and adjacent properties. Construction activities at Shaft Nos. 1, 2A, and 8 sites and the chain link fences surrounding the shaft sites would not be visible from the public thoroughfares.

#### 3.13.1 REC & Shaft Nos. 1, 2A & 8

The most prominent feature in the vicinity of both the REC and Shaft No. 1 is the Rondout Reservoir, which lies to the north of the REC and to the northwest of the shaft site. Vacant land lies between the REC and the nearest residential area (to the south). Similarly, vacant land lies between shaft site and the nearest residences (also to the south). Shaft No. 2A is located on Water Supply land, and is surrounded on all sides by vacant land and an access road that runs adjacent to the site. The nearest residences are to the north of the shaft site, but are not adjacent to the NYCDEP property. The REC is not visible from nearby residences, but is visible from the public thoroughfare. However, since all work activities would be conducted within the confines of the existing building, the only visual alteration of the site from the public thoroughfare would be that of the construction vehicles outside the REC building. The scenic viewshed of the surrounding area from the REC would not be affected. Shaft Nos. 1 and 2A are also not visible from nearby residences or from the public thoroughfares. In addition, there are no scenic viewsheds of the surrounding areas, from the shaft sites. Therefore, significant visual impacts are not anticipated resulting from the work performed at these locations.

The property on which Shaft No. 8 is located is surrounded on the north, east, and south sides by vacant land. The nearest residence is to the north of the shaft site adjacent to the property on which the shaft site is located. A NYCDEP access easement runs through

this adjacent property. Shaft No. 8 is visible from the single adjacent resident but not publicly visible from Route 301. Approximately 55 trees are anticipated to be removed from the Shaft No. 8 site. The maximum number of trees to be removed is 55 trees. Therefore, the removal of these 55 trees would not significantly impact aesthetic resources, nor would the tree removal alter the view of the shaft site from the public thoroughfare.

The shaft caps at Shaft Nos. 1, 2A, and 8 are currently each surrounded by eight foot chain link fences. The existing chain link fence would be replaced, and a new eight foot chain link fence would be installed along the perimeter of each shaft site. Minimal soil excavation and grading, widening, and/or placement of gravel along the existing shaft access roads and entrance ways would occur as a result of the construction activities at Shaft Nos. 1, 2A, and 8. Therefore, the replacement fencing and gravel entrance ways would not significantly alter the existing view of the shaft site and therefore not create a significant visual impact.

Construction activities may result in the disruption of visual continuity at the shaft location due to excavation areas, equipment and construction material laydown areas, and operation of heavy equipment. The hoisting system to deliver equipment and personnel into the shaft, as part of the future tunnel rehabilitation project, may include a headframe and/or mobile cranes, which would be purchased as part of this Project and is therefore being analyzed here. The hoisting system would be temporarily used during the construction period and would be removed and/or stored after construction activities are complete. However, such disruption of visual continuity at the shaft would be temporary, would occur only during course of construction, and would not be visible to the public.

### **3.13.2 Shaft Nos. 4 & 5A**

No ground disturbance or subsurface investigation would occur at Shaft Nos. 4 and 5A, therefore, visual impacts would likely only occur as a result of the occasional disruption due to equipment and construction material laydown areas and the operation of heavy equipment. However, such disruption would be temporary, and would occur only during the course of construction.

### **3.13.3 Shaft No. 6**

An assessment of the visual character of the study area was conducted to describe the features of the area relevant to the proposed Shaft No. 6 work activities. The most prominent feature is the Hudson River, which lies immediately to the west of the HRPS. Across the river from the HRPS are two power generating facilities, one at Danskammer and one at Roseton. The closest residences to the proposed construction activities are located adjacent (to the south and southeast) to the shaft site property. The perimeter of the shaft site is currently surrounded by an eight foot chain link fence. Existing views of the site from the residences include:

- Shaft No. 6 building

- Old well house
- Equipment storage house
- HRPS
- Electrical substation
- Perimeter chain link fencing

Several permanent visual alterations would be made to the site, including the construction of two new electrical substations, a parking lot, additional paved roads, traffic light, a new entrance to the site with new entrance gates, a security guard house, permanent lighting, and new perimeter fencing.

The existing electrical substations on-site provide power for the existing pumps at the HRPS and for the existing Shaft No. 6 pumps. Existing electrical service is provided by CHG&E to an existing service substation connection along River Road. Due to the critical nature of the Shaft No. 6 tunnel unwatering system and the large electrical demand, a redundant electrical feed would be provided through a service routed overhead along River Road from a CHG&E substation. A new on-site substation would be constructed to provide power to the new pumps. The new substation would be constructed on the site of the existing substation and is not expected to exceed the height and dimensions of the existing substation.

A dedicated parking lot for NYCDEP employees as well as construction workers would be provided at the Shaft No. 6 site. The lot would have approximately 50 parking spaces. Roadways within the shaft site property would be paved. The site would appear less vegetated due to the addition of increased impervious surfaces, but the viewscape of the site and of the Hudson River that exists currently would not likely be significantly impaired.

A traffic light would be installed on River Road at the intersection with the Shaft No. 6 construction entrance driveway in order to provide adequate clearance for construction vehicles to enter and exit the shaft site. Appropriate signage would be installed along River Road in order to alert oncoming traffic to the presence of the traffic light. The light would be utilized throughout the construction period at Shaft No. 6. Upon completion of the construction period, appropriate measures would be taken to obscure the traffic light fixture from the view of vehicles on River Road and traffic would revert to preconstruction conditions.

A gate would be installed at the construction truck entrance and a cantilever slide gate and bollards would be installed at the existing main entrance to Shaft No. 6. The crash rated gate would be a heavy steel structure that is opened and closed in a linear motion without the use of roadway track. The gate would have a clear opening of 24-feet and would be 8-feet high. The cantilever gate would be an aluminum structure that is opened and closed in a linear motion without the use of roadway track. The gate would be 8-feet high and have a clear opening of 45-feet. Therefore, the new gates would not significantly alter the existing view of the shaft site and therefore not create a significant visual impact.

A security guard booth would be installed adjacent to the parking lot and construction entrance to authorize clearance before entering the site. The booth shall be 7-feet long by 7-feet wide by 11-feet high and be of welded steel construction with all intersecting welded connections ground smooth. The view of the security booth would be to some extent obstructed by the gate and site fence.

Limited additional permanent lighting fixtures are included in the scope of this Project. To maintain the visual character of the surrounding area, extra care would be taken to prevent glare and minimize light seen outside the site. The lighting would be directed towards the site and would be kept to the minimum needed for security purposes. Limited additional permanent lighting fixtures are included in the scope of this Project for personnel safety. This lighting would be directed onto the site roadways. All lighting would meet the Town's requirements at the site boundaries, and would not significantly impact visual resources. The permanent lighting fixtures to be installed at the site would be utilized only as necessary during the approximately four years of construction. The majority of construction to be conducted during the evening hours would be performed solely within the confines of the Shaft No. 6 building.

Portions of the existing chain link fence would be replaced with new ten and twelve foot sections. Fencing between the proposed parking lot and the adjacent residences along the northern part of the site would be required to attenuate noise during construction; therefore a 12 foot high chain link with removable noise attenuating fabric would be installed along the northern fence line. The chain link fence would remain once construction is complete, however the fabric would be removed. These permanent fixtures may be visible from surrounding residences and from the public thoroughfare.

These permanent visual alterations that would be made to the site, including the construction of two new electrical substations, a parking lot, additional paved roads, traffic light, a new entrance to the site with new entrance gates, a security guard house, permanent lighting, and new perimeter fencing are not expected to significantly alter the visual resources of the shaft site.

Visual impacts during construction would be similar to those of any site improvement project, and may include disruption of visual continuity due to excavation areas, equipment and construction material laydown areas, and operation of heavy equipment. These visual impacts are considered temporary construction alterations to the site and would not likely significantly impair the viewshed of the site and of the Hudson River that exists currently.

Therefore, it is not anticipated that the proposed work at the project sites would result in a significant adverse visual character impact.

### 3.14 PUBLIC HEALTH

The work required at the REC and at the shaft sites in preparation for future rehabilitation of the proposed Project would not constitute a public health risk in terms of drinking water supply. No work would occur in the tunnel during this Project, therefore there is no significant risk of compromising the quality of the water supply.

**REFERENCES AND LIST OF ACRONYMS**

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## REFERENCES

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## LIST OF ACRONYMS

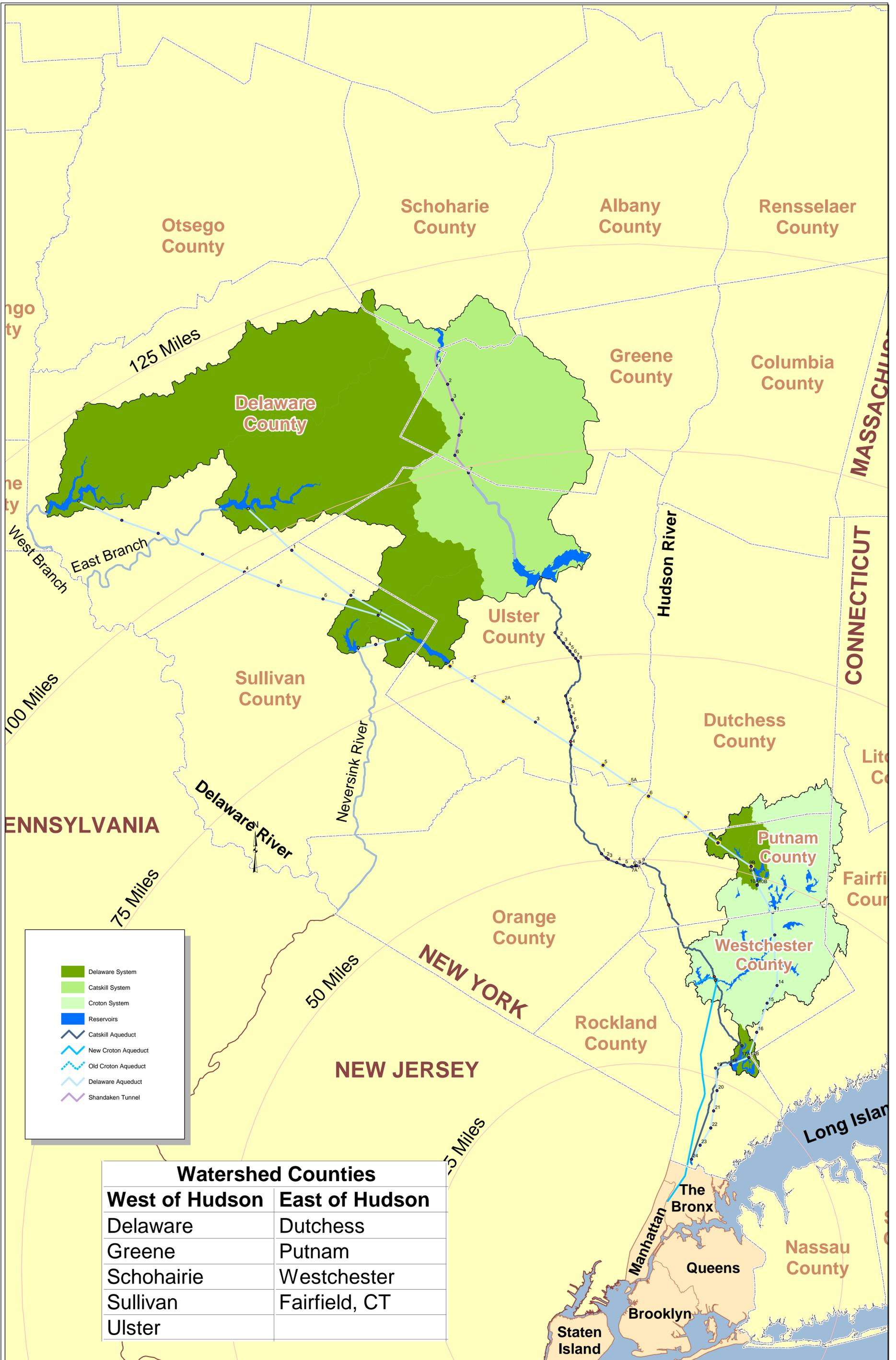
AADT	Average Annual Daily Traffic
ACM	asbestos containing material
BEDC	Bureau of Engineering, Design and Construction
BWS	Bureau of Water Supply
CEA	Critical Environmental Area
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
CEQR	City Environmental Quality Review
CHASP	Construction Health and Safety Plan
CHG&E	Central Hudson Gas & Electric
CO	carbon monoxide
CZMP	Coastal Zone Management Program
dbh	diameter breast height
EAF	Environmental Assessment Form
EEZ	Exclusive Economic Zone
EMTs	Emergency Medical Technicians
ERNS	Emergency Response Notification System
FEMA	Federal Emergency Management Agency
FINDS	Facility Index System
H <sub>2</sub> S	hydrogen sulfide
HGL	Hydraulic Grade Line
HRPS	Hudson River Pump Station
LBP	lead-based paint
LCP	lead-containing paint
LQGs	Large Quantity Generators
LUST	Leaking Underground Storage Tank
mgd	million gallons per day
MPI	Malcolm Pirnie, Inc.
NAAQS	National Ambient Air Quality Standard
NFRAP	no further remedial action planned
NO <sub>2</sub>	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NPL	National Priority List
NTIS	National Technical Information System
NWI	National Wetland Inventory
NYC	New York City
NYCDDC	New York City Department of Design and Construction
NYCDEP	New York City Department of Environmental Protection
NYS	New York State
NYSAAQS	New York State Ambient Air Quality Standards
NYSDOH	New York State Department of Health

## ACRONYMS

NYSDOS	New York State Department of State
O <sub>3</sub>	ozone
OCS	outer continental shelf
OPRHP	New York State Office of Parks, Recreation and Historic Preservation
PADS	PCB Activity Database
Pb	lead
PCB	polychlorinated biphenyl
PM	particulate matter
ppt	parts per thousand
RCRA	Resource Conservation and Recovery Act
RCRAGN	RCRA Information System Large, Small, and Very Small Quantity Generators
RCRIS	Resource Conservation and Recovery Act Information System
REC	Rondout Effluent Chamber
RELEASES	Air and Surface Water Releases – subset of USEPA’s ERNS database
RWB	Rondout-West Branch
SASS	Scenic Area of Statewide Significance
SAV	Submerged Aquatic Vegetation
SESC	Soil Erosion and Sediment Control
SEQR	State Environmental Quality Review
SO <sub>2</sub>	sulfur dioxide
SPCC	Spill Prevention Countermeasures and Control
SPDES	State Pollution Discharge Elimination System
SQGs	Small Quantity Generators
SWL	solid waste landfill
TSDFs	Treatment, Storage, Disposal Facilities
TSP	total suspended particulates
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
UST	Underground Storage Tank

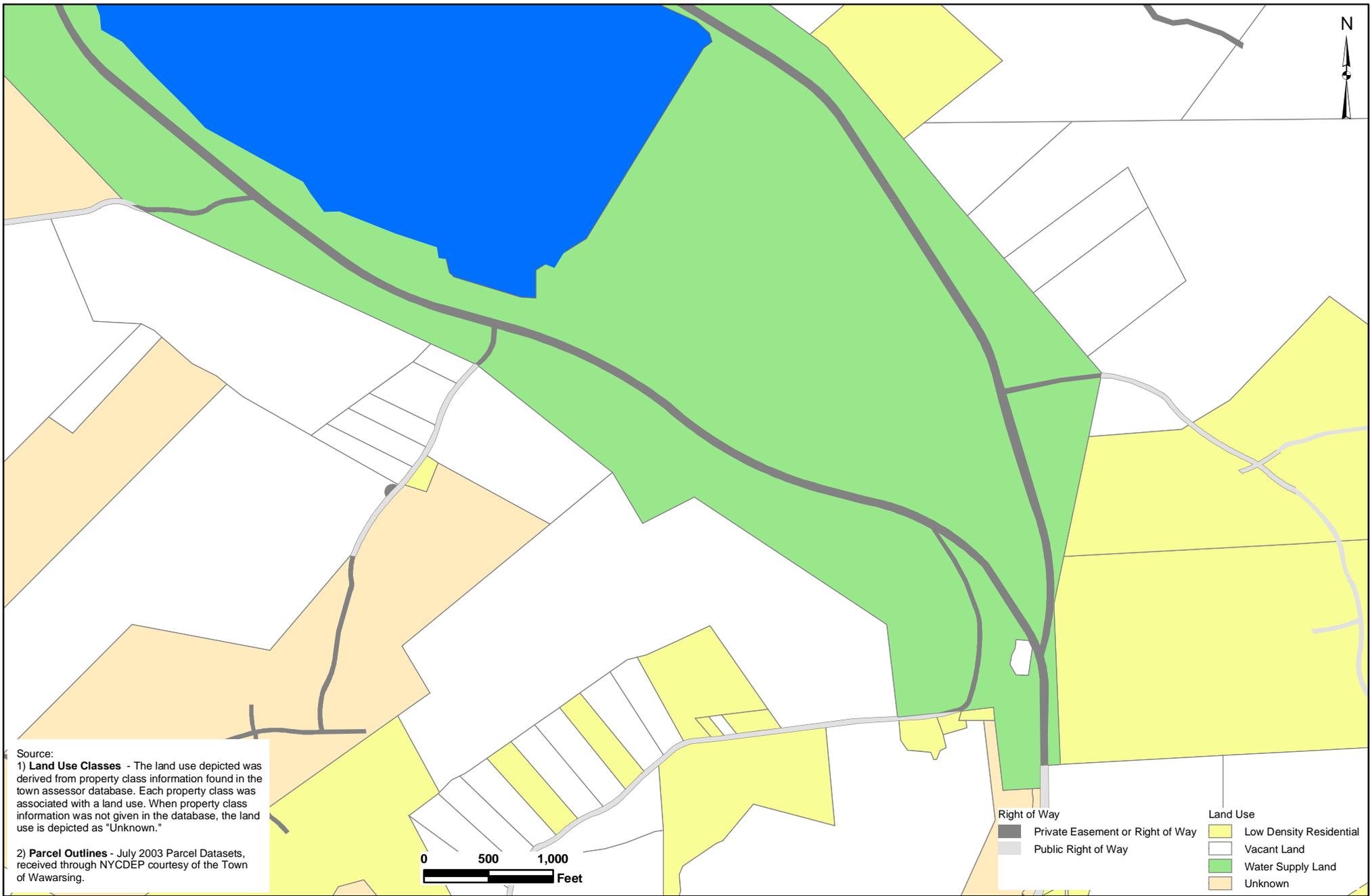
# **APPENDIX A**

## **FIGURES**



Watershed Counties	
West of Hudson	East of Hudson
Delaware	Dutchess
Greene	Putnam
Schoharie	Westchester
Sullivan	Fairfield, CT
Ulster	





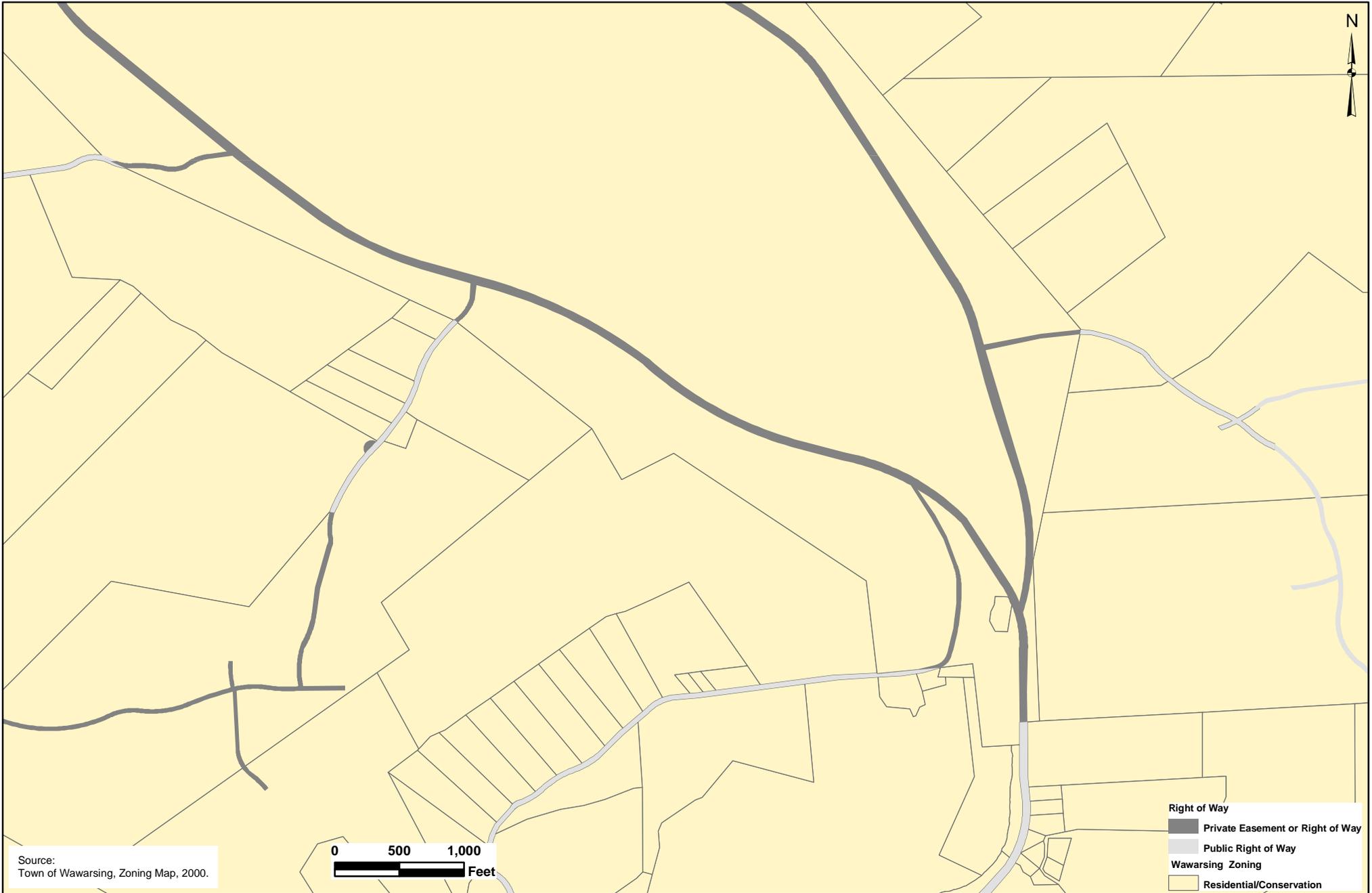
Rondout-West Branch Tunnel and Shaft Rehabilitation Project

Land Use  
**Shaft No. 1**  
 Ellenville, NY

**FIGURE 3.2-1**

**August 2006**





Source:  
Town of Wawarsing, Zoning Map, 2000.

0 500 1,000  
Feet

Right of Way  
 ■ Private Easement or Right of Way  
 ■ Public Right of Way  
 Wawarsing Zoning  
 ■ Residential/Conservation

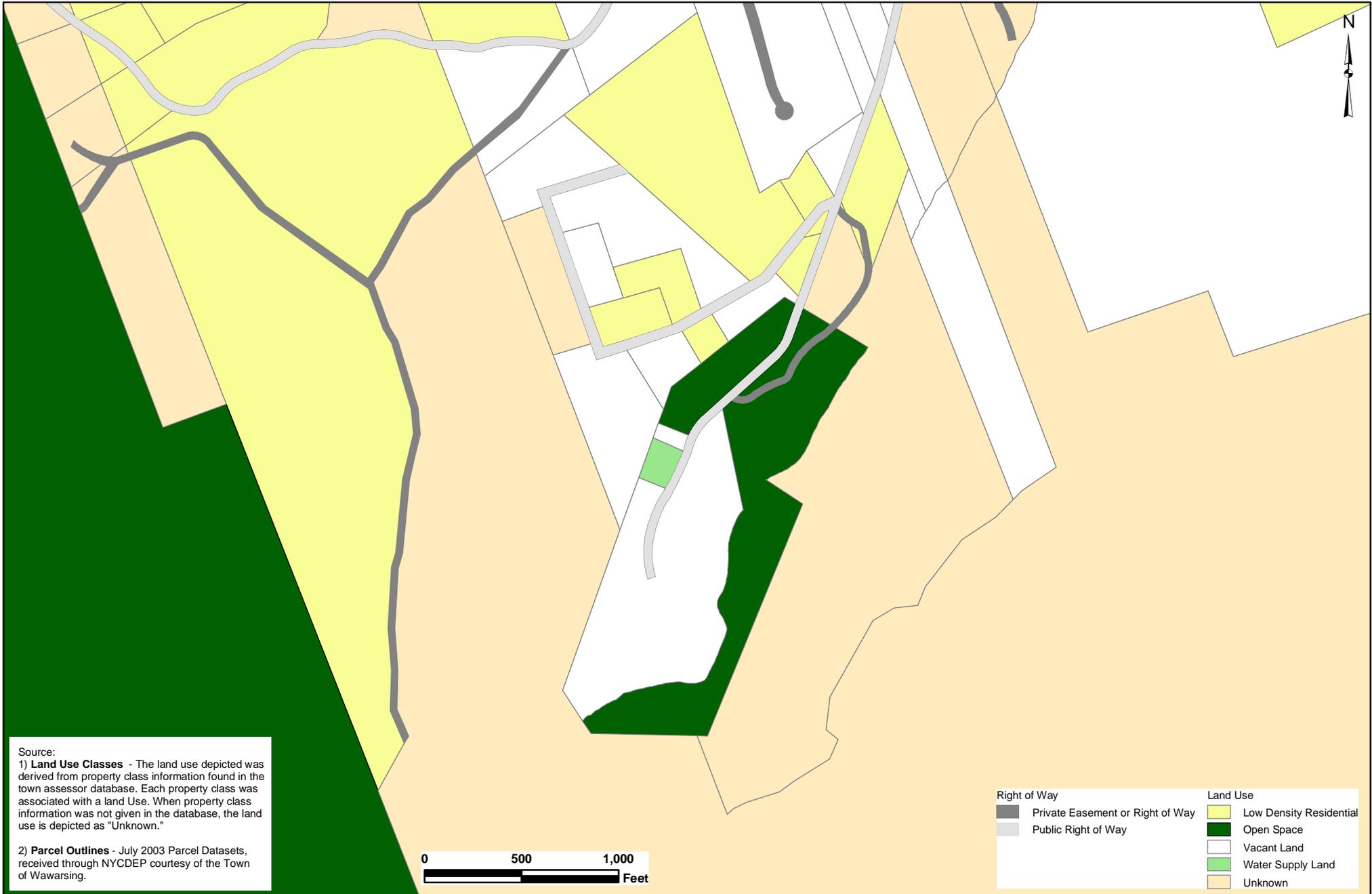
Rondout-West Branch Tunnel and Shaft Rehabilitation Project

Zoning  
**Shaft No. 1**  
 Ellenville, NY

**FIGURE 3.2-2**

August 2006





Source:  
 1) **Land Use Classes** - The land use depicted was derived from property class information found in the town assessor database. Each property class was associated with a land Use. When property class information was not given in the database, the land use is depicted as "Unknown."  
 2) **Parcel Outlines** - July 2003 Parcel Datasets, received through NYCDEP courtesy of the Town of Wawarsing.

Right of Way	Land Use
Private Easement or Right of Way	Low Density Residential
Public Right of Way	Open Space
	Vacant Land
	Water Supply Land
	Unknown

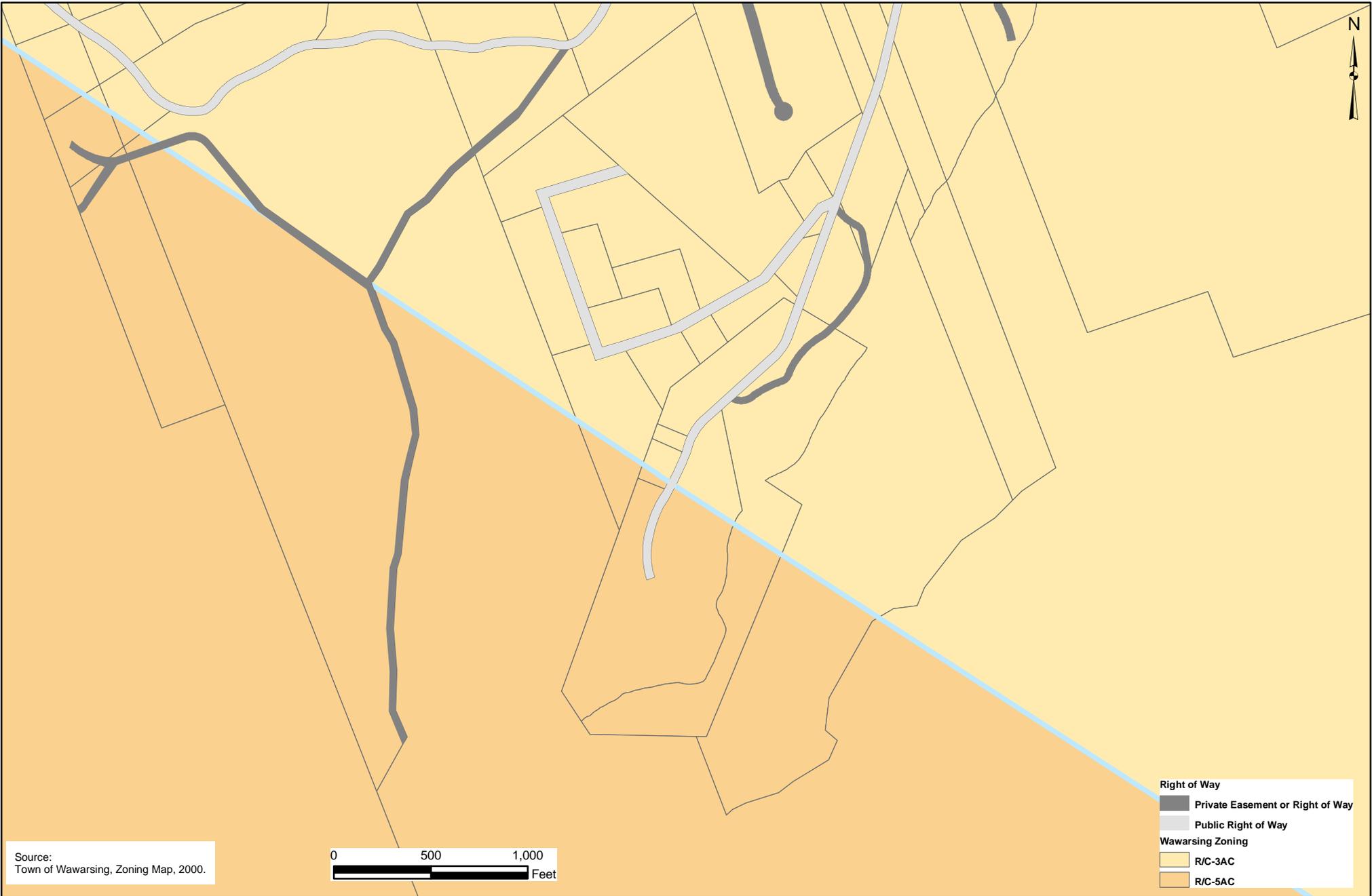
0 500 1,000 Feet

Rondout-West Branch Tunnel and Shaft Rehabilitation Project  
 Land Use  
**Shaft No. 2A**  
 Ellenville, NY

**FIGURE 3.2-3**

**August 2006**





Source:  
Town of Wawarsing, Zoning Map, 2000.

0 500 1,000  
Feet

**Right of Way**  
 Private Easement or Right of Way  
 Public Right of Way  
**Wawarsing Zoning**  
 R/C-3AC  
 R/C-5AC

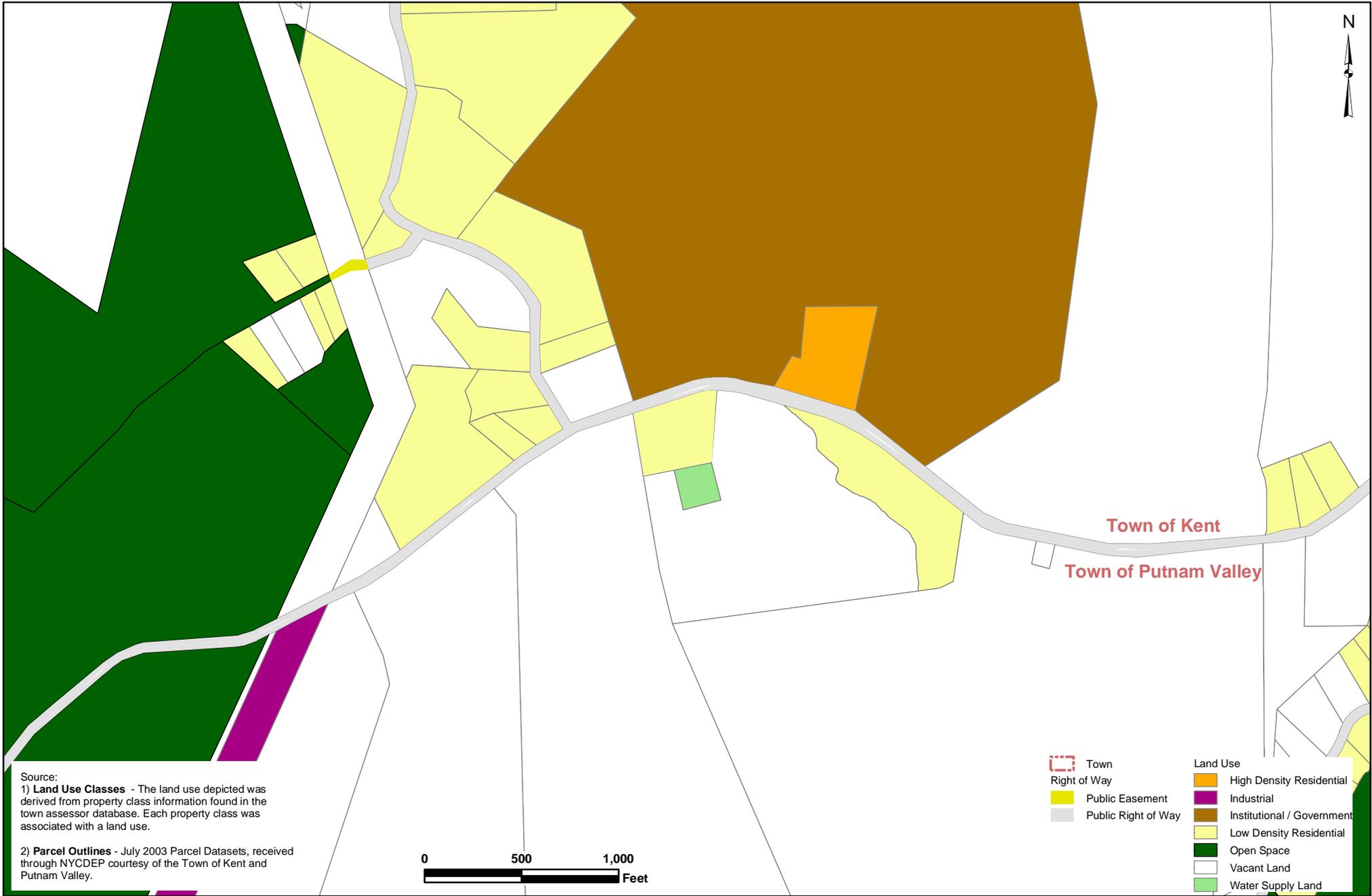
Rondout-West Branch Tunnel and Shaft Rehabilitation Project

Zoning  
**Shaft No. 2A**  
 Ellenville, NY

**FIGURE 3.2-4**

**August 2006**





Source:  
 1) **Land Use Classes** - The land use depicted was derived from property class information found in the town assessor database. Each property class was associated with a land use.

2) **Parcel Outlines** - July 2003 Parcel Datasets, received through NYCDEP courtesy of the Town of Kent and Putnam Valley.



Town		Land Use	
	Right of Way		High Density Residential
	Public Easement		Industrial
	Public Right of Way		Institutional / Government
			Low Density Residential
			Open Space
			Vacant Land
			Water Supply Land

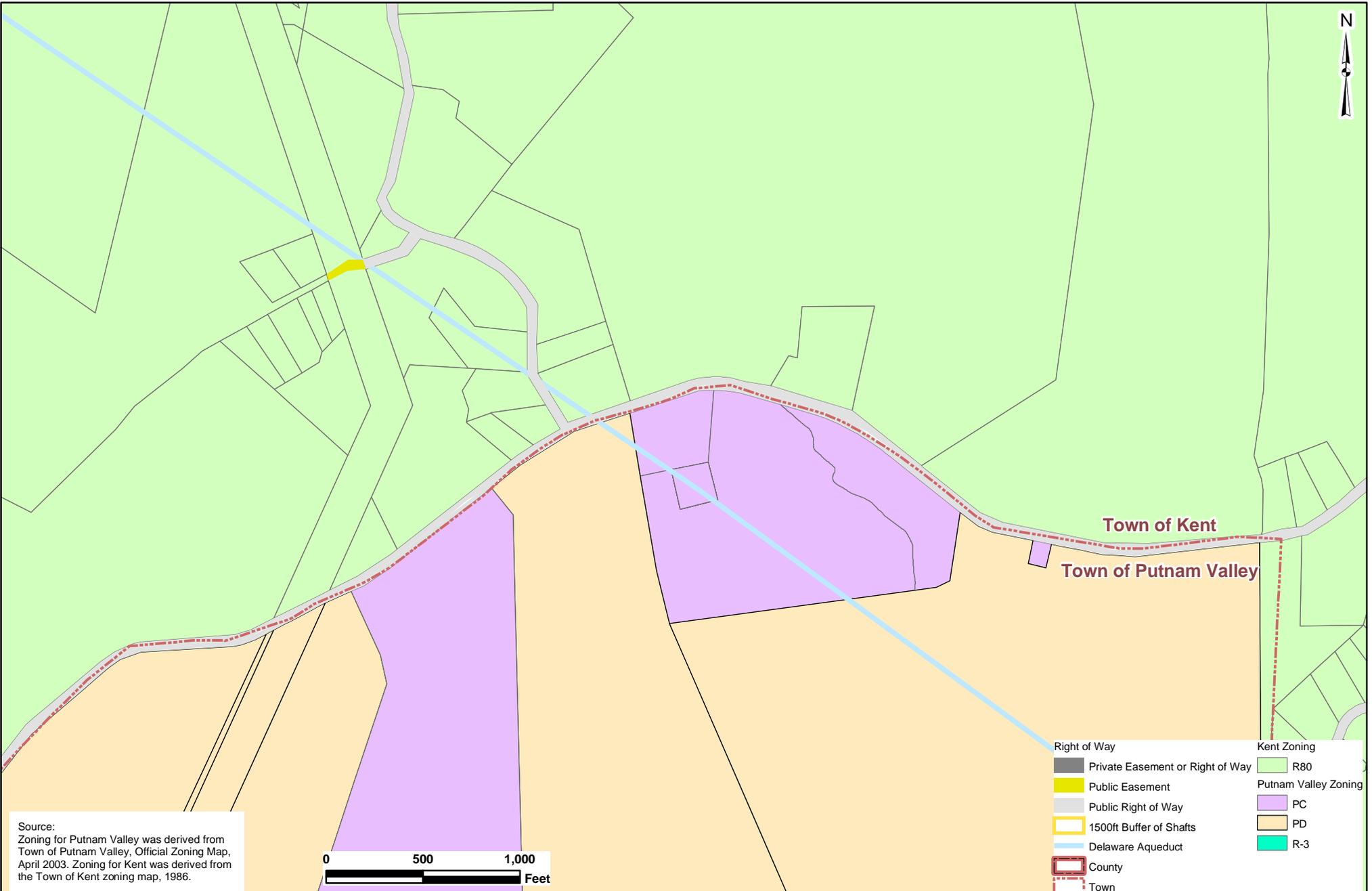
Rondout-West Branch Tunnel and Shaft Rehabilitation Project

Land Use  
**Shaft No. 8**  
 Putnam Valley, NY

**FIGURE 3.2-5**

**August 2006**





Source:  
 Zoning for Putnam Valley was derived from  
 Town of Putnam Valley, Official Zoning Map,  
 April 2003. Zoning for Kent was derived from  
 the Town of Kent zoning map, 1986.



- |                         |                          |
|-------------------------|--------------------------|
| Right of Way            | Kent Zoning R80          |
| Public Easement         | Putnam Valley Zoning PC  |
| Public Right of Way     | Putnam Valley Zoning PD  |
| 1500ft Buffer of Shafts | Putnam Valley Zoning R-3 |
| Delaware Aqueduct       |                          |
| County                  |                          |
| Town                    |                          |

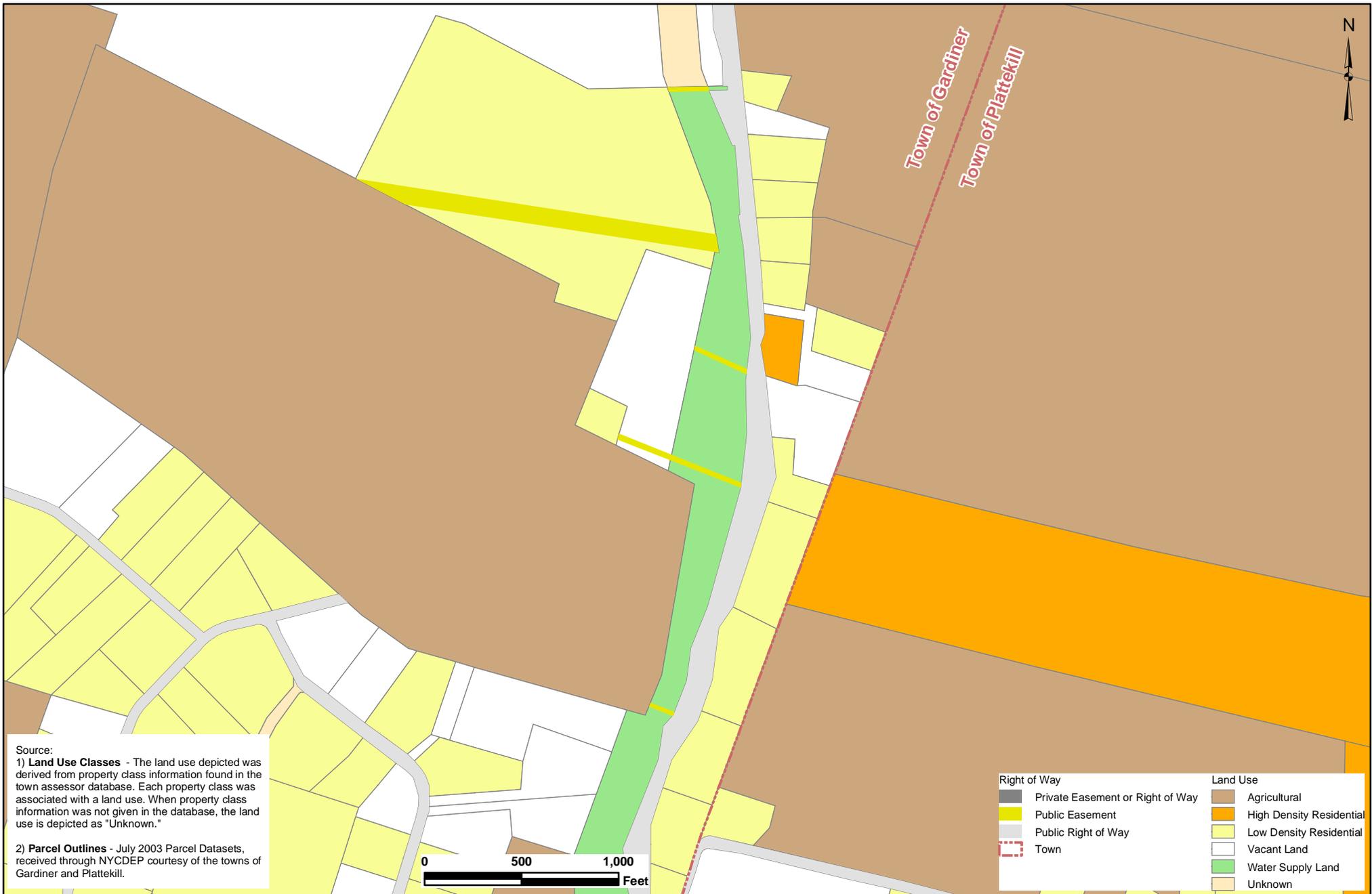
Rondout-West Branch Tunnel and Shaft Rehabilitation Project

Zoning  
**Shaft No. 8**  
 Putnam Valley, NY

**FIGURE 3.2-6**

August 2006





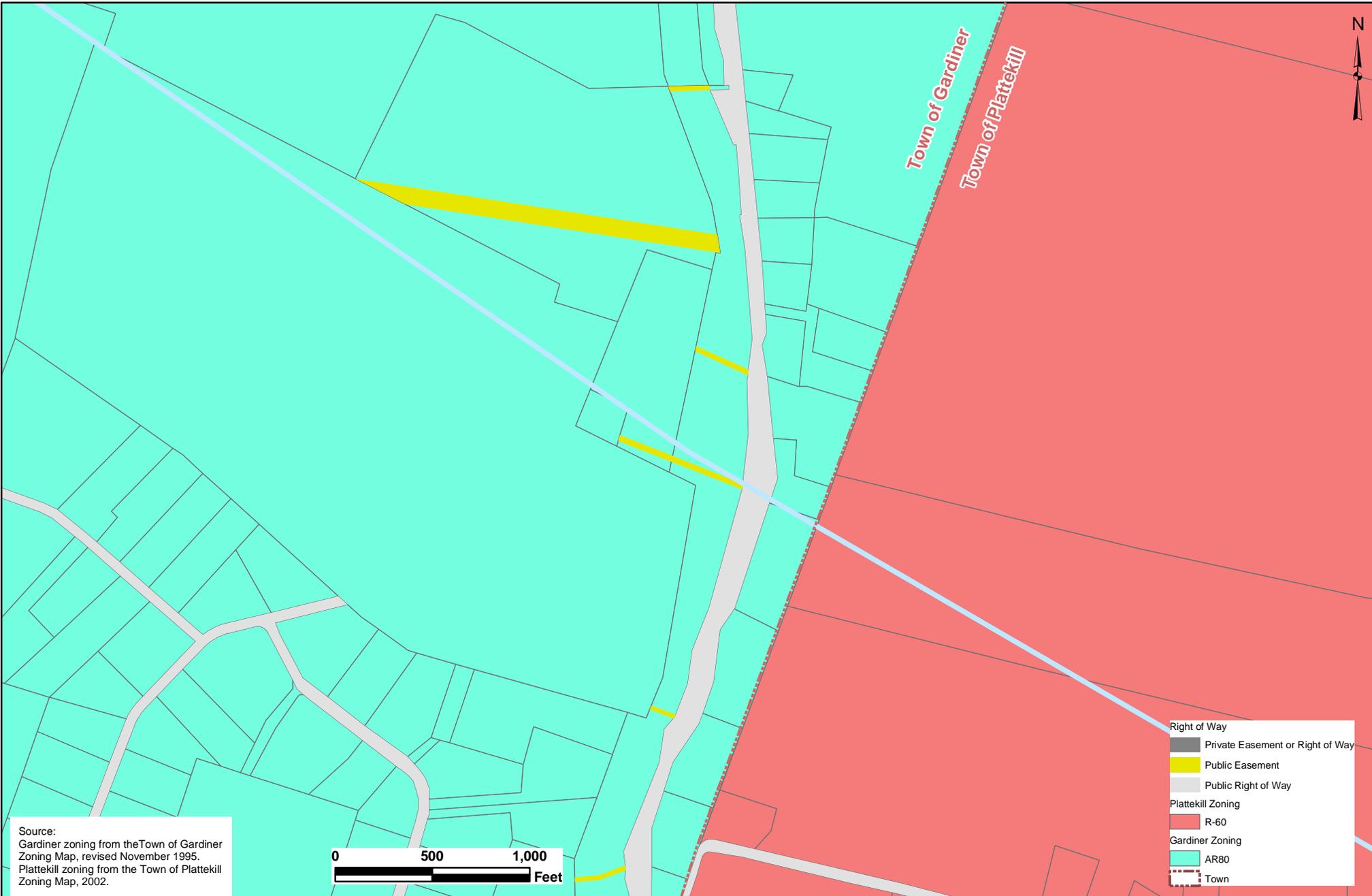
Source:  
 1) **Land Use Classes** - The land use depicted was derived from property class information found in the town assessor database. Each property class was associated with a land use. When property class information was not given in the database, the land use is depicted as "Unknown."  
 2) **Parcel Outlines** - July 2003 Parcel Datasets, received through NYCDEP courtesy of the towns of Gardiner and Plattekill.

Rondout-West Branch Tunnel and Shaft Rehabilitation Project  
 Land Use  
**Shaft No. 4**  
 Gardiner, NY

**FIGURE 3.2-7**

**August 2006**





Source:  
 Gardiner zoning from the Town of Gardiner  
 Zoning Map, revised November 1995.  
 Plattekill zoning from the Town of Plattekill  
 Zoning Map, 2002.

- Right of Way
  - Private Easement or Right of Way
  - Public Easement
  - Public Right of Way
- Plattekill Zoning
  - R-60
- Gardiner Zoning
  - AR80
- Town
  - Town

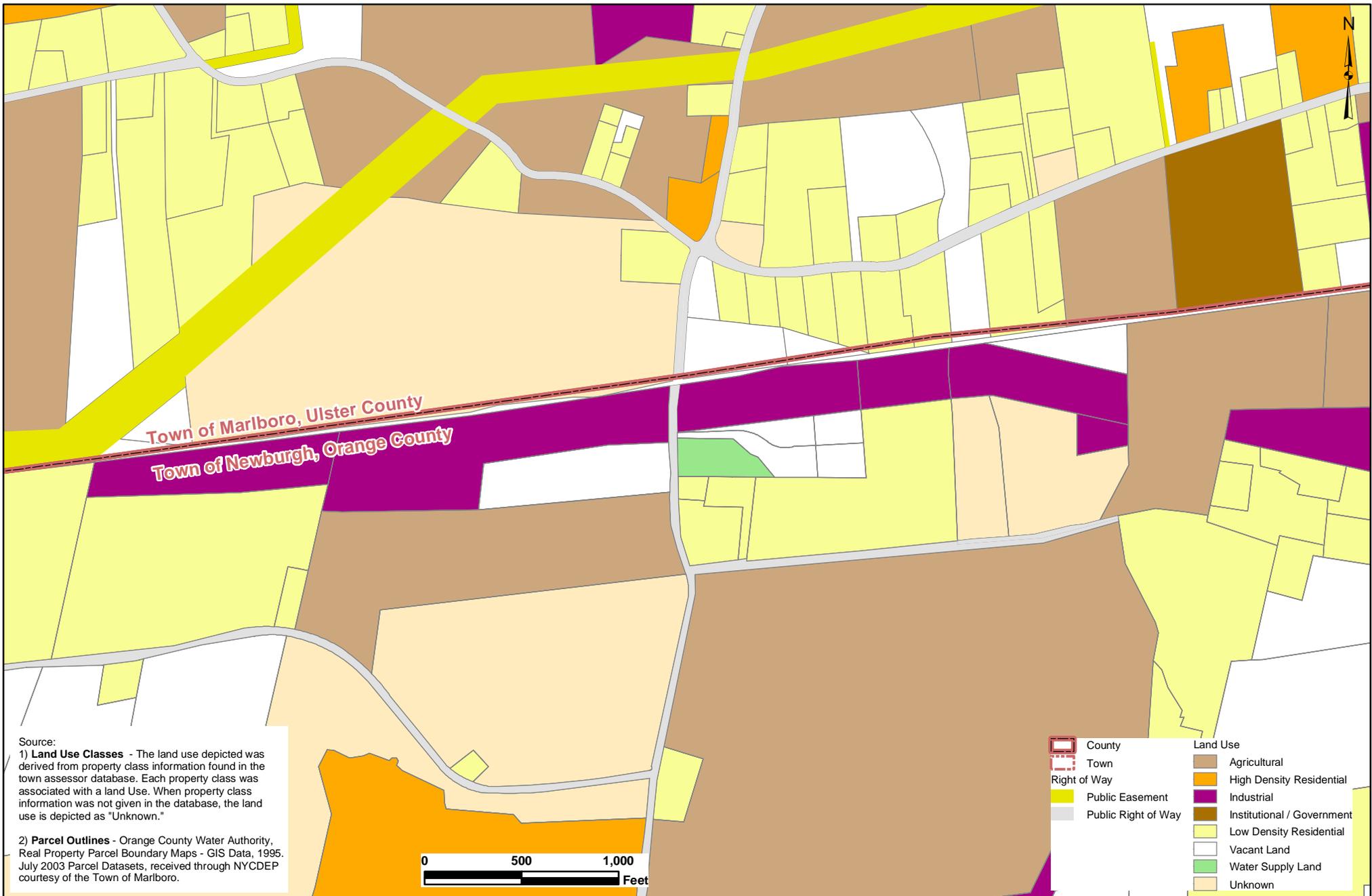
Rondout-West Branch Tunnel and Shaft Rehabilitation Project

Zoning  
**Shaft No. 4**  
 Gardiner, NY

**FIGURE 3.2-8**

**August 2006**





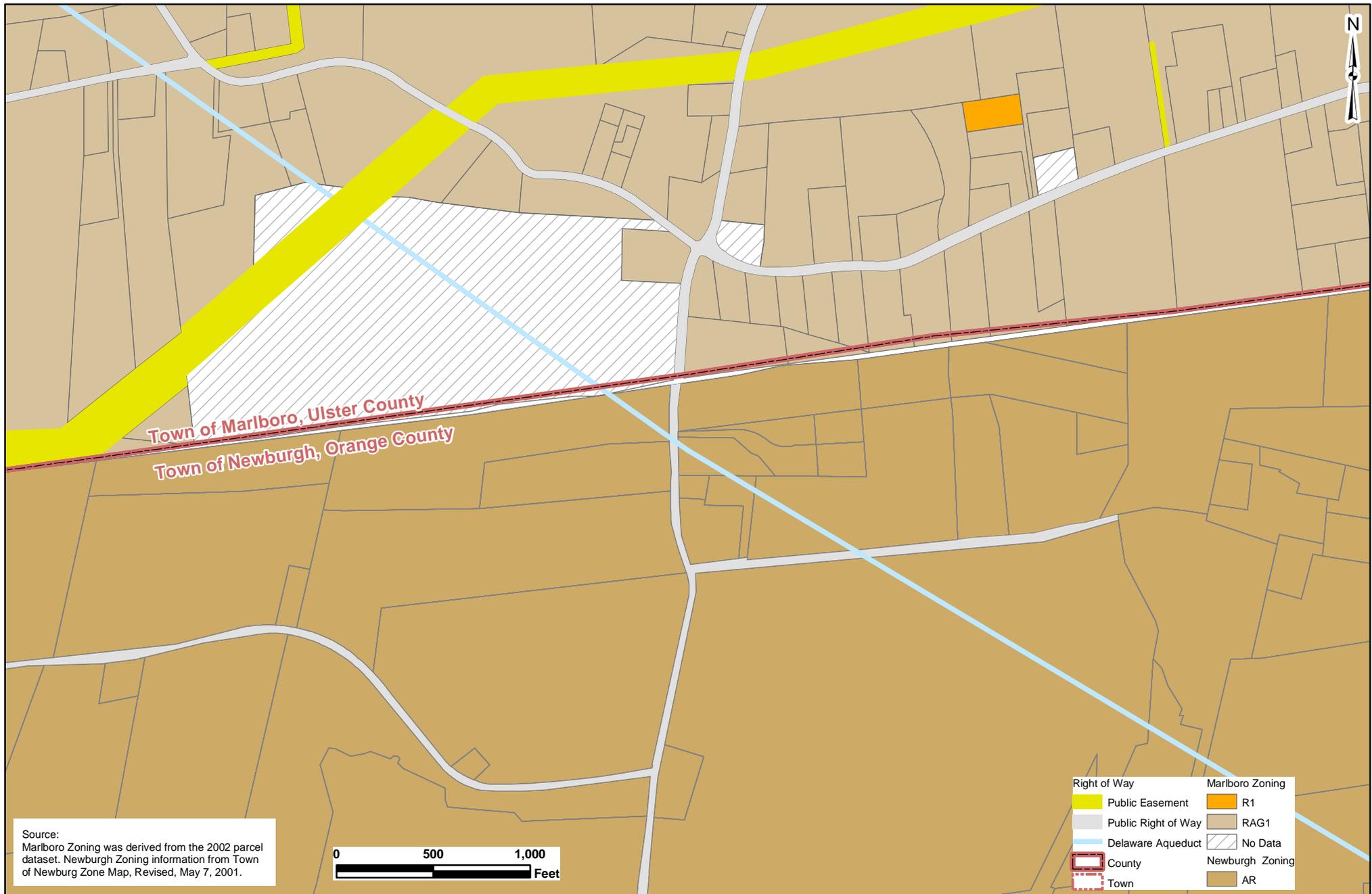
Rondout-West Branch Tunnel and Shaft Rehabilitation Project

Land Use  
**Shaft No. 5A**  
 Newburgh, NY

FIGURE 3.2-9

August 2006





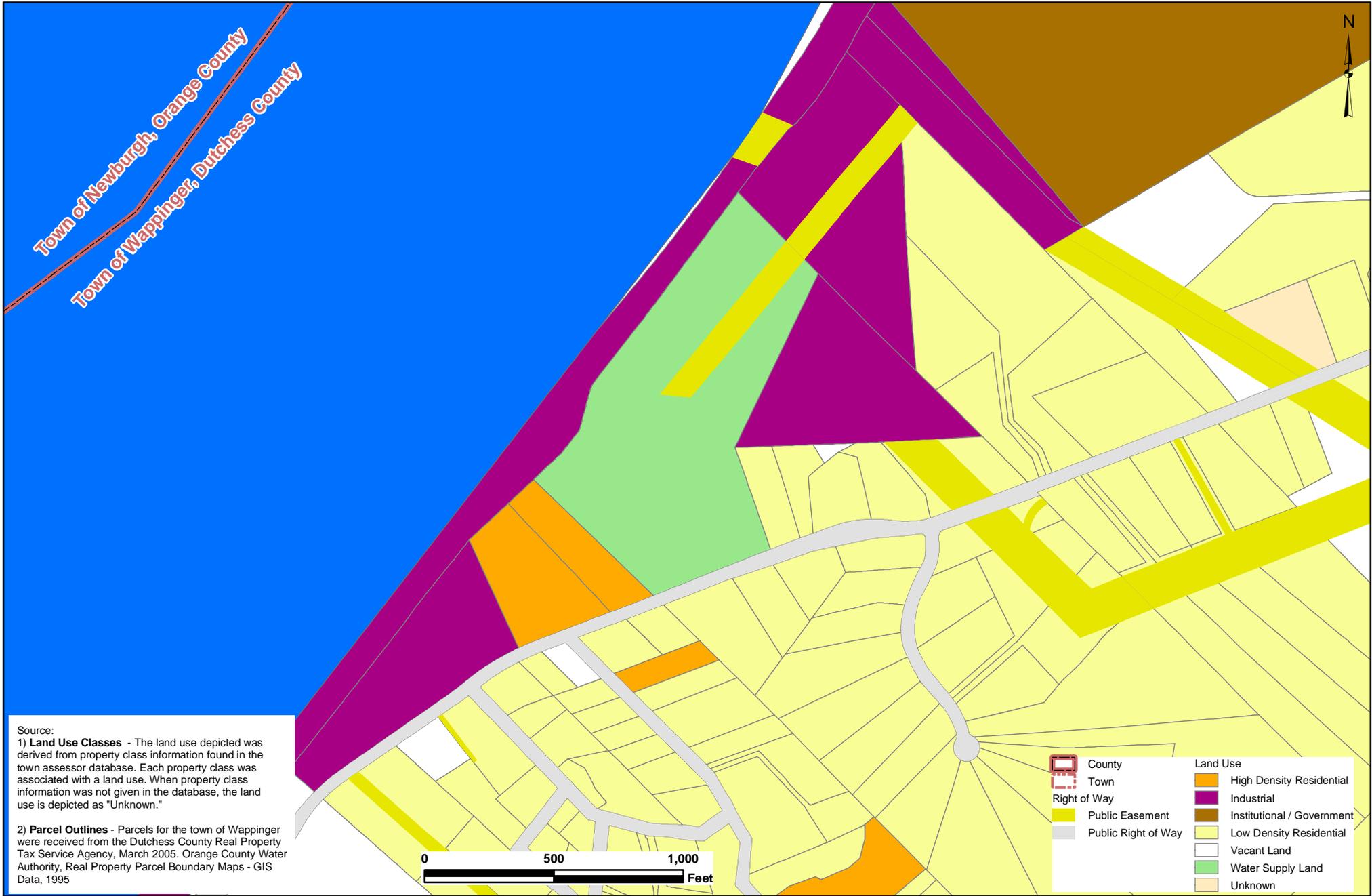
Rondout-West Branch Tunnel and Shaft Rehabilitation Project

Zoning  
**Shaft No. 5A**  
Newburgh, NY

**FIGURE 3.2-10**

August 2006





Source:  
 1) **Land Use Classes** - The land use depicted was derived from property class information found in the town assessor database. Each property class was associated with a land use. When property class information was not given in the database, the land use is depicted as "Unknown."  
 2) **Parcel Outlines** - Parcels for the town of Wappinger were received from the Dutchess County Real Property Tax Service Agency, March 2005. Orange County Water Authority, Real Property Parcel Boundary Maps - GIS Data, 1995

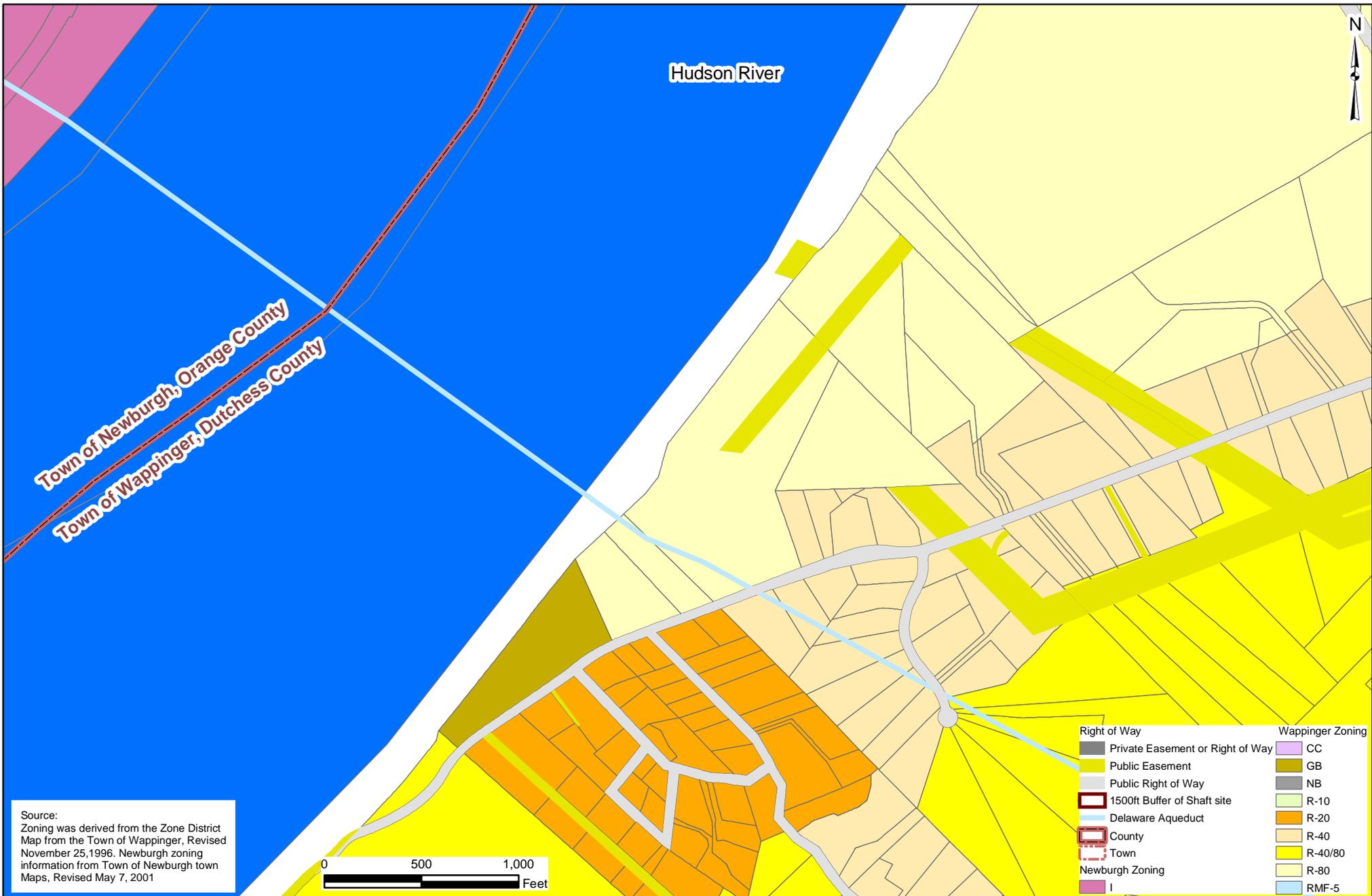
County		Land Use	
	County		High Density Residential
	Town		Industrial
	Right of Way		Institutional / Government
	Public Easement		Low Density Residential
	Public Right of Way		Vacant Land
			Water Supply Land
			Unknown

0 500 1,000 Feet

Rondout-West Branch Tunnel and Shaft Rehabilitation Project  
 Land Use  
**Shaft No. 6**  
 Wappinger, NY

**FIGURE 3.2-11**  
 August 2006





Source:  
 Zoning was derived from the Zone District Map from the Town of Wappinger, Revised November 25, 1996. Newburgh zoning information from Town of Newburgh town Maps, Revised May 7, 2001



Rondout-West Branch Tunnel and Shaft Rehabilitation Project

Zoning  
**Shaft No. 6**  
 Wappinger, NY



**FIGURE 3.2-12**

August 2006

**APPENDIX B**

**AGENCY RESPONSE LETTERS**

**New York State Department of Environmental Conservation**  
**Division of Fish, Wildlife & Marine Resources**  
**New York Natural Heritage Program**  
625 Broadway, 5<sup>th</sup> floor, Albany, New York 12233-4757  
**Phone:** (518) 402-8935 • **FAX:** (518) 402-8925  
**Website:** [www.dec.state.ny](http://www.dec.state.ny).



May 16, 2005

**RECEIVED**

MAY 18 2005

MALCOLM PIRNIE, INC.  
NORTHERN NEW JERSEY

Mark N. Page, Jr  
City of NY Dept. Environmental Protection  
59-17 Junction Blvd.  
Flushing, NY 11373

Dear Mr. Page:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to an Environmental Assessment for the proposed Project DEL-185-Delaware Aqueduct Tunnel and Shaft Rehabilitation, areas as indicated on the maps you provided, located in the County of Ulster.

Enclosed is a report of rare or state-listed animals and plants, significant natural communities, and other significant habitats, which our databases indicate occur, or may occur, on your site or in the immediate vicinity of your site. The information contained in this report is considered sensitive and may not be released to the public without permission from the New York Natural Heritage Program.

The presence of rare species may result in this project requiring additional permits, permit conditions, or review. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, at the enclosed address.

For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our databases. We cannot provide a definitive statement on the presence or absence of all rare or state-listed species or significant natural communities. This information should not be substituted for on-site surveys that may be required for environment impact assessment.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

Sincerely,

Nicholas B. Conrad, Information Services  
NY Natural Heritage Program

Encs.

cc: Reg. 4, Wildlife Mgr.  
Peter Nye, Endangered Species Unit, Albany  
Joanne Iwaskiw, Malcolm Pirnie, Fair Lawn, NJ ✓

**New York State Department of Environmental Conservation**

**Division of Environmental Permits, Region 3**

21 South Putt Corners Road, New Paltz, New York 12561-1696

Phone: (845) 256-3054 FAX: (845) 255-3042

Website: www.dec.state.ny.us



MP  
DM

RECEIVED ENVIRONMENTAL PERMITS DIVISION  
OFFICE OF ENVIRONMENTAL PLANNING & ASSESSMENT  
2005 MAY 23 PM 2:06

May 19, 2005

Mark Page, Project Manager  
New York City Department of Environmental Protection  
59-17 Junction Boulevard  
Flushing, New York 11373

**RE: Response to Inquiry Received April 6, 2005 - Critical Environmental Areas (CEAs)  
Proposed Tunnel/Shaft Rehabilitation at Various Delaware Aqueduct Shafts**

Dear Mr. Page:

We received your correspondence April 6, 2005 inquiring whether any Critical Environmental Areas (CEAs) are located at or near any of the following Delaware Aqueduct facilities: Shafts 1, 2A, 4, 5A, 6, 8, 9 and the Roundout Effluent Chamber. We have reviewed the submitted site location maps for each proposed work location and checked our files for the most recent information regarding CEAs, and have made the following determinations:

- **Shaft 4:** Town of Gardiner, Ulster County - The Shaft 4 facility is located approximately one-half (1/2) mile north of a Critical Environmental Area, noted in our records as *Wallkill Public Water Supply* in the Town of Shawangunk. For further information regarding this CEA, we recommend that you contact the Town of Shawangunk directly.
- **Shafts 1, 2A, 5A, 6, 8, 9 and the Roundout Effluent Chamber** - There are no Critical Environmental Areas located at, or near to, the above proposed project locations.

We believe this response provides the information you requested. Please contact me at (845) 256-3051 to discuss any questions you may have regarding the above. Thank you.

Sincerely,

**Scott Ballard**  
**Environmental Analyst**

cc: general file



New York State Office of Parks, Recreation and Historic Preservation  
Historic Preservation Field Services Bureau  
Peebles Island, PO Box 189, Waterford, New York 12188-0189

518-237-8643

2005 JUL 29 10:29 AM  
July 25, 2005

Mark Page, Jr.  
Office of Environmental Planning, NYCDEP  
59-17 Junction Blvd., 11th floor  
Flushing, New York 11373

Re: DOH  
NYCDEP Cultural Resources Request  
Wawarsing, Ulster County  
05PR01742

Dear Mr. Page:

Thank you for requesting the comments of the Office of Parks, Recreation and Historic Preservation (OPRHP). We have reviewed the project in accordance with the New York State Parks, Recreation and Historic Preservation Law, Section 14.09.

Based upon this review, it is the OPRHP's opinion that your project will have No Impact upon cultural resources in or eligible for inclusion in the State and National Registers of Historic Places.

If further correspondence is required regarding this project, please be sure to refer to the OPRHP Project Review (PR) number noted above.

Sincerely,

Ruth L. Pierpont  
Director

RLP:bsa

**APPENDIX C**

**NEW YORK STATE DEPARTMENT OF STATE  
COASTAL ZONE MANAGEMENT PROGRAM  
FEDERAL CONSISTENCY ASSESSMENT FORM**

NEW YORK STATE DEPARTMENT OF STATE  
COASTAL MANAGEMENT PROGRAM  
Federal Consistency Assessment Form

An applicant, seeking a permit, license, waiver, certification or similar type of approval from a federal agency which is subject to the New York State Coastal Management Program (CMP), shall complete this assessment form for any proposed activity that will occur within and/or directly affect the State's Coastal Area. This form is intended to assist an applicant in certifying that the proposed activity is consistent with New York State's CMP as required by U.S. Department of Commerce regulations (15 CFR 930.57). It should be completed at the time when the federal application is prepared. The Department of State will use the completed form and accompanying information in its review of the applicant's certification of consistency.

A. APPLICANT (please print)

1. Name: New York City Department of Environmental Protection
2. Address: 96-05 Horace Harding Expressway, 5th Floor Low Rise, Corona, NY 11368
3. Telephone: Area Code (718 ) 595-5995

B. PROPOSED ACTIVITY

1. Brief description of activity:

Modifications to pump discharge piping and stilling chamber, new shaft refilling system, new electrical substation, hook-ups for stand-by power, paving and grading, new pump chamber and shaft ventilation system, and new Master Control panel provided. Roadway improvements, replacement of fencing, construction of security guard house, clearing of wooded and brush areas, outfall modification.

2. Purpose of activity:

The purpose of the proposed action is to perform rehabilitation work at the Rondout-West Branch Tunnel Shaft No. 6 of the Delaware Aqueduct.

3. Location of activity:

<u>Dutchess</u>	<u>Wappinger</u>	<u>River Road</u>
County	City, Town, or Village	Street or Site Description

4. Type of federal permit/license required: United States Army Corps of Engineers
5. Federal application number, if known: \_\_\_\_\_
6. If a state permit/license was issued or is required for the proposed activity, identify the state agency and provide the application or permit number, if known:  
\_\_\_\_\_

C. COASTAL ASSESSMENT Check either "YES" or "NO" for each of these questions. The numbers following each question refer to the policies described in the CMP document (see footnote on page 2) which may be affected by the proposed activity.

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|----|---|----------------------|
| 1. | Will the proposed activity <u>result</u> in any of the following:   | <u>YES</u> <u>NO</u> |
|    | a. Large physical change to a site within the coastal area which will require the preparation of an environmental impact statement? (11, 22, 25, 32, 37, 38, 41, 43) . . . . .                      | ___ <u>x</u>         |
|    | b. Physical alteration of more than two acres of land along the shoreline, land under water or coastal waters? (2, 11, 12, 20, 28, 35, 44) . . . . .  | ___ <u>x</u>         |
|    | c. Revitalization/redevelopment of a deteriorated or underutilized waterfront site? (1) . . . . .   | ___ <u>x</u>         |
|    | d. Reduction of existing or potential public access to or along coastal waters? (19, 20) . . . . .  | ___ <u>x</u>         |
|    | e. Adverse effect upon the commercial or recreational use of coastal fish resources? (9,10) . . . . .   | ___ <u>x</u>         |
|    | f. Siting of a facility essential to the exploration, development and production of energy resources in coastal waters or on the Outer Continental Shelf? (29) . . . . .                            | ___ <u>x</u>         |
|    | g. Siting of a facility essential to the generation or transmission of energy? (27) . . . . .   | ___ <u>x</u>         |
|    | h. Mining, excavation, or dredging activities, or the placement of dredged or fill material in coastal waters? (15, 35) . . . . .   | <u>x</u> ___         |
|    | i. Discharge of toxics, hazardous substances or other pollutants into coastal waters? (8, 15, 35) . . . . .   | ___ <u>x</u>         |
|    | j. Draining of stormwater runoff or sewer overflows into coastal waters? (33) . . . . .   | ___ <u>x</u>         |
|    | k. Transport, storage, treatment, or disposal of solid wastes or hazardous materials? (36, 39) . . . . .  | ___ <u>x</u>         |
|    | l. Adverse effect upon land or water uses within the State's small harbors? (4) . . . . .   | ___ <u>x</u>         |
| 2. | Will the proposed activity <u>affect</u> or be <u>located</u> in, on, or adjacent to any of the following:  | <u>YES</u> <u>NO</u> |
|    | a. State designated freshwater or tidal wetland? (44) . . . . .   | <u>x</u> ___         |
|    | b. Federally designated flood and/or state designated erosion hazard area? (11, 12, 17,) . . . . .  | <u>x</u> ___         |
|    | c. State designated significant fish and/or wildlife habitat? (7) . . . . .   | ___ <u>x</u>         |
|    | d. State designated significant scenic resource or area? (24) . . . . .   | ___ <u>x</u>         |
|    | e. State designated important agricultural lands? (26) . . . . .  | ___ <u>x</u>         |
|    | f. Beach, dune or barrier island? (12) . . . . .  | ___ <u>x</u>         |
|    | g. Major ports of Albany, Buffalo, Ogdensburg, Oswego or New York? (3) . . . . .  | ___ <u>x</u>         |
|    | h. State, county, or local park? (19, 20) . . . . .   | ___ <u>x</u>         |
|    | i. Historic resource listed on the National or State Register of Historic Places? (23) . . . . .  | ___ <u>x</u>         |
| 3. | Will the proposed activity <u>require</u> any of the following:   | <u>YES</u> <u>NO</u> |
|    | a. Waterfront site? (2, 21, 22) . . . . .   | <u>x</u> ___         |
|    | b. Provision of new public services or infrastructure in undeveloped or sparsely populated sections of the coastal area? (5) . . . . .  | ___ <u>x</u>         |
|    | c. Construction or reconstruction of a flood or erosion control structure? (13, 14, 16) . . . . .   | ___ <u>x</u>         |
|    | d. State water quality permit or certification? (30, 38, 40) . . . . .  | ___ ___              |
|    | e. State air quality permit or certification? (41, 43) . . . . .  | ___ <u>x</u>         |
| 4. | Will the proposed activity <u>occur within</u> and/or <u>affect</u> an area covered by a State approved local waterfront revitalization program? (see policies in local program document) . . . . . | ___ <u>x</u>         |

D. ADDITIONAL STEPS

1. If all of the questions in Section C are answered "NO", then the applicant or agency shall complete Section E and submit the documentation required by Section F.
2. If any of the questions in Section C are answered "YES", then the applicant or agent is advised to consult the CMP, or where appropriate, the local waterfront revitalization program document\*. The proposed activity must be analyzed in more detail with respect to the applicable state or local coastal policies. On a separate page(s), the applicant or agent shall: (a) identify, by their policy numbers, which coastal policies are affected by the activity, (b) briefly assess the effects of the activity upon the policy; and, (c) state how the activity is consistent with each policy. Following the completion of this written assessment, the applicant or agency shall complete Section E and submit the documentation required by Section F.

E. CERTIFICATION

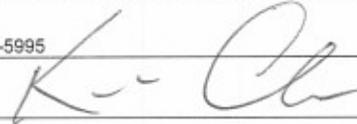
The applicant or agent must certify that the proposed activity is consistent with the State's CMP or the approved local waterfront revitalization program, as appropriate. If this certification cannot be made, the proposed activity shall not be undertaken. If this certification can be made, complete this Section.

"The proposed activity complies with New York State's approved Coastal Management Program, or with the applicable approved local waterfront revitalization program, and will be conducted in a manner consistent with such program."

Applicant/Agent's Name: New York City Department of Environmental Protection

Address: 96-05 Horace Harding Expressway, 5th Floor Low Rise, Corona, NY 11368

Telephone: Area Code (718 ) 595-5995

Applicant/Agent's Signature:  Date: 8/14/06

F. SUBMISSION REQUIREMENTS

1. The applicant or agent shall submit the following documents to the New York State Department of State, Division of Coastal Resources, 41 State Street - 8th Floor, Albany, New York 12231.
  - a. Copy of original signed form.
  - b. Copy of the completed federal agency application.
  - c. Other available information which would support the certification of consistency.
2. The applicant or agent shall also submit a copy of this completed form along with his/her application to the federal agency.
3. If there are any questions regarding the submission of this form, contact the Department of State at (518) 474-6000.

\*These state and local documents are available for inspection at the offices of many federal agencies, Department of environmental Conservation and Department of State regional offices, and the appropriate regional and county planning agencies. Local program documents are also available for inspection at the offices of the appropriate local government.