

Chapter 17: Hazardous Waste and Contaminated Materials

17-1 INTRODUCTION

This chapter assesses the potential for the presence of hazardous materials resulting from previous and existing uses both within the upland study area and in the surrounding area, as well as the potential for the proposed bridge's operation to cause adverse impacts related to hazardous waste and contaminated materials. Note that potential impacts associated with the project's construction are discussed in Chapter 18, "Construction Impacts." The potential for the presence of hazardous materials in Hudson River sediments disturbed during construction, and measures to avoid or minimize those impacts, are discussed in Chapter 15, "Water Resources," and Chapter 18, "Construction Impacts." As described below, project operation would not result in adverse impacts because the potential for exposure to any such materials in the subsurface (i.e., soil and groundwater) would be limited and controlled following construction, and any hazardous materials used, stored or disturbed as part of operation would be properly managed to avoid the potential for exposure.

17-2 REGULATORY CONTEXT

The management of subsurface contamination is subject to various regulatory programs including the federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA, commonly referred to as "Superfund") and Resource Conservation and Recovery Act (RCRA), as well as the state Inactive Hazardous Waste Disposal Site Remedial Program, Brownfield Cleanup Program, New York State Environmental Conservation Law and Article 12 of the New York State Navigation Law (relating to petroleum spills). The New York State Department of Environmental Conservation's (NYSDEC) Technical Guidance for Site Investigation and Remediation (DER-10) establishes methods for site investigation and clean-up, and the Solid Waste Management Facilities Regulations control disposal of excavated materials (6 NYCRR Part 360). As such, a non-ground intrusive study summarized in this chapter was conducted to determine whether site or building contamination is reasonably believed to exist within the study area due to on-site sources or migration of contaminants from nearby sites. A ground intrusive study, summarized in this chapter, was conducted based on the findings of the non-intrusive study to determine the potential for encountering hazardous materials during subsurface disturbance associated with the proposed bridge replacement project. As discussed in Chapter 18, "Construction Impacts," hazardous waste and contaminated materials may be encountered during project construction and/or may remain in the subsurface following the construction and certain post-construction operations (e.g., utility repair) could encounter these.

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Bridge maintenance and other operations could require handling and disposal of asbestos-containing materials (ACM), managing historical lead-based paint waste, storage, use and disposal of fuels and chemicals, maintenance of petroleum and chemical storage tanks, management and disposal of polychlorinated biphenyl (PCB) containing equipment and/or lighting fixtures, etc. These activities, performed in a manner consistent with existing New York State Thruway Authority (NYSTA)/New York State Department of Transportation (NYSDOT) procedures, are subject to a wide variety of federal, state, and/or local regulatory requirements.

17-3 METHODOLOGY

The following methodology was used to evaluate the potential presence of existing hazardous and contaminated materials within the areas to be disturbed by the project: site reconnaissance, research on current/historical use, and review of federal and state regulatory listings for both the limits of project construction activities and adjacent properties within distances specified by the American Society for Testing and Materials (ASTM) Standard E1527-05 (*Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*) were conducted as part of a non-ground-intrusive study. The locations of some construction staging areas and future maintenance or fueling, paint operations and other material storage area were not determined at the time of the study, so Chapter 18, "Construction Impacts," specifies that these areas be investigated for potential hazardous materials prior to any soil disturbance. A subsurface (also known as a Phase II) investigation was conducted to determine the potential impacts of the findings of the preliminary investigation. The Phase II investigation consisted of the collection and laboratory analyses of soil and groundwater samples throughout the study area. Potential sources of contamination that were identified during the Phase II investigation, or may otherwise be encountered during construction, would be addressed prior to and/or during construction with the measures described in Chapter 18, "Construction Impacts," which may include additional subsurface investigations and, if appropriate, remediation. Following construction, no significant potential for exposure to any remaining subsurface contamination would exist unless additional disturbance were to be required, e.g., for subsurface utility repairs. The possibility that post-construction excavation would be required again in areas investigated prior to construction or in other areas not previously investigated is addressed below.

The non-ground-intrusive study was also used to determine the potential nature and extent of non-subsurface hazardous materials typically associated with existing structures such as ACM, historical lead-based paint and/or PCB-containing equipment, which may be encountered during construction as addressed in Chapter 18, "Construction Impacts," or may be present following construction in remaining portions of the current structures in existing or new facilities and associated with day-to-day operation. Post-construction handling of such hazardous materials is addressed below.

This Environmental Impact Statement (EIS) also considers the generation, storage, use and/or disposal of a variety of hazardous materials associated with the operation of the proposed bridge, including (but not limited to):

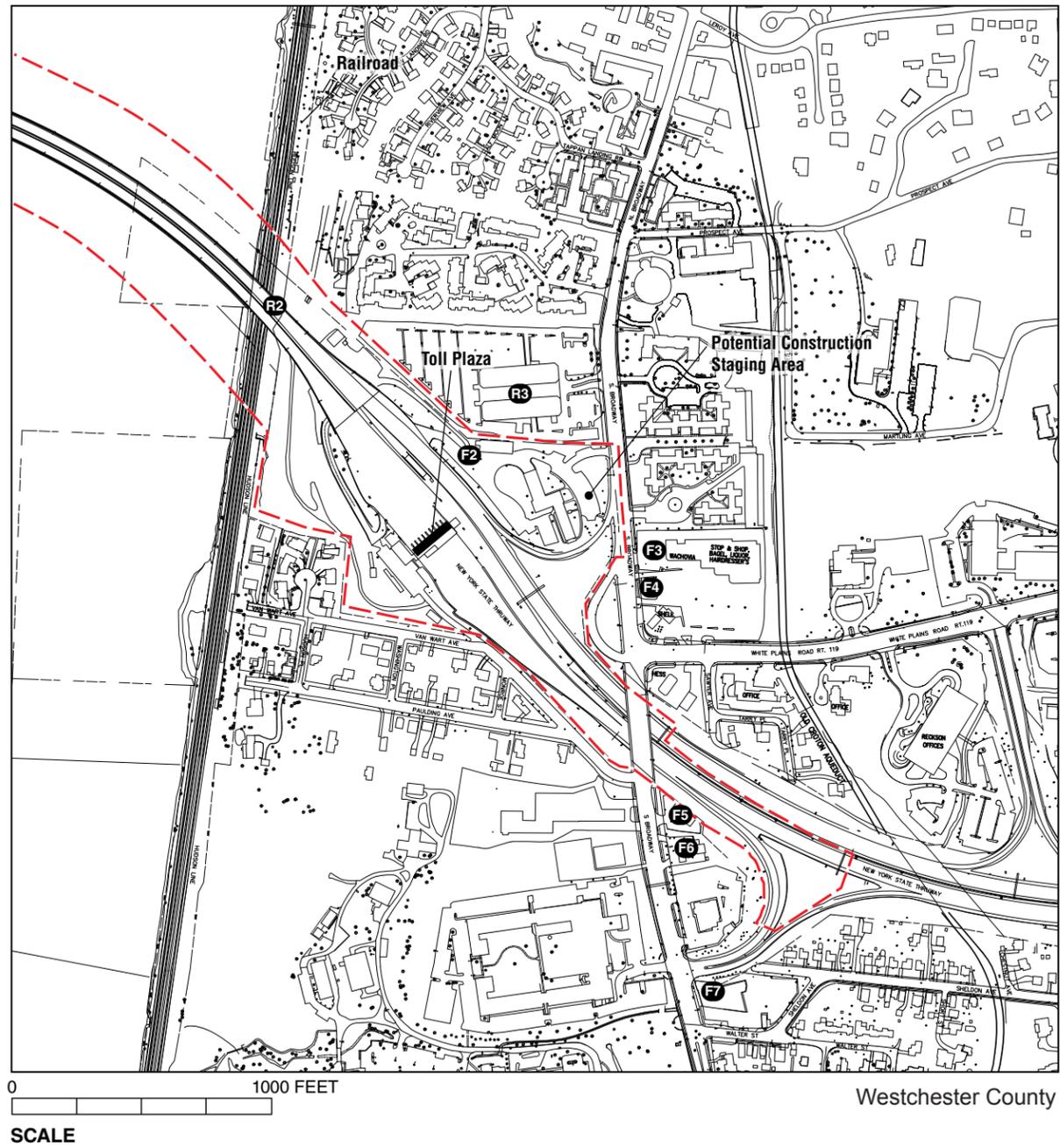
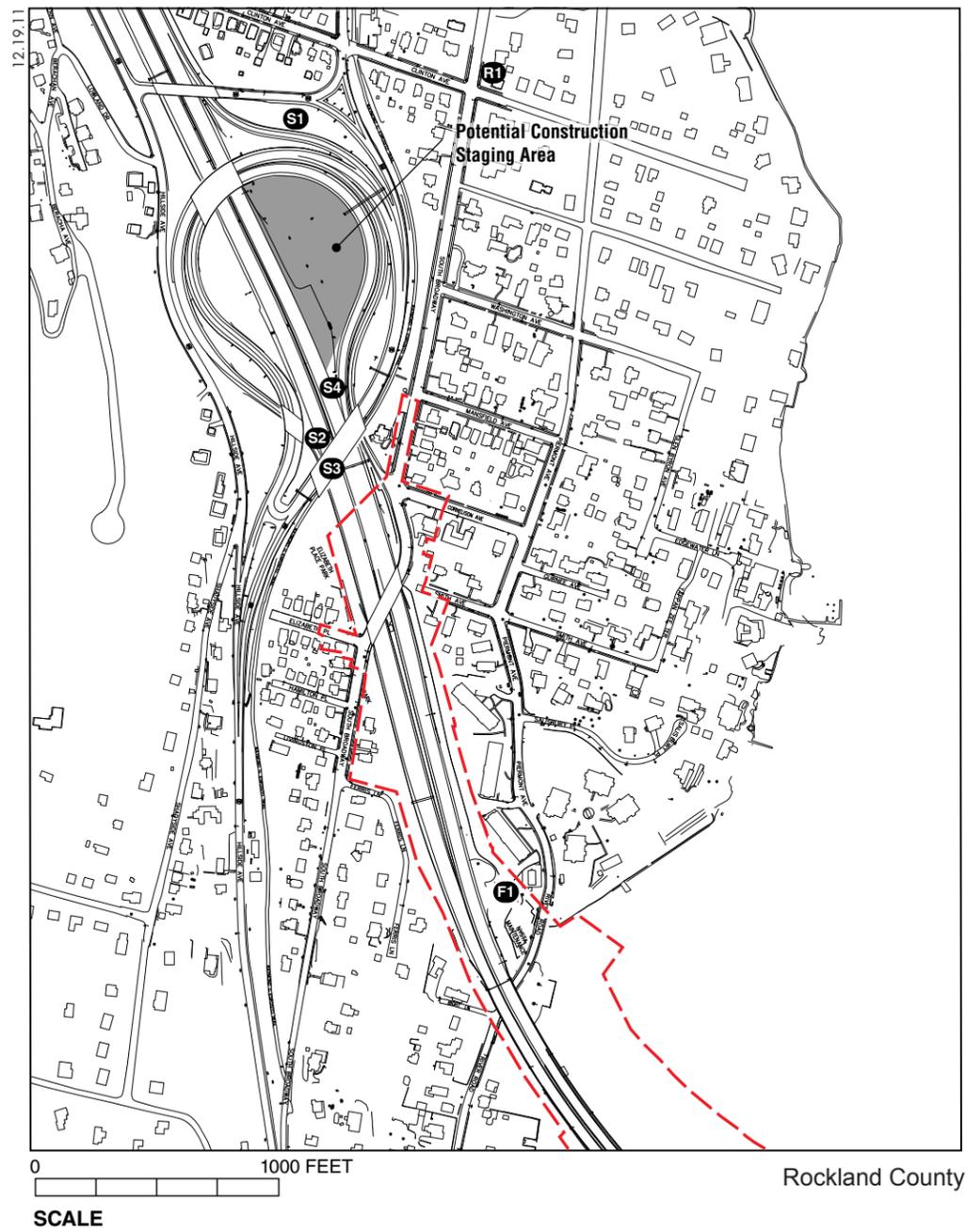
- Storage and use of fuels for maintenance vehicles, emergency generators or other equipment;

- Storage and use of maintenance chemicals (e.g., paints, solvents and lubricating oils); and
- Generation and off-site disposal of wastes (e.g., removed paint, wastes from cleanup of vehicle accidents, and lighting components).

17-4 AFFECTED ENVIRONMENT

The study area consists of the existing Tappan Zee Bridge and adjacent upland parcels on both sides of the Hudson River. A preliminary site investigation for the project identified potential sources of contamination within or in close proximity to the study area, including: two bridge maintenance facilities; historical manufacturing, commercial and/or railroad uses; the historical Tappan Zee Bridge landfill; the Tappan Zee hazardous waste accumulation and temporary storage areas, and suspect ACM and lead-based paint (see **Figure 17-1**). The November 2011 update of the study identified the following within the study area:

- The existing Tappan Zee Bridge and associated maintenance areas, located within the study area at 333 South Broadway in Tarrytown and within the Interchange 10 (Route 9W) ramp and at Piermont Avenue in Nyack, were listed in State regulatory databases with 33 spills reported between 1988 and 2009 and closed between 1988 and 2009. The majority of these related to auto accidents and occurred on the main span rather than upland areas. One 1989 spill involved a report of oil dumping and leaking drums in a fenced construction yard near Interchange 10 (Route 9W) in Nyack from Interstate 87/287. Another spill, reported in 2001, involved the discovery of contaminated soil and groundwater during excavation near the intersection of Interstate 87/287 and Route 9 in Tarrytown, and appeared to be associated with an off-site spill at a filling station. The Tappan Zee Bridge and associated maintenance facilities were listed as a generator of various hazardous wastes including heavy metals and solvents. Hazardous waste generator inspections for RCRA regulations identified non-compliant items in 1990 through 2006 with resolution in 1994 through 2010. The components of the maintenance facilities include heavy equipment storage, petroleum bulk storage tanks, power generators (fueled by petroleum) and miscellaneous maintenance/paint product storage. Six active petroleum aboveground storage tanks (ASTs) were reported at the maintenance facilities in the regulatory database. A duplicate listing in the regulatory database identified additional tanks (four closed and removed Underground Storage Tanks [USTs] and ASTs, one UST closed in place, one active AST and one active UST). However, information provided by NYSTA indicated that the maintenance facilities currently include seven active ASTs (including a recently installed tank which is to be added to the regulatory listing) and one UST which has been closed in place. In 1992, an approximately 25-gallon gasoline spill onto a dirt area occurred due to a tank overflow at the Tarrytown maintenance facility. The spill was reportedly cleaned up, and was closed within a month of being reported. No other spills were reported for the tanks associated with the maintenance facilities.
- Regulatory databases identified a historical Tappan Zee Bridge landfill within the Tarrytown study area. This landfill, historically used for disposal of construction and demolition debris, paint and solvents, was listed as a State Inactive Hazardous Waste Disposal Site. The listing indicated that the wastes were reportedly removed



LEGEND

--- Study Area

**Hazardous Waste and Contaminated Materials
Potential Sites of Concern:**

- S** Sanborn Maps
- R** Government Records
- F** Field Surveys

- F1** Roadway/Bridge Maintenance Facility
- F2** Roadway/Bridge Maintenance Facility with Regulatory Listings
- F3** Dry Cleaner
- F4** Filling Stations
- F5** Tire Shop
- F6** Filling Station
- F7** Auto Sales/Services
- R1** Former Nyack Ice Co. Brownfield Site
- R2** Tappan Zee Bridge Landfill
- R3** Nissan Chemical America Corp.
- S1** Heart Ease Home & Chapel (Former Funeral Home)
- S2** Unspecified Historical Commercial Use
- S3** Unspecified Historical Commercial Use
- S4** Former Railroad Station

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in 1987 with subsequent investigations indicating no significant remaining contamination. A former funeral home (which may have used chemicals such as formaldehyde) was also identified within the upland Nyack study area.

- Fill material of unknown origin associated with bridge construction or other shoreline changes may be present within the upland site limits.
- The existing bridge and other structures within the study area may be covered with lead-based paint and may contain suspect ACM, suspect PCB containing electrical equipment (e.g. transformers or switches) and/or suspect PCB and mercury-containing fluorescent lighting fixtures.

The following were identified nearby, but not within the study area:

- Historical and current commercial, industrial, auto-related (filling stations, auto sales and service) and/or railroad uses were identified, predominantly in the vicinity of the Tarrytown upland study area. Filling stations with active-status spills affecting groundwater were listed at 372 and 386 South Broadway in Tarrytown, immediately southeast of the Tarrytown study area.
- A dry cleaner, listed as a hazardous waste generator, was observed at 350 South Broadway in Tarrytown (approximately 185 feet east-southeast of the Tarrytown study area).
- The Nissan Chemical America Corp. was listed at 303 South Broadway in Tarrytown (approximately 300 feet east-northeast of the Tarrytown study area) with a closed-status violation of the Toxic Substances Control Act.
- The former Nyack Ice Co., located at 90 Clinton Avenue in Nyack (approximately 350 feet north of the Nyack study area) was listed with two closed-status spills and identified as a former State Brownfield Cleanup Program site with soil, soil vapor and groundwater contamination [petroleum compounds and semi-volatile organic compounds (SVOCs)] at which interim remedial actions were implemented.
- Regulatory databases identified numerous other UST facilities, hazardous waste generators and closed-status spills with limited subsurface contamination in the vicinity of the Interstate 87/287 right-of-way.

Based on these past and present uses within and near the study area, subsurface contamination may be encountered during construction as addressed in Chapter 18, "Construction Impacts." During bridge operation, no significant potential for exposure to any remaining subsurface contamination would exist unless additional disturbance were to be required, for example for subsurface utility repairs. Where known or potential contamination is identified, this contingency would be addressed through a set of institutional and/or engineering controls (e.g. requiring areas to remain paved or requiring implementation of health and safety plans for subsurface utility repairs).

A subsurface (Phase II) investigation conducted in April and May 2012 included the collection and laboratory analysis of 32 soil samples and eight groundwater samples from 16 borings in Rockland County, and 71 soil samples and nine groundwater samples from 36 borings in Westchester County. The sampling locations from the investigation are shown on **Figures 17-2A** (Rockland County), **17-2B** (Westchester County – West), and **17-2C** (Westchester County – East). The investigation identified the following:

Aerial Source: 2008 MSN Bingmaps



★ RC-SB-2 Soil Boring Location
 ★ RC-SB-3/
TW-3 Soil Boring/Temporary Well Point Location

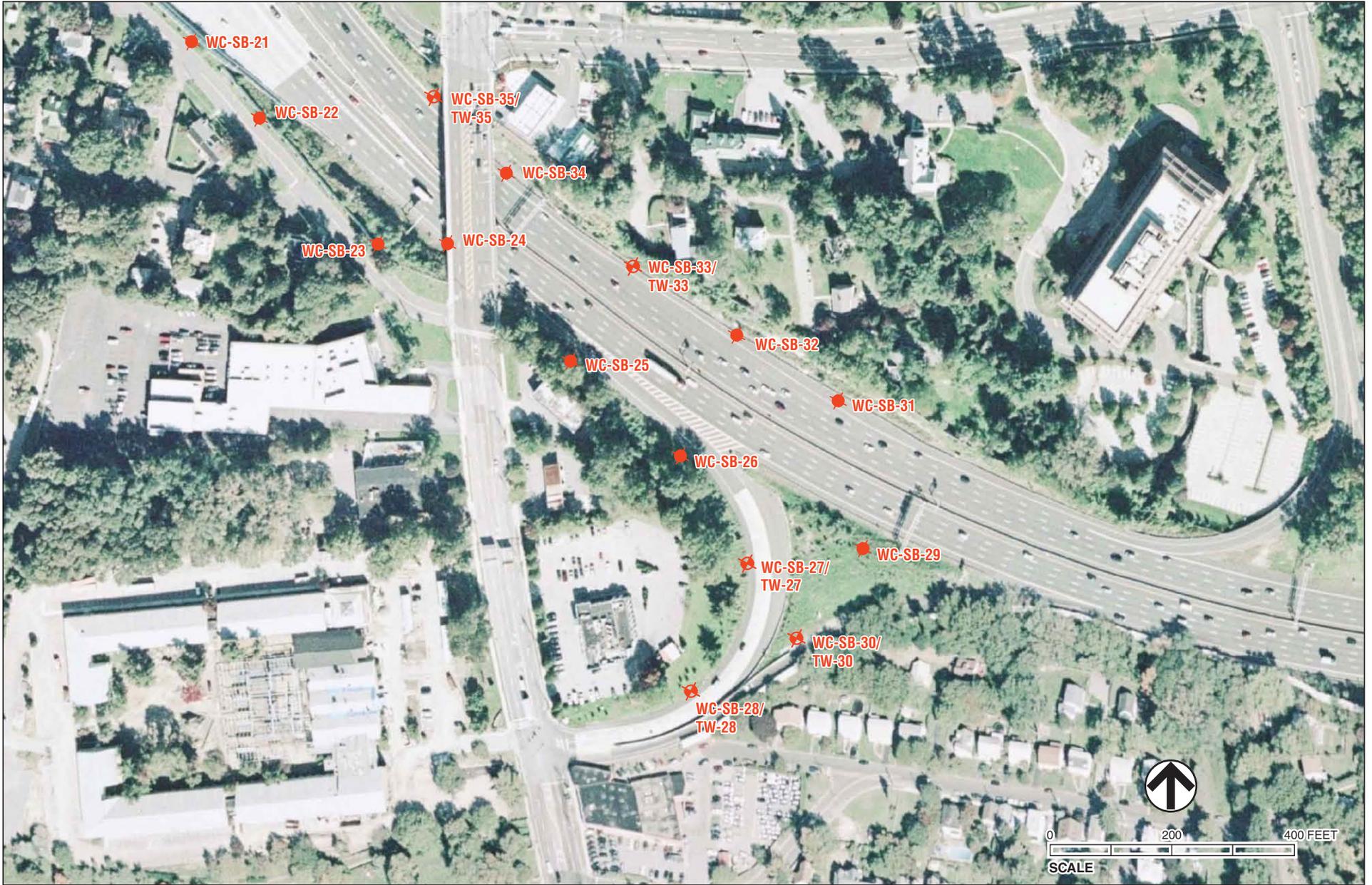
Figure 17-2A
Sampling Locations - Rockland County

Aerial Source: 2008 MSN Bingmaps



★ WC-SB-1 Soil Boring Location
 ★ WC-SB-3/TW-3 Soil Boring/Temporary Well Point Location

Figure 17-2B
Sampling Locations - Westchester County (West)



- ◆ **WC-SB-2** Soil Boring Location
- ◆ **WC-SB-27/
TW-27** Soil Boring/Temporary Well Point Location

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- Soil encountered included urban fill materials consisting of sand with varying amounts of silt and gravel with brick, asphalt, glass, plastic, wood, and ash. Fill materials were generally observed to a depth of two to five feet below surface grade along roadway areas and to depths as great as 20 feet below grade in areas in close proximity to the bridge. Besides the observation of a slight petroleum odor in fill materials within two borings in Westchester County, no indications of contamination (e.g., staining or odors) were detected. No petroleum sheen or odors were detected in the sampled groundwater.
- The geophysical survey did not locate any in-use or potentially abandoned tanks in the vicinity of the maintenance facility buildings, but the extent of the survey was limited in small areas around the buildings by site constraints, including trees and landscaped areas.
- Analytical results of the soil samples indicated only trace amounts of volatile organic compounds (VOCs) in a small number of samples in Rockland and Westchester Counties, some of which were at concentrations exceeding the NYSDEC Part 375 Unrestricted Use Soil Cleanup Objective (UUSCO). The detected VOCs were typical laboratory contaminants and were not indicative of a release at the study area. The VOC, tetrachloroethene (PCE), was detected in two soil samples collected in Westchester County, but at levels below the NYSDEC UUSCO. Levels of semi-volatile organic compounds (SVOCs) and metals were detected in a larger number of samples in both Rockland and Westchester Counties and were in some cases above UUSCOs. Only the SVOC benzo(a)pyrene (in both Rockland and Westchester Counties), which is commonly associated with urban fill and two metals (arsenic and barium—only in Westchester County), exceeded their respective NYSDEC Part 375 Restricted Use Commercial Soil Cleanup Objectives (RUCSCOs). Pesticides were detected in a low number of samples at trace levels (below UUSCOs) in Rockland County and in two soil samples at levels above UUSCOs in Westchester County. PCBs were detected at trace levels in two soil samples each in Rockland and Westchester Counties, but below respective UUSCOs. The soil analytical results were typical of urban fill materials (or potentially historic pesticide applications), with the exception of the PCE detections, which could be related to an off-site source.
- Analytical results of groundwater samples indicated chlorinated VOCs were detected in four groundwater samples collected in Westchester County, with two of the samples (collected in the vicinity of the NYSTA maintenance facility and state police barracks) exhibiting exceedances of NYSDEC Class GA Ambient Water Quality Standards (AWQS). The levels of the compounds, which exceeded standards, were higher in the groundwater sample collected upgradient of the maintenance facility and state police barracks than the groundwater sample collected closer to the river, which suggests the detections may be attributed to an off-site source.
- SVOCs were detected in one groundwater sample in Rockland County at levels above the respective AWQS. No other detections of SVOCs in Rockland or Westchester County were identified. Metals were detected in the majority of groundwater samples in Rockland and Westchester Counties, with some levels exceeding the respective AWQS. Pesticides were detected in a small number of

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groundwater samples collected; a few of which exceeded their AWQS in Rockland County. PCBs were not detected in any of the groundwater samples. The SVOCs, metals, and pesticides detected are likely attributable to the urban fill material and the presence of suspended sediment entrained in the groundwater samples. The detected metals may also be attributable to brackish water (given the proximity to the Hudson River). The pesticide detections may be attributable to past on-site landscaping activities or to urban fill material.

The operation of the new bridge would be associated with generation, storage, use and/or disposal of a variety of hazardous materials including (but not limited to): fuels, paints, solvents, lubricating oils, lighting components and wastes from cleanup of vehicle accidents.

17-5 ENVIRONMENTAL EFFECTS

17-5-1 NO BUILD ALTERNATIVE

Under the No Build Alternative, the existing bridge and the remainder of the study area would continue in their current uses. No new bridge or associated new maintenance facilities would be constructed for the project. As with the current conditions, all applicable regulatory requirements, for example those relating to excavation or disturbance of subsurface contamination, asbestos, lead-based paint, fuel, solvent, salt and maintenance product storage and waste disposal would need to be followed in accordance with existing NYSTA/NYS DOT procedures. As such, there would be no adverse impacts associated with the No Build Alternative. The chlorinated VOC groundwater detections should be reviewed with NYSDEC to determine if additional off-site investigation or remediation is required (by NYSTA or others). It should be noted that the standards used for comparison are drinking water standards, although the groundwater in the vicinity is not used as a source of drinking water. A vapor intrusion investigation may be required by NYSDEC to evaluate potential effects of chlorinated VOCs detected in groundwater on the indoor air quality of the current site buildings located in the Westchester study area. Under the No Build Alternative, direct exposure to the contaminated groundwater would be prevented, as subsurface disturbance would not occur.

17-5-2 REPLACEMENT BRIDGE ALTERNATIVE

Following construction of the Replacement Bridge Alternative, all facilities would be managed in accordance with existing NYSTA/NYS DOT procedures, i.e., in a similar manner to the No Build Alternative. The potential for adverse impacts would be further reduced by removal of the existing bridge (which includes suspect historical lead-based paint, potential PCB-containing electrical equipment and lighting fixtures, and ACM. Construction of more modern facilities would reduce the potential for spills and releases as would the enhanced traffic safety associated with the new design. Cleanup of hazardous spills and accidents and management of petroleum bulk storage, solvents, road salt, etc., would be performed in accordance with applicable laws and standard NYSTA/NYS DOT operating procedures.

Following construction, less subsurface contamination would remain to the extent that construction necessitated removal of identified contaminated materials. Any remaining subsurface contamination would not present a potential for exposure, unless additional

subsurface disturbance were to be required. However, given that some could remain (especially in portions of the study areas which were not disturbed by construction), during utility repairs or other activities necessitating subsurface construction, existing NYSTA/NYS DOT procedures would continue to be followed. If appropriate, following construction a set of institutional and/or engineering controls would be applied (e.g. requiring areas to remain paved or requiring implementation of specific health and safety measures at certain locations). Similar to the No Build Alternative, the chlorinated VOC groundwater detections should be reviewed with NYSDEC to determine if additional off-site investigation or remediation is required (by NYSTA or others). Should continued use of the NYSTA maintenance facility and state police barracks in Westchester County be intended during the bridge replacement project, a vapor intrusion investigation may be required by NYSDEC to evaluate potential effects of chlorinated VOCs detected in groundwater on the indoor air quality of the site buildings located in the Westchester study area, as well as to determine if mitigation is required for the proposed replacement buildings in this area.

17-6 MITIGATION

Conducting construction-related mitigation measures as specified in Chapter 18, "Construction Impacts," and compliance with NYSTA/NYS DOT procedures after project construction would eliminate the potential for the Replacement Bridge Alternative to have adverse impacts relating to hazardous wastes or contaminated materials. Therefore, no post-construction mitigation would be required for the Replacement Bridge Alternative.