

A. INTRODUCTION

This chapter presents the findings of the hazardous materials assessment and identifies potential issues of concern that could pose a hazard to workers, the community, or the environment associated with the proposed project. The proposed project would involve in-ground construction related to excavation below the Armory building for the proposed parking garage and the development of open space south and west of the Armory building.

A two-stage process of Phase I Environmental Site Assessment (ESA) and Phase II Environmental Site Investigations first identified the potential for contamination and then further investigated potential contamination through sampling. Environmental conditions resulting from previous and existing uses, both onsite and in the surrounding area, were assessed and documented in the *Phase I Environmental Site Assessment (ESA), Kingsbridge Armory—29 West Kingsbridge Road* (Metcalf & Eddy, Inc., September 2006). An Asbestos Investigation was performed to confirm the presence/absence of asbestos containing materials (ACMs) within the subject building and the results were documented in *Asbestos Investigation, Kingsbridge Armory* (Langan Engineering & Environmental Services, P.C., October 2008). Two Phase II Environmental Site Investigations were conducted and the results documented in *Phase II Environmental Site Assessment Report, Kingsbridge Armory* (TRC Environmental Corporation, September 2007) and *Phase II Environmental Site Investigation Report, Kingsbridge Armory—29 West Kingsbridge Road* (Langan Engineering & Environmental Services, P.C., Draft November 2008). A supplemental investigation was performed to further investigate subsurface conditions and the results documented in *Supplemental Groundwater Investigation Report, Kingsbridge Armory* (Langan Engineering & Environmental Services, P.C., June 2009).

CONCLUSIONS

With the implementation of the remediation measures included in Section D, no significant adverse impacts related to hazardous materials would be expected to occur as a result of construction of the proposed project. Following construction of the proposed project, there would be no further potential for significant adverse impacts.

PHASE I ENVIRONMENTAL SITE ASSESSMENT

The Phase I ESA identified the following conditions:

- Three earthen-floored rifle and pistol ranges suspected to contain elevated concentrations of lead from spent munitions.
- Multiple containers of petroleum products located in the motor pool workshops of the cellar area, and ten 55-gallon steel drums in the vehicle storage area in the sub-cellar.

- Three (3) 275-gallon fuel oil aboveground storage tank (ASTs) located in the northeastern corner of the building on the drill hall floor and two ASTs located two levels below the drill hall in the southwestern portion of the building, east of the former bowling alley.
- Other potentially hazardous materials were identified throughout the subject building such as polychlorinated bi-phenyls (PCBs), asbestos, lead-based paint, lubricating oils, mold, and refrigerants, deteriorating equipment (e.g., boilers and air conditioning units).
- Unknown urban fill material which likely underlies much of the project site.
- Potential off-site sources including surrounding industrial and commercial properties that may have released a variety of chemicals including petroleum.

B. EXISTING CONDITIONS

SUBSURFACE CONDITIONS

The project site is located approximately 130 to 140 feet above mean sea level. The site is underlain by historic fill material at depths of 7 to 25 feet below the top of pavement and extending to a depth of approximately 50 feet in some areas. Silty sand underlies the fill material and varies in thickness from 3 to 37 feet. Furthermore, decomposed rock was encountered at 9 to 50 feet below sidewalk grade and varies from 2 to 17 feet in thickness. Bedrock in the area reportedly consists of Fordham Gneiss and the bedrock surface was encountered at 9 to 50 feet below sidewalk grade. Groundwater elevations generally range from about elevation 115 on the eastern portion of the site to elevation 109 on the western portion of the site. Depth to groundwater in exterior wells ranged from 11.6 feet north of the building to 30.4 feet in the parking area near Reservoir Avenue. Monitoring wells installed in the Armory's sub-cellar ranged from 4.3 feet deep in the northwest corner of the building, to 6.2 feet deep in the southeastern corner of the building. Groundwater is estimated to be flowing southwest conforming to the south-southwest sloping topographic gradient; however, depth and flow direction are likely influenced by past filling activities, underground openings or obstructions, bedrock geology, and other factors. Groundwater in the Bronx is not used as a potable (drinking) water source.

PHASE I ENVIRONMENTAL SITE ASSESSMENT

The Phase I review included: SanbornTM Fire Insurance maps; environmental regulatory agency databases identifying state and/or federally-listed sites; City Directory Search and records (including electronic Department of Buildings [DOB] and Fire Department records); historical aerial photographs, and historical topographic maps. In addition, reconnaissance of the site and surrounding neighborhood was performed. The research indicated that the site and surrounding area was developed in the middle to late 1800s. The area has since included residential, commercial, and small industrial facilities.

The site was originally below water along the southern portion of the Jerome Park Reservoir in the late 1800s. Construction of the Armory was completed in 1917. The Phase I ESA identified the following:

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- Multiple containers of petroleum products located in the motor pool workshops of the cellar area and ten 55-gallon steel drums in the vehicle storage area in the sub-cellar.

- Three (3) 275-gallon fuel oil ASTs located in the northeastern corner of the building on the drill hall floor and two ASTs located two levels below the drill hall in the southwestern portion of the building, east of the former bowling alley.
- Other potentially hazardous materials were identified throughout the subject building such as PCBs, asbestos, lead-based paint, lubricating oils, mold, and refrigerants, deteriorating equipment (e.g., boilers and air conditioning units).
- Unknown urban fill material which likely underlies much of the project site.
- Potential off-site sources including surrounding industrial and commercial properties that may have released a variety of chemicals including petroleum.

PHASE II AND SUPPLEMENTAL SITE INVESTIGATION REPORTS

Using the findings of the Phase I ESA, two subsurface (Phase II) investigations, and a supplemental groundwater investigation, were conducted including:

- A geophysical survey to identify potential utilities and investigate possible buried storage tanks and their associated piping;
- Excavation of 10 test pits to confirm possible underground storage tank (UST) locations and other underground anomalies identified by the geophysical survey;
- Advancement of 37 soil borings to investigate subsurface conditions; and
- Installation of five groundwater monitoring wells to investigate groundwater quality.

The Phase II investigations found:

- Groundwater analytical results detected volatile and semivolatile organic compounds (VOCs and SVOCs), though the source (whether on-site or off-site) could not be determined.
- Lead levels in certain soil samples 6 inches to 2.5 feet below ground surface of the pistol/rifle range exceeded the regulatory thresholds for hazardous waste.
- Levels of SVOCs and metals detected in soil samples were consistent with and likely attributable to those typically found in urban fill materials in New York City.
- A possible abandoned UST located underneath the guard booth near the western entrance.
- No reportable petroleum impacts to the groundwater or soil; this was confirmed by the supplemental investigation.

C. THE FUTURE WITHOUT THE PROPOSED PROJECT

This analysis assumes that without the proposed project, the project site would remain occupied by a largely vacant building and it is likely that remediation of hazardous materials would not occur.

D. PROBABLE IMPACTS OF THE PROPOSED PROJECT

There is a potential for adverse impacts associated with excavation for new construction resulting from the known and potential presence of subsurface contamination, and with demolition/renovation, related to materials within the structures. Although these activities could increase pathways for human exposure, significant adverse impacts would be avoided by performing construction activities in accordance with the measures identified below.

A Remedial Action Plan (RAP) and Health and Safety Plan (HASP) have been prepared and submitted to New York City Department of Environmental Protection (DEP) and have been reviewed and approved. The RAP includes procedures to identify and manage both known contamination (e.g., petroleum storage tanks and lead contaminated soil in the firing ranges) and unexpectedly encountered contamination. All activities involving disturbance of existing soil would be conducted in accordance with the HASP which details measures to reduce the potential for exposure (e.g., dust control) as well as measures (such as air testing) to ensure that exposure to construction workers and the surrounding community would not occur. The project may also apply for the Brownfield Cleanup Program (BCP) with the New York State Department of Environmental Conservation (DEC), in which case DEC would also be involved in the review and approval of the RAP and HASP.

During or prior to renovation, the following measures would be undertaken:

- All underground and aboveground storage tanks would be properly registered, if required, with DEC and the New York City Fire Department, and closed and removed in accordance with applicable regulatory requirements.
- All material that needs to be disposed of (e.g., both contaminated soil and excess fill, including demolition/renovation debris) would be properly handled and disposed of off-site in accordance with applicable regulatory requirements.
- The 55-gallon drums and all other remaining chemicals, including the petroleum products, would be properly disposed of in accordance with all applicable regulatory requirements.
- Unless there is labeling or test data which indicates that fluorescent lights are not mercury- and/or PCB-containing, disposal would be performed in accordance with applicable regulatory requirements.
- Unless the areas to be disturbed are known not to contain asbestos, they would be surveyed for asbestos, and all asbestos-containing materials (ACMs) would be removed and disposed of in accordance with applicable regulatory requirements.
- Lead-based paint would be managed in accordance with applicable regulatory requirements.
- All demolition/renovation debris would be properly handled and disposed of in accordance with all applicable federal, state and local regulations.

With the implementation of these measures, no significant adverse impacts related to hazardous materials would result from construction activities. Following construction, the proposed project would not be expected to have the potential to have significant adverse impacts. *