

### **3.11 Hazardous Materials**

#### **3.11.1 Existing Conditions**

A description of the Project Site can be found in the Section 2.0, Project Description, of this DEIS. Specific properties constituting the subject property are included in the New York State Brownfields Cleanup Program (BCP) as Site C360085. The existing residences included on the subject site were not evaluated in any site assessments and are not included in the Brownfields program. Given existing and past use of these properties for residential purposes, it is not expected that any hazardous materials would be detected or found.

The State Brownfields Cleanup Program provides tax incentives and liability release to remediate sites for redevelopment and reuse. Eight (8) environmental site assessments have been conducted on the site from 2005 through 2010, some specifically in accordance with the requirements of the BCP and with oversight from the New York State Department of Environmental Conservation (NYSDEC) as required for the Brownfield properties. The Brownfield properties are highlighted in Figure 2-2.

#### **Historical Uses of the Site**

Studies have focused on the prior use of buildings situated at 41 through 53 Buena Vista Avenue. These buildings were used for light industrial and commercial activities. The businesses that occupied the buildings included the manufacturing of clothing, jewelry, and toys, dry cleaning, dental offices, warehouse storage, and auto repair and parts distribution.

Reports discussed herein are summarized below. The reader is advised to consult those reports in their entirety for more detailed information and discussion.

#### **Past Environmental Investigations**

##### *January 2005 Investigation*

In January of 2005, Ecosystems Strategies, Inc. (ESI) completed a Phase I and Phase II investigation on part of the property. This investigation concentrated on the Former Teutonia BCP site (41 to 51 Buena Vista Avenue) and is summarized in detail in Appendix J. The Phase I identified several environmental concerns that required additional investigation.

Two (2) inactive aboveground storage tanks (ASTs) were found on the site. These tanks were used to store fuel oil to heat the buildings at 45 and 51 Buena Vista Avenue. The tank capacities were 3,000 gallons and 1,000 gallons, respectively.

A 55-gallon tank holding a petroleum substance was found in the basement of 51 Buena Vista Avenue. Also, a floor drain system was identified in the basement of 47 Buena Vista Avenue. This system was deemed to have the potential to transport contamination and required further investigation. Based on these environmental concerns along with the historic on-site practices on the property, a Phase II investigation was warranted and conducted.

During the Phase II investigation, subsurface soil and air gas samples were collected as were surface soil samples. Eight (8) borings (HB-1 through HB-8) were completed. From these borings, eight (8) soil samples and three (3) soil gas samples were collected (HB-2 SG, HB-3

SG, and HB-5 SG). One (1) surface soil sample was collected adjacent to the AST in the basement of 51 Buena Vista Avenue (G-1) and one (1) other surface soil sample was collected adjacent to the floor drain observed in 47 Buena Vista Avenue.

Subsurface and surface soil samples were analyzed for Volatile Organic Compounds (VOCs), selected Semi-Volatile Organic Compounds (SVOCs) including polycyclic aromatic hydrocarbons (PAHs) and Resource Conservation and Recovery Act (RCRA) metals. Soil gas samples were collected and analyzed for VOCs by U.S. Environmental Protection Agency (EPA) Method TO-14A.

Analytical results for surface soil sampling results including arsenic, cadmium, lead, and mercury were above the NYS Soil Cleanup Objectives (NYS SCO) for Restricted Residential use guidance criteria in G-2. This sample was collected adjacent to the floor drain in the basement of 47 Buena Vista Avenue.

No other constituents were detected in the subsurface soils or surface soils above the NYS SCO for Restricted Residential Use. No constituents above the New York State Department of Health Air Guideline Values (NYSDOH, 2006) or the Semi-site Specific Soil Gas Concentration Draft Guidance for Evaluating the Vapor Intrusion to indoor Air Pathway from Groundwater and Soils (United States Environmental Protection Agency (USEPA), 2002) were found in the soil gas samples collected. All of the results are tabulated in Table 3-1 (soil gas), Table 3-2 (subsurface samples) and Table 3-3 (surface soil samples) in Appendix J.

#### *June 2005 Investigation*

A second investigation occurred during June 2005 and was conducted by ESI as a supplemental soil gas sampling program at the 41 to 51 Buena Vista Avenue property, and the results are detailed in Appendix J. This investigation was intended to further characterize the shallow subsurface of the property. Eight soil gas samples (2SG-1 through 2SG-8) were collected from the subsurface on the property. These samples were analyzed for VOCs by EPA method TO-14A, similar to the previous investigation.

Analytical results for the soil gas sample results were above the Semi-site Target Soil Gas Concentration for tetrachloroethylene (PCE) in samples 2SG-1, 2SG-2, and 2SG-5 and for trichloroethylene (TCE) in 2SG-1 and 2SG-2. All of the results are tabulated in Table 3-1 in Appendix J.

#### *May 2006 Investigation*

A third investigation was conducted in May 2006 by ESI on the 41 to 51 Buena Vista Avenue property, and the results are summarized in more detail in Appendix J. This investigation was used to further evaluate the physical and chemical properties of subsurface conditions at this site.

Before subsurface investigation work was conducted on the site, a geophysical survey using ground penetrating radar was used west of 45 and 47 Buena Vista Avenue. This survey was used to determine where the floor drain system and the manhole connected to from the basement of 47 Buena Vista Avenue. A semicircular anomaly was identified adjacent and west of 45 Buena Vista Avenue.

Nine (9) subsurface soil borings were completed and twelve (12) soil samples were collected (SB-1 through SB-9). These soil samples were analyzed for the Target Compound List (TCL) VOCs, SVOCs, Polychlorinated biphenyl's (PCBs) and Target Analyte List (TAL) metals. Several SVOCs and metals were detected above the NYS SCO Restricted Residential guidance criteria. Benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene were above the NYS SCO guidance criteria in SB-1, SB-2, SB-3 (8-10 feet below the ground surface (ft bgs)), and BS-8. Benzo(k)fluoranthene was above the NYS SCO guidance criteria in SB-3.

Chrysene was above the NYS SCO guidance criteria in SB-3 and SB-8. indo(1,2,3-cd)pyrene was above the NYS SCO guidance criteria in SB-2, SB-3 (8-10 ft bgs), and SB-8. Arsenic, copper, and lead were found above the NYS SCO guidance criteria in SB-2. Mercury was found above the NYS SCO guidance criteria in SB-2, SB-6, and SB-8. All results are tabulated in Table 3-2 in Appendix J.

Five (5) groundwater samples were collected (MW-1 through MW-5). Locations are shown on Figure 3-1 in Appendix J. These shallow groundwater samples were collected above the bedrock aquifer and analyzed for VOCs, SVOCs, PCBs, and TAL total and dissolved metals.

The groundwater results were compared to Class GA Guidance levels, Class GA waters are considered potable drinking water. The water observed within MW-1 through MW-5 was most likely perched shallow groundwater. When comparing the results to Class GA guidance levels antimony was found above the Class GA guidance levels in MW-1, MW-2, MW-3 and MW-5. Iron was found above the Class GA guidance levels in MW-1, MW-2, MW-4, and MW-5. Magnesium and manganese was found above the Class GA guidance levels in MW-4 and MW-5. Sodium was found above the Class GA guidance levels in MW-1 through MW-5. Thallium was found above the Class GA guidance levels in MW-1. All results are tabulated in Table 3-4 in Appendix J.

Ten (10) soil gas samples were collected (3SG-1 through 3SG-10). These soil gas samples were collected from sub-slab borings within 45 to 51 Buena Vista Avenue, shown on Figure 3-1 in Appendix J. These samples were analyzed for VOCs by EPA Method TO-15. This investigation showed elevated levels of tetrachloroethylene (PCE) in 3SG-6, 3SG-7, and 3SB-8 above the Semi-site Specific Target Soil Gas Concentration. All results are tabulated in Table 3-1 in Appendix J.

#### *July 2006 Investigation*

A fourth investigation was conducted in July 2006. It was a combined Phase I and Phase II effort that focused on 53 Buena Vista Avenue. The results are summarized in detail in Appendix J. The Phase I report identified several environmental concerns including: one (1) 1,000 underground storage tank (UST) used to store waste oil, thirty (30) 55-gallon drums that contained a petroleum based product, and two (2) floor drains. Due to documented work practices, a Phase II was warranted.

The Phase II effort included the collection of six (6) soil gas samples that were analyzed for VOCs by EPA Method TO-14A. Tetrachloroethylene (PCE) was detected in 4SG-1, 4SG-2, 4SG-3, 4SG-4, and 4SG-6 above the Semi-site Specific Target Soil Gas Concentration along with trichloroethylene (TCE) in 4SGF-1 through 4SG-6. All results are tabulated in Table 3-1 in Appendix J.

*July-August 2007 Investigations*

The last investigation was conducted by Macolm Pirnie in July and August 2007 as a NYSDEC approved Remedial Investigation Work Plan (RIW) and is explained in detail in the Remedial Investigation Report (RIR) attached in Appendix J. For this investigation twenty-seven (27) soil borings were completed with thirty-seven (37) subsurface soil samples and eight (8) surface soil samples collected. One (1) shallow groundwater monitoring well was installed, and fourteen (14) soil gas sampling locations were selected.

The soil boring investigation included nineteen (19) shallow borings to a depth of 16 feet below ground surface (bgs) listed as SB-1 through SB-3, SB-5, SB-6, SB-8 through SB-16, SB-18, SB-20, SB-21, SB-23, BS-24 and eight (8) deep borings (to a depth of 40 ft bgs) listed as SB-4D, SB-7D, SB-17D, SB-19D, SB-22D, MW-Temp, MW-5, MW-6.

Out of three (3) temporary wells planned, only one was installed (MW-Temp) due to the lack of groundwater found in the other two locations. Soil samples were collected twice in the deep borings and once in the shallow borings for a total of 35 subsurface samples. Subsurface soil samples were collected and analyzed for TCL VOCs, TCL SVOCs, TAL metals and Pesticide/PCBs.

Subsurface soil results of the thirty-six (36) (SB-12 did not yield a soil sample) were compared to NYS Recommended Soil Cleanup Objectives (Restricted Residential and Restricted Commercial, December 2006). Volatile organic compounds and PCBs/pesticides were not detected above NYS SCO for either restricted residential or restricted commercial use, as shown on Table 7-3 in Appendix J.

A number of SVOCs and metal constituents were found above the NYS SCO objectives for both restricted residential and restricted commercial use. These results are summarized below, in Table 7-3 in Appendix J, and in further detail within the RIR report in Appendix J.

**SVOC's:**

- Benzo(a)anthracene in SB-3 (10-10.5 ft bgs), SB-8 (3-5 ft bgs), SB-9 (7-10 ft bgs), and SB-13 (14-16 ft bgs);
- Benzo(b)fluoranthene in SB-3 (10-10.5 ft bgs), SB-8 (3-5 ft bgs), SB-9 (7-10 ft bgs), and SB-13 (14-16 ft bgs);
- Indeno(1,2,3-cd)pyrene in SB-3 (10-10.5 ft bgs), SB-8 (3-5 ft bgs), SB-9 (7-10 ft bgs), and SB-13 (14-16 ft bgs)
- Benzo(a)pyrene in SB-3 (10-10.5 ft bgs), SB-9 (7-10 ft bgs), and SB-13 (14-16 ft bgs); and
- Dibenzo(a,h)anthracene in SB-9 (7-10 ft bgs) and SB-13 (14-16 ft bgs).

**Total Metals:**

- Chromium in SB-1 (10.5-11 ft bgs);
- Lead in SB-8 (3-5 ft bgs);
- Manganese in SB-2 (7-7.5 ft bgs); and
- Mercury in SB-9 (7-10 ft bgs).

A groundwater sample was collected from the one-inch diameter groundwater well. This groundwater sample was analyzed for TCL VOCs, total/dissolved TAL Metals, and pesticides.

Groundwater results of the one groundwater sample collected from MW-Temp was compared to NYSDEC Class GA potable drinking water standards and guidance values (6NYCRR Part 360). Several VOCs, total and dissolved metals, and pesticides were found above the NYSDEC Class GA standards and guidance values. These results are summarized below, in Table 7-4 in Appendix J, and in further detail within the RIR report in Appendix J.

**VOCs:**

- Methylene Chloride

**Metals:**

- Mercury (Total Metals)
- Antimony (Total & Dissolved Metals)
- Arsenic (Total Metals)
- Cadmium (Total & Dissolved Metals)
- Chromium (Total Metals)
- Copper (Total Metals)
- Iron (Total & Dissolved Metals)
- Lead (Total & Dissolved Metals)
- Manganese (Total & Dissolved Metals)
- Nickel (Total & Dissolved Metals)
- Sodium (Total & Dissolved Metals)

**Pesticides:**

- Hepatachlor
- Heptachlor Epoxide

Eight (8) surface soil samples were collected adjacent to the manhole west of the 47 Buena Vista Avenue building. These samples were collected within 0-6 inches bgs. Samples were analyzed for TCL VOCs, SVOCs, and TAL Metals.

Surface soil sample results were compared to NYS SCO for restricted residential and restricted commercial use (December 2006). Volatile organic compounds were not detected above the NYS SCO for either restricted residential or restricted commercial use, as shown in Table 7-2 in Appendix J. A number of SVOC and metal constituents were found above the NYS SCO for both restricted residential and restricted commercial use. These results are summarized below, in Table 7-2 in Appendix J, and in further detail within the RIR report in Appendix J.

**SVOCs:**

- Benzo(a)anthracene - in all surface soil samples SS-1 through SS-8;
- Chrysene - in all surface soil samples SS-1 through SS-8;
- Benzo(b)fluoranthene - in all surface soil samples SS-1 through SS-8;
- Benzo(k)fluoranthene - SS-8;
- Benzo(a)pyrene - in all surface soil samples SS-1 through SS-8;

- Indeno(1,2,3-cd)pyrene - in all surface soil samples SS-1 through SS-8; and
- Dibenzo(a,h)anthracene - SS-1, SS-3, SS-7, and SS-8.

Metals:

- Arsenic - SS-3 and SS-5;
- Cadmium - SS-1 through SS-6;
- Copper - SS-1 through SS-7;
- Lead - in all surface soil samples SS-1 through SS-8; and
- Mercury - SS-1, SS-2, SS-3, SS-5, and SS-7.

Fourteen (14) soil vapor samples were collected from SG-1 through SG-14. These samples were collected beneath the slab foundation at 53 Buena Vista Avenue and one soil gas sample (SG-14) was collected outdoors directly west of the building at 47 Buena Vista Avenue. These soil vapor samples were analyzed for VOCs by USEPA Method TO-15.

Soil vapor results were compared to Generic Target Indoor Air Concentrations and Generic Screening Levels per the USEPA Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soil. Select VOCs (Trichloroethene or TCE and Tetrachloroethene or PCE) were also compared to New York State Department of Health Air Guideline Values. These results are summarized in Table 7-1 in Appendix J, and in further detail within the RIR report in Appendix J. The contaminants include the following:

- 1,3-Butadiene - SG-2;
- Trichloroethene - SG-2, SG-4, SG-8, SG-9, SG-10, SG-11, and SG-12; and
- Tetrachloroethene (PCE) - SG-1, SG-2, SG-3, SG-4, SG-5, SG-6, SG-7, SG-8, SG-9, SG-10, SG-11, and SG-12.

Existing buildings on the subject site are likely to trap soil gases from escaping vertically through the soil column to the atmosphere. The report indicates PCE vapor in a north-south trending plume under current conditions.

*September 2007 Investigation*

In September 2007, IVI Due Diligence Services Inc. (IVI) completed a Phase I Environmental Site Assessment on part of the property. This investigation concentrated on residential structures south and east of the Teutonia BCP site at the following address: 65 Buena Vista Avenue, 68 Buena Vista Avenue, and 72 Buena Vista Avenue. This investigation found environmental concerns on the properties. At 65 Buena Vista Avenue two 275-gallon USTs were observed. It was recommended that these USTs be removed or tightness tested. At 72 Buena Vista Avenue two 275-gallon USTs had been removed in 2006 but closure documentation was not made available to IVI to be reviewed. It was recommended that the if closure documentation was available it should be forwarded to IVI for review and if it was not available a subsurface investigation was recommended in the area of the former USTs location. The full environmental assessment report is included as Appendix J.

*December 2009 Investigation*

In December 2009, EcolSciences, Inc. (EcolSciences) completed a Phase I Environmental Assessment on part of the property. This investigation concentrated on the residential structure

east of the Former Teutonia BCP site at 66 Buena Vista Avenue. The site representative stated that a 550-gallon fuel oil UST was abandoned in place on the property with no soil samples collected. EcoSciences recommended that soil samples should be collected adjacent to the UST or the UST should be removed with post excavation samples collected for documentation purposes. The full environmental assessment report is included in Appendix J.

#### *October 2010 Investigation*

In October 2010, Tim Miller Associates, Inc., completed a Phase I Environmental Assessment on part of the property. This investigation concentrated on the residential structure south and adjacent to the Former Teutonia BCP site at 61 Buena Vista Avenue. The site was observed to have a fuel UST of unknown quantity, on the southern portion of the property. It was recommended that the UST be tested for tightness to determine if it has the potential to cause an environmental impact to the property. This report is included in Appendix J.

#### **3.11.2 Potential Impacts**

When soil gases and chemicals at certain action levels are found in the surface and subsurface soil, clean up is warranted to avoid health and safety issues, with regard to contact with people, now and in the future.

The groundwater under the site is generally not of significant concern because the site will be supplied with City water from a protected and monitored source. Since the depth to shallow groundwater ranges from 30 feet bgs to 44 feet bgs, utility trenches should not come in contact with the groundwater.

The chemicals of potential concern (COPC) in the surface and subsurface soil were selected by comparing soil analytical results to the NYS SCO for restricted residential use. These guidance values are determined by taking possible ingestion, inhalation, and skin contact into consideration. Any constituent that was detected above the NYS SCO or did not have a corresponding NYS SCO guidance value was considered a COPC, however any inorganic chemicals that are considered an essential nutrient such as calcium, magnesium, potassium, and sodium were not labeled as COPCs. The COPCs within the surface and subsurface soil are the following:

- SVOCs - benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene, di-n-butylphthalate, di-n-octylphthalate, diethylphthalate, bis(2-ethylhexyl)phthalate, indeno(1,2,3-cd)pyrene, and 2-methylnaphthalene.
- Pesticides - gamma-chlordane, endrin aldehyde, heptachlor, epoxide, and methoxychlor.
- Metals - aluminum, antimony, arsenic, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, thallium, and vanadium.

The COPC related to soil gas were selected by comparing soil gas analytical results to the Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH, 2006) as well as the US EPA's Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (US EPA, 2002). Any constituent found above this standard is considered a COPC. The COPCs are as follows:

- 1,3-butadiene, Tetrachloroethene (PCE), and Trichloroethene (TCE).

Currently, there is limited risk for human contact with soil on the property since the site contains vacant buildings and is not inhabited.

Remediation is expected on the property and discussed below in Section 3.11.3. Construction/utility workers, site workers, and onsite and offsite residents have been identified as potential receptors. Because remediation is planned during construction, future employees or residents are not expected to come into direct contact with the COPCs within the surface or subsurface soils. However, construction/utility workers are likely to come into contact with the surface or subsurface soil during soil remediation and foundation construction.

The proposed redevelopment of the property is expected to produce an impervious cover over all the areas that were investigated for hazardous conditions. Large landscaped areas that would result in persons coming into contact with these constituents are not proposed.

During demolition, the trapping effect of the buildings will be eliminated and soil gas will no longer be trapped. A Health and Safety Plan will be implemented for onsite workers to address this situation until the soils are excavated and removed. The soils at the subject site will be removed/remediated and the site will have an impervious cap, there is no potential for COPCs in the soil gas to impact the future residents by migrating into indoor air.

These matters are discussed at length with the RIR in Appendix J. This RIR completed and reviewed by the NYSDEC. The mitigation measures proposed along with other remedial actions are expected to eliminate known hazardous conditions at the site.

### **3.11.3 Mitigation Measures**

Mitigation performed on the BCP properties will be conducted in accordance with the Final Remedial Work Plan that will be approved by the NYSDEC. The property is covered presently by buildings that have aided in sealing or trapping soil vapor. Elimination of any contaminated soil is considered a mitigation measure as it eliminates the potential for vapors to seep into indoor spaces located atop or next to the impacted soils. However, during construction, the proposed demolition of the buildings and foundations would allow some trapped low level vapors to dissipate. Based on the concentrations found in the subsurface investigations, it is not anticipated that the soil vapor will cause an environmental health concern for nearby residences or the Queens Daughters Daycare Center. Also, the daycare center is approximately 120 feet south of the nearest property on which soil vapors may be anticipated as there are two intervening residential properties located between the Brownfields properties and the center. However, continuous air quality monitoring would be conducted in accordance with the site specific Health and Safety Plan as well as the Final Remedial Workplan approved by the NYSDEC. This continuous air quality monitoring would be conducted at the parameters of the property to protect human health, the nearby residences, as well as the Queens Daughters Daycare Center. During construction, soils onsite will be removed to up to 40 feet bgs. Removing the impacted soil would aid in the elimination of vapors from such soils. A sub-slab vapor ventilation system will be installed during construction that will protect site workers and residents.

In conjunction with the demolition of the buildings, the ASTs and USTs observed during the various investigations will be removed per NYSDEC standards. Once the buildings have been

demolished, a confirmatory soil sampling event is proposed for the COPC. Also, an additional three (3) groundwater wells will be installed in the area of 53 Buena Vista Avenue to further characterize the groundwater on the Property.

Depending on the results of the confirmatory soil sampling event precautions may be warranted during the redevelopment of the Project Site. These precautions are as follows:

- The development of a Health and Safety plan/protocols (HASP) for the handling of the site specific media that is impacted with the COPCs. This will minimize the human exposure to the potential concerns.
- Creation of a Soil Management Plan to deal with excavated soils during the construction process of the redevelopment of the Property. This would include a health and safety requirements for handling excavated soil and the disposal requirements of the soil.
- Placing clean soil, asphalt, concrete over exposed areas at the completion of the Site development to limit exposure of any impacted soil (if any remains on the Property).
- As stated above, the installation of the sub-slab ventilation system to reduce the exposure to any soil vapors that remain in the subsurface.