An Employee-Owned Company

Final Data Evaluation Report

Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Remedial Investigation / Feasibility Study
EPA Task Order No. 0018-RI-CO-017F

REMEDIAL ACTION CONTRACT
No. EP-S1-06-03

FOR

U.S. Environmental Protection Agency
Region 1

BY

Nobis Engineering, Inc.

Nobis Project No. 80018

August 2008

U.S. Environmental Protection Agency
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ACRONYMS AND ABBREVIATIONS

AVS-SEM	acid-volatile sulfide/simultaneously extracted metals
bgs	below ground surface
Company	Scovill Manufacturing Company
CSM	Conceptual Site Model
CT	Connecticut
CTDEP	Connecticut Department of Environmental Protection
EPA	U.S. Environmental Protection Agency
ft bgs	feet below ground surface
ft	feet
ft/d	feet per day
FWENC	Foster Wheeler Environmental Corporation
GPR	ground penetrating radar
GWPC	groundwater protection criteria
M&E	Metcalf and Eddy
MEC	munitions and explosives of concern
mg/Kg	milligram per kilogram
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethylene
PMC	Pollutant Mobility Criteria
PRP	Potentially Responsible Party
ResDEC	residential direct exposure criteria
ResGWVC	residential groundwater volatilization criteria
RI	Remedial Investigation
RSR	Remediation Standard Regulations
Site	Scovill Industrial Landfill Superfund Site
SPLP	synthetic precipitation leaching procedure
START	Superfund Technical Assessment and Response Team
SVOC	semivolatile organic compound
TOC	total organic carbon
TtEC	Tetra Tech EC, Inc.
VOC	volatile organic compound
Weston	Roy F. Weston
µg/Kg	microgram per kilogram
µg/L	microgram per liter

1.0 INTRODUCTION

This Data Evaluation Report was prepared by Nobis Engineering, Inc. for the U.S. Environmental Protection Agency (EPA) under Contract No. EP-S1-06-03, Task Order No. 0018-RI-CO-017F. This Data Evaluation Report summarizes previous investigations at and presents a Conceptual Site Model (CSM) for the Scovill Industrial Landfill Superfund Site (the Site) in Waterbury, Connecticut. The CSM is an interpretation of current contaminant conditions and transport mechanisms. Information presented in this Data Evaluation Report will be used to support the completion of Phase III of the Remedial Investigation (RI) for the Site.

This Data Evaluation Report was prepared based on the review and summary of information and data developed during previous RI phases conducted by EPA and by contractors working for the Potentially Responsible Party (PRP), Saltire, Inc. The CSM will be used to develop the Phase III field program anticipated to occur in fall 2008 and early 2009. The CSM was developed using only available, and sometimes dated, information. Should additional or more current information become available, the CSM could be updated to provide more accurate interpretations. EPA believes that with the conclusion of the Phase III field program and scheduled monitoring, there will be sufficient data to support the completion of a Risk Assessment and subsequent completion of the RI Report.

2.0 BACKGROUND INFORMATION

This section describes the Site, summarizes the Site usage and history, and provides a background on Site geology and hydrogeology.

2.1 Site Description

The Site is located in the City of Waterbury, New Haven County, Connecticut (Figure 2-1). The Site's CERCLIS identification number is CT0002265551. The 30-acre Site property line is shown on Figure 2-2 and is bounded to the north generally by residential properties abutting Newbury Street and Academy Avenue, to the east by residential properties abutting Academy Avenue, to the south by Meriden Avenue (State Route 69), and to the west by residential properties that abut Monroe Avenue.

Approximately 23 of the 30 acres on Site have been developed, which consist of two and three story residential structures (single family homes and apartment buildings), small commercial buildings that include a landscaping firm, child daycare facility, elderly housing, social club,

department store, cab service, medical office, car repair shop, and a shopping mall (East Gate Shopping Plaza). The remaining 7-acre parcel is undeveloped and was in the initial stages of development by Calabrese Construction, Inc. before the Site was designated as a Superfund Site on the National Priorities List. For RI purposes, the 23-acre developed parcel will be referred to as the Scovill parcel or Parcel A, while the 7-acre parcel will be referred to as the Calabrese parcel or Parcel B (Figure 2-2). Note that the limit of landfilling activities underlies both parcels.

2.2 Site History

The Site is generally flat and slopes slightly to the south. The eastern and western portions of the Site are bordered by steep hills. In June 1919, the property was sold to the Scovill Manufacturing Company (Company). At that time the property consisted of undeveloped woodlands and wetland areas with Carrington Brook flowing through the Site from north to south.

The Site was used by the Company as a landfill (see Figure 2-2 for estimated limits) from 1919 until the mid-1970s for disposal of ash, cinder, demolition debris, and other wastes generated by the nearby Company facility. The Company began operations in the early 1800s along Mill Street in Waterbury and continued manufacturing through the 1980s. Manufacturing was conducted at other locations in Waterbury, including an 87-acre parcel located southwest of the Site. In 1997, the Company moved its corporate headquarters from Waterbury to Georgia.

The Company was well known for its metal casting capabilities, in particular, the manufacturing of brass products including buttons, belt buckles, clasps and other products. In the 20th century, the Company also manufactured appliances, small motors, watches, injection molded plastics, and photographic equipment. The Company also produced numerous products for the military during World Wars I and II and the Korean conflict. During World War II, it manufactured munitions, fuzes, and brass artillery casings. Gunpowder was used in the assembly of the fuzes. It is unknown whether munitions or explosives of concern (MEC) were deposited in the landfill. The Company also manufactured a variety of objects that used aluminum, chromium, copper, silver, tin, and zinc.

The Company's manufacturing processes included: anodizing, aluminum finishing, buffing, box making, fastener production, carpentry, metal casting, electrical instrument calibration and

maintenance, metal forging, laundry and cleaning services, metals research and analyses, painting and lacquering, metal milling, electro-annealing, electroplating, grinding, wastewater treatment, welding, steam and hot water generation, solenoid coil production, solvent degreasing, power generation, and grenade fuze production. Wastes from these operations may have been sent to the landfill.

Based on interpretations of historical aerial photographs from the Connecticut State Library (CSL, 2008) EPA's Environmental Science Division (EPA, 2001), portions of the Site appear to have been filled from as early as 1934. Filling at the Site commenced along Meriden Road and progressed northward. There is some filling noted in the northeastern corner of the Site on the south side of Dallas Avenue in the 1951 and 1963 aerial photos, but this appears to be related to residential construction and not industrial filling. It is an out of the way location for dumping Scovill waste compared to the more open and accessible areas in the southern part of the Site where filling activity is visible and obviously ongoing.

Once filling was completed in the southeastern portion of the Site, the Company subdivided the property and sold it to developers. As the wetlands and the stream valley were filled, those portions of the property were subdivided and were also sold to developers. Ponding of water in the drainage running between Monroe Avenue and Newbury Street, as well as just west of Dunbar Street, reflects the overall Site drainage pattern developed by Carrington Brook that persists today despite filling operations. Most of the development appears to have occurred between the mid-1950s and the mid-1970s. By the mid-1990s, approximately 23 of the 30 acres had been developed. An index of the current businesses and apartment buildings is listed on Table 2-1 and displayed on Figure 2-2.

In 1988, the Calabrese parcel was in the initial stages of development by Calabrese Construction Inc. when industrial waste was discovered. Excavation to install concrete footings for a proposed apartment complex uncovered waste materials including thirteen capacitors, ash, cinder, crushed drums containing sludge material, metal waste, demolition debris and other waste materials at depths ranging from 8 to 20 feet. The materials contained elevated levels of polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and metals (cadmium, silver, nickel, and zinc). The excavated soils containing waste materials were stockpiled. During a March 1998 inspection, the Connecticut Department of Environmental Protection (CTDEP) noted discolored water with an oily sheen near the concrete building

footings. CTDEP collected soil/source samples and analytical results showed concentrations of PCBs at concentrations ranging from 11,969 milligrams per kilogram (mg/Kg) to 140,230 mg/Kg.

In the spring of 1998, 2,300 tons of PCB contaminated soil and 18 capacitors were removed from the Calabrese parcel by the CTDEP. The area was temporarily capped with one foot of topsoil and hydro-seeded. After the installation of the temporary cap, four of the seven acres of the parcel were fenced and posted.

In April 1999, EPA's Superfund Technical Assessment and Response Team (START) conducted sampling at the Site and surrounding area. Surface soil (0 to 6 and 6 to 24 inches below ground surface [bgs]) samples were collected from 57 locations (Weston, 1999). Analytical results showed elevated levels of certain organic chemicals, including PCBs, and metals such as chromium, copper, nickel, silver, and zinc. Indoor air sampling was also performed in six basements to determine if chemicals from landfill materials were migrating into buildings. None were detected in the indoor air. Based on the April 1999 sampling, elevated levels of certain chemicals were discovered outside of the fenced area, so the fence was extended in December 1999. The report generated from the April 1999 sampling also indicated that the Company manufactured munitions in Waterbury. However, insufficient historical documentation exists to confirm or deny that MEC was ever deposited in the landfill.

The Site was listed on the National Priority List on July 27, 2000. In the fall of 2002, EPA conducted Phase I of the RI for the Site, and provided a Phase I Site Investigation Report articulating the findings (Metcalf & Eddy/Foster Wheeler Environmental Corporation [M&E/FWENC], 2003). Phase I included surface and subsurface soil sampling, a geophysical survey, and surface water and sediment sampling to better define the nature and extent of waste disposal. In 2004, EPA issued an Administrative Order to the PRP, Saltire Inc., to complete the remaining RI activities. In the summer of 2004, the PRP's contractor conducted approximately 90% of the Phase IIA RI, which included surface and subsurface soil sampling, wells installation and groundwater sampling, surface water and sediment sampling, soil gas survey, and a sewer survey. The PRP filed for bankruptcy in July 2004 and all work immediately stopped. EPA acquired the existing Phase IIA data and evaluated the available data on a limited basis. A Phase IIA Technical Memorandum was produced to report the available findings (M&E/Tetra Tech EC, Inc [TtEC], 2005).

2.3 Geology

The following sections present data detailing the current geological and hydrogeological conditions at the Site.

2.3.1 Overburden Geology

Based on the Phase I (2002) and Phase IIA (2004) soil investigation reports, along with a subsequent review of available boring logs and field notes, the overburden subsurface lithology of the Site primarily consists of twelve to eighteen feet of a dark brown, gray, and black ash/waste mixed with varying amounts of silt and sand. Other debris such as wood fragments, slag, and metal were also encountered during the Phase I investigations. None of the previous investigation borings reached bedrock and there is a question whether a till layer overlies bedrock as commonly found throughout glaciated New England. The majority of the boring logs identify fine to coarse sands and silt (dense) with little gravel. At three locations (SB02, SB04, and SB20), Phase I boring logs for deeper samples at approximately 20 feet below the ground surface (ft bgs) indicate clayey silt/silty clay with little to trace gravel (dense) but these strata are not described as till.

Blow counts and soil descriptions recorded during sampling activities characterize the ash waste as soft, fine, and black in color where it is most prevalent (M&E/FWENC, 2003). The ash material was found to be deepest through central portions of the Site where it was encountered as deep as 18 ft bgs and extends to the southern boundary as well as the eastern and western side slopes. Along the southern edge of the Site, ash depths extend approximately 14 ft bgs as identified in borings SB11 and SB18 during Phase I, and SB39 and SB40 during Phase IIA.

Additionally, in the southern portion of the Site, the fill material appears to extend into several other properties along Meriden Road not included in the original 1999 Site delineation (Weston, 1999). The waste appears to terminate at the northern end of the Site prior to reaching Dallas Avenue in the vicinity of a small wooded area, the adjacent wetlands, and the Meridian Apartments. Native soils beneath the landfill area consist of sand and silt with gravel. Peat is present in several portions of the Site particularly in the wetland area (M&E/FWENC, 2003). A more detailed assessment of the vertical and horizontal extent of the landfill based on surface and subsurface soils is discussed in Section 3.1.

2.3.2 Bedrock Geology

Phase I/IIA activities did not include any bedrock coring. However, the Site Inspection Report (Weston, 1999) calls out the underlying bedrock at the Site being mapped as Waterbury Gneiss Formation which is characterized as a dark gray, fine to medium grained composite of schist and gneiss. Several boulders identified on the Calabrese property during Phase IIA investigative activities were used to confirm the available bedrock data (M&E/TtEC, 2005). In addition, based on the seismic refraction survey conducted during Phase I, the depth to bedrock was estimated at between 5 ft bgs (in the northern end of the Calabrese parcel) to approximately 35 feet at the southern end of the Calabrese parcel. The bedrock surface was also estimated to dip S-SE at approximately 5° (M&E/FWENC, 2003).

2.3.3 Hydrogeology

Two hydrogeologic units underlay the Site: stratified drift and bedrock. As discussed above, there may be a till unit also, but a detailed hydrogeologic assessment has not been performed at the Site to date. However, data collected during the limited Phase I geophysical investigation, as well as observations made during subsurface soil investigations (Phase I and Phase IIA), were used to make general interpretations concerning the hydrogeologic conditions for the Site.

Based on the Phase I ground penetrating radar (GPR) data, the depth to groundwater ranged between approximately 6 to 15 ft bgs, with an average depth of 10 ft bgs. These depths were later confirmed during the subsequent Phase I soil boring program which showed depth to groundwater at approximately 10 feet on the Calabrese property (M&E/FWENC, 2003). However, well data from the northwest corner of the Site off of the Calabrese parcel indicate depths to groundwater were generally 3 to 4 ft bgs.

Eight shallow and deep overburden groundwater monitoring wells were installed at five different locations at the Site in 2004 as part of the Phase IIA activities. Table 2-2 summarizes construction details for the wells based on Phase IIA field notes. Table 2-3 shows the calculated groundwater elevations from 2004 and 2008 using the recent survey data. The wells were surveyed in June 2008 and groundwater flow is generally from the topographic highlands to the east and west of the Site and converges to the south as shown on Figure 2-3. This is the same general direction as regional flow towards the Mad and Naugatuck Rivers (Figure 2-1). The estimated horizontal hydraulic gradients for the area are approximately 0.02 ft/ft in both the

shallow and deep overburden. Based on calculations using groundwater elevations from well couplets MW-3S/D, MW-4S/D, and MW-6S/D, vertical gradients appear to be minimal and not suggestive of any significant vertical water movement between the shallow and deep portions of the overburden. Calculated vertical gradients from the June 3, 2008 groundwater elevation data are 0.00 (neutral), -0.01 (slightly up), and 0.08 (slightly down) ft/ft for MW-3S/D, MW-4S/D, and MW-6S/D, respectively.

Rising head and falling head slug tests were performed in all eight wells during Phase IIA field investigation activities. As indicated in Table 2-4, results of the slug tests show mean hydraulic conductivities ranging from 0.45 ft/day in MW-6D to 24.78 feet per day (ft/d) in MW-4S. In general, the deeper overburden monitoring wells exhibited lower hydraulic conductivities than the shallower wells where the non-native materials (ash/waste) are less consolidated. Of particular note are the low hydraulic conductivities for MW-1 relative to the other shallow monitoring wells. Located in the northwest corner of the Site, MW-1 was installed outside of the estimated limits of the former landfill and thus, is surrounded by more compacted and hydraulically less conductive, undisturbed, native materials.

3.0 NATURE AND EXTENT OF CONTAMINATION

This section presents the interpreted current nature and extent of contamination at the Site based on data from the START, Phase I and Phase IIA RI data reports. As a preliminary evaluation step, historical data are compared to Connecticut's Remediation Standard Regulations (RSRs; CTDEP, 1996) which are used to determine whether or not remediation of contamination is necessary to be protective of human health and the environment.

Two criteria must be met for soil remediation: Direct Exposure Criteria (DEC) and Pollutant Mobility Criteria (PMC). DEC are designed to be protective of human health from exposure to contaminants in soil and limits differ for residential and industrial/commercial land use. PMCs are designed to prevent pollution of groundwater from contaminants in soil that are available to migrate into groundwater. PMC limits differ based on the groundwater classification of a site.

Three criteria must be met for groundwater remediation: Groundwater Protection Criteria (GWPC), Surface Water Protection Criteria (SWPC), and Groundwater Volatilization Criteria (GWVC). GWPC mandate that plumes in high quality groundwater are cleaned up to background quality or protective of future drinking water use. SWPC apply to groundwater at

the point of discharge into a surface water in order to be protective of Water Quality Standards. GWVC are designed to be protective of human health from volatile compounds that may migrate from groundwater into buildings and, like the DEC, differ between residential and industrial/commercial use of the property.

3.1 Soil

An assessment of the vertical and horizontal extent of soil conditions at the Site is presented below.

3.1.1 Surface Soil

In April 1999 the START program collected 124 surface and shallow subsurface soil samples throughout the Site and in the surrounding environs from 0 to 6 inches and 6 to 24 inches bgs at each location (i.e., 2 samples per location). An additional 52 surface soil samples were collected from locations during the Phase I and Phase IIA programs (Figure 3-1). Samples were taken from approximately 0 to 3 inches bgs and analyzed for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, PCBs, metals, and dioxins for select samples (M&E/FWENC, 2003 and M&E/TtEC, 2005).

Figure 3-2 depicts the distribution of surface soil concentrations exceeding CTDEP's Residential Direct Exposure Criteria (ResDEC) for individual compound classes (e.g., PAHs). Results from these samples did not identify any VOCs above CTDEP ResDEC. Multiple samples identified PAHs exceeding the CTDEP ResDEC in soils collected from the properties of the Store Avenue Apartments, the Agricare property, the 119 East Elderly Housing Apartments, 55 Academy Avenue, the child day care facility on Store Avenue, the Laur-Ray Apartments, and the Calabrese property. The most frequently encountered PAHs exceeding criteria included benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, and benzo(a)pyrene. These chemicals are not uncommon in urban areas.

In addition to PAHs, certain metals were also detected at concentrations exceeding CTDEP ResDEC throughout the Site. Arsenic was detected in excess of the criteria in samples collected from the Store Avenue Apartments (15,000 micrograms per kilogram [µg/Kg] maximum), 55 Academy Avenue (12,600 µg/Kg maximum), and the Calabrese property (103,000 µg/Kg). Additionally, chromium (19,200 mg/Kg), copper (28,800 mg/Kg), lead (746

mg/Kg), nickel (2,460 mg/Kg), and vanadium (474 mg/Kg) were detected above CTDEP ResDEC on the Calabrese property.

The PCB Aroclor-1254 was also detected by the START program on the Calabrese property at a concentration of 19,000 µg/Kg which exceeds CTDEP ResDEC. Additionally, stained soil was observed by the START team on the Calabrese property in the area northwest of the fenced area of the Site.

Similar to the START data, results from the Phase I and IIA investigations identified PAHs and metals as the principal chemicals of concern in the surface soils. Detectable concentrations of VOCs, pesticides, PCBs, and dioxins were present as well. All 36 Phase I samples had detectable concentrations of PAHs, chromium, copper, and zinc. These samples also had detectable concentrations of VOCs and over half had detections of pesticides. An additional 16 samples were collected during Phase IIA activities and confirmed the presence of these chemicals residing in the surface soils (M&E/FWENC, 2003 and 2005).

Based on Phase I/IIA results, the distribution of the surface soil contamination appears to be highly variable. The frequency of detection for a given compound or analyte in general, does not correspond to any one particular portion of the Site. Figure 3-2 depicts the distribution of START, Phase I and Phase IIA surface soil concentrations exceeding CTDEP ResDEC for individual compound classes (e.g., PAHs). After a review of the analytical data, it appears the highest PAH levels are located predominately in the south-central portion of the Site where an apparent east-west trending band of PAH exceedances to the CTDEP ResDEC exists. The highest metal concentrations, in particular chromium and copper, appear to be generally detected in the north. High concentrations of zinc have been detected in the south. However, as stated previously, the presence of detectable concentrations for any particular analyte appears to be randomly distributed with no clear pattern of occurrence. This type of distribution is consistent with a landfill depositional model. As an example, while numerous PAH exceedances are found in the south-central portion of the Site, there are others in the northern areas (Calabrese property) as wells as several off-site/background locations to the north (SS22), south (SS76), east (SS47), and west (SS77) of the Site.

Table 3-1 lists START, Phase I, and Phase IIA maximum surface soil sample concentrations for individual compounds in comparison to the CTDEP ResDEC and PMC for GB aquifers. During

Phase I, only PAHs were present in concentrations exceeding the CTDEP ResDEC with nine samples containing one to three compounds in excess of the criteria. As stated above, the highest PAH concentrations were detected toward the southern portion of the Site near Newman and Dunbar Streets. During the Phase IIA investigation, in addition to PAHs, metals and pesticides were detected exceeding the CTDEP ResDEC. Two samples (SS38, located on the south-eastern residential properties north of Meriden Road, and SS77, located south-west of the intersection of Monroe and Hindsdale Avenues) exhibited detections of multiple contaminant classes exceeding the criteria. In should be noted that of the nine surface soil samples with detections in exceedance of the CTDEP ResDEC criteria, four samples (SS45, SS47, SS76, and SS77) were designated as "background" locations located outside the bounds of the estimated landfill extent (see Section 3.1.2)) for comparison purposes. To delineate the extent of surficial soil contamination and for risk assessment purposes, the other samples in Phase IIA targeted areas near the locations where Phase I surficial samples exceeded the CTDEP ResDEC for synthetic precipitation leaching procedure (SPLP) parameters (M&E/FWENC, 2003 and 2005).

3.1.2 Subsurface Soil

The Phase I and subsequent Phase IIA subsurface soil investigations consisted of the completion of 35 soil borings (SB1 through SB36; SB 19 not completed) and 22 soil borings (SB37 through 48; SB50 through 51; SB53 through 55; and SB84 through 88), respectively, with the collection of up to 4 samples per boring (M&E/FWENC, 2003 and 2005). The purposes of the boring programs were to delineate the horizontal and vertical boundaries of the former landfill; characterize the nature and extent of subsurface soil contamination; and define potential health risks associated with waste disposal activities at the Site.

The Phase I soil borings were completed to approximately 20 ft bgs with several extending down to 25 ft bgs. Subsurface boring locations are summarized on Figure 3-3. Table 3-2 summarizes the depths of the Phase I borings. Samples were collected for VOCs, SVOCs, pesticides, PCBs, and metals with occasional samples being collected for dioxin, SPLP, total organic carbon (TOC), and grain size analysis. Similar to the surface samples, the subsurface results identified PAHs and metals as the contaminants most frequently detected at concentrations above screening criteria. Twenty nine samples from 21 borings contained between one and seven contaminants with concentrations greater than the CTDEP ResDEC. Table 3-3 summarizes the principal chemical classes of contaminants detected, along with their

maximum detected concentrations, associated sample location, and corresponding CTDEP ResDEC and GB PMC. Figure 3-4 depicts the distribution of Phase I subsurface soil concentrations exceeding the CTDEP ResDEC for individual compound classes (e.g., PAHs). In addition to metals and PAHs, VOCs, pesticides, PCBs, and dioxins were detected, although generally at much lower detection frequencies and concentrations relative to their respective screening criteria (M&E/FWENC, 2003).

Results from the Phase I investigation indicate PAHs as the class of contaminants most frequently exceeding the CTDEP ResDEC. Samples demonstrating the highest concentrations of PAHs were collected from the East Gate Plaza area (e.g., SB27), and in samples collected from southern portions of the Site (e.g., SB18) and on the southern edge of the Calabrese property (SB13) (M&E/FWENC, 2003). SB18 also exceeded the GB PMC for PCE and TCE. The TCE GB PMC was also exceeded at SB45 (Franco-American Hall on Store Avenue)

With respect to Phase I metal detections, arsenic, cadmium, copper, and lead were detected in subsurface samples at concentrations above the CTDEP ResDEC. Elevated concentrations of copper were detected throughout the Site with the highest concentrations occurring in the vicinity of the Store Avenue Apartments (14,500 mg/Kg in SB11-05-10). Additionally, the data shows elevated levels of cadmium and lead distributed sporadically across the Site similar to PAHs. The highest level of cadmium was detected in SB18 at a depth of 10-20 ft bgs (204 mg/Kg) on the Val-U-Mart property with additional elevated levels occurring in samples SB27 from 10-15 ft bgs (198 mg/Kg) and SB26 from 10-15 ft bgs (89 mg/Kg) at the East Gate Plaza. The highest concentration of lead was found in SB32 from 5-10 ft bgs (204 mg/Kg) on the Laur-Ray Apartments property with additional elevated levels occurring in samples SB26 (1,240 mg/Kg) and SB27 (1,200 mg/Kg) at the East Gate Plaza at depths of 10-15 ft bgs (M&E/FWENC, 2003).

In general, the Phase I data suggest that PAH and metal contamination is randomly distributed across the Site with localized areas of moderate to higher concentrations. Little evidence of widespread VOC contamination was encountered with the exception of a relatively high localized concentration (12,000 µg/Kg) of tetrachloroethene (PCE) detected in SB18 at a depth of 12-13 ft bgs, located behind the Val-U-Mart and Sparks Tune and Lube Shop. Additionally, pesticides were detected in generally low concentrations variably across the Site. DDT was the

pesticide most frequently encountered with all detections occurring below the CTDEP ResDEC criteria of 1,800 µg/Kg (M&E/FWENC, 2003).

To better understand the vertical distribution of contaminants across the Site, chemical contours (using 3-D computer modeling software, EVS Pro) were created for total PAHs and copper along the A-A' transect (shown on Figure 2-2). Figures 3-5 and 3-6 show the Phase I distribution of contaminants along this transect and at depth for total PAHs and copper, respectively (M&E/FWENC, 2003).

As previously stated, PAH and metal contamination is unevenly distributed across the Site with some localized areas of high concentrations. For PAHs, as shown on Figure 3-5, locally higher concentrations, relative to surrounding areas, occur at 0-5 ft bgs and at approximately 15 ft bgs. For copper, as shown on Figure 3-6, samples with higher concentrations are found at various depths and at several locations across the area. Along the cross section, elevated concentrations of copper are generally localized and discontinuous (M&E/FWENC, 2003).

The primary objective of the Phase IIA subsurface soil investigation was to further delineate and refine the extent of the landfill boundaries following Phase I results which indicated that portions of the landfill (primarily the southern end along Meriden Road) appeared to extend onto certain abutting properties not previously considered as part of the Site. As such, the majority of the subsurface borings were completed along the perimeter of the Site with few occurring within the interior where sufficient data had been collected as part of the Phase I investigation. Similar to Phase I, borings were completed to approximately 20 ft bgs with up to four subsurface soil samples collected from each boring. Table 3-4 and Figure 3-3 summarize depths and locations, respectively, for the Phase IIA subsurface borings. Samples were collected for VOCs, SVOCs, pesticides, PCBs, and metals with occasional samples being collected for dioxin, SPLP, TOC, and grain size analysis (M&E/TtEC, 2005).

In general, the Phase IIA results confirmed findings of the Phase I investigation with respect to the nature and extent of subsurface soil contamination at the Site. No landfilling is assumed to have taken place south of Meriden Road. Phase IIA borings on residential properties beyond the Scovill property limits approaching the northern edge of Meriden Road did not reach native, undisturbed materials until 7.5 to 18 feet bgs (Table 3-4, Figure 3-3). While fill appears to have been placed along the southern boundary of the Site to support building construction along

Meriden Road, it cannot be firmly established at this time whether those properties, particularly in the southeast corner were filled with materials from the Company. These properties were not part of the original Site property purchase and it is unknown whether the Company would have deposited materials off their property. The earliest aerial photography from 1934 (CSL, 2008) shows structures in place on some of these locations and according to City tax records, the buildings at 299 Meriden Road (third building east of Store Avenue) were built in 1914, several years prior to the Company purchasing the Scovill parcel and beginning their landfilling operations. Therefore, the boundary has been extended off-Site towards Meriden Road west of 299 Meriden Road. On the southeastern side of Store Avenue, 225 Meriden Road (third building west of Store Avenue) was built in 1918, one year prior to the Company purchasing the Site. The adjacent building to the west, 219 Meriden Road, was built in 1926. All aerial photography from 1934 forward does not show any fill operations in that area, and the trees visible on the lot between these two properties look mature and undisturbed. Therefore, the assumption is that the Company honored the southwest property line. Any fill off-Site in that area is presumed to have come from sources other than the Company. In northern portions of the Site, the majority of the landfill's thicker waste deposits were confirmed to end relatively abruptly in the wetland area on the northern edge of the Calabrese property (M&E/TtEC, 2005).

As previously stated, the Phase IIA sampling results tend to confirm Phase I observations. As indicated on Figure 3-4, several Phase IIA samples do exceed the CTDEP ResDEC criteria for one or more chemical classes, (e.g., PAHs and metals). Table 3-5 summarizes the maximum concentration values of metals and PAHs reported in the Phase IIA data for subsurface soils along with corresponding CTDEP ResDEC and GB PMC. Where Phase I results showed a relatively random distribution of chemicals across the Site, Phase IIA observations suggest some evidence of possible contamination patterns. A review of samples exceeding the CTDEP ResDEC on Figure 3-4 shows a significant number of metal exceedances occurring in the southern portion of the Site near Meriden Road. Additionally, in the south-central portion of the Site (immediately to the north of Newman Avenue), a number of PAH samples exceed the CTDEP ResDEC (M&E/TtEC, 2005).

With respect to the vertical distribution of contaminants, Phase IIA results generally show the bulk of PAH and metal exceedances occurring in the top 10 feet of soil. However, within this profile, the depth of concentrations exceeding a given criterion still tend to vary widely, thus a

definitive contaminant depth trend cannot be established with a high level of confidence (similar to the Phase I results) (M&E/TtEC, 2005).

It should also be noted that several background (off-landfill) samples demonstrate CTDEP ResDEC criteria exceedances especially with respect to PAHs and metals. However, there does not appear to be a clearly defined relationship between the geographic location of the background samples and the nature of the chemical class exceedances. Additionally, there does not appear to be any correlation with samples collected from the interior or along the perimeter of the landfill (M&E/TtEC, 2005).

While the Phase IIA observations suggest some sort of horizontal contaminant distribution pattern, combining the Phase I and Phase IIA data (Figure 3-4) demonstrates relatively sporadic occurrences with some localized areas of high concentrations. Both data sets are in agreement with respect to the random vertical distribution of contaminants across the Site.

3.2 Groundwater

As stated previously, 8 shallow and deep overburden groundwater monitoring wells were installed in 5 locations during the Phase IIA investigation to assess groundwater conditions at the former landfill. One monitoring well (MW-2) was not installed in the northeast corner of the Site due to physical access issues (M&E/TtEC, 2005). Table 2-2 and Figure 2-3 show monitoring well construction details and locations respectively. Prior to the unexpected declaration of bankruptcy by the principal PRP, only one round of groundwater sampling was conducted at the Site in July 2004. The wells were sampled for VOCs, SVOCs (PAHs), pesticides, PCBs, and metals. Additionally, one piezometer (PZ-1) was installed to help develop overburden groundwater level contours (M&E/TtEC, 2005).

The July 2004 groundwater sampling results show relatively low concentrations for all the major chemical classes (VOCs, SVOCs [PAHs], pesticides, PCBs, and metals). Tables 3-6 to 3-9 list the detected compounds for each chemical class relative to the proposed CTDEP RSRs for vapor intrusion guidance criteria (Res GWVC; CTDEP, 2003), and Connecticut's existing SWPC and GWPC. It should be noted however, that the groundwater at and in the vicinity of the Site is classified as GB and is not intended for drinking water purposes. Thus, comparison to the GWPC is used to give a first order approximation of any potential risks to human health. The following is a summary of the groundwater analytical results:

- Chloroform in MW4D (32 µg/L) and vinyl chloride in MW-6S (3 µg/L) were the only VOCs detected in exceedance of the CTDEP Res GWVC and CT GWPC;
- No SVOCs were detected in exceedance of the CTDEP Res GWVC and/or CT GWPC;
- Aldrin and beta-BHC in MW-6S (0.017 and 0.034 µg/L respectively), and dieldrin in MW-1 (0.018 µg/L) were the only pesticides detected in exceedance of the CT GWPC;
- No PCBs were detected in exceedance of the CTDEP Res GWVC and/or CT GWPC; and
- Cadmium and nickel in MW-4S (18.5 and 130 µg/L respectively), and vanadium in MW-3S (108 µg/L) were the only metals detected in exceedance of the CT GWPC. Zinc in MW-3S (372 µg/L) and in MW-4S (4,810 µg/L) was the only metal detected in exceedance of the CT SWPC.

3.3 Sediment and Surface Water

In addition to soil and groundwater, sediment and surface water sampling was conducted in the wetlands area in the northeast corner of the Site (east of the Calabrese property) during the Phase I and Phase IIA investigations.

The Phase I investigation consisted of the collection of 10 sediment samples in addition to surface water samples collected from two of the sediment locations, SED01 (SW01) and SED10 (SW02). Sediment samples were collected for VOCs, SVOCs, PAHs, pesticides, PCBs, metals, and acid-volatile sulfides/simultaneously extracted metals (AVS/SEM); surface water samples for VOCs, SVOCs, PAHs, cyanide, and filtered and unfiltered metals. Tables 3-10 and 3-11 show the principal classes of compounds detected in sediment and surface water respectively, in addition to their detection frequencies, maximum concentrations, and associated locations as depicted on Figure 3-7 (M&E/FWENC, 2003). Storm drain samples SD01 and SD02 were also collected in Phase I.

Similar to surface and subsurface soils, the Phase I results showed detections of PAHs, chromium, copper, zinc, and VOCs in the sediment samples. In particular, SED04 contained relatively high levels of metals. Additionally, SED10 contained detectable concentrations of the PCB compounds Aroclor-1254 and Aroclor-1260 at 1,800 µg/Kg and 2,900 µg/Kg respectively (M&E/FWENC, 2003).

Reportable concentrations of filtered and unfiltered metals were detected in both of the surface water samples at levels well below any applicable criteria. PAHs and VOCs were detected in only one of the samples at low levels as well (M&E/TtEC, 2005).

An additional five sediment samples (SED11 and SED14 through SED17) and one surface water sample (SW01) were collected during the Phase IIA investigation to supplement the Phase I samples (Figure 3-7). Sediment samples were collected from several locations along the perimeter of the Calabrese property in addition to the outer portions of the Site (SED11, SED16 and SED17). Table 3-12 shows the chemical classes of compounds detected in sediment, in addition to their detection frequencies, maximum concentrations, and associated locations (M&E/TtEC, 2005).

In general, the Phase IIA results support Phase I detections of PAHs, VOCs, metals, pesticides, and PCBs in sediment. The highest overall contaminant concentrations were detected in SED15, located in the northeast corner of the Calabrese property. Levels exceeding the CTDEP ResDEC for soil included benzo(a)anthracene (15,000 µg/Kg), benzo(b)fluoranthene (17,000 µg/Kg), benzo(a)pyrene (15,000 µg/Kg), and Aroclor-1260 (13,000 µg/Kg). PAH exceedances were also found in SED11, SED14, and SED16 (M&E/TtEC, 2005).

3.4 Sewer Survey

A sewer survey was completed in Phase IIA to evaluate if discharge from the Site eventually reached Hamilton Park one mile south of the Site and historical discharge point for Carrington Brook. Water soluble dyes were introduced at several locations upgradient of the site on May 21, 2004 and visual observations recorded at multiple sewer access points and locations on the Site and downgradient. Dye was introduced at the following locations (see Figure 3-7):

- Location 1 - Manhole at the corner of Store Avenue and Radcliffe St. intersection (red dye);
- Location 2 - Manhole at the southwest corner of Dallas Terrace (red dye)
- Location 3 - Manhole farthest north on Dunbar St (yellow-green dye)
- Location #4 - In the wetland area on the Calabrese property (outside the fence) near the cage/catch basin (yellow-green dye)

Observations include the following:

- Pink-red dye was observed at the catch basin on the Calabrese property (SED12) after introduction at Location 1.
- Pink-red dye was observed in the water at the catch basin in front of the Calabrese Property gate (off Store Avenue) after introduction at Location 2. No dye was observed at the manhole location in the north central portion of the Sanford Condominium parking lot (SED17).
- Yellow-green dye was observed at a manhole located on Newman Avenue after introducing dye at Location 3. Dye was also observed at a manhole on Monroe Avenue north of the Technical Repair Automotive shop (14 Monroe Avenue) and near SED11.
- Red dye was observed in the outfall at Hamilton Park. Green shaded dye was observed at the Carrington Brook outfall.

Overall, the results of the sewer survey suggest that subsurface stormwater flow from at least some portions of the storm sewer system within the boundaries of the Site ultimately discharge to the Hamilton Park area.

3.5 Soil Gas Survey

A limited soil gas survey was performed during Phase IIA at the southern end of the Site in the vicinity of the Rides Auto Parts store to further investigate a PCE detection in soil at SB-18 (Figure 3-3). Samples were collected in a circular pattern approximately 10 and 20 feet from SB-18. Results for the majority of the samples were relatively low with two samples on the northwest side (SG-5 and SG-6) showing measurable levels of benzene and carbon tetrachloride.

4.0 CONCEPTUAL CONTAMINANT MIGRATION MODEL

This section summarizes the current understanding of how contamination from the Site can reach potential receptors including possible mechanisms and pathways. This understanding will be used to help guide the design of the Phase III RI field program.

4.1 Potential Contaminant Sources

Landfilling at the Site was a temporally and spatially varied activity influenced by convenience of access, weather conditions and specific topographic needs during development. Variation in the waste stream (relative to Company production) reaching the Site introduces an additional

component of randomness in the overall chemical distribution pattern. The limits of landfilling based on the identification of ash, debris and recognition of native, undisturbed soil are considered adequate with the exception of a small area in the south along Meriden Road and another area of limited data immediately north of the fenced area on the Calabrese parcel.

As discussed in Section 3.1, there is no distinct pattern or correlation of specific analytes or chemical classes. Elevated levels of various metals and PAHs are distributed sporadically across the Site with isolated samples showing high concentrations. A number of samples with metals exceeding CTDEP ResDEC are located in the southern portion of the Site near Meriden Road. Just north of Newman Avenue, in the central portion of the Site, there are a number of samples with PAHs exceeding CTDEP ResDEC. The majority of these exceedances occur in the top 10 feet of soil. Thus, potential contamination sources in the soil are from these scattered pockets of metals, PAHs and SVOCs. There are also isolated samples of high VOCs scattered across the Site.

No private drinking water supplies are believed to be in the area (this will be verified in Phase III) and there are no nearby surface water supplies. CTDEP GWVC were exceeded in two wells (MW-4D and MW-6D) and thus, represent a potential source of VOCs to indoor air. However, the general absence of any other VOCs across the Site minimizes the probability of vapor intrusion issues.

4.2 Migration Mechanisms

The primary chemical classes of potential concern are generally limited to select SVOCs, PAHs, metals and PCBs. All of these analytes have a high affinity for sorbing on to suitable soil surfaces and do not tend to migrate very far from their initial depositional environments. Surface soils may be subject to physical transport by wind, erosion and surface water runoff, or mechanical contact from people or vehicles. The bowl shape of the Site with the higher topography on the west and east sides directs any overland flow eventually towards the southern portions of the Site. Subsurface soils will generally remain in place unless disturbed by mechanical means from intrusive activities. Solubilities of these chemical classes (SVOCs, PAHs, metals and PCBs) are generally low so there will be negligible loading to groundwater. Dissolved constituents will migrate in groundwater following local and regional gradients. There may be a potential for vapor migration of two identified VOCs toward homes or businesses in the southern portion of the Site and this will be investigated further in Phase III.

4.3 Potential Receptors

Potential human receptors include residents, recreational users, trespassers, groundskeepers, commercial workers and construction and utility workers. Tables 4-1 and 4-2 list potential receptors by exposure media and routes for the Scovill Parcel (Parcel A) and the Calabrese Property (Parcel B), respectively.

To facilitate the completion of the Human Health Risk Assessment for the varied uses and potential receptors on the Site, separate risk exposure areas were developed to differentiate non-contiguous areas and areas with differing site uses or housing styles. These risk exposure areas (Areas A through J) are summarized in Table 4-3 and group adjacent properties with common receptors and uses together for statistical purposes, but still allow discrimination by property use (e.g., commercial, residential, day care, etc.). Figure 4-1 depicts the different risk exposure areas and highlights the background locations identified and approved by EPA in the PRP's Work Plan (Conestoga-Rovers & Associates, 2004).

Ecological receptors are included in the Draft Final Baseline Ecological Risk Assessment completed by EPA (A. Silva, personal communication, 2008).

5.0 POTENTIAL DATA GAPS

This section summarizes specific data needs deemed necessary to complete the Phase III RI.

5.1 Chemical Parameters

The chemical distribution across the Site is considered to be random and additional sampling will not necessarily refine a chemical distribution model. However, additional samples from specific risk exposure areas are needed for statistical purposes to yield a minimum of 8 samples per risk exposure area to calculate 95 percent upper concentration limits on the mean for surface and subsurface soils. For the bordering residential properties on Monroe and Academy Avenues, additional surface samples are proposed to provide individual surface soil samples for each residential property on the Site. Tables 5-1 and 5-2 summarize additional sampling needs by risk exposure area for surface and subsurface soils. All samples would be analyzed for VOCs, SVOCs, PAHs, pesticides, PCBs and metals. Several additional samples are also suggested in the north part of the Site and along Meriden Road in the south to better refine landfill waste limit extents.

Additional monitoring wells and groundwater samples from other portions of the Site are required to better refine groundwater flow patterns and gradients as well as assessing the potential for vapor intrusion at the day care facility and specific residential areas. Table 5-3 summarizes proposed well placements. Initial sampling rounds would be for VOCs, SVOCs, PAHs, pesticides, PCBs and metals analyses with subsequent rounds based on initial results. It is expected that shallow wells would be for VOC only in subsequent rounds if the potential for vapor intrusion is indicated.

The current sediment and surface water samples are considered to be adequate to support the Baseline Ecological Risk Assessment per EPA's evaluation (A. Silva, personal communication, 2008). The present sediment and surface water data are also considered to be suitable for evaluating current and future young adult recreational user/trespasser scenarios (per Tables 4-1 and 4-2).

5.2 Physical Parameters

Potential settling and lateral movement of buried materials (primarily ash) is suspected in several reported cases of utility breaks resulting in water and sewer line ruptures. Engineering parameters will be needed to evaluate potential stabilization or consolidation of the buried ash to minimize future breaks as well as for any capping remedial alternatives. Eight Shelby tube samples are proposed for undisturbed soil sampling of the ash layer at six locations across the Site. Sampling locations would be based on a review of boring logs to target the specific ash layers. Samples would be analyzed for moisture content, grain size (including hydrometer), Atterberg Limits and compressibility characteristics (consolidation tests). Twelve bulk soil samples, co-located above and below the ash layer at the six locations, are proposed and would be analyzed for moisture content and grain size.

5.3 Human Health Risk Assessment

The chemical samples described above in Section 5.1 and 5.2 should prove adequate to complete the Human Health Risk Assessment.

5.4 Ecological Risk Assessment

Based on correspondence with the EPA Task Order Project Officer (A. Silva, personal communication, 2008), EPA has completed the Draft Final Baseline Ecological Risk Assessment. This document will be used for the RI.

6.0 SUMMARY AND CONCLUSIONS

A review of available information was performed to develop a conceptual site model that could be used to support completion of the RI for the Site. The summary and conclusions for this CSM are presented below.

6.1 Summary

The following observations were made during the information review and assessment:

Source Area

- Waste from the Scovill Manufacturing Company including ash, cinder, demolition debris and other wastes was landfilled on the Site from 1919 to the mid-1970s. Filling commenced along Meriden Road and progressed northward.

- The fill in the southern portion of the Site appears to extend into several other properties along Meriden Road not included in the original 1999 Site delineation based on Company property boundaries. The waste appears to terminate at the northern end of the Site prior to reaching Dallas Avenue in the vicinity of a small wooded area, the adjacent wetlands, and the Meridian Apartments.

- As discovered in a company record review, the company did manufacture some munitions components, thus, there is a possibility that there could be some MEC in the waste. However, there is no record specifying that MEC was disposed and the three previous investigations have found no presence of MEC or any chemical or physical indications that MEC was landfilled on Site.

- The ash material is deepest through central portions of the Site (18 feet bgs) and extends to the southern boundary as well as the eastern and western side slopes. Along the southern edge of the Site, ash depths extend approximately 14 ft bgs.

Geology and Hydrogeology

- Lithology of the Site primarily consists of twelve to eighteen feet of a dark brown, gray, and black ash/waste mixed with varying amounts of silt and sand. Other debris such as wood fragments, slag, and metal were also encountered.

- Native soils beneath the landfill consist of sand and silt with gravel. Peat is present in several portions of the Site particularly in the wetland area.

- Underlying bedrock at the Site is mapped as Waterbury Gneiss Formation, a dark gray, fine to medium grained composite of schist and gneiss. Depths to bedrock, estimated using geophysics and overburden boring refusal, range between 5 feet (in the northern end of the Calabrese parcel) to approximately 35 feet at the southern end of the Calabrese parcel. The bedrock surface reportedly dips S-SE at approximately 5°.

- Local groundwater flow is generally to the south and regional flow to the southwest. Depth to groundwater ranges from 6 to 15 ft bgs.

- Mean hydraulic conductivity ranges from 0.45 to 24.78 ft/d with the deeper overburden monitoring wells exhibiting lower hydraulic conductivities than the shallower wells where non-native materials (ash/waste) are less consolidated.

Soil Contamination

- Semi-volatile PAHs and metals are the principal contaminants of concern in surface soils. Detectable concentrations of VOCs, pesticides, PCBs, and dioxins were present in soils as well. The presence of detectable concentrations for any particular analyte appears to be randomly distributed with no clear pattern of occurrence or correspondence to any one particular area on the Site. The highest PAH levels are located predominately in the south-central portion of the Site where an apparent east-west trending band of PAH concentrations exceed CTDEP ResDEC. The highest metal concentrations, in particular chromium and copper, appear to be generally detected in the north. High concentrations of zinc have been detected in the south.

- In subsurface soils, semi-volatile PAHs and metals are also the principal contaminants of concern. PAHs, VOCs, pesticides, PCBs, and dioxins were also detected, although generally at much lower detection frequencies and concentrations compared to the metals and PAHs. The subsurface soil chemical distributions also appear to be varied. There are a number of metal exceedances of CTDEP ResDEC in the southern portion of the Site near Meriden Road. Additionally, in the south-central portion of the Site (immediately north of Newman Avenue), there are a number of PAH concentrations exceeding CTDEP ResDEC.

- The bulk of PAH and metal exceedances of CTDEP ResDEC occur in the top 10 feet of soil. However, within this profile, the depth of concentrations exceeding a given criterion varies widely.

Sediment and Surface Water Contamination

- Similar to surface and subsurface soils, sediment samples showed detections of PAHs, chromium, copper, zinc, and VOCs. Pesticides were detected in some samples and PCBs were detected in one sediment sample from the Calabrese parcel.

- Reportable concentrations of filtered and unfiltered metals were detected in both surface water samples at levels well below any applicable criteria. PAHs and VOCs were detected in only one of the samples at low levels as well.

Groundwater Contamination

- Groundwater at and in the vicinity of the Site is classified as GB and is not intended for drinking water purposes. Thus, the CT GWPC are indicative but not applicable at the Site. It is believed (and will be confirmed during the Phase III investigation) that there are no private drinking water wells on Site.

- Chloroform and vinyl chloride were the only VOCs detected that exceed CTDEP Res GWVC. No other VOCs or SVOCs were detected that exceeded CTDEP Res GWVC and/or CT GWPC.

- Three pesticides (aldrin, beta-BHC and dieldrin) and three metals (cadmium, nickel and vanadium) were detected in exceedance of the CT GWPC.

Vapor Intrusion

- Chloroform (32 µg/L) and vinyl chloride (3 µg/L) were the only VOCs detected in exceedance of the CTDEP Res GWVC. While detected in deep wells, these chemicals may pose a potential vapor intrusion threat and require further evaluation following the installation and sampling of the Phase III monitoring wells. Several isolated samples of elevated VOCs in soils may also represent a potential vapor intrusion threat which will be evaluated with the installation and sampling of the Phase III monitoring wells.

6.2 Conclusions and Recommendations

Conclusions from the evaluation of data and information are as follows:

- Chemicals exceeding CTDEP ResDEC include select PAHs and metals.

- There is no apparent pattern to horizontal or vertical distribution of chemicals on the Site. There is no apparent geographic correlation between individual chemical species or chemical groups.

- The chemicals found in the Site soils generally are not very mobile and would be expected to sorb strongly on the native soils and fill.

- There is a potential for ash wastes to settle based on their size and structure. If left in place, site stabilization or consolidation may be required to prevent further settling. Additional samples need to be evaluated for engineering parameters to address this potential data gap.

- Two VOCs exceeding CTDEP ResGWVC were detected in groundwater at separate locations. Other areas on Site (particularly in proximity to residential area) should be evaluated for VOCs potentially above CTDEP GWVC.

- Additional groundwater monitoring points need to be established to better define groundwater flow direction and gradients.

- Additional soil and groundwater samples are required to satisfy statistical requirements for evaluating human health risk within individual risk exposure areas.

7.0 REFERENCES

Conestoga-Rovers & Associates, 2004. Final Phase II Remedial Investigation/Feasibility Study Work Plan, Scovill Industrial Landfill Superfund Site, Waterbury, Connecticut, April 2004.

Connecticut Department of Environmental Protection (CTDEP), 1996. Remediation Standard Regulations, Connecticut General Statutes, Section 22a-133k1 et seq.

Connecticut Department of Environmental Protection (CTDEP), 2003. Proposed revisions, Connecticut's Remediation Standard Regulations Volatilization Criteria, March 2003.

Connecticut State Library (CSL), 2008. Aerial survey of Connecticut 1934 photograph 07051, http://cslib.cdmhost.com/cdm4/item_viewer.php?CISOROOT=/p4005coll10&CISOPTR=8581&CISOBOX=1&REC=1.

Environmental Protection Agency (EPA), 2001. Historical Aerial Photographic Analysis, Scovill Industrial Landfill, Waterbury, Connecticut. TS-PIC-20101140S. Environmental Sciences Division, Las Vegas, NV, January 2001.

Metcalf & Eddy and Foster Wheeler Environmental Corporation (M&E/FWENC), 2003. Phase I Site Investigation Report, Scovill Industrial Landfill, Waterbury, Connecticut, April 2003.

Metcalf & Eddy and Tetra Tech EC, Inc. (M&E/TtEC), 2005. Technical Memorandum, Review of Phase IIA Data, Scovill Industrial Landfill Superfund Site, October 2005.

Silva, Almerinda, 2008. EPA personal communication to Boyd Allen, Nobis Engineering Inc. with Draft Final Baseline Ecological Risk Assessment for Scovill Industrial Landfill, Waterbury, Connecticut, 2 June 2008.

Roy F. Weston (Weston), 1999. Draft Site Inspection Report for Scovill Industrial Landfill, Waterbury, Connecticut. Roy F. Weston Superfund Technical Assessment and Response Team, Burlington, MA, 17 September 1999.

TABLES

Table 2-1
Site Area Businesses and Apartment Buildings
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Figure 2-2 Map Key	Address	Business Name	Type of Service
1	203 Meriden Rd.	Pete's Front End Service	Auto Repair
2	211 Meriden Rd.	Pete's Front End Service	Auto Repair
3	231 Meriden Rd.	The Clean Shop	Dry Cleaning
4	235 Meriden Rd.	Rides Autosports	Auto Parts & Service
5	265 Meriden Rd.	Waterbury Physical Medicine	Medical
6	281 Meriden Rd.	Former Firefighters Credit Union - Vacant	Banking
7	299 Meriden Rd.	Auto Credit Plus Sales	Auto Sales
8	305 Meriden Rd.	Eagle Printing Co.	Printing Services
9	313 Meriden Rd.	Former Pub - Vacant	Dining
10	34 Monroe Ave.	Sunshine Dance Center Realty & Appraiser	Lessons/Teaching Realty
11	20 Newman Ave	Supertruck & Custom Rims Ganz Landscaping Services	Auto Parts Landscaping
12	55 Newman Ave	Franco American Social Club	Function Hall
13	77 Store Ave	Yellow Cab Co. & Curtin Livery	Transportation
14	87 Store Ave	Yellow Cab Co. & Curtin Livery	Transportation
15	120 Store Ave	Toddler Town	Childcare Services
16	50 Store Ave	East Gate Plaza Shopping Center	
		Barleycorn - Irish Café	Dining
		Richie's Comic Cabana	Retail
		Corners of the World	Retail
		Caribbean Tax & Insurance	Financial Services
		East Gate Restaurant	Dining
		Barleycorn - Irish Café	Dining
		Shahi Zaika - Restaurant	Dining
		Paradise Café - Vacant	Dining
		Family Dollar	Retail
		That's a Wrap - Sub Shop	Dining
		Bismillah Grocery & Halal Meat	Grocery
		Raylene's Laundromat	Laundromat
		Firefighters Credit Union	Banking
101	72 Dallas Ave.	Sanford Condominiums	Condominiums
102	5 Dunbar St.	K&K East Condominiums	Apartment Building
103	17 Dunbar St.	East Pines Apartments	Apartment Building
104	41 Dunbar St.	Dunbar Cove Apartments	Apartment Building
105	143 Newbury St.	Meridian Apartments	Apartment Building
106	27 Newman Ave	Store Avenue Apartments	Apartment Building
107	9 Store Ave.	Store Avenue Apartments	Apartment Building
108	119 Store Ave.	119 East Apartments	Apartment Building
109	136 Store Ave.	Laur-Ray Apartments	Apartment Building

Table 2-2
Phase IIA Monitoring Well Installation Details[1]
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Monitoring Well ID	Total Depth (ft bgs)	Top of Screen (ft bgs)	Bottom of Screen (ft bgs)	Depth to Water (ft bgs)	Date Installed
MW-1	16	3	13	5.1	07/16/04
MW-2	Not installed - rig unable to access area				
MW-3S	16	6	16	9.5	05/28/04
MW-3D	4	43.5	48.5	8.0	05/28/04
MW-4S	18	8	18	11.1	05/21/04
MW-4D	45	40	45	10.6	05/20/04
MW-5	18	7	17	10.2	05/28/04
MW-6S	19	8	18	11.0	05/28/04
MW-6D	51	46	51	11.0	05/28/04

Notes:

[1] Data obtained from Conestoga-Rovers & Associates Phase IIA log books; no as-built drawings available.

[2] ft bgs = feet below ground surface

Table 2-3
Monitoring Well Gaging Data and Groundwater Elevations
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Monitoring Well ID	Date	Top of Riser Elevation (ft msl)	Depth to Groundwater[1] (feet)	Groundwater Elevation (ft msl)
MW-1	07/29/04	439.77	3.91	435.86
	06/03/08		2.89	436.88
MW-3S	06/01/04	430.63	10.61	420.02
	06/09/04		10.8	419.83
	06/03/08		10.55	420.08
MW-3D	06/01/04	430.45	10.22	420.23
	06/09/04		10.42	420.03
	06/03/08		10.5	419.95
MW-4S	05/27/04	429.81	11.1	418.71
	06/09/04		11.19	418.62
	06/03/08		11.53	418.28
MW-4D	05/27/04	429.67	11.28	418.39
	06/09/04		11.47	418.2
	06/03/08		11.8	417.87
MW-5	06/01/04	428.93	9.28	419.65
	06/09/04		9.41	419.52
	06/03/08		9.75	419.18
MW-6S	05/27/04	425.01	7.92	417.09
	06/09/04		8.25	416.76
	06/03/08		8.21	416.8
MW-6D	06/02/04	426.52	6.51	420.01
	06/09/04		6.66	419.86
	06/03/08		6.74	419.78
PZ-1	06/09/04	431.09	12.66	418.43
	06/03/08		13.14	417.95

Note: ft msl = feet above mean sea level

[1] Depth to groundwater measured from top of riser

Table 2-4
Phase IIA Slug Test Results
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Monitoring Well ID	Number of Tests	Range of Results (feet/day)	Mean Hydraulic Conductivity (feet/day)
MW-1	4	1.08 – 3.40	1.92
MW-3S	6	8.79 – 33.2	15.66
MW-3D	4	6.70 – 8.54	7.56
MW-4S	8	16.5 – 32.2	24.78
MW-4D	12	1.06 – 2.13	1.4
MW-5	4	2.50 – 3.64	3.03
MW-6S	6	11.3 – 16.1	13.41
MW-6D	8	0.40 – 0.55	0.45

Table 3-1
Maximum Surface Soil Concentrations
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Chemical Class and Analytes	CTDEP ResDEC	CTDEP GB PMC	Maximum Detected Concentration	Sample Location
START				
PAHs (ug/Kg)				
Benzo(a)anthracene	1,000	1,000	**6,200**	SS-27
Benzo(b)fluoranthene	1,000	1,000	**3,800**	SS-14
Benzo(a)pyrene	1,000	1,000	**3,900**	SS-27
bis(2-ethyhexyl)phthalate	44,000	11,000	11,000	SS-36
PCBs (ug/Kg)				
Aroclor-1254	1,000	SPLP	**19,000**	SS-23
Aroclor-1260	1,000	SPLP	**1,400**	SS-27
Metals (mg/Kg)				
Arsenic	10	SPLP	**15.5**	SS-06
Chromium[2]	3,900	SPLP	**19,200**	SS-25
Copper	2,500	SPLP	**35,300**	
Lead	400	SPLP	**746**	
Nickel	1,400	SPLP	**2,460**	
Vanadium	470	SPLP	**474**	SS-26
Total VOCs (ug/Kg)	--	--	14	SS-34
Phase I				
Total PAHs (ug/Kg)	--	--	63,700	SS14
Benzo(a)pyrene	1,000 ug/Kg	1,000 ug/Kg	**4,300**	SS15
Total PCBs (ug/Kg)	--	--	120	SS04
Pesticides (ug/Kg)				
DDT	1,800 ug/Kg	NE	840	SS15
Metals (mg/Kg)				
Chromium[1]	3,900 mg/Kg	SPLP	618	SS21
Copper	2,500 mg/Kg	SPLP	1,580	SS21
Zinc	20,000 mg/Kg	SPLP	2,550	SS14
Total VOCs	--	--	142	SS15
Dioxins (TEQ) (ng/Kg)[2]	3.9 ng/Kg	NE	**6.42**	SS27

Table 3-1
Maximum Surface Soil Concentrations
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Chemical Class and Analytes	CTDEP ResDEC	CTDEP GB PMC	Maximum Detected Concentration	Sample Location
Phase IIA				
PAHs (ug/Kg)				
Acenaphthylene	1,000,000	84,000	830	SS47
Anthracene	1,000,000	400,000	590	
Benzo(a)anthracene	1,000	1,000	**1,800**	
Benzo(a)pyrene	1,000	1,000	**2,100**	
Benzo(b)fluoranthene	1,000	1,000	**3,900**	
Benzo(g,h,i)perylene	1,000,000	NE	1,400	
Benzo(k)fluoranthene	8,400	1,000	460	SS46
Chrysene	84,000	NE	2,800	SS47
Dibenzo(a,h)anthracene	1,000[1]	NE	700	
Fluoranthene	1,000,000	56,000	5,400	
Fluorene	1,000,000	56,000	180	
Indeno(1,2,3-cd)pyrene	1,000	NE	**1,400**	
Phenanthrene	1,000,000	40,000	2,500	
Pyrene	1,000,000	40,000	3,500	
Metals (mg/Kg)				
Aluminum	NE	NE	13,100	SS47
Arsenic	10	10	**44.3**	SS44
Barium	4,700	SPLP	82.8	SS41
Chromium (total)	618	SPLP	47.7	
Cobalt	70	NE	6.4	
Copper	2,500	SPLP	194	SS38
Cyanide (total)	NE	NE	279	
Lead	400[2]	SPLP	**536**	
Mercury	20	SPLP	0.2	
Nickel	1,400	SPLP	19.2	
Silver	340	SPLP	0.46	SS37
Tin	SS-2,000	NE	5.3	
Vanadium	470	SPLP	53.6	SS38
Zinc	20,000	SPLP	310	SS37

Notes:
CTDEP = Connecticut Department of Environmental Protection
ResDEC = Residential Direct Exposure Criteria
GB PMC = GB aquifer Pollutant Mobility Criteria
NE = Criteria not established
SPLP = Criteria applicable to Synthetic Precipitation Leaching Procedure analysis only; not performed
mg/Kg = milligrams per kilogram
ug/Kg = micrograms per kilogram
ng/Kg = nanograms per kilogram
Bold and shaded indicates concentration exceeds the CTDEP Res DEC for that contaminant.
[1] CTDEP Res DEC value for chromium (+3). Chromium (+6) was not analyzed.
[2] USEPA Region IX Preliminary Goals (PRGs) used for dioxin exceedances.

Table 3-2
Phase I Subsurface Soil Boring Summary
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

			Approximate Depths Based on Visual Observations		
Boring	**Date**	**Depth (ft bgs)**	**Groundwater Level (ft bgs)**	**Native Material (ft bgs)**	**Comments**
Newman and Dunbar Street Area					
SB01	10/14/02	20	<10	16	Vac Truck to 8 ft
SB02	10/14/02	20	6	16	
SB03	10/16/02	12	NA	8	Refusal @ 12 ft
SB04	10/16/02	20	8	16	
SB05	10/18/02	20	NA	NA	
SB06	10/18/02	20	NA	NA	
SB11	10/17/02	26	6	14	
SB12	10/17/02	20	<10	18	Vac Truck to 6 ft
SB13	10/11/02	20	<10	18	Vac Truck to 8 ft
SB18	10/17/02	20	10	14	
SB19	Not Completed Due to Utility Concerns				
SB20	10/21/02	26	8	17	
Calabrese Property Area					
SB07	10/09/02	20	6	18	
SB08	10/09/02	21	13	17	
SB14	10/09/02	20	10	16	
SB15	10/11/02	20	6	16	
SB16	10/23/02	1	NR	NA	Hand Auger in wetlands area
SB17	10/23/02	1	NR	NA	Hand Auger in wetlands area
SB21	10/14/02	20	<10	16	Vac Truck to 8 ft
SB22	10/10/02	20	NA	14	
SB23	10/10/02	20	12	19	
SB24	10/10/02	20	10	18	
SB28	10/23/02	2.5	NR	NA	Hand Auger in wetlands area
SB29	10/23/02	3.5	NR	NA	Hand Auger in wetlands area
SB30	10/23/02	3.5	NR	NA	Hand Auger in wetlands area
East Gate and East of Store Avenue Area					
SB25	10/21/02	20	12	18	Vac Truck to 8 ft
SB26	10/21/02	20	10	17	
SB27	10/22/02	20	12	17	
SB31	10/21/02	20	13	16	
SB32	10/15/02	20	10	14	
SB33	10/15/02	20	15	8	
SB34	10/22/02	8	<8	4	Refusal @ 8 ft
SB35	10/22/02	20	12	10	
SB36	10/15/02	20	12	4	
Meridian Apts. Area					
SB09	10/22/02	8	1	1	Refusal @ 8 ft.
SB10	10/04/02	5	4	NA	Vac Truck to 5 ft; pipe encountered

Notes:
ft bgs = feet below ground surface
NA = Not Available
NR = Not Reached

Table 3-3
Phase I Subsurface Soil Detection Frequency and Maximum Concentrations
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Chemical Class and Analytes	Detection Frequency	CTDEP ResDEC	CTDEP GP PMC	Maximum Detected Concentration	Location and Depth	Property
Total PAHs (ug/Kg)	54/66			962,300	SB27-05-10	East Gate Plaza
Benzo(a)pyrene	47/66	1,000	1,000	53,000	SB27-05-10	East Gate Plaza
Total PCBs (ug/Kg)	9/64		SPLP	3,000	SB14-00-05	Calabrese
Pesticides (ug/Kg)						
DDT	13/64	1,800	NE	65	SB11-00-05	Store Avenue Apts
Metals (mg/Kg)						
Chromium[1]	67/67	3,900	SPLP	655	SB27-10-15	East Gate Plaza
Copper	67/67	2,500	SPLP	14,500	SB11-05-10	Store Avenue Apts
Zinc	67/67	20,000	SPLP	18,900	SB18-05-10	Val-U-Mart
Total VOCs (ug/Kg)	51/60	--	--	17,947	SB18-12-13	Val-U-Mart
Dioxins (TEQ) (ng/Kg)[2]	5/5	3.9	NE	6.7	SB14-10-15	Calabrese

Notes:
CTDEP = Connecticut Department of Environmental Protection
mg/Kg = milligrams per kilogram
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
ResDEC = Residential Direct Exposure Criteria
GB PMC = GB aquifer Pollutant Mobility Criteria
NE = Criteria not established
SPLP = Criteria applicable to Synthetic Precipitation Leaching Procedure analysis only; not performed
SVOC =semivolatile organic compound
ug/Kg = micrograms per kilogram
VOC = volatile organic compound
Subsurface soils - most borings completed to 20 feet below ground surface.
[1] CTDEP Res DEC value is for chromium (+3). Chromium (+6) was not analyzed.
[2] USEPA Region IX Preliminary Remediation Goals (PRGs) used for dioxin exceedances.

Table 3-4
Phase IIA Subsurface Soil Boring Summary
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

			Approximate Depths Based on Visual Observations		
Boring	**Date**	**Depth (ft bgs)**	**Groundwater Level (ft bgs)**	**Native Material (ft bgs)**	**Comments**
SB37	05/12/04	15	NA	NA	
SB38	05/12/04	20	18	18	
SB39	07/15/04	24	8.8	15	Peat encountered at 20 ft bgs
SB40	05/13/04	15	10	NR	
SB41	05/13/04	15	11	10	
SB42	05/18/04	16	12	7.5	
SB43	05/18/04	14	NR	10	
SB44/MW-4D	05/20/04	52	10.6	22	Monitoring well installed
SB45	05/14/04	20	10	15	
SB46	05/21/04	11.5	7.5	8	Refusal at 11.5 ft bgs
SB47	05/19/04	20	8	15	Peat encountered at 15 ft bgs
SB48	05/18/04	10	1	5.5	Refusal at 10.5 ft bgs
SB50/MW-2	05/24/04	7.5	5	2	Refusal at 7.5 ft bgs; MW-2 not installed
SB51	05/17/04	15	10.5	2	
SB53	05/18/04	15	12.5	10	
SB54	05/17/04	15	NR	5	Background Boring
SB55	05/19/04	15	8	4.5	
SB84	05/13/04	15	NR	5	Background Boring
SB85	05/14/04	15	5	5	Background Boring
SB86	05/14/04	15	NR	2	Background Boring
SB87	05/13/04	15	NR	10	
SB88	05/17/04	15	10.5	6	
MW-1	07/16/04	16	5.5	3	Monitoring well installed
MW-3D	05/27/04	42	8	16	Monitoring well installed
MW-5	05/24/04	18	10.2	1.5	Monitoring well installed
MW-6D	05/25/04	50	11	15	Monitoring well installed

Notes:
ft bgs = feet below ground surface
NR = Not Reached
NA = Not Available
Only the MW-2 and MW-4D monitoring well locations had corresponding soil boring (SB) designations

Table 3-5
Maximum Phase IIA Subsurface Metal and PAH Concentrations
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Chemical Class and Analytes	CTDEP ResDEC	CTDEP GB PMC	Maximum Detected Concentration	Sample Location	Depth (ft bgs)
PAHs (ug/Kg)					
2-Methylnaphthalene	474,000	NE	810	SB41	10.5-15
Acenaphthene	1,000,000	NE	850	SB40	4-5.5
Acenaphthylene	1,000,000	84,000	6,200	SB47	0-4
Anthracene	1,000,000	400,000	5,700	SB45	16-18
Benzo(a)anthracene	1,000	1,000	**13,000**	SB41	16-18
Benzo(a)pyrene	1,000	1,000	**11,000**	SB41	4-5.5
Benzo(b)fluoranthene	1,000	1,000	**17,000**	MW-3D	16-18
Benzo(g,h,i)perylene	1,000,000	NE	5,700	SB39	4-5.5
Benzo(k)fluoranthene	8,400	1,000	**11,000**	SB40	0-4
Chrysene	84,000	NE	14,000	MW-3D	16-18
Dibenzo(a,h)anthracene	1,000[1]	NE	**2,700**	SB45	4-5.5
Fluoranthene	1,000,000	56,000	31,000	MW-3D	16-18
Fluorene	1,000,000	56,000	2,600	SB40	16-18
Indeno(1,2,3-cd)pyrene	1,000	NE	**5,700**	SB41	4-5.5
Naphthalene	1,000,000	56,000	2,300	MW-4D	10.5-15
Phenanthrene	1,000,000	40,000	23,000	SB39	16-18
Pyrene	1,000,000	40,000	2,300	SB40	4-5.5
Metals (mg/Kg)					
Aluminum	NE	NE	24,700	SB46	5-8
Antimony	27	SPLP	**40.7**	SB40	0-2
Arsenic	10	SPLP	**22.4**	MW-4D	3-6
Barium	4,700	SPLP	**5,200**	SB45	4-5.5
Beryllium	2	SPLP	**3.4**	SB45	5-8
Cadmium	34	SPLP	33.5	SB47	0-2
Chromium (total)	618	SPLP	354	SB47	4-8
Cobalt	70	NE	13.7	SB45	0-2
Copper	2,500	SPLP	**25,900**	SB47	0-2
Cyanide (total)	NE	NE	7,910	SB45	12-16
Lead	400[2]	SPLP	**4,970**	SB45	4-5.5
Mercury	20	SPLP	4.9	SB47	4-8
Nickel	1,400	SPLP	430	SB45	0-2
Selenium	340	SPLP	3.7	SB47	5-8
Silver	340	SPLP	92.5	SB47	3.5-8.5
Thallium	5.4	SPLP	2.6	SB45	10-15
Tin	SS-2,000	NE	947	MW-4D	0-2
Vanadium	470	SPLP	**849**	SB47	11.5-15
Zinc	20,000	SPLP	13,700	SB45	0-2

Notes:
CTDEP = Connecticut Department of Environmental Protection
mg/KG = milligrams per kilogram
PAHs = polcyclic aromatic hydrocarbons
ResDEC = Residential Direct Exposure Criteria
GB PMC = GB aquifer Pollutant Mobility Criteria
NE = Criteria not established
SPLP = Criteria applicable to Synthetic Precipitation Leaching Procedure analysis only; not performed
ug/Kg = micrograms per kilogram
SS = If statewide criteria have not been established, but site specific criteria are available, this is denoted by the prefix "SS" and the most conservative site specific value are listed.
NE = no criterion established for the corresponding compound.
Bold and shaded indicates concentration exceeds the CTDEP ResDEC for that contaminant.
[1] Criteria based on detection limits.
[2] Codified criterion for lead ResDEC is 500 ppm, but the recommended cleanup criterion is 400 ppm to be protective of human health.

Table 3-6
VOC Detections in July 2004 Groundwater
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Compound	Criteria			MW-1	MW-3S	MW-3D	MW-4S	MW-4D	MW-5	MW-6S	MW-6D
	CT GWPC	ResGWVC	CT SWPC	07/29/04	06/09/04	06/10/04	06/10/04	06/09/04	06/09/04	06/09/04	06/09/04
1,1,1-trichloroethane	200	6,500	62,000			0.1 J					
1,2,4-trimethylbenzene	350	360	NE		0.3 J					0.3 J	
1,3,5-trimethylbenzene	350	280	NE		0.3 J					0.3 J	
Benzene	1	130	710							0.3 J	
Chloroform	6	26	14,100	8		3	0.4 J	**32**			2
cis-1,2-dichloroethene	70	830	NE		0.2 J					0.2 J	
Isopropylbenzene	30	2,800	NE		0.3 J						
MTBE	70[1]	2,100	NE	2	6	0.2 J			0.3 J		0.2 J
Tetrachloroethene	5	340	88						0.4 J		
Toluene	1,000	7,100	4,000,000							0.2 J	
Trichloroethene	5	27	2,340						0.2 J		
Vinyl chloride	2	2	15,750		1					**3**	
Xylene (total)	530	8,700	NE		0.6 J						

Notes:

1. All concentrations are in micrograms per liter (ug/L)
2. Bold and shading indicates the concentration is in exceedance of the proposed Connecticut Groundwater Protection Criteria (CT GWPC), Connecticut Department of Environmental Protection Residential Groundwater Volatilization Citeria (ResGWVC) and/or Surface Water Protection Criteria (SWPC).
3. Blanks indicate that the compound was not detected above the Method Detection Limit (MDL).
4. NE indicates that no criterion is established for the corresponding compound.
5. J = estimated value.
6. VOC = volatile organic compounds

Table 3-7
SVOC Detections in July 2004 Groundwater
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Compound	Criteria			MW-1	MW-3S	MW-3D	MW-4S	MW-4D	MW-5	MW-6S	MW-6D
	CT GWPC	ResGWVC	CT SWPC	07/29/04	06/09/04	06/10/04	06/10/04	06/09/04	06/09/04	06/09/04	06/09/04
2,4-dimethylphenol	140	NE	NE		1 J						
2-methylnaphthalene	49	NE	NE		0.2					5	
Acenaphthene	420	NE	NE				0.1			2	
Acenaphthylene	420	NE	0.3		0.08					0.1	
Anthracene	2,000	NE	1,100,000		0.3 J						
bis (2-ethlhexyl) phthalate	2	NE	59					0.3			0.3
Butlybenzylphthalate	1,000	NE	NE		0.7 J						
Carbazole	NE	NE	NE		0.9 J					0.5 J	
Di-n-butylphthalate	700	NE	120,000		1 J	0.3 J					
Dibenzofuran	28	NE	NE							0.3 J	
Diethylphthalate	5,600	NE	NE		0.4 J						
Fluoranthene	280	NE	3,700		0.09	0.2					
Fluorene	280	NE	140,000			0.1				0.7	
Naphthalene	280	NE	NE		1					1	
Phenanthrene	200	NE	0.077				0.3		0.1	0.4	
Phenol	4,000	NE	92,000,000		3 J						
Pyrene	200	NE	110,000				0.1				

Notes:

1. All concentrations are in micrograms per liter (ug/L)
2. Bold and shading indicates the concentration is in exceedance of the proposed Connecticut Groundwater Protection Criteria (CT GWPC), Connecticut Department of Environmental Protection Residential Groundwater Volatilization Citeria (ResGWVC) and/or Surface Water Protection Criteria (SWPC).
3. Blanks indicate that the compound was not detected above the Method Detection Limit (MDL).
4. NE indicates that no criterion is established for the corresponding compound.
5. J = estimated value.
6. SVOC = semivolatile organic compounds

Table 3-8
Pesticide/PCB Detections in July 2004 Groundwater
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Compound	Criteria			MW-1	MW-3S	MW-3D	MW-4S	MW-4D	MW-5	MW-6S	MW-6D
	CT GWPC	ResGWVC	CT SWPC	07/29/04	06/09/04	06/10/04	06/10/04	06/09/04	06/09/04	06/09/04	06/09/04
Aldrin	SS-0.0031	NE	NE							**0.017 J**	
beta-BHC	SS-0.019	NE	NE							**0.034 J**	
delta-BHC	NE	NE	NE	0.0092 J							
Dieldrin	0.002	NE	0.1	**0.018**							
gamma-BHC (Lindane)	0.2	NE	NE							0.0093 J	0.0063 J
Heptachlor	0.4	NE	0.05							0.022 J	
Heptachlor epoxide	0.2	NE	0.05		0.007						

Notes:

1. All concentrations are in micrograms per liter (ug/L)
2. Bold and shading indicates the concentration is in exceedance of the proposed Connecticut Groundwater Protection Criteria (CT GWPC), Connecticut Department of Environmental Protection Residential Groundwater Volatilization Citeria (ResGWVC) and/or Surface Water Protection Criteria (SWPC).
3. Blanks indicate that the compound was not detected above the Method Detection Limit (MDL).
4. J = estimated value.
5. NE indicates that a criterion has not been established for the corresponding compound.
6. SS = If statewide criteria have not been established, but site specific criteria are availiable, this is denoted by the prefix "SS" and the most conservative site specific value are listed.
7. PCBs = polychlorinated biphenyls; no PCBs were detected in groundwater

Table 3-9
Metal Detections in July 2004 Groundwater
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Analyte	Criteria			MW-1	MW-3S	MW-3D	MW-4S	MW-4D	MW-5	MW-6S	MW-6D
	CT GWPC	ResGWVC	CT SWPC	07/29/04	06/09/04	06/10/04	06/10/04	06/09/04	06/09/04	06/09/04	06/09/04
Aluminum	NE	NE	NE							783	595
Barium	1,000	NE	NE	18.5	190	11.4	102	17.2	27.5	149	19.4
Cadmium	5	NE	6				**18.5**				
Calcium	NE	NE	NE	19,700	108,000	43,800	31,400	14,900	40,100	128,000	42,200
Copper	1,300	NE	48		25.6		13.5			20.7	
Cyanide (total)	200	NE	52		31.9						
Nickel	100	NE	880		63.2		**130**				
Vanadium	50	NE	NE		**108**	19.3					
Zinc	5,000	NE	123		**372**		**4,810**		65.5		

Notes:

1. All concentrations are in micrograms per liter (ug/L)
2. Bold and shading indicates the concentration is in exceedance of the proposed Connecticut Groundwater Protection Criteria (CT GWPC), Connecticut Department of Environmental Protection Residential Groundwater Volatilization Citeria (ResGWVC) and/or Surface Water Protection Criteria (SWPC).
3. Blanks indicate that the analyte was not detected above the Method Detection Limit (MDL).
4. J = estimated value.
5. NE indicates that a criterion has not been established for the corresponding analyte

Table 3-10
Phase I Sediment Detection Frequencies and Maximum Concentrations
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Chemical Class and Analytes	Detection Frequency	CTDEP ResDEC	Maximum Detected Concentration	Location
Total VOCs (ug/Kg)	10 / 10		1,530	SED-04
Total PAHs (ug/Kg)	10 / 10		179,400	SED-10
Benzo(a)pyrene	10 / 10	1,000	7,200	SED-10
Total PCBs (ug/Kg)	1 / 10		4,700	SED-10
Pesticides (ug/Kg)				
DDT	3 / 10	1,800	140	SED-06
Metals (mg/Kg)				
Chromium[1]	10 / 10	3,900	3,300	SED-04
Copper	10 / 10	2,500	7,800	SED-04
Zinc	10 / 10	20000	5,400	SED-04

Notes:
CTDEP = Connecticut Department of Environmental Protection
ResDEC = Residential Direct Exposure Criteria
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
VOC = volatile organic compound
ug/Kg = micrograms per kilogram
mg/Kg = milligrams per kilogram
[1] CTDEP Res DEC value is for chromium (+3). Chromium (+6) was not analyzed.

Table 3-11
Phase I Surface Water Detection Frequencies and Maximum Concentrations
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Chemical Class and Analytes	Detection Frequency	Maximum Detected Concentration	Location
Total VOCs (ug/L)	1 / 2	1.5	SW-01
Total PAHs (ug/L)	1 / 2	0.87	SW-02
Benzo(a)pyrene	1 / 2	0.07	SW-02
Metals, unfiltered (ug/L)			
Chromium	2 / 2	21.6	SW-02
Copper	2 / 2	174	SW-02
Zinc	2 / 2	410	SW-02
Metals, unfiltered (ug/L)			
Chromium	2 / 2	2	SW-01
Copper	2 / 2	8	SW-01
Zinc	2 / 2	74	SW-01

Notes:
CTDEP = Connecticut Department of Environmental Protection
ResDEC = Residential Direct Exposure Criteria
PAHs = polycyclic aromatic hydrocarbons
VOC = volatile organic compound
ug/L = micrograms per liter

Table 3-12
Phase IIA Sediment Detection Frequencies and Maximum Concentrations
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Chemical Class and Analytes	Detection Frequency	CTDEP ResDEC	Maximum Detected Concentration	Location
Total VOCs (ug/Kg)	5 / 5		279	SED-15
Total PAHs (ug/Kg)	5 / 5		208,630	SED-15
Benzo(a)pyrene	5 / 5	1,000	15,000	SED-15
Benzo(a)anthracene	5 / 5	1,000	15,000	SED-15
Benzo(b)floranthene	5 / 5	1,000	14,000	SED-15
Chrysene	5 / 5	84,000	17,000	SED-15
Total PCBs (ug/Kg)	3 / 5		13,000	SED-15
Aroclor-1260	3 / 5	1,000	13,000	SED-15
Pesticides (ug/Kg)				
DDE	3 / 5	1,800	26	SED-14
Metals (mg/Kg)				
Arsenic	4 / 5	10	3.6	SED-15
Copper	5 / 5	2,500	93.6	SED-14/16
Lead	5 / 5	400	153	SED-14/16
Zinc	5 / 5	20,000	366	SED-17

Notes:
CTDEP = Connecticut Department of Environmental Protection
ResDEC = Residential Direct Exposure Criteria
PAHs = polycyclic aromatic hydrocarbons
PCBs = polychlorinated biphenyls
ug/Kg = micrograms per kilogram
mg/Kg = milligrams per kilogram
VOC = volatile organic compound

Table 4-1
Potential Exposure Media, Receptors, and Exposure Routes
Scovill Property (Parcel A, Excludes Calabrese Property)
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Exposure Media	Receptors	Exposure Routes
Surface Soil	• Current and Future Resident (Adult and Child) • Current and Future Groundskeeper • Current and Future Recreational Users (Adult and Child) • Current and Future Commercial Worker	• Incidental ingestion of surface soil • Dermal contact with surface soil • Inhalation of particulate and volatile released from the surface soil • Consumption of home-grown vegetables (resident only)
Surface and Subsurface Soil	• Future Resident (Adult and Child) • Current and Future Construction/Utility Worker	• Incidental ingestion of surface/subsurface soil • Dermal contact with surface/subsurface soil • Inhalation of particulate and volatiles released from the surface/subsurface soil • Consumption of home-grown vegetables (resident only)
Surface Water and Sediment At Wetland area	• Current and Future Recreational User (young adult) [1]	• Incidental ingestion • Dermal contact
Groundwater	• None	• Assume all on city water
Indoor Air	• Current and Future Resident (Adult and Child) • Current and Future Commercial Worker	• Inhalation of volatiles [2]

[1] The recreational user exposure will account for the potential exposure to a trespasser.
[2] Would apply only if significant levels of VOCs were present in soil gas and/or groundwater.

Table 4-2
Potential Exposure Points, Receptors, and Exposure Routes
Calabrese Property (Parcel B)
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Exposure Point	Receptor	Exposure Route
Surface Soil	• Current Trespasser	• Incidental ingestion of surface soil • Dermal contact with surface soil
Subsurface Soil	• Future Resident (Adult and Child) • Future Groundskeeper • Future Commercial Worker • Future Construction/Utility Worker	• Incidental ingestion of surface/subsurface soil • Dermal contact with surface/subsurface soil • Inhalation of particulate and volatiles released from the surface/subsurface soil • Consumption of home-grown vegetables (resident only)
Surface Water and Sediment	• None	• No surface water or sedimen.
Groundwater	• None	• Assume all on city water
Indoor Air	• Future Resident (Adult and Child) • Future Commercial Worker	• Inhalation of volatiles [1]

[1] Would apply only if significant levels of VOCs were present in soil and/or groundwater.

Table 4-3
Proposed Risk Exposure Areas
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Exposure Areas	Type of Area	Structure	Comments
A	Residential	Single family house	Neighborhood adjacent to former Scovill property
B	Open Space/ Residential	Apartment building and open space	Undeveloped parcel with apartment building generally outside estimated landfill limits
C	Residential	Single family house	Neighborhood adjacent to former Scovill property
D1	Residential	Apartment building	
D2	Residential	Multifamily housing	
D3	Residential	Multifamily housing	
E1	Residential	Apartment building	Elderly housing; more sensitive population
E2	Commercial	Single story	Day care; more sensitive population
E3	Residential	Apartment building	
F	Residential	Apartment building	
G	Commercial	Single story	
H	Commercial	Multi story	Mixed business usage and social club
I	Commercial	Single story	Shopping plaza
J	Open Space/ Future Residential	None	Fenced and capped area from PCB removal action

Table 5-1
Proposed Phase III Sampling Locations – Surface Soil
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Exposure Areas	Locations Sampled To Date	Locations With Full Analyses	Limitations of Past Sampling	Phase III Samples	Rationale
A	4	4		8	4 to complete statistics and 4 additional for each property
B	21	21		3	Have enough for statistics for risk; add 3 for landfill limits
C	0	0		15	8 to complete statistics and 7 additional for each property
D1	6	6		2	2 to complete statistics
D2	1	1		12	7 to complete statistics and 5 additional for each property
D3	1	1		7	7 (2 at each developed property and one more at vacant lot) for risk and landfill limits
E1	8	8		0	Have enough for statistics
E2	4	4		4	4 to complete statistics
E3	8	7	One sample had VOCs only	1	1 at or near SB36
F	12	12		0	Have enough for statistics
G	4	4	One sample had all VOCs rejected	0	No more needed; area is paved
H	8	8	Two samples had all VOCs rejected	0	No more needed; area is paved
I	3	3		0	No more needed; area is paved
J	9	7	One sample no metals One sample no VOCs	0	Have 8 samples for each analytical fraction
			Total Phase III Surface Soil Samples	52	

Note: Goal is to have a minimum of eight samples per risk exposure area

Table 5-2
Proposed Phase III Sampling Locations – Subsurface Soil
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Exposure Areas	Locations Sampled To Date	Locations With Full Analyses	Limitations of Past Sampling	Phase III Samples	Rationale
A	2	2		6	6 to complete statistics and from properties not sampled
B	8	7	1 no VOCs	3	Have enough for statistics for risk; add 3 for landfill limits
C	0	0		8	8 to complete statistics
D1	2	2		6	6 to complete statistics
D2	1	1		7	7 to complete statistics
D3	1	1		7	7(2 at each developed property and one more at vacant lot) for risk and landfill limits
E1	3	2	1 no VOCs	5	5 to complete statistics
E2	0	0		8	8 to complete statistics
E3	2	2		6	6 to complete statistics
F	3	2	1 no VOCs	5	5 to complete statistics
G	2	2		6	6 to complete statistics
H	4	4	1 all VOCs rejected	4	4 to complete statistics
I	7	3	3 no VOCs, 1 no metals	2	2 to complete statistics
J	8	6	1 no VOCs, 1 no metals	2	2 to complete statistics
			Total Phase III Subsurface Samples	75	

Note: Goal is to have a minimum of eight samples per risk exposure area

Table 5-3
Proposed Phase III Sampling Locations – Groundwater
Scovill Industrial Landfill Superfund Site
Waterbury, Connecticut

Exposure Areas	Locations With Wells To Date	Comment	Limitations of Past Sampling	Phase III Locations	Rationale
A				0	Place upgradient well on B for VI
B	1	Shallow well	Additional shallow well (MW-2 not installed); but needed for flow direction and neighborhood VI	2	Install MW-2 couplet as background near Newbury Street Install shallow well for VI at A
C				0	Area too narrow for installation; use wells on adjoining areas
D1				1	Install couplet for flow direction and apartment VI
D2				0	Utilize existing MW-6S and MW-5 plus new well on F
D3				0	Utilize new well on I
E1				2	Add two couplets on west and east sides for flow direction and VI at C, D1, E1, H and I
E2				1	Shallow well for VI at daycare
E3				0	Use well from B for VI
F	2	One couplet One shallow	Need well upgradient for VI	1	Add couplet upgradient for flow direction and apartment VI
G	0			0	Use well MW-5 for VI
H				0	Problematic area based on site use; taxi service and lawn care products. Use wells from E
I	1	Couplet	Need well for VI into stores	1	Add couplet in south end for flow direction and D3 VI
J	1	Couplet		1	Add bedrock well at MW-3 couplet.
			Total of New Well Locations	9	Shallow – 8 Deep – 6 Bedrock – 1

Note: VI = vapor intrusion

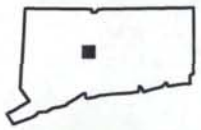
FIGURES

USGS TOPOGRAPHIC MAP

WATERBURY, CONNECTICUT
1968; (Photo-revised 1984)

SOUTHINGTON, CONNECTICUT
1968; (Photo-revised 1992)

APPROXIMATE SCALE
1" = 2,000 FEET



Quadrangle Location

FIGURE 2-1	SCOVILL INDUSTRIAL LANDFILL WATERBURY, CONNECTICUT SITE LOCUS PLAN	Nobis Nobis Engineering, Inc. 439 South Union Street Building 2, Suite 207 Lawrence, MA 01843 (978) 683-0891 www.nobisengineering.com	DATE: 08/26/08 REV. 01 PROJECT NO. 80018 FILE NAME: Locus Plan.MXD PREPARED BY: D. McGRATH CHECKED BY: B. ALLEN	N

J:\80000 EPA RAC2 Region 1\80000 Task Orders\80018 Scovill LF\Technical Data (TD)\GIS_Data\Maps\Site_Locus.mxd

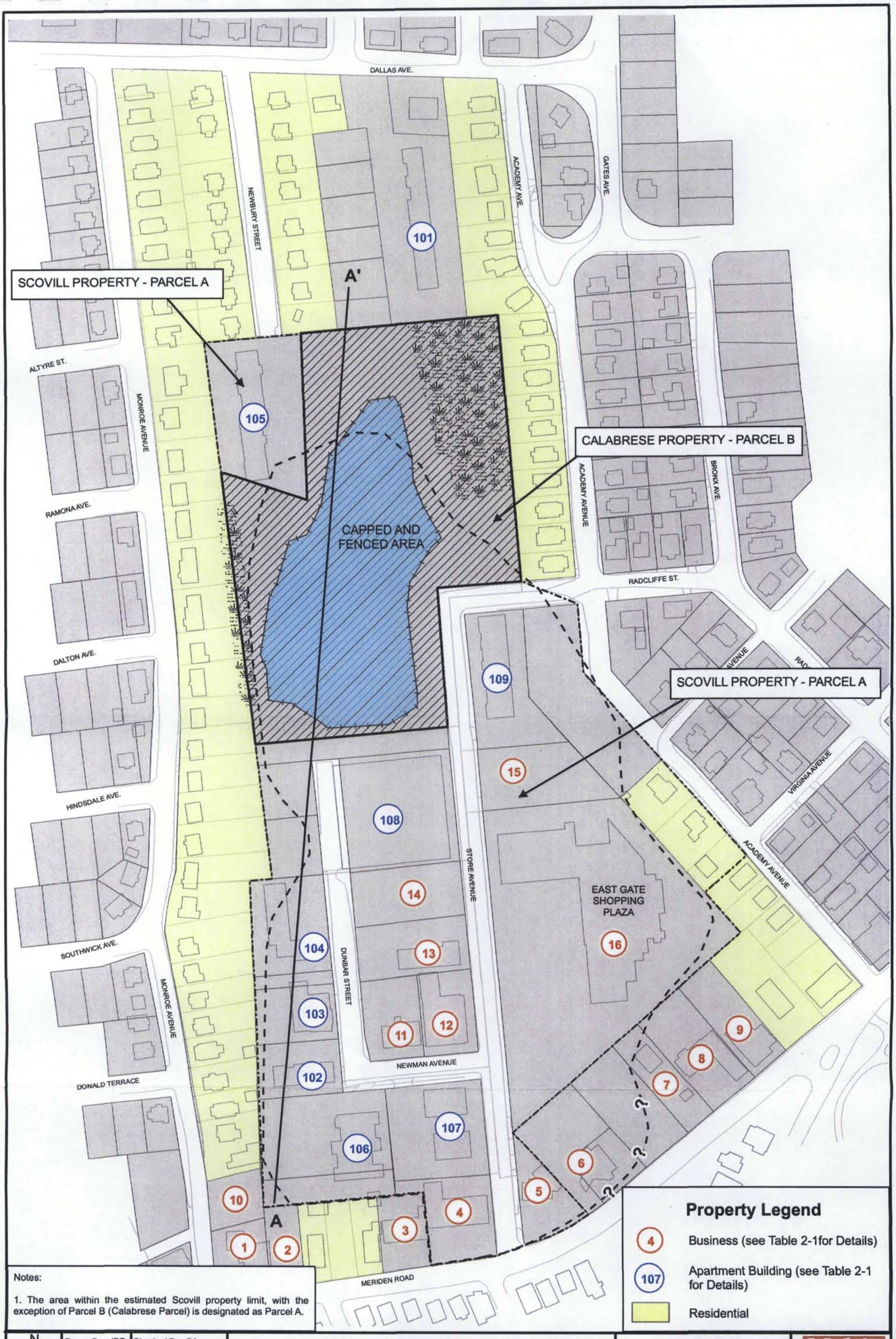


FIGURE 2-2

SITE LAYOUT WITH CROSS-SECTIONAL TRANSECT
SCOVILL INDUSTRIAL LANDFILL
WATERBURY, CONNECTICUT

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fax (978) 683-0966
www.nobisengineering.com

MW-1
436.88 ft msl

CAPPED AND
FENCED AREA

MW-3S
420.08 ft msl

MW-3D

420

418

MW-4S
418.28 ft msl

MW-4D

PZ-1
417.95 ft msl

MW-5
419.18 ft msl

MW-6S
416.80 ft msl

MW-6D

EAST GATE
SHOPPING
PLAZA

MONROE AVENUE
HINDSDALE AVE.
DONALD TERRACE
DUNBAR STREET
STORE AVENUE
NEWMAN AVENUE
MERIDEN ROAD
ACADEMY AVENUE
BRONX AVE.
RADCLIFFE ST.
ATWOOD AVENUE
VIRGINIA AVENUE

Notes:

1. S denotes shallow well; D denotes deep well.

2. Only shallow well elevations were used to produce groundwater contours.

N

Drawn By: JDF	Checked By: BA
Filename: OB Contours_Rev01.mxd	
Date: 8/28/08	Revision No. 01

APPROXIMATE SCALE
70 35 0 70 140
Feet

Shallow Monitoring Well Location
Deep Monitoring Well Location
Direction of Overburden Groundwater Flow
418 Overburden Groundwater Contour
Wetland Area (Approximated)
Estimated Limit of Former Scovill Property
Estimated Limit of Landfill
Existing Structure
Fence Line

FIGURE 2-3

OVERBURDEN GROUNDWATER CONTOURS - JUNE 3, 2008 SCOVILL INDUSTRIAL LANDFILL WATERBURY, CONNECTICUT

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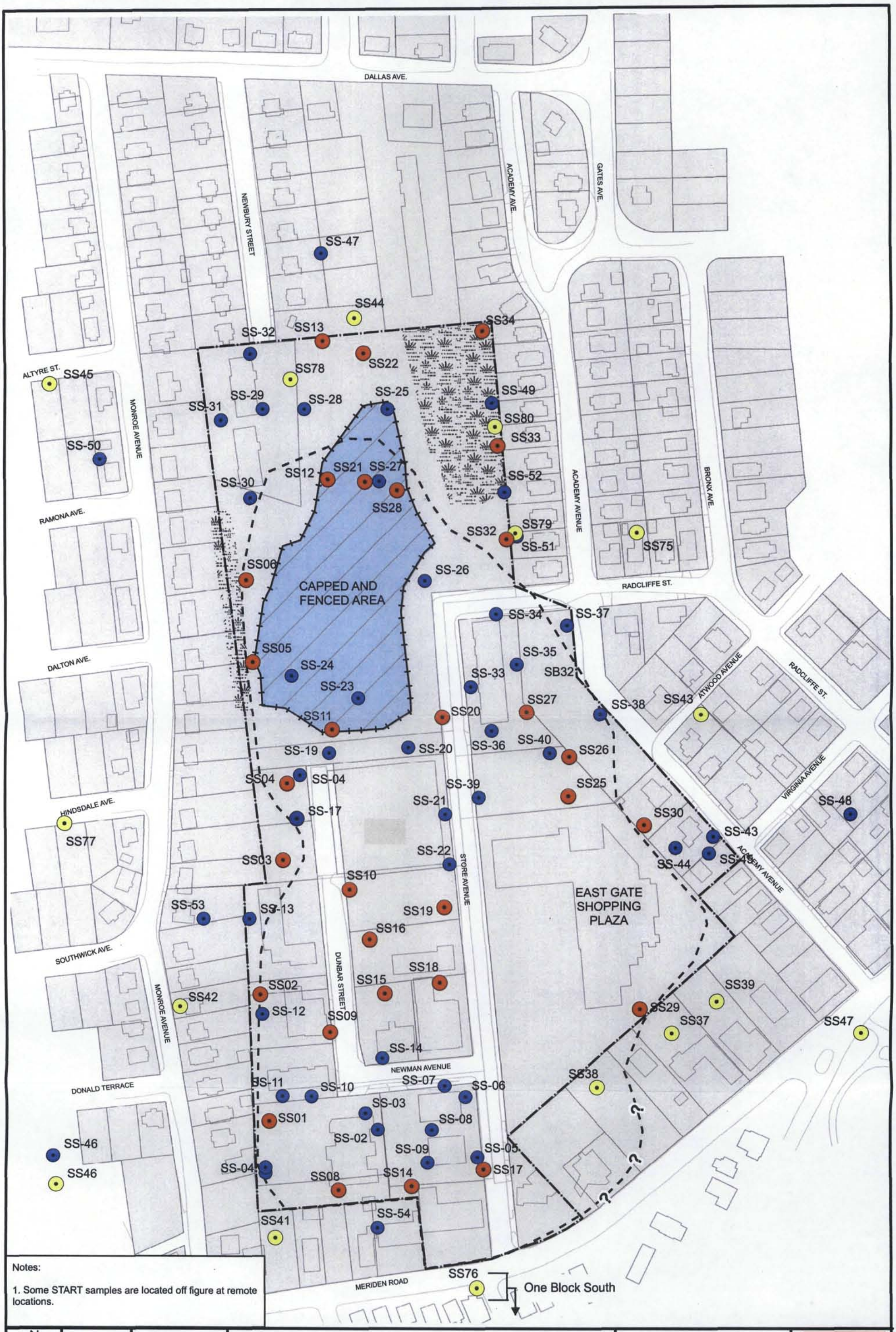

Notes:

1. Some START samples are located off figure at remote locations.

N

Drawn By: JDF	Checked By: BA
Filename: SS Locations_Rev 02.mxd	
Date: 8/28/08	Revision No. 02

APPROXIMATE SCALE
80 40 0 80 160 Feet

- Phase I Surface (< 2 ft bgs) Sample Locations
- Phase IIA Surface (< 2 ft bgs) Sample Locations
- START Surface Sample Locations
- Limit of Former Scovill Property
- Existing Structure
- Fence Line
- Estimated Limit of Landfill
- Wetland Area (Approximated)

FIGURE 3-1

SURFACE SOIL
SAMPLE LOCATIONS
SCOVILL INDUSTRIAL LANDFILL
WATERBURY, CONNECTICUT

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fax (978) 683-0966
www.nobisengineering.com

CAPPED AND FENCED AREA

NEWBURY STREET
ACADEMY AVE.
GATES AVE.
ALTYRE ST.
MONROE AVENUE
RAMONA AVE.
DALTON AVE.
HINDSDALE AVE.
SOUTHWICK AVE.
DONALD TERRACE
MONROE AVENUE
DUNBAR STREET
NEWMAN AVENUE
STORE AVENUE
ACADEMY AVENUE
BRONX AVE.
RADCLIFFE ST.
ATWOOD AVENUE
VIRGINIA AVENUE
MERIDEN ROAD
EAST GATE SHOPPING PLAZA
One Block South

SS-47, SS44 A, SS13, SS34, SS-32, SS78, SS22 B, SS-25 E, SS-49, SS45 A, SS-31, SS-29, SS-28, SS80, SS33, SS-50, SS21 B, SS27 E, SS12, SS-30, SS28, SS-52, SS79, SS75, SS-51, SS-26 E, SS32, SS05, SS-34 B, SS-37, SS-35, SS05, SS-24, SS-23 C, SS-33, SS20, SS27, SS-38, SS43 C, SS11, SS-36, SS-40 B, SS-20, SS26, SS-18, SS-19, SS-21 B, SS-39, SS25, SS30 B, SS-48, SS04, SS-17, SS-44 E, SS-43 A, SS77 E, SS03, SS-22, SS-45, SS10, SS19, SS-53, SS-13, SS16, SS02 B, SS15 B, SS18, SS42 B, SS-12, SS09 B, SS29 B, SS39 B, SS-14 B, SS37, SS47 B, SS-07 E, SS-11, SS-10, SS-06 E, SS-03, SS38 E, SS-08 B, SS01, SS-46, SS-04, SS-02, SS-09 A, SS17 B, SS08, SS46, SS-01, SS14 B, SS-05, SS41, SS-54, SS76 B

Notes:

1. START location names are denoted with a hyphen (e.g. SS-54). Phase I/IIA location names do not contain a hyphen (e.g. SS17).

2. Locations depicted in light gray indicate all analytical results were below the CTDEP RES DEC.

N

Drawn By: JDF	Checked By: BA
Filename: SS Exceedances_Rev02.mxd	
Date: 8/28/08	Revision No. 02

APPROXIMATE SCALE
80 40 0 80 160 Feet

- Surface (0-2 ft bgs) Sample Locations
- Limit of Former Scovill Property
- Existing Structure
- Estimated Limit of Landfill
- Wetland Area (Approximated)

- A One or More Metals Exceed
- B One or More PAHs Exceed
- C One or More Pesticides Exceed
- D One or More VOCs Exceed
- E One or More of Multiple Contaminant Classes Exceed

FIGURE 3-2

SURFACE SOIL
RES DEC EXCEEDANCES
SCOVILL INDUSTRIAL LANDFILL
WATERBURY, CONNECTICUT

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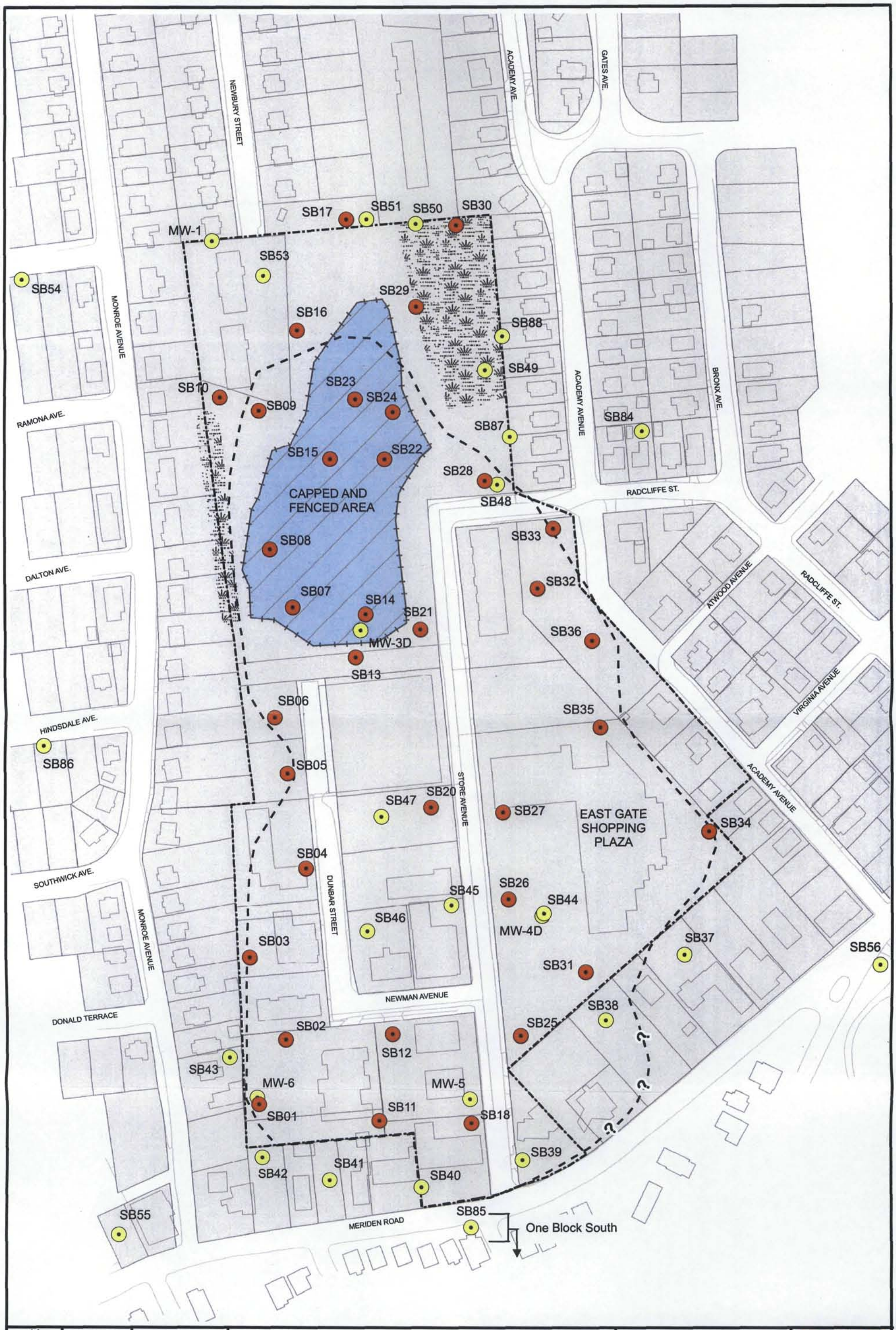
NEWBURY STREET
ACADEMY AVE.
GATES AVE.
MONROE AVENUE
RAMONA AVE.
DALTON AVE.
HINDSDALE AVE.
SOUTHWICK AVE.
DONALD TERRACE
MONROE AVENUE
DUNBAR STREET
STORE AVENUE
NEWMAN AVENUE
MERIDEN ROAD
ACADEMY AVENUE
BRONX AVE.
RADCLIFFE ST.
ATWOOD AVENUE
VIRGINIA AVENUE
EAST GATE SHOPPING PLAZA
CAPPED AND FENCED AREA
SB01
SB02
SB03
SB04
SB05
SB06
SB07
SB08
SB09
SB10
SB11
SB12
SB13
SB14
SB15
SB16
SB17
SB18
SB20
SB21
SB22
SB23
SB24
SB25
SB26
SB27
SB28
SB29
SB30
SB31
SB32
SB33
SB34
SB35
SB36
SB37
SB38
SB39
SB40
SB41
SB42
SB43
SB44
SB45
SB46
SB47
SB48
SB49
SB50
SB51
SB53
SB54
SB55
SB56
SB84
SB85
SB86
SB87
SB88
MW-1
MW-3D
MW-4D
MW-5
MW-6
One Block South
N
Drawn By: JDF
Checked By: BA
Filename: SB Locations_Rev01.mxd
Date: 8/28/08
Revision No. 01
APPROXIMATE SCALE
80 40 0 80 160
Feet
Phase I Subsurface (> 2 ft bgs) Sample Locations
Phase IIA Subsurface (> 2 ft bgs) Sample Locations
Limit of Former Scovill Property
Existing Structure
Fence Line
Estimated Limit of Landfill
Wetland Area (Approximated)
FIGURE 3-3
SUBSURFACE SOIL SAMPLE LOCATIONS
SCOVILL INDUSTRIAL LANDFILL
WATERBURY, CONNECTICUT
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fax (978) 683-0966
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SB51 (0 - 2)C
SB50 (5 - 7.5)B
SB30 (0 - 4)A
MW-1
SB17 (0 - 1)B
SB53
SB54
SB29
SB16
SB88 (0 - 2)B
MONROE AVENUE
SB10
SB09
SB23 (0 - 5)B
SB24
SB49
SB84
ACADEMY AVENUE
BRONX AVE.
RAMONA AVE.
SB15 (0 - 5)B
SB22 (0 - 5)B
SB87
SB28
SB48
RADCLIFFE ST.
CAPPED AND FENCED AREA
SB08 (0 - 5)B
SB33
SB32 (5 - 10)A
DALTON AVE.
SB07 (0 - 5)E
SB14 (0 - 5)E
MW-3D (4 - 8)E
SB21 (4 - 6)A
ATWOOD AVENUE
SB36
SB13 (10 - 15)B
SB06
SB35 (5 - 10)A
HINDSDALE AVE.
SB86 (5 - 10)A
SB05
SB20 (5 - 10)A
SB47 (3 - 6)E
STORE AVENUE
SB27 (5 - 10)E
EAST GATE SHOPPING PLAZA
SB34
SB04 (5 - 10)A
SB45 (0 - 4)B (4 - 4.5)E
SB26 (10 - 15)A
SB44 (0 - 2)B (3.5 - 8.5)E
SOUTHWICK AVE.
SB46 (5.5 - 7.5)B
DUNBAR STREET
MW-4
SB31 B
SB37
MONROE AVENUE
SB03
NEWMAN AVENUE
SB38 (0.5 - 4)B
SB02 (5 - 10)A
SB12 (15 - 20)E
SB25
DONALD TERRACE
SB43
MW-5 (0.5 - 1.5)A
SB01
SB11 (0 - 5)A (5 - 10)A
MW-6
SB18 (5 - 10)A
SB39 (5 - 10)A
SB41 (5 - 8)A
SB40 (0 - 2)A
SB42
SB55
SB85
MERIDEN ROAD
One Block South

Notes:

1. Locations depicted in light gray indicate all analytical results were below the CTDEP RES DEC.

N

Drawn By: JDF | Checked By: BA
Filename: SB Exceedances_Rev01.mxd
Date: 8/28/08 | Revision No. 01
APPROXIMATE SCALE
70 35 0 70 140 Feet

Subsurface (>2 ft bgs) Sample Locations
Limit of Former Scovill Property
Existing Structure
Estimated Limit of Landfill
Wetland Area (Approximated)

A One or More Metals Exceed
B One or More PAHs Exceed
C One or More Pesticides Exceed
D One or More VOCs Exceed
E One or More of Multiple Contaminant Classes Exceed

FIGURE 3-4

PHASE I/IIA SUBSURFACE SOIL RES DEC EXCEEDANCES
SCOVILL INDUSTRIAL LANDFILL
WATERBURY, CONNECTICUT

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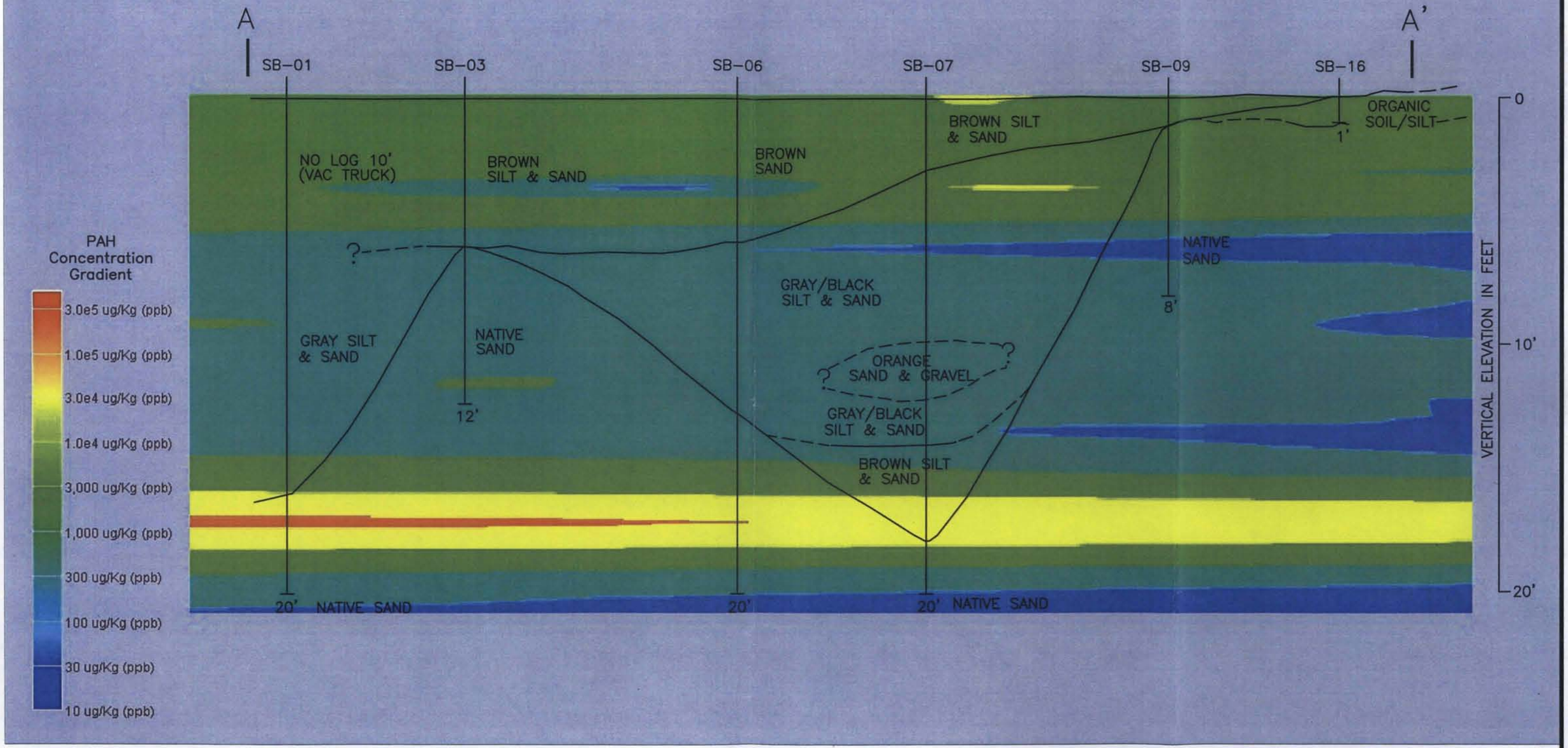

Notes:
1) Graphics from Metcalf&Eddy/Foster Wheeler Environmental Corp., 2003
2) ug/Kg = micrograms per kilogram

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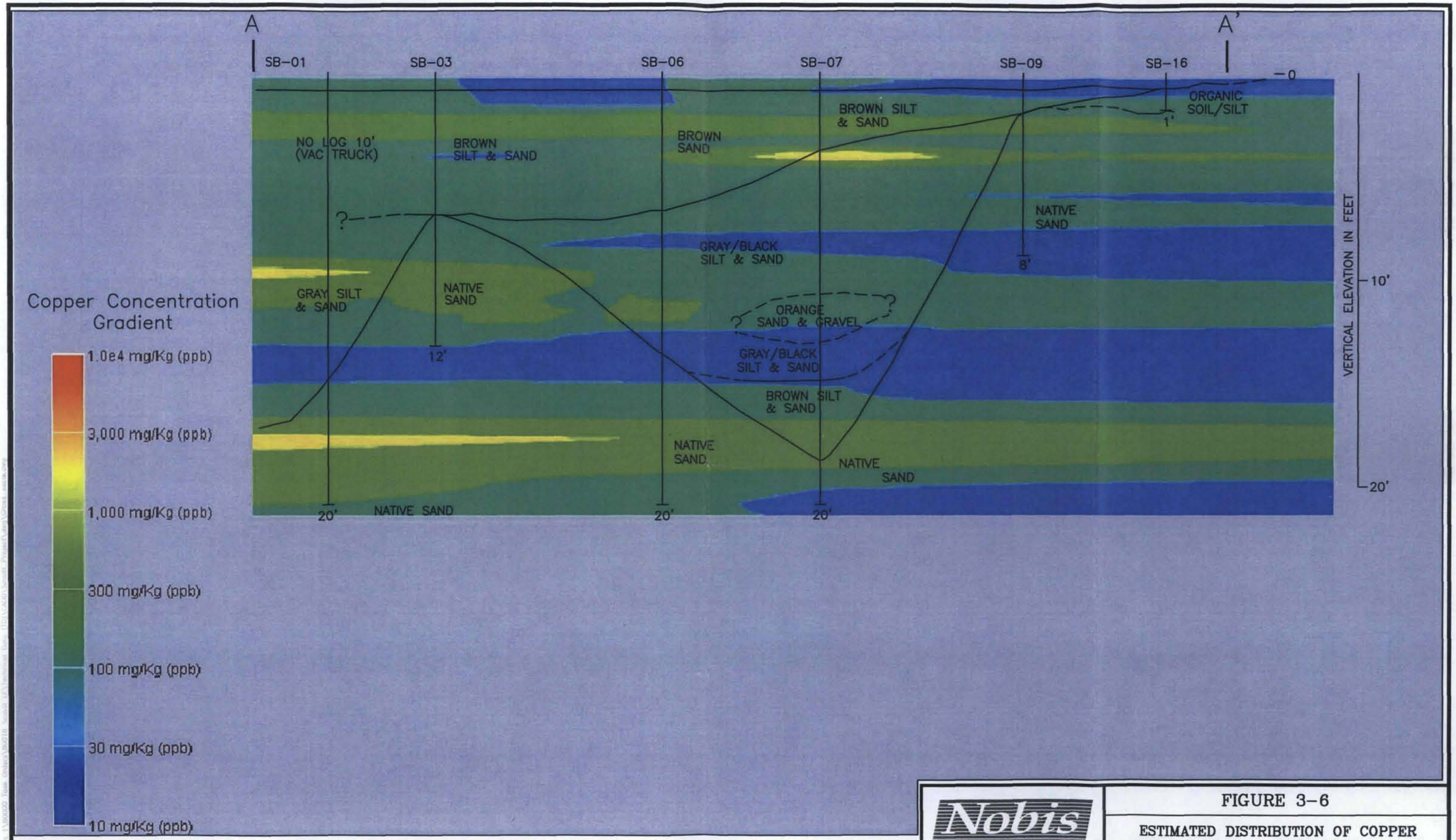
FIGURE 3–5

ESTIMATED DISTRIBUTION OF PAH
ALONG GEOLOGIC CROSS–SECTION A–A'
SCOVILL INDUSTRIAL LANDFILL SITE
WATERBURY, CONNECTICUT

DRAWN BY:	DFM	APPROVED BY:	BA
PROJECT:	80018.00		07/09/08



Notes:
1) Graphics from Metcalf&Eddy/Foster Wheeler Environmental Corp., 2003
2) mg/Kg = miligrams per kilogram

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FIGURE 3-6

ESTIMATED DISTRIBUTION OF COPPER ALONG GEOLOGIC CROSS-SECTION A-A'
SCOVILL INDUSTRIAL LANDFILL SITE
WATERBURY, CONNECTICUT

DRAWN BY:	DFM	APPROVED BY:	BA
PROJECT:	80018.00	07/09/08	

Notes:
1) Locations based upon data received from EPA, all locations are approximate

2) Basemap features are derived from City of Waterbury, CT Tax Assessors Office and from Compass Engineering Services, LLC survey.

3) Sediment samples SD06, SD07, and SD08 were collected from a pond located in Hamilton Park, approximately 1 mile southwest of the site.

4) Culverted portions of Carrington Brook based on depiction in START Report (WESTON, 1999).

N

Drawn By: DFM	Checked By: BA
Filename: SW&SD_Rev02.mxd	
Date: 8/28/08	Revision No. 02

APPROXIMATE SCALE
80 40 0 80 160
Feet

- Culverted Portion of Carrington Brook
- Sediment Sample Location
- Surface Water Location
- Storm Drain Sample Location
- Dye Test Location
- Limit of Former Scovill Property
- Existing Structure
- Fence Line
- Estimated Limit of Landfill
- Wetland Area (Approximated)

FIGURE 3-7

SURFACE WATER & SEDIMENT SAMPLE LOCATIONS
SCOVILL INDUSTRIAL LANDFILL
WATERBURY, CONNECTICUT

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NEWBURY STREET
ACADEMY AVE.
GATES AVE.
ALTYRE ST.
SS45
SB54
MONROE AVENUE
RAMONA AVE.
DALTON AVE.
HINDSDALE AVE.
SS77
SB86
SOUTHWICK AVE.
MONROE AVENUE
DONALD TERRACE
SS46
SB55
B
A
C
J
CAPPED AND FENCED AREA
E3
E2
E1
F
G
H
I
D1
D2
D3
DUNBAR STREET
STORE AVENUE
NEWMAN AVENUE
MERIDEN ROAD
ACADEMY AVENUE
BRONX AVE.
SB84
SS75
RADCLIFFE ST.
ATWOOD AVENUE
RADCLIFFE ST.
VIRGINIA AVENUE
ACADEMY AVENUE
EAST GATE SHOPPING PLAZA
SS47
SB56
SS76
SB85
One Block South

N

Drawn By: JDF	Checked By: BA
Filename: Site Layout_Rev02.mxd	
Date: 8/28/08	Revision No. 02

APPROXIMATE SCALE
80 40 0 80 160
Feet

Limit of Former Scovill Property
Estimated Limit of Landfill Based on Phase I & IIA Results
Existing Structure
Fence Line
Wetland Area (Approximated)
H Exposure Area Name & Boundary
Background Surface Soil Location
Background Subsurface Soil Location

FIGURE 4-1

CONCEPTUAL
EXPOSURE AREAS
SCOVILL INDUSTRIAL LANDFILL
WATERBURY, CONNECTICUT

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