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Tighe & Bond, Inc (Tighe & Bond) has prepared the following Phase II Environmental Site Assessment (ESA) for 13 Watrous Street, East Hampton, CT (site). This Phase II ESA has been prepared in accordance with the guidelines provided in the Connecticut Department of Environmental Protection (CTDEP) *Transfer Act Site Assessment Guidance Document* dated June 1989, and revised November 1991, and *Draft Site Characterization Guidance Document* dated June 2000. This report also generally follows the standards of the American Society for Testing and Materials (ASTM) Standard Guide for Environmental Site Assessments: Phase II Environmental Site Assessment Process (ASTM E 1903-97).

This Phase II report is one component of a United States Department of Environmental Protection Agency (USEPA) Brownfields Assessment Grant awarded to the Town of East Hampton. Tighe & Bond performed the Phase I ESA on the site and the results are summarized in a report dated May 2005. The site was selected for additional investigation based, in part, to its location in the Village Center area of East Hampton. The redevelopment of the site is consistent with the Town's planning goals including the revitalization of the Village Center area.

There are four components to this Phase II investigation:

- development of the scope of work;
- assessment activities;
- evaluation and presentation of data; and
- presentation of findings and conclusions.

The following table provides reference information for the four components of the Phase II ESA.

Phase II Component	Reference
Development of Scope of Work	<i>Phase I Site Assessment 13 Watrous Street</i> performed by Tighe & Bond dated May 2005. <i>Quality Assurance Project Plan (QAPP) East Hampton Village Center</i> performed by Tighe Bond, Inc. dated May 2005. The QAPP was reviewed and approved by the Environmental Protection Agency (EPA) prior to conducting the Phase II assessment activities. Section 4 Field Investigation
Assessment activities	Section 4 Field Investigation Appendix A, B, and C
Evaluation and presentation of data	Section 6 Site Regulatory Criteria Section 7 Analytical Results Section 8 Conceptual Site Model
Presentation of findings and conclusions	Section 9 Summary and Recommendations

References in bold refer to sections contained in this report.

SECTION 2 OBJECTIVES

The objective of this Phase II ESA is to determine if there has been a release of contaminants of concern (COCs) to the environment at the potential areas of concern (pAOCs) identified during the Phase I ESA. The information was evaluated to determine if a Phase III ESA is necessary to define the full nature and extent of contamination at the site. Ultimately, the recommendations and conclusions provided in this report will assist the Town of East Hampton to prioritize their redevelopment decision-making process. These decisions will reflect the Town's goals of protecting human health and the environment in addition to improving the economic vitality of the Village Center area.

3.1 LOCATION

The site is located at 13 Watrous Street in East Hampton, Connecticut (Figure 1). The site is comprised of approximately 1.36 acres. The site sketch provided by the current tenant identifies the first floor area as 11,675 ft²; however, the property card lists the building area as 14,017 ft². There is no basement under the building. A subfloor extends throughout the building.

Tax Assessor's Code: Map 06A Block 59 Lot 12 (East Hampton Town Hall files).

Zoning: Industrial (East Hampton Town Hall files).

Number of Buildings: An irregular shaped building with three distinct sections. Refer to Figure 2 (site reconnaissance and East Hampton Town Hall files).

Building(s) Description: An industrial complex with concrete floors, a mixture of concrete and brick walls, and steel trusses. The roof was replaced in October 2004 (site reconnaissance and interviews).

Dates of Construction: The main building was built in 1910 (East Hampton Town Hall records). The southern section of the building was added after 1936 but before 1959 (Sanborn Fire Insurance maps).

3.2 SITE OPERATIONS AND HISTORY

Current Use: Automobile repair and storage and industrial storage for J.C. Products (site reconnaissance).

Previous Uses: The site was originally designed as a powerhouse for the former Summit Thread Company and Artistic Wire Company from the early 1900s to 1940s. The site was also used as an automobile body and repair shop (Ghezzi Motors).

3.3 POTENTIAL AREAS OF CONCERN

A pAOC is defined as an interior or exterior area at which a release of hazardous substances and/or petroleum products may have occurred to the environment. The Phase I Environmental site Assessment, performed by Tighe & Bond dated May 2005,

identified four on-site pAOCs. The pAOCs and associated contaminants of concern (COCs) from the Phase I ESA are provided below.

- **pAOC 1 - Floor Drain:** The floor drain in the central section of the building could present a conduit for contaminants to enter the environment from inside the building. The direction and extent of the floor drainage system is not known. The potential exists for groundwater and/or soil contamination near the floor drain, drain pipes, and discharge point. Potential COCs may include VOCs, polycyclic aromatic hydrocarbons (PAHs), and/or petroleum hydrocarbons.
- **pAOC 2 - 300-gallon AST Location:** Three 300-gallon tanks were contained in the northern section of the building. Minor floor staining was observed in the former AST storage location. The condition of the tanks is unknown but the potential exists that the one of the tanks has leaked and adversely affected soil or groundwater quality at the site. Potential COCs may include petroleum hydrocarbons and/or PAHs.
- **pAOC 3 - In-Ground Hydraulic Lift:** An in-ground hydraulic lift is located in the northern section of the site. The current tenant does not use the lift. However, the hydraulic fluids are still contained in the lift and present a potential environmental hazard. Potential COCs may include PAHs, PCBs, and/or petroleum hydrocarbons.
- **pAOC 4 - Former Coal Pocket Storage Area:** The northern section of the building was used as a coal pocket for coal storage. It is likely that the area was not covered. Although the floor is concrete, there is a potential that coal constituents have historically leached into the soil and groundwater underlying the concrete slab. Potential COCs may include metals and/or PAHs.
- **pAOC 5 - Interior Floor Stained Areas:** Several areas of staining were documented during the site reconnaissance. Most notably, the northeast area of the building. Visibility of the floors was limited due to on-site automobile storage. Cracks in the concrete floor may provide a pathway for contaminants to migrate to the subsurface and environment. Potential COCs may include VOCs, PAHs, and/or petroleum hydrocarbons.
- **pAOC 6 - Exterior Areas of Stressed Vegetation and Soil Staining:** Current and historic site information suggests a potential for soil or groundwater contamination at the site perimeter. Automobile and refuse storage has historically occurred on the property exterior. In addition, a railroad track formerly traversed the western portion of the property. Stressed vegetation and

soil staining has been documented during site reconnaissance. Potential COCs may include metals, VOCs, PAHs, and/or petroleum hydrocarbons.

- **pAOC 7 – Temporary Storage Area:** The Phase I site reconnaissance noted storage of industrial cleaners and petroleum product in the southern section of the building. This area was used as temporary materials storage for J.C. Products. Minor floor staining was observed. Potential COCs may include VOCs and/or petroleum hydrocarbons.

Soil and/or groundwater data were collected during this Phase II ESA to determine the nature and extent of COCs and impacted media at the pAOCs.

4.1 BORING INSTALLATION

Three borings (B-1, B-2, B-3) were advanced on July 24, 2005, three borings (B-7, B-8, B-9) were advanced on July 25, 2005, and twelve soil borings (B-5, B-6, B-10, B-11, B-12, B-13, B-14, B-15, B-16, B-17, B-18) were advanced on July 26, 2005. Locations of the borings are illustrated on Figure 2. Copies of the boring logs are provided in Appendix A. Table 1 contains the sample identifications listed by potential area of concern.

The borings B-9, B-11, and B-16 were installed during the installation of monitoring wells. Split spoons were used to collect soil samples at continuous 2-foot intervals in these borings to characterize the overburden materials. Upon retrieval of each two-foot sample, the sampler was opened and examined for physical characteristics such as grain size/distribution, apparent moisture content, visual evidence of contamination, and odors. Additionally, the samples were field-screened with a PID for the presence of total volatile organic compounds. The sample exhibiting the greatest impacts based on visual observations and field screening were sampled per boring.

The remaining fifteen borings were collected in a continuous manner from surface grade using a 4-foot long, 2-inch diameter “macro-core” sampling tube to a depth of approximately eight feet. The sampling tube was driven into the ground by a smaller diameter drive rod advanced by the direct-push assembly. The “macro-core” sampling tube was fitted with a single-use, disposable liner for each sample (one liner per four-foot sample) to minimize cross-contamination between sample locations.

Upon retrieval of each four-foot sample, the disposable liner was cut open and the sample examined for physical characteristics such as grain size/distribution, apparent moisture content, visual evidence of contamination, and odors. The sample exhibiting

the greatest impacts based on visual observations and field screening were sampled per boring.

Boring installation and sampling standard operations procedures (SOPs) associated with direct push-drilling and split spoon sampling techniques are described in the QAPP prepared by Tighe & Bond dated May 2005.

4.2 MONITORING WELL INSTALLATION

Three monitoring wells (MW-1 – MW-3) were installed on site. MW-1 was installed on July 25, 2005 and MW-2 and MW-3 were installed on July 26, 2005 in accordance with the techniques described in the QAPP prepared by Tighe & Bond dated May 2005. Boring logs illustrating construction details are provided in Appendix A. A summary of monitoring well construction details is provided in Table 2.

Martin Geo-Environmental, LLC of Belchertown, MA, used a truck-mounted CME-75 drilling rig using 4.25-inch ID hollow stem augers. Tighe & Bond personnel were on site to supervise the well installation. A two-foot split-spoon sampler was advanced ahead of the auger to collect continuous soil samples. Sampling was advanced through the overburden to the bedrock. Once bedrock was encountered, an air hammer powered by compressed air advanced the boring to groundwater within the bedrock. Bedrock was encountered between 3 and 12 feet below the surface across the site. The on-site monitoring wells characterize groundwater quality and groundwater flow direction.

Upon reaching the water table, the boring was advanced to a depth of approximately seven feet below the existing water table and a monitoring well was installed. A two-inch diameter, 0.010-inch slotted PVC monitoring well with a ten-foot screened horizon was installed in the boring. The screened horizon straddles the water table. A filter pack of No. 2 grade washed sand was placed in the annular space surrounding the well

screen. Filter sand was placed around each well to a depth of one to two feet above the screen, followed by a 1 to 2-foot bentonite seal over the sand to restrict percolation of surface water into the well screen. The remaining annular space was filled with clean drill cuttings to approximately one foot below grade. A locking expansion cap was fitted on the riser and a stand pipe was installed over each well.

4.3 ADDITIONAL SAMPLING

Two additional samples were collected from the building interior. Sed-1 Floor Drain was collected from the floor drain located in the center section of the building on August 7, 2005. A second sample, Oil-1, was collected from the hydraulic fluid reservoir located in the northern section of the building on July 26, 2005.

Two additional groundwater samples are included in this report: Dug Well and Drilled Well. These samples were analyzed by the Connecticut Department of Public Health Laboratories through the custody of the Chatham Health District. Both samples were analyzed by drinking water test methods and are compared to both national drinking water standards and the Connecticut Department of Public Health Action Level List for Private Wells (Table 6). However, only one well, Dug Well, is currently providing a source of potable water.

A groundwater sample, Drilled Well, was collected from the former facility supply well located in the northern section of the building. The sample was collected by Tighe & Bond personnel using a disposable polypropylene bailer. The bailer was slowly lowered to the top of the water table with minimal agitation to the water column. The sample was immediately placed on ice and delivered to the Chatham Health Department for analysis.

The second sample, Dug Well, was collected from a residence supplied by a well excavated into bedrock “dug well” located at the southeastern extent of the property.

The residential property is located due east of the site. The sample was collected from an interior location closest to the wellhead. The well was purged for 15 minutes prior to sample collection. No in-line water treatment system exists at the residence.

4.4 SOIL SAMPLING AND ANALYSIS

Soil samples collected from each acetate liner during direct-push drilling were screened in the field for total VOCs. A sample for field sampling was placed in a jar, the jar was sealed and shaken for several minutes, and the headspace (air inside the jar) was screened using a Photovac 2020 photoionization detector (PID). The PID, equipped with a 10.2 electron-volt (eV) lamp, was calibrated to an isobutylene standard and programmed to a response factor setting of 1. Concentrations are displayed in digital form in parts per million (ppm) volume to volume (v/v).

Many of the most common VOCs are ionized by the 10.2 eV lamp and will generate a response on the PID; however, the sensitivity of the instrument to VOCs other than that used for calibration may vary from the response for the calibration gas. Positive PID screening results indicate that VOCs are likely to be present in the sample.

PID responses ranged from non-detect (ND) to 823 ppm throughout the site. Petroleum/solvent odor and/or staining were observed in borings B-4, B-6, B-8, B-11, B-12, B-15, and B-18 during this investigation. Fill materials including ash, coal, brick, wood, and glass were observed in B-4, B-6, and B-8 at depths of one to six feet below grade. PID results and observations made during boring advancement activities are documented on boring logs included in Appendix A.

One sample per boring was collected from the site for a total of eighteen soil samples. B-1D was analyzed as a duplicate for sample B-1. Soil samples collected from the site were analyzed for one or more of the following suite of compounds:

- mass priority pollutant 13-metals (pp-13 metals) (Method SW846 6010B);

- synthetic precipitate leaching potential (SPLP) pp-13 metals (Method SW846 1312 and SW846 6910B);
- total cyanide;
- VOCs (Method 8260B);
- PAHs (Method 8270c);
- SPLP PAHs (Method SW846 1312 and 8270c);
- Connecticut extractable petroleum hydrocarbons (CTETPH); and
- PCBs (Method 8082A).

Samples collected for laboratory analysis were transferred directly to the appropriate sample containers. Following collection, the samples were immediately stored in a cooler on ice and delivered to Severn Trent Laboratories in Westfield, Massachusetts (a Connecticut-certified analytical laboratory). A trip blank was carried in the cooler along with the samples and logged in for laboratory VOC analysis as a quality control measure. Copies of completed chain-of-custody forms are attached to the laboratory reports in Appendix B. Soil sampling and laboratory procedures were conducted in accordance with the QAPP dated May 2005.

4.5 GROUNDWATER SAMPLING AND ANALYSIS

On August 6, 2005, Tighe & Bond personnel collected groundwater samples from all four wells on the site. Low flow purging and sampling procedures were performed at each location in accordance with the USEPA Region 1 Low Stress (low flow) Sampling Procedures dated July 1996. Purging and sampling were performed using a bladder pump with disposable bladders and dedicated Teflon-lined tubing. The pump intake depths were selected to coincide with the center-of-saturated-screen elevations. Copies of the field data sheets for the groundwater sampling are provided in Appendix C.

The purged volumes were based on the stabilization of field-measured water quality parameters. The field-measured parameters include dissolved oxygen, specific conductance, temperature, pH, turbidity, and oxidation/reduction potential. The field-measured parameters were generally measured at five to ten minute intervals along with purging rate and depth-to-water. A groundwater sample was collected upon stabilization of the field parameters as indicated by three consecutive readings within acceptable limits. All four groundwater samples were analyzed for the following suite of compounds:

- mass priority pollutant 13-metals (pp-13 metals) (Method SW846 6010B);
- VOCs (Method 8260B);
- PAHs (Method 8270C); and
- Connecticut extractable petroleum hydrocarbons (CTETPH).

Samples collected for laboratory analysis were transferred directly to the appropriate sample containers. Following collection, the samples were immediately stored in a cooler on ice and delivered to Severn Trent Laboratories in Westfield, Massachusetts (a Connecticut-certified analytical laboratory). A trip blank was carried in the cooler along with the samples and logged in for laboratory VOC analysis as a quality control measure.

4.6 ADDITIONAL SAMPLING AND ANALYSIS

The additional samples collected from the interior of the building were analyzed for the following suite of compounds:

SED-1 Floor Drain

- CTETPH;
- VOCs (Method 8260).

Oil -1 – In-Ground Hydraulic Lift Reservoir

- PCB Analysis (Method 8082A)

Samples collected for laboratory analysis were transferred directly to the appropriate sample containers. Following collection, the samples were immediately stored in a cooler on ice and delivered to Severn Trent Laboratories in Westfield, Massachusetts (a Connecticut-certified analytical laboratory). A trip blank was carried in the cooler along with the samples and logged in for laboratory VOC analysis as a quality control measure.

The additional samples collected by the Chatham Health District were analyzed for the following suite of compounds:

Drilled Well – Former Facility Supply Well

- VOCs (Method 524.2)
- Pesticides and PCBs (Method 505)
- PAHs (Method 525.2)

Dug Well – Residential Well Sample

- Total Coliform
- Basic Potability
- Pesticides and PCBs (Method 505)
- VOCs (Method 524.2)
- CTETPH
- PAHs (Method 525.2)

Dug Well and Drilled Well samples were collected for laboratory analysis and transferred directly to the appropriate sample containers. Following collection, the samples were

immediately stored in a cooler on ice and delivered to the State of Connecticut Department of Public Health Laboratory. A trip blank was carried in the cooler along with the samples and logged in for laboratory VOC analysis as a quality control measure.

4.7 SITE SURVEY AND WATER/LNAPL LEVEL MEASUREMENTS

Locations and elevations of the newly installed borings were surveyed by Tighe & Bond personnel on July 26, 2005. An arbitrary benchmark was established on-site and set at 100 feet. Well locations, including top of well and PVC riser, were measured relative to the benchmark. The elevations are reported on the boring logs; the locations were directly imparted to the site mapping.

On August 6, 2005, Tighe & Bond measured water levels and for the presence of light non-aqueous phase liquid (LNAPL) at all three monitoring wells. Water level measurements were conducted with an electronic water level meter capable of measuring the depth to water to within 0.01 feet. LNAPL measurements were made through the use of a oil/water interface probe and a 2-inch polyethylene bailer. The water level measurement data for the site are summarized in Table 2. No LNAPL was observed or measured in any of the four wells.

The survey data was used in conjunction with the water level data to calculate groundwater elevations. The calculated elevations were used to create a water table contour map (see Figure 3).

4.8 DEVIATION FROM QAPP

Six deviations from the QAPP dated May 2005 were made to the scope of work prepared for this Phase II ESA.

- The QAPP specified four monitoring wells to be installed as part of the Phase II ESA. The fourth monitoring well, MW-1 as referenced in the QAPP, was to be

a 1-inch microwell to be installed via GeoProbe direct push method. However, GeoProbe refusal was encountered prior to reaching the groundwater table. In fact, the investigation demonstrated that the groundwater was located in the bedrock and therefore the installation of a microwell was not feasible.

- The location of MW-2, referred to as MW-3 in the QAPP, was moved approximately 50-feet to the northeast. The original location was attempted but auger refusal was encountered at approximately 6-feet. Additional attempts were made with the air hammer but the boring could not be advanced at the location. The new location is adjacent to the western property boundary.
- The location of MW-3, referenced as MW-4 in the QAPP, was moved approximately 10-feet to the east. Town sewer maps depicted sewer lines along the property boundary in close proximity to the initial monitoring well location. As a preventative measure, the location of the monitoring well was adjusted to the east.
- The boring location, B-1 as referenced in this report and the QAPP, was shifted to the north. The boring was designed to detect any releases associated with the former 300-Gallon AST (pAOC 2). The original location was inaccessible to drilling equipment due to automobile part storage.
- The boring location, B-2 as referenced in the QAPP, was not sampled. The original location was inaccessible by the drilling equipment due to automobile parts storage.
- The boring location, B-19 as referenced in the QAPP, was shifted approximately ten feet to the south at the entrance to the southern section of the building. The original location could not be sampled due to the extensive subfloor within the southern section of the building. The revised boring location is labeled B-18 and

is designed to detect any released associated with the temporary storage area (pAOC 7).

5.1 GEOLOGY

The Middlesex County Soil Survey classifies the surficial on-site soil as Udorthents. Udorthents refer to the urban soils that have extensively altered by cuttings or filling activities. This description is generally consistent with the observations made during field activities.

The shallow (less than eight feet in depth) subsurface geology consists of two distinct units as follows:

- Fill materials; and
- Medium to fine brown compacted sand.

Fill material, consisting of ash, coal, cinders, brick fragments, wood, and glass is found throughout the site. The ash, cinders, and construction materials are likely remnants of the former industrial building. The coal is a likely waste product from coal usage at the site or surrounding area.

The majority of these waste materials were likely used as fill during site development during the late 1800s and early 1900s. The fill exists to depths of six feet throughout the site; however, the thickness may be in excess of eight feet or absent in selected areas of the site. The areas with increased fill thickness were likely topographically lower areas prior to the site development. The fill material is found above the water table.

Medium to fine sand is found immediately below grade of the fill. The sand becomes tighter and finer grade with increasing depth. In fact, GeoProbe refusal was encountered between three to eight feet below grade. No groundwater was encountered in the overburden.

Bedrock was encountered between three and 12 feet below grade across the site. The bedrock in this area is classified as Brimfield Schist, based on the Connecticut Geological Survey Bedrock Map. Brimfield Schist is gray, rusty weathering, medium to coarse grained inter-layered schist and gneiss. The bedrock observed on-site was consistent with the Brimfield Schist designation.

5.2 HYDROLOGY

According to the United States Geologic Survey Moodus Quadrangle 7.5 Minute Topographic Map the elevation of the site is approximately 400 feet above sea level. The contours found on the USGS topographic map indicates a slight elevation slope in a southwesterly direction.

The nearest surface water body, Pocotopaug Creek, is located approximately 250 feet east of the site. The Pocotopaug Creek is classified by the State of Connecticut as C/B. Inland surface waters classified by the CTDEP as C/B are those that, due to point or non-point sources of pollution, currently do not meet certain Class B Water Quality Criteria or one or more designated uses. The water quality goal is achievement of Class B criteria and attainment of Class B designated uses. Class B waters are those known or presumed to meet Class B Water Quality Criteria that support the following designated uses: recreational use; fish and wildlife habitat; agricultural and industrial supply and other legitimate uses, including navigation.

Depth to groundwater was encountered between thirteen to fifteen feet below grade in the bedrock at the site. Groundwater flow was evaluated by the installation of monitoring wells during the Phase II ESA. Site-wide water level data collected from the monitoring well network are presented in Table 2. Relative groundwater elevations and inferred flow directions are illustrated on Figure 3. The ground water table encountered in the bedrock appears to follow a southwesterly direction toward Pocotopaug Creek. Based on the water table elevation and observed proximity of

Pocotopaug Creek, groundwater likely discharges to the Creek. However, this would need to be confirmed through the installation of staff gauges in the Creek.

Several factors interfere with groundwater flow interpretation. First, the number and location of on-site monitoring wells may not adequately characterize the site. Secondly, it was out of the scope of this report to collect bedrock cores samples. Therefore, it is not possible to determine the quality of the bedrock material or orientation of fractures. The groundwater flow direction through the bedrock is therefore uncertain.

Analytical results reported in this Phase II ESA are compared to remediation criteria listed in the Connecticut Department of Environmental Protection (CTDEP) Remediation Standard Regulations (RSRs). CTDEP's intent in developing the RSRs was to define the following:

- Minimum remediation performance standards;
- Specific numeric clean-up criteria; and
- A process for establishing alternative site-specific standards, if warranted.

In general, RSR criteria are used to remediate contaminated environmental media (i.e., soils and groundwater). RSR criteria are not specifically applicable to building interiors and sediment.

The RSRs apply to efforts to remediate contaminated soil, surface water, soil vapors, or a groundwater plume at or emanating from a release area or AOC, provided that the remedial action is required by the following:

- Connecticut General Statutes (CGS) Chapter 445 (Hazardous Waste) or Chapter 446K (Water Pollution Control); or
- Relevant subsections of CGS 22a-133 (Voluntary Clean-up) including but not limited, any such action required to be taken or verified by a Licensed Environmental Professional, except as otherwise provided in the regulations.

Specifically, the regulations provide that the RSRs do not apply to the following:

- The soil and water within the zone of influence of a groundwater discharge permitted under CGS Section 22a-430;
- A release which has been remediated and which remediation has been approved in writing by the CTDEP; or

- Sites at which the only source of contamination results from the use or application of pesticides and fertilizers in accordance with labeling requirements.

6.1 SOIL REMEDIATION CRITERIA

The CTDEP soil remediation criteria integrate two risk-based goals: (1) Direct Exposure Criteria (DEC) to protect human health and the environment from risks associated with direct exposure (ingestion) to contaminated soil; and (2) Pollutant Mobility Criteria (PMC) to protect groundwater quality from contaminants that migrate or leach from the soil to groundwater. Soils to which both criteria apply must be remediated to a level which is equal to the more stringent criteria.

6.1.1 Direct Exposure Criteria

Specific numeric exposure criteria for a broad range of contaminants in soil have been established by the CTDEP, based on exposure assumptions relative to incidental ingestion of contaminants in soils. The DEC applies to accessible soil to a depth of 15 feet. The DEC for substances other than PCBs does not apply to inaccessible soil at a release area provided that, if such inaccessible soil is less than 15 feet below the ground surface, an environmental land-use restriction (ELUR) is in effect with respect to the subject release area. For PCBs, a maximum concentration of 10 milligrams per kilogram (mg/Kg) can remain in soils considered inaccessible. Inaccessible soil generally means polluted soil which is the following:

- More than four feet below the ground surface;
- More than two feet below a paved surface comprised of a minimum of three inches of bituminous pavement or concrete;
- Beneath an existing building; or

- Beneath another permanent structure(s) approved by the CTDEP Commissioner. Buildings can be constructed and/or clean fill can be placed over contaminated soils rendering them inaccessible.

The CTDEP has established two sets of DEC using exposure assumptions appropriate for residential land use (RES DEC) or for industrial and certain commercial land use (I/C DEC). In general, all sites are required to be remediated to the residential criteria. If the industrial/commercial land use criteria are applicable and used, an ELUR notification is required in accordance with the RSRs.

6.1.2 Pollutant Mobility Criteria

The PMC that will apply to remediation of a site depend on the groundwater classification of the site. The purpose of these criteria is to prevent any contamination to groundwater in GA classified areas, and to prevent unacceptable further degradation to groundwater in GB classified areas. The PMC generally apply to all soil in the unsaturated zone, from the ground surface to the seasonal low water table in GA classified areas. For GB classified areas, the PMC are applicable to all soils from ground surface to the seasonal high water table. The criteria do not apply to environmentally isolated soils that are polluted with substances other than VOCs provided that an ELUR is recorded for the release area which ensures that such soils will not be exposed (unless approved in writing by the CTDEP Commissioner). Environmentally isolated soils are defined as certain contaminated soils which are above the seasonal high water table, beneath an existing building and not a source of ongoing contamination. An ELUR must be recorded for the site which ensures that such soils will not be exposed as a result of building demolition or other activities. Buildings can be constructed over contaminated soils rendering them environmentally isolated.

Remediation based upon the listed PMC requires that a substance, other than an inorganic substance or PCB, in soil be remediated to at least that concentration at which

the results of a mass analysis of soil for such substances does not exceed the PMC applicable to the groundwater classification (i.e., GA or GB) of the area in which the soil is located. An inorganic substance or PCB in soil must be remediated to at least that concentration at which the analytical results of leachate produced from either the TCLP or the SPLP does not exceed the PMC applicable to the groundwater classification of the area in which the soil is located.

6.2 GROUNDWATER REMEDIATION CRITERIA

Groundwater remediation requirements are dependent upon the groundwater classification of the site. The objectives of these standards are the following:

- Protect and preserve groundwater in GA areas as a natural resource;
- Protect existing use of groundwater regardless of the area's groundwater classification;
- Prevent further degradation of groundwater quality;
- Prevent degradation of surface water from discharges of contaminated groundwater; and
- Protect human health.

Portions of the RSRs governing groundwater regulate remediation of groundwater based on each substance present in plume and by each distinct plume of contamination. Several factors influence the remediation goal at a given site, including: background water quality, the groundwater classification, the proximity of nearby surface water, existing groundwater uses, and existing buildings and their use. When assessing general groundwater remediation requirements, all of these factors must be considered in conjunction with the major numeric components of the RSRs.

The three major numeric components which are described herein include the following:

- Groundwater Protection Criteria (GWPC);
- Surface Water Protection Criteria (SWPC); and
- Volatilization Criteria.

6.2.1 Groundwater Protection Criteria

The Groundwater Protection Criteria (GWPC) applies to all groundwater in a GA classified area. For GB groundwater areas, the CTDEP has made the risk management decision to not seek restoration of groundwater to drinking water protection criteria unless the existing uses include potable water supply. A supply well is present on site and serves two off-site residential properties. In addition, numerous supply wells are located within a 500-foot buffer of the property. Therefore, the GWPC are applicable to the site.

6.2.2 Surface Water Protection Criteria

The Surface Water Protection Criteria (SWPC) applies to all groundwater which discharges to surface water, including groundwater designated as GB. Groundwater at the site is classified by the CTDEP as GA. The SWPC ensure the groundwater contamination resulting from on-site sources which exceed background is remediated to levels that adequately protect surface water quality. In general, compliance with the SWPC is achieved when the average concentration of a compound in groundwater emanating from a site is equal to or less than the SWPC established by the CTDEP. The SWPC, therefore, will apply to the site.

6.2.3 Volatilization Criteria

The volatilization criteria (VC) apply to all groundwater contaminated with a VOC within 15 feet of the ground surface or a building. According to the regulations, the VOC of concern will be remediated to a concentration which is equal to or less than the

applicable residential volatilization criterion for groundwater. If groundwater contaminated with a VOC is below a building used solely for industrial or commercial activity, groundwater may be remediated such that the concentration of the substance is equal to or less than the applicable industrial/commercial VC in lieu of the residential VC for groundwater, provided that an ELUR is in effect with respect to the parcel (or portion of the parcel covered by the building). The ELUR must also ensure that the parcel (or portion thereof beneath the building) will not be used for any residential purpose in the future and that future use is limited to industrial or commercial activity.

The CTDEP proposed revisions to the GW VC in March 2003. These changes have not yet been implemented. The changes will reduce the threshold values for residential and commercial/industrial VC for many VOCs including TCE and PCE.

6.3 DRINKING WATER STANDARDS

6.3.1 National Primary Drinking Water Standards

National Primary Drinking Water Standards are legally enforceable standards that apply to public water systems. Primary standards protect public health by limiting the level of contaminants in drinking water.

6.3.2 National Secondary Drinking Water Standards

National Secondary Drinking Water Regulations are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, color, or odor) in drinking water. EPA recommends secondary standards to public water systems but does not require systems to comply; however, states may choose to adopt them as enforceable standards.

6.3.3 Connecticut Department of Public Health Action Level List for Private Wells

If well contamination exceeds these standards, then the CTDEP is authorized to provide treatment or bottled water to residents. The Action Levels are set by the Department of Public Health (DPH), and include the most common contaminants. If a contaminant is not on the list, CTDEP may ask DPH to evaluate the public health risk of contamination for the specific chemical.

7.1 SOIL

Nineteen samples, including one duplicate, were collected for analysis from the site during this investigation. Results from the soil analysis are summarized in Table 3. Nine of the 13 PP-13 metals (mass concentrations) were detected. The following metals were detected in the indicated number of samples and concentration range:

- Antimony, one of nine samples, 43 mg/Kg;
- Arsenic, seven of nine samples, 1.4 to 6.7 mg/Kg;
- Cadmium, five of nine samples, 0.27 to 5.4 mg/Kg;
- Chromium, nine of nine samples, 8.4 to 20 mg/Kg;
- Copper, nine of nine samples, 16 to 10,000 mg/Kg;
- Lead, nine of nine samples, 5.5 to 3,300 mg/Kg;
- Mercury, six of nine samples, 0.036 to 14 mg/Kg;
- Nickel, eight of nine samples, 6.6 to 39 mg/Kg; and
- Zinc, nine of nine samples, 19 to 21,000 mg/Kg.

Beryllium, selenium, silver, and thallium were not detected in soil samples collected on site.

Two of the 13 PP-13 metals (SPLP extraction) were detected in five soil samples. The following metals were detected in the indicated number of samples and concentration range:

- Copper, three of six samples, 0.013 to 0.032 mg/L; and
- Lead, two of six samples, 0.0092 to 0.011 mg/L.

ETPH was detected in 16 of the 18 samples collected from the site ranging in concentrations from 1,900 to 17 mg/Kg.

PCBs (Aroclor 1254) were detected in two of the six collected from the site ranging in concentrations from 14,000 to 1,000 $\mu\text{g/Kg}$.

Eight VOCs were detected in 13 soil samples collected for VOC analysis from the site. The following VOCs were detected in the indicated number of samples and concentration range:

- Toluene, one of 13 samples, 1,000 $\mu\text{g/Kg}$;
- Xylenes (total), one of 13 samples, 1,920 $\mu\text{g/Kg}$;
- Trichloroethylene, nine of 13 samples, 6.4 to 310,000 $\mu\text{g/Kg}$;
- Tetrachloroethylene, four of 13 samples, 4.8 to 870 $\mu\text{g/Kg}$; and
- Naphthalene, one of 13 samples, 900 $\mu\text{g/Kg}$

Ten PAHs were detected in fourteen soil samples collected for PAH analysis from the site. The following PAHs were detected in the indicated number of samples and concentration range:

- Phenanthrene, two of 14 samples, 210 to 1,100 $\mu\text{g/Kg}$;
- Fluoranthene, five of 14 samples, 300 to 2,000 $\mu\text{g/Kg}$;
- Pyrene, five of 14 samples, 290 to 3,000 $\mu\text{g/Kg}$;
- Benzo (a) anthracene, one of 14 samples, 170 $\mu\text{g/Kg}$;
- Chrysene, one of 14 samples, 210 $\mu\text{g/Kg}$;
- Benzo (b) fluoranthene, two of 14 samples, 120 to 250 $\mu\text{g/Kg}$;
- Benzo (k) fluoranthene, one of 14 samples, 140 $\mu\text{g/Kg}$;
- Benzo (a) pyrene, two of 14 samples, 100 to 200 $\mu\text{g/Kg}$;

- Indeno (1,2,3-cd) pyrene, one of 14 samples, 130 $\mu\text{g/Kg}$; and
- Benzo (ghi) perylene, one of 14 samples, 100 to 110 $\mu\text{g/Kg}$.

One sample, B-11, was analyzed for SPLP PAHs. No SPLP PAHs were detected above detection limits.

Nine constituents exceeded their respective soil criteria. Four metals exceeded one or more RSRs:

- Antimony was detected in B-2(1-2ft) exceeding the RES DEC;
- Copper was detected in B-2(1-2ft) exceeding the RES DEC;
- Lead was detected in B-2(1-2ft) exceeding the RES DEC and I/C DEC and exceeded the GA PMC for lead SPLP; and
- Zinc was detected in one sample, B-2(1-2ft) exceeding the RES DEC.

ETPH was detected in two samples B-4(4-6ft) and B-12(3-4ft) above RES DEC and GA PMC standards. Refer to the Table 3.

Two VOCs were detected exceeding RSR criteria.

- Trichloroethylene (TCE) was detected in five samples, B-6(0-2ft), B-8(4-5ft), B-11 (0-2ft), B-15(2-3ft), and B-18(3-4ft) above GA PMC; and
- Tetrachloroethylene (PCE) was detected in two samples, B-15(2-3ft) and B-18(3-4ft) above GA PMC.

One PAH was detected exceeding RSR criteria. Fluoranthene was detected in B-10(0-2ft) above GA PMC.

One PCB was detected exceeding RSR criteria. Aroclor was detected in B-11(0-2ft) exceeding the RES DEC.

7.2 GROUNDWATER

Three groundwater samples were collected for analysis from the site during this investigation. Groundwater analytical results are provided in Table 4. Four of the 13 PP-13 metals were detected in the groundwater sample. The following metals were detected in the indicated number of samples and concentration range:

- Chromium, three of three samples, 6.1 to 10 $\mu\text{g/L}$;
- Copper, three of three samples, 19 to 39 $\mu\text{g/L}$;
- Lead, three of three samples, 5.4 to 7.9 $\mu\text{g/L}$; and
- Nickel, three of three samples, 11 to 20 $\mu\text{g/L}$.

No ETPH was detected in any of the three samples.

Six VOCs were detected in the indicated number of samples and concentration range:

- Chloromethane, one of three samples, 1.00 $\mu\text{g/L}$;
- Cis 1,2 – dichloroethylene, one of three samples, 0.71 $\mu\text{g/L}$;
- TCE, three of three samples, 1.7 to 27.0 $\mu\text{g/L}$;
- PCE, one of three samples, 2.9 $\mu\text{g/L}$;
- MTBE, one of three samples, 0.91 $\mu\text{g/L}$; and
- Trichlorofluoromethane (Freon 11), one of three samples, 1.70 $\mu\text{g/L}$.

One SVOC, Di-n-butyl phthalate, was detected in two monitoring wells, MW-1 and MW-2, at a concentration of 1.00 and 0.59 $\mu\text{g/L}$, respectively.

One constituent was detected in the groundwater exceeding applicable RSR standards. TCE was detected in MW-1 exceeding the GWPC. The CTDEP has proposed revisions to the groundwater volatilization criteria dated March 2003. These revisions

have not been finalized but the proposed new standards for TCE and PCE are 67 and 810 $\mu\text{g/l}$, respectively for industrial/commercial land use.

7.3 ADDITIONAL SAMPLING

7.3.1 Interior Sampling

The sediment sample collected from the floor drain, SED-1, was analyzed for CTETPH and VOCs. CTETPH was detected at 19,000 mg/Kg.

Four VOCs were detected in the following concentrations:

- Toluene, 950 $\mu\text{g/Kg}$;
- Xylenes (total), 540 $\mu\text{g/Kg}$;
- Trichloroethylene, 400 $\mu\text{g/Kg}$; and
- 1,2,4-Trimethylbenzene, 430 $\mu\text{g/Kg}$.

The sample collected from the hydraulic lift reservoir, Oil-1, was analyzed for the presence of PCBs. No PCBs were detected from the reservoir. The analytical results for the floor drain and hydraulic lift samples is provided in Table 5.

7.3.2 Chatham Health District Samples

A groundwater sample, Drilled Well, was collected from the former facility supply well located in the northern section of the building. The well was sampled for VOCs with two detections in the following concentrations:

- TCE, 3.9 $\mu\text{g/L}$; and
- Trichlorofluoromethane, 7.80 $\mu\text{g/L}$.

Four organohalide pesticides were detected in the well with the following concentrations:

- Alpha Chlordane, 0.05 $\mu\text{g/L}$
- Gamma Chlordane, 0.05 $\mu\text{g/L}$
- Dieldrin, 1.06 $\mu\text{g/L}$; and
- Trans-Nonachlor, 0.03 $\mu\text{g/L}$.

The dieldrin detection in the drilled well exceeded the Connecticut Department of Public Health Action Level established for drinking water.

One SVOC was detected in the sample. Bis (2-Ethylhexyl) Phthalate was detected at 3.87 $\mu\text{g/L}$.

No PCBs were detected in sample taken from the former facility supply well.

The second sample, Dug Well, was collected from a residence supplied by the excavated well located at the southeastern extent of the property. No VOCs, organohalide pesticides, PCBs, or ETPH were detected in the sample. Two SVOCs were detected in the well with the following concentrations:

- Bis (2-Ethylhexyl) Phthalate, 0.42 $\mu\text{g/L}$; and
- Bis (2-Ethylhexyl) Adipate, 0.36 $\mu\text{g/L}$.

7.4 SIGNIFICANT ENVIRONMENTAL HAZARD REPORT

TCE concentrations detected in the groundwater constituted a threat to drinking water supplies and required a written notification, under the requirements of Connecticut General Statutes (CGS) Section 22a-6u, to the CTDEP. Section 1-(g) states that a written notification must be made when groundwater within 500 feet of a public or private drinking water supply well is contaminated above CTDEP's ground water protection criteria. The Town of East Hampton filed the significant hazard report on August 27, 2005.

SECTION 8 QUALITY ASSURANCE/ QUALITY CONTROL

Tighe&Bond

Field sampling quality assurance included the collection of four types of quality control samples: duplicate samples, field blanks, equipment blanks, and trip blanks. Quality control checks on field activities were performed to assure collection of data that is representative and valid. Table 7 provides a summary of the quality control and quality assurance data.

Laboratory quality assurance measures are also provided in this report. Table 8 presents information provided by Severn Trent Laboratories regarding sample delivery, laboratory receipt, and laboratory analysis of the samples.

8.1 DUPLICATE SAMPLES

Field duplicate samples are collected to provide information on sample collection, handling, shipping, storage, preparation, and analyses. The duplicate samples were obtained by collecting two identical sets of samples from a single sample location. The respective duplicate sample was analyzed for several parameters analyzed in the original sample. The comparison is a measurement of analytical precision.

One duplicate sample was collected during the soil investigation at the sight. Soil sample B-1 (1-2ft) was a duplicate of B-1D (1-2ft). The duplicate was analyzed for PP-13 Metals, VOCs, CTETPH, and PAHs. All detections were common between both sets of samples. A comparison of concentrations between the duplicate samples yielded varying results from 2 to 42 percent relative difference. Since there were no anomalous detections between pairs and the relative percent differences are within limits, the results suggest good precision.

8.2 FIELD BLANK SAMPLES

Two field blank samples were analyzed during this investigation - one was created during soil sampling and one was created during groundwater sampling activities. The field blank was created by filling three 40-ml VOA vials with laboratory-grade deionized water during field collection activities. The field blank is immediately stored in the same cooler with the samples and transported to the laboratory. The samples are analyzed for VOCs. The presence of VOCs in the sample may indicate contamination in the field or during transportation.

No VOCs were detected in any of the trip blanks. Accordingly, no VOC cross-contamination occurred during the soil and groundwater sampling events.

8.3 TRIP BLANK SAMPLES

A trip blank sample was used for site activities during VOC sampling activities for soil and groundwater. The purpose of analyzing this control sample was to determine if potential cross-contamination occurred as a result of improper sample container cleaning, contaminated blank source water, sample contamination during storage and transportation, and other environmental conditions during the sampling event. The trip blank sample consisted of a container of laboratory-supplied reagent-grade water (groundwater analysis) or methanol (soil analysis) that was kept with the field groundwater or soil sample containers from the time they left the laboratory until the time they were returned to the laboratory. One trip blank sample was supplied for the sample cooler containing VOC sample bottles per shipment event.

No VOCs were detected in any of the trip blanks. Accordingly, no VOC cross-contamination occurred during the soil and groundwater sampling events.

8.4 EQUIPMENT BLANK SAMPLES

An equipment blank sample was created during both soil and groundwater sampling activities. The equipment blank is created by pouring laboratory grade deionized water over sampling equipment after the decontamination process. The rinsate is collected into appropriate containers for analysis. Both equipment blanks were analyzed for pp-13 metals, CTETPH, PAHs, and VOCs. The soil equipment blank contained four COCs:

- Zinc at 54 $\mu\text{g/L}$;
- ETPH at 0.46 mg/L;
- Chloromethane at 2.0 $\mu\text{g/L}$; and
- Bis (2-ethylhexyl) phthalate at 13 $\mu\text{g/L}$.

The groundwater equipment blank contained two contaminants:

- Zinc at 76 $\mu\text{g/L}$;
- ETPH at 0.50 mg/L;
- Chloromethane at 1.0 $\mu\text{g/L}$; and
- Bis (2-ethylhexyl) phthalate at 70 $\mu\text{g/L}$.

Chloromethane was discovered in several of the QA/QC measurements and is believed to be the result of laboratory contamination. Bis (2-ethylhexyl) phthalate is also a common laboratory contaminant and is not believed to be an indication of incomplete decontamination processes. In addition, the compound was not detected in any of the soil samples. ETPH was detected at similar concentrations in both equipment blanks. The most likely source of the contaminant is the deionized water used for the rinsate. Zinc also appears in both of the equipment blanks at relatively similar concentrations. Zinc is not a common laboratory contaminant and furthermore is not evident in any of

the groundwater samples. Severn Trent Laboratories was questioned about the presence of zinc in QA/QC samples. They reported that they are unaware of zinc contamination in their laboratory facility. The source for zinc in the equipment blanks may be the deionized water used for the rinsate.

8.5 LABORATORY QUALITY CONTROL

Table 8 provides descriptions of information provided by Severn Trent Laboratories regarding sample delivery, laboratory receipt, and laboratory analysis of the samples. All of the samples were within appropriate holding times. All of the samples were received at the property temperature and in the appropriate containers. Several internal laboratory QA/QC standards were not met during analysis. For each of these occurrences, Severn Trent Laboratories provided a detailed narrative. This narrative is provided under the comments section of Table 8.

8.6 DATA USABILITY ASSESSMENT

The quality control data and the analytical data were reviewed to form a data usability assessment. This assessment takes into consideration the following parameters:

- Detection limits;
- Regulatory criteria;
- Matrix effects; and
- Importance of nonconforming data relative to data quality objectives (DQOs).

Three soil samples contained detection limits for VOCs above the GA PMC criteria. B-6(0-2ft), B-8 (4-5ft), and B-11 (0-2ft) contained target analytes within the sample that required laboratory dilution of the sample. These dilutions elevated the detection limits.

Two detection limits were above RSR criteria for groundwater samples:

- Arsenic SWPC established at 4 $\mu\text{g/L}$ with detection limits at 10 $\mu\text{g/L}$; and
- Thallium GWPC established at 5 $\mu\text{g/L}$ with detection limits at 10 $\mu\text{g/L}$.

Multiple soil samples were collected throughout the site to provide characterization of the property. Only TCE and PCE were detected in the soil samples above RSR criteria. The elevated detection limits for the above mentioned soil samples, however, represent a data gap. Proximate soil samples with sufficiently low detection limits did not identify constituent concentrations approaching the RSR limits. It is unlikely additional COCs above RSR limits would have been discovered during this investigation. Therefore, the DQOs of identifying the COCs exceeding RSR criteria were met.

The matrix effects were not evident when conducting duplicate analysis on soil samples. The duplicates were similar in detections and concentrations. Only one sediment sample, SED-1, was taken from the interior floor drain. Typically, significant of constituent concentration variance exists for grab samples from floor drains. Since, only one grab sample was taken for this matrix, the percent relative difference could not be measured.

The detection of contaminants in the quality control data represents the largest nonconforming data relative to the DQOs. In particular, the detection of zinc and ETPH in the equipment blanks suggest that the deionized water may have contained these constituents. used to that cross contamination during soil sampling may have occurred. It should also be noted that zinc was detected in all soil samples but at concentrations well below applicable RSRs. Zinc was not detected in the groundwater. Therefore, the data suggests that zinc does not occur above RSR criteria on the site. ETPH was detected at concentrations exceeding RSR criteria in soil samples but not groundwater samples. The concentrations detected in the equipment blanks were minor, relative to applicable RSR standards, and would not influence the conclusions

made during this assessment. The data derived from this ESA is usable and adequate for the project DQOs.

A conceptual site model (CSM) is a representation of an environmental system at a site that is used as a tool to identify releases, pathways of migrations, potential receptors, and ultimately risk. The CSM is used to develop work plans and provide a framework to address issues that arise during the investigation of a site. The CSM is refined throughout the site characterization process as new data are acquired. The final CSM will fully define the environmental system at a site and validate the hypotheses regarding the environmental fate of released contaminants.

The CSM includes the following:

- Description of the site, environments, and AOCs;
- Nature and extent of contaminants;
- Potential release mechanisms for such contaminants;
- Evaluation of migration pathways and locations at which environmental media are most likely to have been impacted by a release;
- Identification of AOCs at which releases have occurred as well as AOCs at which no releases have occurred; and
- Data and rationale to support the conclusions.

The CSM is summarized in Table 9. This investigation did not include any off-site investigations and thus off-site potential sources have not been defined.

9.1 DESCRIPTION OF THE SITE, ENVIRONMENTS, AND AOCs

A description of the site, history, and operations as derived from the Phase I ESA is provided in Section 3. A description of site hydrogeology is provided in Section 5.

9.2 NATURE AND EXTENT OF CONTAMINATION

A discussion of the nature and extent of contamination in soil is provided in Section 9.2.1, for groundwater, in Section 9.2.2, and for Sediment, in Section 9.2.3.

9.2.1 Soil

The COCs detected in the soil at the site include: metals (arsenic, antimony, cadmium, chromium, mercury, nickel copper, lead, and zinc), ETPH, and VOCs. These detections were found in unsaturated soils ranging in depth from zero to seven feet below grade.

All of the COCs listed above were detected above regulatory criteria in one or more boring locations on the site. A summary of the analytical data by AOC is provided in Table 10. Locations of AOCs with confirmed releases above regulatory criteria are depicted on Figure 4. Metals and VOC detections in soils are provided in Figures 6 and 7, respectively.

The on-site impacts are attributed to four factors:

- spills and chemicals releases during power generation, wire production, and automotive repair;
- deposition of ash and coal fragments from historic coal combustion; and
- spills and chemical releases associated with automobile repair and storage.

The building was originally built in 1910 to serve as a coal fired boiler powerhouse for the Summit Thread Company. The northern portion of the building was used as a coal pocket for coal storage. The 1925 Sanborn Fire Insurance Map depicts railroad tracks traversing the western perimeter of the property. Coal was unloaded from the railroad cars into the coal pocket. For many years, this section of the building did not contain a roof. The roof was present in 1959 when the building was under the management of Artistic Wire Products Company. The exact date of the roof installation is not known. The southern section of the building was roofed and contained the actual boiler. Little description is provided about the boiler house except for the steel roof trusses and concrete floor. On-site spills and chemical releases as a result of these operations are likely to have occurred. In addition, the deposition of ash and coal fragments from the

powerhouse, as well as nearby industrial plants, is likely to have affected the on-site soil quality.

In 1943, the building changed ownership to the Artistic Wire Products Company. Artistic Wire Products Company also owned the manufacturing buildings to the north of the property (formerly Summit Thread). The Sanborn Fire Insurance Map from 1959 depicts the northern section of the building as a factory building. The specific manufacturing activities in the northern portion of the site are unknown. The southern portion of the building was used as storage.

Prior to the Town purchasing the property, it was owned by Ghezzi Motors, Inc., an auto body and auto repair shop. Historic photographs and accounts document the storage of multiple junk cars and parts throughout exterior and interior locations of the site. It is likely that automobile repair activities took place both inside and outside of the facility. Automobile fluid is likely to have historically leaked from these automobiles at multiple locations.

Antimony

Antimony is a metal that is found at low levels in the environment. Small amounts of antimony are released into the environment by incinerators and coal combustion. Antimony is used as an alloy with lead and zinc in the manufacturing of lead storage batteries, solder, sheet and pipe materials, bearings, castings, and pewter.

The RES DEC is established at 27 mg/Kg. Antimony was detected at only one location B-2(1-2ft) at a concentration, 43 mg/Kg exceeding the RES DEC standard. Antimony was not detected after SPLP extraction. This result suggests that the antimony in this location will not leach into the subsurface at concentrations above the GWPC.

The source of antimony is believed to be from on-site wire production. B-2(1-2ft) was positioned in the former coal pocket storage area.

Copper

Copper is a metal that can occur at concentrations of 25 mg/Kg naturally in Connecticut soils. Copper is used as an alloy, in metal plating, in paint pigment, and in the manufacturing of electric wire and plumbing.

The RES DEC for copper is established at 2,500 mg/Kg. One exceedence, B-2(1-2ft), was detected at a concentration of 10,000 mg/Kg. Despite the relatively high concentration, the sample did not exceed the GA PMC by the SPLP procedures for leaching potential.

The detections of copper are coincident with antimony suggesting the source is related to on-site manufacturing of copper wire. This activity was likely conducted on site during the operations of the Artistic Wire company. The location of manufacturing activities is unknown. The high concentration of copper suggests copper wire manufacturing was performed in the northern section of the building.

Lead

Lead is a metal that is commonly found in soils. Lead is used in metal manufacturing, a base for paint, a component of gasoline, and a constituent of coal.

Elevated lead concentrations (above an assumed background range of 2.7 to 23 mg/Kg) were found near the former coal storage pocket. The soil sample from B-2(1-2ft) contained concentrations of lead exceeding the RES DEC. Two of the five samples analyzed by the SPLP extraction procedure for the leaching potential of lead, contained detectable concentrations. However, none of the samples exceeded the GA PMC established at 0.015 mg/L. The source of the lead is believed to be from wire production.

Zinc

Zinc occurs naturally, however, most zinc concentrations have anthropogenic sources. Mining, smelting metals (like zinc, lead and cadmium) and steel production, as well as burning coal and certain wastes can release zinc into the environment. High levels of zinc in soil may have resulted from former metal manufacturing industries and wire production.

Zinc was detected in the soil throughout the site. However, B-2(1-2ft) contained significantly higher concentrations and exceeded the RES DEC. However, none of the samples exceeded the GA PMC established at 0.015 mg/L. The source of the lead is believed to be from wire production.

VOCs

VOCs have multiple industrial uses. The VOCs detected above RSR criteria, TCE and PCE, are associated primarily with metal degreasing and as a metal drying agent.

Concentrations of TCE were detected throughout the site. The GA PMC criteria were exceeded at B-6(0-2ft), B-8(4-5ft), B-11(0-2ft), B-15 (0-2ft), and B-18 (3-4ft). Three additional locations, B-17(6-7ft), B-5(0-2ft), and B-1(1-2ft), contained detectable concentrations below RSR criteria.

Concentrations of PCE were detected above GA PMC at B-15 (0-2ft) and B-18 (3-4ft). Two additional locations, B-5(4-6ft) and B-1(1-2ft) contained detectable concentrations below RSR criteria.

The sources of the PCE and TCE are most likely from on-site metal degreasing and drying. Concentrations in B-6 suggest a central use location in the area. Concentrations near B-18, near the building doorway, suggest that previous tenants may have dumped or spilled the constituent in this location. Both compounds are detected throughout the site suggesting several release areas.

ETPH

ETPH is a non-specific measure of hydrocarbons and can be attributed to ash or coal fragments in the fill material or residual petroleum compounds from a release to the environment.

ETPH was detected above the RES DEC and GA PMC of 500 mg/Kg at B-4 (4-6ft) and B-12 (3-4ft). ETPH was detected, below RSR criteria, at 13 of the 18 locations with detections ranging from 4.6 mg/Kg to 400 mg/Kg.

ETPH was detected throughout the site. However, the detections found in the soil were not elevated enough to suggest a release from a large storage tank. Rather, the concentrations suggest the releases are the result of automobile storage and repair activities. Coal fragments and ash can also be a contributor of ETPH to the environment. Soil samples taken near the former coal pocket did not contain elevated concentrations of ETPH suggesting that coal did not contribute greatly to the ETPH detections in this area. Coal and/or ash fragments may be ETPH contributors in other areas of the site.

PAHs

The potential sources of PAHs detected at the site include spills from petroleum products or the deposition from the incomplete combustion of coal. Flouranthene exceeded the GA PMC criteria at locations B-10(4-5ft) and B-11(0-2ft). Flouranthene was not detected in the leachate of B-11(0-2ft) during SPLP extraction.

It is believed the main source of the flouranthene is from the deposition of ash and coal fragments during coal combustion and disposal of ash byproducts. The exceedences were located at the exterior of the property on the western property line.

PCBs

PCBs, in particular aroclor 1254, was formerly used in various ways including hydraulic fluid, rubber plasticizers, synthetic resin plasticizers, and sealants and caulking compounds. Although the production and sales was discontinued in late 1977, it is still present in transformers now in use. PCBs can be present within electrical capacitors, hydraulic oils, electrical transformers, vacuum pumps and gas-transmission turbines.

Aroclor 1254 was detected in two of the six borings. B-11(0-2ft) was detected at concentrations exceeding the RES DEC. Both of these exceedences are exterior boring locations. The source of the contaminant is unknown. A release of hydraulic fluid or transmission oil from historic property use, are likely sources.

9.2.2 Groundwater

Based on groundwater flow directions (Figure 3), groundwater follows a southwesterly direction toward Pocotopaug Creek. A summary of groundwater analytical data along with a comparison to regulatory criteria is provided in Table 4. Only one constituent, TCE, was detected above RSR criteria.

TCE

TCE was detected above the GWPC in MW-1. It was detected in lower concentrations in the other two wells. The source of the TCE is believed to be from on-site metal degreasing and cleaning activities. It is also possible that off-site sources of TCE exist due to the density of industry and the history of TCE contaminant in the area.

9.2.3 Additional Sampling

A summary of the additional analytical data for the two interior samples, Sed-1 and Oil-1, is provided in Table 5. Sed-1, a grab sample collected from the interior floor drain, contained elevated concentrations of VOCs and ETPH. RSR criteria do not apply to

sediment in floor drains. However, elevated concentrations of the following compounds represent COCs:

- TCE, detected at 400 $\mu\text{g/L}$, is likely from on-site parts degreasing;
- ETPH, detected at 19,000 mg/L , is likely from automobile repair, storage, and on-site parts degreasing. No evidence was found of nearby storage tanks suggests the migration pathway is from interior runoff or direct discharge to the floor drain; and
- Toluene, xylenes (total), and 1,2,4-trimethylbenzene were detected at 950, 540, and 430 $\mu\text{g/L}$, respectively. All three compounds are gasoline additives. The elevated concentrations of these constituents and the ETPH, suggest similar sources.

A summary of the supply well samples, collected by the Chatham Health District, is provided in Table 6. Only one constituent exceeded applicable drinking water standards. Dieldrin, detected in the former facility supply well at a concentration of 1.06 $\mu\text{g/L}$, exceeded the drinking water Connecticut Department of Public Health Action Limit of 0.03 $\mu\text{g/L}$. From the 1950s until 1970, dieldrin was a widely used pesticide for crops like corn and cotton. Because of concerns about damage to the environment and potentially to human health, the EPA banned all uses of dieldrin in 1974, except to control termites. In 1987, the EPA banned all uses.

The source of the dieldrin is unknown but may be from former termite control efforts. A photograph from 1970 was reviewed to determine if agricultural land use was present in a 500-foot area around the site. No large-scale farm operations were visible. It should be noted that pesticides were not considered a COC and therefore were not sampled in the monitoring wells or soil samples.

No constituents of concern were identified from the excavated supply well sample, Dug Well, located on the property. This supply well periodically runs dry and is

supplemented with potable water from a private water supply company. Therefore, the water quality may not reflect the actual groundwater quality from the surrounding area.

9.3 POTENTIAL RELEASE MECHANISMS

The potential release mechanism at each AOC is identified in Table 9. A summary of the potential release mechanisms for each COC at the site are as follows:

Metals	spills and chemicals releases during historic industrial activities, fill materials, deposition of ash and coal fragment from coal combustion and disposal of ash by products, and leaching of coal from coal storage.
PAHs	deposition of ash and coal fragment from coal combustion and fill materials containing contaminants.
VOCs	spills and chemicals releases during power generation, wire manufacturing, and automobile activities
ETPH	spills and chemicals releases during power generation, wire manufacturing, and automobile activities, deposition of ash and coal fragments from coal combustion and disposal of ash by products.
PCBs	spills and chemical releases during industrial and automobile repair activities.

9.4 MIGRATION PATHWAYS

Potential migration pathways for each AOC are identified in Table 9. The migration pathway or transport mechanisms fall into two general types depending upon the sources. The first migration pathway consists of spills, leaks or deposition at ground surface with vertical migration to the water table, then horizontally with groundwater. The second migration pathway is contaminant transport through overland flow at the ground surface. Contaminants may then be discharged into the nearby Pocotopaug Creek where further travel may occur within the surface water.

9.5 AREAS OF CONCERN

A description of each AOC is provided below. Locations of AOCs where releases have occurred and COCs are present above criteria are shown on Figure 4. A summary of soil analytical data by pAOC is provided in Table 10. The conceptual site model is presented as Table 9.

pAOC 1 - Floor Drain

The investigation conducted during the Phase II ESA suggests that a release to the environment has occurred through the floor drain. Sediment sample, SED-1, had elevated concentrations of ETPH and VOCs (including TCE, toluene, xylene, and 1,2,4-trimethylbenzene).

pAOC 2 - 300-gallon AST Location

This Phase II ESA did not encounter evidence of any release occurred near the storage location of the 300-gallon AST. Therefore, a release to the environment by a former or current AST is not evident. Soil borings and groundwater analytical data do not indicate a substantial release of petroleum hydrocarbons on site. Boring sample B-1 (1-2ft), located near the tank storage area, did not exhibit elevated concentrations of ETPH or VOCs.

pAOC 3 - In-Ground Hydraulic Lift

The hydraulic fluid contained in the in-ground hydraulic lift was sampled for the presence of PCBs. The fluid did not contain detectable concentrations of PCBs. However, lack of access prevented the installation of additional borings. The pAOC requires additional investigation.

pAOC 4 - Former Coal Pocket Storage Area

The northern section of the building was used as a coal pocket for coal storage. Borings B-1(1-2ft), B-2(1-2ft), and B-3(1-2ft) were positioned to determine if releases

have occurred in this section of the building. The analytical data suggests that metals (antimony, lead, copper, and zinc) were released to the environment in this area. It is likely the release occurred during wire manufacturing activities. Low ETPH concentrations suggest that coal storage and combustion was not a major contributor of metals to the environment.

pAOC 5 - Interior Floor Stained Areas

The borings associated with pAOC-5 suggest that a release of ETPH and VOCs has occurred to the environment. B-4(4-6ft), B-5(4-6ft), and B-6(0-2ft) all contained VOCs and B-4 and B-6 contained ETPH detections. In particular, B-6(0-2ft) exhibited very high concentrations (310,000 $\mu\text{g/L}$) of TCE suggesting that a central use area may have been located in this location.

pAOC 6 - Exterior Areas of Stressed Vegetation and Soil Staining

The borings associated with pAOC-6 indicate that a release of ETPH, TCE, PCBs, and PAHs have occurred to the environment. ETPH and TCE concentrations were detected at varying concentrations throughout the exterior soils. PAHs and PCBs were found in discrete locations on the site. The concentrations of TCE at B-8 and B-11 suggest that excess TCE was dumped or spilled outside. Interior concentrations suggest a main interior use area. B-11 also contained PCBs, suggesting that they were commingled with the discarded TCE waste. The potential sources for PAHs include spills from petroleum products, fill and ash materials, and coal deposition.

pAOC 7 - Temporary Storage Area

As stated in the Section 5.8 *Deviations from the QAPP*, the original boring location to assess the temporary storage location was moved. The new location, B-18(3-4ft), was located directly outside the temporary storage location. This boring contained elevated concentrations of VOCs (TCE, PCE, toluene, and xylenes) suggesting a release to the

environment has occurred near the temporary storage area. Once again, these substances may have been dumped or spilled outside following interior industrial use.

SECTION 10 SUMMARY AND RECOMMENDATIONS Tighe&Bond

The objective of this Phase II ESA is to determine if there has been a release of petroleum products or hazardous substances to the environment at the pAOCs identified during the Phase I ESA. The information was evaluated to determine if a Phase III ESA is necessary to define the full nature and extent of contamination at the site. Ultimately, the recommendations and conclusions provided in this report will assist the Town of East Hampton to prioritize their redevelopment decision-making process. These decisions will reflect the Town's goals of protecting human health and the environment in addition to improving the economic vitality of the Village Center area.

This Phase II ESA has been performed in accordance with the *QAPP East Hampton Village Center* performed by Tighe Bond, Inc. dated May 2005. The QAPP was reviewed and approved by the Environmental Protection Agency (EPA) prior to conducting the Phase II ESA.

10.1 HYDROGEOLOGIC CHARACTERIZATION

According to the United States Geologic Survey Moodus Quadrangle 7.5 Minute Topographic Map the elevation of the site is approximately 400 feet above sea level. The contours found on the USGS topographic map indicates a slight elevation slope in a southwesterly direction. The shallow (less than eight feet in depth) subsurface geology consists of two distinct units as follows:

- Fill materials; and
- Medium to fine brown compacted sand.

Fill material, consisting of ash, coal, cinders, brick fragments, wood, and glass is found throughout the site at depths from the surface to 10 feet.

Bedrock was encountered between three and 12 feet below grade across the site (The bedrock in this area is classified as Brimfield Schist, based on the Connecticut

Geological Survey Bedrock Map. Brimfield Schist is gray, rusty weathering, medium to coarse grained inter-layered schist and gneiss. The bedrock observed on site was consistent with the Brimfield Schist designation.

Depth to groundwater was encountered between 13 to 15 feet below grade in the bedrock. The groundwater encountered in the bedrock appears to flow in a southwesterly direction toward Pocotopaug Creek.

10.2 CONTAMINANT CHARACTERIZATION

The on-site impacts are attributed to four factors:

- spills and chemicals releases during power production, wire manufacturing, and automobile repair;
- deposition of ash and coal fragments from historic coal combustion; and
- spills and chemical releases associated with automobile repair and storage.

The building was originally built in 1910 to serve as a coal fired boiler powerhouse for the Summit Thread Company. Coal was unloaded from the railroad cars into the coal pocket. On-site spills and chemical releases as a result of these operations are likely to have occurred. In addition, the deposition of ash and coal fragment from the powerhouse, as well as nearby industrial plants, is likely to have affected the on-site soil chemistry.

In 1943, the building changed ownership to the Artistic Wire Products Company. Artistic Wire Products Company also owned the manufacturing buildings to the north of the property (formerly Summit Thread). The Sanborn Fire Insurance Map from 1959 depicts the northern section of the building as a factory building. The specific manufacturing activities in the northern portion of the site is unknown. The southern portion of the building was used as storage.

Prior to the Town purchasing the property, it was the owned by Ghezzi Motors, Inc., an auto body and auto repair shop. Historic photographs and accounts document the storage of multiple junk cars and parts throughout exterior and interior locations of the site. It is likely that automobile repair activities took place both inside and outside of the facility. Automobile fluid is likely to have historically leaked from these automobiles at multiple locations. Four of seven pAOCs had confirmed releases to the environment:

pAOC 1 - Floor Drain

The investigation conducted during the Phase II ESA suggests that a release to the environment has occurred through the floor drain. Sediment sample, SED-1, had elevated concentrations of ETPH and VOCs (including TCE, toluene, xylene, and 1,2,4-trimethylbenzene). TCE was commonly used as a metal degreaser and was likely used during former autobody repair operations. ETPH, toluene, and xylene are likely indications of releases due to automobile repair activities and use of petroleum products.

pAOC 2 - 300-gallon AST Location

This soil samples collected during the Phase II investigation did not suggest a release has occurred near the storage location of the 300-gallon AST.

pAOC 3 - In-Ground Hydraulic Lift

The hydraulic fluid contained in the in-ground hydraulic lift was sampled for the presence of PCBs. The fluid did not contain detectable concentrations of PCBs. However, additional borings could not be installed near the hydraulic lift due to lack of access. Therefore, it is not possible to determine if the hydraulic lift has leaked fluid to the subsurface. Further investigation is required to address this data gap.

pAOC 4 - Former Coal Pocket Storage Area

The analytical data suggests that metals (antimony, lead, copper, and zinc) were released to the environment in this area. It is likely the release occurred during wire manufacturing activities. Copper concentrations were detected coincident with antimony concentrations indicating the source was wire production. ETPH concentrations do not support coal as a major contributor of metals in this area.

pAOC 5 - Interior Floor Stained Areas

The borings associated with pAOC-5 suggest that a release of ETPH and TCE has occurred to the environment. In fact, the detected concentrations at B-6 suggest a central TCE usage area in this part of the building. Low concentrations of TCE found throughout the building may suggest incidental releases during industrial practices. ETPH detections inside the building are most likely the result of autobody repair activities.

pAOC 6 - Exterior Areas of Stressed Vegetation and Soil Staining

The borings associated with pAOC-6 indicate that a release of ETPH, TCE, PCBs, and PAHs have occurred to the environment. The ETPH detections may be the result of automobile storage and repair activities that occurred at the exterior areas of the property. The TCE and PCBs are likely commingled wastes that were dumped or spilled outside the building. The PAHs can be from several sources including fill material, coal deposition, and/or petroleum releases.

pAOC 7 - Temporary Storage Area

Due to the presence of a subfloor beneath this section of the building, interior locations could not be accessed. The sample, B-18, collected immediately outside the temporary storage area contained detections of TCE of 22,000 and PCE at 870. These detections exceed the GA PMC and constitute a release to the environment. These solvents were dumped or spilled outside of the building during industrial and commercial activities.

10.3 GROUNDWATER IMPACTS

Only one constituent, TCE, was detected above applicable RSR criteria. TCE was detected above the GWPC in MW-1. It was detected at lower concentrations in the other two wells. The source of the TCE may be related to on-site metal degreasing and cleaning activities and automobile repair. It is likely the constituent has migrated through the subsurface into the groundwater. It is also possible that off-site sources of TCE exist due to the density of industry and the history of TCE contaminant in the area. Several metals were also detected in the groundwater samples but at concentrations below RSR criteria.

10.4 RECOMMENDATIONS

The Phase II Report has confirmed the release of COCs to the environment at four of the seven pAOCs identified during the Phase I ESA. The Town of East Hampton has expressed an interest in maintaining low intensity industrial operations at the site. A remedial action plan should be prepared to address the VOCs and petroleum hydrocarbons in the soil. Further delineation of soils containing metals and/or PCBs should be performed for possible off-site disposal. Soil vapor extraction (SVE) or similar in situ remediation technologies should be considered to address the volatile organics and petroleum hydrocarbons in the soil and groundwater. In addition, the Town of East Hampton should consider filing an environmental land use restriction (ELUR) for the property limiting or eliminating the need to conduct a Phase III ESA.

