TASK 210:
SURFICIAL SITE INVESTIGATION

GUILFORD AND CLINTON RAILROAD STATIONS
GUILFORD AND CLINTON, CONNECTICUT

ConnDOT Assignment No. 0400-3278
ConnDOT Project No. 0310-0007

Submitted to:

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Revised June 9, 2003
January 20, 2000
Project 99459

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1.0 INTRODUCTION

The Connecticut Department of Transportation (ConnDOT) retained GEI Consultants, Inc., Atlantic Environmental Division (GEI/Atlantic), to perform a Task 210 Surficial Site Investigation (SSI) at properties located at the Guilford Railroad Station (311 to 342 Whitfield Street) in Guilford, Connecticut and at the Clinton Railroad Station (between John Street and Hull Street) in Clinton, Connecticut. The subject site locations are depicted in Figures 1 and 2. ConnDOT has proposed the construction of elevated platforms and pedestrian track crossings (including elevators and handicapped ramps) at the Guilford Railroad Station, and elevated platforms at the Clinton Railroad Station (ConnDOT Project No. 0310-0007).

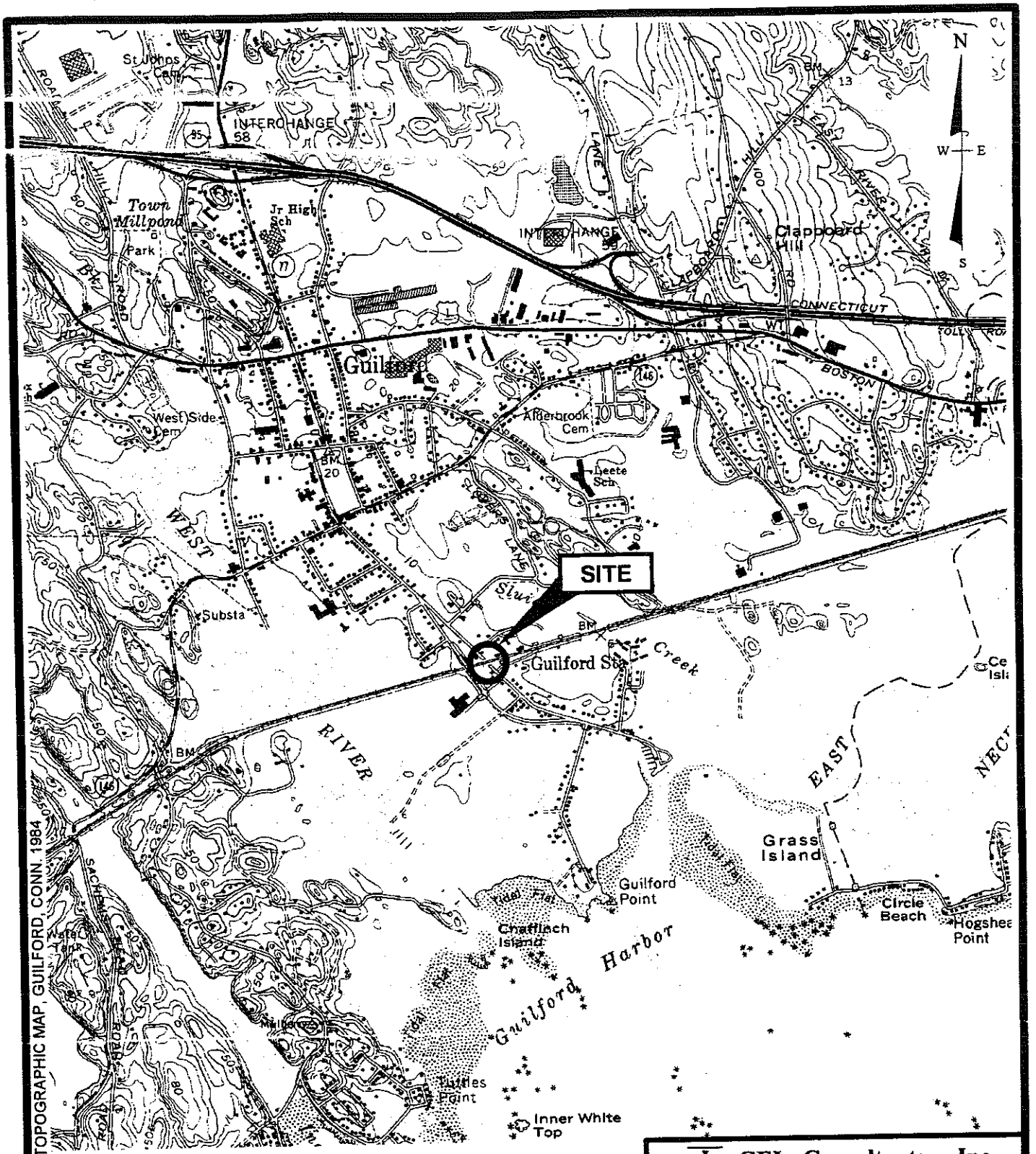
The purpose of the Task 210 SSI was to perform an investigation of the subject properties to assess the presence of on-site contamination in the general areas of proposed construction and to evaluate whether proposed construction activities may include the management of contaminated soil and dewatering liquids. This SSI includes surface-soil, subsurface-soil, and groundwater sampling and analysis. The proposed investigation program at this site is described in Section 4.0.

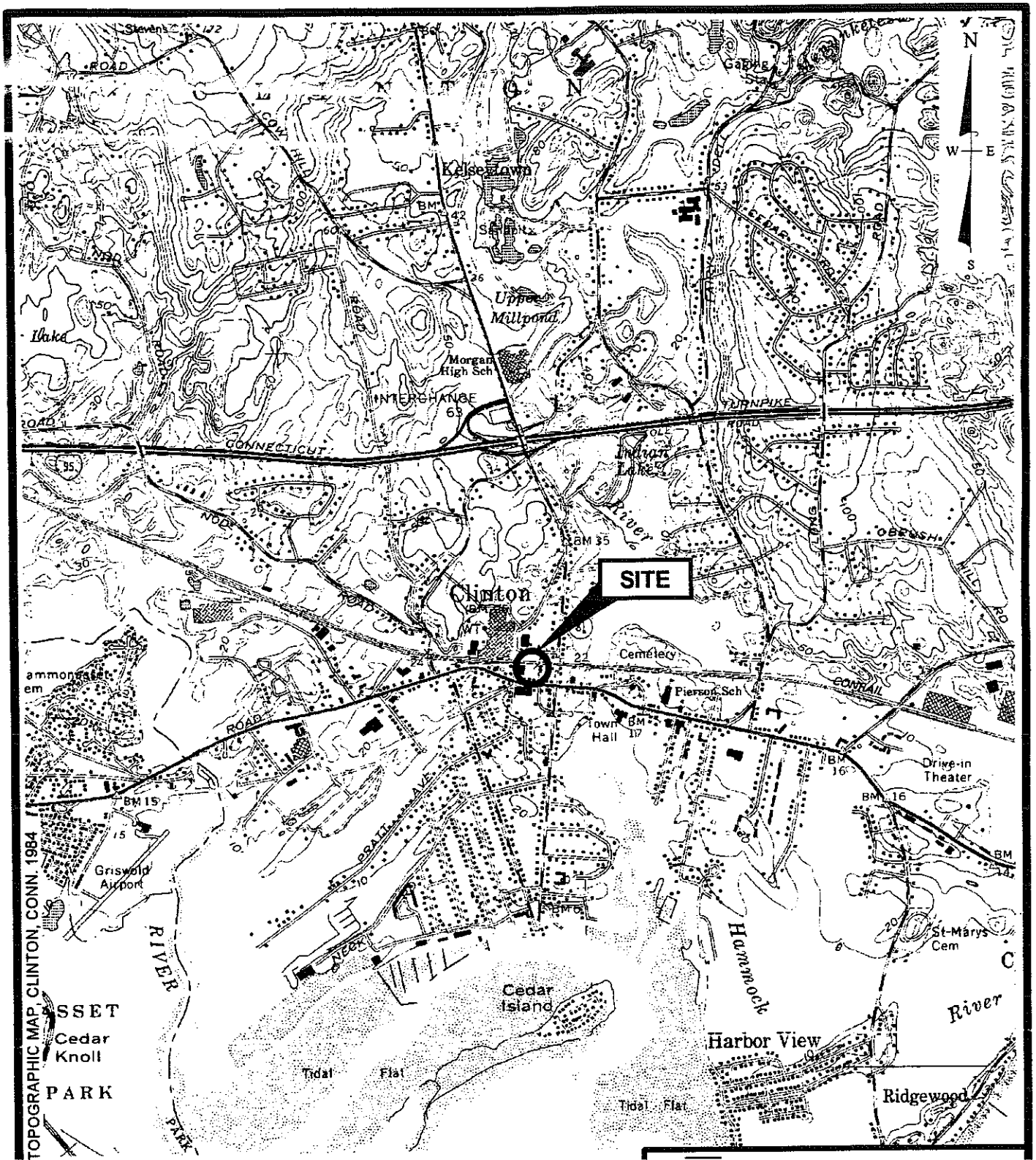
GEI/Atlantic previously conducted a Task 110 Corridor Land Use Evaluation (December 12, 1997) for the subject sites, which can be referenced for complete site information; summary information is presented herein.

Environmental concerns were noted at and adjacent to the Guilford and Clinton Railroad Stations. Environmental concerns at the Guilford Railroad Station are primarily related to the possible gasoline or petroleum underground storage tanks (USTs) located at an adjacent parcel, possible historic spills or applications (waste oil, pesticides and herbicides), and the unknown nature of fill material used within the railroad right-of-way (ROW). Environmental concerns at the Clinton Railroad Station are related to potential off-site sources of contamination from manufacturing and chemical waste handling; current and former automobile repair shops; a former dry cleaner; and a current gasoline station. Impacts from possible historic spills/applications (waste oils, pesticides, and herbicides) and the unknown nature of the fill material within the railroad ROW are also environmental concerns. This task was conducted in accordance with the Task 210, Surficial Site Investigation Work Plan, dated November 30,1999, which was based on proposed ConnDOT construction project descriptions and/or plans dated October 22, 1999 (prepared by T. Omstein at ConnDOT).

This document provides a brief description and history of the subject sites (Section 2.0); the local environment and geology of each site (Section 3.0); the field investigation methods and rationale (Section 4.0); a summary of the local geology encountered during drilling activities at each site (Section 5.0); a discussion of the hydrogeology of each site (Section 6.0); laboratory analytical results and evaluation of data (Section 7.0); a discussion of the local environment and receptors (Section 8.0); and the summary and conclusions (Section 9.0).

Dimensions are given in metric units, with the standard equivalents in parentheses. Exceptions are made where specific standard units are part of the historical or regulatory record (for instance, UST volumes, building dimensions), or are industry-standard specifications (e.g., well-screen length). A chart of equivalent units is provided as Appendix A.


SITE
Guilford
Guilford Sta
Town Millpond
Park
Jr High Sch
West Side Cem
Alderbrook Cem
Leete Sch
Clapboard Hill
INTERCHANGE 58
INTERCHANGE 59
CONNECTICUT
BOSTON
WEST
RIVER
EAST
Creek
Grass Island
Guilford Point
Chaffiach Island
Guilford Harbor
Circle Beach
Hogshee Point
Tuttles Point
Inner White Top
St Johns Cem
Water Tank
N
S
W
E
SOURCE: USGS TOPOGRAPHIC MAP, GUILFORD, CONN. 1984
600 300 0 600 1200
GRAPHIC SCALE IN METERS
2000 1000 0 2000 4000
GRAPHIC SCALE IN FEET
GEI Consultants, Inc.
ATLANTIC ENVIRONMENTAL DIVISION
FIGURE 1
SITE LOCATION MAP
CONNDOT PROJECT NO. 0310-0007
GUILFORD RAILROAD STATION
GUILFORD, CONNECTICUT
GE\CONNDOT\CLINTON\97616\110\SITELOC.PRE



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ATLANTIC ENVIRONMENTAL DIVISION

FIGURE 2
SITE LOCATION MAP

CONNDOT PROJECT NO. 0310-0007
CLINTON RAILROAD STATION
CLINTON, CONNECTICUT

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2.0 SITE DESCRIPTION AND HISTORY

2.1 Site Description

The Guilford Railroad Station is located at the intersection of Old Whitfield Street and the New York-New Haven Railroad ROW. According to the Town of Guilford Tax Assessor's office, the site is currently owned by the State of Connecticut and is utilized as a railroad station. The site consists of two active railroad tracks, a wooden waiting platform on the southern side of the railroad tracks, a one-story wooden structure on the northern side of the railroad tracks, and catenary structures with raised electrical lines within the railroad ROW. A bituminous paved parking area is located to the south of the railroad ROW. A gravel access road parallels the ROW on the north. A site schematic is provided in Figure 3.

The Clinton Railroad Station is located at the end of John Street Extension in the Town of Clinton, Connecticut. The site consists of the New York-New Haven Railroad ROW, including two active railroad tracks on a railroad bed and a wooden waiting platform on the southern side of the railroad tracks. A bituminous paved parking lot utilized for railroad commuter parking is located on the southern side of the ROW. A site schematic is provided in Figure 6.

2.2 Site History

The site history for each of the Guilford and Clinton Railroad stations is summarized as follows. The Guilford Railroad Station is currently occupied by the New York-New Haven Railroad and has been since at least 1868, according to aerial photographs and historic atlases. The Clinton Railroad Station is currently occupied by the New York-New Haven Railroad. Historically, the site has been used for a train station as indicated in an 1874 Middlesex County Atlas, historic Sanborn Fire Insurance (Sanborn) maps, and aerial photographs.

3.0 LOCAL ENVIRONMENT

3.1 Groundwater

Groundwater below and near the eastern portion of the Guilford Railroad Station (east of Whitfield Street) is classified by the Connecticut Department of Environmental Protection (CTDEP) as a GA groundwater area (Reference 1). The GA classification indicates groundwater within the area of influence of private and potential public water supply wells that is presumed suitable for direct human consumption without need for treatment. The state's goal is to maintain the quality of the drinking water.

Groundwater below and near the western portion of Guilford Railroad Station (west of Whitfield Street) and the Clinton Railroad Station is classified by the CTDEP as a GA groundwater area, but may not meet current standards (Reference 1). The GA classification indicates groundwater that may not be suitable for direct human consumption without treatment because of waste discharges, spills or leaks of chemicals, or land-use effects. The state's goal is to restore the groundwater to drinking water quality.

3.2 Surface Water

The land surface at the Guilford Railroad Station is generally flat. Surface water runoff is expected to flow west, via overland flow and other drainage pathways, to an unnamed tributary located 305± meters [1,000± feet] to the west of the subject site. This surface water is classified by the CTDEP as SB/SA, designating the waters for use as a marine fish, shellfish, and wildlife habitat, shellfish harvesting, for direct human consumption, recreation, and all other legitimate uses, including navigation (Reference 2). The SB/SA classification indicates that the water does not meet water quality criteria for one or more designated uses. The state's goal is Class SA.

The land surface at the Clinton Railroad Station is generally flat. Surface water runoff is expected to flow southwest, via overland flow and other drainage pathways, to an unnamed tributary that flows into the Hammonassett River, located 335± meters [1,100± feet] to the west of the subject site.

The unnamed tributary is unclassified, but the Hammonassett River is classified by the CTDEP as SB, designating the waters for marine fish, shellfish, and wildlife habitats, recreation, industrial supply, and other legitimate uses, including navigation (Reference 2). The SB classification indicates that the waters are known or presumed to meet water quality criteria for the designated uses. The state's goal is Class SB.

3.3 Water Supply

The Guilford Railroad Station is not supplied with potable water from public or private water supply wells. It is noted that one private residential well is located at 15 Driveway Street adjacent to the ROW, based on the Task 110 Corridor Land Use Evaluation (December 12, 1997). The remainder of the adjacent parcels are supplied with potable water by the Connecticut Water Company Guilford-Chester Division Guilford System (Reference 3).

The Clinton Railroad Station is not supplied with potable water from public or private water supply wells, based on the Task 110 Corridor Land Use Evaluation (December 12, 1997). Adjacent parcels are supplied with potable water by the Connecticut Water Company Guilford-Chester Division Guilford System (Reference 3).

Two public water supply wells are located 650± meters [2,115± feet] northwest of the Clinton Railroad Station (Reference 3).

No other public water supply wells located within a 1.6-kilometer (1.0-mile) radius were noted (Reference 3).

3.4 Bedrock Geology

According to the *1985 United States Geological Survey (USGS) Bedrock Geology Map of Connecticut*, the Guilford Railroad Station is indicated as having an unknown bedrock geology; however, based on the geology of the surrounding area, the site is believed to be underlain by Monson Gneiss. The Clinton Railroad Station is underlain by Clinton Granitic Gneiss, which is described as a pink biotitic granitic (quartz-monozonitic) gneiss.

3.5 Surficial Geology

According to the *1967 and 1968 USGS Map of the Surficial Geology of the Guilford Quadrangle, Connecticut,* the Guilford Railroad Station is underlain by outwash sediments. These sediments are described as sand and gravel, mainly with cut-and-fill stratification, grading up-valley into ice-contact stratified drift. The Clinton Railroad Station is underlain by sand. This unit is described as composed as mainly coarse to fine sand, commonly in well-sorted layers. Coarser layers may contain up to 25% gravel particles. Finer layers may contain some very fine sand, silt, and clay.

Site-specific geology and hydrology are provided in Sections 5.0 and 6.0 of this report.

4.0 FIELD INVESTIGATION

4.1 Objective

The objective of this investigation was to conduct a screening level investigation (SSI) to assess the presence of contamination within the proposed construction areas. Surface-soil, subsurface-soil, and groundwater sampling and analysis was conducted to investigate these sources. This investigation did not assess the potential for contaminant sources outside the construction area. The field aspects of this investigation were conducted on December 7, 1999 and December 8, 1999 by Lynn Willey of GEI/Atlantic.

Based upon the results of a Task 110, Corridor Land Use Evaluation (dated December 12, 1997), the following areas of potential environmental concern were noted.

Environmental concerns at the Guilford Railroad Station are related to the potential historic applications of herbicides, pesticides, and waste oils along the railroad ROW for pest and weed controls, and the unknown characteristics of the on-site fill materials used in the construction of the railroad (Parcel 11). In addition, an adjacent parcel (Parcel 6) has potential environmental concerns related to two petroleum USTs that could potentially impact the construction area.

Environmental concerns at the Clinton Railroad Station are related to the potential historic applications of herbicides, pesticides, and waste oils along the railroad ROW for pest and weed controls, and the unknown characteristics of the on-site fill materials used in the construction of the railroad (Parcel 10). In addition, potential environmental concerns noted at parcels adjacent to the proposed Clinton Railroad Station are summarized as follow:

- Parcel 1 (located to the south of the proposed work area) is currently occupied by Jerry's Auto (automobile repair shop) and plastics manufacturing;
- Parcel 3 (to the south of the proposed construction area) was previously occupied by Parkside Cleaners (former tenant);
- Parcel 4 (located to the south of the proposed construction area) has a current commercial tenant;
- Parcel 6 (located to the west of the proposed construction area) is currently and has historically been a gasoline service station;
- Parcel 7 (located to the west of the proposed work area) is currently a feed and hardware store and has potential environmental concerns with on-site storage of paints, solvents and hazardous material; and
- Parcel 9 (located to the north of the proposed work area) is currently occupied by Cheseborough Ponds, Inc., has potential on-site manufacturing/chemical waste handling activities, and has been a manufacturing facility since 1884. These parcels are all in close proximity to the proposed construction area and could potentially impact the area.

4.2 Sampling Plan and Rationale

This subsection provides an overview of the site sampling plan, including the rationale for sampling locations and individual sample selection for laboratory analysis. Sample locations are shown in

Figures 3 and 4. Sample locations were field measured from existing mapped structures and translated onto mapped information using CAD. The rationale for the placement of sample locations is summarized in Table 1.

4.3 Field Investigation and Sampling Methods

4.3.1 Subsurface-Soil Sampling

The drilling subcontractor, Earth Technologies Incorporated, completed the boring work on December 7 and 8, 1999. Lynn Willey of GEI/Atlantic was on site to monitor the test boring and temporary groundwater monitoring well installation activities.

4.3.1.1 Geoprobe™ Sampling

Subsurface-soil samples (GP-1 to GP-4, GP-10, and GP-12) were collected using a truck-mounted, direct-push (Geoprobe™) drilling rig. Samples were collected continuously from the ground surface to the final depth of each boring using a 4-foot long, approximately 2-inch diameter, stainless-steel macro-core sampling tube with an acetate disposable sleeve insert. At sampling locations that were overlain by pavement, sampling began immediately beneath the pavement and any underlying gravels. Soil samples were collected by driving the macro-core sampling tube equipped with a dedicated acetate liner into the soil. The soil samples were collected within the acetate liner, which was subsequently removed from the core and opened using a utility knife. The soil samples were then logged, screened, and sampled for laboratory analysis. After the completion of each boring, drillers decontaminated the macro-core sampling device with tap water and detergent wash followed by a tap water rinse.

Sampling locations were generally coincident with the proposed locations within the Task 210 work plan; however, some exceptions were noted. At the Guilford Railroad Station, GP-1 was offset 1.5± meters (0.457± foot) to the west of its proposed location because an automobile covered the proposed location. GP-3 was moved 21± meters [70± feet] east of its proposed location because the proposed GP-3 location did not appear to be cleared for underground utilities.

Table 1
Sampling Rationale

Sample ID	Sample Location/ Rationale	Sample Designations (Sample Depth in feet)	Selected Soil Sample Interval Rationale	Sample Type		Analysis[1]					
				Soil	Water	VOCs[2]	SVOCs[3]	Metals[4] (SPLP & Total)	TPH[5]	PCB[6]/ Pest-icides[7]	Herb-icides[8]
Temporary Geoprobe ™ Microwells											
Guilford Railroad Station											
GP-1	Located on the northern side of the railroad ROW adjacent to the one-story wooden structure/To screen soils and groundwater in proposed elevator and overpass construction area.	GP-1 (0-4)	Black-stained soils and fill material (coal dust, fragments, and ash) noted, and PID reading	•		•	•	•	•		
		GP-1 (4-8)	Highest PID reading and approximate groundwater table	•		•					
		GW-1	Screen groundwater in proposed construction area for potential construction dewatering		•	•	•	•			
Geoprobe ™ Borings											
Guilford Railroad Station											
GP-2	Located on the southern side of the railroad ROW adjacent to the current wooden waiting platform	GP-2 (0-4)	Black-stained soils noted and PID reading	•			•	•	•		
		GP-2 (4-8)	Approximate groundwater table	•		•					
GP-3	Located on the northern side of the railroad ROW chain-link fence/To screen soils adjacent to proposed elevated platform construction area for possible applications of waste oils/herbicides/ pesticides and to describe fill material.	GP-3 (0-4)	Black-stained soils and fill material (coal fragments) and PID reading	•		•	•	•	•	•	•
GP-4	Located in the paved railroad parking area south of the railroad ROW/To screen soils in the proposed elevated platform construction area for possible historic applications of waste oils/ herbicides/pesticides and to describe fill material.	GP-4 (0-4)	Black-stained soils and fill material (coal fragments)	•		•	•	•	•	•	•

Table 1 (continued)
Sampling Rationale

Sample ID	Sample Location/ Rationale	Sample Designations (Sample Depth in feet)	Selected Soil Sample Interval Rationale	Sample Type		Analysis[1]					
				Soil	Water	VOCs[2]	SVOCs[3]	Metals[4] (SPLP & Total)	TPH[5]	PCB[6]/ Pest-icides[7]	Herb-icides[8]
Clinton Railroad Station											
GP-9	Located south of the railroad ROW within the commuter parking lot/To screen soils in the proposed elevated platform construction area for possible historic impacts from waste oil/ herbicide/pesticide applications and to characterize the unknown nature of the fill material.	GP-9 (0-1)	Black-stained soils and artificial fill material (slag)	●		●	●	●	●	●	●
GP-10	Located on the northern portion of the railroad ROW/To screen shallow soils in the proposed elevated platform construction area for possible historic applications of waste oils and to address the unknown nature of fill within the ROW.	GP-10 (0-4)	Black-stained soils and some fill material (slag) noted	●		●	●	●	●		
GP-11	Located on the northern portion of the railroad ROW/To screen shallow soils in the proposed elevated platform construction area for possible historic applications of waste oils and to address the unknown nature of fill within the ROW.	GP-11 (0-1)	Black-stained soils	●		●	●	●	●		
GP-12	Located south of the railroad ROW within the commuter parking lot/To screen soils in the proposed elevated platform construction area for possible historic impacts from waste oil/ herbicide and pesticide applications and to characterize unknown nature of the fill material.	GP-12 (0-4)	Black-stained soils	●		●	●	●	●	●	●
Surface-Soil Samples											
Guilford Railroad Station											
SS-1	Located within the south side of the railroad ROW/To screen railroad ballast and ROW surficial materials for possible historic applications of waste oil/pesticides/ herbicides.	SS-1 (0.0-0.5)	Black-stained soils	●		●	●	●	●	●	●

Table 1 (continued)
Sampling Rationale

Sample ID	Sample Location/ Rationale	Sample Designations (Sample Depth in feet)	Selected Soil Sample Interval Rationale	Sample Type		Analysis[1]					
				Soil	Water	VOCs[2]	SVOCs[3]	Metals[4] (SPLP & Total)	TPH[5]	PCB[6]/ Pest-icides[7]	Herb-icides[8]
Clinton Railroad Station											
SS-3	Located within the south side of the railroad ROW/To screen railroad ballast and ROW surficial materials for possible historic applications of waste oil/pesticides/ herbicides.	SS-3 (0.0-0.5)	Black-stained soils	•		•	•	•	•	•	•

Notes:
1. All test methods specified are from EPA SW-846 test methods.
2. VOCs refers to aromatic and chlorinated volatile organic compounds (EPA Method 8021B).
3. SVOCs refers to semivolatile organic compounds (EPA Method 8270 modified).
4. Resource Conservation Recovery Act (RCRA) Metals analyzed are as follow: arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver. SPLP refers to Synthetic Precipitation Leaching Procedure (EPA Method 1312), which was completed on soils only.
5. TPH refers to total petroleum hydrocarbons (EPA Method 418.1).
6. PCB refers to polychlorinated biphenyl (EPA Method 8082).
7. Pesticides were completed by EPA Method 8081A.
8. Herbicides were completed by EPA Method 8151A.

At the Clinton Railroad Station, the GP-9 and GP-11 locations were completed with a hand auger to a depth of 0.3048 meter [1 foot] because of limited space within the railroad ROW. The GP-10 and GP-12 locations were offset 1.8 meters (6 feet) to the south from their proposed locations because of the limited space for the Geoprobe™ drilling rig within the ROW. The proposed temporary monitoring well at the Clinton Railroad Station was not completed because groundwater was not encountered at the proposed boring depth of 1.22± meters [4± feet] below ground surface (bgs).

No other exceptions to the Task 210 work plan were noted.

4.3.1.2 Soil Sample Selection

Each soil sample collected was visually examined and logged in the field by GEI/Atlantic personnel. Each soil sample was screened for total volatile organic compounds (VOCs) using an organic vapor analyzer equipped with a photoionization detector (PID). This instrument was calibrated daily prior to the start of work. Soil samples were selected for laboratory analysis based on visual evidence of contamination, PID screening results, any odors observed, the water table interface, and observed geologic features that may affect the migration of contaminants in the soil. If soils from a particular sampling location did not exhibit any evidence of contamination, then the sample corresponding with the water table interface or from a depth consistent with the proposed construction activity was typically submitted for analysis.

Observations made during the soil sample collection revealed black staining and artificial fill at the Guilford and Clinton Railroad Stations. Black staining of soils was observed in subsurface soils in GP-1, GP-2, GP-3, and GP-4 at the Guilford Railroad Station; and GP-9 GP-10, GP-11, and GP-12 at the Clinton Railroad Station. Artificial fill (slag, or coal fragment and dust, brick fragments or ash) was noted in GP-1, GP-3, and GP-4 (Guilford Railroad Station); and GP-9 and GP-10 at the Clinton Railroad Station. No odors were noted during the collection of these soil samples. PID detections were noted in GP-1, GP-2, and GP-3. A summary of subsurface-soil selection rationale and laboratory samples submitted to the laboratory is presented on Table 1. See boring logs in Appendix B for a complete description of subsurface soils.

4.3.1.3 Decontamination Procedures

To prevent cross contamination between sampling rounds, the Geoprobe™ macro-corer and other sampling tools used to collect samples as indicated in subsequent sections of this report were decontaminated in accordance with GEI/Atlantic Standard Operating Procedures (SOPs). Soil samples were collected in accordance with GEI/Atlantic SOPs.

4.3.2 Groundwater Sampling Methods

During the subsurface-soil sampling program, temporary 1-inch diameter microwells were installed into select boring annuli. The well material consists of a 5-foot length of 0.015-inch slotted polyvinyl chloride (PVC) pipe fitted with solid PVC riser to the surface.

Prior to sampling, the temporary wells were evacuated of approximately three well volumes or pumped until dry. A groundwater sample was collected for analysis of VOCs, semivolatile organic compounds (SVOCs), and RCRA-8 metals using a peristaltic pump and dedicated tubing.

A groundwater sample for metals analysis was collected in the same manner as the SVOCs and were field preserved using laboratory grade nitric acid. Groundwater was not filtered from the temporary monitoring wells in order to assess groundwater as possible construction dewatering liquids at the site.

A groundwater sample collected from GW-1 (Guilford Railroad Station) was clear to slightly cloudy. No sheening, product, or odors were noted.

4.3.3 Surface-Soil Sampling

Surface-soil sampling and analysis was conducted to screen for potential contamination from herbicide/pesticide application, spills, and possible waste oil application, and to characterize railroad ballast material within the railroad ROW. The number of samples and rationale for collection are summarized in Table 1. Samples were collected in accordance with GEI/Atlantic SOPs.

Surface-soil samples were collected using a stainless-steel sampling spoon which was decontaminated between sampling events according to GEI/Atlantic SOPs. Samples were collected from the surface to a depth of 0.013± meter [0.5± foot].

Observations made during the collection of surface soil revealed black-stained soils at SS-1 (Guilford Railroad Station) and SS-3 (Clinton Railroad Station). No odors or detections were observed on the PID during the collection of these soil samples.

4.4 Laboratory Analysis

All soil and groundwater samples collected for analysis were placed into an ice-filled cooler immediately after collection. Samples selected for laboratory analysis were recorded on chain-of-custody forms which are included in Appendix C. Samples were preserved with ice and delivered by GEI/Atlantic personnel to Environmental Science Corporation laboratory on December 7 and December 9, 1999.

Samples collected for laboratory analysis were analyzed as specified in Table 1. VOCs and SVOCs were selected for analysis because they comprise chemicals contained in solvents, degreasers, and petroleum products, all of which are commonly associated with areas of potential chemical releases. The metals selected for analysis (arsenic, barium, cadmium, chromium, lead, mercury, selenium, and silver) have been identified by the United States Environmental Protection Agency (EPA) as common metal contaminants. Polychlorinated biphenyls (PCBs) were selected for analysis because of unknown characteristics of on-site fill, hydraulic fluids, and waste oils. Total petroleum hydrocarbon (TPH) analysis was conducted because it can provide an indication whether petroleum-

related product is present. Pesticide and herbicide analysis was completed to address potential historic applications of pesticides and herbicides within the proposed construction area.

5.0 GEOLOGY

Generally, the geology encountered during the SSI was consistent with the geology described within subsection 3.5, Surficial Geology.

Generally, soils encountered at the Guilford Railroad Station included very fine to medium, well-sorted sand with some horizontal bedding noted. Sands were encountered at 0.3 to 0.61± meter [1 to 2± feet] bgs to a maximum depth of 3.0± meters (10± feet). In addition, artificial fill (including coal fragments, coal dust or ash) was encountered in GP-1, GP-2, GP-3, and GP-4 borings from the ground surface to 0.61± meters [2± feet] bgs. See boring logs (GP-1, GP-2, GP-3, and GP-4) in Appendix B for a full description of the logged soils from the Guilford Railroad Station.

Soils collected from the Clinton Railroad Station included fine to medium sand from the ground surface to a maximum depth of 1.2± meters (4 feet). Artificial fill (slag) was noted in GP-9 and GP-11 from the ground surface to 0.3± meter (1± feet). See boring logs (GP-9, GP-10, GP-11, and GP-12) in Appendix B for a full description of the logged soils from the Clinton Railroad Station.

6.0 HYDROLOGY

6.1 Groundwater Flow Direction

The land surface at the Guilford Railroad Station is generally flat. Surface water runoff is expected to flow west, via overland flow and other drainage pathways, to an unnamed tributary located 305± meters [1,000± feet] to the west of the subject site. Groundwater was encountered at 1.20± meters [4 feet] bgs at the site.

The land surface at the Clinton Railroad Station is generally flat. Surface water runoff is expected to flow southwest, via overland flow and other drainage pathways, to an un-named tributary that flows into the Hammonassett River, located 335 ± meters [1,100± feet] to the west of the subject site. No groundwater was encountered to 1.2± meters [4± feet] bgs at the site.

7.0 LABORATORY ANALYTICAL RESULTS

7.1 CTDEP Cleanup Criteria

7.1.1 Overview and Applicability

Analytical results for soils and groundwater obtained during this investigation were compared to the Connecticut Remediation Standard Regulations (RSRs) (January 1996) developed by the CTDEP. The cleanup standards are summarized herein, but the actual referenced document should be consulted for complete details.

The CTDEP's intent in developing these regulations is to define: minimum remediation performance standards, specific numeric cleanup criteria, and a process for establishing an alternative site-specific standard.

The regulations apply at any action taken to remediate polluted soil, surface water, or a groundwater plume at or emanating from a release area, provided that the remedial action is: (1) required pursuant to Chapter 445 (Hazardous Waste) or 446K (Water Pollution Control) of the Connecticut General Statutes; or (2) undertaken pursuant to the voluntary cleanup provisions of Public Act 95-183 or 95-190; including, but not limited to, 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 standards do not apply to: (1) the soil and water within the zone of influence of a groundwater discharge permitted under Section 22a-430 CGS; or (2) a release which has been remediated and which remediation has been approved in writing by the CTDEP.

7.1.2 Soil Cleanup Criteria

The CTDEP soil remediation goals integrate two soil cleanup criteria: (1) Direct Exposure Criteria (DEC) to protect human health and the environment from risks associated with direct exposure to pollutants in contaminated soil; and (2) Pollutant Mobility Criteria (PMC) to protect groundwater quality from pollutants that migrate 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. The CTDEP cleanup criteria also include a requirement that contaminated soils which pose an ecological risk be remediated on a case-by-case basis.

Direct Exposure Criteria (DEC). Specific numeric exposure criteria for a broad range of pollutants in soil have been established by CTDEP, based on exposure assumptions relative to incidental ingestion of pollutants in soils and dermal contact with soils. The DEC apply to accessible soil to a depth of 15 feet. The DEC for substances other than PCBs do not apply to inaccessible soil at a release area provided that an environmental land-use restriction

(ELUR) is in effect with respect to the subject parcel. Refer to the cleanup regulations for specific requirements regarding PCB-contaminated soil. Inaccessible soil generally means polluted soil which is: (1) more than 4 feet bgs; (2) more than 2 feet below a paved surface comprised of a minimum of 3 inches of bituminous concrete or concrete; (3) beneath an existing building; or (4) beneath another permanent structure(s) approved by the Commissioner. Inaccessible soil cannot be exposed by excavation, demolition, or construction activities without written approval from the Commissioner.

CTDEP has established two sets of DEC using exposure assumptions appropriate for residential land use or for industrial and certain commercial land use. In general, all sites are required to be cleaned up to the residential criteria. An industrial/commercial site (in lieu of meeting the residential standards) may meet the industrial land-use criteria, if an ELUR is in effect with respect to such parcel.

Pollutant Mobility Criteria (PMC). 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 sites within GB-classified areas, the PMC are applicable to all soils from the ground surface to the seasonal high water table. The PMC or an appropriate alternative criteria may also be applied to soils below the water table if such soils constitute an ongoing source of groundwater pollution and if remediation of such soils is technically practicable. 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 site which ensures that such soils will not be exposed as a result of demolition of the building or other activities. Environmentally isolated soils are defined as contaminated soils beneath an existing building (or other permanent structure, as approved by the Commissioner) which are not a source of ongoing pollution. "Urban fill" material (coal or wood ash, or asphalt fragments) may also be exempt from the PMC in certain cases.

A substance, other than an inorganic substance or PCB, in soil shall be remediated to at least that concentration at which the results of a mass analysis of soil for such substance does not exceed the PMC applicable to the groundwater classification (GA such as the site) of the area in which the soil is located. An inorganic substance or PCB in soil shall be remediated to at least that concentration in which the results of a toxicity characteristic leaching procedure (TCLP) or synthetic precipitation leaching procedure (SPLP) analysis of such soil for such substance does not exceed the PMC applicable to the groundwater classification of the area in which the soil is located. If certain conditions are met, a site in a GA area need only be remediated to GB standards.

7.1.3 Groundwater Remediation Standards

Similar to remediation standards for soil, groundwater remediation requirements are dependent upon the groundwater classification. The objectives of these standards are to: (1) protect and preserve groundwater in GA areas as a natural resource; (2) protect existing use of groundwater regardless of the area's groundwater classification; (3) prevent further degradation of groundwater quality; (4) prevent degradation of surface water from discharges of contaminated groundwater; and (5) protect human health.

The Groundwater Remediation Standards regulate remediation of groundwater based on each substance present in a plume and by each distinct plume of contamination. Several factors influence the remediation goal at a site, including background groundwater 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)
- Volatilization Criteria (VC)

Groundwater Protection Criteria. The GWPC apply to all groundwater in a GA-classified area. The GWPC ensure that groundwater contamination resulting from on-site sources which exceeds background is remediated to levels that adequately protect its designated use as an existing or potential supply of water suitable for drinking without treatment. In general, compliance with GWPC is achieved when the concentration of all substances in a plume is less than the GWPC.

Surface Water Protection Criteria. The SWPC apply to all groundwater which discharges to surface water. The SWPC ensure that groundwater contamination resulting from on-site sources which exceeds background is remediated to levels that adequately protect the surface water quality. SWPC are based on Connecticut's water quality standards which are protective of both human health and the environment. In general, compliance with the SWPC is achieved when the average concentration of a compound in groundwater emanating from a site is less than the SWPC established by the CTDEP.

Volatilization Criteria. The VC apply to all groundwater polluted with a volatile organic substance within 15 feet of the ground surface or a building. According to the regulations, the volatile organic substance of concern will be remediated to a concentration which is equal to or less than the applicable residential VC for groundwater. If groundwater polluted with a volatile organic substance is below a building used solely for industrial or commercial activity, groundwater may be remediated to 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 also must ensure that

the parcel (or portion thereof beneath the building) will not be used for any residential purpose in the future and that any future use is limited to industrial or commercial activity. There are a number of exceptions to the VC under the RSRs.

In GA-classified areas, the remediation goal is generally the background concentration and compliance with the SWPC and VC. Background concentration for a compound in groundwater at a site is defined as the concentration of that compound in groundwater (immediately upgradient of the contamination plume) that is not affected by any release of pollutants on or related to the site.

Groundwater in a GA area can be remediated to the numerical GWPC, rather than background, under one of two scenarios, as follow.

- When the following conditions are met.
  - Groundwater background concentration is less than or equal to the GWPC.
  - A public water supply system is available within 200 feet of the site.
  - The site is not located within an aquifer protection area.
  - The site is not located within an area of influence associated with a public water supply well.

Or:

- **If prior to remediation, the maximum concentration in the plume is less than or equal to the GWPC.**

The objective of groundwater remediation in a **GB-classified area** is compliance with the SWPC and VC background levels. In addition, concentrations must be such that the groundwater plume does not interfere with any existing uses of the groundwater.

7.2 Evaluation of Data

7.2.1 Soil Sample Analytical Results

Ten subsurface-soil samples and two surface-soil samples were collected from the proposed construction areas at the Guilford and Clinton Railroad Stations. Eleven of the soil samples were submitted for VOCs; ten soil samples were submitted for SVOCs, RCRA-8 total metals, RCRA-8 SPLP metals, and TPH; and six soil samples were submitted for PCB, pesticide, and herbicide analyses. Soil sample laboratory test results are summarized in Table 2, which provides a comparison between the detected concentrations and the CTDEP RSRs. Laboratory analytical results are provided in Appendix C. Analytical results above applicable CTDEP RSR criteria are displayed on Figure 3 and 4.

Volatile Organic Compounds

Laboratory analytical results completed on soil samples reveal that VOCs were detected in 11 soil samples from the Guilford and Clinton Railroad Stations.

Table 2
Soil Analytical Results
Guilford and Clinton Railroad Stations
Guilford and Clinton, Connecticut

Substance	CTDEP Criteria					Sample ID/Depth (feet) Guilford Railroad Station						
	RDEC (ppm)	IDEC (ppm)	GA PMC (ppm)	RVC (ppm)	IVC (ppm)	GP-1 (0-4)	GP-1 (4-8)	GP-2 (0-4)	GP-2 (4-8)	GP-3 (0-4)	GP-4 (0-4)	SS-1 (0-0.5)
Volatile Organic Compounds (VOCs) (ppm)												
Chloroform	100	940	0.12	4.5	10.4	0.0012	ND	NA	ND	ND	ND	ND
Dichlorodifluoromethane	---	---	---	---	---	0.013	0.0031	NA	0.0032	0.01	0.023	0.0081
Methylene chloride	82	760	0.1	1200	2907	0.014	0.0033	NA	0.005	0.022	0.034	0.013
Tetrachloroethene	12	110	0.1	1500	3820	ND	ND	NA	ND	ND	ND	ND
Semivolatile Organic Compounds (SVOCs) (ppm)												
Acenaphthylene	1000	2500	8.4	---	---	ND	NA	0.27	NA	ND	ND	ND
Benz(a)anthracene	1	7.8	1	---	---	ND	NA	0.7	NA	1.2	2.5	ND
Benzo(b)fluoranthene	1	7.8	1	---	---	ND	NA	0.78	NA	1.3	2.8	ND
Benzo(k)fluoranthene	8.4	78	1	---	---	0.2	NA	1.1	NA	1.8	3.3	ND
Benzo(a)pyrene	1	1	1	---	---	ND	NA	0.22	NA	ND	ND	ND
Chrysene	84	780	1#	---	---	0.2	NA	0.94	NA	1.6	3.7	ND
Fluoranthene	1000	2500	5.6	---	---	0.3	NA	1.4	NA	2.1	7.1	ND
Indeno(1,2,3-cd)pyrene	1#	7.8	1#	---	---	ND	NA	0.29	NA	ND	ND	ND
Phenanthrene	1000	2500	4	---	---	ND	NA	0.42	NA	1.2	2.7	ND
Pyrene	1000	2500	4	---	---	0.31	NA	1.4	NA	2.2	6.0	ND
Total Metals (ppm)												
Arsenic	10	10	---	---	---	2.64	NA	29.7	NA	4.51	57.5	16.9
Barium	4700	140000	---	---	---	37.4	NA	57.2	NA	82.2	75.8	43.3
Cadmium	34	1000	---	---	---	0.593	NA	0.763	NA	0.511	0.797	0.601
Chromium	100*	100*	---	---	---	13.2	NA	13.2	NA	9.4	17.3	8.8
Lead	500	1000	---	---	---	75	NA	62.1	NA	84.6	99.3	66.1
Mercury	20	610	---	---	---	ND	NA	ND	NA	ND	ND	0.59
SPLP Metals (ppm)												
Arsenic	---	---	0.05	---	---	ND	NA	ND	NA	ND	ND	ND
Barium	---	---	1	---	---	0.05	NA	0.12	NA	0.06	ND	0.04
Chromium, total	---	---	0.05	---	---	ND	NA	ND	NA	ND	0.02	ND
Lead	---	---	0.015	---	---	0.03	NA	0.02	NA	ND	ND	0.01
Total Petroleum Hydrocarbons (TPH) (ppm)												
TPH	500	2500	500	---	---	ND	NA	5	NA	ND	38	32
Polychlorinated Biphenyls (PCBs) (ppm)												
Total PCBs	1	10	0.0005	---	---	NA	NA	NA	NA	ND	ND	ND
Chlorinated Herbicides (ppm)												
Total Herbicides	---	---	---	---	---	NA	NA	NA	NA	ND	ND	ND
Pesticides (ppm)												
Total Pesticides	---	---	---	---	---	NA	NA	NA	NA	ND	ND	ND

Table 2 (continued)
Soil Analytical Results
Guilford and Clinton Railroad Stations
Guilford and Clinton, Connecticut

Substance	CTDEP Criteria RDEC (ppm)	IDEC (ppm)	GA PMC (ppm)	RVC (ppm)	IVC (ppm)	Sample ID/Depth (feet) Clinton Railroad Station GP-9 (0-1)	GP-10 (0-4)	GP-11 (0-1)	GP-12 (0-4)	SS-3 (0-0.5)
Volatile Organic Compounds (VOCs) (ppm)										
Chloroform	100	940	0.12	4.5	10.4	ND	ND	ND	ND	ND
Dichlorodifluoromethane	---	---	---	---	---	0.016	0.0045	0.024	0.072	0.0078
Methylene chloride	82	760	0.1	1200	2907	0.021	0.0084	0.024	0.03	0.016
Tetrachloroethene	12	110	0.1	1500	3820	ND	0.0012	ND	ND	ND
Semivolatile Organic Compounds (SVOCs) (ppm)										
Acenaphthylene	1000	2500	8.4	---	---	ND	ND	ND	ND	ND
Benz(a)anthracene	1	7.8	1	---	---	**2.0**	ND	ND	ND	ND
Benzo(b)fluoranthene	1	7.8	1	---	---	**2.5**	ND	ND	ND	ND
Benzo(k)fluoranthene	8.4	78	1	---	---	**2.9**	ND	**1.8**	ND	ND
Benzo(a)pyrene	1	1	1	---	---	ND	ND	ND	ND	ND
Chrysene	84	780	1#	---	---	**2.5**	ND	ND	ND	ND
Fluoranthene	1000	2500	5.6	---	---	3.9	ND	2.0	0.17	0.18
Indeno(1,2,3-cd)pyrene	1#	7.8	1#	---	---	ND	ND	ND	ND	ND
Phenanthrene	1000	2500	4	---	---	ND	ND	ND	ND	ND
Pyrene	1000	2500	4	---	---	3.8	ND	1.7	0.17	0.2
Total Metals (ppm)										
Arsenic	10	10	---	---	---	6.09	0.855	2.99	1.42	1.29
Barium	4700	140000	---	---	---	54	23	58	27.4	25.7
Cadmium	34	1000	---	---	---	0.939	ND	0.81	ND	ND
Chromium	100*	100*	---	---	---	15.3	5.4	7.0	7.7	4.5
Lead	500	1000	---	---	---	103	15.1	62.1	26.4	25.8
Mercury	20	610	---	---	---	ND	ND	ND	ND	ND
SPLP Metals (ppm)										
Arsenic	---	---	0.05	---	---	ND	ND	ND	ND	ND
Barium	---	---	1	---	---	ND	ND	ND	0.01	ND
Chromium, total	---	---	0.05	---	---	ND	ND	ND	ND	ND
Lead	---	---	0.015	---	---	**0.02**	ND	0.01	ND	ND
Total Petroleum Hydrocarbons (TPH) (ppm)										
TPH	500	2500	500	---	---	12	ND	39	5	ND
Polychlorinated Biphenyls (PCBs) (ppm)										
Total PCBs	1	10	0.0005	---	---	ND	NA	NA	ND	ND
Chlorinated Herbicides (ppm)										
Total Herbicides	---	---	---	---	---	ND	NA	NA	ND	ND
Pesticides (ppm)										
Total Pesticides	---	---	---	---	---	ND	NA	NA	ND	ND

Notes:

Only those compounds detected are shown.
ppm - indicates parts per million.
RDEC - Residential Direct Exposure Criteria.
IDEC - Industrial/Commercial Direct Exposure Criteria
GA PMC - Pollutant Mobility Criteria for GA Groundwater Area.
SPLP - Synthetic Precipitation Leaching Procedure.
--- - indicates no applicable CTDEP-established criteria.
NA - Indicates compound was not analyzed.
ND - indicates analyte was not detected
- criterion is based upon detection limits.
* - indicates no established RDEC or IDEC for total chromium. For comparison, CTDEP-established values for hexavalent chromium were used.
Shading/Bolding indicates the analyte concentration exceeds CTDEP-established criterion.
A criterion of 1 ppm using mass analysis may be used to assess PCB impacts for pollutant mobility.

Prepared by: MP
Checked by: LEW

Guilford Railroad Station. All detections of VOCs were well below the established CTDEP RSR criteria for the constituents detected in soil samples.

Clinton Railroad Station. All detections of VOCs were well below the established CTDEP RSR criteria for the constituents detected in soil samples.

Semivolatile Organic Compounds

Laboratory analysis indicates that SVOCs were detected in eight soil samples from the Guilford and Clinton Railroad Stations.

Guilford Railroad Station. Laboratory analysis indicates that SVOCs were detected in four soil samples from the Guilford Railroad Station. Two exceedances of the CTDEP RDEC were noted in soil samples GP-4 (0-4) and GP-3 (0-4). Eleven compound exceedances of established CTDEP GA PMC criteria were noted in GP-2 (0-4), GP-3 (0-4), and GP-4 (0-4). No other SVOC exceedances of CTDEP-established criteria were noted at the Guilford Railroad Station.

Clinton Railroad Station. Laboratory analysis indicates that SVOCs were detected in four soil samples from the Clinton Railroad Station. Two exceedances of the CTDEP RDEC were noted in GP-9 (0-1) for the compounds benz(a)anthracene and benzo(k)fluoranthene. Five compound exceedances of the CTDEP GA PMC were noted in GP-9 (0-1) and GP-11 (0-1). No other SVOC exceedances of CTDEP-established criteria were noted.

RCRA-8 Metals (Mass Analysis)

Guilford Railroad Station. Laboratory results indicate that metals were detected in all five of the soil samples analyzed for metals. Three exceedances of established CTDEP RDEC and IDEC for arsenic were noted: GP-2 (0-4) at a concentration of 29.7 mg/kg (ppm); GP-4 (0-4) at a concentration of 57.5 mg/kg (ppm); and SS-1 (0.0-0.5) at a concentration of 16.9 mg/kg (ppm). No other RCRA-8 metal exceedances of established CTDEP criteria were noted from soils collected from the Guilford Railroad Station.

Clinton Railroad Station. Laboratory results indicate that metals were detected in all five of the soil samples analyzed for metals. No exceedances of established CTDEP criteria for metals were noted at the Clinton Railroad Station.

SPLP RCRA-8 Metals

Laboratory results indicate that SPLP RCRA-8 metals were detected in eight soil samples collected from the Guilford and Clinton Railroad Stations.

Guilford Railroad Station. Laboratory analysis indicates that RCRA-8 metals were detected in all five of the soil samples analyzed for SPLP metals at the Guilford Railroad Station. Exceedances of SPLP lead were noted in GP-1 (0-4) at a concentration of 0.03 mg/L and in GP-2 (0-4) at a concentration of 0.02 mg/L. No other exceedances in SPLP RCRA-8 metals were noted at the Guilford Railroad Station.

Clinton Railroad Station. Laboratory analysis indicates that RCRA-8 metals were detected in three soil samples collected from the Clinton Railroad Station. One exceedance of SPLP lead was noted in GP-9 (0-1) at a concentration of 0.02 mg/L. No other exceedances of established CTDEP criteria were noted at the Clinton Railroad Station.

Total Petroleum Hydrocarbons

Laboratory analysis indicates that TPH was detected in six samples from the Guilford and Clinton Railroad Stations. None of the detections exceeded any of the established CTDEP criteria.

PCBs, Pesticides, and Herbicides

Laboratory analysis indicates that no PCBs, pesticides, and herbicides were detected above laboratory detection limits for six soil samples collected and analyzed from the Guilford and Clinton Railroad Stations.

The presence of SVOCs and TPH (which are common waste oil and hydraulic fluid constituents) could be attributed to railcar spills, possible historic applications of waste oils, or the unknown nature of the fill material along the railroad ROW. The detections of metals (including arsenic) and SPLP metals (including lead) could be attributed to the artificial fill used within the ROW.

7.2.2 Groundwater Analytical Results

One groundwater sample was collected from a temporary monitoring wells GW-1 at the Guilford Railroad Station. The sample was analyzed for VOCs, SVOCs, and metals. Groundwater results are presented in Table 3, which gives a comparison between detected concentrations and the CTDEP RSRs. Laboratory analytical results are provided in Appendix C. Analytical results above applicable CTDEP RSRs are shown on Figures 3.

Table 3
Groundwater Analytical Results Summary
Guilford Railroad Station
Guilford, Connecticut

Substance	CTDEP Criteria				Sample ID
	GA GWPC (µg/L)	SWPC (µg/L)	RVC (µg/L)	IVC (µg/L)	Guilford RR Station GW-1 (µg/L)
Volatile Organic Compounds (VOCs) (ppb)					
Dichlorodifluoromethane	---	---	---	---	2.3
Semivolatile Organic Compounds (SVOCs) (ppb)					
SVOCs	---	---	---	---	ND
RCRA-8 Metals (ppb)					
Barium	1000	---	---	---	10.0

Notes: Only detected compounds are shown.

ppm - indicates parts per million
ppb - indicates parts per billion
GA GWPC - Groundwater Protection Criteria for a GA groundwater area.
SWPC - Surface Water Protection Area
RVC - Residential Volatilization Criteria
IVC - Industrial/Commercial Volatilization Criteria
--- - indicates no applicable CTDEP-established criterion for compound(s)
Shading/Bolding indicates that the analyte concentration exceeds CTDEP-established criterion.

Volatile Organic Compounds

Only one VOC was detected (dichlorodifluoromethane) in groundwater collected from the Guilford (at GW-1) Railroad Station. No exceedances of established CTDEP criteria were noted for groundwater. No other detections of VOCs were noted above laboratory detection limits.

Semivolatile Organic Compounds

SVOCs were not detected above the laboratory detection limits at the Guilford Railroad Station.

RCRA-8 Metals

One detection of metals (barium at 10 ppb) at the Guilford Railroad Station was noted. No other concentrations of metals above laboratory detection limits were noted in groundwater sample from the Guilford Railroad Station. The detected analyte was not present above established CTDEP criteria.

The presence of metals (barium) at the Guilford Railroad Station is possibly attributable to natural sources or to the nature of the material. The presence of dichlorodifluoromethane in groundwater collected from the Guildford Railroad Station is speculated to be due to possible laboratory contamination. This will be discussed in subsection 7.2.3, Quality Assurance/Quality Control (QA/QC).

7.2.3 Quality Assurance/Quality Control

QA/QC samples included one duplicate surface-soil sample, two duplicate subsurface-soil samples, one equipment rinsate blank, and two trip blanks. The duplicate samples were analyzed for all of the same parameters as the parent samples, the rinsate samples were analyzed for the same parameters as the samples which were collected with the equipment prior to the collection of the rinsate, and the trip blanks were analyzed for VOCs.

7.2.3.1 Duplicate Sample Results

For subsurface soils, the parent soil sample and duplicate soil sample was collected, logged and sampled according to GEI/Atlantic soil sampling protocol, and placed directly into pre-cleaned soil jars with a Teflon™-lined cap. Soil was collected from the entire length of the Geoprobe™ acetate sleeve and placed directly into the parent soil jar. Soil was then collected from along the length of the same interval and placed into a separate duplicate soil sample jar. This process was repeated until both the parent and duplicate soil sample jar were filled. The parent soil sample was marked with a sample identification number, time, date and

project number, and the duplicate soil sample was given a fictitious sample identification number and time. The sample was then sealed and placed into an ice-filled cooler and delivered to the laboratory for analysis. The parent subsurface-soil sample and its duplicate is indicated as follows: GP-1 (0-4) is the parent sample with a duplicate sample of GP-12/8/99B with a fictitious time of 8:30 a.m.

The duplicate sample analytical results are summarized on Tables 4.

Table 4
Duplicate Sample Summary
GP-12/8/99B

Analyte	Parent Sample Results GP-1 (0-4)	Duplicate Sample Results GP-12/8/99B	RPD
Volatile Organic Compounds (VOCs) (ppm)			
Chloroform	0.0012	ND	NC
Dichlorodifluoromethane	0.013	0.007	60 %
Methylene Chloride	0.014	0.020	35 %
Styrene	ND	1.8	NC
Semivolatile Organic Compounds (SVOCs) (ppm)			
Acenaphthylene	ND	0.340	NC
Anthracene	ND	0.180	NC
Benz(a)anthracene	ND	0.780	NC
Benzo(b)fluoranthene	ND	1.2	NC
Benzo(k)fluoranthene	0.2	1.4	150 %
Benzo(g,h,i)perylene	ND	0.620	NC
Benzo(a)pyrene	ND	0.360	NC
Chrysene	0.2	1.2	143 %
Dibenz(a,h)anthracene	ND	0.170	NC
Fluoranthene	0.3	1.8	143 %
Indeno(1,2,3-cd)pyrene	ND	0.570	NC
Phenanthrene	ND	0.640	NC
Pyrene	0.31	2.0	147 %
RCRA-8 Metals (ppm)			
Lead	75.0	48.0	44 %
Barium	37.4	37.4	0 %
Cadmium	0.593	0.547	8 %
Chromium	13.2	14.9	12 %
Arsenic	2.64	2.52	5%
SPLP RCRA-8 Metals (mg/L)			
Barium	0.05	0.01	133 %
Lead	0.03	0.02	40%

Notes: Those analytes detected in either sample are shown.
ND indicates not detected.
NC indicates that the relative percent difference (RPD) was not able to be calculated because a non-detected analyte was present in the parent sample or duplicate.
RPD means Relative Percent Difference = difference/mean times 100.

Generally, the relative percent difference between the parent sample GP-1 (0-4) and the duplicate soil sample GP-12/8/99B did not fall within the acceptable relative percent difference of 30 percent. These differences are likely to be explained by the inherit heterogeneity of the soil. The VOC variability in the relative percent difference between the GP-1 (0-4) and GP-12/8/99B samples is likely attributable to laboratory contamination from methylene chloride and dichlorodifluoromethane, which were also found in the trip blank. The trip blank results are discussed in detail in subsection 7.2.3.3.

7.2.3.2 Rinsate Sample Results

A rinsate sample, FB-12/8/99, was collected at the GP-3 location at the Guilford Railroad Station. The rinsate sample was collected with laboratory-provided organic-free water which was poured over a soil spatula which was decontaminated (as specified in GEI/Atlantic Task 210 work plan) and an unused nitrile sampling glove into the appropriate laboratory-provided sampling container for analysis. The rinsate sample is completed to ensure that sampling equipment has been decontaminated between samples and the disposable equipment is not contaminated. The following laboratory tests were completed on FB-12/8/99: VOCs, SVOCs, RCRA-8 metals, PCB, pesticides, herbicides. A summary of results is presented in Table 7.

Table 5
Rinsate Sample Summary
FB-12/8/99

Analyte	Results
Volatile Organic Compounds (VOCs) (ppb)	
Dichlorodifluoromethane	2.2
Semivolatile Organic Compounds (SVOCs) (ppb)	
SVOCs	ND
RCRA-8 Metals (ppm)	
RCRA-8 metals	ND
Total Petroleum Hydrocarbons (TPH) (ppm)	
TPH	ND
Polychlorinated Biphenyls (PCBs) (ppb)	
PCB	ND
Pesticides	
Pesticides	ND
Herbicides	
Herbicides	ND

Notes: Those analytes detected in either sample are shown.

Only one detection (dichlorodifluoromethane at a concentration of 2.2 ppb) was noted in FB-12/8/99. This detection is interpreted to be laboratory contamination because dichlorodifluoromethane was also found within the trip blank. This detection is discussed in subsection 7.2.3.3 of this report. No other concentrations above laboratory detection limits were noted for FB-12/8/99.

7.2.3.3 Trip Blank Results

The trip blank consisted of two sample jars prepared and sealed at the laboratory which accompanied soil and groundwater samples in the field. The trip blanks (TB-12/8/99 and TB-12/8/99A) were submitted to the laboratory for VOC analysis as part of this investigation. Results indicate that dichlorodifluoromethane was present in TB-12/8/99 at a concentration of 2.2 μg/L (ppb) and methylene chloride (a common laboratory instrument cleaning solution) was present at a concentration of 1.0 μg/L (ppb). Similar results were detected in TB-12/8/99A with dichlorodifluoromethane detected at a concentration of 2.2 μg/L (ppb) and methylene chloride was detected at a concentration of 1.0 μg/L (ppb). The presence of VOCs (dichlorodifluoromethane and methylene chloride) in the TB-12/8/99 and TB-12/8/99 is interpreted as laboratory contamination because the trip blanks were prepared and sealed at the laboratory. The detections of these VOCs in the majority of the soil samples and the field blank are also speculated to be potential laboratory contamination.

7.2.3.4 Laboratory QA/QC Review

In addition, a cursory review of the laboratory-provided data packet indicates methylene chloride was detected in the laboratory method blanks at concentrations of 1.4 μg/L (ppb), 1.6 ug/L (ppb), and 1.8 ug/L (ppb), and dichlorodifluoromethane was detected at a concentration of 2 ug/L (ppb) and 4 ug/L (ppb) in laboratory project number 9912000141. This packet contained the following samples: FB-12/8/99, TB-12/8/99, GW-1, GP-4 (0-4), GP-3 (0-4), GP-1 (0-4), GP-1 (4-8), GP-12/8/99B, and GP-2 (0-4). In laboratory project number 9912000142, methylene chloride was detected in the method blank at 1.6 ug/L, 1.8 ug/L , and 1.7 ug/L, and dichlorodifluoromethane was detected in the method blank at 2.4 ug/L (ppb) and 2.5 ug/L (ppb). This packet contained the following samples: GP-2 (4-8), TB-12/8/99A, and SS-1 (0.0-0.5). In laboratory project number 9912000143, methylene chloride was detected in the method blank at a concentration of 1.7 ug/L (ppb) and dichlorodifluoromethane was detected in the method blank at a concentration of 2.5 ug/L (ppb). This packet contained the following samples GP-9 (0-1), GP-10 (0-4), GP-11 (0-1), GP-12 (0-4), and SS-3 (0.0-0.5). The detections of methylene chloride and dichlorodifluoromethane in the laboratory method blanks infer that the detection of these analytes in the soil and groundwater samples is possibly laboratory contamination.

As part of the QA/QC of the laboratory data packs, it was discovered that the laboratory mean detection limits for SVOCs in groundwater did not attain CTDEP criteria for some of the analytes. A laboratory representative was contacted regarding the problem. He indicated that this is attributable to the imprecision of laboratory instrumentation.

8.0 RECEPTORS

The following is a summary of affected environmental media and associated potential receptors.

8.1 Groundwater and Soils

Receptors of contaminated soils could include construction workers via direct exposure and area residents via exposure to windblown particles from the construction activities. Contaminated soil that is excavated could also migrate to nearby surface waters through overland flow or other pathways.

One residential well is located adjacent to the Guilford Railroad Station and two public water supply wells are located 650± meters [2,115± feet] northwest of the Clinton Railroad Station. The potential for exposure of these groundwater sources to contamination is interpreted as low because of the limited proposed on-site excavation activities.

9.0 SUMMARY AND CONCLUSIONS

A Task 210 field investigation was completed for ConnDOT at the Guilford and Clinton Railroad Stations. ConnDOT has proposed the construction of elevated platform and pedestrian track crossings (including elevators and ramps) at the Guilford Railroad Station and elevated platforms at the Clinton Railroad Station (ConnDOT Project No. 0310-0007). The field investigation was performed to assess potential on-site contamination from past spills and historic applications of waste oils, and the unknown characteristics of fill materials and possible impacts from potential off-site sources of contamination that could possibly impact the proposed construction areas.

Based on the review of analytical results obtained from the field investigation, several detections of VOCs, SVOCs, RCRA-8 metals, SPLP RCRA-8 metals, and TPH were detected in soils from both of the railroad stations and VOCs and the RCRA-8 metal barium were detected in groundwater at the Guilford Station only. Of the detected constituents in soils at the Guilford Railroad Station, detectable levels of either SVOCs, arsenic, or SPLP lead exceeded the RDEC, IDEC and/or GA PMC criteria in soils collected from GP-1 (0-4), GP-2 (0-4), GP-3 (0-4), GP-4 (0-4), and SS-1 (0.0-0.5). Detectable levels of SVOCs and SPLP lead exceeded the established CTDEP levels for either RDEC, IDEC, or the GA PMC in GP-9 (0-1) and GP-11 (0-1) at the Clinton Railroad Station. All other detections in soils at the railroad stations were found at levels below applicable CTDEP criteria.

Given the results of the field investigation, the potential exists that construction workers involved with the disturbance of the upper 1.22± meters [4± feet] of the ROW fill material at the Guilford and Clinton Railroad Stations may be exposed to SVOCs and arsenic above the applicable CTDEP RDEC values based upon proposed construction plans. Other soils within the proposed construction areas had detectable levels of VOCs, RCRA-8 metals, SPLP RCRA-8 metals, and TPH, which may require special disposal, handling or re-use considerations. This study was based upon proposed construction depths of 3.05 meters [10 feet] bgs at the Guilford Railroad Station and 1.22 meters [4 feet] bgs at the Clinton Railroad Station. If construction activities should extend below the screened depths at the Guilford and Clinton Railroad Stations, or if groundwater is encountered at the Clinton Railroad Station, then soil or groundwater samples should be screened to characterize the materials. Given the presence of contaminants identified within the proposed construction areas, a Task 310, Materials Management Plan, should be developed to manage potentially impacted soils during construction activities.

10.0 LIMITATIONS

The investigation described in this report and this report were conducted and prepared on behalf of and for the exclusive use of ConnDOT and its counsel. No other entity may rely upon the results of the investigation or contents of this report for any reason or purpose whatsoever.

The conclusions summarized herein were based on the limited observations and investigations described within this submittal at the time the investigation was conducted. Future events at the site or the surrounding properties may alter these findings.

In preparing this report, GEI relied on direction and certain information provided by state and local officials, and information and representations made available to GEI at the time of the assessment. To the extent that such information is incomplete or inaccurate, GEI is not responsible. To the extent that specific subsurface conditions have not been characterized or identified, GEI is not responsible.

GEI has performed this study in a professional manner using that degree of skill and care exercised for similar projects under similar conditions by reputable and competent environmental consultants. The conclusions provided by GEI are based solely on the scope of work conducted, and on observations and limited explorations described within this submittal at the time these services were conducted. No other warranty, expressed or implied, is made as to the professional opinions included by GEI in this report.

REFERENCES

1. *Community Water Systems in Connecticut*: A 1984 Inventory. CTDEP, Natural Resources Center.

2. *Water Quality Classifications Connecticut River and South-Central Coastal River Basins. (Sheet 3 of 3).* Connecticut Department of Environmental Protection: Bureau of Water Management, Planning and Standards Division. Adopted February 1993.

3. *Atlas of the Public Water Supply Sources and Drainage Basins of Connecticut.* June 1982, D.E.P. Bulletin No. 4, CTDEP and Natural Resources Center.

APPENDIX B

BORING LOGS

GEI Consultants, Inc.

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SOIL BORING LOG GP-1

Boring/Well ID:	**GP-1**	**Client:**	**Connecticut Department of Transportation**
Project Number:	**99459**	**Project Name:**	**Guilford, Madison, Clinton Railroad Stations**
Logged By:	**Lynn Willey**	**Site Address:**	**Guilford Railroad Station**
Date:	**12/8/99**	**Contractor:**	**Earth Technologies Incorporated**
Total Depth:	**10 feet**	**Driller:**	**Geoff Parker**

Depth (feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Soil Description
0.0-4.0	NA	3.2	0.4	0.0-2.0: Black, fine SAND, little silt, trace fine gravel and coal dust/ fragments and ash, non-cohesive, loose, moist. No odors noted. Black color (staining) noted. 2.0-4.0: Brown to tan-brown, fine to medium SAND, trace silt, well-sorted, non-cohesive, moist. No odors or visual contamination noted. Approximate groundwater table at 4.0' below ground surface. SAMPLE: GP-1 (0-4) and duplicate GP-12/8/99B
4.0-8.0	NA	4.0	3.9	4.0-7.0: Brown, very fine to medium SAND, non-cohesive, well-sorted, saturated. No odors or visual contamination noted. (SW) 7.0-8.0: Brown, very fine SAND, non-cohesive, well-sorted, saturated. No odors or visual contamination noted. (SW) SAMPLE: GP-1 (4-8)
8.0-10.0	NA	2.0	0.7	8.0-10.0: Brown, very fine to fine SAND, some mica flakes, non-cohesive saturated. No odor or visual contamination noted. (SW) End of Boring 10.0 feet.

NA-Indicates not applicable because no blow counts are able to be recorded with Geoprobe™ drilling technique.
PID (ppm)-PID readings are based upon headspace PID readings
(SW)-Indicates Unified Soil Classification of sampled soils

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SOIL BORING LOG GP-2

Boring/Well ID:	**GP-2**	**Client:**	**Connecticut Department of Transportation**
Project Number:	**99459**	**Project Name:**	**Guilford, Madison, Clinton Railroad Stations**
Logged By:	**Lynn Willey**	**Site Address:**	**Guilford Railroad Station**
Date:	**12/8/99**	**Contractor:**	**Earth Technologies Incorporated**
Total Depth:	**10 feet**	**Driller:**	**Geoff Parker**

Depth (feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Soil Description
0.0-4.0	NA	3.2	0.2	Bituminous pavement. 0.0-1.5: Brown to tan, fine SAND, some silt and angular gravel, non-cohesive, medium dense, dry. No odor or visual contamination. (SM) 1.5-3.0: Black, fine SAND, trace silt, non-cohesive loose, dry to slightly moist. No odor noted. Black-colored (staining) soils. (SP) 3.0-4.0: Dark brown, fine SAND, trace silt, non-cohesive, loose, moist. No odor or visual contamination noted. (SP) SAMPLE: GP-2 (0-4) Approximate groundwater table at 4.0' below ground surface.
4.0-8.0	NA	4.0	0.0	4.0-7.0: Brown, fine to medium SAND, trace coarse SAND in layers, non-cohesive, moderately dense, saturated. No odors or visual contamination noted. (SW) 7.0-8.0: Brown, very fine SAND, trace silt, saturated. No odor or visual contamination noted. (SW) SAMPLE: GP-2 (4-8)
8.0-10.0	NA	2.0	0.0	8.0-10.0: Same as above, saturated. No odors or visual contamination noted. (SW) End of boring 10.0 feet below ground surface.

NA-Indicates not applicable because no blow counts are able to be recorded with Geoprobe™ drilling technique.
PID (ppm)-PID readings are based upon headspace PID readings
(SW)-Indicates Unified Soil Classification of sampled soils

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SOIL BORING LOG GP-3

Boring/Well ID:	**GP-3**	**Client:**	**Connecticut Department of Transportation**
Project Number:	**99459**	**Project Name:**	**Guilford, Madison, Clinton Railroad Stations**
Logged By:	**Lynn Willey**	**Site Address:**	**Guilford Railroad Station**
Date:	**12/8/99**	**Contractor:**	**Earth Technologies Incorporated**
Total Depth:	**4 feet**	**Driller:**	**Geoff Parker**

Depth (feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Soil Description
0.0-4.0	NA	3.8	0.4	0.0-2.0: Black, silty-SAND, trace fine gravel and coal fragments, non-cohesive, loose, slightly moist. No odors noted. Black color (staining) noted. (SM) 2.0-4.0: Brown, fine to medium SAND, trace silt, little coarse sand, non-cohesive, loose, dry. No odors or visual contamination noted. (SP) SAMPLE: GP-3 (0-4) End of boring at 4.0 feet below ground surface. NA-Indicates not applicable because no blow counts are able to be recorded with Geoprobe™ drilling technique. PID (ppm)-PID readings are based upon headspace PID readings (SW)-Indicates Unified Soil Classification of sampled soils

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SOIL BORING LOG GP-4

Boring/Well ID:	**GP-4**	**Client:**	**Connecticut Department of Transportation**
Project Number:	**99459**	**Project Name:**	**Guilford, Madison, Clinton Railroad Stations**
Logged By:	**Lynn Willey**	**Site Address:**	**Guilford Railroad Station**
Date:	**12/8/99**	**Contractor:**	**Earth Technologies Incorporated**
Total Depth:	**4 feet**	**Driller:**	**Geoff Parker**

Depth (feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Soil Description
0.0-4.0	NA	3.2	0.0	Bituminous pavement. 0.0-1.0: Brown to tan, SILT and SAND, some angular gravel, non-cohesive, dry. No odor or visual contamination noted. (SM) 1.0-2.75: Black, fine SAND, trace coal fragments and gravel, non-cohesive, loose. No odors noted. Black color (staining) noted. (SP) 2.75-4.0: Medium brown, fine to medium SAND, non-cohesive, dry to slightly moist. No odor or visual contamination noted. (SW) SAMPLE: GP-4 (0-4) End of boring at 4.0 feet below ground surface. NA-Indicates not applicable because no blow counts are able to be recorded with Geoprobe™ drilling technique. PID (ppm)-PID readings are based upon headspace PID readings (SW)-Indicates Unified Soil Classification of sampled soils

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SOIL BORING LOG GP-5

Boring/Well ID:	**GP-5**	**Client:**	**Connecticut Department of Transportation**
Project Number:	**99459**	**Project Name:**	**Guilford, Madison, Clinton Railroad Stations**
Logged By:	**Lynn Willey**	**Site Address:**	**Madison Railroad Station**
Date:	**12/8/99**	**Contractor:**	**Earth Technologies Incorporated**
Total Depth:	**10 feet**	**Driller:**	**Geoff Parker**

Depth (feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Soil Description
0.0-4.0	NA	2.8	0.0	0.0-1.5: Black to dark brown, fine to medium SAND (FILL), some coarse slag, non-cohesive, dry. No odors noted. Black color (staining) noted. (SP) 1.5-4.0: Brown, fine to medium SAND, trace coarse SAND, non-cohesive, loose, dry. No odor or visual contamination noted. (SW) SAMPLE: GP-5 (0-4)
4.0-8.0	NA	0.5	0.0	Brown to light brown, fine to medium SAND, non-cohesive, loose, dry. No odor or visual contamination noted. (SW) Note: Acetate sleeve bound up inside the macro core resulting in low sample recovery.
8.0-10.0	NA	2.0	0.0	Brown to light brown, fine to medium SAND, some coarse sand, well sorted, distinct layers throughout sample, moderately dense, wet. No odor or visual contamination noted. (SW) SAMPLE: GP-5 (8-10) Note: Approximate depth to groundwater is 9.0 feet below ground surface. End of boring 10 feet below ground surface.

NA-Indicates not applicable because no blow counts are able to be recorded with Geoprobe™ drilling technique.
PID (ppm)-PID readings are based upon headspace PID readings
(SW)-Indicates Unified Soil Classification of sampled soils

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SOIL BORING LOG GP-6

Boring/Well ID:	**GP-6**	**Client:**	**Connecticut Department of Transportation**
Project Number:	**99459**	**Project Name:**	**Guilford, Madison, Clinton Railroad Stations**
Logged By:	**Lynn Willey**	**Site Address:**	**Madison Railroad Station**
Date:	**12/8/99**	**Contractor:**	**Earth Technologies Incorporated**
Total Depth:	**8 feet**	**Driller:**	**Geoff Parker**

Depth (feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Soil Description
0.0-2.0	NA	1.0	NM	0.0-2.0: Brown, fine SAND, some silt, non-cohesive, non-plastic, loose, moist. No odor or visual contamination noted. (SM) SAMPLE: GP-6 (0-2)
2.0-4.0	NA	2.0	NM	2.0-4.0: Brown to orange-brown, fine to medium SAND, well-sorted, non-cohesive, loose, dry. No odors or visual contamination noted. (SW) SAMPLE: GP-6 (2-4)
4.0-6.0	NA	1.7	NM	4.0-6.0: Brown to orange-brown to light brown, fine to medium SAND, trace coarse sand, well-sorted, trace silt, non-cohesive, loose, dry. (SW)
6.0-8.0	NA	1.7	NM	6.0-8.0: Orange-brown to light brown, fine to medium SAND, some layers of light tan fine sand, non-cohesive, loose, dry. No odors or visual contamination noted. (SW) SAMPLE: GP-6 (6-8) Note: GP-6 (6-8) was the last sample at GP-6 location because drillers did not have enough rods for hand driven Geoprobe™ to complete the boring to 10'.
				End of boring 8.0 feet below ground surface.

NA-Indicates not applicable because no blow counts are able to be recorded with Geoprobe™ drilling technique.
NM-Indicates PID readings were not taken because of insufficient sample volume.
PID (ppm)-PID readings are based upon headspace PID readings
(SW)-Indicates Unified Soil Classification of sampled soils

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SOIL BORING LOG GP-7

Boring/Well ID:	**GP-7**	**Client:**	**Connecticut Department of Transportation**
Project Number:	**99459**	**Project Name:**	**Guilford, Madison, Clinton Railroad Stations**
Logged By:	**Lynn Willey**	**Site Address:**	**Madison Railroad Station**
Date:	**12/8/99**	**Contractor:**	**Earth Technologies Incorporated**
Total Depth:	**4 feet**	**Driller:**	**Geoff Parker**

Depth (feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Soil Description
0.0-4.0	NA	3.3	0.0	0.0-0.33: Bituminous pavement and roadbase. 0.33-4.0: Dark brown to brown, fine SAND, some silt, trace fine gravel, non-cohesive, dry. No odor or visual contamination noted. (SM) SAMPLE: GP-7 (0-4) and duplicate GP-12/8/99 End of boring at 4.0 feet below ground surface. NA-Indicates not applicable because no blow counts are able to be recorded with Geoprobe™ drilling technique. PID (ppm)-PID readings are based upon headspace PID readings (SW)-Indicates Unified Soil Classification of sampled soils

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SOIL BORING LOG GP-8

Boring/Well ID:	**GP-8**	**Client:**	**Connecticut Department of Transportation**
Project Number:	**99459**	**Project Name:**	**Guilford, Madison, Clinton Railroad Stations**
Logged By:	**Lynn Willey**	**Site Address:**	**Madison Railroad Station**
Date:	**12/8/99**	**Contractor:**	**Earth Technologies Incorporated**
Total Depth:	**4 feet**	**Driller:**	**Geoff Parker**

Depth (feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Soil Description
0.0-4.0	NA	1.9	0.0	0.0-4.0: Black to dark brown, fine to medium SAND, trace brick fragments and slag, slightly moist, non-cohesive, loose, slightly moist. No odors noted. Black color noted. (SP) SAMPLE: GP-8 (0-4) End of boring was approximately 4.0 feet below ground surface. NA-Indicates not applicable because no blow counts are able to be recorded with Geoprobe™ drilling technique. PID (ppm)-PID readings are based upon headspace PID readings (SW)-Indicates Unified Soil Classification of sampled soils

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SOIL BORING LOG GP-9

Boring/Well ID:	**GP-9**	**Client:**	**Connecticut Department of Transportation**
Project Number:	**99459**	**Project Name:**	**Guilford, Madison, Clinton Railroad Stations**
Logged By:	**Lynn Willey**	**Site Address:**	**Clinton Railroad Station**
Date:	**12/7/99**	**Contractor:**	**Earth Technologies Incorporated**
Total Depth:	**1 feet**	**Driller:**	**Geoff Parker**

Depth (feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Soil Description
0.0-1.0	NA	1.0	NM	0.0-1.0: Dark brown to black, fine SAND, trace coarse gravel and slag, non-cohesive, loose, moist. No odor noted. Black color (staining) noted. SAMPLE: GP-9 (0-1) Note: Because of the limited space available. GP-9 was hand augered to a depth of 1.0 feet below ground surface. End of boring at 1.0 feet below ground surface. NA-Indicates not applicable because sample was hand augered due to limited. NM-Indicates PID readings were not taken because of insufficient sample volume. PID (ppm)-PID readings are based upon headspace PID readings (SW)-Indicates Unified Soil Classification of sampled soils

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SOIL BORING LOG GP-10

Boring/Well ID:	**GP-10**	**Client:**	**Connecticut Department of Transportation**
Project Number:	**99459**	**Project Name:**	**Guilford, Madison, Clinton Railroad Stations**
Logged By:	**Lynn Willey**	**Site Address:**	**Clinton Railroad Station**
Date:	**12/7/99**	**Contractor:**	**Earth Technologies Incorporated**
Total Depth:	**4 feet**	**Driller:**	**Geoff Parker**

Depth (feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Soil Description
0.0-4.0	NA	2.7	0.0	0.0-1.5: Black, fine to medium SAND, trace fine gravel, non-cohesive loose, dry to slightly moist. No odors noted. Black color (staining) noted. (SP) 1.5-4.0: Brown to tan, fine to medium SAND, non-cohesive, loose, dry. No odors or visual contamination noted. (SW) SAMPLE: GP-10 (0-4) End of boring at 4.0 feet below ground surface.

NA-Indicates not applicable because no blow counts are able to be recorded with Geoprobe™ drilling technique.
NM-Indicates PID readings were not taken because of insufficient sample volume.
PID (ppm)-PID readings are based upon headspace PID readings
(SW)-Indicates Unified Soil Classification of sampled soils

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SOIL BORING LOG GP-11

Boring/Well ID:	**GP-11**	**Client:**	**Connecticut Department of Transportation**
Project Number:	**99459**	**Project Name:**	**Guilford, Madison, Clinton Railroad Stations**
Logged By:	**Lynn Willey**	**Site Address:**	**Clinton Railroad Station**
Date:	**12/8/99**	**Contractor:**	**Earth Technologies Incorporated**
Total Depth:	**1 feet**	**Driller:**	**Geoff Parker**

Depth (feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Soil Description
0.0-1.0	NA	1.0	NM	0.0-1.0: Dark brown to black, fine SAND, trace coarse gravel and slag, non-cohesive, loose, moist. No odor noted. Black color (staining) noted. SAMPLE: GP-11(0-1) Note: Because of the limited space available. GP-11 was hand augered to a depth of 1.0 feet below ground surface. End of boring at 1.0 feet below ground surface. NA-Indicates not applicable because sample was hand augered due to limited space. NM-Indicates PID readings were not taken because of insufficient sample volume. PID (ppm)-PID readings are based upon headspace PID readings (SW)-Indicates Unified Soil Classification of sampled soils

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SOIL BORING LOG GP-12

Boring/Well ID:	**GP-12**	**Client:**	**Connecticut Department of Transportation**
Project Number:	**99459**	**Project Name:**	**Guilford, Madison, Clinton Railroad Stations**
Logged By:	**Lynn Willey**	**Site Address:**	**Clinton Railroad Station**
Date:	**12/7/99**	**Contractor:**	**Earth Technologies Incorporated**
Total Depth:	**4 feet**	**Driller:**	**Geoff Parker**

Depth (feet)	Blow Counts	Recovery (Feet)	PID (ppm)	Soil Description
0.0-4.0	NA	3.1	0.0	0.0-1.0: Bituminous pavement and roadbase (Dark brown to grey, fine SAND, some silt, trace gravel, non-cohesive, dry. (SM) 1.0-2.0: Black, fine to medium SAND, non-cohesive, loose, moist. 2.0-4.0: Brown-tan, fine to medium SAND, trace gravel, dry. No odors noted from 0-4 feet. Black color (staining) noted from 1.0 to 2.0 feet below ground surface. SAMPLE: GP-12 (0-4) End of boring at 4.0 feet below ground surface. NA-Indicates not applicable because no blow counts are able to be recorded with Geoprobe™ drilling technique. PID (ppm)-PID readings are based upon headspace PID readings (SW)-Indicates Unified Soil Classification of sampled soils