
TASK 210: SURFICIAL SITE INVESTIGATION

Property Location:

**IMPROVEMENTS TO ROUTES 82 AND 85
SALEM AND MONTVILLE**

**ConnDOT Assignment No. 95632
ConnDOT Project No. 0120-0079**

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1.0 INTRODUCTION

The Connecticut Department of Transportation (ConnDOT) has retained Atlantic Environmental Services, Inc. (Atlantic) to perform a Task 210 Surficial Site Investigation (SSI) within the right-of-way (ROW) adjacent to five areas along Route 85 in the towns of Salem and Montville, Connecticut.

Table 1 provides information regarding each property owner and the town Tax Assessor's records, including map and lot numbers. The property locations are depicted in Figures 1, 2, and 3.

ConnDOT has proposed safety improvements to sections of Route 82 and Route 85 and several intersecting roads in Salem and Montville (ConnDOT Project No. 0120-0079).

Atlantic previously prepared a Task 110 Corridor Land Use Evaluation report (dated September 27, 1995) of the project area and Task 120 Preliminary Site Evaluation reports (dated December 29, 1995) for eight sites within the subject corridor, which can be referenced for complete site and vicinity information; summary information is presented herein.

The purpose of the Task 210 was to screen for the presence of contamination in the ConnDOT ROW along portions of Route 85 in Salem and Montville. This SSI employed Geoprobe™ test borings and soil, sediment, groundwater, and surface water sampling and analysis. This SSI was conducted in accordance with Atlantic's Task 210, Surficial Site Investigation Work Plan, dated April 15, 1996.

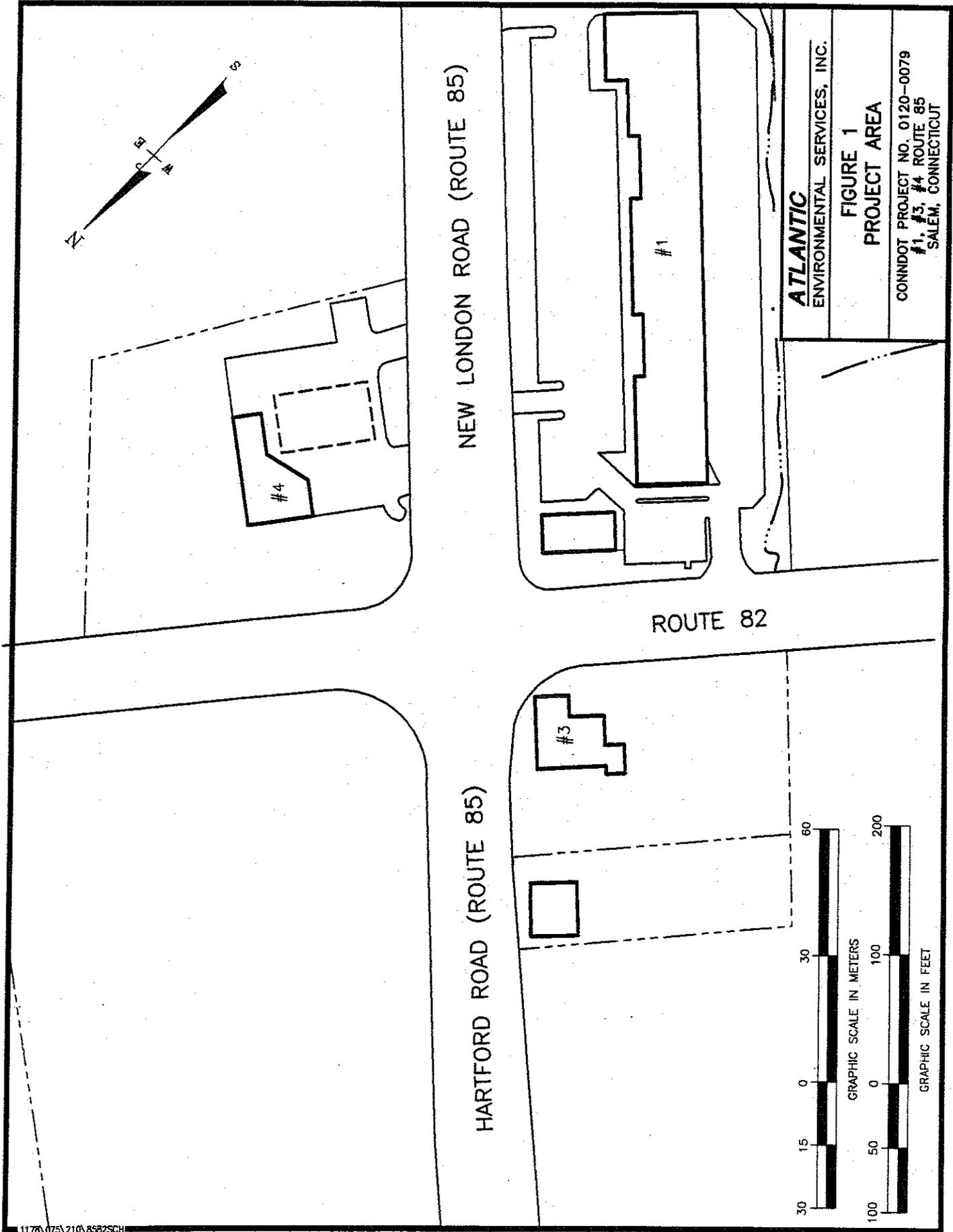
For purposes of this investigation, five separate ROW areas were screened, including:

- intersection of Routes 82 and 85, Salem, Connecticut;
- intersection of Route 85, Grassy Hill Road, and Chesterfield Road, Montville, Connecticut;
- intersection of Routes 85 and 161;
- 1450 Route 85, Montville, Connecticut; and
- 1384 Route 85, Montville, Connecticut.

A brief summary of environmental concerns associated with each of these areas is provided below.

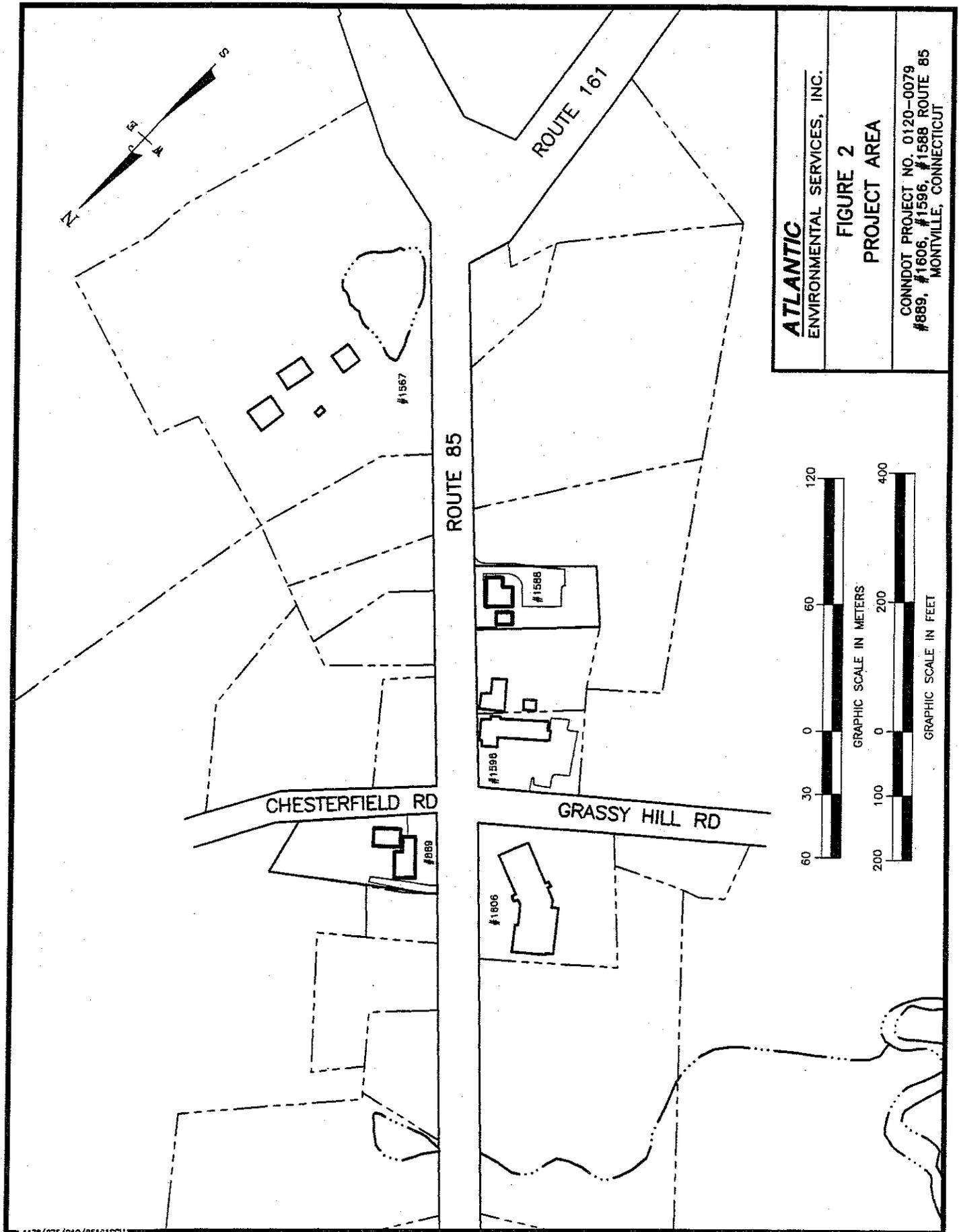
**Table 1
Properties Adjacent to ROW Investigation**

Location	Property Owner/Use	Tax Assessor's Designation
<i>Intersection of Routes 82 and 85</i>		
3 Hartford Road	Calvin H. McCall, Jr. Four Corners Motors (autobody shop)	Map 18, Lot 10
1 New London Road	McKinley Development Salem Town Center (former gasoline station)	Map 18, Lot 36
4 New London Road	Hendel's Investors Corporation Henny Penny/Sunoco (gasoline station)	Map 18, Lot 26-1
12 New London Road	Irwin J. Samuels Salem Auto Center (former autobody shop)	Map 18, Lot 26-10
<i>Intersection of Route 85, Grassy Hill Road and Chesterfield Road</i>		
889 Chesterfield Road/ 1605 Route 85	Mary and James Kennitz Otto's (service garage)	Map 5, Lot 16
1606 Route 85	Chesterfield Fire Company (owner and occupant)	Map 5, Lot 12; Map 5, Lot 12A
1596 Route 85	Sashikant and Sangeeta Patel Chesterfield Lodge Motel (convenience store and motel)	Map 5, Lot 7
1588 Route 85	A & F Realty Izzy's Gas Station (gasoline station)	Map 5, Lot 5
<i>Intersection of Routes 85 and 161</i>		
1567 Route 85	Gail M. Everett (residential home with private pond)	Map 5, Lot 22
1450 Route 85	John F. Zaist Ahlberg's Furniture Stripping and Refinishing	Map 5, Lot 27A
1384 Route 85	Paul F. La Frambois Aerodynamic Performance (service and autobody garage)	Map 2, Lot 6A
Source: Tax Assessor's records from Salem and Montville.		

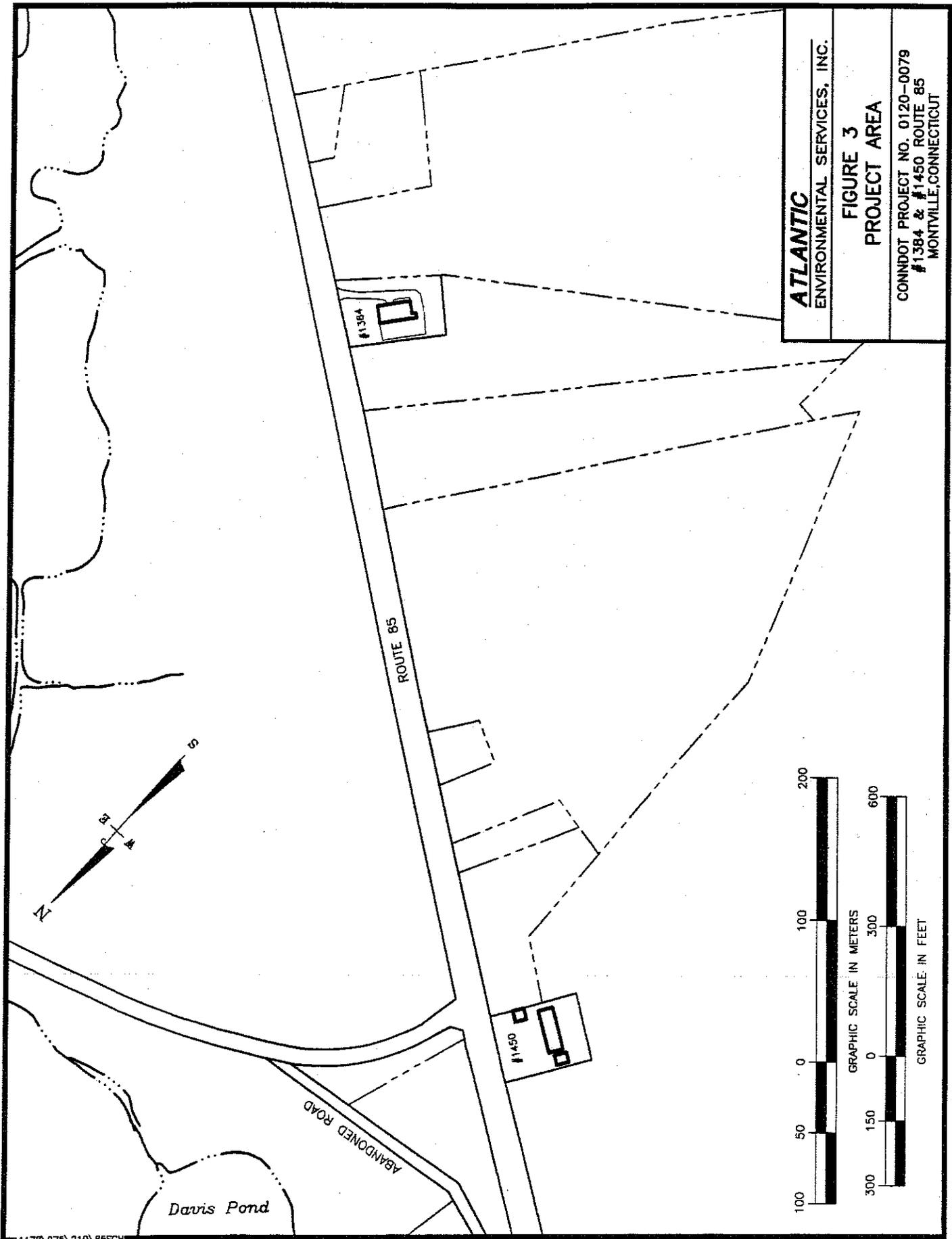


ATLANTIC
 ENVIRONMENTAL SERVICES, INC.
FIGURE 1
PROJECT AREA
 CONNDOT PROJECT NO. 0120-0079
 #1, #3, #4 ROUTE 85
 SALEM, CONNECTICUT

1178-075-210-3532SCH



1178/075/210/85161SCH



1178\075\210\85SCH

Route 82/Route 85 Intersection

Environmental concerns within the ConnDOT ROW at the intersection of Routes 82 and 85 in Salem, Connecticut include, but are not limited to: former/current gasoline stations and automobile and autobody repair activities; documented releases of gasoline and other petroleum products and impacts to soils and groundwater; current/former underground storage tanks (USTs); documented leaking UST incidents; potential contamination leaching from individual septic systems; hazardous waste generation; and improper waste oil handling practices.

Route 85/Grassy Hill Road/Chesterfield Road Intersection

Environmental concerns within the ConnDOT ROW at the intersection of Route 85, Grassy Hill Road, and Chesterfield Road in Montville, Connecticut include, but are not limited to: former/current automotive repair activities; hazardous waste generation; documented soil, groundwater, and surface water contamination (including organo-halides, gasoline and other petroleum products); potential contamination leaching from individual septic systems; current/former USTs; and documented leaking UST incidents.

Route 85/Route 161 Intersection

Environmental concerns within the ConnDOT ROW at 1567 Route 85 include, but are not limited to, pesticide and herbicide applications.

1450 Route 85

Environmental concerns within the ConnDOT ROW at 1450 Route 85 in Montville, Connecticut include, but are not limited to: furniture refinishing activities; hazardous waste generation; on-site septic system; and unknown chemical/waste handling practices by former automotive-related tenants.

1584 Route 85

Environmental concerns within the ConnDOT ROW at 1384 Route 85 in Montville, Connecticut include, but are not limited to: current/former automotive and autobody repair activities; on-site septic system with associated dry wells; hazardous waste generation; and possible improper waste management by former on-site tenant.

This document provides a brief description and history of the subject site (Section 2.0); the field investigation methods and rationale (Section 3.0); laboratory analytical results and evaluation of data (Section 4.0); a discussion of the local environment and receptors (Section 5.0); and the summary and conclusions (Section 6.0).

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.

2.0 SITE DESCRIPTION AND HISTORY

Intersection of Routes 82 and 85

3 Hartford Road: The site was used as a gasoline station and automobile service garage from 1925 until the 1960s. Various automobile repair facilities have occupied the site since that time. A hazardous waste transporter also occupied the site for approximately two years. The rear portion of the lot was used as a vehicle storage and fueling area for ConnDOT for approximately 40 years. This property is currently occupied by Four Corners Motors (since 1993). Four Corners Motors is a two-bay automotive garage conducting automotive and autobody repairs on site.

1 New London Road: The site was vacant circa 1868. Site tenants from 1921 to 1980 included a package store, a grocery store, offices, a flower shop (located in a two-bay garage), and a gasoline station. This station may have performed automotive repairs at the site. An unspecified number of USTs located on the site were removed in the 1960s. Development for the current strip mall began in 1980 and was completed by 1990. The subject parcel currently consists of the original commercial structure and the new strip mall. The commercially developed portion of the site was apparently filled with approximately 1.5 to 3 meters (5 to 10 feet) of material on the southwestern side. The wetlands surrounding the developed area appear to remain undeveloped.

4 New London Road: The subject site was undeveloped wooded land until 1975 when a gasoline station was constructed on the property. The station was expanded to include a convenience store in 1989. At that time, former on-site USTs were replaced. A convenience store (Henny Penny) and gasoline station (Sunoco) currently occupy the parcel. Four petroleum USTs are located on site. Approximately half of the site consists of a forested area on the northern portion of the site. A small stream crosses the property through the wooded area, is directed to subsurface piping near developed portions of the site, and discharges to the storm drain system located in the adjacent street.

12 New London Road: Available information indicates that the site was historically undeveloped and wooded land prior to site development in 1977. Computer Auto Repair occupied the site circa 1977. Site tenancy during the 1980s is not clear. The site was last occupied by Salem Auto Center, a vehicle repair and used car sales facility, and has been vacant since 1991. The subject site is improved with a 10-bay automobile repair garage building. An area east of the building is occupied by a collapsed shed, an automobile engine, various small automobile parts, and a bulky waste disposal area. Much of the site is forested land.

Intersection of Route 85, Grassy Hill Road and Chesterfield Road

889 Chesterfield Road/1605 Route 85: The subject property has likely been the location of an automobile repair garage since at least 1934. The site was also occupied by a gasoline station from at least 1940 to circa 1988. Otto's Auto Repairs has occupied the parcel

since circa 1951. A residential home and an automobile repair garage occupy the parcel. A paved parking area with evidence of a former pump island is located west of the garage. A monitoring well is located in the parking lot. The rear of the lot is occupied by an old camper used for junk storage and various debris.

1588 Route 85: This property was originally developed prior to 1920 as a mixed commercial/residential structure intended for use as a gasoline station, convenience store, and residential apartment building. The original on-site structures were destroyed as the result of a fire in 1920. At that time the current on-site structures were erected. Since that time, the parcel has been used as a gasoline station, a convenience store, a package store, and a residential apartment building. In the late 1980s, the package store was converted to the current automotive parts store. Izzy's One Stop Gas Station and Izzy's Discount Auto Parts Store lease the property from the current owner, A&F Realty. Residential apartments continue to occupy the property. The site is also occupied by a residential garage, a fuel pump island, and a 2,000-gallon kerosene aboveground storage tank (AST). These structures are located in the northeastern portion of the property.

Intersection of Routes 85 and 161

1567 Route 85: The ConnDOT ROW is currently occupied by the edge of a small private pond. The surrounding vicinity is dominated by residential properties. The vicinity historically has been occupied by residential properties. Prior to development, these parcels were either vacant or used for agricultural purposes.

1450 Route 85: The parcel was used for agricultural purposes circa 1934. The current structures (a one-story wood-frame office/storage building, a four-bay wood-frame garage and attached outbuilding, and a storage shed) were erected in 1949. The site was originally established by Zaist Brothers Builders/Contractors, who remained on site until the 1980s. Aerial photographs depict large quantities of industrial vehicles and construction materials on site during their tenure. The design of the garage (four bays) suggests that the business conducted its own maintenance activities. Various industrial and commercial tenants have occupied the property since this time. Tenancy through the 1980s and 1990s is somewhat unclear. According to the current tenant, the property was most recently occupied by an automobile servicing center and an automobile painting business. Ahlberg's Furniture Stripping & Restoration has occupied the site for the past two years.

1384 Route 85: Prior to 1970, the parcel was used for agricultural purposes. The site appears to have been vacant until the current site structure was erected in 1979. The site was occupied by Yankee Cabinet from 1979 to 1987. La Framboise Well Drilling occupied the site from 1987 to 1991. Several automotive servicing and autobody shop facilities have occupied the parcel since 1991, including Thunder and Race Motors. Current site tenant, Aerodynamic Performance, has operated on site since 1993. The parcel is occupied by a commercial building containing an office and an automotive repair garage.

3.0 SURFICIAL SITE INVESTIGATION

3.1 Objective

The objective of this surficial site investigation was to conduct a screening level investigation using non-intrusive techniques to assess the potential contamination sources within the proposed roadway construction ROWs. This investigation did not assess the potential for contaminant sources outside the highway construction area or the study area. To investigate these sources, a Geoprobe™ soil boring and sampling program was conducted. Additionally, groundwater samples as well as sediment and surface water samples were taken. EnviroShield of Stratford, Connecticut was retained to perform the Geoprobe™ borings. The field aspects of this investigation were conducted on April 23 and 24, 1996, by Lisa Buckley and Kyle Sullivan of Atlantic.

Areas of environmental concern addressed by this investigation include the following.

Intersection of Routes 82 and 85, Salem, Connecticut

3 Hartford Road: Hazardous waste transportation; operation as a gasoline and/or service station since 1925; current/former on-site USTs—conditions unknown; on-site septic system; unknown chemical/waste handling practices of former tenants; and former exterior automobile greasing pit.

1 New London Road: Former gasoline station; former on-site USTs—condition unknown; potential former automobile repair activities; documented on-site gasoline contamination (originated off site)—contaminated soil/groundwater may still exist; on-site septic problems—inadequate holding time for sewage waste, possibly entering the stormwater catch basin leading to adjacent wetlands; and fill material located on site—source unknown.

4 New London Road: Possibly two outstanding orders against the subject site; on-site gasoline station since 1975; current/former on-site USTs; documented LUST incidents—1978, 1982, and 1987; documented impacts to groundwater, soil, and surface waters; on-site oil/water separator; lack of file information at CTDEP regarding remediation activities; and an on-site septic system.

12 New London Road: Hazardous waste generation—quantity unknown; former on-site automobile repair activities; documented surface-soil impacts due to waste oil handling practices; and possible subsurface contamination via on-site septic system and/or floor drains.

Intersection of Route 85, Grassy Hill Road, and Chesterfield Road, Montville, Connecticut

889 Chesterfield Road/1605 Route 85: Former/current automotive repair activities; hazardous waste generation—quantity unknown; documented soil and groundwater contamination in site vicinity—specifically the Route 85 corridor as a result of an 8,000-gallon gasoline discharge; remediation activities have occurred; however, residual contamination may remain; documented LUST incidents; unknown status of current/former USTs; on-site septic system; presence of floor drains unknown; current/former chemical/waste handling practices unknown; and benzene, toluene, ethylbenzene, xylene (BTEX) and methyl tertiary butyl ether (MTBE) contamination in the Route 85 roadway immediately northwest of this property (greatest readings from a depth of 2.3 to 2.9 meters [7.5 to 9.5 feet]).

1588 Route 85: Current/former USTs; reported LUST incidences circa 1982 and 1985; possible former remediation activities; and indications that site soil and groundwater have been adversely impacted with organo-halides and petroleum constituents—source and extent of suspect contamination not determined, but evidently has impacted the Route 85 roadway.

Intersection of Routes 85 and 161

1567 Route 85: Potential for pesticides/herbicides contamination as a result of historic agricultural use.

1450 Route 85: On-site hazardous waste generation; on-site furniture-stripping activities; unknown chemical/waste handling practices of former automotive-related tenants; possible impact of site soils and/or groundwater from discharges to septic system; and former on-site USTs and fuel pumps likely.

1384 Route 85: Current on-site autobody activities; on-site septic system and two associated dry wells upgradient of the Route 85 roadway; unknown quantities of hazardous waste generation; potential improper disposal of chemicals/wastes generated by former on-site tenant; and current/former on-site USTs and fuel pump-condition unknown.

3.2 Sampling Procedures, Plan and Rationale

This subsection provides an overview of the site sampling plan, the rationale for sample locations, and sample selection for laboratory analysis. All field investigation and sampling methods were conducted as specified in the Task 210 Surficial Site Investigation Work Plan prepared for this site, dated April 15, 1996. Tables 2 and 3 provide a summary of the sample plan and rationale, as discussed herein.

**Table 2
Surficial Site Investigation Rationale**

ID	Location/Rationale	Sample Designations	Sample Type		Analysis ¹				
			Soil/Sediment	Water	VOCs ²	Metals ³	TPH ⁴	PCB ⁵	Pesticides/herbicides ⁶
GEOPROBE™ SOIL SAMPLES									
Intersection of Routes 82 and 85									
GP-1	ConnDOT ROW: 3 Hartford Road (current automobile repairs & autobody)	GP-1	•		•		•	•	
GP-2		GP-2	•	▲	▲	▲	•	•	
GP-3		GP-3	•		•		•	•	
GP-4	ConnDOT ROW: 1 New London Road (former gasoline station/documentated gasoline contamination)	GP-4	•		•	•	•		
GP-5		GP-5	•		•		•		
GP-6	ConnDOT ROW: 4 New London Road (current gasoline station/LUST site)	GP-6	•	▲	▲	•	•		
GP-7		GP-7	•		•	•	•	•	
Intersection of Route 85, Grassy Hill Road, & Chesterfield Road									
GP-8	ConnDOT ROW: 889 Chesterfield Road/1605 Route 85 (current automotive repairs/possible autobody repairs/LUST site/contamination detected in roadway)	GP-8	•	▲	▲	▲	•	•	
GP-9		GP-9	•		•	•	•		
GP-10	ConnDOT ROW: 1606 Route 85 (contamination detected in roadway)	GP-10	•		•		•		
GP-11		GP-11	•		•		•		
GP-12	ConnDOT ROW: 1596 Route 85 (contamination detected in roadway)	GP-12	•	▲	▲	▲	•		
GP-13	ConnDOT ROW: 1588 Route 85 (current gasoline station/organo-halides and petroleum detected in site soils and groundwater)	GP-13	•	▲	▲	▲	•	•	
1450 Route 85									
GP-14	ConnDOT ROW: 1450 Route 85 (current furniture stripping/former vehicle maintenance/former on-site fuel pumps)	GP-14	•	▲	▲	▲	•	•	
1384 Route 85									
GP-15	ConnDOT ROW: 1384 Route 85 (current autobody and automotive repairs/on-site USTs/current fuel pump/improper disposal of wastes by former tenant)	GP-15	•	▲	▲	▲	•	•	
SEDIMENT									
Intersection of Routes 85 and 161									
SD-1	ConnDOT ROW: Intersection of Routes 85 & 161 (potential historic herbicide and pesticide use in vicinity)	SD-1	•		•	•			•
SD-2	ConnDOT ROW: Intersection of Routes 85 & 161 (potential historic herbicide and pesticide use in vicinity)	SD-2	•		•	•			•
SURFACE WATER									
Intersection of Routes 85 and 161									
SW-1	ConnDOT ROW: Intersection of Routes 85 & 161 (potential historic herbicide and pesticide use in vicinity)	SW-1		▲	▲	▲			▲
<p>Notes: 1. All test methods specified are from EPA SW-846 test methods. 2. VOC refers to volatile organic compounds analyzed by Method 8010/8020. 3. Metals to be analyzed are as follows: arsenic, barium, cadmium, chromium, lead, mercury, selenium, silver. Soil/sediment samples to be analyzed by both mass (total) analysis and synthetic precipitation leaching procedure; groundwater and surface water samples will be analyzed for dissolved metals. 4. TPH refers to total petroleum hydrocarbons by Method 418.1. 5. PCBs refer to polychlorinated biphenyls by EPA Method 8080. 6. Pesticides/herbicides to be analyzed by EPA Methods 8080/8150.</p> <p>• Soil/sediment sample ▲ Water sample</p>									

3.2.1 Surface Soil Sampling

Surface soil sampling and analysis were conducted to screen for potential contamination in the ConnDOT ROW from a variety of sources, including gasoline stations, automobile repair shops, autobody shops, and a furniture stripper. The number of samples, rationale for collection, and laboratory analysis conducted are summarized in Table 2.

3.2.2 Sediment Sampling

Sediment sampling and analysis was conducted to screen for potential contamination in the ConnDOT ROW from a variety of sources, including possible former herbicide and pesticide applications in the vicinity and nearby gasoline station and automotive repair shop. The number of samples, rationale for collection, and laboratory analysis conducted are summarized in Tables 2 and 3.

3.2.3 Groundwater Sampling

Groundwater sampling and analysis was conducted to screen for potential contamination in the ConnDOT ROW from a variety of sources, including gasoline stations, auto repair shops, autobody shops, and a furniture stripper. The number of samples, rationale for collection, and laboratory analysis conducted are summarized in Tables 2 and 4.

Table 4 Groundwater and Surface Water Analytical Results									
Parameter	CTDEP Groundwater Protection Criteria (GA)	GP-2	GP-6	GP-8	GP-12	GP-13	GP-14	GP-15	SW-1
<i>Volatle Organic Compounds (VOCs) (ppb)</i>									
Benzene	1	ND	30	ND	ND	ND	ND	ND	ND
Ethylbenzene	700	ND	700	ND	ND	ND	ND	ND	ND
Methyl-tertiary-butyl-ether (MTBE)	100	ND	1,100	ND	ND	ND	ND	ND	ND
Toluene	1,000	ND	2,500	ND	ND	ND	ND	ND	ND
Xylenes	530	ND	4,400	ND	ND	ND	ND	ND	ND
<i>Total Metals (ppb)</i>									
Barium	1,000	210	NA	ND	20	40	40	60	ND
Cadmium	5	1	NA	ND	ND	ND	ND	1	ND
Lead	15	1	NA	5	2	7	6	3	ND
Notes: 1. Only those compounds detected are shown. 2. NA means not analyzed 3. ND means not detected 4. ppb means parts per billion. 5. Herbicide/Pesticide was analyzed in SW-1 only; sample was ND.									

3.2.4 Surface Water Sampling

Surface water sampling and analysis was conducted to screen for potential contamination in the ConnDOT ROW from a variety of sources, including possible former herbicide and pesticide applications in the vicinity and nearby gasoline station and automotive repair shop. The number of samples, rationale for collection, and laboratory analysis conducted are summarized in Table 2.

3.3 Laboratory Analysis

Samples collected for laboratory analysis were analyzed as specified in Table 2. The samples were analyzed by Matrix Analytical, Inc. of Hopkinton, Massachusetts. Volatile organic compounds (VOCs) 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 their association with transformer fluids, hydraulic fluids, and waste oils. TPH analysis was conducted because it can provide an indication whether petroleum-related product is present. Herbicide and pesticide analyses were conducted as a result of historic agricultural land use.

All field investigation and sampling methods were conducted as specified in the Task 210, Surficial Site Investigation Work Plan, prepared for this site, dated April 15, 1996. One modification to the Work Plan was implemented during the investigation. An additional groundwater sample was collected (GP-6) adjacent to a gasoline station, as strong gasoline odors were evident in the soil. VOC samples for this point were collected at three separate intervals to determine if the gasoline contamination was consistent and continuous from 0 to 8 feet.

4.0 LABORATORY ANALYTICAL RESULTS

4.1 CTDEP Cleanup Criteria

4.1.1 Overview and Applicability

Analytical results for soils and water obtained during this investigation were compared to the *Connecticut Cleanup Standard Regulations* (January 1996) developed by the CTDEP as a means of comparison. The proposed cleanup standards are summarized herein, but the actual referenced document should be consulted for complete details. Note that this source was only used as a bench mark, as upgradient wells were not installed and background levels have not been determined.

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 site at which the CTDEP requires remediation in accordance with any provision of Title 22a of the Connecticut General Statutes (CGS), except as otherwise provided in the regulations. Specifically, the regulations provide that the standards do not apply to: (1) sites at which the only source of contamination results from the use or application of pesticides and fertilizers in accordance with labeling requirements, or (2) the soil and water within the zone of influence of a groundwater discharge permitted under Section 22a-430 CGS.

4.1.2 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 includes a requirement that contaminated soils which do not support a healthy community of plant and soil organisms be remediated on a case-by-case basis.

Direct Exposure Criteria. 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 criteria apply to accessible soil to a depth of 15 feet. The DEC for substances other than PCB do 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 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 below the ground surface; (2) more than 2 feet below a paved surface comprised of a minimum of 3 inches of bituminous concrete or concrete; or (3) beneath an existing building. Also, the soil cannot be exposed by excavation, demolition, or construction activities and an environmental land-use restriction must be recorded.

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. If the industrial land-use criteria are applicable and used, an environmental land use restriction notification is required in accordance with Section 22a-133q-1 of the Regulations of Connecticut State Agencies.

Pollutant Mobility Criteria (PMC). The PMC that will apply to remediation of a site depend on: (1) the groundwater classification of the site, and (2) the date on which the release of pollutants to the environment occurs. The PMC generally apply to all soil in the unsaturated zone, from the ground surface to the seasonal low 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 practicable. The criteria do not apply to environmentally isolated soils that are polluted with substances other than VOCs. Environmentally isolated soils are defined as certain contaminated soils beneath an existing building which are not a source of ongoing pollution and are above the seasonal high water table. An environmental land-use restriction must be recorded for the site which assures that such soils will not be exposed as a result of demolition of the building or other activities.

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 (e.g., GA/GAA or GB) of the area at which the soil is located. An inorganic substance or PCB in soil shall be remediated to at least that concentration at 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 at which the soil is located.

4.1.3 Groundwater Remediation Standards

Remediation of a groundwater plume shall result in the attainment of the requirements of the Surface Water Protection Criteria (SWPC) and the requirements concerning Volatilization Criteria (VC) or the background concentration for groundwater for each substance in such plume. Background concentration for a compound in groundwater at a site is defined as the concentration of that compound in immediately upgradient groundwater that is not affected by any release of pollutants on or related to the site.

The SWPC requires that the groundwater contamination resulting from on-site sources which exceeds background be remediated to levels that adequately protect the surface water based on the SWPC. Compliance with the SWPC is determined by averaging the concentration of a compound within the area of groundwater contamination emanating from a site and comparing the average to the SWPC established by the CTDEP.

The VC apply to all groundwater polluted with a volatile organic substance within 15 feet of the ground surface or a building. The volatile organic substance shall be remediated to a concentration which is equal to or less than the applicable residential volatilization criterion for groundwater. If groundwater polluted with a volatile organic substance is below a building used solely for industrial or commercial activity, such groundwater shall be remediated such that the concentration of such substance is equal to or less than the applicable industrial/commercial effect.

Remediation of a groundwater plume in a GA area (such as the area of investigation) shall generally also result in the reduction of each substance therein to a concentration equal to or less than the background concentration for groundwater of such substance. However, if the CTDEP determines that groundwater is not currently used for drinking water purposes and is not a resource needed for drinking water purposes in the future, or it is not technically feasible to restore groundwater to its natural quality, the cleanup criterion for any pollutant in groundwater is the numerical groundwater protection criterion provided by CTDEP.

4.2 Evaluation of Data

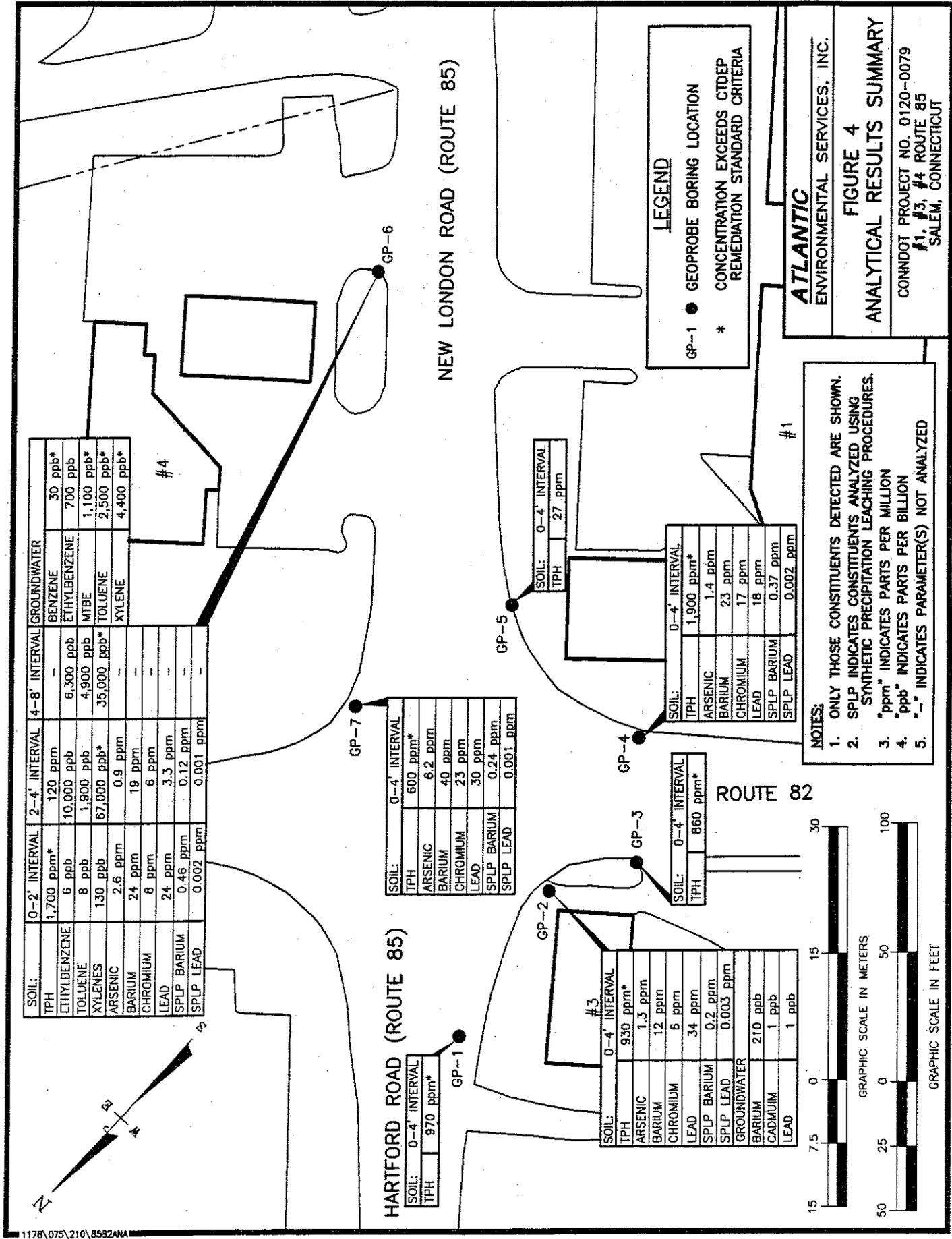
Figures 4, 5, and 6 depict sample locations and summarize analytical data discussed herein.

4.2.1 Soil and Sediment Sample Analytical Results

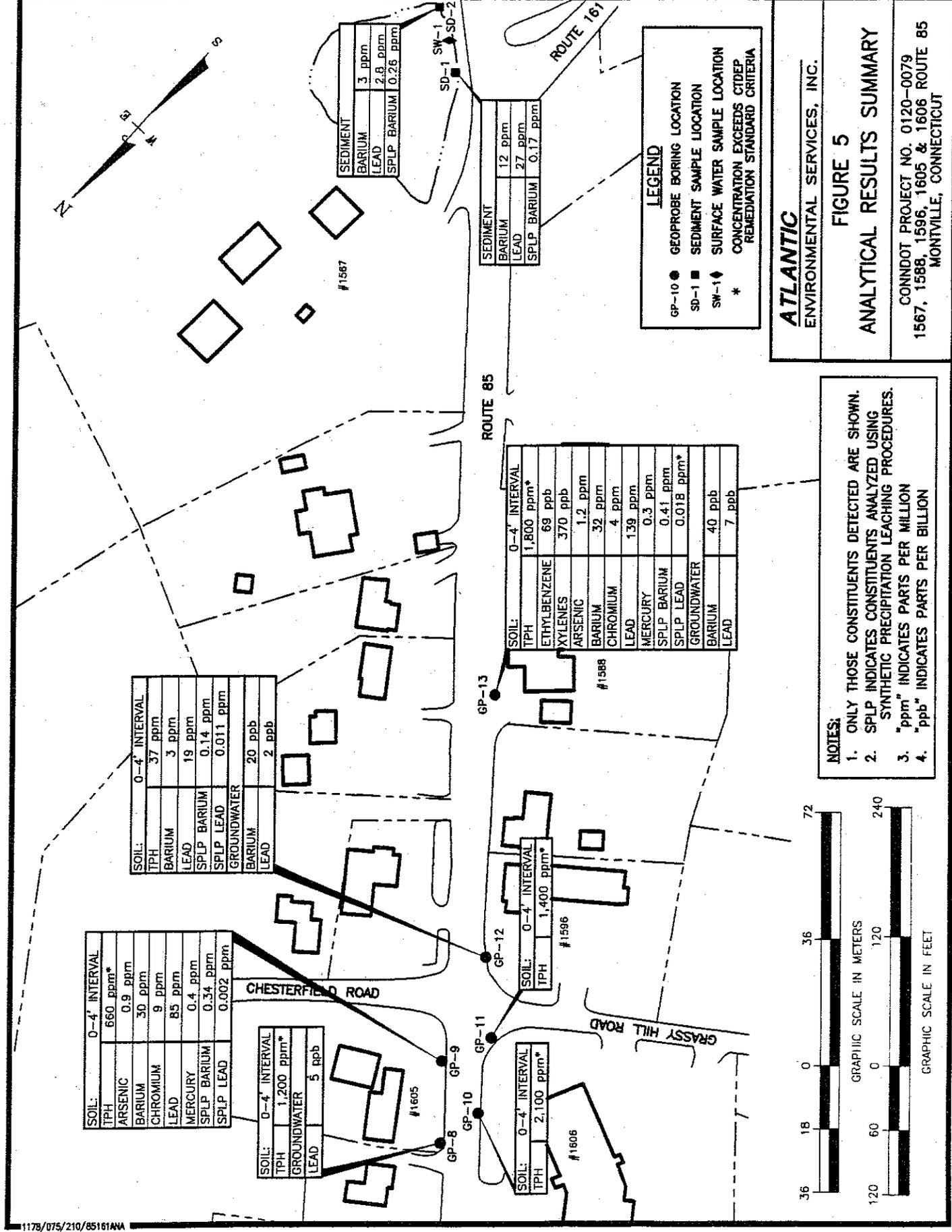
Twenty soil samples were analyzed for VOCs. Twelve soil samples were analyzed for TCLP metals and total (RCRA 8) metals. Sixteen soil samples were analyzed for TPHs. Eight soil samples were analyzed for PCBs. Two soil samples were analyzed for herbicides and pesticides. A summary of soil analytical results is provided in Table 3; copies of the complete laboratory results are provided in Appendix B.

PCBs were not detected in any of the Geoprobe™ samples analyzed (GP-1, GP-2, GP-3, GP-7, GP-8, GP-13, GP-14, and GP-15). Herbicides and pesticides were not detected in either of the two sediment samples analyzed.

Methylene chloride was detected in GP-4, GP-6, GP-9, GP-11, GP-12, GP-13, and GP-15. Matrix Analytical believes that the detection of this parameter in all seven samples is due to laboratory contamination.



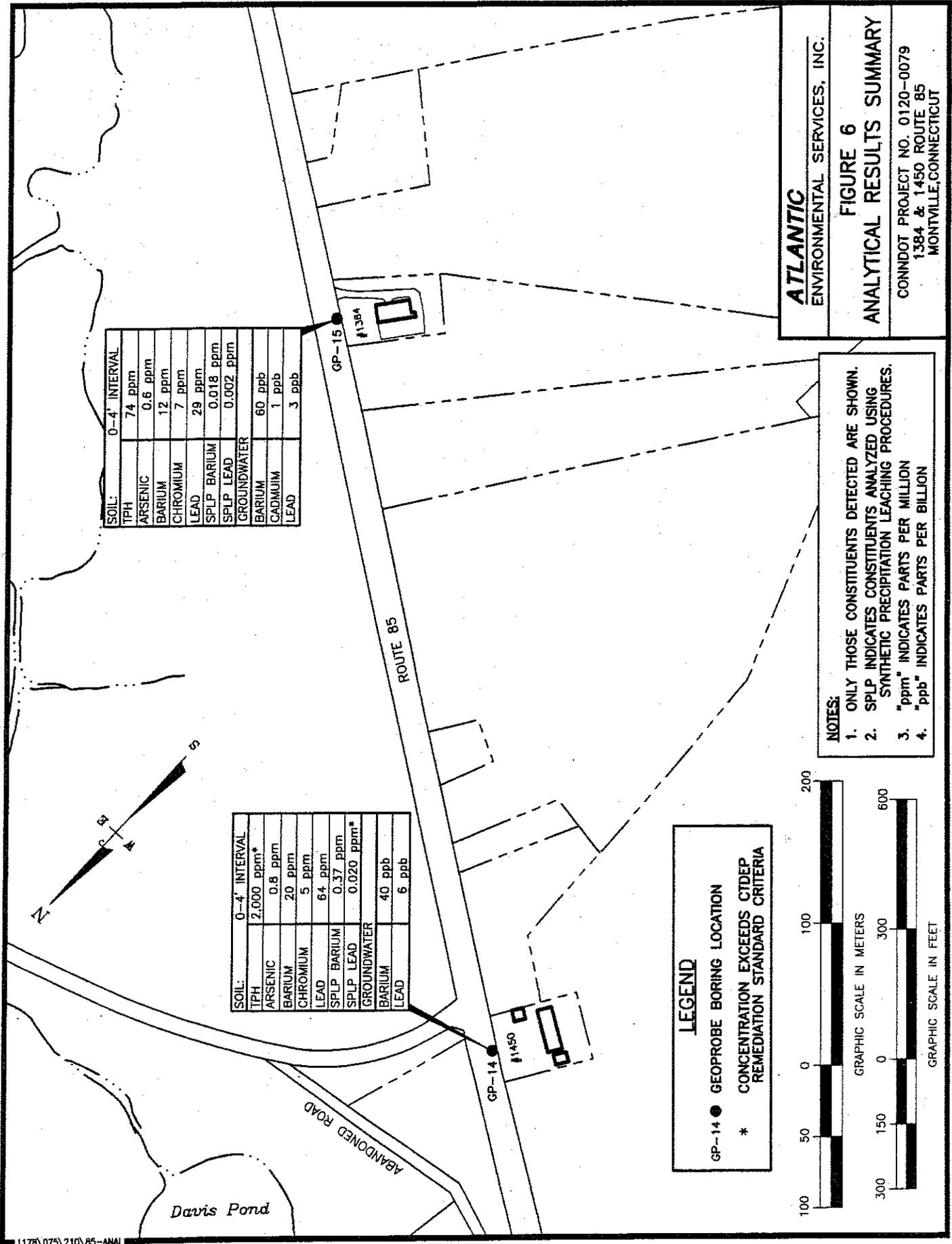
1178-075-210/8582ANA



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FIGURE 5
ANALYTICAL RESULTS SUMMARY

CONDOT PROJECT NO. 0120-0079
1567, 1588, 1596, 1605 & 1606 ROUTE 85
MONTVILLE, CONNECTICUT



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FIGURE 6
ANALYTICAL RESULTS SUMMARY

CONDOT PROJECT NO. 0120-0079
1384 & 1450 ROUTE 85
MONTVILLE, CONNECTICUT

1178\075\210\85-ANAL

Twelve of the 16 Geoprobe™ samples analyzed for TPH were found to exceed applicable CTDEP remediation standard criteria: GP-1 (970 ppm); GP-2 (930 ppm); GP-3 (860 ppm); GP-4 (1,900 ppm); GP-6, 0 to 2 feet (1,700 ppm); GP-7 (600 ppm); GP-8 (1,200 ppm); GP-9 (660 ppm); GP-10 (2,100 ppm); G-11 (1,400 ppm); GP-13, 0 to 4 feet (1,800 ppm); and GP-14 (2,000 ppm). It has been Atlantic's experience that these levels are not uncommon in soils underlying paved roadways. All of these samples were collected from the ground surface (immediately beneath the paved roadway) to a depth of 2 to 4 feet. It is likely that the source of the TPH present in these samples is associated with the bituminous material and is not indicative of a release of petroleum product.

A discussion of the analytical results specific to each area is presented below.

Intersection of Route 85 and Route 82

Ethylbenzene, toluene and xylenes were detected in GP-6, located adjacent to Henny Penny (4 New London Road). Xylenes were above the CTDEP PMC for GP-6 at depths of 2 to 4 feet (67,000 parts per billion [ppb]), and 4 to 8 feet (35,000 ppb). Ethylbenzene (10,000 ppb) and toluene (1,900 ppb) were present at concentrations below the PMC. These concentrations are all well below the CTDEP DEC. These constituents were also present in the sample collected at the surface (0 to 2 feet); however, at concentrations well below the PMC and the DEC. The detected levels are indicative of a gasoline release in the immediate vicinity. No other VOC parameters were detected in any of the soil samples analyzed at this intersection.

Arsenic, barium, chromium, and lead were identified in all of the samples analyzed for total metals at this intersection (GP-2, GP-4, GP-6 and GP-7). Only low levels of these constituents were noted; none of them exceeded the DEC. Barium and lead were detected by the SPLP metals analysis in the aforementioned samples; no levels exceeded the PMC.

As previously discussed, TPH was present at elevated concentrations in eight samples collected from this intersection. It appears that these concentrations are related to asphalt interference in the sample matrix. TPH was detected below applicable CTDEP remediation standards in samples GP-5 and GP-6 (2 to 4 feet). Sample GP-6 (2 to 4 feet) contained significantly elevated levels of gasoline constituents; the low concentration of TPH in this sample (120 ppm) supports the opinion that TPH concentrations in other samples are related to the presence of asphalt, and are not solely indicative of a petroleum release.

Intersection of Route 85, Grassy Hill Road and Chesterfield Road

Ethylbenzene and xylene were detected in GP-13 (0 to 4 feet) at levels of 69 ppb and 370 ppb, respectively. This sample is located adjacent to 1588 Route 85 (Izzy's Gas Station). Both constituents are below applicable CTDEP remediation standards.

Barium and lead were identified in all the samples analyzed for total metals taken from this area. Additionally, GP-9 and GP-13 (0 to 4 feet) were noted to contain detectable quantities of arsenic, chromium and mercury. None of the levels observed exceeded the DEC. Barium and lead were detected using the SPLP method in GP-9, GP-12 and GP-13 (0 to 4 feet). The lead value for GP-13 (0 to 4 feet [0.018 ppm]) was noted to exceed the PMC; the remainder of the SPLP metal results were below the PMC for this area.

TPH was present in site soil samples collected from this intersection; five samples were above applicable criteria. TPH was noted in GP-12; however, the level was below the PMC and the DEC.

Due to the presence of some VOCs in GP-13 (0 to 4 feet) it would appear that a minor petroleum release has occurred. The lead value was notably higher than other samples taken from the project area. This might suggest that the released petroleum product was of historic nature (i.e., leaded gasoline). The absence of VOCs in the lower sample interval (GP-13 [4 to 8 feet]) suggests that the release may have occurred as a result of a surface spill rather than a leak from a UST, or the release has not migrated to a significant depth.

Intersection of Routes 85 and 161

Total barium and lead were detected in both sediment samples SD-1 and SD-2. The levels were below the DEC.

SPLP barium was present in both samples at concentrations (0.17 ppm and 0.26 ppm, respectively) below the PMC. No additional metals were detected in these samples.

1450 Route 85

Arsenic, barium, chromium, and lead were identified in the total metal analysis of GP-14; none of these levels exceeded the DEC. Barium and lead were detected using the SPLP metal analysis. Lead was noted to be 0.020 ppm, which exceeds the PMC. Barium was below this criteria.

No VOCs were detected in the sample taken from this area.

1384 Route 85

Arsenic, barium, chromium, and lead were detected by the total metals analysis performed on GP-15. The levels of each constituent did not exceed applicable CTDEP criteria. Levels of barium and lead were identified by the SPLP analysis; they did not exceed the PMC.

No VOCs were detected in GP-15.

4.2.2 Groundwater and Surface Water Sample Analytical Results

Eight groundwater samples were analyzed for VOCs and total dissolved metals. One surface water sample was analyzed for herbicides and pesticides. A summary of ground and surface water analytical results is provided in Table 4; copies of the complete laboratory results are provided in Appendix B.

Intersection of Route 85 and Route 82

Elevated levels of VOC parameters were detected in GP-6, exceeding the Groundwater Protection Criteria (GPC) for GA areas. These include benzene (30 ppb), methyl-tertiary-butyl-ether (1,100 ppb), toluene (2,500 ppb), and xylenes (4,400 ppb). This is indicative of a recent gasoline leak/spill. No other VOC parameters were detected in this water sample. No VOC parameters were detected in the groundwater sample obtained from GP-2 (western side of intersection).

Dissolved barium, cadmium and lead were identified in GP-2; these levels are below the GPC. No metals were analyzed for groundwater sample GP-6.

Intersection of Route 85, Grassy Hill Road, and Chesterfield Road

No VOCs were detected in the groundwater samples taken from this area (GP-8, GP-12 and GP-13). Low levels of dissolved lead were noted in GP-8. Dissolved barium and lead were identified in samples taken from GP-12 and GP-13. None of the groundwater samples taken from this area exceeded the GA GPC for dissolved metals.

Intersection of Route 85 and 161

No herbicides/pesticides, VOCs or metals were present in the surface water sample (SW-1) taken from this area.

1450 Route 85

Low levels of dissolved barium and lead were identified in the groundwater sample taken from GP-14. These levels are below the CTDEP GPC for GA areas. No VOCs were detected in this sample.

1384 Route 85

Dissolved barium, cadmium and lead were detected in GP-15; none of these constituents exceed the applicable CTDEP criteria. No VOCs were identified.

5.0 LOCAL ENVIRONMENT AND RECEPTORS

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

5.1 Groundwater and Soils

Groundwater below and near the intersection of Routes 82 and 85 is classified by the CTDEP as a GB/GA groundwater area. The GB/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 and, therefore, any potential remediation activities would defer to the GA cleanup criteria.

The CTDEP groundwater classification within the remainder of the project area is GA. 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.

Based on the analytical results obtained from GP-6, the soils and groundwater within the ROW adjacent to the southwestern property boundary of the Henny Penny (4 New London Road) have been impacted with petroleum product. The levels of xylenes from samples taken from 2 to 8 feet below surface grade exceed the CTDEP PMC. Benzene, MTBE, toluene, and xylenes were detected in the groundwater sample exceeding the GPC for GA areas.

Other constituents which exceed the CTDEP criteria include SPLP lead in GP-13 (0 to 4 feet) and GP-14 as well as TPH in the majority of the surficial soil samples.

Receptors of the contaminated groundwater adjacent to the Henny Penny could include construction workers involved in excavation and utility work. 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 and groundwater could also migrate to surface waters.

5.2 Surface Water

The surface water closest to the intersection of Routes 82 and 85 is Harris Brook, located west and south of this intersection. This surface water is classified by the CTDEP as A, indicating a potential drinking water supply; fish and wildlife habitat; recreational use; agricultural supply; industrial supply; and other legitimate uses, including navigation. The A classification indicates that the waters are known or presumed to meet the water-quality criteria that support the designated uses. The state's goal is Class A.

The levels of the VOCs observed in the groundwater sample taken from GP-6 were noted to be below the CTDEP Surface Water Criteria.

The surface water closest to the intersection of Route 85, Grassy Hill Road, and Chesterfield Road is Latimer Brook, located west of this intersection. This surface water is classified by CTDEP as A.

The small private pond adjacent to the ConnDOT ROW at the intersection of Routes 85 and 161 is classified AA. The AA classification indicates that this surface water is designated as a water supply watershed or a potential water supply watershed.

No VOCs, total dissolved metals, herbicides or pesticides were detected in the surface water sample taken from this private pond (SW-1).

The surface waters closest to 1450 and 1384 Route 85 are Davis Pond and Lake Konomoc, respectively, located to the east across Route 85. These surface waters are both classified by the CTDEP as A.

5.3 Water Supply

Private drinking water wells are located in the vicinity of all project areas. Numerous water-supply sources are located in close proximity to the project areas. These public water supply sources are depicted on Figures 7 and 8.

Nearby private drinking water wells and public water supply sources provide a source of exposure to those individuals consuming the water.

6.0 SUMMARY AND CONCLUSIONS

The purpose of the Task 210 was to screen for the presence of contamination in the ConnDOT ROW along portions of Route 85 in Salem and Montville. This SSI employed Geoprobe™ test borings and soil, sediment, groundwater, and surface water sampling and analysis. This SSI was conducted in accordance with the Task 210, Surficial Site Investigation Work Plan, dated April 15, 1996.

The results of this Task 210 SSI indicate that gasoline contamination is present in soil and groundwater within the existing Route 85 ROW adjacent to 4 New London Road in Salem (Henny Penny) and 1588 Route 85 in Montville (Izzy's). The extent of contamination associated with these releases is not known at this time. Relying on our understanding of the project, it is likely that contaminated material will be encountered and handled in these areas.

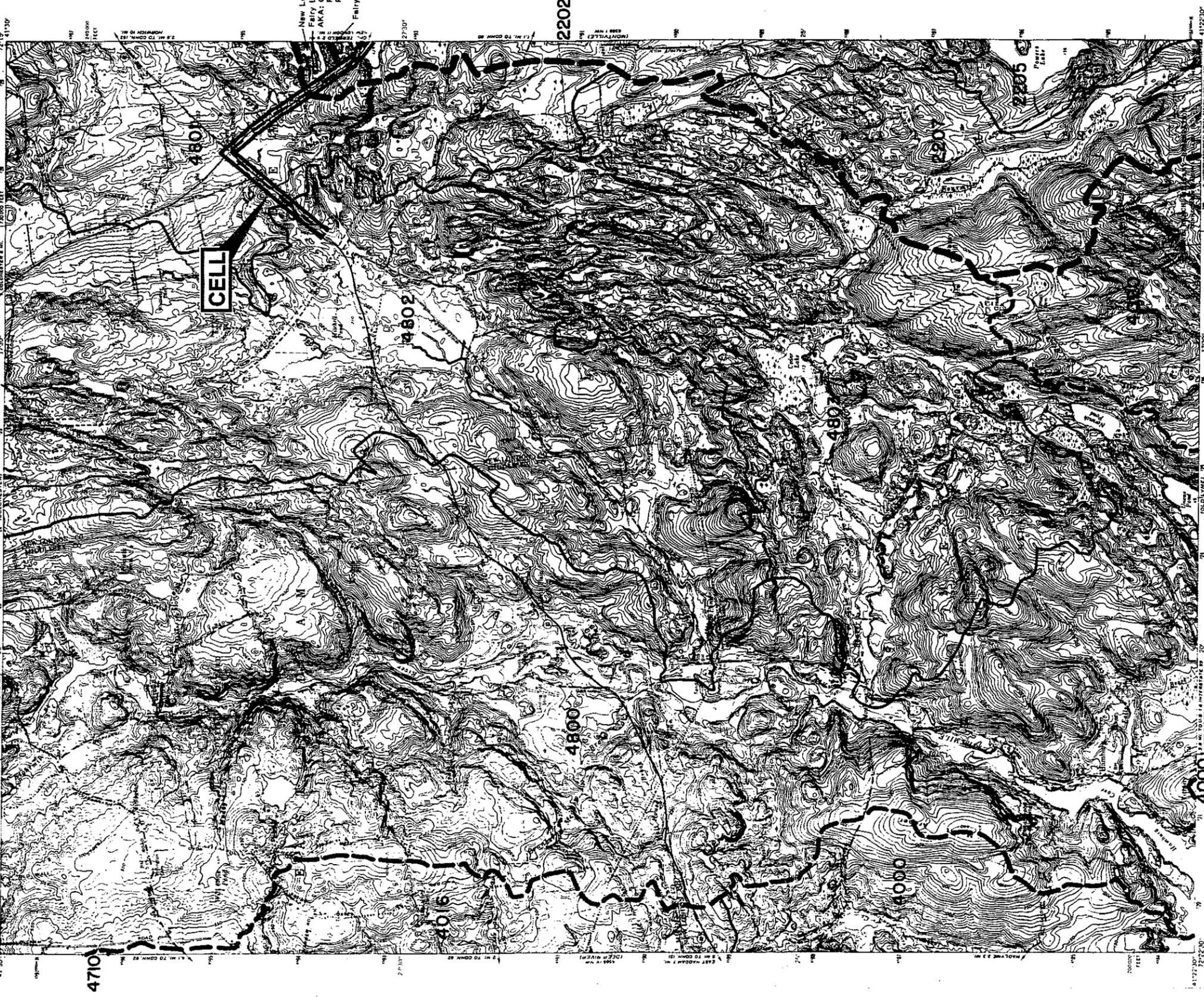
No additional significant areas of concern were identified within the existing ROW during the course of this evaluation. However, this screening level investigation did not assess potential contamination beyond the limits of the ROW. Several potential sources of contamination have been previously identified on properties located adjacent to the road. The potential for future property takings involving those sites with suspect environmental conditions warrants additional investigations.

Based on available information to date, Atlantic recommends additional site screening within the existing ROW to determine the extent of gasoline-related contamination at the two identified areas of concern. In addition, those sites requiring property takes should also be further evaluated to determine current subsurface conditions.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

STATE OF CONNECTICUT
HIGHWAY DEPARTMENT

HAMBURG QUADRANGLE
CONNECTICUT
7.5 MINUTE SERIES (TOPOGRAPHIC)



Mapped, edited, and published by the Geological Survey
Control by USGS, USCGS, and Connecticut Geologic Survey
Topography by photogrammetric methods from aerial photographs
taken 1949. Field checked 1952. Revised 1961.
SRTM30 hydrographic data compiled from USCGS Chart 216 (1960).
This information is not intended for navigational purposes.
Polarsic projection. 1927 North American datum.
10,000 foot grid based on Connecticut coordinate system.
Zone 18, shown in blue.
To place on the predicted North American Datum, 1983,
move the projection lines 5 meters south and
39 meters west as shown by dashed corner ticks.
Fire and dashed lines indicate selected fence and land lines where
primarily visible on aerial photographs. This information is unchecked.

SCALE
Graphic scale in feet and meters.
Graphic scale in kilometers and miles.
CONTOUR INTERVAL 10 FEET
NOTE: THE RELATIONSHIP BETWEEN THE HORIZONTAL AND VERTICAL SCALES IS AS FOLLOWS: 1 HORIZONTAL INCH = 2.5 VERTICAL INCHES.
DEPTH CURVES AND SOUNDINGS IN FEET. SOUNDINGS IN METERS.
INDICATE THE MEAN RANGE OF TIDE IS APPROXIMATELY 2 FEET.

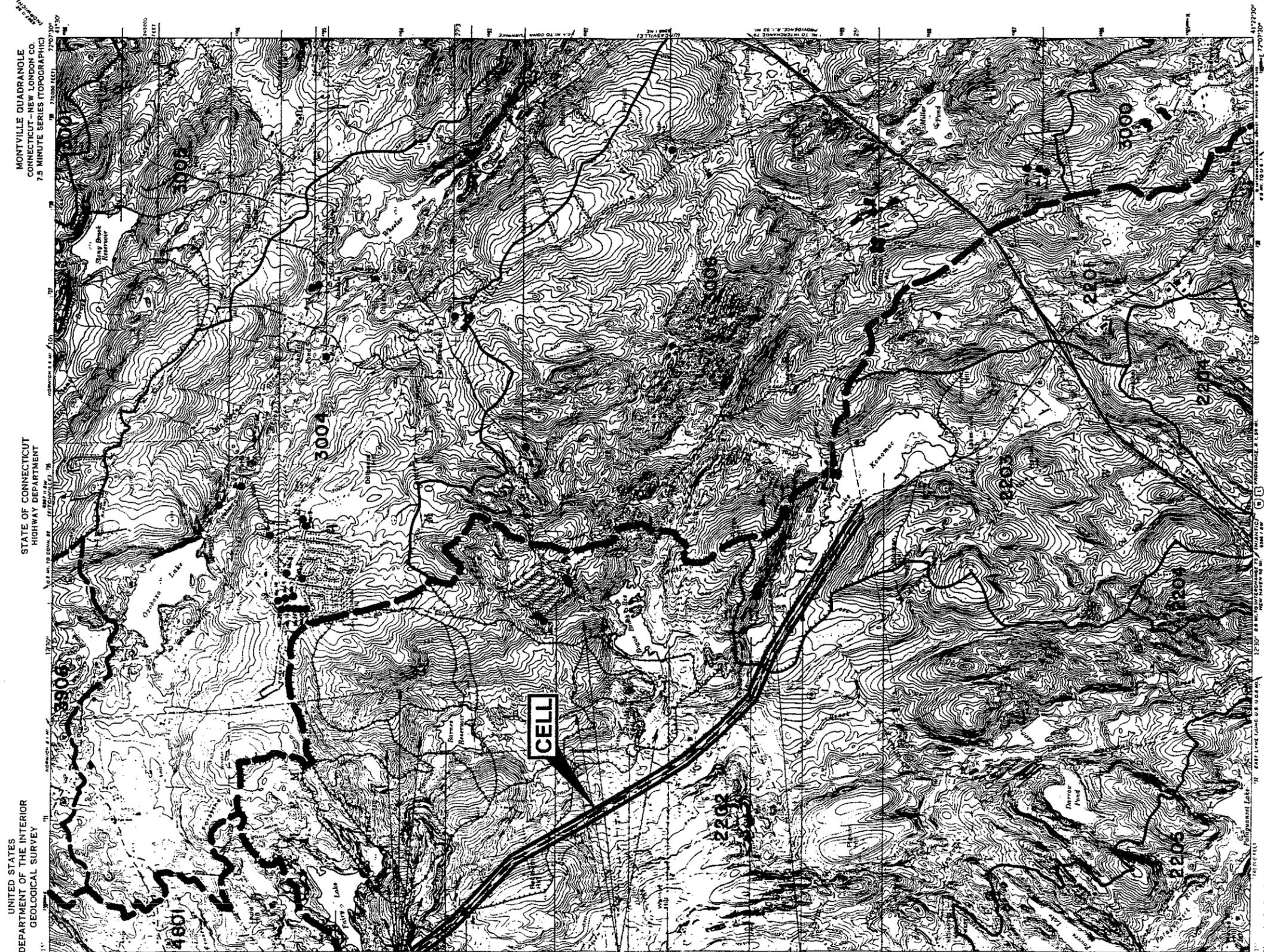
ROAD CLASSIFICATION
Heavy duty
Medium duty
Light duty
Unimproved dirt
State Route

HAMBURG, CONN. -85
N4122.5-W7215.7.5
1961
PHOTO REVISIONS 1971
AND 1984 BY NE-SCIENCE VETS

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FIGURE 7
PUBLIC WATER SUPPLY
AND DRAINAGE BASINS

CONNDOT PROJECT NO. 0120-0079
ROUTES 82 & 85
SALEM/MONTVILLE, CONNECTICUT



MONTVILLE QUADRANGLE
CONNECTICUT-NEW LONDON CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

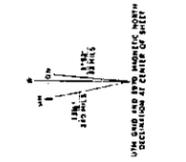
STATE OF CONNECTICUT
HIGHWAY DEPARTMENT

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ROAD CLASSIFICATION
 Heavy duty
 Medium duty
 Light duty
 Unimproved dirt
 U.S. Route
 State Route



SCALE 0 1 2 3 4 5 6 7 8 9 10
 FEET
 METERS
 CONTOUR INTERVAL 10 FEET
 DATUM IS MEAN SEA LEVEL



Mapred, edited, and published by the Geological Survey
 Connecticut 1:25,000 scale, and Connecticut General Survey
 Connecticut 1:25,000 scale, 1914
 Photographic aerials, 1927 North American datum
 10,000 foot grid based on Connecticut coordinate system
 1000 meter Universal Transverse Mercator grid lines
 Zone 18, shown in blue
 UTM GRID AND 1:25,000 SCALE
 "ELEVATION AT CENTER OF SHEET"

MONTVILLE, CONN.
 1948
 PHOTOGRAPHED: 1970
 AND 1987, 1988, 1989, 1990

- New London Water Dept.
Fairy Lake (S)
AKA: Carr Pond, Stump
Pond, Rawalle's
Pond, Rawalle Pond
- New London Water Dept.
- New London Water Dept.
Barnes Reservoir (S)
AKA: Barnes Reservoir
"Shady Brook" Highway
Picnic Rest Area
- Oakdale Heights Water
Association
- New London Water Dept.
Beckwith Pond (S)
AKA: Chappel Pond
- New London Water Dept.
Bogus Brook Reservoir (S)
- New London Water Dept.
Davis Pond (E)
- New London Water Dept.
- New London Water Dept.
Lake Konomoc (D)
AKA: Lakes Pond or New
London Reservoir

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 ENVIRONMENTAL SERVICES, INC.

FIGURE 8
PUBLIC WATER SUPPLY
AND DRAINAGE BASINS

CONNDOT PROJECT NO. 0120-0079
 ROUTES 82 & 85
 SALEM/MONTVILLE, CONNECTICUT