INITIAL SITE INVESTIGATION

SMS Site #97-2285
Janet Warren Residence
28 Olcott Falls Manor
Wilder, VT 05088

Prepared for:

Mrs. Janet Warren
28 Olcott Falls Manor
Wilder, VT 05088

Prepared By:

North Country Environmental Services, Inc.
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Milford, MA 01757

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NCES Job #1548

February 10th, 1997

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1.0 EXECUTIVE SUMMARY

An Initial Site Investigation was performed at the residence of Ms. Janet Warren, 28 Olcott Falls Manor, Wilder, Vermont (hereinafter referred to as "the site"). This investigation was performed to define the degree and extent of soil and groundwater contamination as the result of a release of kerosene from an aboveground storage tank (AST) in November of 1997. The investigation was conducted following guidelines established by Bob Haslam of the Vermont Department of Environmental Conservation (VT DEC).

In addition to the above, this document serves as a record of initial spill response efforts made at the site.

North Country Environmental Services, Inc. (NCES) was notified of the release on Friday, November 28, 1997. On Saturday, November 29, 1997, employees of NCES removed ten drums of oil-contaminated soil from the release area at Ms. Warren's trailer. Total Organic Vapor (TOV) screening by jar headspace analysis revealed soil contamination in the range of 25 to 150 ppm.

It was noted that the water supply well for the town of Wilder, Vermont, was less than 200 yards from the area of the release. Because of this, additional and immediate work was requested by Bob Haslam of the Vermont Department of Environmental Conservation.

Approximately 20 cubic yards of contaminated soil were removed and polyencapsulated at the former Wilder wastewater treatment plant. Excavated soils were screened in the field for TOV using the jar headspace method. Three soil borings were advanced at the site, and then completed as groundwater monitoring wells. Soil samples collected were screened for TOV using the jar-headspace method. No organic vapors were detected in the headspace of the jars. Consequently, no soil samples were submitted for laboratory analysis.

On December 10th, 1997, groundwater samples were collected from each of the monitoring wells and analyzed for Total Petroleum Hydrocarbons and volatile aromatic compounds including methyl tertiary-butyl ether. No contaminants were detected at above reportable levels. A second round of sampling was conducted on the 21st of January, 1998. These samples were similarly tested, and the analytical results were comparable, with the exception of a trace amount of Xylenes (7.40 µg/L).

Groundwater at the site was established to be at between ten and fifteen feet below grade, and traveling in a westerly direction. The only identified receptor was the one million gallon per day Wilder town well located approximately 200 yards downgradient from the release area.

North Country Environmental Services, Inc., recommends the following actions:

- Monitor the three groundwater monitoring wells on a quarterly basis for the presence of EPA 8100M and EPA 602 compounds.
- Continue monitoring the Soil Vapor Extraction System (SVES) and report to the Vermont DEC at the intervals discussed in the letter from NCES to the VT DEC on December 23, 1997 (included as Appendix D to this report).

2.0 INTRODUCTION

The following report has been prepared to outline the scope of work and results of an Initial Site Investigation which were performed at the residence of Ms. Janet Warren, 28 Olcott Falls Manor, Wilder, Vermont.

On November 29, 1997, North Country Environmental Services Inc. was notified of the release of kerosene from a 275-gallon aboveground fuel oil storage tank (AST) at the site. NCES conducted the initial spill response on Saturday, November 29, 1997, and removed 2-3 yards of contaminated soil to a depth of 32 inches below grade.

On Monday, December 1, 1997, an additional twenty cubic yards of contaminated soil was removed and polyencapsulated at a nearby town property. Excavation was continued to a depth of approximately eight feet below grade, at which depth soil TOV readings were in the 100 ppm range. This TOV concentration has been evaluated as the practical lower limit at which groundwater will be impacted.

A vapor recovery well was installed directly below the release area to a depth of fourteen feet below grade. An additional three soil borings were advanced at the site, one upgradient of the release area and two downgradient of the release area. Soil samples retrieved from the boreholes revealed no elevated TOV levels. The borings were then completed as groundwater monitoring wells. Groundwater samples retrieved from these wells showed no EPA 8100M or EPA 602 compounds (see Appendix C to this document).

A Soil Vapor Extraction (SVE) treatment system was installed at the site to remediate subsurface contamination, utilizing the aforementioned vapor recovery well.

3.0 EMERGENCY SPILL RESPONSE

On Friday, November 28, 1997, NCES was contacted by Bob Haslam of the VT DEC regarding the release of kerosene from a 275-gallon #2 fuel oil AST at the residence of Janet Warren, 28 Olcott Falls Manor, Wilder, Vermont. NCES representatives arrived at the site on Saturday, November 29, 1997 at 9:00 a.m.

It was noted that Ms. Warren's trailer was located less than 200 yards from the one million gallon per day well which supplies drinking water to the town of Wilder.

The 275-gallon AST was located directly behind the trailer. The bottom of the AST had rusted through, causing the release of approximately 100 to 150 gallons of virgin kerosene.

NCES personnel removed and properly disposed of the AST, and cleanup work was initiated. Ten drums of fuel-contaminated soil and debris were removed from the area directly below the former location of the tank. Excavated soils were fine to coarse sands with some construction debris. Ten soil samples were collected and analyzed by jar headspace method with a Photo-Ionization Detector (PID) to determine the degree and extent of the contamination. An HNu P101 PID calibrated on Saturday, November 29, 1997 was used for the headspace analysis. PID readings ranged from 12 ppm at the ground surface to 150 ppm at thirty-two inches below grade. The initial area of

excavation was four feet by six feet, and the depth of excavation was approximately thirty-two inches.

At the completion of work on the 29th, Michael McCarley of NCES contacted Bob Haslam of the VT DEC to discuss further remediation activities at the site. Approval was gained from Mr. Haslam for NCES to return to the site on Monday, December 1, 1997 to continue soil removal in order to further define the vertical extents of contamination.

Under a plan approved by Robert Halsam of the Vermont Department of Environmental Conservation, NCES representatives returned to the site on Monday, December 1st, 1997 to continue soil removal. Approximately 20 cubic yards of contaminated soil were removed at that time. The contaminated soil was transported to the former Wilder wastewater treatment plant for poly-encapsulation. Twenty soil samples were taken at various depths within the excavation and screened for TOV using the PID. Concentrations of TOV in the soil directly beneath the release area were found to be in the 100 ppm range, regardless of depth.

Removal was halted at eight feet below grade to avoid undermining the trailer supports. PID readings at this depth were 110 ppm. Neither groundwater nor free phase product were encountered. The composition of the excavated soils is best described as fine to coarse sands with some gravel.

The excavation was backfilled and a soil vent pipe installed on Wednesday, December 3rd, 1997. The vent pipe was installed to a depth of 14 feet below grade. The vent pipe was constructed of a five-foot section of .020 inch slotted, two-inch inner diameter (ID) PVC well screen connected to two-inch ID PVC riser pipe. The excavation was backfilled to approximately five feet below grade (approximately one foot above the top of the well screen), at which point an eight-foot long by eight-foot wide layer of 6 mil polyethylene sheeting was placed around the vent pipe to act as a vapor barrier. The excavation was then backfilled to grade, with approximately three feet of riser pipe remaining above the ground surface.

4.0 WORK PLAN

Due to the proximity of the work site to the public water supply well, and because the vertical extents of contamination could not be defined during emergency response activities, further actions at the site were directed by the VT DEC.

A proposed work plan was submitted by North Country Environmental Services, Inc. to Bob Haslam of the VT DEC in a letter dated December 3rd, 1997. Mr. Haslam approved this plan in a letter to NCES dated December 4th, 1997. The work plan included the following tasks:

1. The advancement of one upgradient soil boring and two downgradient soil borings and the completion of these borings as groundwater monitoring wells.

2. The conduct of split spoon sampling at five (5) foot intervals at each of the boring locations, with all samples to be screened in the field for TOV utilizing a PID.

3. The sampling and analytical testing of groundwater from the installed monitoring wells for EPA 8100M and EPA 602 compounds.

4. The measurement of site groundwater depth, the establishment of groundwater monitoring well wellhead elevations, and the establishment of a groundwater flow direction across the site.

5. The compilation of pertinent data and preparation of an Initial Site Assessment Report, including a summary of initial spill response activities.

An additional work plan was prepared by North Country Environmental Services, Inc. for the design and installation of an SVE system the site. The details of this plan were outlined in a letter from Richard Mansfield of NCES to Bob Haslam of the Vermont DEC dated December 23, 1997. Mr. Haslam approved this plan in a letter to NCES dated January 6, 1997. This additional work plan included the following tasks:

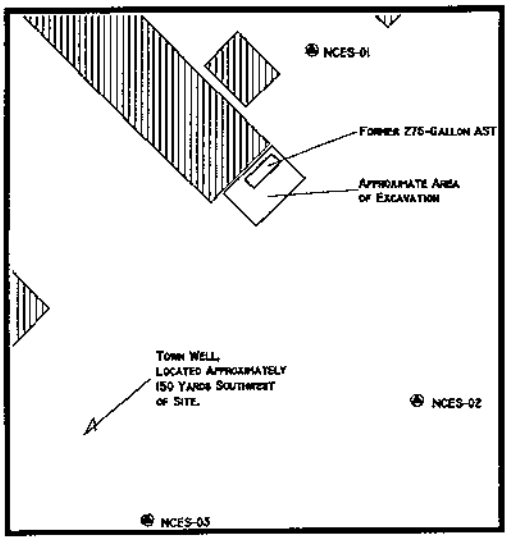
1. The installation of a soil vapor extraction system utilizing the installed soil vent pipe at the subject site.

2. The periodic PID screening of the system air stream for TOV, using the four system sampling ports to monitor contaminant concentration in the air stream.

3. The collection of confirmatory groundwater samples from the installed monitoring wells in January of 1998, with collected groundwater samples to be analyzed for EPA 8100M and EPA 602 compounds.

4. The initiation of quarterly groundwater sampling of the installed groundwater monitoring wells to monitor subsurface contaminant migration, collected groundwater samples to be analyzed for EPA 8100M and EPA 602 compounds.

5.0 SOIL BORING ADVANCEMENT AND MONITORING WELL INSTALLATION



Three soil borings were advanced at the site on December 8th, 1997 and converted to monitoring wells as outlined in the scope of work. The borings were advanced by Green Mountain Boring of East Montpelier, Vermont, under the direct supervision of NCES engineering personnel.

All borings were advanced utilizing a Bombardier all terrain vehicle mounted hydraulic rotary drill rig utilizing continuous flight 4.25 inch ID hollow stem augers. All down hole drilling equipment and tools were decontaminated prior to use at each boring location to prevent potential cross contamination. These borings were advanced in the overburden soils to a depth of twenty to twenty-five feet below grade. The monitoring wells were installed to further define the degree and extent of contamination downgradient of the release area, assess subsurface soil conditions, and to collect groundwater samples for analytical testing. Copies of all boring logs are available as Appendix B. The locations of all monitoring wells are presented in the accompanying figure and in Appendix A.

All monitoring wells were constructed of two-inch ID schedule 40 PVC pipe with flush threads and end caps. The screen sections of each well were constructed of .020-inch slotted, two-inch ID schedule 40 PVC pipe with flush threads. The well screen in each well was installed in such a manner as to intercept the elevation of the upper level groundwater. The annular space was filled with washed silica sand to a level approximately two feet above the well screen, following placement of the riser pipe and screen section of each well. A bentonite seal was then installed above the sand pack. The remainder of the annular space was then filled with natural materials. Watertight roadway boxes were placed at grade and sealed with concrete to complete the installation. Table 1 outlines the monitoring well construction details.

Table 1

MONITORING WELL CONSTRUCTION DETAILS

Well Number	Date of Installation	Total Well Depth	Well Screen Location
NCES-1	12/08/97	25 feet	15 - 25 feet
NCES-2	12/08/97	20 feet	10 - 20 feet
NCES-3	12/08/97	20 feet	10 - 20 feet

During the advancement of soil borings on the site, soil samples were collected from each location utilizing twenty-four inch long by two inch ID split spoon samplers. Samples were collected at five foot intervals or strata change using the Standard Penetration Test Method. All soil samples were classified in the field according to the Modified Burmister Soil Classification System. Please refer to the Soil Boring Logs in Appendix B for detailed soil characteristics at each sampling location.

All soil samples collected from the borings were screened in the field for the presence of TOV by jar headspace analysis using a pre-calibrated HNu P101 PID. Table 2 below outlines the results of TOV field tests.

Table 2

SOIL SCREEN TOV RESULTS

Boring Location	Sample Number	Sample Depth	TOV Result
NCES-1	S1	5-7 feet	0 ppm
	S2	10-12 feet	0 ppm
	S3	15-17 feet	0 ppm
	S4	20-22 feet	0 ppm
NCES-2	S1	5-7 feet	0 ppm
	S2	10-12 feet	0 ppm
	S3	15-17 feet	0 ppm
NCES-3	S1	5-7 feet	0 ppm
	S2	10-12 feet	0 ppm
	S3	15-17 feet	0 ppm

NOTES: PID Calibrated with Isobutylene prior to use.
TOV results expressed as parts per million (ppm) v/v benzene.

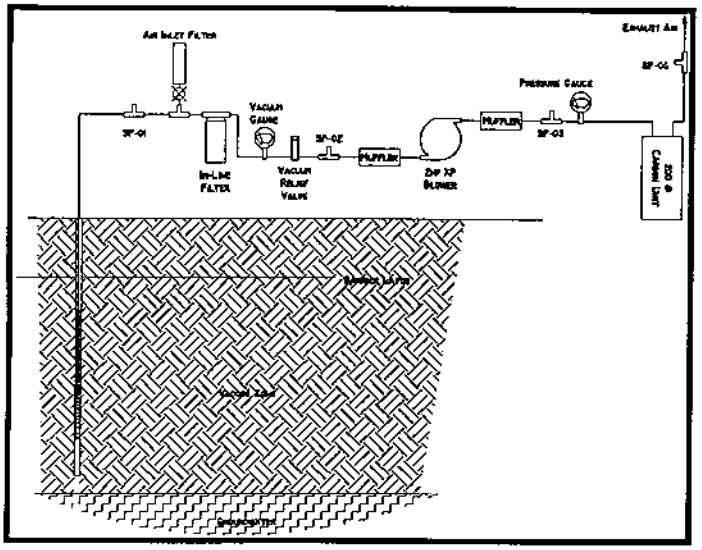
6.0 GROUNDWATER SAMPLING AND ANALYTICAL RESULTS

On December 10th, 1997, groundwater samples were collected from monitoring wells NCES-1, NCES-2, and NCES-3. Prior to sample collection, the depth to groundwater and total well depth were measured to the nearest .01 foot with an ORS Interface Probe. The groundwater depth measurement, as well as a description of the odor and appearance of the groundwater, was logged in the field. There were no visual or olfactory signs of contamination present in any of the samples. A minimum of three well volumes of groundwater was removed from each monitoring well and then each well was allowed to recharge prior to sample collection. All groundwater samples were properly packaged and preserved pending delivery to GeoLabs of Braintree, Massachusetts, for analysis by EPA Method 8100M and EPA Method 602 under a signed chain of custody. Please refer to Appendix C for copies of the laboratory reports.

A comparison of the groundwater sampling results with applicable Primary Groundwater Quality Standards established by the State of Vermont was performed as part of this investigation. The analytical results from the groundwater samples collected from monitoring wells NCES-1, NCES-2, and NCES-3 contained no detectable concentrations of EPA 8100M (Total Petroleum Hydrocarbons). No EPA 602 compounds (Benzene, Toluene, Ethylbenzene, Xylenes) were detected at concentrations above Vermont Groundwater Enforcement Standards (VGES).

7.0 SOIL VAPOR EXTRACTION SYSTEM INSTALLATION AND MONITORING

The VT DEC requested that NCES prepare a Scope of Work detailing the design and installation of a Soil Vapor Extraction (SVE) system at the site (as detailed in the "Work Plan" section of this document).



On December 15th and 16th, 1997, NCES personnel installed the SVE system. The system was composed of a "Rotron XP" 2 horsepower, 230 volt, 160 standard cubic feet per minute (cfm) maximum rated blower with a 200 pound vapor phase activated carbon contactor. The SVE system was equipped with sample ports, pressure and vacuum gauges, an inline air filter, an inlet air filter with gate valve, influent/effluent noise mufflers and an emergency vacuum relief valve (see accompanying figure).

The system is located in a locked secure shed adjacent to the on-site residence. System controls were located in a weatherproof box mounted to the outside shed wall. The system is vented approximately 14 feet above grade at the rear of the residence. The SVE system was started by NCES on December 17, 1997 with a vacuum of eleven inches of H_2O and a pressure of thirty inches of H_2O. This represents approximately 125 cfm based on manufacturer blower performance curves.

The recommended frequency of the SVE system inspections is detailed in the Scope of Work for the project (correspondence in Appendix D). The plan also details the frequency with which PID air monitoring results should be submitted to the VT DEC.

8.0 SITE GEOLOGY

Based on an inspection of the soil samples obtained by split spoon at the site during the advancement of soil borings, the upper surficial geology at the site consists of a mixture of fine to medium brown sand with some stones. A layer of coarse sand and fine to medium gravel was encountered at the water table, approximately ten to fifteen feet below grade. Detailed descriptions of soil samples from each boring are available in Appendix B.

Bedrock at the site is identified as part of the Ordville Formation according to published Bedrock Geology Maps for the State of Vermont. The formation consists of post pond volcanics, greenstone, and schist.

9.0 SITE HYDROGEOLOGY

Groundwater at the site has been measured to be present at depths between ten and fifteen feet below grade across the work area. The wellhead elevation of each monitoring well was established utilizing a surveying level, and the location of each well was established with reference to the site. Using triangulation, groundwater at the site was estimated to be flowing in a southwesterly direction. The data used to calculate the groundwater flow direction are summarized on the following table.

Table 3

WELLHEAD ELEVATION AND GROUNDWATER DEPTH MEASUREMENT

Well Number	Wellhead Elevation	Groundwater Depth	Groundwater Elevation
NCES-1	96.56 feet	19.71 feet	76.85 feet
NCES-2	91.64 feet	15.01 feet	76.63 feet
NCES-3	92.40 feet	16.11 feet	76.29 feet

NOTES: Measurements taken December 10, 1997.
Ground elevations surveyed relative to an arbitrary reference datum of 100.00 feet.

10.0 SUMMARY AND RECOMMENDATIONS

On November 29, 1997, North Country Environmental Services, Inc. responded to the release of kerosene at the residence of Ms. Janet Warren of 28 Olcott Falls Manor, Wilder, Vermont. Subsequent contaminated soil removal did not fully delineate the vertical extents of contamination beneath the area of the release. It was requested by the VT DEC that NCES conduct a further investigation to better determine the extents of contamination at the site and to evaluate the potential impact to a one million gallon per day town drinking water supply well located approximately 200 yards downgradient of the release area.

In order to investigate the potential impact to site soil and groundwater and to evaluate subsurface soils, three soil borings were advanced and completed as shallow groundwater monitoring wells at the site.

Soil samples collected from the borings were screened in the field for TOV by jar headspace analysis method using a pre-calibrated PID. No detectable TOV results were recorded from any of the boring locations.

Groundwater was collected from the three on site monitoring wells and analyzed for EPA 8100M and EPA 602 compounds. Groundwater analysis revealed no contamination by EPA 8100M or EPA 602 compounds.

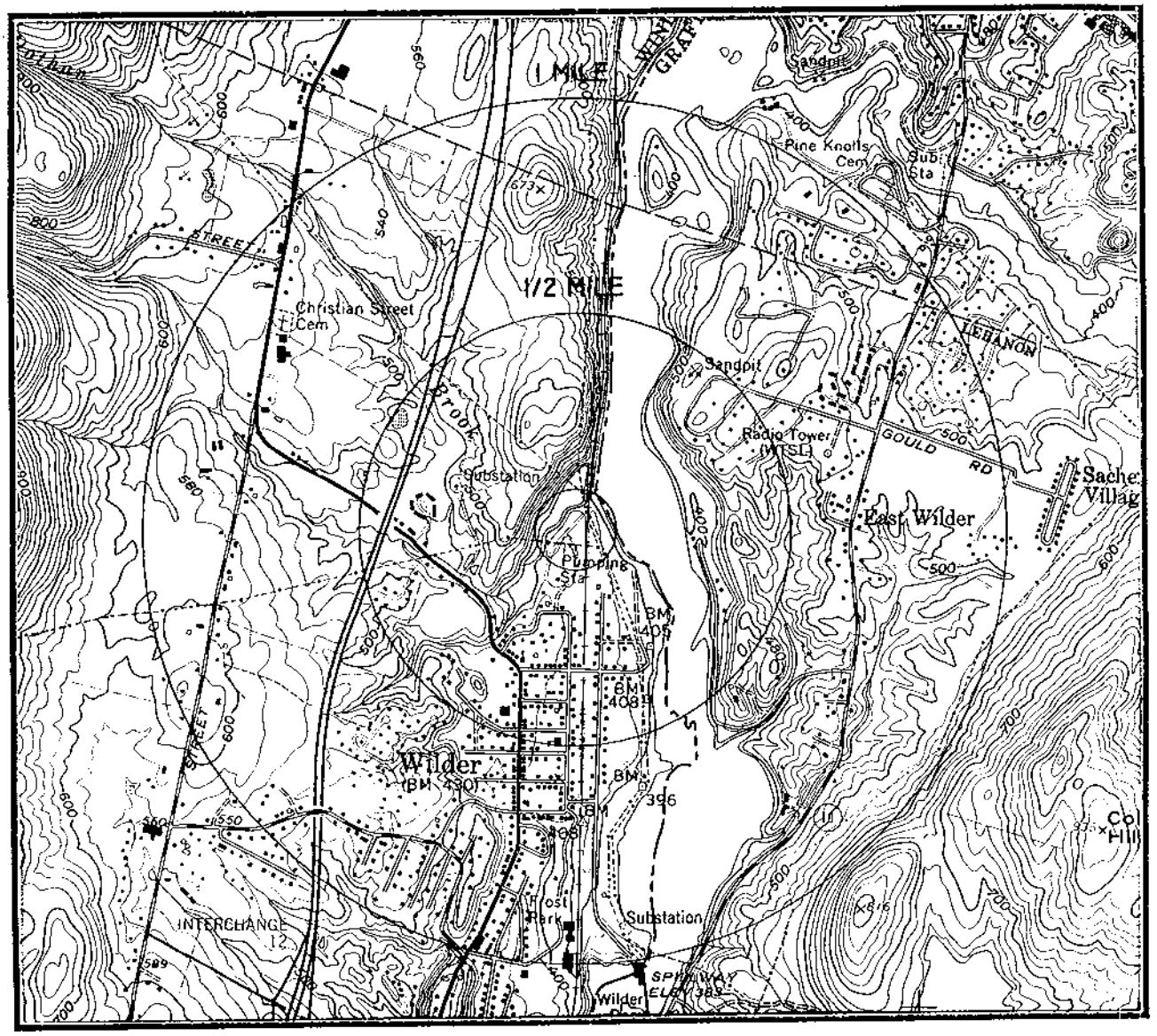
A soil vapor extraction system was installed at the site. The system utilizes a pump to draw air through the contaminated soil; the contaminant-laden air is drawn up the soil vent pipe and through an activated carbon treatment system, which strips the contaminants from the air. The treated air is then exhausted to the atmosphere. It is anticipated that the system will remain in operation until influent concentrations are below 5 ppm, with periodic system reports prepared and submitted by North Country Environmental Services, Inc., under a schedule approved by the VT DEC.

Groundwater at the site was established to be at fifteen to twenty feet below grade. Groundwater flow direction has been estimated to be westerly, based on groundwater depth measurements collected at the site. An assessment of potential receptors identified a one million gallon per day town drinking water well apparently downgradient of the release.

There is no current evidence that this well has been impacted.

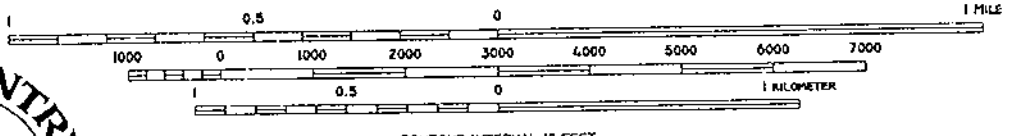
North Country Environmental Services, Inc., recommends the following actions:

- The continued quarterly monitoring of the three groundwater monitoring wells installed at the site for EPA Method 8100M and EPA Method 602 compounds.
- The continued periodic monitoring of the SVE System and submission of monitoring results to the VT DEC, as outlined in the December 23rd letter from NCES to the VT DEC.



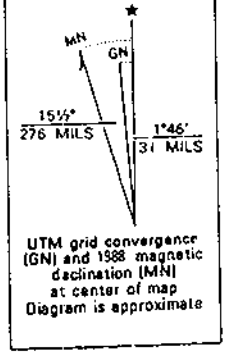
Olcott Falls Manor
Wilder, Vermont

Locus Map



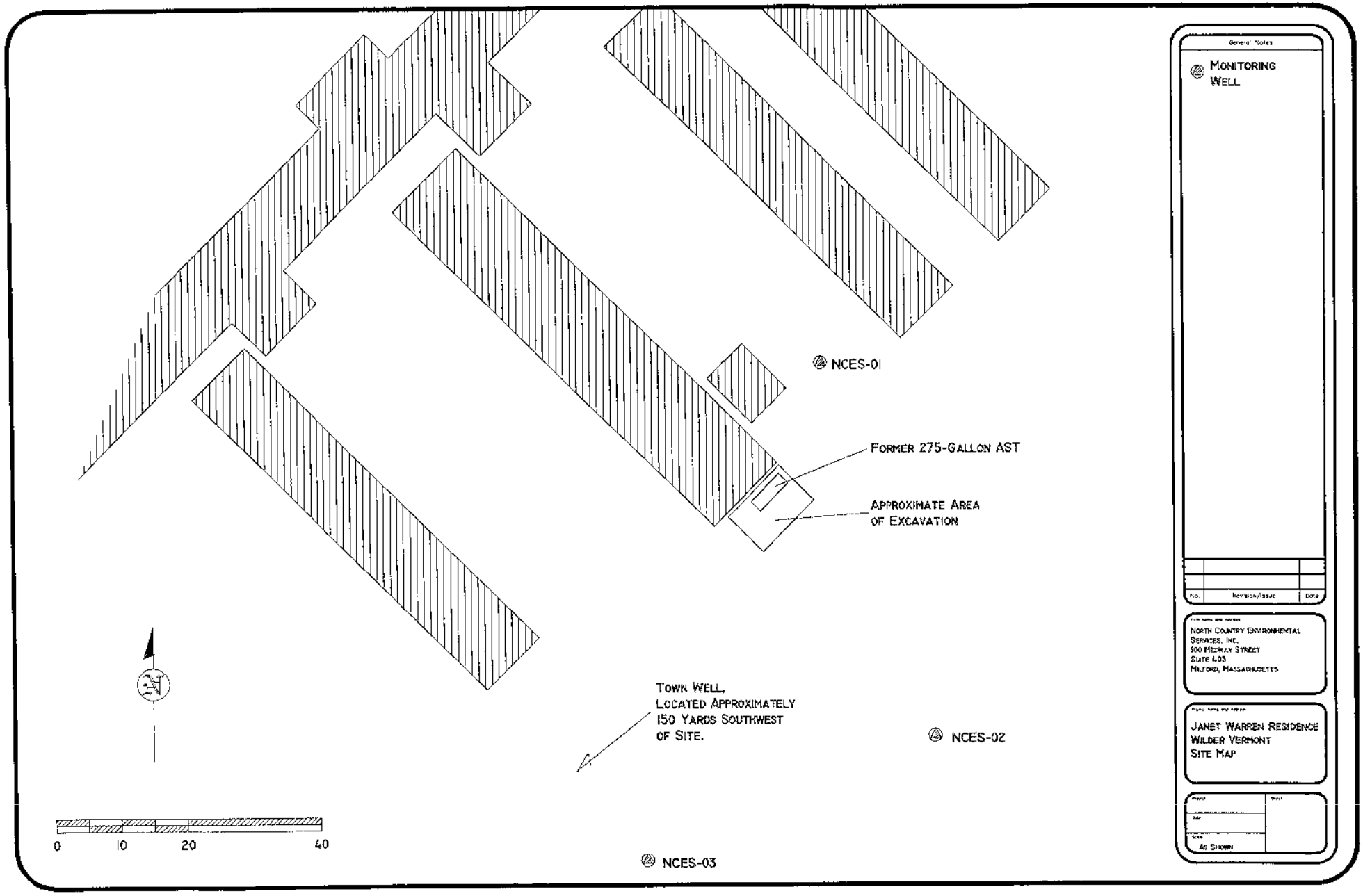
CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL
DEPTH CURVES AND SOUNDINGS IN FEET - DATUM IS MEAN LOW WATER

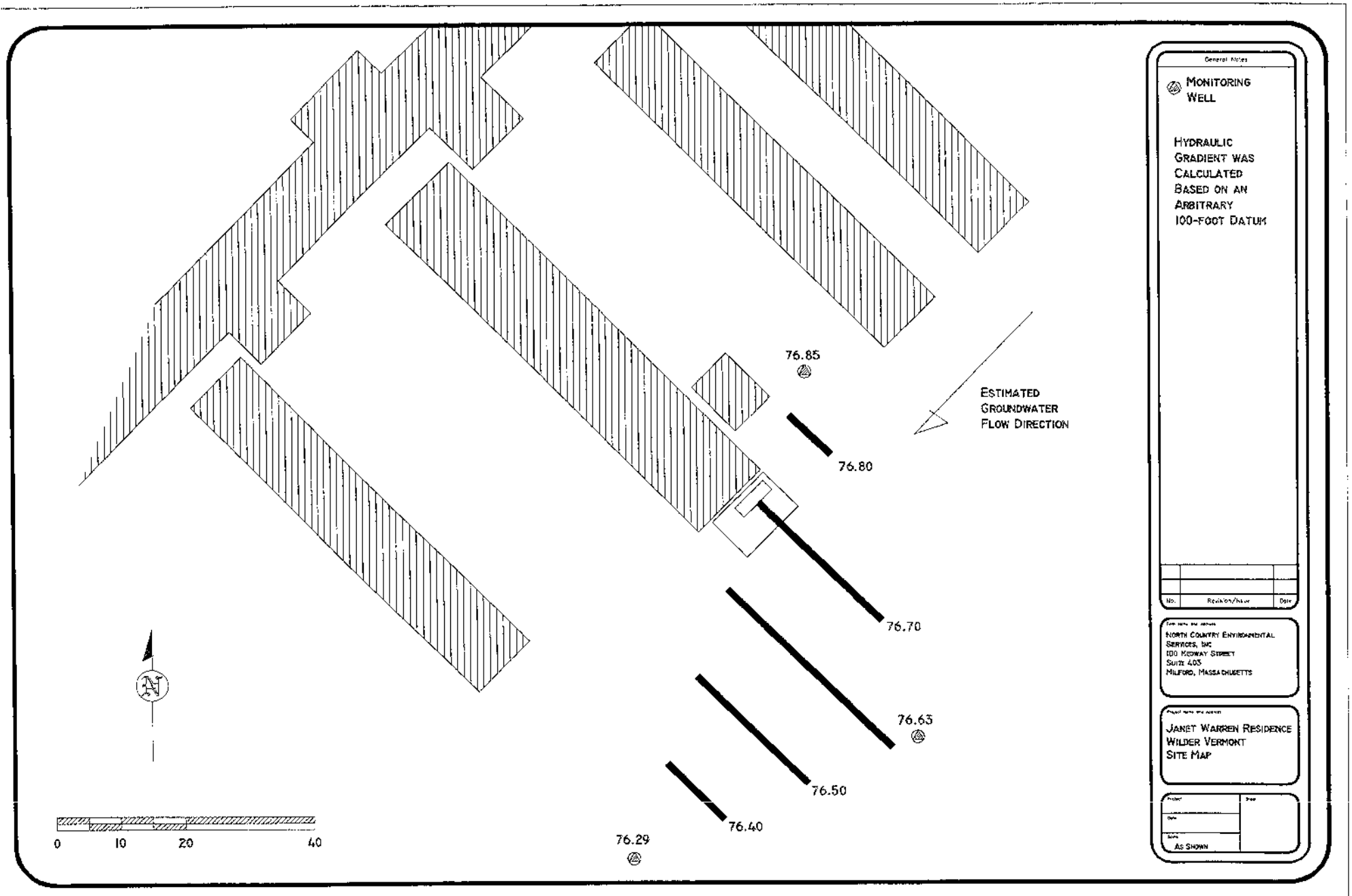
DECLINATION DIAGRAM



UTM grid convergence (GN) and 1988 magnetic declination (MN) at center of map
Diagram is approximate

NORTH COUNTRY ENVIRONMENTAL SERVICES


NCES-01
FORMER 275-GALLON AST
APPROXIMATE AREA
OF EXCAVATION
TOWN WELL,
LOCATED APPROXIMATELY
150 YARDS SOUTHWEST
OF SITE.
NCES-02
NCES-03
0
10
20
40
General Notes
MONITORING
WELL
No.
Revision/Issue
Date
NORTH COUNTRY ENVIRONMENTAL
SERVICES, INC.
100 MEDWAY STREET
SUITE 403
MILFORD, MASSACHUSETTS
JANET WARREN RESIDENCE
WILDER VERMONT
SITE MAP
Project
Sheet
Date
Scale
As Shown



General Notes

MONITORING WELL

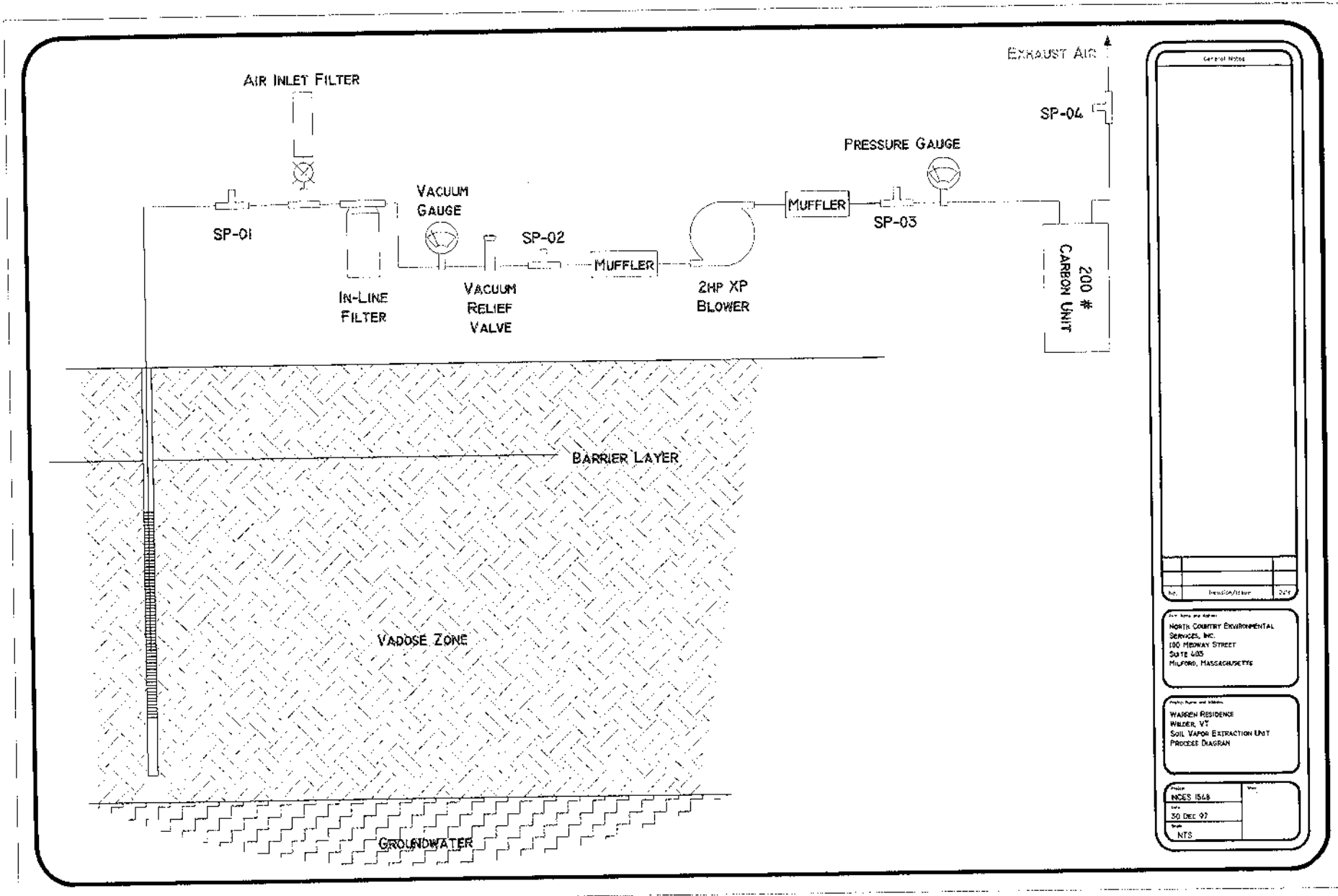
HYDRAULIC GRADIENT WAS CALCULATED BASED ON AN ARBITRARY 100-FOOT DATUM

No.	Revision/Issue	Date

NORTH COUNTRY ENVIRONMENTAL SERVICES, INC
100 KIDWAY STREET
SUITE 403
MILFORD, MASSACHUSETTS

JANET WARREN RESIDENCE
WILDER VERMONT
SITE MAP

Project
Date
Scale
AS SHOWN
Sheet


AIR INLET FILTER
EXHAUST AIR
SP-04
PRESSURE GAUGE
VACUUM GAUGE
SP-01
SP-02
MUFFLER
MUFFLER
SP-03
IN-LINE FILTER
VACUUM RELIEF VALVE
2HP XP BLOWER
200 # CARBON UNIT
BARRIER LAYER
VADOSE ZONE
GROUNDWATER
General Notes
No.
Revision/Issue
Date
NORTH COUNTRY ENVIRONMENTAL SERVICES, INC.
100 MIDWAY STREET
SUITE 405
MILFORD, MASSACHUSETTS
WARREN RESIDENCE
WILDER, VT
SOIL VAPOR EXTRACTION UNIT
PROCESS DIAGRAM
Project
NCES 1548
Date
30 DEC 97
Scale
NTS

GREEN MOUNTAIN BORING

PO Box 218 * East Barre, Vermont 05649 * 802 476-5073

TO: North Country Environmental Services, Inc.
11 Mill Street
Barre, VT 05641
Attn.: Michael McCarley

PROJECT NAME: Olcott Falls Manor

LOCATION: Wilder, VT

GMB JOB #: 97-150

SHEET:	1
DATE	12/8/97
HOLE #:	NCES-1
LINE & STA.	
OFFSET:	

Ground Water Observations				Surface Elev.:	
At 15 at 1 hours	Type	Augers	Split Spoon	Date Started:	12/8/97
	Size I.D.	4.25	13/8"	Date Completed:	12/8/97
At at hours	Hammer Wt.		140#	Boring Foreman:	Steve Lawrence
	Hammer Fall		30"	Inspector:	
				Soils Eng.:	

LOCATION OF BORING: As Indicated

Depth	Casing Blows Per Foot	Sample Depths From/To	Type of Sample	Blows per 6" on Sampler	Moisture Density or Consist.	Strata Change Elev.	Soil Identification	Sample No.	Sample Pen	Sample Rec.
		5'-7'	SS	3/1/2/3	moist		Fine and medium sand	1	24"	12"
		10'-12'	SS	2/3/3/2	dry		Fine and medium sand and stones	2	24"	14"
		15'-17'	SS	8/12/30/45	dry	16'	Fine and medium sand into gravel layer	3	24"	14"
		20'-22'	SS	21/21/15/12	wet		Sandy gravel	4	24"	18"
							Drilled to 25'			
							Installed well			
							Materials used:			
							10' .020 screen			
							15' PVC riser			
							3 bags sand			
							1 bag of bentonite			
							1 set of top locking and bottom point caps			
							1 bag of cement			

Ground Surface to 25' Used 4.25" Augers: Then installed well

SUMMARY: Earth Boring 25' Rock Coring Samples 4 HOLE # NCES-1

GREEN MOUNTAIN BORING

PO Box 218 ° East Barre, Vermont 05649 ° 802 476-5073

TO: North Country Environmental Services, Inc.
11 Mill Street
Barre, VT 05641
Attn.: Michael McCarley

PROJECT NAME: Olcott Falls Manor

LOCATION: Wilder, VT

GMB JOB #: 97-150

SHEET:	2
DATE	12/8/97
HOLE #:	NCES-2
LINE & STA.	
OFFSET:	

Ground Water Observations			
At 15 at 1 hours	Type	Augers	Split Spoon
	Size I.D.	4.25	13/8"
	Hammer Wt.		140#
At at hours	Hammer Fall		30"

Surface Elev.:	
Date Started:	12/8/97
Date Completed:	12/8/97
Boring Foreman:	Steve Lawrence
Inspector:	
Soils Eng.:	

LOCATION OF BORING: As Indicated

Depth	Casing Blows Per Foot	Sample Depths From/To	Type of Sample	Blows per 6" on Sampler	Moisture Density or Consist.	Strata Change Elev.	Soil Identification	Sample No.	Sample Pen	Sample Rec
		5'-7'	SS	2/2/3/3	dry		Fine sand and small stones	1	24"	18"
		10'-12'	SS	14/18/21/16	dry		Sandy gravel	2	24"	14"
		15'-17'	SS	23/18/15/17	wet		Sandy gravel	3	24"	12"
							Drilled to 20'			
							Installed well			
							Materials used:			
							10' .020 screen			
							10' PVC riser			
							3 bags sand			
							1 bag of bentonite			
							1 set of top locking and bottom point caps			
							1 bag of cement			
							1 5' tall protective casing			

Ground Surface to 20' Used 4.25" Augers: Then installed well

SUMMARY: Earth Boring 20' Rock Coring Samples 3 **HOLE #** NCES-2

GREEN MOUNTAIN BORING
PO Box 218 ° East Barre, Vermont 05649 ° 802 476-5073

TO: North Country Environmental Services, Inc.
11 Mill Street
Barre, VT 05641
Attn.: Michael McCarley

PROJECT NAME: Olcott Falls Manor

LOCATION: Wilder, VT

GMB JOB #: 97-150

SHEET:	3
DATE	12/8/97
HOLE #:	NCES-3
LINE & STA.	
OFFSET:	

Ground Water Observations			
At 15 at 1 hours	Type	Augers	Split Spoon
	Size I.D.	4.25	13/8"
	Hammer Wt.		140#
At at hours	Hammer Fall		30"

Surface Elev.:
Date Started: 12/8/97
Date Completed: 12/8/97
Boring Foreman: Steve Lawrence
Inspector:
Soils Eng.:

LOCATION OF BORING: As Indicated

Depth	Casing Blows Per Foot	Sample Depths From/To	Type of Sample	Blows per 6" on Sampler	Moisture Density or Consist.	Strata Change Elev.	Soil Identification	Sample No.	Sample Pen	Sample Rec.
		5'-7'	SS	1/1/2/2	dry		Fine sand and small stones	1	24"	16"
		10'-12'	SS	14/15/10/9	dry		Fine sand and gravel	2	24"	18"
		15'-17'	SS	11/16/21/25	wet		Sandy gravel	3	24"	12"
							Drilled to 20'			
							Installed well			
							Materials used:			
							10' .020 screen			
							10' PVC riser			
							3 bags sand			
							1 bag of bentonite			
							1 set of top locking and bottom point caps			
							1 5' tall protective casing			

Ground Surface to 20' | Used 4.25" Augers: Then installed well

SUMMARY: Earth Boring 20' | Rock Coring | Samples 3 | HOLE # NCES-3

GeoLabs, Inc.

Environmental Laboratories

PREPARED FOR:	North Country Environmental Services, Inc. 100 Medway Street Suite 403 Milford, MA 01757 **Attn:** Willis Doe
PROJECT ID:	NCES Job #1548 Janet Warren
GEOLABS CLIENT #:	1325-95
SAMPLE NUMBER:	63327-63329
DATE PREPARED:	January 28, 1998
PREPARED BY:	Christine Johnson
APPROVED BY:	Jim Chen 1-28-98 Jim Chen, Laboratory Director/Date

Location: 10 Plain Street
Braintree, MA 02184

Phone: (781) 848-7844
Fax: (781) 848-7811

GeoLabs, Inc.
Environmental Laboratories

CLIENT NAME:	**NORTH COUNTRY ENV.**	PROJECT ID:	NCES JOB #1548
SAMPLE TYPE:	GROUND WATER	REPORT DATE:	01/28/98
COLLECTION DATE:	01/21/98	ANALYZED BY:	SRW 01/27/98
REC'D BY LAB:	01/23/98	EXTRACTION DATE:	01/26/98
COLLECTED BY:	CLIENT	DIGESTION DATE:	N/A

TOTAL PETROLEUM HYDROCARBONS

SAMPLE NUMBER	SAMPLE LOCATION	TPH (mg/L)	DETECTION LIMIT (mg/L)
63327	GW WELL NCES 1	ND	0.20
63328	GW WELL NCES 2	ND	0.20
63329	GW WELL NCES 3	ND	0.20

ND = NOT DETECTED

Method Reference:

EPA Method 8100 (1) Modified

1) U.S. EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846,

GeoLabs, Inc.
Environmental Laboratories

CLIENT NAME:	**NORTH COUNTRY ENV.**	PROJECT ID:	NCES JOB #1548
SAMPLE TYPE:	GROUND WATER	REPORT DATE:	01/28/98
COLLECTION DATE:	01/21/98	ANALYZED BY:	ZYZ 01/26/98
REC'D BY LAB:	01/23/98	EXTRACTION DATE:	N/A
COLLECTED BY:	CLIENT	DIGESTION DATE:	N/A

VOLATILE AROMATIC COMPOUNDS

SAMPLE NUMBER:	63327	63328	63329
SAMPLE LOCATION:	NCES 1	NCES 2	NCES 3

	RESULTS (µg/L)			**DETECTION LIMIT (µg/L)**
Methyl tert-butyl ether	ND	ND	ND	5.00
Benzene	ND	ND	ND	5.00
Toluene	ND	ND	ND	5.00
Chlorobenzene	ND	ND	ND	5.00
Ethylbenzene	ND	ND	ND	5.00
Xylenes	**7.40**	ND	ND	5.00
1,2-Dichlorobenzene	ND	ND	ND	5.00
1,3-Dichlorobenzene	ND	ND	ND	5.00
1,4-Dichlorobenzene	ND	ND	ND	5.00

ND = NOT DETECTED

Method Reference:

EPA Method 602 by 624 (1) GC/MS

1) Code of Federal Regulations 40 CFR, Parts 100-149, 1993.

GEOLABS, INC.
10 PLAIN STREET
BRAINTREE, MA 02184

LIMITATIONS & EXCLUSIONS

All the professional opinions presented in this report are based solely on the scope of work conducted and sources referred to in our report. The data presented by GeoLabs in this report was collected and analyzed using generally accepted industry methods and practices at the time the report was generated. This report represents the conditions, locations and materials that were observed at the time the work was conducted. No inferences regarding other conditions, locations or materials, at a later or earlier time may be made based on the contents of the report. No other warranty, express or implied is made.

This report was prepared for the sole use of our client. Portions of the report may not be used independent of the entire report.

All analyses were performed within required holding times, in accordance with EPA protocols and using accepted QA/QC procedures. The information contained in this report is, to the best of my knowledge, accurate and complete.

GeoLabs, INC.

ENVIRONMENTAL LABORATORIES

Location:
10 Plain Street
Braintree, MA 02184

(617) 848-7844 Office (617) 848-7811 Fax

CHAIN OF CUSTODY

TURNAROUND SCHEDULE:
☐ RUSH ☑ STANDARD
CLIENT DUE DATE:
LAB CLIENT ID#:

GeoLabs Client: NORTH COUNTRY ENVIRONMENTAL
Address: 100 MEDWAY ST SUITE 403
MILFORD MA 01757
Phone: 888 2-779800 / 800 479 5299
Fax: 508 634 8259 / 802 479 3499
Contact Name: WILLIS DOE

CLIENT PROJECT INFORMATION:
Project Name/ID: JANET WARREN
JOB 1548
Purchase Order #: 98-088
Sample Collector: Willis Doe

COMMENTS:

page 1 of 1

ANALYSES REQUESTED

FIELD SAMPLE ID #	COLLECTION DATE	COLLECTION TIME	SOURCE/ LOCATION/ STATION	CONTAINER TYPE	CONTAINER #	MATRIX	COMP.	GRAB	PRES.	GEOLABS SAMPLE ID NUMBER	EPA 8260M	EPA 602 BTEX
NCES-1	1-21-98	1:00 P	GW WELL NCES1	✓	2	GW		✓	1	63327		✓
NCES-1	1-21-98	1:00 P	GW WELL NCES1	A	2	GW		✓			✓	
NCES-2	1-21-98	1:20 P	GW WELL NCES2	✓	2	GW		✓	1	63328		✓
NCES-2	1-21-98	1:20 P	GW WELL NCES2	A	2	GW		✓			✓	
NCES-3	1-21-98	1:40 P	GW WELL NCES3	✓	2	GW		✓	1	63329		✓
NCES-3	1-21-98	1:40 P	GW WELL NCES3	A	2	GW		✓			✓	

CONTAINER TYPE CODES: A = Amber B = Bag G = Glass P = Plastic V = VOA S = SUMMA O = Other

MATRIX CODES: WW = Wastewater GW = Groundwater DW = DrinkingWater S = Soil O = Oil SL = Sludge OT = Other

PRESERVATIVE CODES 1 = Hcl 2 = HNO_3 3 = H_2SO_4 4 = $Na_2S_2O_3$ 5 = NaOH 6 = 4C 7 = MeOH

RELINQUISHED BY: DATE/TIME
Willis Doe 1-22-98 8 AM

RECEIVED BY: DATE/TIME 1-23-98
E. Connor 10:19 AM

RELINQUISHED BY: DATE/TIME 1-23-98
E Connor 1150 PM

RECEIVED BY: DATE/TIME

RELINQUISHED BY: DATE/TIME

RECEIVED BY GeoLabs: DATE/TIME 1/23/98 1350

GeoLabs, Inc.

Environmental Laboratories

PREPARED FOR:	North Country Environmental Services, Inc. 100 Medway Street Suite 403 Milford, MA 01757 **Attn:** P. Cook
PROJECT ID:	#1548 Warren Residence
GEOLABS CLIENT #:	1325-95
SAMPLE NUMBER:	61743-61745
DATE PREPARED:	December 12, 1997
PREPARED BY:	Christine Johnson
APPROVED BY:	Jim Chen 12-12-97 Jim Chen, Laboratory Director/Date

Location: 10 Plain Street
Braintree, MA 02184

Phone: (781) 848-7844
Fax: (781) 848-7811

GeoLabs, Inc.
Environmental Laboratories

CLIENT NAME:	**NORTH COUNTRY ENV.**	PROJECT ID:	#1548
SAMPLE TYPE:	GROUND WATER	REPORT DATE:	12/12/97
COLLECTION DATE:	12/10/97	ANALYZED BY:	EA 12/12/97
REC'D BY LAB:	12/11/97	EXTRACTION DATE:	12/11/97
COLLECTED BY:	CLIENT	DIGESTION DATE:	N/A

TOTAL PETROLEUM HYDROCARBONS

SAMPLE NUMBER	SAMPLE LOCATION	TPH (mg/L)	DETECTION LIMIT (mg/L)
61743	NCES-1/1A	ND	0.20
61744	NCES-2/2A	ND	0.20
61745	NCES-3/3A	ND	0.20

ND = NOT DETECTED

Method Reference:

EPA Method 8100 (1) Modified

1) U.S. EPA Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 1986, 3rd Edition.

GeoLabs, Inc.
Environmental Laboratories

CLIENT NAME:	**NORTH COUNTRY ENV.**	PROJECT ID:	#1548
SAMPLE TYPE:	GROUND WATER	REPORT DATE:	12/12/97
COLLECTION DATE:	12/10/97	ANALYZED BY:	ZYZ 12/11/97
REC'D BY LAB:	12/11/97	EXTRACTION DATE:	N/A
COLLECTED BY:	CLIENT	DIGESTION DATE:	N/A

VOLATILE AROMATIC COMPOUNDS

SAMPLE NUMBER:	61743	61744	
SAMPLE LOCATION:	NCES-1/1A	NCES-2/2A	
	RESULTS (µg/L)		**DETECTION LIMIT (µg/L)**
Methyl tert-butyl ether	ND	ND	5.0
Benzene	ND	ND	5.0
Toluene	ND	ND	5.0
Chlorobenzene	ND	ND	5.0
Ethylbenzene	ND	ND	5.0
Xylenes	ND	ND	5.0
1,2-Dichlorobenzene	ND	ND	5.0
1,3-Dichlorobenzene	ND	ND	5.0
1,4-Dichlorobenzene	ND	ND	5.0

ND = NOT DETECTED

Method Reference:

EPA Method 602 by 624 (1) GC/MS

1) Code of Federal Regulations 40 CFR, Parts 100-149, 1993.

GeoLabs, Inc.
Environmental Laboratories

CLIENT NAME:	**NORTH COUNTRY ENV.**	PROJECT ID:	#1548
SAMPLE TYPE:	GROUND WATER	REPORT DATE:	12/12/97
COLLECTION DATE:	12/10/97	ANALYZED BY:	ZYZ 12/11/97
REC'D BY LAB:	12/11/97	EXTRACTION DATE:	N/A
COLLECTED BY:	CLIENT	DIGESTION DATE:	N/A

VOLATILE AROMATIC COMPOUNDS

SAMPLE NUMBER: 61745
SAMPLE LOCATION: NCES-3/3A

	RESULTS (µg/L)	DETECTION LIMIT (µg/L)
Methyl tert-butyl ether	ND	5.0
Benzene	ND	5.0
Toluene	ND	5.0
Chlorobenzene	ND	5.0
Ethylbenzene	ND	5.0
Xylenes	ND	5.0
1,2-Dichlorobenzene	ND	5.0
1,3-Dichlorobenzene	ND	5.0
1,4-Dichlorobenzene	ND	5.0

ND = NOT DETECTED

Method Reference:

EPA Method 602 by 624 (1) GC/MS

1) Code of Federal Regulations 40 CFR, Parts 100-149, 1993.

GEOLABS, INC.
10 PLAIN STREET
BRAINTREE, MA 02184

LIMITATIONS & EXCLUSIONS

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This report was prepared for the sole use of our client. Portions of the report may not be used independent of the entire report.

All analyses were performed within required holding times, in accordance with EPA protocols and using accepted QA/QC procedures. The information contained in this report is, to the best of my knowledge, accurate and complete.

GeoLabs, INC.

ENVIRONMENTAL LABORATORIES

Location:
10 Plain Street
Braintree, MA 02184

(617) 848-7844 Office (617) 848-7811 Fax

CHAIN OF CUSTODY

TURNAROUND SCHEDULE:
[X] RUSH [ ] STANDARD
CLIENT DUE DATE: 12/12/97
LAB CLIENT ID#:

GeoLabs Client: North Country Env.
Address: 100 Medway St. Suite 403
Milford, MA
Phone: 508-634-9800
Fax: 508-634-8259
Contact Name: P. Cook

CLIENT PROJECT INFORMATION:
Project Name/ID: # 154B
Warren Residence
Purchase Order #: 97-1090
Sample Collector: WJD

COMMENTS:

page 1 of 1

ANALYSES REQUESTED

FIELD SAMPLE ID #	COLLECTION DATE	COLLECTION TIME	SOURCE/ LOCATION/ STATION	CONTAINER TYPE	CONTAINER #	MATRIX	COMP.	GRAB	PRES.	GEOLABS SAMPLE ID NUMBER	TPH (8100M)	EPA 602+ MTBE
NCES-1	12/10/97	AM	Monitoring Well	G	1	GW		✓	Ice	61743	✓	
NCES-1A	12/10	AM	"	V	2	GW		✓	1			✓
NCES-2	12/10	AM	Monitoring Well	G	1	GW		✓	Ice	61744	✓	
NCES-2A	12/10	AM	"	V	2	GW		✓	1			✓
NCES-3	12/10	AM	Monitoring Well	G	1	GW		✓	Ice	61745	✓	
NCES-3A	12/10	AM	"	V	2	GW		✓	1			✓

CONTAINER TYPE CODES: A = Amber B = Bag G = Glass P = Plastic V = VOA S = SUMMA O = Other

MATRIX CODES: WW = Wastewater GW = Groundwater DW = DrinkingWater S = Soil O = Oil SL = Sludge OT = Other

PRESERVATIVE CODES 1 = Hcl 2 = HNO_3 3 = H_2SO_4 4 = $Na_2S_2O_3$ 5 = NaOH 6 = 4C 7 = MeOH

RELINQUISHED BY: DATE/TIME
12/10/97

RECEIVED BY: DATE/TIME 12-11-97
7:10 AM

RELINQUISHED BY: DATE/TIME 12-11-97
8:11 AM

RECEIVED BY: DATE/TIME

RELINQUISHED BY: DATE/TIME

RECEIVED BY GeoLabs: DATE/TIME 8:11
12/11/97

COPY

December 23, 1997

Mr. Robert Haslam
State of Vermont - Agency of Natural Resources
Department of Environmental Conservation
Waste Management Division - Sites Management Section
103 South Main Street/West Building
Waterbury, VT 05671-0404

RE: SVES & GROUNDWATER MONITORING - SCOPE OF WORK
WARREN RESIDENCE/OLCOTT FALLS MANOR - WILDER, VT
VT-WMD # 97-2285

Dear Mr. Haslam:

North Country Environmental Services, Inc. (NCES) is pleased to provide you with this scope of work relative to the Janet Warren Residence located at 28 Olcott Falls Manor in Wilder, Vermont (VT-WMD 97-2285). This scope of work outlines recommended procedures and schedules for a groundwater monitoring plan and soil vapor extraction system (SVES) O&M/monitoring.

Soil Vapor Extraction System

NCES personnel installed a Rotron XP, 2 hp, 230 volt, 160 scfm blower (max.) with 200 lb. vapor phase, activated carbon contactor on December 15/16, 1997. The system is equipped with sample ports, pressure/vacuum gauges, inline air filter, inlet air filter with gate valve, influent/ effluent noise mufflers and emergency vacuum relief valve. The system is located in a secure shed with controls located in a weather-proof box mounted on the outside of the shed wall. The system is vented approximately 14 feet above grade in the rear of the trailer. The SVES was started by NCES on December 17, 1997 with a vacuum of 11" H2O and a pressure of 30" H2O which represents approximately 125 scfm based on manufacturer blower performance curves.

NCES will conduct SVES system inspections on or about 12/22 and 12/24 to complete the first week of system operation. NCES proposes to conduct weekly SVES inspections for the remainder of the first month of operation or 1/15/98 (3 inspections). We propose an inspection every two weeks from 1/15/98 to 2/15/98 for a total of 2 inspections. Finally we propose one inspection per month until 6/15/98 or system termination (5 ppm w/ HNU-PID) for a total of 4 inspections.

Corporate Office:
100 Medway Street, Suite 403, Milford, MA 01757
(508) 634-9800 Fax (508) 634-8259

Vermont Office:
11 Mill Street, Barre, VT 05641
(802) 479-5299 Fax (802) 479-5499

Each inspection is expected to take approximately three hours portal to portal. Inspection tasks will include recording vacuum/pressure gauge readings, air inlet valve positions and general observations/modifications. The system air stream will be screened in the field with a properly calibrated HNU-PID at sample ports SP1, SP3 and SP4 (see attached system schematic). These ports will provide data relative to the undiluted air from the well, the diluted air prior to carbon treatment and the treated air prior to discharge, respectively. It has been recommended that NCES use a target of 5 ppm with the HNU-PID for the undiluted air stream from the well. NCES recommends that when this level is achieved the SVES be shut down for a minimum of two days prior to down well screening to confirm soil concentrations at steady-state conditions.

Groundwater Monitoring

NCES has collected a first round of groundwater samples from the newly installed monitoring wells in December 1997. It is recommended that a confirmatory round of samples be collected in January 1998. It is further recommended that quarterly groundwater sampling be conducted once in March and once in early June to provide analytical data relative to the fluctuating groundwater table. NCES will observe these samples carefully for obvious olfactory or visual signs of contamination. If no signs of contamination are noted then samples will be analyzed at a state-certified laboratory for TPHs by EPA 8100M and for VOCs by EPA 8020 on a standard lab turn around time. If signs of contamination are noted then these samples will be rushed in the laboratory. Groundwater interface levels will also be measured in each well.

It has been a pleasure providing this proposed scope of work to you. Please call if you have any questions, need further information or to approve the scope of work.

Very truly yours,
NORTH COUNTRY ENVIRONMENTAL SERVICES, INC.

Richard D. Mansfield
Project Manager

C. Phil Nelson - Concord Insurance Group

CWL\1548-WV.DOC

#1543

State of Vermont

AGENCY OF NATURAL RESOURCES
Department of Environmental Conservation

Department of Fish and Wildlife
Department of Forests, Parks and Recreation
Department of Environmental Conservation
State Geologist
RELAY SERVICE FOR THE HEARING IMPAIRED
1-800-253-0191 TDD>Voice
1-800-253-0195 Voice>TDD

Waste Management Division
103 South Main Street / West Building
Waterbury, VT 05671-0404
802-241-3888

January 6, 1998

RICHARD MANSFIELD
NORTH COUNTRY ENVIRONMENTAL SERVICES, INC.
100 MEDWAY STREET, SUITE 403
MILFORD, MA 01757

RE: Janet Warren Residence / Olcott Falls Manor in Wilder, WMD Site # 97-2285

Dear Mr. Mansfield:

The Waste Management Division (WMD) has reviewed your scope of work dated 12/23/97 for the above referenced site. The WMD approves this scope if the following additions are included:

1.) Change out or regenerate the carbon when effluent (discharge to atmosphere) concentrations exceed 5 ppm by PID, or if effluent concentrations fall below a 90% reduction from influent concentrations.

2.) Provide brief written summary reports containing the findings of the operation and maintenance of the SVE system. The schedule for these reports should be approximately late January, and again at the completion of work at this site.

3.) Provide verbal updates of system performance on a monthly basis or as significant changes occur.

Thank you for work at this site. If you have any comments or questions regarding the requested additions, please call.

Sincerely,

Bob Haslam
Hazardous Materials Specialist
Sites Management Section

BH/bh
cc Phil Nelson, Concord Insurance Group