Groundwater Monitoring Report

2nd Quarter 2008

May 6, 2008

Conducted at:

Little Tor Road Site
New City, New York
Voluntary Cleanup Program Site Code # V-00310-3

Prepared for:

New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York

IE Project Number: 04-268

TABLE OF CONTENTS

Section Topic Page

FIGURES:

Table:

Appendix:

1. Introduction

This Report was prepared to summarize the investigative and remedial activities performed at the Little Tor Road Site, herein referred to as the Site, to satisfy the requirements of the New York State Department of Environmental Conservation (NYSDEC) under the Voluntary Cleanup Plan. This report includes data collected during investigative and remedial activities conducted from April 2005 through January 2008. The investigative and remedial activities conducted at the Site were performed in accordance with work plans approved by the NYSDEC. The remedial activities conducted at the Site were performed in accordance with the Interim Remedial Measures Work Plan, dated February 2005, and Remedial Investigation Report, dated July 15, 2005, both approved by the NYSDEC.

The methodologies and procedures presented in this work plan are based upon the following documents: the New York State Department of Environmental Conservation Draft DER-10, Technical Guidance for Site Investigation and Remediation; the United States Environmental Protection Agency's (USEPA) Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA, dated October 1998; the USEPA Compendium of Superfund Field Operations Methods, dated September 1987; the NYSDEC, Technical Operational Guidance Series (TOGS) 1.1.1 Ambient Water Quality Standards and Limitations ; and the USEPA Standard Operating Safety Guides, dated June 1992.

2. Site Background

Section 2.1 to 2.9 presents site specific data provided by William L. Going & Associates, Inc. concerning the location, topography, geology, hydrogeology and bedrock conditions of the site. Section 2.10 presents the interim remedial actions conducted by Impact Environmental.

2.1 Site Location

The site is situated at the corner of Little Tor Road and New Valley Road in New City, Town of Clarkstown, Rockland County, New York. The site is approximately 1.5 acres and improved with one two-story commercial building and one two-story restaurant building. The commercial building is occupied by several tenants, one of which is a dry cleaner. See **Plate 1:** Site Location Map, *New City, New York*.

2.2 Site History

The current owner of the site constructed the commercial building in 1964 on previously undeveloped land. The building was constructed with an on-site sanitary disposal system in 1964. The system consisted of a septic tank and cesspools. The sanitary system was abandoned in January 1979 during connection of the building with the public sewer.

2.3 Site Topography

The Tor Valley strip mall is located on the northwest corner of the intersection of Tor Valley Road and New Valley Road. The west bank of the Hudson River lies approximately eight miles to the west. Three large lakes, Lake de Forest, Congers, and Rockland Lakes, are located between the site and the river. The site is situated on a west-sloping hill or the east valley wall of a north flowing stream. The stream joins others and eventually flows into the north end of Lake de Forest, about three miles to the northeast. Topographic elevations at the site range from 270-292 feet above mean sea level according to a survey conducted by Atzl, Scatassa, & Zigler, PC on June 20, 1988.

2.4 Soil Component Identification

The Rockland County Soil Survey (USDA, 1990) shows the soils in this area mapped as WeB on the hillside and Ad in the stream valley to the west. The “WeB” is the Wethersfield gravelly silt loam described as reddish glacial till derived from Triassic sandstone, shale, and conglomerate. The “Ad” is the Alden silt loam found in the dissected till plain along streambeds. The majority of the borings penetrated the Wethersfield soil substrata. In micro-monitoring well MW-9, some of the yellow brown fine-grain sediments from 3 to 4.5 feet may represent the fluvial Alden soil type above the till.

2.5 Site Geology

Driven by the Geoprobe on April 14 to 16, 1999, nine soil borings penetrated an average of 15 feet of Pleistocene glacial till immediately west and north of the strip mall building. The till has the characteristic red color of the Brunswick Formation from which it is derived and deposited on till plains. Frequently gravel size rock fragments of dark gray crystalline diabase remnants of the Palisades Sill encountered randomly in the overburden indicative of the proximity of the igneous intrusive rock beneath.

Quite different subsurface conditions were encountered in 10 additional geoprobe borings and four micro-monitoring wells driven and installed on May 17 and 18, 1999. Six borings reached refusal at a depth of 4 to 6 feet below the ground surface in the area to the northwest believed to be the direction of groundwater flow based on the interpretation of the data from the first field mobilization. Four micro-monitoring wells (MW-13) were installed, including two that were dry after heavy rainfall.

All of the borings reached refusal, often ending in dark gray to black fine crystalline rock fragments indicative of the of the diabase bedrock of the Palisades Sill directly beneath the red till. A contour map of the elevation of refusal in the 20 soil borings portrays a buried bedrock valley and bedrock ridge, given that refusal is evidence of the overburden-bedrock interface. After erosion of the bedrock valley, glacial till was deposited in the valley. The axis of the valley trends down gradient from the southeast to northwest.

2.6 Site Hydrogeology

The site hydrogeology is interpreted from 20 soil borings driven by Geoprobe and 13 micro-monitoring wells installed in selected borings during two Geoprobe field mobilizations (April and May 1999). The *New York Geologic Map* (NYSGS, 1970) and the *Soil Survey of Rockland County* (USDA, 1990) were referenced for background information.

This hydrogeologic interpretation is based on two sets of water levels measurements, first with 10 micro-monitoring wells (April 27, 1999) and second with 14 wells (May 25, 1999). The surface elevations of the monitoring wells and the water levels are relative to an arbitrary elevation of 100 feet on the ground surface at the corner at the northwest corner of the two-story Tor Valley shopping plaza.

During the drilling the water table was encountered deeper in the till than the equilibrium water levels recorded on April 27, 1999 in the micro-monitoring wells. The first potentiometric surface indicated that the horizontal groundwater flow direction was generally west down the valley wall and north along the valley axis at the foot of the parking lot.

The additional geoprobe borings and micro-monitoring wells enhanced the hydrogeologic interpretation and modified the interpreted groundwater flow direction in the area of MW-3, MW-8, and MW-9. Discovery of the east-west trending bedrock ridge requires a change in the direction of groundwater from northward to the northwestward flow farther down the hill and then to the north (parallel to the stream farther west) to skirt the west end of the bedrock ridge. Also the potentiometric surface on May 25, 1999 shows a high water table at MW-9, evidently due to rainfall recharging shallow groundwater after washing downhill on the macadam parking lot. Heavy rainfall events occurred on the two days prior to sampling and taking water level measurements on May 25.

The tills were observed to frequently have more than one water bearing zone within the screened interval in the same boring. The saturated zones are predominantly loose sand and gravel. In most borings, the zones of saturation were often separated by till that was dry, damp, or moist in contrast to saturation. These intervening aquitards are generally fine grain and compact silt and clay material. Often the base of the till was observed as a dry compact red silt directly above rock fragments presumably from the Palisades Sill beneath. Correlation of the zones of saturation lead to this hydrostratigraphic interpretation. The two zones of saturation lead to were found to merge and thin down-gradient of the shopping plaza.

The equilibrium water levels are mapped as the potentiometric surface because of the difference in water table and equilibrium elevations. This differential may reflect either confinement of the lower zone of saturation and/or an upward vertical component of groundwater flow, both within the 15 feet of glacial till. At MW-9, groundwater mounding from heavy rainfall suggests that semi-confined or unconfined conditions exist there.

The lack of groundwater in the MW-13 indicates that the bedrock ridge presents a barrier to subsurface flow. The base of the screened interval in MW-13 is at a relative elevation of 81.6 feet which is below the projection of the potentiometric surface.

The dominant groundwater flow direction in the overburden fill and natural sediments is controlled by sediment porosity and bedrock surface configuration. In the area of interest behind the shopping plaza, groundwater flow to the northwest is limited by scant recharge. Upgradient areas to the south, southeast, and east are paved providing very little vertical infiltration of precipitation into the subsurface overburden.

2.7 Bedrock Geology

The property is quite close to the northwest-southeast trending boundary between the Palisades diabase sill to the northeast that intruded into the Triassic Brunswick Formation consisting of arkose sandstone, mudstone, conglomerate, and siltstone characterized by the red color of the iron oxide.

2.8 Source Characteristics

This section presents data obtained from remedial investigations conducted by William L. Going & Associates, Inc. for the purposes of defining the extent of contamination.

A subsurface investigation was conducted in 1999 at the site as part of a due diligence requirement for a lending transaction. The results of the investigation confirmed the presence of chlorinated solvent soil and groundwater contamination resulting from the historic operation of an on-site dry cleaner. It was concluded that the source of the contamination was an area where a former sanitary system was located on the western side of the existing commercial building.

Additional subsurface investigations previously performed at the site were designed to assess the suspected source and extent of the contamination resulting from the release of chlorinated solvents to cesspools associated with the former on-site disposal system from the dry cleaning facility.

The concentrations of tetrachloroethene within the soil samples secured from within the inverts, sidewalls and surrounding the former cesspools in January 2002 ranged from non-detect to 15.2 ppb. These results indicate that the primary source of the chlorinated solvents released to the former sanitary system is not present at concentrations significant to warrant further soil removal.

Additional sampling of the perched water contained within the former cesspools was conducted in July 2004 to assess natural attenuation based on the concentrations of contaminations present. The concentrations of tetrachloroethene within the perched water contained within the former cesspools in July 2004 ranged from 3.6 to 880 ppb. These results suggest that residual concentrations of chlorinated solvents were still present with the groundwater beneath the former cesspools at levels warranting further action.

2.9 Nature and Extent of Contamination

Based on a review of the data colleted from groundwater samples secured from on-site, the solvent related groundwater contaminant plume emanating from the area of the former cesspools has migrated in a northwest direction with the flow of groundwater.

The centerline of the contaminant plume appears to be along groundwater wells MW-4 and MW-8. The length of the tetrachloroethene plume at concentrations exceeding 10 ppb is approximately two hundred and twenty feet down-gradient. The horizontal extent of the solvent related groundwater contaminant plume appears to be limited to within the locations of wells MW-2 and MW-6, and MW-9 and MW-11. Detailed monitoring well locations can be referenced with **Plate 2**: Groundwater Monitoring Network.

No up-gradient source of chlorinated solvent contamination was identified from the results of the remedial investigation.

2.10 Interim Remedial Measures

An IRM was conducted in May 2002 that included the removal and off-site disposal of 18,427 gallons of perched water contained within the former cesspools. This effort was conducted to reduce contaminant concentrations in groundwater at the site. The concentrations of tetrachloroethene within the perched water contained within the former cesspools in July 2002 subsequent to the pumping ranged from 1.1 to 470 ppb. These results suggest that residual concentrations of chlorinated solvents were still present with the groundwater beneath the former cesspools at levels warranting further action.

In June 2005, feasibility testing was conducted to determine the appropriateness and effectiveness of utilizing HRC for accelerated anaerobic natural attention for the site. Testing parameters included current volatile organic contaminant concentrations, nitrate and sulfate concentrations, iron and manganese concentrations.

Based on the data generated from remedial investigations, a grid pattern of injection points was established to encompass the effective area. The grid injection points (number and spacing of points) and HRC injection volumes was determined based on the extent of groundwater contamination, concentrations of contaminants, calculations accomplished utilizing application software and physical access to the proposed locations.

The Hydrogen Release Compound (HRC) injection was completed on the Site from May 30, 2006 through June 1, 2006 under the supervision of the NYSDEC. A total of 39 injection points and 4 cesspool locations were completed as part of the injection procedures in accordance with the NSDEC approved work plan. The HRC injection locations can be referenced with **Plate 3:** HRC Application Plan.

3. Groundwater Monitoring

In March 2005, Impact Environmental installed five (5) groundwater monitoring wells, identified as MW-4, MW-5, MW-7, MW-8 and MW-12, at the Site for monitoring contaminant fate and transport. The wells were installed hydraulically down-gradient of the Site relative to the current understanding of the contaminant plume geometry. The placement of the wells is presented on **Plate 4**: Sample Acquisition Plan**.** The placement of the wells has been selected based on an evaluation of historic data collected from the Site in consultation with the NYSDEC. The sampling activities conducted at the Site were performed in accordance with the field procedures provided in **Appendix A**.

3.1 Quarterly Monitoring Well Sampling and Analysis

On March 27, 2008, quarterly groundwater sampling was conducted on the Site by Impact Environmental under the supervision of the NYSDEC.

One groundwater sample was acquired from each monitoring well of MW-4, MW-5, MW-7, MW-8 and MW-12. The groundwater samples were subjected to ELAP certified laboratory analysis. The laboratory analysis consisted of USEPA Test Method 8260 for total volatile organic analytes. The laboratory analytical results were reported with Analytical Sampling Protocol (ASP) B deliverables. Additional parameters including temperature, dissolved oxygen, pH, and conductivity were collected as part of development procedures.

3.2 Monitoring Well Development and Sampling Procedures

The development and sampling procedures conformed to NYSDEC protocol. A field log protocol was conducted to record sampling data including; date, time, location, sample identification code, depth to water, total depth of the well, method of well development, and sampling technique. The monitoring wells were developed by purging a minimum of three (3) static well volumes utilizing a peristaltic pump. A static well volume is defined as *Static well volume = height of water column x (well radius)*^{2} *x* π *x 7.48* (7.48 is the conversion factor for cubic feet to gallons). Following development, one water sample was acquired from each of the monitoring wells utilizing a dedicated disposable bailer to prevent cross-contamination. All of the samples were transferred with minimal disturbance into the appropriate vessels. The development wastewater was containerized for subsequent disposal.

4. Evaluation of Laboratory Analysis

The samples were subjected to ELAP certified laboratory analysis by Chemtech of New Jersey (New York State ELAP Certification # 11376). The laboratory analysis was performed according to EPA Method 8260 with low minimum detection level (MDL) for target volatile organic analytes. The laboratory analysis results were reported with NYSDEC Analytical Sampling Protocol (ASP) deliverables. A summary of the laboratory analysis results is presented in **Table 1:** Detected Analytes in Groundwater. No quality assurance or control issues were identified with the data from the laboratory ASP B validation.

The laboratory analysis performed on the groundwater samples collected on March 27, 2008 identified concentrations of chlorinated solvents in the groundwater consistent with the previous quarter sampling event conducted in January 3, 2008. The concentration of tetrachloroethylene (PCE) observed in MW-5 was elevated as compared with the baseline sampling data. The absence of PCE's breakdown compounds; including trichloroethylene (TCE), cis-1, 2 -dichloroethylene (DCE) and vinyl chloride (VC); in the sample data from MW-5 may be indicative of a new release of PCE.

Groundwater monitoring will be continued on a quarterly basis as required by the NYSDEC at the Site to further observe contaminant trends.

TABLES

Table 1: Detected Analytes in Groundwater
New City, New York

Sample ID	Date	Tetrachloroethene	Trichloroethene	cis-1,2-Dichloroethene	Vinyl Chloride	trans-1,2-Dichloroethene	1,1-Dichloroethane	MTBE	1,1-Dichloroethene	2-Butanone	1,1,2-Trichloroethane	Acetone	2-Hexanone	1,2-Dichloroethane	1,1,1,2-Tetrachloroethane	Chloroform	Chloroethane	1,2,4-Trimethylbenzene
Unit		μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l	μg/l
NYSDEC Ambient Water Quality Standards & Guidance Values (μg/l)		5	5	5	2	5	5	10	5	50	1	50	50	0.6	5	7	5	5
MW-4	4/26/1999	**450**	**210**	**210**	**12**	ND	ND	**110**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/6/2005	**1400**	**54**	**150**	**4.8**	1J	0.93J	1.8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/13/2006	**170**	**49**	**590**	**150**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/27/2006	**180**	**29**	**920**	**39**	2.3	ND	ND	1.1	ND	**2.5**	ND	ND	ND	ND	ND	ND	ND
	3/15/2007	**28**	**14**	**85**	**7**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	6/6/2007	**400**	**64**	**470**	**30**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/5/2007	**620**	**130**	**790**	**44**	4.1	1.8	ND	ND	ND	**12**	ND	ND	ND	ND	ND	ND	ND
	1/3/2008	**180**	**40**	**280**	**26**	1	ND	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	3/27/2008	**280**	**44**	**210**	**73**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-5	4/26/1999	**320**	**5.3**	**24**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/17/2002	**78**	**8**	**35**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/6/2005	**36**	1.5	2.4	ND	ND	ND	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/13/2006	**180**	ND	7.5J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/27/2006	**200**	5.8	4.5	ND	ND	ND	ND	ND	ND	**3.1**	ND	ND	ND	ND	ND	ND	ND
	3/15/2007	**120**	4.7	**5.2**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	6/6/2007	**69**	3.1	4.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/5/2007	**2300**	**10**	**6.5**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**2.8**	1.2	ND	ND	ND
	1/3/2008	**2000**	**11**	**5.2**	ND	ND	ND	ND	ND	ND	ND	24	ND	ND	2	0.66	ND	ND
	3/27/2008	**1300**	**35**	**25**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-7	4/26/1999	**29**	ND	ND	ND	ND	ND	1.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/6/2005	**9.2**	ND	ND	ND	ND	ND	**22**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/13/2006	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/27/2006	1.6	ND	2.5	ND	ND	ND	**11**	ND	**71**	ND	ND	ND	ND	ND	ND	ND	ND
	3/15/2007	1.8	ND	ND	ND	ND	ND	6.5	ND	**53**	ND	**240***	ND	ND	ND	ND	ND	ND
	6/6/2007	1	ND	1.4	ND	ND	ND	4.8	ND	**57**	ND	**290***	6.5	ND	ND	ND	ND	ND
	9/5/2007	1	ND	3.1	ND	ND	ND	6	ND	12	ND	**68**	ND	ND	ND	ND	ND	ND
	1/3/2008	**5.6**	ND	2.2	ND	ND	ND	2.9	ND	ND	ND	16	ND	ND	ND	ND	ND	ND
	3/27/2008	2.4	ND	2	ND	ND	ND	4.3	ND	**15**	ND	20	ND	ND	ND	ND	ND	2
MW-8	4/26/1999	**210**	**8**	**24**	1.4	ND	ND	6.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/17/2002	**170**	**5.8**	**12**	ND	ND	ND	0.93J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/6/2005	**51**	1.1	**2.7**	ND	ND	ND	**24**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/13/2006	**27**	ND	**25**	ND	ND	ND	5.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/27/2006	**41**	1.4	**14**	1.2	ND	ND	2.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	3/15/2007	**26**	1.7	**6.4**	**2.6**	ND	ND	1.7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	6/6/2007	**9.6**	2	**27**	ND	ND	ND	4.1	ND	ND	ND	21	ND	ND	ND	ND	ND	ND
	9/5/2007	**7.5**	4.2	**18**	**5.4**	ND	ND	3.2	ND	ND	ND	18	ND	ND	ND	ND	ND	ND
	1/3/2008	**13**	**5.4**	**120**	**21**	0.54	ND	1.6	ND	ND	ND	ND	ND	ND	ND	ND	2	ND
	3/27/2008	**120**	**38**	**110**	**13**	ND	ND	2.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
MW-12	5/25/1999	**24**	1.7	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7/17/2002	**48**	1.7	4.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	4/6/2005	**7**	ND	.93J	ND	ND	ND	1.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/13/2006	.88J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12/27/2006	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	3/15/2007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	6/6/2007	0.45J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9/5/2007**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	ND	ND	ND
	1/3/2008	2	ND	1.3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	3/27/2008	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

ND: Not detected
NA: Not available
HRC injection was conducted from May 30 to June 1, 2006.
Dissolved Oxygen (DO) was acquired during monitoring well development.
* The analyte was found in the laboratory blank as well as the sample.
** No sample were obtained due to low water table.

FIGURES

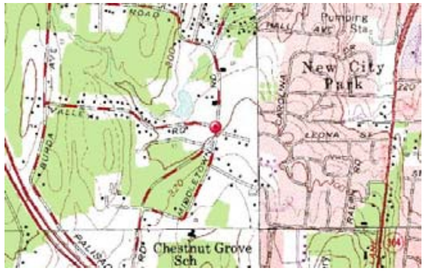


Plate 1: Project Location Map

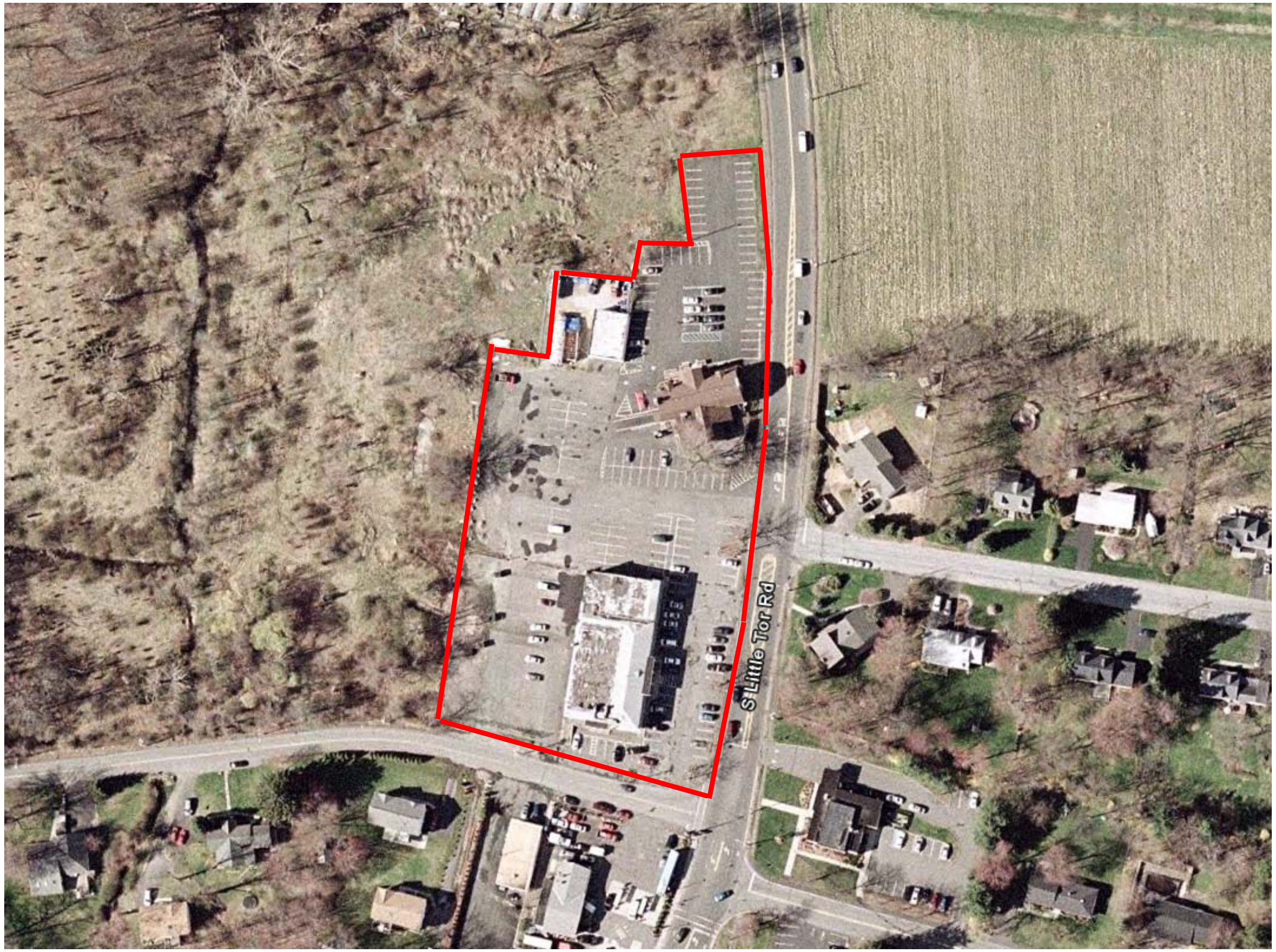
Little Tor Road Site
New City, New York

N

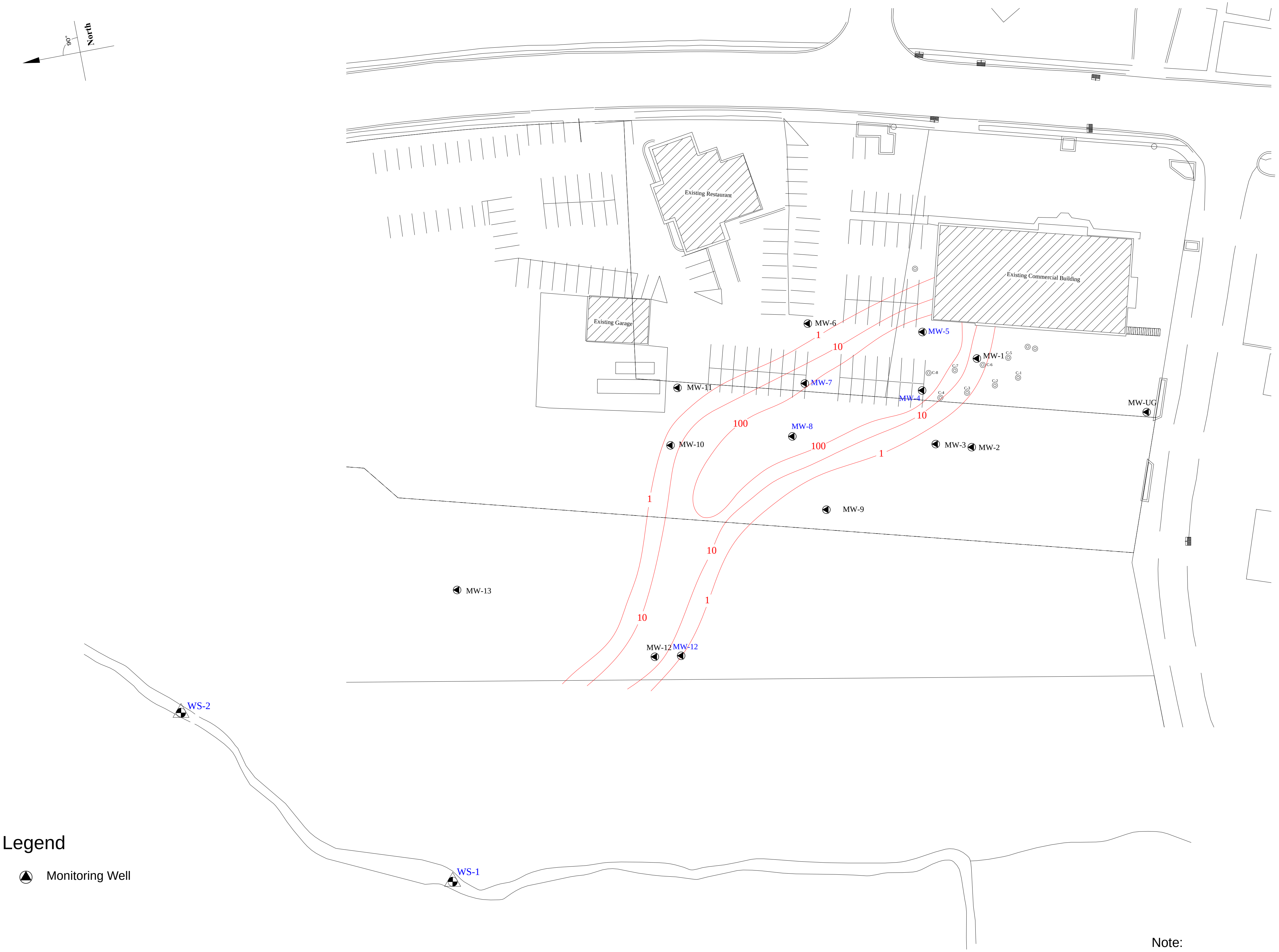
IMPACT ENVIRONMENTAL

170 Keyland Court
Bohemia, New York 11716
TEL (631) 269-8800 FAX (631) 269-1599

1560 Broadway, Suite 1024
New York, New York 10036
TEL (212) 201-7905 FAX (212) 201-7906



New York State Geographic Information System
2001 Half Foot Natural Color Long Island Zone



Note:
Contours were based on the data collected in 1999.

TITLE:
Groundwater Monitoring Network

Little Tor Road Site
New City, New York

DRAWN BY:	WF
CHECKED BY:	KK
DATE:	3/5/2007
SCALE:	1" = 80'

PROJECT #	04-268
PLATE #	02

Scale in Feet
20 0 20 40 100

IMPACT ENVIRONMENTAL
170 KEYLAND COURT
BOHEMIA, NEW YORK 11716
TEL (631) 269-8800 FAX (631) 269-1599

1560 BROADWAY, SUITE 1024
NEW YORK, NEW YORK 10036
TEL (212) 201-7905 FAX (212) 201-7906

Legend

- ▲ Monitoring Well
- 🟩 HRC Injection Well

Note:
Contours were based on the data collected in 1999.

IMPACT ENVIRONMENTAL
170 KEYLAND COURT
BOHEMIA, NEW YORK 11716
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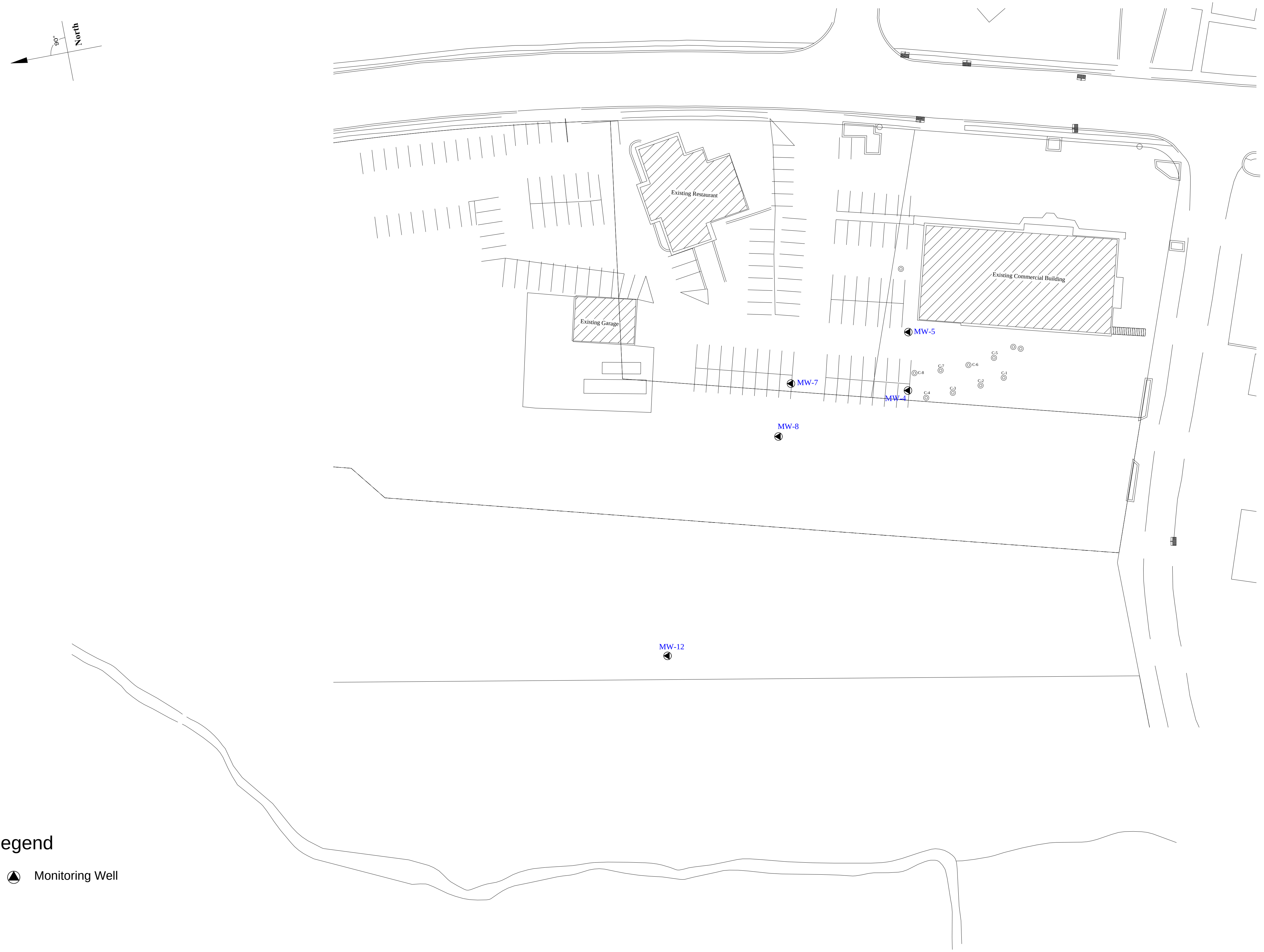
NEW YORK, NEW YORK 10036
TEL (212) 201-7905 FAX (212) 201-7906

TITLE:
HRC Application Plan

Little Tor Road Site
New City, New York

DRAWN BY:	WF
CHECKED BY:	KK
DATE:	3/5/2007
SCALE:	1" = 80'

PROJECT # 04-268
PLATE # 03



Legend

▲ Monitoring Well

PROJECT # 04-268

PLATE # 04

Scale in Feet
20 0 20 40 100

TITLE:
Sample Acquisition Plan

Little Tor Road Site
New City, New York

DRAWN BY:	WF
CHECKED BY:	KK
DATE:	3/5/2007
SCALE:	1" = 80'

IMPACT ENVIRONMENTAL
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Appendix A:
Field Procedures

QA/QC Field Procedures

Decontamination Procedures

Prior to arrival on the Site and between sample locations, the probes will be decontaminated by Alconox wash, and rinsing with distilled water. This will be followed by air drying as per project requirements. All sampling apparatus will be dedicated or disposable. A clean, new liner will be used for each sample. Parts will be inspected for wear and damage before each use.

Field Blanks

A field blank is a sample of analyte-free water transferred, at the project site, into an appropriate container for the purpose of distinguishing ambient air contamination from in-situ sample contamination. Field blanks are used to indicate potential cross contamination from sampling equipment as quality control of decontamination procedures. With regards to field sampling, one field blank will be collected for every work day. The procedure for obtaining a field blank sample are as follows:

- Collect two sets of sample vessels. One vessel shall contain analyte free water and the other is empty.
- Run the analyte free water through the decontaminated sampling equipment into the empty vessel. Analye the water of this collecting vessel for target analytes.

Trip Blanks

A trip blank is used to identify the presence of volatile compound contamination attributable to transfer across a sample container septum during shipping and storage of samples. A trip blank is a sample of analyte-free matrix that is transported from the laboratory to the sampling site with the sample containers. The trip blank is stored on-site with the sample containers and field samples and then transported back to the laboratory with the samples for analysis. The trip blank is received and processed as a sample by the laboratory. One trip blank shall be submitted per pickup from laboratory personnel.

Record Keeping and Documentation Procedures

Sampling Documentation

The sample team or individual performing a particular activity shall be required to keep a weatherproof Site field notebook. The Site field notebook will be used on-site to record notes pertaining to the field sampling plan. Field notebooks are intended to provide sufficient data and observations to enable participants to reconstruct events that occurred during projects and to refresh the memory of the field personnel if called upon to give testimony during legal proceedings. In a legal proceeding, notes, if referred to, are subject to cross-examination and are admissible as evidence. The field notebook entries should be factual, detailed, and objective. All entries are to be signed and dated. All members of the field investigation team are to use this notebook, which shall be kept as a permanent record. The field notebook shall be filled out at the location of sample collection immediately after sampling. It shall contain sample descriptions including: sample number, sample collection time, sample location, sample description, sampling method used, daily weather conditions, field measurements, name of sampler, and other site-specific observations. The field notebook shall contain any deviations from the protocol contained herein, visitor’s names, community contacts made during sampling, and geologic and other site-specific information that may be noteworthy.

Sample Containers and Analytical Requirements

All sample vessels will be "level A" certified decontaminated containers supplied by a New York State Certified Commercial Laboratory. Samples analyzed for hydrocarbons will be placed in containers with Teflon lined caps. All samples will be preserved by cooling them to a temperature of approximately four degrees Celsius. If glass bottles are used, extra glass bottles will be obtained from the laboratory to allow for accidental breakage that may occur. Necessary preservatives will be placed in the sample bottles by the laboratory. The sample bottles will be handled carefully so that preservatives and glassware are not inadvertently spilled. All liquid samples will be put into 40-ml glass vials with Teflon liners.

Sample Tracking System

In order to provide for proper identification in the field, and proper tracking in the laboratory, all samples must be labeled clear and in a consistent fashion using the procedures and protocols described below and with the following subsections.

Sample labels will be waterproof and have a pre-assigned, unique number that is indelible.
Field personnel must maintain a field notebook. This notebook must be water resistant with sequentially numbered pages. Field activities shall be sequentially recorded at a later time. The notebook, along with the chain of custody form, must contain sufficient information to allow reconstruction of the sample

collection and handling procedure at a later time. Each sample shall have a corresponding notebook entry that includes:

- Sample ID number
- Well location and number
- Date and time
- Analysis for which sample was collected
- Additional comments as necessary
- Sampler's name

Each sample must have a corresponding notebook entry on a chain-of-custody form. The manifest entry for sampling at any one location is to be completed before sampling is initiated by the same sampling team at any other location. In cases where the samples leave the immediate control of the sampling team, the samples must be sealed.

Sample Identification System

Each sample collected shall be designated by an alphanumeric code that shall identify the type of sampling location, the specific location, the matrix sampled, and a specific sample designation. Site specific procedures are described below.

Sample identifications shall contain a sequential code consisting of three segments. The first segment shall designate the project number. The second segment shall identify the location type. Location types shall be identified by a two-letter code. For example, MW will be used for monitoring well and GP for geoprobe. The third segment shall identify the specific sample location. The specific sampling location shall be identified using a three-digit number.

The fourth segment shall identify the matrix type and sample designation or identifier that identifies the sample depth, the sample event number, or other designation depending on the sample type. The matrix type shall be designated by a two-letter code. For example: GW will be used for groundwater.

The following shall be a general guide for sample identification:

First Segment	Second Segment	Third Segment	Fourth Segment
NNN	AA	NNN	AA
Project #	Location Type	Specific Type	Matrix Sample Identifier
04-268	MW	5	GW

Symbol Definitions:	Location Type:	Matrix Type:
A = Alphabetic	MW = Monitoring Well	S = Soil
N = Numeric	GP = Geoprobe	GW = Groundwater

Sample Transfer

Samples shall be containerized and immediately transferred within a cooler to the mobile laboratory with minimal disturbance. Chain-of-custody forms will be completed at the time of sample collection and will accompany the samples inside a cooler for transfer from sample team to mobile laboratory representatives.

Chain-of-Custody Protocol

The primary objective of the sample custody procedures is to create an accurate written record that can be used to trace the possession and handling of all samples from the moment of their collection, through analysis, until their final disposition. Sample custody for samples collected during the investigation will be maintained by the field personnel collecting the samples. Field personnel are responsible for documenting each sample transfer and maintaining custody of all samples until they are transferred to the mobile laboratory.