NYCDEC
BROWNFIELDS CLEANUP PROGRAM
FORMER JERICHO MARINE
BCP Site #: C1-52-205

REMEDIAL INVESTIGATION WORK PLAN
SEPTEMBER 2008 – Revised DECEMBER 2008

EBC Project No: CMF0701

269 East Montauk Highway
Lindenhurst, NY

Prepared for:

Deja Vu
490A Broadway
West Babylon, NY 11747

Submitted to:

New York State Department of Environmental Conservation
Region 1 – Division of Environmental Remediation
50 Circle Road
Stony Brook, NY 11790-3409

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road. Ridge, NY 11961 Ph: 631.504.6000 Fax: 631.924.2870

Charles B. Sosik, P.G.
email: csosik2@optonline.net

NEW YORK STATE BROWNFIELDS CLEANUP PROGRAM
BCP ID No. C1-52-205

REMEDIAL INVESTIGATION WORK PLAN

Former Jericho Marine
269 E. Montauk Highway
Lindenhurst, NY

September 2008
Revised December 2008

REMEDIAL INVESTIGATION WORK PLAN
FORMER JERICHO MARINE

TABLE OF CONTENTS

TABLES

FIGURES

1.0 INTRODUCTION

Environmental Business Consultants (EBC) has prepared the following Remedial Investigation Work Plan to depict the remaining items to investigate at the Former Jericho Marine site located at 269 E. Montauk Highway in Lindenhurst, New York.

The site was previously accepted into the New York State Voluntary Cleanup Program on October 17, 2000 (Site No. V00378-2). The site was subsequently transferred into the New York State Brownfield Cleanup Program (BCP) in May 2007 and is identified as Site No. C1-52-205 by the New York State Department of Environmental Conservation (NYSDEC). The interim remedial work completed at the site was performed in accordance with the conditionally approved Remedial Action Work Plan prepared by Fenley and Nicol Environmental Inc. (10/30/06), as amended by EBC (8/14/07). The Interim Remedial Measure Completion Report was submitted to the NYSDEC in June of 2008 and resubmitted with revisions in August of 2008.

1.1 Site Location and Description

The subject property is known as 269 East Montauk Highway, and is situated on the south side of East Montauk Highway between Deauville Parkway and Venetian Boulevard in Lindenhurst, New York (see **Figure 1**). The site is located in the Town of Babylon and the County of Suffolk.

As shown in **Figure 2**, the lot has 190 feet of frontage on Montauk Highway, 115 feet of frontage on Deauville Parkway and 100 feet of frontage on Venetian Boulevard for a total area of 20,600 ft^2. The property is currently improved with a derelict single-story, masonry building which was originally utilized as a service station. A 12 ft x 60 ft office trailer, currently utilized as a real estate business is present in the northeastern corner of the lot.

The area around the property is characterized by commercial properties and strip stores along the East Montauk Highway corridor with residential areas adjacent to and behind the commercial strip. A Hess service station is present along the north side of E. Montauk Highway. Adjacent properties to the south are single family residential homes.

The property has an elevation of approximately 11 feet above the National Geodetic Vertical Datum (NGVD). The general topographic gradient is south toward the Great South Bay. Based upon site measurements, the depth to groundwater beneath the site is approximately 8 feet below existing grade and flows south toward the Bay. However, since groundwater occurs at such a shallow depth, subsurface structures such as building foundations and recharge from drainage structures could influence local flow.

ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

2.0 SITE BACKGROUND

The former Jericho Marine site was first developed in 1962 and operated as a gas station until 1974. At that time the property was renovated and operated as a convenience store until 1979 when the property was sold to Suffolk Marine Center. Suffolk Marine Center operated a new and used boat retail business known as Jericho Marine. The property was abandoned at some time in1995.

In May of 1996 the Suffolk County Department of Health Services (SCDHS) performed a routing inspection of the sanitary system at the property. The inspection included the collection of sediment samples from the septic pools, two drywells in the parking area and a grass area near the northeast corner of the building which appeared to be the outfall area of a bay drain located in the building. The results indicated elevated levels of volatile organic compounds (VOCs) and/or metals in some of the sampling locations. The SCDHS reported the findings to the NYSDEC which assigned Spill No. 9825156 to the site. SCDHS conducted subsequent investigations in July 1998 and May 1999 which indicated that groundwater contaminated with gasoline constituents were leaving the property and migrating south into the residential area.

In June of 1999 the NYSDEC took over the investigation of the dissolved gasoline plume in the residential area south of the Former Jericho Marine site and contracted JNM Environmental to collect soil, groundwater and soil gas samples from residential properties between Venetian Blvd and Deauville Parkway.

JNM collected groundwater samples from fourteen permanent monitoring wells and five temporary monitoring wells. Soil samples were also collected from the water table interface at each of the permanent well locations. Samples were analyzed for a limited series of volatile organic compounds (VOCs) according to EPA method 602. The results indicated elevated levels of VOCs forming a plume which extended from the site in a south-southeast direction more than 400 feet into the residential area. Soil samples indicated that residually affected soils do not extend to any appreciable extent beyond the property line.

JNM also performed a soil gas survey at the four nearest residential properties to the site. A total of five soil samples were collected. The results indicated that detectable levels of VOC compounds were present in the samples.

2.1 Previous On-site Investigations

Two subsurface investigations were completed at the site by Fenley & Nicol Environmental Inc. (F&N) in February and April of 2002. The initial investigation consisted of the installation of 3 groundwater monitoring wells at locations spread around the site. The follow-up investigation in April 2002 consisted of the installation of 6 soil borings and the collection of 6 soil and groundwater samples and 4 soil gas samples. F&N also completed some off-site investigations as part of there work including the March 2002 collection of a round of samples from the monitoring wells installed by JNM, the collection of supplemental groundwater samples from 6 temporary probe-point sampling locations (GW10-GW14) in July 2002, and the collection of indoor air samples from two homes downgradient from the site. The results of these investigations were summarized in a report prepared

ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

by F&N. This document underwent several revisions in response to comments received from the NYSDEC. The fourth and final version of the report was submitted on March 18, 2003.

2.1.1 Revised Subsurface Investigation Report IV – Fenley & Nicol, 3/18/03

The initial investigation was conducted from February 8 to February 11, 2002, and included the installation of 3 one-inch monitoring wells and the collection of 3 groundwater samples. Two of the wells were installed in upgradient positions on the property line in the northeast and northwest corners of the site. The third well was installed within the former tank area. Groundwater samples from the 3 wells were analyzed for volatile organic compounds (VOCs) according to EPA method 8260, semi-volatile organic compounds (SVOCs) according to method 8270 (STARS list) and RCRA metals. Predictably the sample from the well within the former tank area (FN3) contained elevated levels of VOCs. Although there were some minor detections, VOCs above groundwater standards were not reported in the other two wells (MW1, MW2) at the site. SVOCs and metals were also below groundwater standards in all three of the wells.

F&N returned to the site on April 22, 2002 and collected soil and groundwater samples from six locations (SP4-SP9) which were concentrated in the former tank area and downgradient property line. Soil samples were analyzed for VOCs by method 8260, SVOCs by EPA method 8270 (STARS List) and RCRA metals. SP4, within the former tank area, was the only soil sample location which showed elevated levels of VOCs. SVOCs and metals were within soil cleanup criteria.

Groundwater samples indicated exceedances for VOCs in four of the five samples with the highest concentrations reported in GW6, GW7 and GW8 which were located along the southern property line downgradient of the former UST area and the garage building. GW8, behind the garage had the highest levels of VOCs reported in any of the samples. SVOC exceedances were also reported in some of the samples.

In addition to the on-site work F&N collected groundwater samples from the existing off-site monitoring network on March 25, 2002. The off-site groundwater delineation effort was supplemented on July 31, 2002 by the installation of 6 temporary probe point locations. The results from this effort confirmed that the highest groundwater concentrations were in close proximity to the southern property line of the site, though VOC components did extend roughly 350 feet from the site.

F&N collected indoor air samples from the basement level of two homes adjacent to the site on August 2, 2002. Samples were collected in summa canisters and analyzed for VOCs by EPA method TO15. The indoor air results were reviewed by the NYS Department of Health which concluded that although some VOC detections were reported in one of the homes the concentrations were within background levels typically observed.

2.2 Previous Remedial Actions

2.2.1 Interim Remedial Measure Completion Report

On October 30, 2006, F&N prepared and subsequently submitted to the NYSDEC, the final version of a Remedial Action Plan for the on-site contamination. Several components of this plan were approved

ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

for implementation by the NYSDEC. EBC submitted several amendments to the plan on August 14, 2007 which were subsequently approved by the DEC.

The approved IRM consisted of the following components:

1) Remediate the parking lot drywell located near the northeast corner of the building, and the main sanitary pool located near the southwest corner of the building;

According to the F&N Remediation Report, a Guzzler truck was utilized to remove impacted sediments from the base of the structure until groundwater was encountered and the integrity of the structure began to show evidence of potential failure. The SCDHS representative on-site during the procedure indicated that impacted material likely remained in the cesspool and that it was unlikely that it could be safely removed. The SCDHS representative further indicated that additional remediation would likely be required through excavation. According to F&N sediment removal from the structure was terminated at a depth of approximately 8 feet below ground surface. Endpoint samples were collected from the structure at this depth.

F&N utilized the same technique and equipment to remediate the drywell located in the parking area north of the building. Impacted soil was removed from the structure until groundwater was encountered and the structure was in danger of collapsing. Soil appeared clean within the pool following the procedure. The SCDHS was not available to confirm this through personal inspection though approval was given to collect endpoint samples.

Endpoint samples were collected for analysis of VOCs by EPA method 8260, SVOCs by EPA Method 8270, and Suffolk County Metals. A total of approximately 11.62 tons of non-hazardous sludge was removed from the two structures.

2) Investigate and, if present, remove a suspect waste oil tank located beneath the floor of the former mechanic shop area inside the eastern portion of the building;

F&N excavated an area within the eastern side of the building and along the exterior of the building near the northeast corner to search for the suspect waste oil tank. According to F&N no UST was present in these areas.

3) Excavate the contaminated soil on the west side of the building associated with the former underground storage tank area;

Excavation was initiated by the removal of clean overburden materials as determined by physical inspection and field monitoring instruments (photoionization detector). This material, estimated as approximately 300 cubic yards, was stockpiled on clean plastic sheeting in the northwest corner of the property. As per instructions from the DEC, 2 samples were collected from the clean soil pile for verification. Upon review of the laboratory results, the DEC approved the return of the clean soil to the excavation.

Removal of the impacted soils continued to the north, south and west until visibly clean soil was encountered and the PID confirmed that no VOC response was present. Clean soil was not

ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

encountered to the east and it was not possible to expand the excavation in this direction due to concerns about undermining the cinder-block structure of the existing building. During excavation in this area, the sanitary pool, which was previously remediated by F&N was encountered and removed. The concrete ring was removed from the excavation and broken up by the excavation contractor. Soil adjacent to and beneath the pool was excavated as needed to obtain clean endpoint samples in this area.

A second pool, located closer to the building than the first, was also discovered during excavation in the western area of the site. This pool, estimated to be an 8 foot ring, partially extends underneath the building addition. Removal was considered impractical due to concerns of undermining the building. A sample was collected from the base of the pool at a depth of approximately 8 feet using a stainless steel hand auger. The results of this sample indicated several VOCs above the Unrestricted Soil Cleanup Objectives including ethylbenzene, xylenes and 1,2,4-trimethylbenzene, though all VOCs were within the Restricted Commercial Cleanup Criteria. SVOCs and metals were within the Unrestricted Cleanup Criteria. These results were consistent with endpoint samples collected from the same depth along the eastern sidewall of the excavation, and are representative of soil quality at the water table interface in the general area. As such, the IRM Completion report concluded the results generally reflect residuals associated with the source (former UST) area "smear" zone and are not directly related to the sanitary pool.

A total of 240.68 tons of contaminated soil, classified as non-hazardous petroleum impacted soil was transported to the Soil Safe disposal facility in Logan, NJ. All of the endpoint samples collected from the sidewalls and bottom of the excavation were within the unrestricted soil cleanup criteria for SVOCs. With the exception of the east wall samples, all of the endpoint samples were within the unrestricted soil cleanup criteria for VOCs, though all samples were within the restricted residential cleanup criteria. Following the collection of the endpoint samples, the excavation was backfilled to grade utilizing a clean soil pile as approved by the NYSDEC and fill from a source approved by the NYSDEC (letter dated February 14, 2008).

Following the removal of affected soil, a dry chemical oxidant was added to the base of the excavation to address residual contamination which might remain in the soil. Approximately 2,860 pounds of oxidant and 396 pounds of activator were added to the open excavation. Following the initial treatment the oxidant was mixed into the base of the open excavation using a track-mounted excavator.

4) Investigate and, if needed, remediate soil near the northeast corner of the building suspected to be a discharge point for a floor drain in the former mechanic shop area of the building.

Based on the presence of a suspect discharge outfall from an interior bay drain in the former service station area of the existing building, the DEC had requested a soil sampling program be conducted along the northeast exterior of the building.

A total of 5 soil borings were performed in accordance with the approved IRM amendment letter. Each soil boring was performed continuously from grade to a depth of 8 feet below grade (groundwater interface) utilizing a Geoprobe equipped with macrocore tooling.

ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

Soil recovered from each boring was field screened with a PID for the presence of volatile organic compounds (VOCs) and physically inspected for evidence of contamination. No PID or physical evidence of petroleum contamination was noted. Therefore in accordance with approved IRM, a single soil sample from each boring at the interval of 6-8 feet below grade was retained for laboratory analysis for the presence of VOCs by EPA Method 8260 and SVOCs by EPA Method 8270. The laboratory results reported no detections for VOC or SVOC parameters in any of the samples submitted.

Groundwater sampling was initiated at the site on August 27, 2007, to establish background conditions prior to implementing the excavation of the former tank area. Since there were no on-site wells remaining on the property, the nearest off-site wells designated as OSMW3, OSMW6 and OSMW8 were utilized for sample collection. The results from these wells did not provide data which could be correlated to post remedial conditions, since they were not located in optimal downgradient positions with respect to the source.

Following the remediation of the source area, three new one-inch diameter wells were installed along the south property line (MW1-MW3) on March 25, 2008, using a Geoprobe drilling machine. The wells were sampled for VOCs by EPA 8260 on March 31, 2008. The results indicated exceedances for multiple VOC parameters in all 3 wells. The highest concentrations were reported in MW3 which is located directly behind the existing building.

ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

3.0 SUPPLEMENTAL FIELD INVESTIGATION

The purpose of this work plan will be to fill in identified data gaps and supplement the investigations previously completed at the site.

Additional characterization data as described below will be collected upon approval of this Remedial Investigation Work Plan. The remedial investigation will consist of the following:

- Installation of a soil boring near the east side of the building as illustrated by the Suffolk County Department of Health Services (SCDHS)
- Installation of borings within interior of building to collect soil and groundwater samples
- Collection of a soil sample from the storm drain located in the front of the building

A Remedial Investigation Report will be prepared using historical data and the data generated during implementation of this work plan.

3.1 Soil Boring on East Side of Building

One soil boring (SB12) will be advanced approximately 5 feet off of the east wall of the building, in the general area identified by the Suffolk County Department of Health Services (SCDHS) as the location of a suspected floor drain outfall. The boring will be advanced using a track or truck mounted Geoprobe™ sampling system. The Geoprobe™ uses direct push technology to drive core samplers/groundwater probe points to the desired depth for soil or groundwater sample collection. Geoprobe® standard operating procedures will be utilized for both Geoprobe® operations.

Samples will be collected continuously from ground surface to the water table (approximately 8 feet) using a 4 foot macro-core sampler. Samples will be screened for the presence of volatile organic compounds (VOCs) using a photo-ionization detector (PID). Two soil samples will be collected from this soil boring for laboratory analysis. One sample will be retained from the surface and one soil sample will be retained from the interval with the highest PID reading. If no PID readings above background levels are observed, the second soil sample will be collected from the end of the boring at the water table interface. The location of the soil boring is shown on **Figure 3**. A sample matrix showing the number, type and analysis of samples collected during the supplemental investigation is provided as **Table 1**.

3.2 Soil and Groundwater Borings within Interior of Existing Building

As discussed previously, the former tank area was excavated under the IRM with petroleum impacted soil removed to the extent practical. "Clean" endpoint samples were obtained from the north, south and west sidewalls of the excavation though contaminated soil remained along the east wall. Due to concerns of structural damage to the building, further excavation could not be continued in this area.

To further delineate the extent and degree of affected soil east of the tank area excavation, six soil borings (SB6 through SB11) will be performed within the interior of the building. Each soil boring will be advanced using a track or truck mounted Geoprobe™ sampling system.

ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

Samples will be collected continuously from ground surface to the extent of contamination as determined from PID screening and visual staining using a four-foot macro-core sampler. Samples will be screened for the presence of volatile organic compounds (VOCs) using a photo-ionization detector (PID). These observations will be meticulously noted in the soil boring logs. At each boring location, one soil sample will be retained for laboratory analysis from the interval with the highest PID reading above the water table and one soil sample will be retained for laboratory analysis from the interval with the highest PID reading below the water table. If no PID readings above background levels are observed, the soil sample retained from the water table interface will be submitted for analysis. The soil boring locations are shown on **Figure 3**.

In addition, a groundwater sample will be collected from soil boring locations SB6, SB9 and SB11 to delineate the north and eastern boundaries of the plume. The groundwater samples will be collected by driving a Geoprobe groundwater sampler 5 feet below the water table. Sample procurement will be achieved through the use of dedicated polyethylene tubing and either a peristaltic pump or a check valve combined with the hand oscillation method. A sample matrix showing the number, type and analysis of samples collected during the supplemental investigation is provided as **Table 1**.

3.3 Storm Drain Sampling

As noted in the Drywell and Septic Pool Remediation Report prepared by F&N in May of 2007, Mr. Zachory Baldwin of the SCDHS was not available to inspect the remediation of the drywell located in the parking area north of the building. The SCDHS field notes indicate that the SCDHS had concerns that the sample collected from the base of the pool following remediation was not representative of actual endpoint conditions. Therefore, a confirmatory soil/sediment sample, identified as SD13, will be collected from the base of the structure.

Prior to sampling, the SCDHS and NYSDEC will be notified to schedule a mutually agreeable sampling date and time. The soil sample will be collected using a Geoprobe™ sampling machine equipped with a four-foot macro-core soil sampler. Continuous cores will be taken from the base of the pool to a depth of 12 feet below surface. All cores will be screened in the field with a photo-ionization detector and a detailed description of the lithology and observations will be recorded in a soil boring log. These observations will be utilized to determine the vertical extent of the replacement fill. A representative sample of the native soil will then be collected from below the replacement fill and submitted for laboratory analysis.

3.4 Monitoring Well Installation

Three monitoring wells (MW1-MW3) were installed as part of the IRM to monitor groundwater quality down gradient of the former UST area. Analytical results obtained from these wells indicated that the monitoring network did not extend far enough to the east to provide full width coverage of affected groundwater at the down gradient property line.

A fourth monitoring well (MW4) is proposed approximately 25 feet east of MW3 as shown in **Figure 3**. The monitoring well will be constructed of 1-inch diameter schedule 40 pvc riser with 10-feet of 0.010 slotted screen. The well will be installed to a total depth of 15 feet and set to intersect the water table with approximately 7 feet of screen below and 3 feet above the water table interface. This well

ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

and the three pre-existing monitoring wells will be fitted with compression caps and completed with flush mount 5-inch bolt-down manhole covers. Following installation of MW4, each of the onsite monitoring wells will be surveyed to determine relative casing elevation to the nearest 0.01 ft and horizontal position to the nearest 0.1 ft.

3.5 Monitoring Well Sampling

Following the installation of the fourth monitoring well (MW4) a full round of groundwater samples will be collected. Groundwater samples will be collected using a peristaltic pump and dedicated polyethylene tubing in accordance with standard low-flow sampling methods as follows:

- Record pump make & model in log book.
- Wear appropriate health and safety equipment as outlined in the Health and Safety Plan
- Inspect each well for any damage or evidence of tampering and note condition in field logbook.
- Remove the well cap.
- Lay out plastic sheeting and place the monitoring, purging and sampling equipment on the sheeting.
- To avoid cross-contamination, do not let any downhole equipment touch the ground.
- Measure well headspace with a PID or FID and record the reading in the field logbook.
- Measure and record the depth to water using a water level meter or interface probe. Record the measurement in the field logbook. Do not measure the depth to the bottom of the well at this time (to avoid disturbing any sediment that may have accumulated). Obtain depth to bottom information from installation information in the field logbook or soil boring logs.
- Calculate number of linear feet of static water (total depth or length of well pipe minus the depth to static water level).
- Calculate the total volume of water (Vt) in the casing. Well purge data sheets will be used in the field to perform these calculations.
- Connect the polyethylene tubing to the peristaltic pump and lower the tubing into the well to approximately the middle of the screen. Tubing should be a minimum of 2 feet above the bottom of the well as this may cause mobilization of any sediment present in the bottom of the well. Start purging the well at the highest rate in which the pump is capable. Continue purging until the purge volume has been extracted.
- There should be at least 1 foot of water over the end of the tubing so there is no risk of entrapment of air in the sample. Pumping rates should, if needed, and reduced to the minimum capabilities of the pump to avoid purging the well dry. However, if the recharge rate of the well is very low and the well is purged dry, then wait until the well has recharged to a sufficient level and collect the appropriate volume of sample.
- Reduce pump rate to 200 ml per minute. Collect the samples directly from the end of the tubing.
- Use pre-preserved 40 ml glass vials as provided by the contract laboratory. Fill each container with sample to just overflowing so that no air bubbles are entrapped inside. Fill all sample bottles by allowing the pump discharge to flow gently down the inside of the bottle with minimal turbulence. Cap each bottle as it is filled.
- Preserve and label the samples, and record them on the chain of custody form. Place immediately into a cooler for shipment and maintain at 4°C.
- Remove the tubing from the well. The polyethylene tubing must either be dedicated to each

ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

well or discarded. If dedicated the tubing should be placed in a large plastic garbage bag, sealed, and labeled with the appropriate well identification number.
- Close and lock the well.
- Decontaminate pump either by changing the surgical pump tubing between wells or by flushing with ½ gallon alconox solution, followed by 1 gallon of tap water followed by 1 gallon of distilled water.

All sampling data will be recorded on dedicated well sampling forms. A sample matrix showing the number, type and analysis of samples collected during the supplemental investigation is provided as **Table 1**.

3.6 Soil Vapor Sampling

Soil vapor samples will be collected in accordance with the Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH 10/06) to determine if the medium is contaminated with VOCs. If VOCs are present, the results will be used to evaluate current off-site human exposures and future human exposures within any new or refurbished building on the site. The evaluation of current off-site exposure will be useful in determining if further off-site investigation of the exposure pathway is warranted. The evaluation of future on-site exposure will determine whether or not the use of control measures will be necessary to prevent exposure by commercial workers in any new building refurbished building to be placed into service on the property.

In order to determine the vapor quality in the soil beneath the site, soil vapor samples will be taken from six vapor implants (SG1-SG6) located as shown in **Figure 4**. Vapor sampling locations were selected to be representative of conditions both on the site and at the property boundary. Since the water table surface is approximately 8 feet below the surface, the vapor implants will be set at a depth of 5 feet below the surface.

3.6.1 Soil Vapor Sampling Protocols

The vapor implants will be installed with Geoprobe™ equipment at a depth of 5 feet below grade. Each vapor implant will be constructed in the same manner at all locations to minimize possible discrepancies. The implants will be made from stainless steel and fitted with polyethylene tubing. Coarse sand or glass beads will be added to create a sampling zone of one foot in length and sealed above with a bentonite slurry for a minimum distance of 1 foot.

After installation of the probes, one to three volumes (i.e., the volume of the sample probe and tube) will be purged prior to collecting the samples to ensure samples collected are representative. Flow rates for both purging and collecting will not exceed 0.2 liters per minute to minimize outdoor air infiltration during sampling. Samples will be collected in Summa® canisters which have been certified clean by the laboratory and analyzed by using USEPA Method TO-15. All samples will be collected over the same period of time and submitted to Severn Trent Laboratories, Inc. (STL), an Environmental Laboratory Approval Program (ELAP) certified laboratory.

A sample log sheet will be maintained summarizing sample identification, date and time of sample collection, sampling depth, identity of samplers, sampling methods and devices, soil vapor purge

ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

volumes, volume of soil vapor extracted, vacuum of canisters before and after samples are collected, apparent moisture content of the sampling zone, and chain of custody protocols.

As part of the vapor intrusion evaluation, a tracer gas will be used in accordance with NYSDOH protocols to serves as a quality assurance/quality control (QA/QC) device to verify the integrity of the soil vapor probe seal. Helium will be used as the tracer gas and a box will serve to keep it in contact with the probe during the testing. A portable monitoring device will be used to analyze a sample of soil vapor for the tracer prior to sampling. If tracer sample results show a significant presence of the tracer, the probe seals will be adjusted to prevent infiltration. At the conclusion of the sampling round, tracer monitoring will be performed a second time to confirm the integrity of the probe seals.

After the collection of the analytical sample, a field reading will be recorded at each sampling point utilizing a photoionization detector capable of detecting organic compounds in the parts per billion

3.7 Laboratory Analysis

Samples will be submitted to the laboratory for a standard turnaround time, which is estimated to be one to two weeks. The proposed sampling program is summarized in **Table 1**.

3.7.1 Analysis of Soil and Groundwater Samples

Collected soil and groundwater samples will be placed in pre-cleaned laboratory supplied glassware, and placed in a cooler packed with ice for transport to the laboratory. Sample analysis will be provided by York Analytical Laboratories, Inc. (York) of 120 Research Drive, Stamford, Connecticut, a New York State ELAP certified environmental laboratory (ELAP Certification No. 10854). Transport to the laboratory will be through a York courier under strict chain-of custody documentation

The endpoint sample collected from SD1 located in the storm drain near the northeast corner of the building will be analyzed for the following parameters:

- Volatile Organic Compounds (VOCs) by EPA Method 8260 (SCDHS List);
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270 (SCDHS List);
- Heavy Metals (SCDHS List)

Soil samples retained from borings SB6 through SB11 in the interior of the building will be analyzed for the following parameters:

- Volatile Organic Compounds (VOCs) by EPA Method 8260

Soil samples retained from boring SB12 located approximately 5 feet off of the east wall of the building will be analyzed for the following parameters:

- Volatile Organic Compounds (VOCs) by EPA Method 8260
- Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270

Groundwater samples obtained from the [redacted] on-site monitoring wells will be analyzed for the following parameters:

ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

- [redacted]

3.7.2 Analysis of Soil Vapor Samples

Analytical procedures and corresponding reporting limits will be identified when reporting the sampling results. Samples will be analyzed by USEPA Method TO-15 for volatile organic compounds. All samples will be analyzed by York Laboratories of Stamford Connecticut, a New York State ELAP certified environmental laboratory.

3.8 Quality Assurance / Quality Control

The fundamental QA objective with respect to accuracy, precision, and sensitivity of analysis for laboratory analytical data is to achieve the QC acceptance of the analytical protocol. The accuracy, precision and completeness requirements will be addressed by the laboratory for all data generated.

3.8.1 Soil and Groundwater Samples

A blind duplicate sample will be collected for each matrix (soil and groundwater) at a rate at of 5% per parameter per matrix or at least one per sampling event. Collected samples will be appropriately packaged, placed in coolers and shipped via overnight courier or delivered directly to the analytical laboratory by field personnel. Samples will be containerized in appropriate laboratory provided glassware and shipped in plastic coolers. Samples will be preserved through the use of ice or "cold-paks" to maintain a temperature of 4°C and delivered to the analytical laboratory as soon as possible after collection.

Dedicated disposable materials will be used for both soil (acetate liners) and groundwater (polyethylene tubing, dedicated samplers) samples, therefore, field equipment (rinsate) blanks will not be part of the QA/QC program. Trip blanks will accompany samples each time they are transported to the laboratory. Trip blanks will be prepared by the laboratory and shipped with the coolers and sampling glassware.

3.8.2 Soil Vapor Samples

Extreme care will be taken during all aspects of sample collection to ensure that sampling error is minimized and high quality data are obtained. The sampling team members will avoid actions (e.g., using permanent marker pens and wearing freshly dry-cleaned clothes or personal fragrances) which can cause sample interference in the field. QA/QC protocols will be followed for sample collection and laboratory analysis, such as use of certified clean sample devices, meeting sample holding times and temperatures, sample accession, and chain of custody.

A tracer gas, helium, will be used in accordance with NYSDOH sampling protocols to serve as a QA/QC device to verify the integrity of the soil vapor probe seals.

3.8.3 Laboratory Quality Control

The laboratory analyzes QC samples with each analytical batch, including a Method Blank (MB), Laboratory Control Sample (LCS), and a Laboratory Control Sample Duplicate (LCSD). Internal standards are added to all calibration standards, samples, and blanks to verify that the analytical system is in control.

ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

4.0 HEALTH AND SAFETY PLAN

The Remedial Investigation at the site were performed under a Health and Safety Plan (HASP) prepared to identify and account for hazards specific to the site so that the field crew can avoid and, if necessary, protect against, health and/or safety hazards. EBC previously prepared a HASP for this site which was submitted to and approved by the DEC.

The HASP includes on-site health and safety monitoring to protect field crews and others entering the site and to also monitor for potential vapor impacts to the surrounding community as the result of sample collection activity. Health and safety monitoring includes periodic air monitoring for the presence of volatile organic compounds (VOCs).

A copy of the HASP will be available on-site during the Remedial Investigation. The drilling subcontractor will be briefed on the conditions of the HASP and will be provided with a copy prior to site mobilization. See the site HASP (EBC 6/07) for further information.

ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

5.0 REMEDIAL INVESTIGATION REPORT

Following completion of the investigation and receipt of the analytical data, EBC will prepare a Remedial Investigation Report which will include the following:

1. A description of the work which was performed under the off-site RI.
2. Any modification from this work scope and the reason for the modifications
3. The nature and extent of the off-site groundwater plume
4. Soil, and groundwater conditions that were observed
5. Analytical data in tabular form comparing results to the most current applicable guidance
6. Cross sections and data figures
7. Laboratory analytical data, sampling logs and well completion logs for all samples and areas covered by the investigation
8. Scaled drawings showing the locations of temporary sampling points, monitoring wells and surface water sampling locations.
9. A Qualitative Exposure Assessment which identifies potential exposures to site related compounds of concern to current and future occupants of the site and to current and future residents, commercial workers and utility workers at off-site locations.

ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

6.0 REFERENCES

Environmental Business Consultants, IRM Amendment Letter – Former Jericho Marine Site, Lindenhurst, NY, August 14, 2007.

Environmental Business Consultants, Interim Remedial Measure Closure Report – Former Jericho Marine Site, Lindenhurst, NY, June 2008, Revised August 2008.

Environmental Business Consultants, Health and Safety Plan – Former Jericho Marine Site, Lindenhurst, NY, June, 2007.

Fenley and Nicol Environmental, Inc. – Drywell and Cesspool Remediation Report Revised, Former Jericho Marine Site, Lindenhurst, NY, June 14, 2007.

Fenley and Nicol Environmental, Inc. – Remedial Action Plan Revision 6, Former Jericho Marine Site, Lindenhurst, NY, October 30, 2006.

NYSDEC, Division of Environmental Restoration, December 2002, Draft DER-10, Technical Guidance for Site Investigation and Remediation.

NYSDEC, Division of Technical and Administrative Guidance, January 24, 1994, Memorandum # 4046, Determination of Soil Cleanup Objectives and Soil Cleanup Levels.

NYSDEC, Division of Water, June 1998, Addendum April 2000, Technical and Administrative Guidance Series 1:1:1, Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations.

NYSDOH, Division of Environmental Health Assessment, Center for Environmental Health, Bureau of Environmental Exposure Investigation, October 2006, Guidance for Evaluating Soil Vapor Intrusion in the State of New York.

Environmental Conservation Law, Article 27 Subparts 375-1 through 375-5. December 14, 2006.

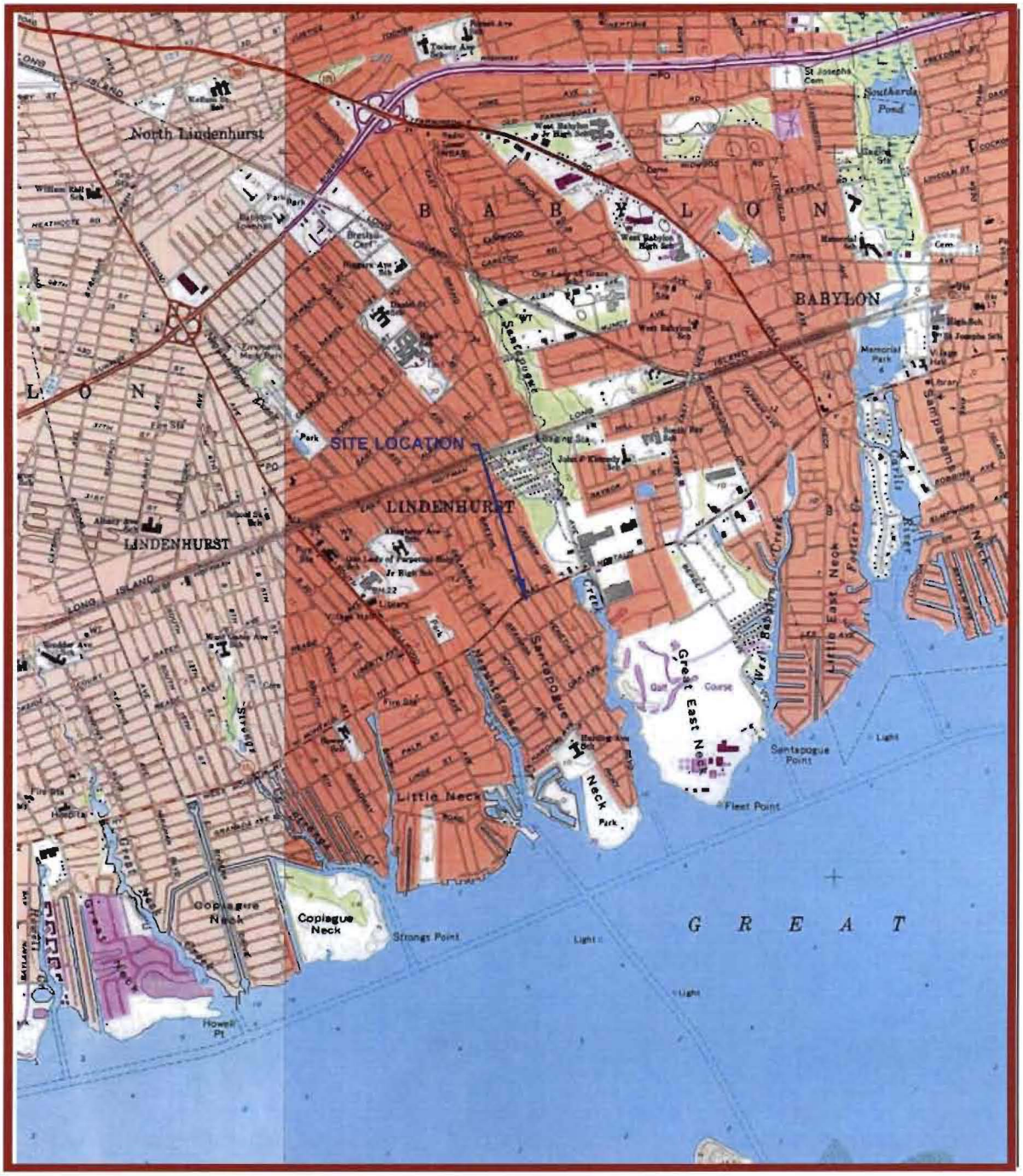
ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

TABLES

TABLE 1
SUMMARY OF SUPPLEMENTAL RI INVESTIGATION
SAMPLING PROGRAM, RATIONALE AND ANALYSES

Matrix	Location	Approximate Number of Samples	Rationale for Sampling	Laboratory Analyses
Soil	6 Soil borings located within the existing building	6	Identification and characterization of source area	VOCs by 8260
Soil	1 boring located on east side of existing building	[redacted]	Evaluation of suspect floor drain outfall area	VOCs by 8260, SVOCs by 8270
Total (Soil)		**7**		
Sediment	1 sediment sample from base level 8-12 feet of remediated drywell. (NE)	5	Confirm previous remediation of NE drywell	VOCs, by EPA 8260, SVOCs by EPA 8270 (SCDHS List), metals (SCDHS list)
Total (Sediment)		**1**		
Groundwater	3 existing monitoring wells and 1 new well along downgradient (south) property line	4	Evaluate general groundwater quality at downgradient property line and downgradient of former source area	VOCs by 8260
Total (Groundwater)		**4**		
Soil Gas	6 soil gas implants located across the site	6	determine whether medium is contaminated, characterize the nature and extent of contamination and evaluate potential for impact to new building and off-site migration	VOCs by EPA TO15
Total (Soil Gas)		**6**		

FIGURES

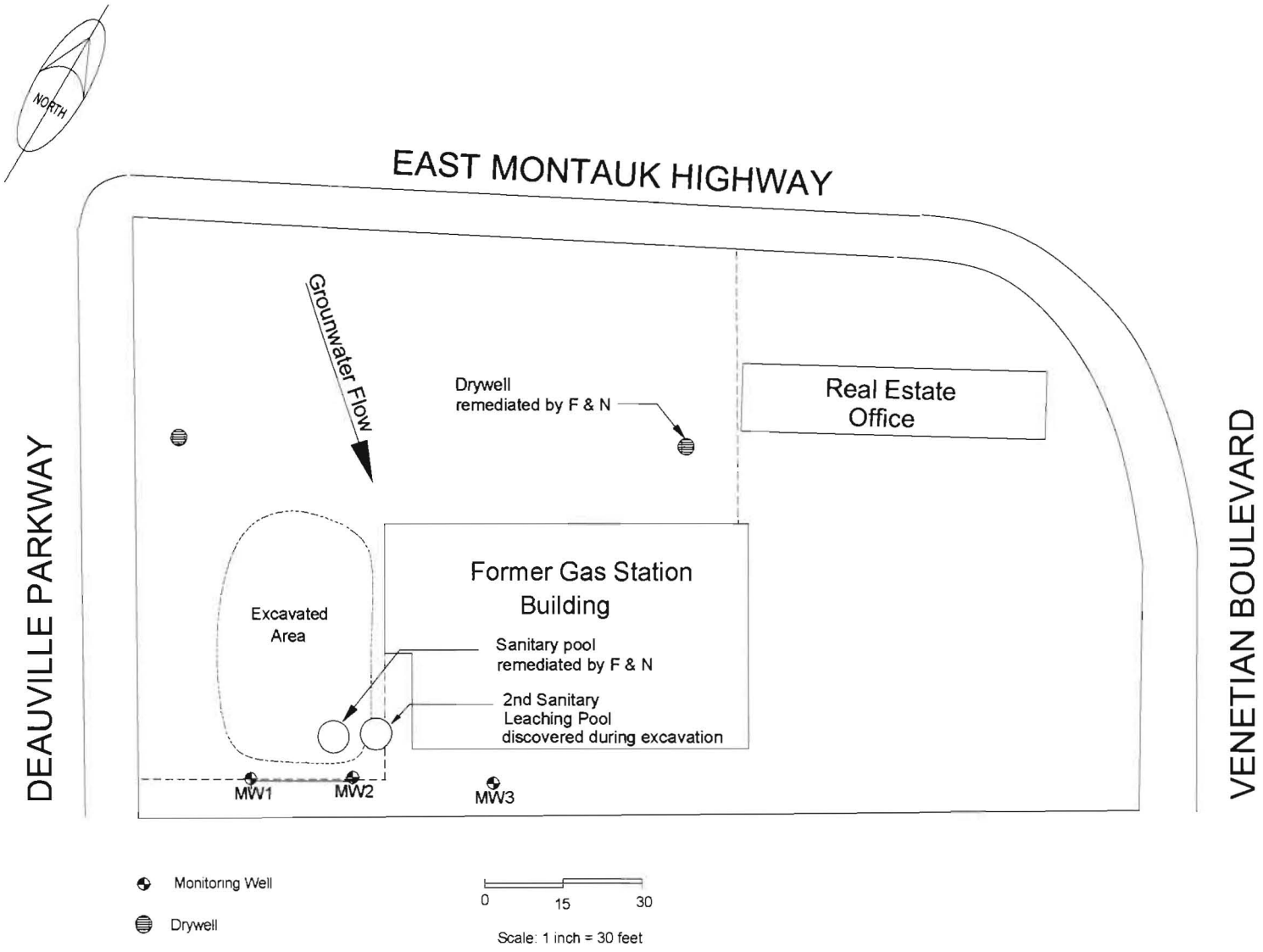


Source: USGS Amityville Quadrangle, 1994, Contour Interval = 5 feet

BBC
ENVIRONMENTAL BUSINESS CONSULTANTS
1808 Middle Country Road
Ridge, NY 11961
Phone 631.504.6000
Fax 631.924.2870

FORMER JERICHO MARINE
269 E. MONTAUK HWY
LINMDENHURST, NY

FIGURE 1 SITE LOCATION MAP



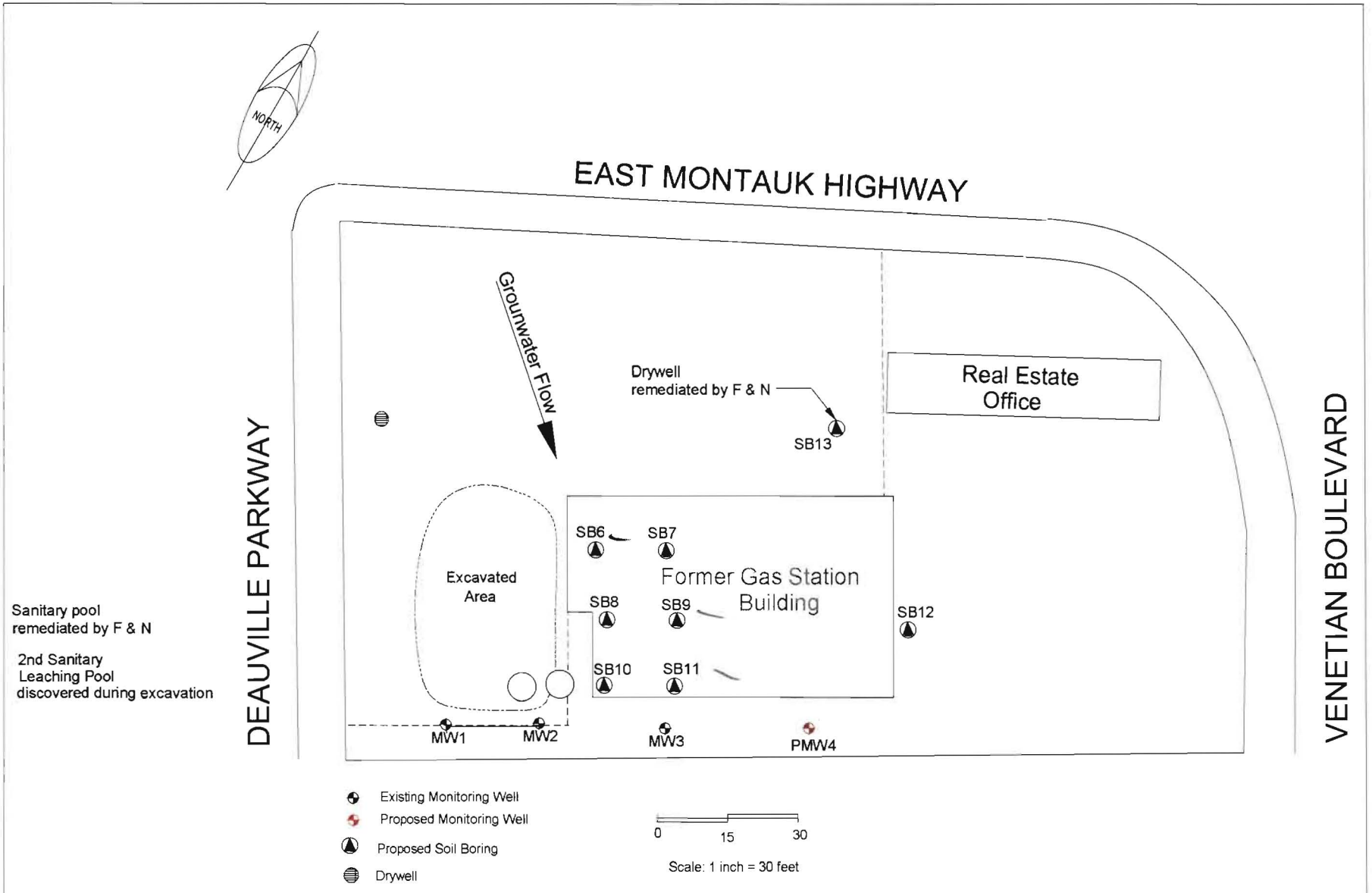
EBC
ENVIRONMENTAL BUSINESS CONSULTANTS
1806 MIDDLE COUNTRY ROAD
RIDGE, NY 11961
Ph:631.504.6000
Fax:631.924.2870

FORMER JERICHO MARINE

SITE PLAN

269 E. MONTAUK HIGHWAY
LINDENHURST, NY

FIGURE 2



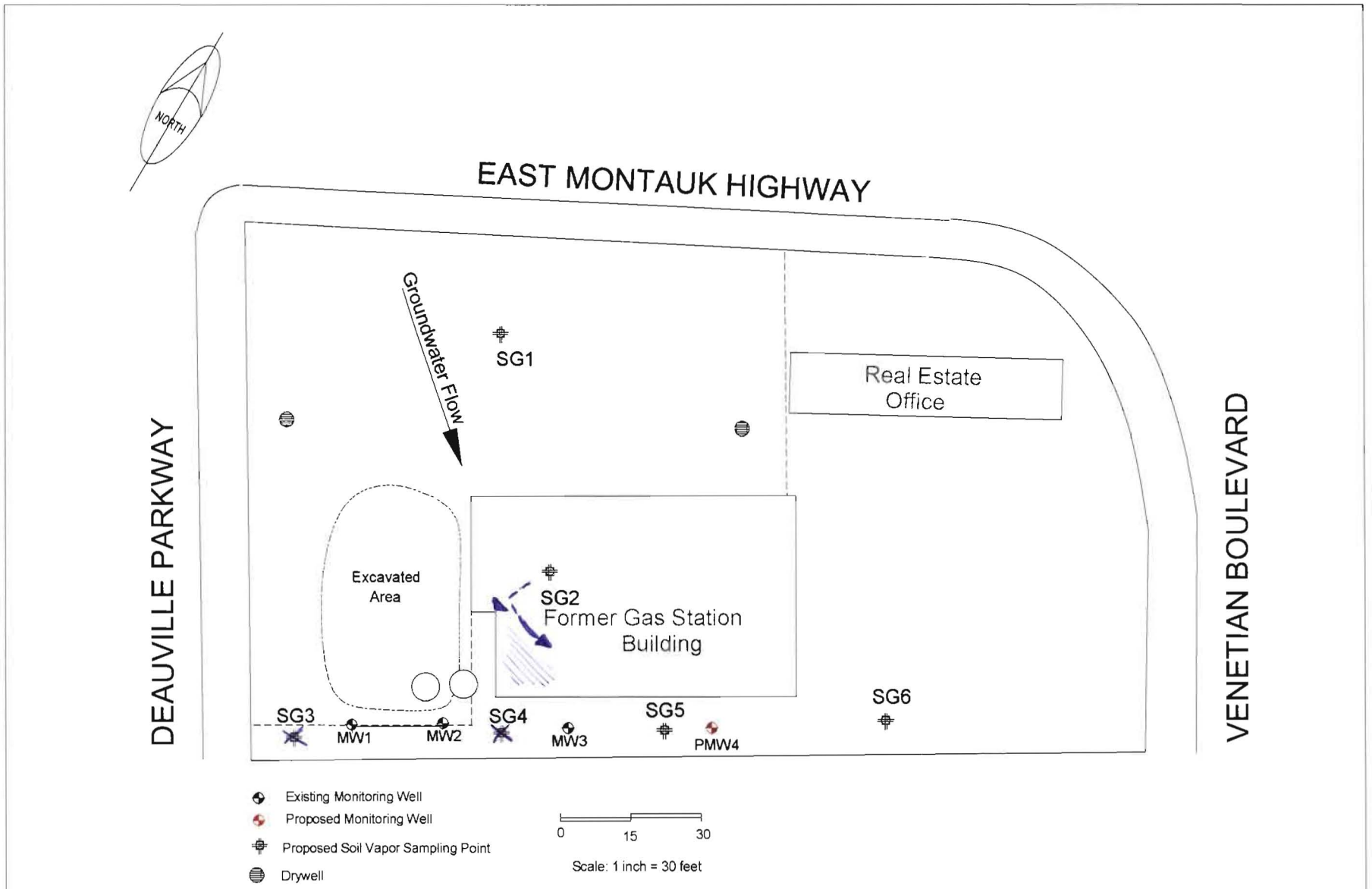
EBC
ENVIRONMENTAL BUSINESS CONSULTANTS
1806 MIDDLE COUNTRY ROAD
RIDGE, NY 11961
Ph:631.504.6000
Fax:631.924.2870

FORMER JERICHO MARINE

SOIL & GROUNDWATER SAMPLING LOCATIONS

269 E. MONTAUK HIGHWAY
LINDENHURST, NY

FIGURE 3



EBC
ENVIRONMENTAL BUSINESS CONSULTANTS
1806 MIDDLE COUNTRY ROAD
RIDGE, NY 11961
Ph:631.504.6000
Fax:631.924.2870

FORMER JERICHO MARINE
SOIL VAPOR
SAMPLING LOCATIONS

269 E. MONTAUK HIGHWAY
LINDENHURST, NY

FIGURE 4