REMEDIAL INVESTIGATION REPORT
And
FEASIBILITY STUDY

Mill Neck Marina
Hernan Avenue
Locust Valley, New York 11560

Site Code # 130166
Work Assignment # D006130-25

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HRP Associates, Inc.

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And
FEASIBILITY STUDY

Mill Neck Marina
Hernan Avenue
Locust Valley, New York 11560

(Site Code # 130166)
(WA # D006130-25)

CERTIFICATION

I, Nancy Garry, certify that I am currently a NYS Registered Professional Engineer as defined at 6 Part NYCRR Part 375 and that this report, Remedial Investigation Report and Feasibility Study, was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER -10) and that all activities were performed in full accordance with the DER-approved work plan and any DER-approved modifications.

Nancy Garry, PE
Project Manager

REMEDIAL INVESTIGATION REPORT
And
FEASIBILITY STUDY

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1.0 INTRODUCTION

This Remedial Investigation (RI) Report and Feasibility Study (FS) summaries HRP Engineering P.C. (HRP) investigation of the former Mill Neck Marina site at Hernan Avenue in the Town of Locust Valley, Nassau County, New York (Site # 130166), referred to herein as the Site (see Figure 1). The RI, conducted from June 2011 through July 2012 for the New York State Department of Environmental Conservation (NYSDEC) under Engineering Services Standby Contract Work Assignment (WA) #D006130-25 is based on the investigations described herein and previous investigations completed by others. Applicable data from these reports have been included in relevant sections of this report and are included in Section D.

1.1 PURPOSE

The purpose of this Engineering Services Standby Contract WA was to conduct a Remedial Investigation and Feasibility Study (RI/FS) to characterize on-site media potentially impacted by historic activities at the Former Mill Neck Marina site. The primary objectives of the RI Scope of Work (SOW) were to:

- Investigate possible on-site contamination from the Mill Neck Marina to determine if there is surface and/or subsurface, sediment, and groundwater contamination. Previous on-site remedial investigations have revealed groundwater and soil contamination above NYSDEC standards and guidance values;
- Evaluate surface soil, subsurface soil, sediment and groundwater quality to assess if chemical concerns exist relative to NYSDEC standards and guidelines;
- Delineate the vertical and horizontal extent of contaminated surface soil, subsurface soil, sediment and groundwater; and
- Determine alternative remedial options for the contamination that may be revealed on-site.
- Present and compare remedial goals and potential remedial alternatives for remediation of the Site.

1.2 BACKGROUND

1.2.1 Site Description

The former Mill Neck Marina is located at the north-eastern terminus of Hernan Avenue, in the Hamlet of Locust Valley, Nassau County, New York (see Figure 1). The 1.4± acres site, consisting of a total of 9 individual tax lots according to the Nassau County Assessor's office, is currently a vacant overgrown lot, but was used as a boat marina from at least 1953 until its abandonment in 2001. The Site was reportedly designated a NYS Inactive Hazardous Waste Site List in 2006.

The Site is located in a mixed residential area of Locust Valley, New York. At present, the areas surrounding the property include:

North: Oak Neck Creek (a tributary of Mill Neck Creek) and tidal wetlands

West: Residential properties

South: Hernan Avenue and residential properties

East: Oak Neck Creek and tidal wetlands

1.2.2 Site History

Based on a review of historical photographs completed by others, the subject property appears to have been developed before 1953 as the Mil Neck Bay Marine Service marina. The Site is zoned R1 – single family residential. The property was expanded between 1953 and 1966, and further modified between 1966 and 1976 with the excavation of an inlet area along Oak Neck Creek. The marina reportedly included a large commercial building (on tax lot 348), outdoor boat storage area, maintenance areas, septic system, and gasoline storage and dispensing facilities. A review of New York State Tidal Wetlands Map Number 618-528 confirmed the existence of the former features. Based on previous reports, a cesspool permit was issued for the Site in 1957, and tidal permits, as per Article 25, Environmental Conservation Law Implementing Regulations 6NYCRR PART 661, were issued to the occupants of the Site from at least 1998 to approximately 2004.

Since at least 2001, the Mill Neck Marina ceased operations and removed the buildings and associated utilities, boats and waste from the premises. The Site has been vacant since that time and portions of the site have become overgrown with vegetation.

Prior site investigations by others have documented that historical operations have adversely impacted subsurface and surface soil, sediment, and groundwater on-site with metals and Semi-Volatile Organic Compounds (SVOCs). In particular, past reports completed by others noted that the soils contain arsenic, mercury, lead, copper, and zinc at levels exceeding 1993

NYSDEC TAGM soil clean-up NYSDEC standards. Historical figures including soil, sediment and groundwater analytical results as well as groundwater contour maps are presented in Appendix D. A grid map referring to approximate historical sample locations is presented on Figure 3.

1.2.3 Previous Investigations

The following provides a summary of previous environmental investigations regarding the Mill Neck Marina Site.

Phase I Environmental Site Assessment for the property known as the: Mill Neck Marina, Hernan Avenue, Locust Valley, New York. Completed by Cashin Associates, P.C. February 2002

In February 2002, Cashin Associates, P.C. completed a Phase I ESA of the Mill Neck Marina, located at the terminus of Hernan Avenue, Locust Valley, Nassau County, New York. This report was prepared for The Town of Oyster Bay, Office of the Town Supervisor, Town Hall, Oyster Bay, New York. Cashin stated that the Site consisted of a 1.4 acre parcel. Based on a review of historical records and interviews with the current owner Cashin stated that the site had been used as a marina since at least 1953. The Site was vacant at the time of the site inspection. The only structures on-site at the time of the inspection were "deteriorated walkways and docking structures" located in the northeast corner of the Site. Piles of debris were observed on the west side of the Site. A search of the NYSDEC spill database revealed on open spill report for the Site. The spill report complained of containers of unknown chemicals left in an abandoned building; at the time of the Site inspection the chemicals and building had been removed.

The report included the following recommendations:

- The NYSDEC should be contacted to determine the actions necessary to properly close out the active spill file.
- The subject property was previously the site of a marina, which had been in operations as far back as the 1950s. This long term use indicates a potential for contamination of on-site soil and groundwater involving substances related to marina operations. It was recommended by Cashin that soil and groundwater samples be collected at various locations across the Site.
- The subject property contains areas in which waste dumping has occurred. It is recommended that all debris be removed from the Site and properly disposed of.
- The shoreline of the subject property contains tidal wetlands and the Site is largely located in the 100 year flood plain. Flood elevations should be verified to determine if flood proofing or other special measures are required.

Environmental Investigation Report for the property known as the: Mill Neck Marina, Hernan Avenue, Locust Valley, New York. Completed by Cashin Associates, P.C. August 2004

In August 2004, Cashin Associates, P.C. completed an Environmental Investigation Report of the Mill Neck Marina, located at the terminus of Hernan Avenue, Locust Valley, Nassau County, New York. The report was prepared for The Town of Oyster Bay, Office of the Town Supervisor, Town Hall, Oyster Bay, New York. Cashin stated that the Site consisted of a similar background as presented in the February 2002 Phase I ESA.

The report included the following recommendations:

- The Nassau County Department of Health (NCDOH) should be contacted for agency review and comment.
- Additional sampling to further define the extent of contamination and determine and define the scope of remedial needs for metals and SVOCs is needed.
- Extensive remediation of in-site soils, including the removal and disposal of the most contaminated foils, may be required following review and evaluation of the attached data by the NCDOH and NYSDEC.

Environmental Services of Former Mill Neck Marina, Hernan Avenue, Locust Valley, New York, completed by Beringer Environmental, Inc., November 2005

On November 2, 2005, Beringer Environmental, Inc. issued an Environmental Services report for Former Mill Neck Marina at Hernan Avenue in the City of Locust Valley, New York to OTS Associates, Inc. The purpose of the investigation was to determine if any heavy metals contamination exists in the subsurface of the Site, as a result of the past and current Site usage as a marina and boat yard. The report noted that soil sampling locations were selected based upon a review of a Site Plan by the Locust Valley Water Department dated November 10, 2000.

The scope of work included the installation of twelve shallow soil borings (B-1 to B-12) across the Site (sample points appear to coincide with individual lots) and the collection and analysis of select soil samples for Target Analyte List (TAL) Metals. Groundwater samples were not collected during the soil boring activities.

Analytical results indicated that soil from 0 to 2.5 foot below ground surface (bgs) contained metals at concentrations that exceeded applicable regulatory guidance values. Reportedly, concentrations were highest at the easternmost and northwesterly portions of the Site.

1.3 REPORT ORGANIZATION

The remainder of this report is divided into eleven (11) sections. Immediately following the text are the references, tables, figures and appendices. A brief summary of each report section is provided below.

Section 2.0 Study Area Investigation: Summarizes field activities associated with the RI, including surficial and subsurface soil investigations, sediment sampling, groundwater investigations, contaminant source investigations, geological investigations, and well receptor survey. Technical correspondence documenting field activities are also summarized in this section.

Section 3.0 Physical Characteristics of the Study Area: Includes results of field activities to determine physical characteristics, including surface features, geology, soils, hydrogeology, demography and land use.

Section 4.0 Nature and Extent of Contamination: Presents the results of RI, both natural and chemical components and contaminants in the following media: surface and subsurface soils, sediment, and groundwater.

Section 5.0 Contaminant Fate and Transport: An evaluation of potential migration pathways and contaminant persistence and/or migration is presented.

Section 6.0 Exposure Assessment: Presents the results of a general human health and environmental impact assessment completed at the Site. The assessment includes an estimation of exposure point concentrations and a comparison of this data with established and published standards, criteria and guidance values (SCG) including: New York State Standards as well as Federal requirements.

Section 7.0 Remedial Investigation Conclusions and Data Limitations: Summarizes the results and findings of the RI.

Section 8.0 Remedial Goals and Remedial Action Objectives: Summarizes and defines the remedial goals and remedial action objective for the Feasibility Study.

Section 9.0 Identification and Screening of Alternative: This section of the report provides an overview of potential remedial alternatives which are screened for possible detailed consideration, for the Site to achieve the remedial action objectives and goals.

Section 10.0 Detailed Analyses and Comparison of Alternatives to Protection Criteria: Details the alternatives to allow an analysis of their effectiveness and implementability with the Site's remedial action objective and NYSDEC criteria for the ERP program, DER - 10 Technical Guidance for Site Investigation and Remediation.

Section 11.0 Summary of Remedial Alternatives: summary of the advantages and disadvantages for each of the five (5) alternatives

2.0 STUDY AREA INVESTIGATIONS

Study area investigations were completed to evaluate the surface and subsurface environmental conditions and to provide data pertaining to the degree and extent of contamination. A description of the study area investigations conducted during this Remedial Investigation (RI) is presented in this Section.

This RI report was completed in accordance with the scope of work described in the letter issued to HRP from the NYSDEC, "Work Assignment Issuance/Notice to Proceed, NYSDEC Site Number: 130166," dated June 27, 2011. The scope of work for the Site was prepared by the NYSDEC, Division of Environmental Remediation. Deviations, based on field conditions are noted in Section 2.1.7. The investigation tasks described in the work plan utilized the NYSDEC's DER-10 (DER-10), Technical Guidance for Site Investigation and Remediation, dated May 3, 2010 for guidance and 6 NYCRR Part 661 Tidal Wetlands Land Use Regulations. In September 2011, the Site Investigation Work Plan was approved by the NYSDEC which incorporated the following site specific components:

- Field Sampling Plan (FSP);
- Quality Assurance Project Plan (QAPP);
- Health and Safety Plan (HASP); and
- Community Air Monitoring Plan (CAMP).

Field work for this RI was conducted in several mobilizations to the site and included the following tasks:

- Initial site inspection (October 17, 2011);
- Installation of soil borings and temporary groundwater monitoring wells and the collection and submittal for analysis of select surface and subsurface soil and groundwater samples (October 17 through October 20, 2011);
- Collection of sediment samples and submittal for analysis of select sediment samples (November 7 and 8, 2011);
- Installation of permanent groundwater monitoring wells (January 31, 2012);
- Development of groundwater monitoring wells (February 1, 2012);
- Global Positioning System (GPS) survey of groundwater monitoring wells and relative groundwater monitoring well elevation survey (February 1, 2012);
- Sampling of groundwater monitoring wells and submittal for analysis (February 7, 2012); and
- Advancement of a second round of soil borings and the collection and submittal (based on exceedances in the analytical results of the first analytical results, deeper soil samples were submitted upon review of the shallow results) for analysis of select soil samples (July 18 through July 27, 2012).

2.1 Field Activities Associated with the RI

To determine the degree and extent of possible contaminants at the former Mill Neck Marina Site, HRP advanced soil borings, collected sediment samples, installed permanent and temporary groundwater monitoring wells for the collection of groundwater samples, as presented in the Work Assignment Issuance/Notice to Proceed. Groundwater, surface and subsurface soil, and sediment samples that were collected, illustrated in Figures 8 through 18, were submitted to a New York State Department of Health (NYSDOH) certified laboratory for analysis. Sampling procedures are discussed throughout Section 2.1. The analytical results for each medium are discussed in Section 3.0. The Data Usability Summary Reports (DUSR) are included in Appendix B.

2.1.1 Surface Features: Natural and Manmade Features

As previously discussed, the site was historically improved with boat storage and maintenance areas, a septic system, and gasoline storage and dispensing systems. A review of New York State Tidal Wetlands Map Number 618-528 confirmed the locations of former features. In addition, previous investigations by others noted that a cesspool permit was issued for the Site in 1957. No further information was available regarding the cesspool was available.

The 1.4± acres Mill Neck Marina property is currently vacant with several areas of overgrown vegetation. Based on previous investigation reports, the former marina building consisted of a street level floor, which housed maintenance equipment. The area surrounding the former Mill Neck Marina property is a residential neighborhood. Hernan Avenue is located immediately south of the site. The west side of Site is border by adjoining residential properties than North Bayview Place, across the street from the site. The adjoining property to the west, at 18 Meadow Street, is improved by a two-story residential building and a blacktopped drive way. The Site is bordered on the north and east by the Oak Neck Creek.

2.1.2 Meteorological Observations

Throughout HRP's investigations, visual and thermal observations (i.e. ambient temperature readings) were noted and recorded in field logs. Other meteorological observations were conducted as part of the Community Air Monitoring Program (CAMP) and are further discussed on Section 4.1.9.

2.1.3 Sediment and Surface Water Investigations

Oak Neck Creek, a tidal estuary which borders the site to the east and north, flows into the Mill Neck Preserve located north of the site. In an effort to assess the nature of the sediment at the site and in the adjacent tidal marsh samples were collected at eleven (11) designated locations in accordance with DER-10 sediment samples were collected at 0-6", 6" to 12", and 12" to 24" in areas where sediment depth allowed a sample to be collected. The samples was

analyzed for VOCs, SVOCs, TAL Metals, PCB/Pesticides, Mercury (total and organic) and Total Organic Carbon (TOC). The eleven (11) sediment samples (HRP-SS-1 through HRP-SS-11) were collected on November 7 and 8, 2011. The sediment samples were collected from the periphery and center of the active channel of Oak Neck Creek, at the upstream end, midstream part, and downstream end of the Site. A dedicated, sterile, polyethylene tube was used to collect each sediment sample.

Sediment samples were examined in the field for physical evidence of contamination (i.e., odor, staining). HRP personnel maintained a detailed log of each sample, and recorded all pertinent field information on the logs, including mineralogy and grain size utilizing the Udden-Wentworth Scale (1922). Upon collection, each sediment sample was placed into a sealable (i.e., Ziploc®) bag, labeled, and was subjected to a headspace analysis for gross volatile organics via a photoionization detector (PID) that was field calibrated to manufactures standards, equipped with a 10.2 eV bulb. Sediment sample locations are depicted on Figure 2, 13 and 14 and are summarized below. Sediment sample logs are available in Appendix C.

Sediment Sample ID	Location	Justification
HRP-SS-1	North of Site, Periphery of Channel	Assess the potential for off-site migration of contaminants to Oak Neck Creek.
HRP-SS-2	North of Site, Periphery of Channel	
HRP-SS-3	Northeast of Site, Center of Channel	
HRP-SS-4	Northeast of Site, Periphery of Channel	
HRP-SS-5	North of Site, Periphery of Channel	
HRP-SS-6	East of Site, Periphery of Channel	
HRP-SS-7	East of Site, Periphery of Channel	
HRP-SS-8	East of Site, Center of Channel	
HRP-SS-9	East of Site, Periphery of Channel	
HRP-SS-10	East of Site, Periphery of Channel	
HRP-SS-11	East of Site, Center of Channel	

Surface-water samples were not included under the scope of this investigation.

2.1.4 Subsurface Investigations

To evaluate the degree and extent of subsurface soil and groundwater contamination, HRP mobilized to the Site three times to advance a total of twenty-five (25) soil borings and four (4) groundwater wells including the following:

- *Surficial Soil Investigation* - From July 17 through 24, 2012 hand auger points HRP-SB-1 through HRP-SB-17 were installed across the site on a grid pattern. Each hand auger was advanced to refusal, if groundwater was encountered groundwater samples were collected for analysis.

- *Subsurface Soil Investigation* - Based on the July 17 through 24, 2012 surficial soil sample results, soil borings (soil borings HRP-SB-18 through HRP-SB-25) were installed in areas that exhibited containment above appropriate standards from October 17 through 20, 2012. It is important to note that due to the presence of marsh soils and overgrown vegetation in the northwest portion of the site, HRP conducted hand auger sampling in this area.

- *Groundwater Monitoring Well Replacement* - On January 2011, monitoring wells were installed to replace previously installed monitoring well locations that had been destroyed or could not be found due to overgrown site conditions.

During the investigations all non-disposable soil sampling equipment was decontaminated between samples using an Alconox wash followed by a clean water rinse. In addition, all investigation derived waste (IDW) was stored in approved 55-gallon drums for proper disposal. Also an air mercury vapor meter (Jerome 431-X or similar) was used during periods of surface intrusion to monitor the mercury levels in the air. The mercury vapor level did not detect levels above baseline for the entire project.

Each of the investigations is detailed below.

2.1.4.1 Surficial Soil Boring Installation and Sampling

To initially assess site conditions, HRP installed surficial soil borings HRP-SB-1 through HRP-SB-17, in a grid-like pattern across the site using a 3" diameter stainless steel hand auger. Boring locations were determined by HRP and the NYSDEC, and were specified in the Mill Neck Marina Site-Specific Field Activities Plan (FAP) and in subsequent email conversations between the NYSDEC project manager and HRP. Soil boring locations are summarized below in reference to Figure 2. Soil boring logs are provided in Appendix C.

Soil Boring ID	Location	Justification
HRP-SB-1	C'-Z'	To assess the presence, concentration and identity of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), and pesticides across the Mill Neck Marina property.
HRP-SB-2	C'-Z'	
HRP-SB-3	C'-Z'	
HRP-SB-4	C-Y'	
HRP-SB-5	C-Y'	
HRP-SB-6	C-Y'	
HRP-SB-7	C-X'	
HRP-SB-8	C'-Z'	
HRP-SB-9	B-X	
HRP-SB-10	B-Y	
HRP-SB-11	B-Y	
HRP-SB-12	B'-Z	

Soil Boring ID	Location	Justification
HRP-SB-13	B'-Z	
HRP-SB-14	A-X	
HRP-SB-15	A-Y	
HRP-SB-16	A'-Z	
HRP-SB-17	A'-Z	

Note: Sample coordinates refer to the Site Grid identified on Figure 2.

During soil boring installation activities, continuous soil samples were collected at 0 to 6-inch intervals from the ground surface to a point of auger refusal. HRP personnel maintained a detailed log of each sample, and recorded all pertinent field information on the logs, including mineralogy and grain size utilizing the Udden-Wentworth Scale (1922). The collected soil samples were placed in laboratory-provided 4-ounce and 8-ounce clear tephlon sealed glass jars, labeled, and preserved on ice in a cooler. In addition, a small portion (1-2 oz.) was also placed in a polyethylene bag, allowed to attain ambient temperature, and then subjected to a headspace analysis via a PID. Each sample was also reviewed for physical evidence of contamination (i.e. odor, staining).

Each soil boring location that produced water was converted into temporary monitoring well location. Subsequently, seventeen (17) soil borings from the first round of advancement (HRP-SB-1 through HRP-SB-17) were converted to temporary monitoring wells for the collection of eleven (11) grab groundwater samples (HRP-SB-2W, HRP-SB-3W, HRP-SB-4W, HRP-SB-6W, HRP-SB-8W, HRP-SB-11W, HRP-SB-12W, HRP-SB-13W, HRP-SB-13W, HRP-SB-15W, and HRP-SB-16W). Groundwater sampling techniques are described in section 2.1.4.3.

In total, HRP collected seventeen (17) surficial soil samples from seventeen (17) sample locations. Based on the results of the field screening and observations, HRP selected one (1) to two (2) soil samples from the 6-inch intervals exhibiting the highest PID reading. When no elevated PID readings were observed, a soil sample from the upper and lower extent of the boring was selected. The selected samples were sent to Chemtech (all analytes except methyl mercury) and Test America (methyl mercury), NYSDOH ELAP approved laboratories, for analysis. In addition, three (3) matrix spike/matrix spike duplicate (MS/MSD) samples were also sent to the lab for analysis. The MS/MSD samples were an aliquot of a field sample, which is fortified with the analyte(s) of interest and analyzed to monitor measurement bias associated with the sample matrix.

The soil samples that were collected and analyzed are listed below.

Sample ID	Sample Depth	Surface or Subsurface	Sample Location	Analysis
HRP-SB-1	(0.0-0.5)	Surface	C'-Z'	VOCs (via USEPA 8260B), SVOCs (via USEPA 8270C), TAL metals (via 6010B + 7471A), organic and total mercury (via 1630 and 7471A), PCBs (via 8082), and pesticides (via 8081A)
HRP-SB-2	(0.0-0.5)	Surface	C'-Z'	
HRP-SB-2	(1.0-1.5)	Subsurface	C'-Z'	
HRP-SB-2	(3.0-3.5)	Subsurface	C'-Z'	
HRP-SB-3	(0.0-0.5)	Surface	C'-Z'	
HRP-SB-3	(2.0-2.5)	Subsurface	C'-Z'	
HRP-SB-4	(0.0-0.5)	Surface	C-Y'	
HRP-SB-4	(2.0-2.5)	Subsurface	C-Y'	
HRP-SB-5	(0.0-0.5)	Surface	C-Y'	
HRP-SB-5	(2.0-2.5)	Subsurface	C-Y'	
HRP-SB-6	(0.0-0.5)	Surface	C-Y'	
HRP-SB-6	(1.5-2.0)	Subsurface	C-Y'	
HRP-SB-7	(0.0-0.5)	Surface	C-X'	
HRP-SB-8	(0.0-0.5)	Surface	C'-Z'	
HRP-SB-8	(4.5-5.0)	Subsurface	C'-Z'	
HRP-SB-9	(0.0-0.5)	Surface	B-X	
HRP-SB-10	(0.0-0.5)	Surface	B-Y	
HRP-SB-10	(2.5-3.0)	Subsurface	B-Y	
HRP-SB-11	(0.0-0.5)	Surface	B-Y	
HRP-SB-11	(2.5-3.0)	Subsurface	B-Y	
HRP-SB-12	(0.0-0.5)	Surface	B'-Z	
HRP-SB-12	(2.5-3.0)	Subsurface	B'-Z	
HRP-SB-13	(0.0-0.5)	Surface	B'-Z	
HRP-SB-13	(2.0-2.5)	Subsurface	B'-Z	
HRP-SB-14	(0.0-0.5)	Surface	A-X	
HRP-SB-15	(0.0-0.5)	Surface	A-Y	
HRP-SB-15	(2.5-3.0)	Subsurface	A-Y	
HRP-SB-16	(0.0-0.5)	Surface	A'-Z	
HRP-SB-16	(2.5-3.0)	Subsurface	A'-Z	
HRP-SB-17	(0.0-0.5)	Surface	A'-Z	
HRP-SB-17	(3.0-3.5)	Subsurface	A'-Z	

Note: Sample coordinates refer to the Site Grid identified on Figure 2.

Soil samples not selected for analysis were placed in zip lock bags and retained in a refrigerator at the HRP office in the event that additional vertical delineation was required based on sample analytical results.

2.1.4.2 Subsurface Soil Boring Installation and Sampling

Based on the surface soil sampling results eight (8) subsurface soil boring (HRP-SB-18 though HRP-SB 25) were installed utilizing a Geoprobe 54 Series and 6610DT direct push rig at surface soil sample locations that exhibited elevated concentrations of contaminates. Soil boring locations are summarized below and depicted on Figure 2. Soil boring logs are provided in Appendix C.

Soil Boring ID	Location	Justification
HRP-SB-18	C-2	To assess the presence, concentration and identity of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), and pesticides across the Mill Neck Marina property
HRP-SB-19	B-2	
HRP-SB-20	D-2	
HRP-SB-21	B-3	
HRP-SB-22	B-4	
HRP-SB-23	A-3	
HRP-SB-24	A-4	
HRP-SB-25	C-5	

Note: Sample coordinates refer to the Site Grid identified on Figure 2.

During soil boring installation continuous soil samples were collected initially from 0 to 0.2 feet below grade and then at 1-foot intervals thereafter to a depth of 6 feet. HRP personnel maintained a detailed log of each sample, and recorded all pertinent field information on the logs, including mineralogy and grain size utilizing the Udden-Wentworth Scale (1922). The collected soil samples were placed in laboratory-provided 4-ounce and 8-ounce clear tephlon sealed glass jars, labeled, and preserved on ice in a cooler. In addition, a small portion (1-2 oz.) was also placed in a polyethylene bag, allowed to attain ambient temperature, and then subjected to a headspace analysis via a PID. Each sample was also reviewed for physical evidence of contamination (i.e. odor, staining).

In total, HRP collected eight surficial soil samples from eight (8) boring locations. A total of 3 soil samples from each boring location were submitted for analysis. In particular, the initial surfical sample (surface to 0.2 foot) and two subsurface samples that exhibited the highest PID reading. When no elevated PID readings were observed, a soil sample from the upper and lower extent of the boring was selected. The selected samples were submitted to Chemtech (all analytes except methyl mercury) and Test America (methyl mercury), NYSDOH ELAP approved laboratories, for analysis. In addition, three (3) matrix spike/matrix spike duplicate (MS/MSD) samples were also sent to the lab for analysis. The MS/MSD samples were an aliquot of a field sample, which is fortified with the analyte(s) of interest and analyzed to monitor measurement bias associated with the sample matrix.

The following soil samples were submitted for analysis:

Sample ID	Sample Depth	Surface or Subsurface	Sample Location	Analysis
HRP-SB-18	(0.0-0.2)	Surface	A'-X	To assess the presence, concentration and identity of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), and pesticides across the Mill Neck Marina property
HRP-SB-18	(3.0-4.0)	Subsurface	A'-X	
HRP-SB-18	(4.0-5.0)	Subsurface	A'-X	
HRP-SB-19	(0.0-0.2)	Surface	A-Y	
HRP-SB-19	(4.0-5.0)	Subsurface	A-Y	
HRP-SB-19	(5.0-6.0)	Subsurface	A-Y	
HRP-SB-20	(0.0-0.2)	Surface	A-Z	
HRP-SB-20	(3.0-4.0)	Subsurface	A-Z	
HRP-SB-20	(4.0-5.0)	Subsurface	A-Z	
HRP-SB-21	(0.0-0.2)	Surface	B'-Z	
HRP-SB-21	(4.0-5.0)	Subsurface	B'-Z	
HRP-SB-21	(5.0-6.0)	Subsurface	B'-Z	
HRP-SB-22	(0.0-0.2)	Surface	C-X'	
HRP-SB-22	(4.0-5.0)	Subsurface	C-X'	
HRP-SB-22	(5.0-6.0)	Subsurface	C-X'	
HRP-SB-23	(0.0-0.2)	Surface	B'-Z	
HRP-SB-23	(4.0-5.0)	Subsurface	B'-Z	
HRP-SB-23	(5.0-6.0)	Subsurface	B'-Z	
HRP-SB-24	(0.0-0.2)	Surface	C'-Z'	
HRP-SB-24	(4.0-5.0)	Subsurface	C'-Z'	
HRP-SB-24	(5.0-6.0)	Subsurface	C'-Z'	
HRP-SB-25	(0.0-0.2)	Surface	C-X'	
HRP-SB-25	(4.0-5.0)	Subsurface	C-X'	
HRP-SB-25	(5.0-6.0)	Subsurface	C-X'	

Note: Sample coordinates refer to the Site Grid identified on Figure 2.

2.1.4.3 Groundwater Monitoring Well Installation and Sampling

HRP and LAWES, Inc. (LAWES) remobilized to the site January 31, 2012 to install four (4) monitoring wells (HRP-MW-1, HRP-MW-2, HRP-MW-3, and HRP-MW-4). Monitoring well locations were determined by HRP and the NYSDEC, and were specified in the former Mill Neck Marina site-specific FAP. The final location of one well (HRP-MW-2) was slightly modified based on field conditions from the proposed location in the FAP (see Section 2.1.6). Soil boring/monitoring well locations are depicted on Figure 2 are summarized below. Monitoring well construction logs are provided in Appendix C. Subsequent to the advancement of soil borings, the boreholes were converted to permanent, stand up groundwater monitoring wells.

Soil Boring ID	Location	Justification
HRP-MW-1	C-X'	To assess the presence, concentration and identity of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), metals, polychlorinated biphenyls (PCBs), and pesticides across the former Mill Neck Marina property.
HRP-MW-2	B-Y	
HRP-MW-3	B'-Z	
HRP-MW-4	B'-Z	

Note: Sample coordinates refer to the Site Grid identified on Figure 2.

During soil boring installation activities, continuous soil samples were collected from the ground surface to 15 feet bgs at 2-foot intervals using a 2-inch diameter split-barrel sampler. The samples were collected by the attending HRP geologist and logged per the Udden-Wentworth Scale (1922) in monitoring well construction logs presented in Appendix C. Each sample was then reviewed for physical evidence of contamination (i.e. odor, staining).

In addition, a small portion (1-2 oz.) was also placed in a polyethylene bag, allowed to attain ambient temperature, and then subjected to a headspace analysis via a PID.

All non-disposable soil sampling equipment was decontaminated between samples using an Alconox wash followed by a clean water rinse. All investigation derived waste (IDW) was returned to the boring of origin at roughly the same interval it came from (i.e. deeper soil samples were returned to the boring before the shallow soil was).

Based on the results of the field screening and observations, no additional soil samples were collected to be analyzed due to no obvious contamination noted in the samples.

Methods of Installation – Monitoring Wells

Overburden monitoring wells were installed at the Site within unconsolidated material in the shallow aquifer in order to allow for the monitoring of groundwater elevation and acquisition of groundwater samples for laboratory testing. Four (4) 2-inch diameter, PVC monitoring wells were installed in the shallow saturated zone beneath the site. The overburden monitoring wells were installed using the procedures described below:

- Soil borings were advanced to the desired depth.
- The 2-inch diameter Schedule 40 PVC well screen (0.010-inch slot) and riser pipe were inserted and placed on the bottom of the borehole. The riser was capped to prevent well construction materials from entering the well.
- Washed silica was poured into the annular space between the well material and the borehole sidewall. The sand pack was filled only to the

top of the screen section due to the screen interval being so close to the ground surface. The sand was kept from plugging by using a weighted tape and slowly removed from the rods allowing for sand to properly settle.

- Above the sand, a seal (bentonite pellets) was formed in the borehole. The bentonite seal extended 1 foot above the top of the sand pack section.
- Clean water was periodically added to the borehole to hydrate the pellets. The pellets were then allowed to hydrate for at least 30 minutes.
- The well riser was cut to approximately 3 feet above grade and 4-inch steel stick-up pipes with locking tops were installed and grouted in place.
- A lockable gripper plug was inserted onto the top of each well casing and locked.

Monitoring Well Survey

HRP obtained the services of YEC Inc. (YEC) of Valley Cottage, New York to complete the survey portion of the RI. A Site survey was conducted to properly locate all sampling locations. The field survey included establishing project horizontal and vertical control and the collection of planimetric and topographic data. Horizontal coordinate values were based on the North American Datum (NAD) of 1983. Vertical coordinate (elevation) values were based on the North American Vertical Datum (NAVD) of 1988. YEC was on-site February 1, 2012 to collect geophysical and site data for the survey needed to be completed in accordance with the site specific field activities plan.

Groundwater Development Method

HRP mobilized to the site on February 1, 2012 to develop the four (4) recently installed groundwater monitoring wells. HRP pumped the wells utilizing a whale pump and Teflon lined polyethylene tubing. This method was chosen as the appropriate well development method based on water depth, well productivity, and sediment content of the water. Non-disposable equipment (i.e. water level indicator) was decontaminated prior to use in each well. Care was taken not to introduce contaminants to the equipment during installation. All development waters were emptied into a clean 5-gallon pail for approximate volume measurement and were then disposed of on the ground surface. The volume of water, depth to bottom of the well, and other visual observations were recorded in a field notebook and are presented in Appendix C.

Well development was discontinued when field parameters met the following conditions:

- Well water had achieved a turbidity value of less than 50 NTU; and
- Greater than six (6) well volumes were purged from each monitoring well.

Groundwater Sampling Method

Groundwater samples were collected from each monitoring well (HRP-MW-1, HRP-MW-2, HRP-MW-3, and HRP- MW-4), including a duplicate sample (Duplicate 2/7/2012) split with HRP-MW-2 on February 7, 2012 utilizing the following well purging and sampling procedures:

- All field instruments were calibrated to manufactures standards at the beginning of each work day.
- Monitoring well covers were unlocked and carefully removed to avoid having any foreign material enter the well.
- The water level was measured below the top of casing at a notched location using an electronic water level indicator. With knowledge of the total depth of the well, it was possible to calculate the volume of water in the well. The tape and probe of the water level indicator was cleaned with an Alconox and water soaked paper towel while reeling in.
- New Teflon lined polyethylene tubing was installed into the well and the end of the tubing was set to approximately the midpoint of the groundwater column inside the well.
- The Teflon lined polyethylene tubing was attached to a Geopump peristaltic pump. Another section of tubing was attached to the effluent side of the pump.
- The tubing was attached to a flow-through cell water quality monitor (YSI 600xl or similar).
- The pump was turned on and set to a relatively low discharge rate (less than 1-liter per minute) and drawdown rate was monitored using a water level indicator.
- The wells were purged while collecting water quality measurements (pH, specific conductivity (sc), temperature, dissolved oxygen, oxidation/reduction potential (ORP), and turbidity) and water level measurements were collected every 3 to 5-minutes until water quality parameter stabilization.
- After water quality conditions stabilized and well purging was completed, a groundwater sample was collected into the appropriate containers.
- The VOC sample containers were filled first with the remaining sample containers being filled in order of decreasing volatility. The discharge tubing was directed toward the inside wall of the sample container to minimize volatilization. VOC sample containers were filled so that no headspace (air bubbles) was present.
- Each sample bottle was labeled in the field and placed in a cooler with double bagged ice.

- All non-disposable equipment was decontaminated with alconox and water, and then rinsed with deionized water prior to and after each use.
- Monitoring well sampling data was recorded in a groundwater sampling data sheet (provided in Appendix C).

A summary of the collected groundwater samples is provided below.

Sample ID	Analyses
HRP-MW-1	VOCs (via USEPA 8260B), SVOCs (via USEPA 8270C), total TAL metals and mercury
HRP-MW-2	
HRP-MW-3	
HRP-MW-4	
VOC: Volatile Organic Compounds SVOC: Semi Volatile Organic Compounds TAL: Target Analyte List USEPA: United States Environmental Protection Agency	

Each sample was submitted to Chemtech Laboratory of Mountainside, New Jersey, an NYSDOH ELAP approved laboratory, for analysis.

2.1.5 Ecological Investigations

As part of the original scope of work HRP was tasked with completing a Fish and Wildlife Impact Analysis (FWIA) through Step I.

HRP submitted a request for public records through the Freedom of Information Law (FOIL) to the New York Natural Heritage Program for information pertaining to local flora and fauna. Specifically, HRP requested the following information within a 1.0-mile radius from the site: (1) a map and description of NYSDEC Significant Habitats, (2) habitats supporting endangered, threatened, or rare species, or species of special concern, (3) wild, scenic, or recreational rivers, and (4) significant coastal zone areas. In addition, HRP requested the following information within a 0.5-mile radius from the site: a map and description of major vegetative communities including wetlands, aquatic habitats, NYSDEC Significant Habitats, and areas of special concern.

The New York Heritage Program responded to the FOIL request in a letter, dated November 22, 2011, with an enclosed report of rare or state-listed animals and plants, significant natural communities, and other significant habitats. The letter stated that the search distance for Inactive Hazardous Waste Remedial Investigation / Feasibility Studies was a 1.0-mile radius. The report identified three rare species within a 2.0-mile radius of the subject site. The information contained in this report is considered sensitive, however, permission from NYSDEC's New York Natural Heritage Program to release the information to the public was given on December 14, 2012 during a phone conservation between the New York Natural Heritage Program Information Services representative and HRP. As the RI field work began, the NYSDEC directed HRP that the FWIA

would not be required. This is due to the fact that the Site and surrounding area is subject to Article 25 and 6 NYCRR Part 661 Tidal Wetlands land use regulations.

Also, in a May 14, 2012 letter (Appendix A), the Division of Fish and Wildlife & Marine Recourses (DFWMR) stated that the site is an old marina that contains fill and some soil contamination. The sediments surrounding the site in Oak Neck Creek demonstrate some contamination that may or may not be attributed to the site. The site is located in an area that contains important tidal march habitat. The DFWMR letter stated, "While remediation for contaminants to protect fish and wildlife is not necessary based on these data, the entire site, including sediments and upland soils, is subject to Article 25 and 6 NYCRR Part 661 Tidal wetlands land-use regulations. Therefore, any remedial or re-development action must meet the substantive requirements of these regulations or obtain a permit before action occurs."

2.1.6 Deviations from Workplan

HRP deviated from the RI Workplan only with approval from the NYSDEC. Deviations included changes to the location of one (1) monitoring well and few soil borings due to site access. The site is currently undeveloped and has a dense cover of phragmites and a grove of trees on the west side of the Site (grid C-2 and C-3), as well as small trees in center of the site (Grid B-4 and C-4). Of note, subsurface soil samples were not collected from HRP-SB-1, HRP-SB-7, and HRP-SB-9 due to low sample recovery during borehole advancement.

It is HRP's opinion that these deviations have not affected our ability to identify and determine the degree and extent of contamination at the subject property.

2.2 Technical Correspondence

No formal technical correspondence documenting field activities was identified between HRP and the NYSDEC. However, HRP and the NYSDEC project manager kept in constant coordination throughout the RI field work and other activities via joint site visits, email, telephone conversations, and meetings. Any changes to the work plan and items encountered in the field were relayed to the NYSDEC project manager immediately and if approval was needed for a change it was obtained prior to it being completed.

3.0 PHYSICAL CHARACTERISTICS OF THE SITE

The following section discusses the results of field activities to determine physical characteristics.

3.1 Results of Field Activities

3.1.1 Surface Features

The Site is approximately 1.4 acres in size and compromises a total of 9 individual tax lots, according to the Nassau County Assessor's office. The Site is bordered on the north and east by the Oak Neck Creek and on the south and west by residential properties. The Site is currently vacant with no current improvements, but was used as a marina from at least 1953 until its abandonment in 2001.

The marina was reportedly improved with boat storage and maintenance areas, a septic system, and gasoline storage and dispensing facilities. A review of New York State Tidal Wetlands Map Number 618-528 confirmed the locations of former features. A cesspool permit was issued for the Site in 1957. Tidal permits, as per Article 25, Environmental Conservation Law Implementing Regulations 6NYCRR PART 661, were issued to the occupants of the site from at least 1998 to approximately 2004.

3.1.2 Meteorology

Throughout HRP's investigations, the weather varied due to seasonal temperature changes and precipitation. HRP collected daily outdoor temperature, rain fall measurements (as applicable), and wind direction readings each day that drilling activities were ongoing with a Davis Weather Station. In addition, visual and thermal observations (i.e. ambient temperature readings) were also noted and recorded in field notebooks and in Appendix E.

3.1.3 Surface Water Hydrology

No open bodies of water (i.e. ponds, wetlands, streams, etc.), stormwater detention, or retention ponds were observed on the Site. However, the Site is bordered on two (2) sides by the Oak Neck Creek. On-site drainage and surface run-off flows to the north and east into the creek. Stormwater from off-site likely flows to the northeast and is conveyed to a series of stormwater drains located on the both sides of Hernan Avenue.

3.1.4 Geology

Surficial Geology

Surficial geological materials were encountered throughout the Site and surrounding area to varying depths below grade. Regolith (overburden) was variable across the site, however, generally consisted of organic materials and sand to gravel, with a brown to grey color. With increasing depth, organic material decreased in volume. Bedrock was not encountered during this investigation. Boring logs prepared during this investigation are presented in Appendix C.

According to the Surficial Geology Map of New York – Lower Hudson Sheet (1989), the material underlying the site is classified as till (t). Till is a glacially-derived diamictite, consisting of a poorly sorted mix of clay, silt, sand, pebbles, cobbles, and boulders. Till generally has a relatively impermeable matrix and its thickness is variable, ranging from 1 to 50-meters. Till is deposited by direct glacial action, at the edge or underneath, in this case, continental glaciers. HRP's observations are consistent with the mapped descriptions.

Cross section representative figures were completed as part of this RI. Figure 4 shows the overview for the cross section orientation for A-A', B-B' and C-C' (Figure 5), oriented in a general north-south direction, and X-X', Y-Y', and Z-Z' (Figure 6), oriented in a general east-west direction. Surficial soil maps were also completed as part of this RI. Four (4) surficial maps were completed in 1-foot intervals starting at grade (0-feet bgs) continuing to 3 feet bgs. The surficial soil maps are presented on Figures 7A, 7B, 7C, and 7D. The information presented in the maps is consistent with the previously mentioned soil descriptions.

Bedrock Geology

The bedrock beneath the Site is comprised of the Coastal Plain Deposits, which is comprised primarily of silty clay, glauconitic, sandy clay, sand and gravel. Bedrock was not encountered during this investigation.

3.1.5 Subsurface Soils

Surficial soils encountered at the Site and surrounding areas were similar, and generally consisted of brown to grey sand and gravel with organic material and little cobble and clay. According to the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), soils are the site and surrounding area are classified as urban land (Uf). Urban land soils are designated in areas where greater than seventy percent of the land surface is covered by impervious materials (i.e. buildings, roads, etc.).

During the installation of borings HRP-SB-3 (2.5 to 3' bgs) and HRP-SB-5 (2 to 2.5' bgs) slight staining, odor, and elevated PID readings were observed in soil samples between the referenced respective depths.

3.1.6 Hydrogeology

Groundwater in Monitoring Wells

Groundwater was observed in the overburden wells at depths ranging from 2.18 to 4.51-feet below grade prior to monitoring well sampling. Groundwater levels in the temporary wells were not surveyed for relative depth; therefore, depth to water was not measured in the temporary wells. The groundwater was observed with no odor, no sheen, and no free product.

HRP conducted a relative groundwater elevation survey between on-site wells on February 7, 2012. The groundwater levels recorded during the event are as follows.

Overburden Well ID	**Relative Groundwater Elevation Depth Below Grade (feet)**
	February 7, 2012
HRP-MW-1	4.51
HRP-MW-2	3.09
HRP-MW-3	3.36
HRP-MW-4	2.18

Based on the results of the groundwater elevation surveys, flow in the overburden wells was generally to the north, northeast. Groundwater flow diagrams are presented in Figure 15 for the overburden wells. Tidal data for Long Island Sound, collected at Oyster Bay Harbor, New York, is also provided in Appendix C.

3.1.7 Investigation Derived Waste

During the installation of the overburden wells, investigation derived waste (IDW) was not generated. Groundwater was allowed in infiltrate into the shallow aquifer of origin based on NYSDEC DER-10 requirements.

3.1.8 Demography and Land Use

The Hamlet of Locust Valley is located in the Town of Oyster Bay, Nassau County, New York, which is approximately 25 miles east of the City of New York. According to the United States census of 2000, there were 3,521 people, 1,279 households, and 915 families residing in the hamlet. The population density was 3,832 people per square mile (1,477.7 per square kilometer). In addition, there were 1,324 housing units at an average density of 1,441 per square mile (555.7/km^2).

The Site is currently vacant and the land use in the surrounding area is mostly residential. The Site is located along the north side of Hernan Avenue at the roads terminus.

3.1.9 Ecology

As part of the original scope of work HRP was tasked with completing a Fish and Wildlife Impact Analysis (FWIA) through Step I. As the RI field work began, the NYSDEC and the FWIA directed HRP that the FWIA would not be required. See Section 2.1.7 for more detail.

4.0 NATURE AND EXTENT OF CONTAMINATION

In order to identify the nature and extent of contamination and the impacts from the former Mill Neck Marina, HRP submitted surface, subsurface, sediment, and groundwater samples to NYSDOH ELAP certified laboratories for analysis. The various media samples were analyzed for one (1) or more of the following: volatile organic compounds (VOCs); semi-volatile organic compounds (SVOCs); polychlorinated biphenyls (PCBs); TCL Pesticides; Target Analyte List (TAL) Metals, and Mercury (both organic and inorganic) and the NYSDEC Full Target Compound List (TCL). The July 2012 soil samples were not analyzed for VOC's, SVOC's or TCL Pesticides based on the October 2011 soil analytical sample results.

Chemtech Laboratories of Mountainside, New Jersey provided the analytical laboratory services for the surface and subsurface soil, sediment and groundwater samples collected on-site. Test America of North Canton, Ohio (methyl mercury) and Buffalo, NY (mercury) provided the analytical laboratory services for surface and subsurface soil and sediment samples. Both labs are NYSDOH ELAP and NELAC certified labs. Environmental Data Services, Inc. (EDS) of Williamsburg, Virginia, provided data validation services for this project. Data qualifiers and their definitions, as defined by EDS are included in Appendix B. The presentation of results, within this text, does not include data qualifiers. However, the data qualifiers are shown on the Tables included with this report. Detected chemical compounds in the various media sampled as part of the RI and the analytical results are presented in Tables 1 through 15 and Figures 8 through 15. A general description of the various media sampled and analyzed is provided below.

- Surface and subsurface soil samples (HRP-SB-1 through HRP-SB-25) were collected from the Site;
- One round of grab groundwater samples were collected from temporary groundwater monitoring wells (HRP-SB-2W, HRP-SB-3W, HRP-SB-4W, HRP-SB-6W, HRP-SB-8W, HRP-SB-11W, HRP-SB-12W, HRP-SB-13W, HRP-SB-13W, HRP-SB-15W, and HRP-SB-16W);
- Sediment samples (HRP-SS-1 through HRP-SS-11) were collected from in the Oak Neck Creek adjacent to the Site; and
- One round of groundwater samples were collected from newly installed overburden groundwater monitoring wells (HRP-MW-1 through HRp-MW-4).

To determine if migration of contaminants at the Mill Neck Marina Site has occurred, this RI evaluated a broad range of parameters including VOCs, SVOCs, TAL Metals, mercury (both organic and inorganic), PCBs, and pesticides that had the potential for subsurface movement.

Compounds detected in the various media tested during this RI were compared to the following New York State guidance documents and standards:

- Groundwater: NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1); Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations dated October 1993; Revised June 1998; ERRATA Sheet dated January 1999; and Addendum dated April 2000 (NYSDEC Class GA).

- NYSDEC Regulation, 6 NYCRR Subpart 375-6, "Remedial Program Soil Cleanup Objectives" which applies to the development and implementation of the remedial programs for soil and other media set forth in subparts 375-2 through 375-4 [Inactive Hazardous Waste Disposal Site Remedial Program, Brownfield Cleanup Program, and Environmental Restoration Program] and includes the soil cleanup objective tables developed pursuant to ECL 27-1415(6).

- Sediment: NYSDEC Regulation, 6 NYCRR Part 661, "Tidal Wetlands Land Use Regulations" which designates classification of allowable permitted and non permitted uses in coastal fresh marshes, intertidal marshes, coastal shoals, bars and flats, high marshes or salt meadows, littoral zones, and adjacent areas.

- Sediment: NYSDEC Regulation, Article 25 Environmental Conservation Law Implementing Regulations – 6 NYCRR PART 661, Tidal Wetland Regulations, designated to prevent the despoliation and destruction of tidal wetlands by establishing and enforcing regulations that; preserve, protect, and enhance the present and potential values of tidal wetlands, protect the public health and welfare, and give due consideration to the reasonable economic and social development of the state.

- NYSDEC Division of Fish, Wildlife and Marine Resources, "Fish and Wildlife Impact Analysis for Inactive Hazardous Waste Sites (FWIA)", October 1994.

- NYSDEC Division of Fish, Wildlife and Marine Resources, "Technical Guidance for Screening Contaminated Sediments", November 1993, reprinted July 1994, March 1998, and January 1999.

The Mill Neck Marina Site is zoned R.17, a residential zoning designation. As a result, soil analytical results for this investigation were compared against Unrestricted, and Residential Soil Cleanup Objectives (SCOs).

4.1 Results of Remedial Investigation

This section presents the analytical results of the remedial investigation, both natural chemical components and contaminants of surface and subsurface soils, sediments, and groundwater:

4.1.1 Sources

Based on the results of the previous subsurface investigations on-site at Mill Neck Marina, several source areas were identified. These areas are the western and central portion of the Site where reportedly boat repairs occurred. Another possible historical source area is an underground storage tank (UST) and cesspool associated with the marina building that were possibly located north and west of the former on-site marina building. The location of this historical source area was based on previous documents for the cesspool permitting and the sampling nomenclature on past investigation figures and reports. However, the exact location of the former UST and cesspool is not know. The approximate location of the former marina building is depicted on Figure 3.

The principal contaminants of concern at the Site are metals, including copper, mercury, arsenic, zinc, and lead, as well as pesticides. Media impacted by site-related contamination includes surface and subsurface soil, and sediments. It is assumed that the presence of pesticides at the Site is due to historical on-site and off-site applications of pesticides to the wetlands area. Pesticides are not expected to be a contaminant of concern originating from past operations at the Site.

4.1.2 Soils

4.1.2.1 Subsurface Soils

Subsurface Sample Submittal

A total of thirty (30) subsurface soil samples were collected at twenty-five (25) locations between October 2011 and July 2012. Fourteen (14) subsurface soil samples were collected in October 2011 from soil borings HRP-SB-1 through HRP-SB-17 and sixteen (16) subsurface soil samples were collected in July 2012 from soil borings HRP-SB-18 through HRP-SB-25. Fourteen (14) samples were analyzed for TCL VOCs (via USEPA 8260B), TCL SVOCs (via USEPA 8270C). Thirty samples were analyzed for TAL Metals (via USEPA 6010). One sample, had a matrix spike/matrix spike duplicate (MS/MSD) from HRP-SB-8. Sample results are presented below.

Analytical Results - Subsurface Soils for VOCs

VOCs were detected in five of the fourteen subsurface samples analyzed. However, there were no VOC exceedances above the Unrestricted or Residential Part 375.6 SCOs. VOC results for subsurface soil samples are listed in Table 1.

Analytical Results - Subsurface Soils for SVOCs

SVOCs were detected in fourteen (14) subsurface soil samples analyzed. Of the fourteen samples analyzed there were five (5) exceedances in above the Unrestricted and Residential SCOs. SVOC results for subsurface soil samples are listed in Table 1 and on Figure 8.

Analytical Results - Subsurface Soils for TAL Metals

TAL metals were detected in all thirty (30) subsurface soil samples analyzed. In total, nineteen (19) samples exceeded unrestricted use SCOs and eight samples exceeded restricted use SCOs for one or more TAL metals. Of those eight samples, six of the samples were collected from a depth of 2-3 feet below grade at each location. Only two locations had an exceedance from 4-5 feet below grade and 5-6 feet below grade and both exceedances were for mercury.

Five metals (Arsenic, Copper, Lead, Zinc and Mercury) were detected above their respective unrestricted use SCO. In addition, four metals were detected above residential use SCOs (Arsenic, Copper, Lead, and Mercury). Based on the results of the sampling, the metals which exceeded Site SCOs were throughout the site. Metal results for subsurface soil samples collected are listed in Table 2 and on Figure 9 and Figure 20.

Analytical Results - Subsurface Soils for PCBs and Pesticides

Pesticides were detected in six of the fourteen (14) subsurface soil samples and PCBs were detected in three (3) of the fourteen (14) subsurface soil samples analyzed. Of the six (6) pesticides detected, there were three (3) exceedances above Unrestricted SCOs, however, there were no exceedances above Residential NYSDEC Part 375.6 SCOs. Of the three (3) PCBs detected, there were no there were no exceedances above Unrestricted and Residential NYSDEC Part 375.6 SCOs. PCB and Pesticide results for subsurface soil samples collected are listed in Table 3 and pesticides are presented on Figure 10.

DUSR – subsurface soils

The analytical results were reviewed by Environmental Data Services, Inc. (EDS) for overall usability issues. The EDS Report (Appendix B) found several rejections of data in various samples due to low initial and continuing calibration RRF values. These rejections included the rejection of acetone in thirteen (13) soil samples.

Summary – Subsurface soils

In summary, five (5) SVOCs and three (3) pesticides were detected among the fourteen (14) samples analyzed and six (6) metals were detected in the thirty (30) samples analyzed that exceeded Unrestricted or Residential NYSDEC Part

375.6 SCOs. No exceedances of NYSDEC SCOs were observed among the VOCs or PCBs detected.

Based on the subsurface soil analytical results, the four metals in the subsurface soils at concentrations exceeding NYSDEC SCOs for residential (protection of public health) are Copper, Lead, Mercury, and Arsenic. The highest concentrations of Mercury and Copper are in the central portion of the site (near HRP-SB-10 and HRP-SB-11) and emanating to the South. Figures 19 and 20 depict the concentrations of Copper and Mercury in the subsurface soils. The areas that have the highest concentrations of Copper and Mercury are in the areas previously reported as being used for boat repairs, seen on Figures .

In addition, the subsurface analytical results for Lead also have concentrations exceeding NYSDEC SCOs for unrestricted and residential (protection of public health). The highest concentration of Lead is located in the southwestern portion of the site (near HRP-SB-16). Lead exceeded the unrestricted NYSDEC values on site in the central and southwestern areas of the site. Figure 19 depicts the concentrations of Lead in the subsurface soils. These areas that have Lead concentrations over NYSDEC standards are in the areas previously reported as being used for boat repairs.

4.1.2.2 Surface Soils

Surface Sample Submittal

Twenty-five (25) surface soil samples were collected at twenty-five (25) locations from depths of grade - 0 to 0.5-inches bgs (HRP-SB-1 through HRP-SB-17) or grade to 0.2 inches (HRP-SB-19 through HRP-SB-25) between October 2011 and July 2012 during the investigation. Seventeen (17) surface soil samples (HRP-SB-1 through HRP-SB-17) were collected in October 2011 and eight (8) surface soil samples (HRP-SB-19 through HRP-SB-25) were collected in July 2012. Seventeen (17) samples were analyzed for TCL VOCs (via USEPA 8260B) and TCL SVOCs (via USEPA 8270C), mercury (organic and inorganic). All twenty-five (25) samples analyzed for TAL Metals (via USEPA 6010). Two (2) samples, HRP-SB-16 (0-0.5”) (Duplicate 1) and HRP-SB-17 (0-0.5”) (Duplicate 2) had a duplicate samples submitted. Sample results are presented below.

Analytical Results - Surface Soils for VOCs

VOCs were detected in four (4) of the seventeen (17) surface soil samples analyzed. Of the four (4) VOCs detected, there was one (1) exceedance of acetone (HRP-SB-10 at 200 UG/KG) in one surface sample above NYSDEC Part 375 Unrestricted SCOs, however, there were no exceedances above Residential NYSDEC Part 375.6 SCOs. It should be noted that acetone is generally considered a lab artifact, and its detection could be attributed as such. VOC results for surface soil samples are listed in Table 4 and on Table 7.

Analytical Results - Surface Soils for SVOCs

SVOCs were detected in twelve (12) of the seventeen (17) surface soil samples analyzed. However, there were no SVOC exceedances above the Unrestricted or Residential Part 375.6 SCOs. SVOC results for surface soil samples are listed in Table 4.

Analytical Results - Surface Soils for TAL Metals

TAL metals were detected in all of the twenty-five (25) surface soil samples analyzed (taken at a depth of 0-0.5 inches and 0-2 inches). Among those twenty-five samples, twenty-one (21) metals were detected. The analytical sampling results determined that seven TAL metals (Arsenic, Cadmium, Copper, Lead, Nickel, Zinc, and Mercury) were detected above their respective unrestricted use SCOs, while five TAL metals (Arsenic, Cadmium, Copper, Lead, and Mercury) were detected above residential use SCOs. There were twenty sample locations that had an exceedance of Unrestricted use SCO, therefore the surface soil throughout the site has been impacted with metals. TAL metal results for surface soil samples collected are listed in Table 5 and on Figure 11.

In addition, all surface soil samples analyzed for organic mercury (methyl mercury) had detections of methyl mercury ranging from 0.13-3.6 ug/kg. There is currently not a Part 375-6 SCO established for methyl mercury.

Analytical Results - Surface Soils for Pesticides and PCBs

Pesticides were detected in five of the nine (9) surface soil samples and PCBs were detected in three (3) of the nine (9) surface soil samples analyzed. Of the five (5) pesticides detected, there were three (3) exceedances above Unrestricted SCOs, however, there were no exceedances above Residential NYSDEC Part 375.6 SCOs. PCB and pesticide results for surface soil samples collected are listed in Table 6 and pesticides are presented on Figure 12.

DUSR – Surface soils

The analytical results were reviewed by Environmental Data Services, Inc., (EDS) for overall usability issues. The EDS Report (Appendix B) found no rejections of data.

Summary – Surface Soils

In summary, one (1) VOCs, eight (8) TAL metals, and three (3) pesticides were detected among the total of twenty-five (25) samples analyzed that exceeded Unrestricted or Residential NYSDEC Part 375.6 SCOs. No exceedances of NYSDEC Part 375.6 SCOs were observed among the SVOCs or PCBs detected.

Based on the surface soil analytical results, the four metals, Copper, Lead, Mercury, and Arsenic are present at concentrations exceeding NYSDEC SCOs for residential (protection of public health). The highest concentrations of Copper are on the eastern-central portion of the site concentrated around HRP-SB-3 (Grid

location B4, see figure 11). The levels of Copper in the surface soils at this location are 14 times higher than the unrestricted RSOs. Figure 21 depicts the concentrations of Copper in the surface soils. This area was reported where the former cesspool was located.

The highest concentrations of Lead are on the eastern-central portion of the site concentrated around HRP-SB-2 (grid location A4, see figure 11). There was also one sample location north of HRP-SB-2 at HRP-SB-8, adjacent to the water, which had a high concentration of lead. The levels of Lead in the surface soils at this location are approximately 14 times higher than the unrestricted RSOs. Figure 22 depicts the concentrations of Lead in the surface soils. This area was reported where the former marina building was located.

In addition, the highest concentrations of Mercury were located adjacent to Hernan Ave at the southeastern edge of the site at HRP-SB-1, and emanating north. The levels of Mercury in the surface soils at this location are approximately 18 times higher than the unrestricted RSOs. Figure 23 depicts the concentrations of Mercury in the surface soils. This area was reported where the former marina building was located.

4.1.3 Surface Water and Sediments

4.1.3.1 Surface Water

No surface water or water detention/retention ponds were observed on the site. However, abutting the property to the East of the Site is the Oak Neck Creek which discharges into the Mill Neck Creek and then Long Island Sound. No surface water investigations were included as part of the scope of work for this RI.

4.1.3.2 Sediments

Sediment Sample Submittal

Thirty-two sediment soil samples were collected at eleven locations during the RI in November 7 and 8, 2011. All of the samples were analyzed for TCL VOCs (via USEPA 8260B) TCL SVOCs (via USEPA 8270C), TAL Metals (via USEPA 6010) including mercury (organic and inorganic), pesticides and PCBs. Due to sample recovery volume limitations, duplicate samples or MS/MSDs were not submitted. Sample results are presented below.

Analytical Results – Sediment Samples for VOCs

A total of five VOCs were detected among the analyzed sediment samples. VOCs were detected at twenty six of the thirty-two (32) sediment samples analyzed. There were no exceedances above Division of Fish, Wildlife, and Marine Resources (DFWMR) sediment criteria values found in the Technical Guidance for Screening Contaminated Sediments, Appendix 4, Table 4 for the

VOC compounds detected. VOC results for sediment samples are listed in Table 7.

Analytical Results – Sediment Samples for SVOCs

SVOCs were detected at eighteen of the thirty-two sediment samples analyzed. There were five exceedances above the DFWMR sediment criteria values in the Technical Guidance for Screening Contaminated Sediments for the Effect Range Low (ERL) and presented in Appendix 4, Table 4. One SVOC exceeded the DFWMR Effect Range Median (ERM) for sediment criteria. SVOC results for subsurface soil samples are listed in Table 8 and on Figure 13. It should be noted that sediment sample SS-1 is located next to an active dock from an adjacent property. Therefore the SVOC contamination at this location may be attributed to the active use of the dock and boating activities.

Analytical Results – Sediment Samples for Metals

Metals were detected in all of the thirty-two sediment samples analyzed. There were nine exceedances above DFWMR sediment criteria for metal found in the Technical Guidance for Screening Contaminated Sediments for the Effect Range Low (ERL) Effect. Also, four of the nine metals also exceeded the sediment criteria for metals Range Median (ERM) in Appendix 4, Table 4. Metal results for subsurface soil samples collected are listed in Table 9 and on Figure 14. In addition, all four sediment samples analyzed for organic mercury (methyl mercury) had detections of methyl mercury ranging from 0.28-6.9 mg/kg.

Analytical Results – Sediment Samples for Pesticides and PCBs

Pesticides were detected in four of the thirty-two sediment samples analyzed and PCBs were detected in four of the thirty-two sediment samples analyzed. Of the four pesticides and four PCBs detected, there were two exceedances above the DFWMR sediment criteria for PCBs for the Effect Range Low (ERL), as listed in Appendix 4, Table 4. Pesticide results for the sediment samples collected are listed in Table 10 and PCBs are listed on Table 11.

DUSR – Sediment Samples

The analytical results were reviewed by Environmental Data Services, Inc. (EDS) for overall usability issues. The EDS Report (Appendix B) found a rejection of data in the VOC sample from HRP-SS-8 due to severely low internal standard recoveries.

Summary – Sediment Samples

HRP collected sediment at eleven (11) designated locations in accordance with DER-10. The samples will be analyzed for VOCs, SVOCs, TAL Metals, PCB/Pesticides, Mercury [total and organic (methyl mercury)] and Total Organic Carbon (TOC). The sediment samples were collected from the periphery and center of the active channel of Oak Neck Creek, at the upstream end, midstream part, and downstream end of the Site.

Several metals exceeded the sediment criteria set by the NYSDEC DFWMR. In addition, two PCB detections and one SVOC detection was above the DFWMR sediment criteria for each respective chemical compound. Also, all four sediment samples analyzed for organic mercury (methyl mercury) had detections of methyl mercury ranging from 0.28-6.9 mg/kg.

The NYSDEC Division of Fish and Wildlife & Marine Recourses (DFWMR) stated in a memorandum dated May 14, 2012 that the site is an old marina that contains fill and some soil contamination. The sediments surrounding the site in Oak Neck Creek demonstrate some contamination that may or may not be attributed to the site. The site is located in an area that contains important tidal march habitat.

4.1.4 Groundwater Sampling

Groundwater – Sample Submittal

Eleven grab groundwater samples from temporary groundwater wells (HRP-SB-2, HRP-SB-3, HRP-SB-4, HRP-SB-6, HRP-SB-8, HRP-SB-11, HRP-SB-12, HRP-SB-13, HRP-SB-14, HRP-SB-15, and HRP-SB-16) were collected on October 20, 2011 and four groundwater samples from the four installed monitoring wells (HRP-MW-1, HRP-MW-2, HRP-MW-3, HRP-MW-4) were collected on February 7, 2012. All the groundwater samples were analyzed for TCL VOCs (via USEPA 8260B). The four samples from the monitoring wells were additionally analyzed for TCL SVOCs (via USEPA 8270C) and TAL Metals (via USEPA 6010). A duplicate sample (FD 2/7/2012) from HRP-MW-2 and a MS/MSD from HRP-MW-4 were submitted with the groundwater samples. The results for the analysis of the groundwater samples collected from monitoring wells are summarized below.

Additionally, a groundwater contour map (Figure 15) from the groundwater levels obtained on February 7, 2012 from the monitoring wells. Groundwater flow is to the north by northeast.

Analytical Results – Grab GW Samples (October 2011) for VOCs
VOCs were detected in six (6) of the eleven groundwater samples analyzed. Of the four VOCs detected, there were no exceedances above their respective NYSDEC Division of Water Technical and Operational Guidance Series 1.1.1 (TOGS) Ambient Water Quality Standards and Guidance Value for GA groundwater classification. All other VOCs detected did not exceed their respective TOGS guidance values. The VOC results for the groundwater samples are listed in Table 12.

Analytical Results – Monitoring Well samples (February 2012) for VOCs
VOCs were detected in two of the four groundwater samples analyzed. Of the two VOCs detected, there were no exceedances of their respective NYSDEC TOGS 1.1.1 groundwater GA classification. The VOC results for the groundwater samples are listed in Table 13.

Analytical Results – Monitoring Well Samples (February 2012) for SVOCs
SVOCs were detected in the groundwater samples analyzed. Four SVOCs were detected, however there were no exceedances that exceeded TOGS 1.1.1 GA groundwater values. The SVOC results for the groundwater samples are listed in Table 14 and on Figure 16.

Analytical Results – Monitoring Well Samples (February 2012) for Metals
Metals were detected in four of the four groundwater samples analyzed. There were six metals that exceeded their respective TOGS 1.1.1 GA guidance values, however, none of the metals that exceeded the TOGS values were contaminants of concern. The metal results for the groundwater samples are listed in Table 15 and on Figure 17.

DUSR
Environmental Data Services, Inc., (EDS), reviewed the analytical results for overall usability issues. The EDS Report (Appendix B) found rejections of acetone and methylene chloride grab groundwater sample data. As such, the acetone and methylene chloride sample results were not used.

Summary
In summary, among the fifteen groundwater samples tested, six metals (Aluminum, Iron, Magnesium, Manganese, Sodium, and Thallium), two VOCs, and four SVOCs were detected among the four groundwater monitoring wells on-site. The metals that exceeded their respective TOGS 1.1.1 GA guidance values were not contaminants of concern for the Site. There were no other exceedances of VOCs or SVOCs above the TOGS 1.1.1 GA values in the analyzed groundwater samples. The groundwater has not been significantly impacted by past operations on-site.

4.1.5 Air

A Community Air Monitoring Plan (CAMP) was included in the scope of work as presented and approved in the RI Work Plan. Real-time monitoring was conducted for volatile organic compounds (VOCs), mercury, and particulates (i.e., dust) at the downwind perimeter of each designated work area when ground intrusive activities were being conducted, including soil borings and monitoring wells installation. Its intent was to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

VOCs were monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis during intrusive work or as otherwise specified. Upwind concentrations were measured at the start of each

workday and periodically thereafter to establish background conditions. The monitoring work was performed using a Mini Rae 2000 photo ionization detector (PID) equipped with a 10.2 eV bulb. The PID was routinely calibrated for the contaminant(s) of concern or for an appropriate surrogate. The PID was placed in a weather proof box that sat on a tripod approximately 4 feet off the ground. The downwind PID readings did not exceed 5 ppm during the field investigations or IRM activities.

Particulate concentrations were monitored continuously at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations during intrusive work. The particulate monitoring was performed using a Quest Dust Trak 8520, a real-time monitor capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The Dust Trak was routinely zero (0) checked and was placed in a weather proof box that sat on a tripod approximately 4 feet off the ground. The equipment was equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration was visually assessed during all work activities. The particulate readings were below 100 mcg/m^3 during all field investigations and IRM activities. All tables for VOCs and particulates concentration readings can be found in Appendix E (on attached CD).

5.0 CONTAMINANT FATE AND TRANSPORT

This section discusses the mechanisms that may affect migration of contaminants at the Site, and the chemical behavioral characteristics of the compounds detected, including persistence of these chemical substances. This information is compared with the site specific data and observations to assist in assessing the extent of migration that has occurred.

5.1 Potential Routes of Exposure and Transport

5.1.1 Soil Vapor

Soil Vapor was not evaluated as part of this RI.

5.1.2 Groundwater

Groundwater Routes of Exposure

Groundwater samples were collected and analyzed from the four permanent monitoring wells on-site and eleven grab groundwater samples collected from temporary groundwater wells. Two VOC and two SVOC were detected in GW at below NYSDEC TOGS 1.1.1 groundwater GA values. No contaminants of concern (lead, arsenic, cadmium, mercury or copper) were among the several metals which were detected above groundwater standards. The site and surrounding area utilize municipal water, therefore there is no risk to exposure by ingestion of the groundwater.

Groundwater Routes of Transport

Due to the history of the site and the fact fill was placed at the Site at some point in the past, the metals detected may be remnants of the past operations or fill placed on or near the site. Based on the analytical results from the groundwater sampling of the four monitoring wells, there are no significant sources of contamination within the groundwater from the subject site and therefore no potential for the groundwater contamination to migrate off-site.

5.1.3 Soil

Surface Soils

TAL metals were detected in all 25 surface soil samples. Metals contamination is widespread, with 19 samples exceeding unrestricted use SCOs, and 8 exceeding residential use SCOs for metals.

Pesticides were detected in three surface soil samples, out of the twenty-five surface soil samples, which exceeded Unrestricted use NYSDEC Part 375.6

SCOs. The sample locations that had these exceedances were located in the southeast corner of the Site near the former marina building.

One VOC, Acetone, was detected in one surface soil sample analyzed. Based on the DUSR, the acetone result was rejected and was determined to be a lab artifact.

The surface soil samples that were analyzed did not have any exceedances of Unrestricted use Part 375.6 SCOs for SVOCs and PCBs detected.

Subsurface Soils

TAL metals were detected in all thirty (30) subsurface soil samples. Of the 30 subsurface soil samples analyzed for metals, 19 samples exceeded unrestricted use SCOs, and 8 exceeded residential use Part 375-6 SCOs. Metals contamination is widespread.

Pesticides were detected in five subsurface soil samples, out of the thirty subsurface soil samples collected, which exceeded Unrestricted use NYSDEC Part 375.6 SCOs. The sample locations that had these exceedances were located in the central portion of the Site, with one location on the central southern property border of the Site.

SVOCs were detected in three subsurface soil samples analyzed which exceeded Unrestricted use NYSDEC Part 375.6 SCOs. The sample locations that had these exceedances were located in the central portion of the Site, with one location on the central southern property border of the Site.

The surface soil samples that were analyzed did not have any exceedances of Unrestricted use Part 375.6 SCOs for VOCs and PCBs detected.

Soil Routes of Exposure

Exposure associated with encountering contaminated soil is possible through dermal contact. The risk of exposure to on-site soil contamination is moderate. There are elevated levels of metals, SVOCs, and pesticides in on-site surface (0-6 inches below the ground surface) and subsurface (0-5 foot below the ground surface) soil. The extent of the sub surface soil contamination appears to be limited to the central portion of the site. The surface soil contamination is primarily limited to the central and western portion of the site in areas associated with the former buildings, boat storage, and boat maintenance areas. Access to the site should be restricted to prevent exposure to contaminated soil by trespassers on the site.

The site is accessible from the road and it does have several worn paths through the site that pedestrian traffic has created for access to Oak Neck Creek. The site has been temporarily secured with a snow fence and signs to discourage people

to access the site. However the worn paths on-site will allow people to gain access to the site and possibly have dermal contact with the soil. Access to the site should be restricted to prevent exposure to contaminated soil by trespassers on-site.

The other exposure risk is associated with any future development of the site that involves dermal contact and possible ingestion through soil disturbance; such as excavation, grading that would require heavy equipment, and clearing and/or grubbing of the site.

Subsurface Soil Routes of Transport

Even though numerous chemical compounds were detected above NYSDEC SCOs, the groundwater at the site was not impacted with the contaminants detected in the subsurface soil samples. Therefore, there is little to no potential for the subsurface soil contaminants to migrate off-site.

Surface Soil Routes of Transport

The majority of the site is marsh land and not covered with asphalt or structures. Due to the vegetative cover throughout the site the majority of the stormwater should permeate the soil. For a large storm event, the stormwater will flow via overland sheet flow to the east toward Oak Neck Creek. There is little potential for the surface soil contamination to migrate off-site.

5.1.4 Sediment

Sediment Routes of Exposure

Thirty surface sediment samples were submitted for analysis. Nine metals exceeded the sediment criteria set by the NYSDEC DFWMR. In addition, two PCB detections and one SVOC detection was above the DFWMR sediment criteria for each respective chemical compound.

The majority of the investigation area where the sediment samples were collected is under the Oak Neck Creek and not easily accessible. The sediment is partially exposed during periods of low tide, however the areas are extremely soft and foot traffic to the areas of sediment is not expected.

Sediment Routes of Transport

The sediment is partially exposed during periods of low tide, the sediment is being redistributed slightly across the bottom by erosion and water flow. This movement can expose sediment contamination, making it available to aquatic biota and the water column. The flow of the Oak Neck Creek was not studied as part of this SC. There is a low potential for the sediment contaminates to migrate.

5.2 Contaminant Persistence

In general, chemical compounds within a given chemical class will behave similarly. However, differences in chemical reactions of compounds may be observed within a chemical class due to environmental influences. Their behavior is dependent on their physical and chemical properties as well as environmental conditions, such as the presence of bacteria, pH variations, and oxidation potential (Eh) conditions. Certain metals detected above in applicable TOGS values in the groundwater samples, are expected to be persistent on Site because of their chemical nature or natural occurrence in the area.

Classes of chemical compounds were detected in various environmental media at the Site. The detected classes were at relatively low concentrations. Also, several VOCs, acetone and methylene chloride, and several SVOC, benzo(a)anthracene, benzon(A)pyrene, benzon(b)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene were detected above TOGS 1.1.1 groundwater (GA) values. At least eleven metals: total aluminum, arsenic, copper, lead, magnesium, manganese, nickel, total sodium, thallium, zinc and mercury exceeded NYSDEC TOGS 1.1.1 groundwater (GA) values. Also, three pesticides: 4,4'-DDD, 4,4'-DDE, and 4,4'-DDT and Total PCBs all exceeded established NYSDEC TOGS values in the groundwater.

5.3 Contaminant Migration

5.3.1 Factors Affecting Contaminant Migration

Factors affecting contaminant migration for the media of importance (i.e. subsurface soil, surface soil, and groundwater) includes future development of the Site or alteration of the off-site properties.

5.3.2 Modeling Methods and Results

Modeling methods were not included in the Scope of this RI.

6.0 EXPOSURE ASSESSMENT

A qualitative baseline exposure assessment was completed based on the information presented in Sections 1.0 through 5.0. Generally, the human health evaluation involves an exposure assessment, an evaluation of Site occurrence, hazard identification and comparison to New York State risk-based criteria.

6.1 Qualitative Public Exposure Assessment

This section discusses the exposure assessment, an evaluation of Site occurrence and a comparison to state criteria related to potential impacts to human health. It should be noted that several conservative assumptions were used in completing this assessment; and, thus, the risks identified are expected to be "worse case scenarios".

6.1.1 Exposure Assessment

This exposure assessment discusses potential migration routes by which chemicals in the environment may be able to reach human receptors. This discussion is based on current and hypothetical future conditions at the Site and investigation area.

The Site is located at the north eastern terminus Hernan Avenue, in Locust Valley, Nassau County, New York (see Figure 1). The Mill Neck Marina Site is currently unimproved. The Site is approximately 1.4 acres, and consists of the vegetated land. The former boat marina facility consisted of two (2) buildings, formerly located at grid 3A and 5A (Figure 3 – Historical Samples). Boat storage areas were located along the south edge of the property and it is inferred that boat maintenance occurred in the middle of the Site.

The hypothetical future conditions for the Site will be similar to historic conditions/use, recreational uses (i.e. water front park), or the Site has the potential to be redeveloped with residential housing.

A complete exposure pathway must exist for an exposure to occur to the population from chemicals at the Site. A complete exposure pathway includes the following:

1. a source and mechanism of chemical release;
2. a transport medium;
3. a point of potential human contact with the contaminated medium;
4. an exposure route at the contact point; and
5. receptor population.

The Sections below focus primarily on identifying potential points of human contact with contaminates in various media and exposure pathways identified for the Site and investigation area.

6.1.1.1 Overburden Groundwater

Exposure to overburden groundwater, if used as a drinking water supply, includes ingestion, dermal contact and inhalation of vapors.

At the time of investigation, the Site vicinity utilizes municipal water for drinking water only. Therefore, a possible potential threat would occur during future renovations, demolitions, redevelopment, or utility repair within the Site, which may require excavation and dewatering, and presenting a situation where workers could be exposed to contaminants in groundwater. A second possible exposure could occur while visitors or trespassers were to come on-site during future construction activities and are exposed to contaminants in groundwater. The likelihood for these exposure scenarios to occur is considered low.

6.1.1.2 Surface Water

The Oak Neck Creek abuts the northern and eastern property line of the Site. There is no surface water on-site and therefore no direct exposure pathway. The surface water in Oak Neck Creek was not sampled as part of the remedial investigation. The surface soils (0-6 inches) on the eastern half of the site are contaminated with metals (copper, lead, and mercury) and there is a possibility during a storm event that these surface soils could be washed into the Oak Neck Creek. Therefore, there is a low potential exposure pathway via dermal contact to possible surface water contamination from soils mixed in the surface water after a storm event via emergency service operations, recreational activities, or site work.

6.1.1.3 Subsurface Soils

Potential routes of exposure to contaminants in subsurface soils include dermal contact, ingestion and inhalation of soil particulates. Exposure through dermal contact and ingestion is considered high due to the undeveloped nature of the site with worn footpath throughout. In addition, based on previous activities detected on-site, the western portion of the site abutting the water is an area frequented by people. Exposure to contaminants through inhalation is also considered moderate since no intrusive activities occur on-site that disturb soils and generates inhalable dust; however the possibility for subsurface soil contact is moderate. At present, the exposure to subsurface soils is moderate since the Site is un-developed.

During future construction activities, specifically the disturbance of soils, the potential for exposures to contaminants in soils would increase for on-site workers, utility workers, trespassers and visitors. During development periods, construction fencing would be installed for safety reasons. This scenario would limit exposure to soils and exposure to contaminants would be considered minimal to low since access to the Site would be limited by a snow fence and signage.

6.1.1.4 Surface Soils

Potential routes of exposure to contaminants in surface soils include dermal contact, ingestion and inhalation of soil particulates. Exposure through dermal contact and ingestion is considered high due to the limited of soil coverage leading to contact with surface soils across the entire Site area. Exposure through inhalation is considered low since there is no known intrusive activities to on-site that disturbs soils and generates inhalable dust. The exposure to surface soils is low since the Site is unused and access to the Site is limited by a snow fence and signage. However, if future construction activities, specifically disturbance of soils, the potential for exposures to contaminants in soils would increase for on-site workers, utility workers, trespassers, neighbors and visitors. During development periods, construction fencing would be installed for safety reasons. This scenario would keep trespassers out, and exposure to soils would be minimal to low.

Access to the Site is limited by the construction of a snow fence that covers the un-vegetative entrances to the Site, warning signs instructing people to stay off of the Site, and letters that were sent to the surrounding home owners to limit access to the Site.

6.1.1.5 Sediment Soils

Potential routes of exposure to contaminants in sediments within areas adjacent to the Oak Neck Creek include dermal contact, ingestion and inhalation of soil particulates. Exposure through dermal contact and ingestion is moderate due to the tidal nature of the Oak Neck Creek adjacent to the Site area. Exposure through inhalation is also considered low to moderate since there is a risk of intrusive activities to occur that disturbs sediment and generates inhalable dust. At present, the exposure to contaminants in sediments is moderate since there are footpaths throughout the Site, and sediments are covered with water part of the time (depending on the tide).

During future construction activities, specifically disturbance of soils, the potential for exposures to contaminants in sediments would increase for on-site workers, utility workers, trespassers, neighbors and visitors. During development periods, construction fencing would be installed for safety reasons. This scenario would limit exposure, and contact with sediments would be considered low.

6.1.2 Hazard Identification and Comparison to State Risk-Based Criteria

The potential Site hazards due to human exposures were reviewed based on chemical-specific health exposure based criteria. State values believed potentially applicable to the medium or pathway were examined (see Tables 1 through 15 and Figures 8 through 18).

6.1.2.1 Subsurface and Surface Soils

The State risk-based criteria used for the Site subsurface and surface soils include the following:

- 6 NYCRR Part 375-6: Remedial Program Soil Cleanup Objectives, Technical Support Document (TSD). "Technical Support Document" is also known as the "New York State Brownfield Cleanup Program Development of Soil Cleanup Objectives Technical Support Document" dated September 2006. This document presents and discusses the assumptions, exposure scenarios, receptors, rationale, and calculations utilized by the Department and the New York State Department of Health to develop the soil cleanup objectives in ECL 27-1415(6).

- NYSDEC, Division of Environmental Remediation, DER-10, “Technical guidance for site investigation and remediation”, dated May 2010.

All subsurface and surface soil analytical results for this investigation were compared to Unrestricted and Residential Part 375.6 Soil Cleanup Objectives (SCOs). A comparison of soil risk-based criteria and investigation occurrence information compiled from analytical testing results of subsurface and surface soil samples collected from the investigation is included on Tables 1 through 15.

The former marina Site is zoned R1 – single family residential. The definitions of the zoned area according to City of Locust Valley municipal code is as follows:

- For all R1 Residential, to encourage the development of single housing units on lots 7,000 square feet or larger.

If the Site were to be redeveloped in the future, it would have to be done in accordance with the site management plan and use of this land in accordance with the NYSDEC definition of “restricted residential use” as the Site is currently zoned residential, and the contamination exists on-site above NYSDEC SCOs for residential values. By definition restricted residential use is a land category which shall only be considered when there is common ownership or a single owner/managing entity of the Site. This use also has restrictions which prohibit any vegetable gardens on-site and single family housing. It does include active recreational uses, which are public uses with a reasonable potential for soil contact.

6.1.2.2 Groundwater

Human health risks associated with exposure to contaminants in groundwater were examined by considering both:

- Use of the overburden groundwater as a drinking water source; and
- Potential exposure to overburden groundwater at a point of contact, by construction or utility workers.

The State criteria used for human health risks associated with use of overburden groundwater at the Site as drinking water source includes the following.

- NYSDEC Division of Water Technical and Operational Guidance Series (TOGS 1.1.1)

Two VOCs were detected in the eleven grab groundwater samples at levels that slightly exceed the TOGS value for these parameters. In addition, one SVOC and six metals exceeded their respective TOGS values for groundwater in the monitoring wells. There were no other exceedances above the TOGS values in submitted groundwater samples.

The potential for exposure due to use of overburden groundwater as a drinking water source or for cooling, dewatering, or irrigation is considered minimal. The Site currently uses and will presumable use municipal water in the future, and therefore there is minimal risk on-site water will be used for drinking purposes. However in the event that construction activities are carried out on-site, construction or utility workers would have minimal contact of the overburden groundwater.

7.0 REMEDIAL INVESTIGATION CONCLUSIONS AND DATA LIMITATIONS

The purpose of this Remedial Investigation is to identify and define the extent of hazardous substances as well as assess the lateral and vertical extent of contamination at the Site. This investigation identified contamination in subsurface and surface soils and sediment at levels exceeding applicable criteria.

7.1 Conclusions

- Based on the findings to date, the subsurface soils have detections of volatile organic compounds and PCBs. The concentrations of individual chlorinated compounds are not present above Unrestricted and Residential land use values listed for 6 NYCRR Part 375-6 Soil Cleanup Objectives. Therefore meeting the proposed SCO's for VOCs and PCBs the area, and the use definitions in DER-10;
- Based on the findings to date, the subsurface soils have five TAL metals and three pesticides detected over Unrestricted SCOs. In addition, five SVOCs and four TAL metals were detected over Residential SCOs listed for 6 NYCRR Part 375-6 Soil Cleanup Objectives;
- Based on the RI, the extent and degree of contamination remaining on-site, above NYSDEC Part 375 SCGs, is inorganic metal (Mercury) within the subsurface soils to a depth of 5 feet below the ground surface. The area on-site in which the subsurface contamination is located is the central portion of the site where the buildings were previous located and was used for boat maintenance;
- Based on the findings to date, the surface soils have detections of VOCs, TAL metals and PCBs. Three pesticides and one VOC (acetone, a known lab artifact) exceeded 6 NYCRR Part 375-6 SCOs for Unrestricted use;
- Based on the findings to date, the surface soils have five metals (Arsenic, Cadmium, Copper, Lead, Mercury) with concentrations detected above Part 375 SCOs for unrestricted use;
- Based on the RI, the extent and degree of contamination remaining on-site, above NYSDEC SCGs, is inorganic metals (Arsenic, Cadmium, Copper, Lead, and Mercury) within the surface soils. The area on-site in which the surface contamination is located is the western and central portions of the site where the reported boat maintenance/repair/storage occurred and in the southeast corner where the former building was located;
- During the installation of HRP-SB-23 (2.5 to 3' bgs) and HRP-SB-5 (2 to 2.5' bgs), significant staining, odor, and elevated PID readings were observed in soil samples between depths of 3 to 12 feet. Based on the analytical results from the soil samples, there is evidence of metal contamination at this location;

- Two VOCs (acetone and methylene chloride) and six metals (Aluminum, Iron, Magnesium, Manganese, Sodium, and Thallium) were detected among the four groundwater monitoring wells on-site. The VOCs have been attributed to lab artifacts. The metal contaminants of concern did not exceed TOGS 1.1.1 groundwater (GA) standard. Therefore, groundwater at the site has not been impacted by metal contaminants of concern used in past operations on-site; and

- The NYSDEC Division of Fish and Wildlife & Marine Recourses (DFWMR) stated in a memorandum dated May 14, 2012 that the site is an old marina that contains fill and some soil contamination. The sediments surrounding the site in Oak Neck Creek demonstrate some contamination that may or may not be attributed to the site. The site is located in an area that contains important tidal march habitat.

7.2 Data Limitations

Data limitations were not identified in the course of HRP's investigations.

8.0 REMEDIAL GOALS AND REMEDIAL ACTION OBJECTIVE

Goals for the remedial program have been established through the remedy selection process stated in 6 NYCRR Part 375. At a minimum, the remedy selected must eliminate or mitigate all significant threats to public health and/or the environment presented by the hazardous substances disposed at the Site through the proper application of scientific and engineering principles.

The remedial goal for the Site is:

- Surface and subsurface soils to achieve the soil cleanup objectives for the protection of public health for restricted residential use, set forth in 6 NYCRR, subpart 375-1.8 (g)(2)(ii) and presented in the protection of public health-restricted residential use column of Table 375-6.8(b).

The remedial action objectives (RAO) for the Site are:

- Prevent or minimize exposures of persons at or around the Site to exposures to Site-related contamination;

- Prevent migration of contaminants that would result in surface water and groundwater contamination; and

- Prevent ingestion / direct contact with contaminated surface and subsurface soils.

9.0 IDENTIFICATION AND SCREENING OF ALTERNATIVES

This section of the report provides an overview of potential remedial alternatives which are screened for possible detailed consideration, for the Site to achieve the remedial action objectives and goals.

- **Alternative No. 1: No Action**
- **Alternative No. 2: No Further Action with Site Management**
- **Alternative No. 3: Limited Surface and Subsurface Soil Removal and Site Management**
- **Alternative No. 4: Surface Soil Removal, Limited Subsurface Excavation and Site Management**
- **Alternative No. 5: Site Excavation**

9.1 Alternative No. 1: No Action

The "No Action" Alternative is evaluated as a procedural requirement and as a basis for comparison. It requires continued monitoring only, allowing the Site to remain in an unremediated state. This alternative would leave the Site in its present condition and would not provide any additional protection to human health and the environment. The "No Action" Alternative would not involve any surface or subsurface soil remedial activity. In addition, the "No Action" alternative would not place any institutional or engineering controls on the Site property, such as future land use restrictions, and/or application of protective soil cover/barrier. With no further action being taken under this alternative, there are no additional costs.

9.2 Alternative No. 2: No Further Action with Site Management

The No Further Action with Site Management alternative would involve the implementation of future land use and securing the site. This alternative would not involve any additional surface soil, subsurface soil, or groundwater remedial actions. Institutional controls (ICs) would consist of restricting the future use of the site to restricted residential purposes. Engineering controls (ECs) would include securing the site through installation of fencing as possible to restrict site access.

An Environmental Easement would be needed to provide an enforceable legal instrument to ensure compliance with all ECs and ICs placed on the site. A Site Management Plan (SMP) would be required and it would specify the methods necessary to ensure compliance with all ECs and ICs required by the Environmental Easement for contamination that remains at the site. This SMP would provide a detailed description of all procedures required to manage remaining contamination at the site after completion of the Remedial Action, including: (1) implementation and management of all Engineering and Institutional Controls; (2) media monitoring; and (3) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports. Specifically, the SMP would include a provision for a soil management plan for any future site excavation or development, and site security.

This alternative would also include the abandonment of the remaining on-site monitoring wells according to NYSDEC policy CP-43, Groundwater Monitoring Well decommissioning policy.

Estimated costs associated with Alternative 2 are listed in Table 1.

Present Worth: $60,015.00
Capital Cost:..... $21,590.00
Annual Costs: $2,500.00

9.3 Alternative No. 3: Limited Surface and Subsurface Soil Removal, and Site Management

The purpose of this alternative would be to return the Site to 375-6.8(b) SCO – Protection of Public Health – Restricted, Restricted Residential Use. This remedial alternative would involve excavating contaminated surface soil from the top foot across the Eastern portion of the site [grids A4, B4, C4, A5, B5, and C5 (figure 2)]. For the subsurface soils, the excavation and removal of soils would consist of the removal of soils between one to two feet below grade in grids B3 and C3 (including HRP-SB-11 area)(Figure 2). This will remove the highest concentrations of metal contamination in the subsurface soils. The excavation of the subsurface soils will be halted if groundwater is encountered. A demarcation layer will be installed at that the final depth of the excavation.

The Site would be restored to grade with clean backfill in those areas that have been excavated. The backfill must be below the Site's RAO's and meet DER-10 fill requirements. The excavated soils will be analyzed prior to off-site disposal by TCLP and other parameters set by the NYSDEC approved disposal facility. During the RI, the subsurface soils from 4-5 feet below grade at SB-21 (grid B3) were analyzed via a TCLP test. The results of the TLCP analysis determined that the concentrations of lead (.046 mg/l), Chromium (0.025 mg/l), and Mercury (0.001mg/l) were leaching from the soil sample. These concentrations of lead, chromium, and mercury do not exceed their respective TCLP limit concentration of 5 mg/l (lead and chromium) and 1 mg/l (Mercury) to designate the soil as hazardous. In the same soil sample that was analyzed for TCLP, the concentration of lead via TAL metal analysis was 100 mg/kg, mercury (1.2 mg/kg).

However, the concentrations of lead, mercury and copper in the surface and subsurface soils at select sampling locations have much higher results than the ones analyzed via TCLP. Therefore, the excavated soils still have the potential to be considered hazardous via a TCLP analysis. The excavated soils will be taken to NYSDEC approved disposal facility for hazardous or non-hazardous soils; this will be done in accordance with NYSDEC's Technical Guidance for Site Investigation and Remediation (DER-10).

Pursuant to the NYSDEC DER-10, confirmatory end point soil samples will be collected along the sidewalls and bottom throughout the excavation area. All soil samples will be labeled, preserved on ice in coolers, and sent to the analytical laboratory under chain of custody procedures. The soil samples will be submitted to a NYSDOH-certified laboratory

for analysis of TAL metals. Backfill activities not will occur prior to receipt of confirmatory sample results.

Prior to removal of the surface and subsurface soils the site may need some clearing and grubbing to remove the dense underbrush from the majority of the area being excavated on-site and to also allow for stockpiling of excavated soils on-site during the remedial activities.

In addition, this alternative would include the abandonment of the four on-site monitoring wells according to NYSDEC CP-43, Groundwater Monitoring Well decommissioning policy.

A Site Management Plan (SMP) would be required and it would specify the methods necessary to ensure compliance with all ECs and ICs required for contamination that remains at the site. The institutional controls (ICs) would consist of restricting the future use of the site to restricted residential purposes. The engineering controls (ECs) would include securing the site through installation of fencing to restrict site access. This SMP would provide a detailed description of all procedures required to manage remaining contamination at the site after completion of the Remedial Action, including: (1) implementation and management of all Engineering and Institutional Controls; (2) media monitoring; and (3) performance of periodic inspections, certification of results, and submittal of Periodic Review Reports. Specifically, the SMP would include a provision for a excavation work plan for any future site excavation or development, and site security. In addition, an Environmental Easement would be needed to provide an enforceable legal instrument to ensure compliance with all ECs and ICs placed on the site.

This alternative provides sufficient protection to both public health and the environment by removing the most contaminated subsurface soils and limiting access to surface and subsurface contaminated soils with site management options. This alternative would achieve the Site RAO's.

Present Worth:.....$182,930
Capital Cost: $144,505
Annual Cost: $2,500

9.4 Alternative No. 4: Surface Soil Removal, Limited Subsurface Excavation, and Site Management

The purpose of this alternative would be to return the Site to 375-6.8(b) SCO – Protection of Public Health – Restricted, Restricted Residential Use. This remedial alternative would involve excavating contaminated surface soil from the top foot across the entire Site. For the subsurface soils, the excavation and removal of soils would consist of the removal of soils between one to four feet below grade in grids B3 and C3 (including HRP-SB-11 area)(as seen in Figure 2). This will remove the highest concentrations of metal contamination in the subsurface soils. Since groundwater is anticipated at 2 to 4 feet below ground surface at the site, the excavation of the subsurface soils will be halted if

groundwater is encountered. When the excavation is halted, a demarcation layer will be installed at that the final depth of the excavation.

The Site would be restored to grade with clean backfill in those areas that have been excavated. The backfill must be below the Site's RAO's and meet DER-10 fill requirements. The excavated soils will be analyzed prior to off-site disposal by TCLP and other parameters set by the NYSDEC approved disposal facility. During the RI, the subsurface soils from 4-5 feet below grade at SB-21 (grid B3) were analyzed via a TCLP test. The results of the TLCP analyzed determined that the concentrations of lead (.046 mg/l), Chromium (0.025 mg/l), and Mercury (0.001mg/l) were leaching from the soil sample. These concentrations of lead, chromium, and mercury do not exceed their respective TCLP limit concentration of 5 mg/l (lead and chromium) and 1 mg/l (Mercury) to designate the soil as hazardous. In the same soil sample that was analyzed for TCLP, the concentration of lead via TAL metal analysis was 100 mg/kg, chromium (17.9 mg/kg), and mercury (1.2 mg/kg).

However, the concentrations of lead, mercury and copper in the surface and subsurface soils at select sampling locations have much higher results than the ones analyzed via TCLP. Therefore, the excavated soils still have the potential to be considered hazardous via a TCLP analysis. The excavated soils will be taken to NYSDEC approved disposal facility for hazardous or non-hazardous soils; this will be done in accordance with NYSDEC's Technical Guidance for Site Investigation and Remediation (DER-10).

Pursuant to the NYSDEC DER-10, confirmatory end point soil samples will be collected along the sidewalls and bottom throughout the excavation area. All soil samples will be labeled, preserved on ice in coolers, and sent to the analytical laboratory under chain of custody procedures. The soil samples will be submitted to a NYSDOH-certified laboratory for analysis of TAL metals analysis. Backfill activities not will occur prior to receipt of confirmatory sample results.

Prior to removal of the surface and subsurface soils the site may need some clearing and grubbing to remove the dense underbrush from the majority of the area being excavated on-site and to also allow for stockpiling of excavated soils on-site during the remedial activities.

In addition, this alternative would include the abandonment of the four on-site monitoring wells according to NYSDEC CP-43, Groundwater Monitoring Well decommissioning policy.

A Site Management Plan (SMP) would be required and it would specify the methods necessary to ensure compliance with all ECs and ICs required for contamination that remains at the site. The institutional controls (ICs) would consist of restricting the future use of the site to restricted residential purposes. The engineering controls (ECs) would include securing the site through installation of fencing as possible to restrict site access. This SMP would provide a detailed description of all procedures required to manage remaining contamination at the site after completion of the Remedial Action, including: (1) implementation and management of all Engineering and Institutional Controls; (2) media monitoring; and (3) performance of periodic inspections, certification of results, and

submittal of Periodic Review Reports. Specifically, the SMP would include a provision for a excavation work plan for any future site excavation or development, and site security. In addition, an Environmental Easement would be needed to provide an enforceable legal instrument to ensure compliance with all ECs and ICs placed on the site.

This alternative would achieve Site remedial action objectives and goals for surface and subsurface soils. This will be accomplished through the removal highest contaminated soils in the surface and subsurface soils, installation of a demarcation layer, clean fill above the demarcation layer, and a Site Management Plan for the Site.

Present Worth:.....$263,355
Capital Cost: $224,930
Annual Cost: $2,500

9.5 Alternative No. 5: Site Excavation

The purpose of this alternative would be to return the Site to 375-6.8(b) SCO – Protection of Public Health – Residential Use. This alternative would achieve Site remedial action objectives and goals for surface and subsurface soils. This alternative would include returning the Site to RAOs by excavating and removing contaminated soils above residential soil clean up objectives (SCOs) and/or with unacceptable nuisance characteristics (i.e. soil staining, odor, etc.) from the Site for proper disposal off-site. This remedial alternative would consist of excavation to varying depths, between three (3) feet below grade across the majority of the Site and five (5) feet below grade in the area of Grid A3, B3, C3, B4, and C4 (including HRP-SB-11 area) and the subsequent disposal of fill materials and contaminated soil. If groundwater was encountered during excavation (expected at 2-5 feet below the ground surface), the excavation would cease at that depth. The excavation of soils would stop during the excavation process if groundwater was encountered, and a demarcation layer would be installed at that depth.

Pursuant to the NYSDEC DER-10, confirmatory end point soil samples will be collected along the sidewalls and bottom throughout the excavation area. All soil samples will be labeled, preserved on ice in coolers, and sent to the analytical laboratory under chain of custody procedures. The soil samples will be submitted to a NYSDOH-certified laboratory for analysis of TAL metals analysis. Backfill activities will not occur until after receipt of confirmatory sample results.

The Site would be restored to grade with clean backfill in those areas that have been excavated. The backfill must be below the Site's RAO's and meet DER-10 fill requirements. The excavated soils will be analyzed prior to off-site disposal by TCLP and other parameters set by the NYSDEC approved disposal facility. The excavated soils will be taken to NYSDEC approved disposal facility for hazardous or non-hazardous soils; this will be done in accordance with NYSDEC's Technical Guidance for Site Investigation and Remediation (DER-10).

Prior to removal of the surface and subsurface soils the site will require clearing and grubbing to remove the dense underbrush from the majority of the area being excavated

on-site and to also allow for stockpiling of excavated soils on-site during the remedial activities.

A Site Management Plan (SMP) would be required and it would specify the methods necessary to ensure compliance with all ECs and ICs required for contamination that remains at the site. The ECs and IC would be the same as in Alternatives 3 and 4.

In addition, this alternative would include the abandonment of the four on-site monitoring wells according to NYSDEC CP-43, Groundwater Monitoring Well decommissioning policy.

Present Worth: $350,990.00
Capital Cost:..... $312,565.00
Annual Costs: $2,500.00

10.0 DETAILED ANALYSIS AND COMPARISON OF ALTERNATIVES TO PROTECTION CRITERIA

Alternative selected for detailed analysis and comparison include:

- **Alternative No. 1: No Action**
- **Alternative No. 2: No Further Action with Site Management**
- **Alternative No. 3: Limited Surface and Subsurface Soil Removal and Site Management**
- **Alternative No. 4: Surface Soil Removal, Limited Subsurface Excavation and Site Management**
- **Alternative No. 5: Site Excavation**

These alternatives are developed in sufficient detail to allow an analysis of their effectiveness and implementability with the Site's remedial action objective and NYSDEC criteria for the ERP program, DER - 10 Technical Guidance for Site Investigation and Remediation, which require consideration of the following criteria:

- Overall Protection of Public Health and Environment
- Compliance with NYSDEC Standards, Criteria, and Guidance (SCGs) for Investigation and Remediation of Inactive Hazardous Waste Disposal Site's
- Long Term Effectiveness and Permanence
- Reduction in Toxicity and Mobility
- Short Term Effectiveness
- Implementability
- Cost Effectiveness
- Land Use

10.1 Alternative No. 1 - No Action

- **Overall Protection of Public Health and Environment** – This alternative does not provide sufficient protection to human health and the environment. Residual public health risks would be high in consideration of: 1) the future use of the site and 2) exposure to surface and subsurface soils that exhibit levels of contamination over the NYSDEC SCGs. This alternative would not achieve Site RAO's.

- **Compliance with SCGs** – This alternative will not comply with SCGs since known contaminants exist in surface and subsurface soils and their use or development would not be allowable without the implementation of institutional and engineering controls.

- **Long Term Effectiveness and Permanence** – This alternative will not constitute an effective long term solution because the lack of any remedial action or set controls may result in significant public health and environment risks.

- **Reduction in Toxicity and Mobility** – This alternative will not reduce the toxicity or mobility of the known contaminants on-site since no remedial action is proposed.

- **Short Term Effectiveness** – This alternative will not provide any benefits in the short term except for zero cost associated with "No Action" and the time to implement the remedy. Potential human exposure, adverse environmental impacts and nuisance conditions at the Site resulting from this alternative are not anticipated.

- **Implementability** – This alternative could be easily implemented.

- **Cost** – The initial cost to implement this alternative would be zero and the least costly Alternative presented. Future costs, however, may arise if the Site is developed and public health issues arise.

- **Land Use** – This alternative will not comply with the future proposed land use of the Site or the revitalization plans of the area and could possibly affect the general public that utilize the adjacent properties.

  Although the "No Further Action" alternative would be the least expensive alternative, it would represent the greatest risk to public health and to any future use of the Site property. This alternative will not comply with SCGs since known contaminants exist in surface and subsurface soils**.** This alternative does not limit the exposure to the remaining onsite contamination and therefore the sites RAO's would not be achieved. In addition, the No Further Action alternative may result in an unknown amount of future costs related to public health and/or future remedial action costs. As a result of the known residual contamination of the Site's surface and subsurface soil, and groundwater the No Further Action alternative is an impractical alternative.

10.2 Alternative No. 2 – No Further Action with Site Management

- **Overall Protection of Public Health and Environment** – This alternative does provide minimal protection to both public health and the environment. This alternative would control potential exposure pathways through the implementation of institutional and engineering controls, however this alternative would not achieve the RAOs for soil.

- **Compliance with SGCs** – This alternative will not comply with the SGCs regarding surface or subsurface soils SCGs. With no remedial actions under this alternative, contaminated soils would be left onsite.

- **Long Term Effectiveness and Permanence** – This alternative would not be an effective long term solution based on the exceedances of restricted residential remaining on Site. However, this alternative will not constitute an effective long term solution because the lack of any remedial actions and contaminated soils would remain onsite.

- **Reduction in Toxicity and Mobility** – This alternative does not reduce the toxicity and mobility of contaminants in the soils because remedial actions are not included as part of this alternative.

- **Short Term Effectiveness** - This alternative will not provide any benefits in the short term. Potential human exposure, adverse environmental impacts and conditions at the Site resulting from this alternative would be anticipated.

- **Implementability** - This alternative is easily implementable through the placement of Institutional and Engineering Controls and the preparation of a Site Management Plan.

- **Cost** - The cost to implement this alternative would be minimal, due to the lack of any remedial activities (i.e. soil excavation). Costs would include the preparation of a Site Management Plan and the periodic certification required by an easement.

- **Land Use** - This alternative would comply with the current land use of the Site by implementing the ICs and ECs.

  This alternative would be the cheapest alternative to implement after the No Further Action Alternative and would be easily implemented. This alternative would control potential exposure pathways through the implementation of institutional and engineering controls, however this alternative would not achieve the RAOs for soil because of the lack of remedial actions. In addition, this alternative would provide no reduction of the toxicity and mobility of contaminants in the soils. This alternative would not comply with the SCGs for surface or subsurface soils and would provide very minimal protection to both public health and the environment.

10.3 Alternative No. 3 – Limited Surface and Subsurface Soil Removal and Site Management

- **Overall Protection of Public Health and Environment** – This alternative provides sufficient protection to both public health and the environment by removing the most contaminated surface and subsurface soils and limiting access to surface and subsurface contaminated soils with site management options. This alternative would achieve the Site RAO's.

- **Compliance with SCGs** – SCGs are satisfied under this remedial alternative. Contaminants in the most contaminated subsurface soils in the middle portion (Grid B3, B4, A4, and A5) of the Site would be removed via excavation and the subsurface soil would remain on-site below the soil cover, and below recommended RAOs and clean-up objectives for Restricted Residential Use, Part 375-6 Protection of Public Health.

- **Long Term Effectiveness and Permanence** – This alternative will constitute an effective long term solution due to the removal of the majority of the contaminated subsurface soil on-site. There would be residual risks since the source(s) of the

contamination would not be eliminated by the excavation. A Site Management Plan, would be put into place to limit the property uses due to the remaining subsurface soil contamination.

- **Reduction in Toxicity and Mobility** – This alternative will significantly decrease the toxicity of the contaminants in the soils. Reduction in toxicity and mobility will be achieved via subsurface soil removal with the remaining access to surface soils mitigated by a Site management Plan and subsurface soils would not be accessible.

- **Short Term Effectiveness** – This alternative will provide significant benefits in the short term, notably the removal of the contaminated subsurface soil. Potential human exposure, adverse environmental impacts and nuisance conditions at the Site resulting from this alternative are anticipated for a period of one-three weeks during which time Site remedial work will occur.

- **Implementability** – This alternative will result in the remediation of the surface soils on the eastern half of the Site. It is implementable through the temporary installation of a silt fencing of the area abutting the Oak Neck Creek, the use of available contractors under the supervision and oversight of qualified field personnel to perform soil excavation, backfill activities, and site restoration. The time to perform the job can be completed over several weeks (approx. three-six weeks).

- **Cost** – The cost to implement this alternative would be the third most expensive alternative. Cost would include site preparation, a limited excavation, backfilling, disposal of soils, and long-term monitoring would be required. See Table 2 for cost estimates.

- **Land Use** – The future land use under this alternative would be consistent with current zoning and surrounding land use.

This alternative provides protection of public health and environment. The risk of exposure to remaining soil contamination is low since there will be limited completed pathways through which the public may be exposed to contaminated surface and subsurface soil. This alternative would provide public protection and would remediate the site in a quicker timeframe than Alternative 2. The soil disposal costs for Alternative 3 are lower due to reduced amount of soils being excavated than in Alternative 4 and 5. This Alternative 3 would be more cost effective than Alternatives 4 and 5.

10.4 Alternative No. 4 – Surface Soil Removal, Limited Subsurface Excavation, and Site Management

- **Overall Protection of Public Health and Environment** – This alternative provides sufficient protection to both public health and the environment by removing the threat of exposure to surface soils as well as removing the highest concentration of contaminated subsurface soils and limiting access to the remaining subsurface contaminated soils. This alternative would not achieve the Site RAO's.

- **Compliance with SCGs** – SCGs are satisfied under this remedial alternative for the surface soils. The contaminants in the surface soil and the highest concentration of contaminated subsurface soils in the middle portion (Grid B3 and C3) of the Site would achieve Site RAOs. There would be subsurface soil at concentrations exceeding Site RAOs.

- **Long Term Effectiveness and Permanence** – This alternative will constitute an effective long term solution due to the removal of the contaminated surface and highest concentration of subsurface soil contamination on-site. There would be very limited residual risks since the source(s) of the contamination would be removed in the surface soils and for the subsurface soils be contained under the clean fill brought to the site. A Site Management Plan would be in place to limit the use of the subsurface soils on Site.

- **Reduction in Toxicity and Mobility** – This alternative will significantly decrease the toxicity of the contaminants in the soils. Full reduction in toxicity and mobility will be achieved via surface soil removal with the remaining subsurface soils under the clean fill and below the demarcation layer would not be accessible without notifying the NYSDEC.

- **Short Term Effectiveness** – This alternative will provide significant benefits in the short term, notably the removal of the contaminated surface soil and subsurface soil. Potential human exposure, adverse environmental impacts and nuisance conditions at the Site resulting from this alternative are anticipated to be for a period of several weeks during which time Site work will occur.

- **Implementability** –This alternative will result in the remediation of the surface soils on the eastern half of the Site. It is implementable through the temporary installation of a silt fencing of the area abutting the Oak Neck Creek, the use of available contractors under the supervision and oversight of qualified field personnel to perform soil excavation, backfill activities, and site restoration. The time to perform the job can be completed over several weeks to a month.

- **Cost** – The cost to implement this alternative would be the fourth most expensive alternative. Cost would include site preparation, a limited excavation, backfilling, disposal of soils, and long-term monitoring would be required. See Table 3 for cost estimates.

- **Land Use** – The future land use under this alternative would be consistent with current zoning and surrounding land use.

This alternative provides adequate protection of public health and environment. The risk of exposure to remaining soil contamination is very low because there are no completed pathways through which the public may be exposed upon removal of the contaminated surface and subsurface soil and installation of clean fill. This alternative would provide the most public protection and would be effective faster than Alternative 3. However, the soil disposal costs would be slight higher than in Alternative 3 due to increase in soil removal from across the satire. Alternative 4 would be more cost effective than Alternative 5.

10.5 Alternative No. 5 – Site Excavation

- **Overall Protection of Public Health and Environment** – Upon completion, this alternative provides a sufficient level of protection to both public health and the environment by removing contaminated soil to restricted residential use of the site as stated in the RAOs. This alternative would achieve the Site RAO's.

- **Compliance with SCGs** – The Site SCGs are satisfied under this remedial alternative. Contaminants in the saturated subsurface soil may possibly remain on-site, however the surface soil and the unsaturated subsurface soil would be removed. The concentrations would be below the Restricted Residential SCOs of Part 375.

- **Long Term Effectiveness and Permanence** – This alternative will constitute an effective long term solution due to the removal of the contaminated surface and subsurface soil on the Site. There would be no residual risks since the source(s) of the contamination would be removed.

- **Reduction in Toxicity and Mobility** – This alternative will significantly decrease the toxicity of the contaminants in the soils through the soil excavation.

- **Short Term Effectiveness** – This alternative will provide significant benefits in the short term, notably the removal of contaminated surface and unsaturated subsurface soil. Potential human exposure, adverse environmental impacts and nuisance conditions at the Site resulting from this alternative are anticipated to be for a period of several weeks during which time Site work will occur.

- **Implementability** – This alternative will result in the remediation of the Site. This alternative is implementable through the excavation of the on-site surface and subsurface soil, temporary silt fencing of the area abutting the Oak Neck Creek, and use of available contractors under the supervision and oversight of qualified field personnel to excavate and dispose of contaminated soil, backfill activities, and site restoration. The time to perform the job can be completed over several weeks to a month.

- **Cost** – The cost to implement this alternative would be the most expensive alternative.

Costs would include site preparation, excavation, soil disposal, backfilling activities, and site restoration would be required. See Table 4 for cost estimates.

- **Land Use** Once the work was completed, uninterrupted use of the Site would be possible. The future land use under this alternative would be consistent with current zoning and surrounding land use.

This alternative is the most expensive remedial alternative, although it would restore the Site to Restricted Residential SCOs and thus be the protective alternative to public health and environment.

11.0 SUMMARY OF REMEDIAL ALTERNATIVES

Alternative No. 1 - No Action

Although the "No Further Action" alternative would be the least expensive alternative, it would represent the greatest risk to public health and to any future use of the Site property. This alternative will not comply with SCGs since known contaminants exist in surface and subsurface soils**.** This alternative does not limit the exposure to the remaining onsite contamination and therefore the sites RAO's would not be achieved. In addition, the No Further Action alternative may result in an unknown amount of future costs related to public health and/or future remedial action costs. As a result of the known residual contamination of the Site's surface and subsurface soil the No Further Action alternative is an impractical alternative.

Alternative No. 2 – No Further Action with Site Management

This alternative would be the second least expensive alternative to implement after the No Further Action Alternative and would be easily implemented. This alternative would control potential exposure pathways through the implementation of institutional and engineering controls, however this alternative would not achieve the RAOs for soil because of the lack of remedial actions. In addition, this alternative would provide no reduction of the toxicity and mobility of contaminants in the soils. This alternative would not comply with the SCGs for surface or subsurface soils and would provide very minimal protection to both public health and the environment. Annual site inspections would be required as part of the Site Management Plan.

Alternative No. 3 – Limited Surface and Subsurface Soil Removal and Site Management

This alternative is the third most expensive remedy. This alternative provides adequate protection of public health and environment and would meet the Sites RAOs through the removal of the highest concentration of contamination in the surface and subsurface soils in the middle portion (Grid B3 and C3) of the Site. The risk of exposure to remaining subsurface soil contamination is very low because of limited exposure to the soils through the placement of clean fill and a site management plan. This alternative would provide similar public and environmental protection as Alternatives 4 and 5, however, would require long term monitoring not required with Alternative 5. Due to the limited subsurface soil removal, the disposal costs would be lower and the time to complete the work would be slightly shorter (terms of days) than Alternatives 4 and 5. Annual site inspections would be required as part of the Site Management Plan.

Alternative No. 4 - Surface Soil Removal, Limited Subsurface Excavation, and Site Management

This alternative is the second most expensive remedy. This alternative provides adequate protection of public health and environment and would meet the Sites RAOs for the contaminants in the surface soil and the highest concentration of contaminated

subsurface soils in the middle portion (Grid B3 and C3) of the Site. The risk of exposure to remaining subsurface soil contamination is very low because of limited exposure to the soils due to the installation of a cap. This alternative would provide similar public and environmental protection as Alternative 4 and would take more time to implement that Alternative 3. Annual Site inspections would be required as part of the Site Management Plan.

Alternative No. 5 - Site Excavation

This alternative is the most expensive remedy. This alternative provides protection of public health and environment and meets the sites RAOs. This alternative would provide additional public health and environmental protection than Alternatives 3 and 4. During site remedial activities if all of the subsurface contamination is able to be excavated without encountering groundwater. A site management plan would not be required.

Section 10- TABLE 1 Alternative No. 2 – No Further Action with Site Management Plan		
Description	**Quantity**	**Cost (estimated)**
CAPITAL COSTS		
Staff prep time ($100/hr)	6 hours	$600
Staff on-site labor ($100/hr)	14 hours	$1,400
Senior staff oversight ($130/hr)	3 hours	$390
Field Equipment/PPE	2 day	$200
Prepare Site Management Plan	1 plan	$4,000
Well Abandonment	1 day	$6,000
Prepare Environmental Easement	1 plan	$3,000
Site ALTA Survey for environmental easement	1 event	$6,000
Total		**$21,590**
ANNUAL COSTS		
Average annual cost to prepare periodic certification required by easement, annual inspections	0-30 years	**$2,500**

Present Worth Costs calculated using 30 year timeframe at 5%.

Section 10- TABLE 3 Alternative No. 4: Surface Soil Removal, Limited Subsurface Excavation and Site Management		
Description	**Quantity**	**Cost (estimated)**
Well Abandonment	1 day	$6,000
Excavation Preparation- Installation of 500 linear feet of hay bales or silt fence along excavation area adjacent to Oak Neck Creek	lump sum	$2,000
Subcontractor Costs (includes labor, equipment for excavation, phragmites removal and disposal, excavate and live load soil in to permitted trucks for disposal, and transportation and disposal of soil)	2 weeks	$110,000
Transportation and disposal of non-hazardous soil across top foot and excavation at the central portion of the site ($60/ton)	800 tons	$48,000
Transportation and disposal of hazardous soil ($290/ton)	15 tons	$4,350
Furnish, place and compact structural backfill ($24/ton)	200 tons	$4,800
Staff prep time ($100/hr)	20 hours	$2,000
Staff on-site labor ($100/hr)	160 hours	$16,000
Senior staff oversight ($130/hr)	20 hours	$2,600
PID, 2 required ($200/wk)	2 weeks	$400
CAMP air monitoring equipment ($735/wk)	2 weeks	$1,470
Field Equipment/PPE	2 weeks	$2,000
Confirmatory soil samples from excavation (TAL Metals - $120/sample)	Estimated 35 samples	$4,200
Confirmatory soil samples of clean backfill (VOCs, SVOCs, TAL Metals, PCBs, Pesticide.0s - $328/sample)	Estimated 5 samples	$1,640
Waste Characterization Samples (VOCs, SVOCs, TCLP RCRA 8 Metals, DRO, GRO- $298/sample)	Estimated 15 samples	$4,470
Lab Shipping Fees	Estimated	$2,000
Prepare Site Management Plan	1 plan	$4,000
Prepare Environmental Easement	1 plan	$3,000
Site ALTA Survey for environmental easement	1 event	$6,000
TOTAL COSTS		**$224,930**
ANNUAL COSTS		
Average annual cost to prepare periodic certification required by easement, annual inspections	0-30 years	**$2,500**

Present Worth Costs calculated using 30 year timeframe at 5%.

Section 10- TABLE 4 Alternative No. 5- Site Excavation		
Description	**Quantity**	**Cost (estimated)**
Well Abandonment	1 day	$6,000
Excavation Preparation- Installation of 500 linear feet of hay bales or silt fence along excavation area adjacent to Oak Neck Creek	lump sum	$2,000
Subcontractor Costs (includes labor, equipment for excavation, in-situ soil stabilization, excavate and live load stabilized soil info permitted trucks for disposal, and transportation and disposal of stabilized soil as a landfill cover)	3 weeks	$197,250
Transportation and disposal of hazardous soil ($290/ton)	15 tons	$4,350
Furnish and place structural backfill ($24/ton)	2,000 tons	$48,000
Staff prep time ($100/hr)	20 hours	$2,000
Staff on-site labor ($100/hr)	180 hours	$18,000
Senior staff oversight ($130/hr)	25 hours	$3,250
PID, 2 required ($200/wk)	3 weeks	$600
CAMP Air monitoring equipment ($735/wk)	3 weeks	$2,205
Field Equipment/PPE ($200/wk)	3 weeks	$600
Confirmatory soil samples from excavation (TAL Metals - $120/sample)	Estimated 60 samples	$7,200
Confirmatory soil samples of clean backfill (VOCs, SVOCs, TAL Metals, PCBs, Pesticide.0s - $328/sample)	Estimated 5 samples	$1,640
Waste Characterization Samples (VOCs, SVOCs, TCLP RCRA 8 Metals, DRO, GRO- $298/sample)	Estimated 15 samples	$4,470
Lab Shipping Fees	Estimated	$2,000
Prepare Site Management Plan (if needed)	1 plan	$4,000
Prepare Environmental Easement (if needed)	1 plan	$3,000
Site ALTA Survey for environmental easement (if needed)	1 event	$6,000
TOTAL		**$312,565**
ANNUAL COSTS		
Average annual cost to prepare periodic certification required by easement, annual inspections (if needed)	0-30 years	**$2,500**

Present Worth Costs calculated using 30 year timeframe at 5%.

Section 10- TABLE 2 Alternative No. 3: Limited Surface and Subsurface Soil Removal and Site Management		
Description	**Quantity**	**Cost (estimated)**
Well Abandonment	1 day	$6,000
Excavation Preparation- Installation of 500 linear feet of hay bales or silt fence along excavation area adjacent to Oak Neck Creek	lump sum	$2,000
Subcontractor Costs (includes labor, equipment for excavation, excavate and live load soil in to permitted trucks for disposal, and transportation and disposal of soil)	1 week	$70,000
Transportation and disposal of non-hazardous soil across top foot and excavation at the central portion of the site ($60/ton)	300 tons	$18,000
Transportation and disposal of hazardous soil ($290/ton)	15 tons	$4,350
Furnish, place and compact structural backfill ($24/ton)	300 tons	$7,200
Staff prep time ($100/hr)	20 hours	$2,000
Staff on-site labor ($100/hr)	90 hours	$9,000
Senior staff oversight ($130/hr)	10 hours	$1,300
PID, 2 required ($200/wk)	1 week	$200
CAMP air monitoring equipment ($735/wk)	1 week	$735
Field Equipment/PPE	1 week	$1,000
Confirmatory soil samples from excavation (TAL Metals - $120/sample)	Estimated 30 samples	$3,600
Confirmatory soil samples of clean backfill (VOCs, SVOCs, TAL Metals, PCBs, Pesticide.0s - $328/sample)	Estimated 5 samples	$1,640
Waste Characterization Samples (VOCs, SVOCs, TCLP RCRA 8 Metals, DRO, GRO- $298/sample)	Estimated 10 samples	$2,980
Lab Shipping Fees	Estimated	$1,500
Prepare Site Management Plan	1 plan	$4,000
Prepare Environmental Easement	1 plan	$3,000
Site ALTA Survey for environmental easement	1 event	$6,000
TOTAL COSTS		**$144,505**
ANNUAL COSTS		
Average annual cost to prepare periodic certification required by easement, annual inspections	0-30 years	**$2,500**

Present Worth Costs calculated using a 30 year timeframe at 5%.

APPENDIX A

TECHNICAL CORRESPONDENCE ON FIELD ACTIVITIES

APPENDIX B

QA/QC EVALUATION RESULTS (DUSRs)
(on enclosed CD)

APPENDIX C

FIELD DATA (SOIL BORING LOGS, GROUNDWATER SAMPLING SHEETS, WELL LOGS, etc.)

APPENDIX D

PREVIOUS REPORTS
(Included on enclosed CD)

APPENDIX E

ENIVONRONMENTAL DATA REPORTS (EDR)
(on enclosed CD)

USGS Quadrangle data Copyright:
© 2009 National Geographic Society, i-cubedxt
USGS Quad ID: 40073-H5
Quad Name: Bayville, New York
Revision Date: 1967
Publish Date: 1968
Photorevised: 1975

0 1,000 2,000 4,000 6,000 8,000 Feet

1 inch = 2,000 feet

N

Figure 1
Site Location
Former Mill Neck Marina Site
Hernan Avenue
Locust Valley (Oyster Bay), New York
HRP # NEW9626P2
Scale 1"=2,000'

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Path: S:\Data\NNEWEN - NY STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION\MILL NECK MARINA, HERNAN AVEUNE, OYSTER BAY, NY\NEW9626P2\GIS\Site Location.mxd

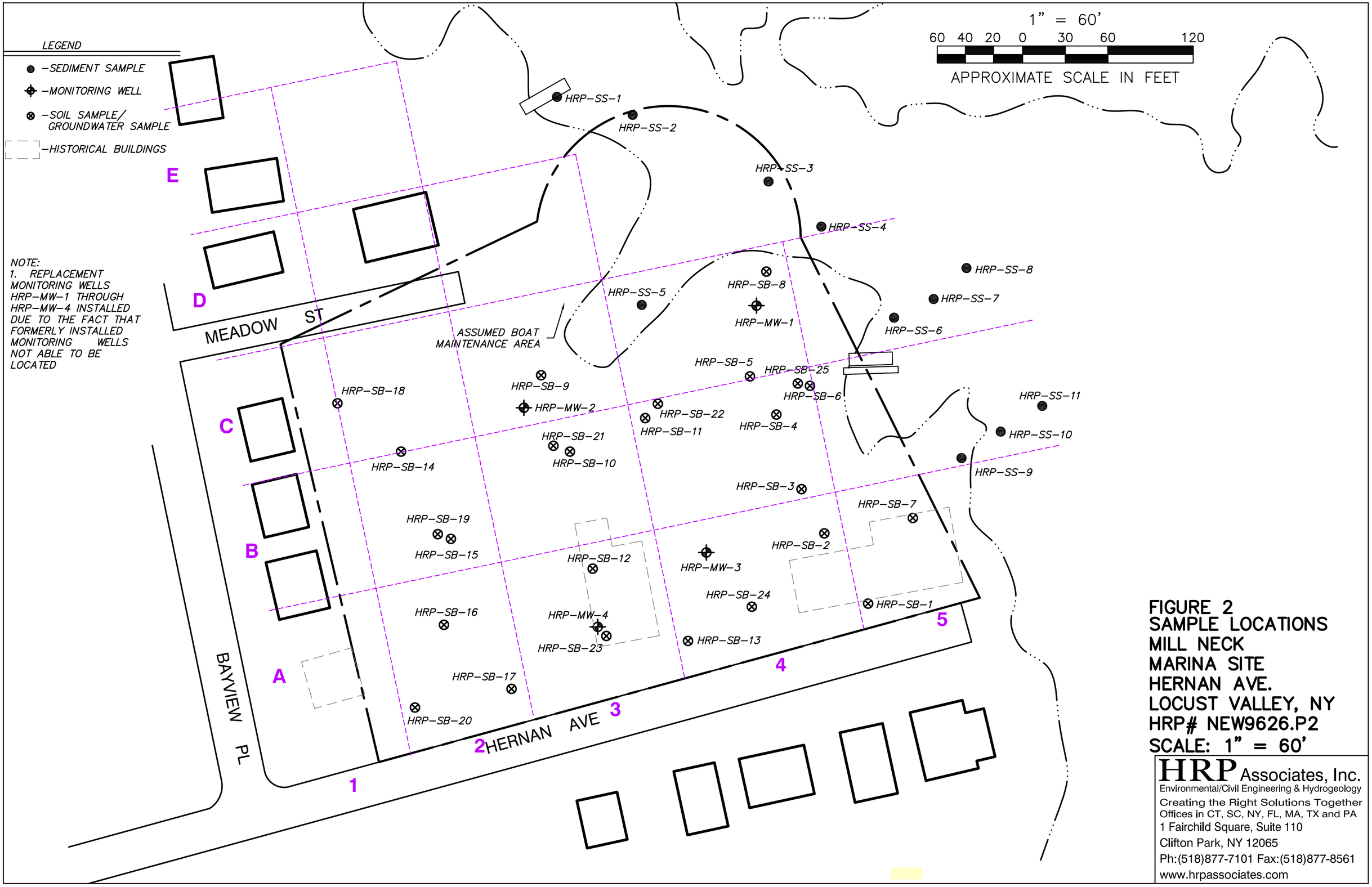

FIGURE 2
SAMPLE LOCATIONS
MILL NECK
MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 60'

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S:\Data\NY\NEWEN – NY STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION\MILL NECK MARINA, HERNAN AVEUNE, OYSTER BAY, NY\NEW9626P2\CAD\RI FIGURES – FIGURE 2 – SAMPLE LOCATIONS.dwg, 11X17 LANDSCAPE, 7/29/2013 3:12:43 PM, Adobe PDF

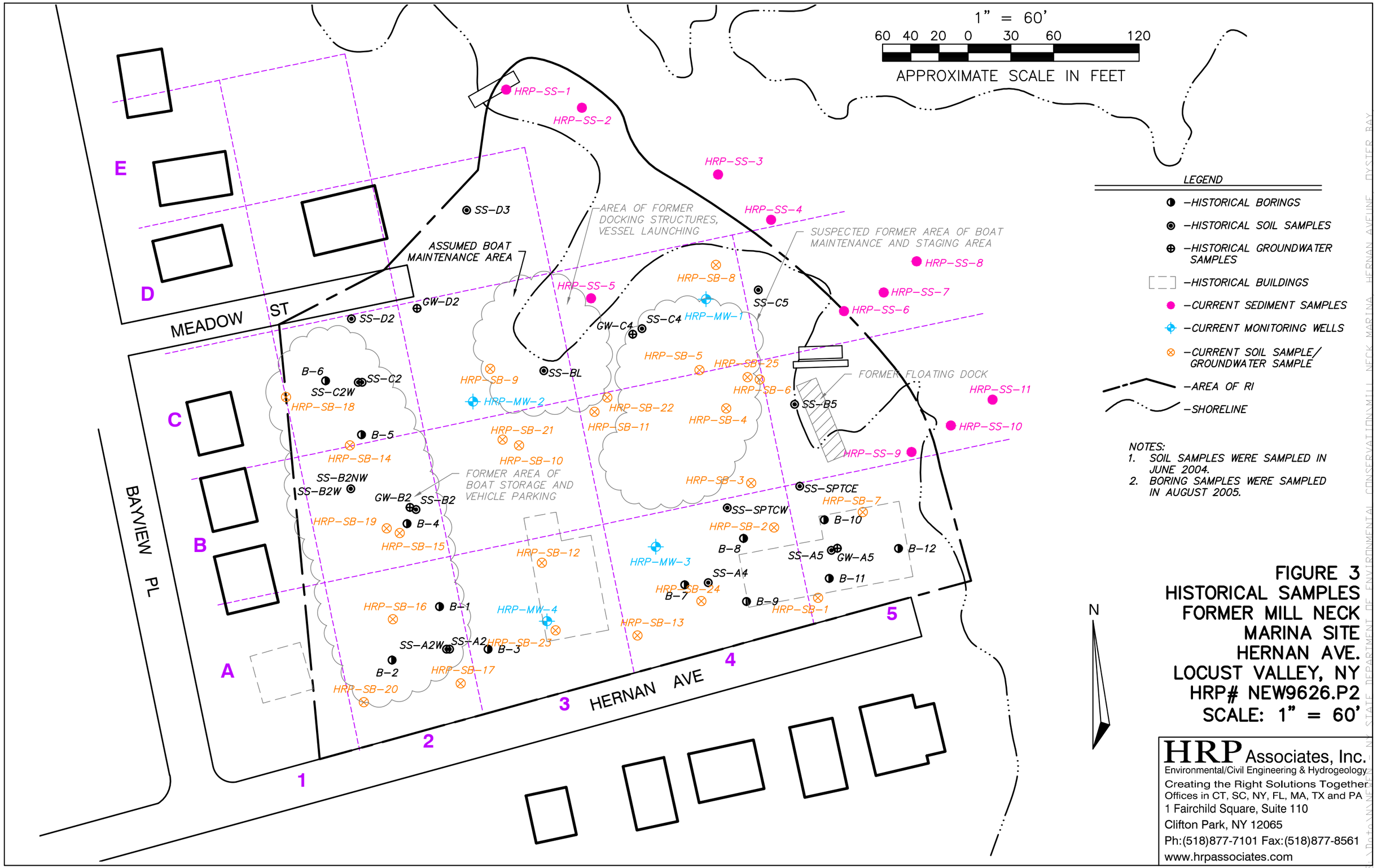

FIGURE 3
HISTORICAL SAMPLES
FORMER MILL NECK MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 60'

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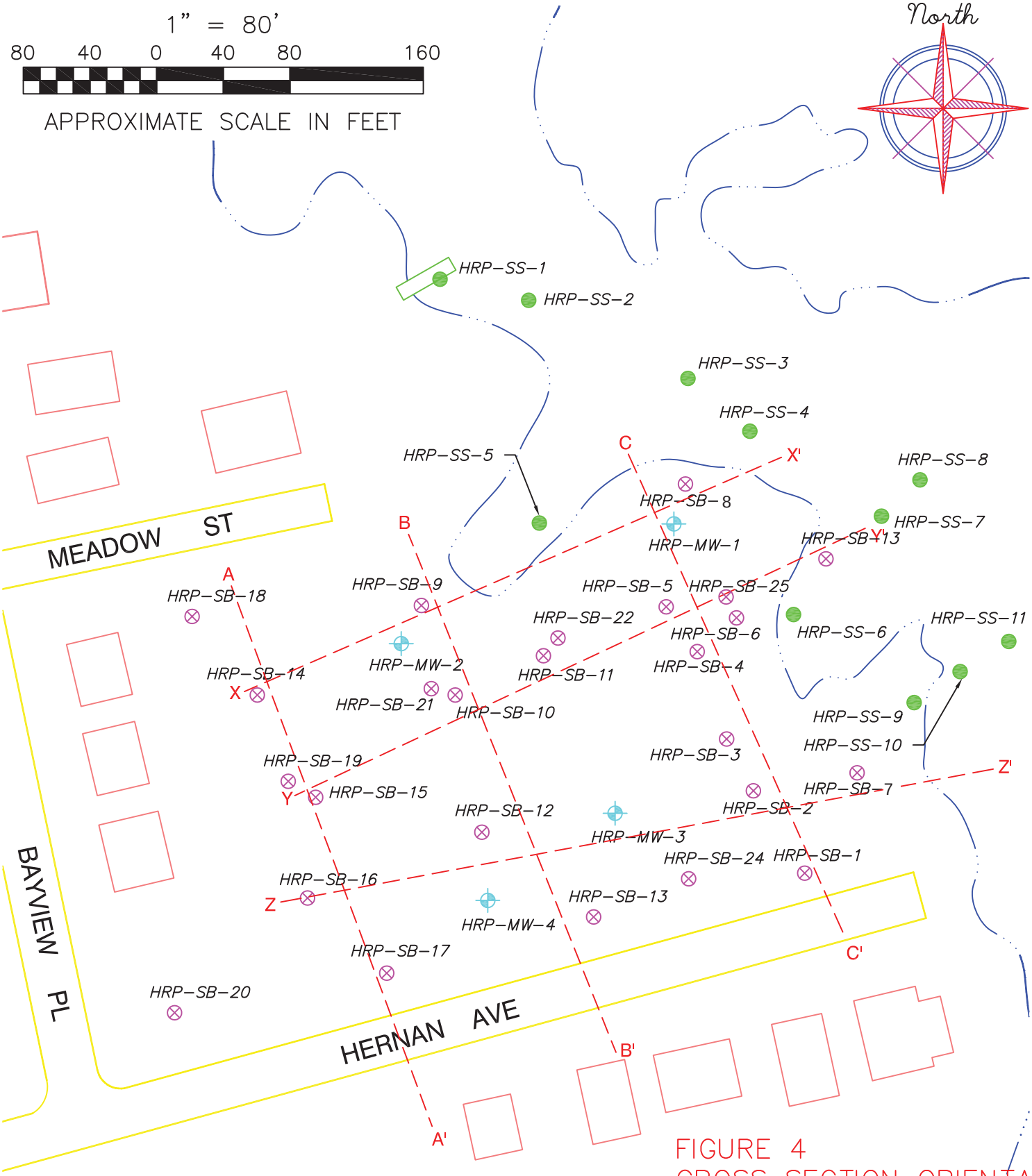
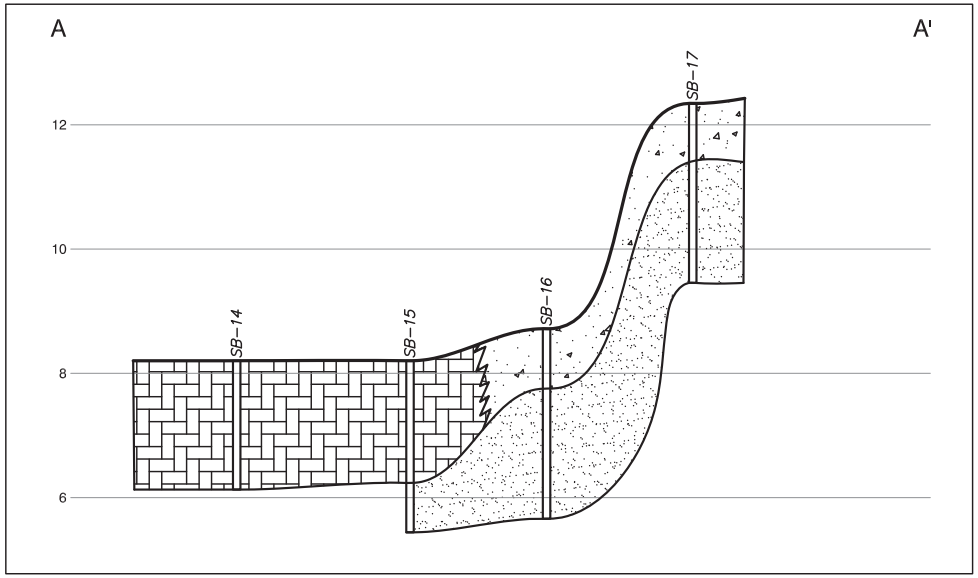
Data\NANWP\NEW9626P2\CAD\RI FIGURES - FIGURE 3 - HISTORICAL SAMPLE LOCATIONS.dwg, 11X17 LANDSCAPE, 8/1/2013 2:20:22 PM, DWG To PDF.pc3

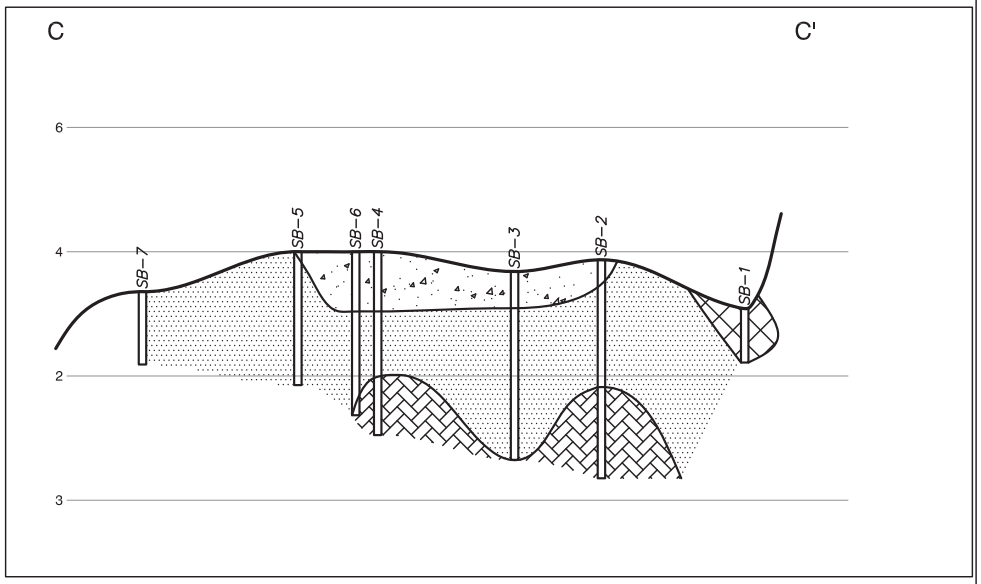


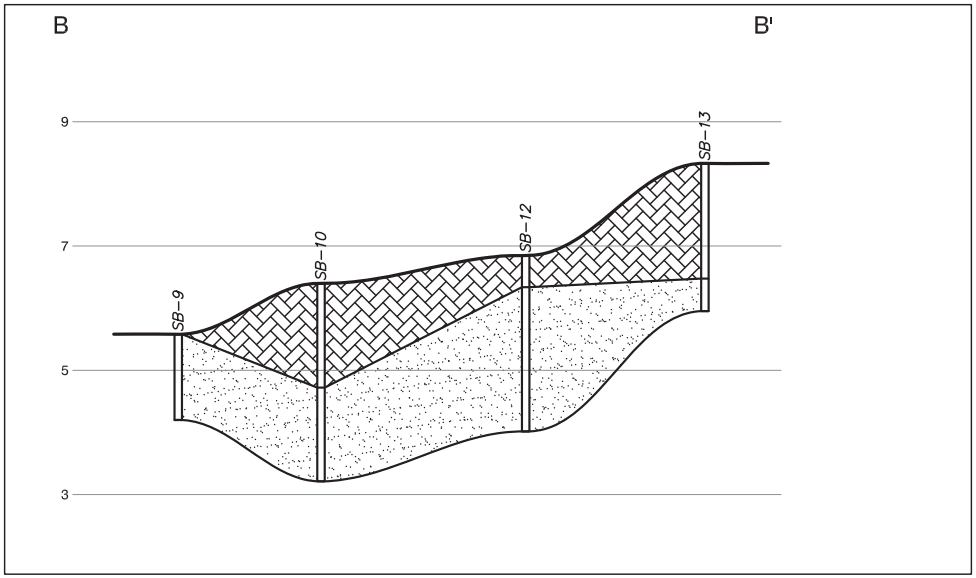
LEGEND

- –SEDIMENT SAMPLE
- –MONITORING WELL
- –SOIL SAMPLE/ GROUNDWATER SAMPLE

FIGURE 4
CROSS SECTION ORIENTATION
MILL NECK
MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 80'







LEGEND

- –GRAVEL
- –GRAVEL, SILT
- –GRAVEL, SOME SAND
- –GRAVEL, SOME SILT, SOME SAND
- –BLACK GRAVEL
- –SAND, SOME GRAVEL
- –SAND, SOME SILT, SOME GRAVEL
- –SAND–GRAVEL, SILT
- –SAND
- –SAND AND GRAVEL
- –SAND AND COBBLES
- –SAND, CLAY, ORGANICS
- –MUCK

FIGURE 5
CROSS SECTIONS
A–A', B–B', C–C'
FORMER MILL NECK
MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
VERTICAL SCALE: 1" = 10'
HORIZONTAL SCALE: 1" = 50'

1" = 10'
10 0 5 10 20
APPROXIMATE VERTICAL SCALE IN FEET

1" = 50'
50 0 25 50 100
APPROXIMATE HORIZONTAL SCALE IN FEET

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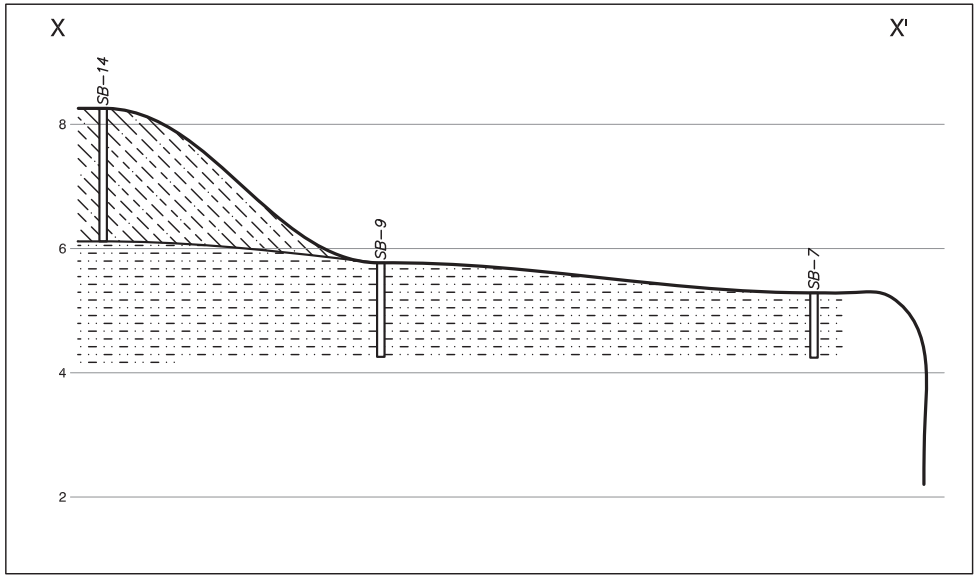

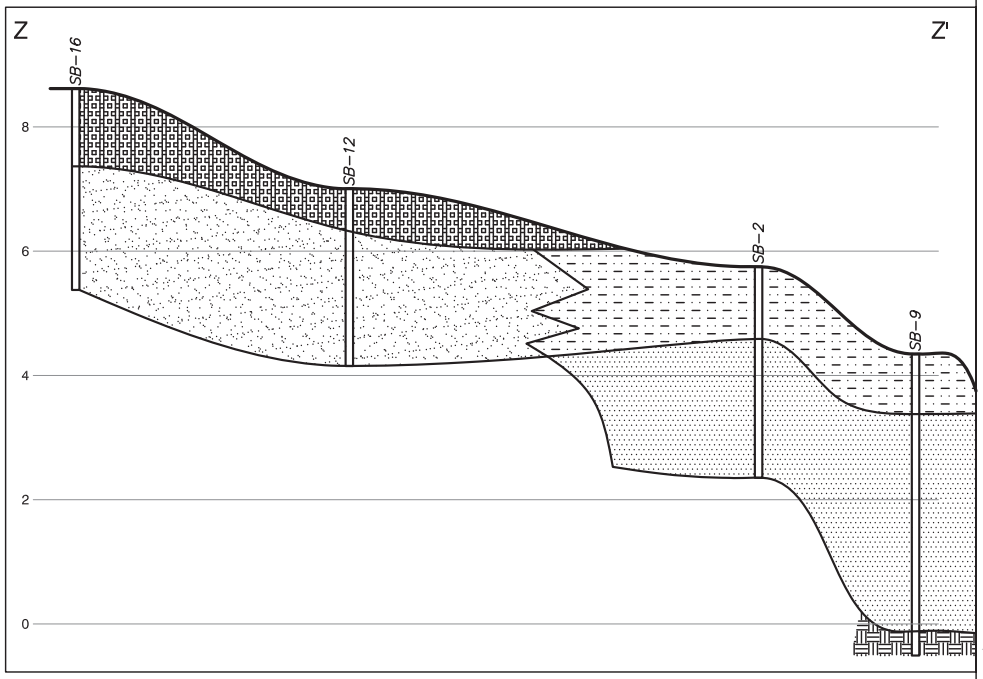

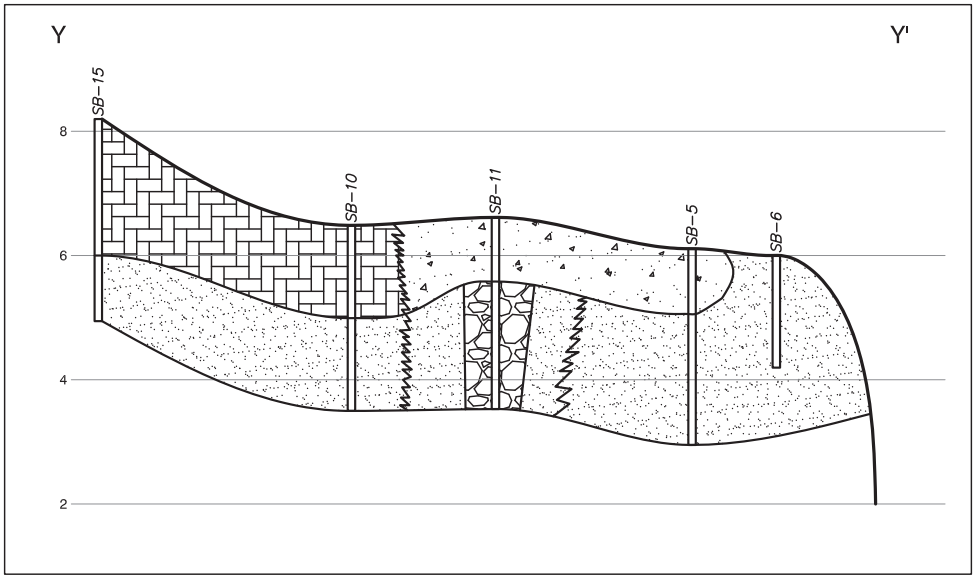

LEGEND

- –GRAVEL
- –GRAVEL, SILT
- –GRAVEL, SOME SAND
- –GRAVEL, SOME SILT, SOME SAND
- –BLACK GRAVEL
- –SAND, SOME GRAVEL
- –SAND, SOME SILT, SOME GRAVEL
- –SAND–GRAVEL, SILT
- –SAND
- –SAND AND GRAVEL
- –SAND AND COBBLES
- –SAND, CLAY, ORGANICS
- –MUCK

FIGURE 6
CROSS SECTIONS
X–X', Y–Y', Z–Z'
FORMER MILL NECK
MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
VERTICAL SCALE: 1" = 10'
HORIZONTAL SCALE: 1" = 50'

1" = 10'

10 0 5 10 20

APPROXIMATE VERTICAL SCALE IN FEET

1" = 50'

50 0 25 50 100

APPROXIMATE HORIZONTAL SCALE IN FEET

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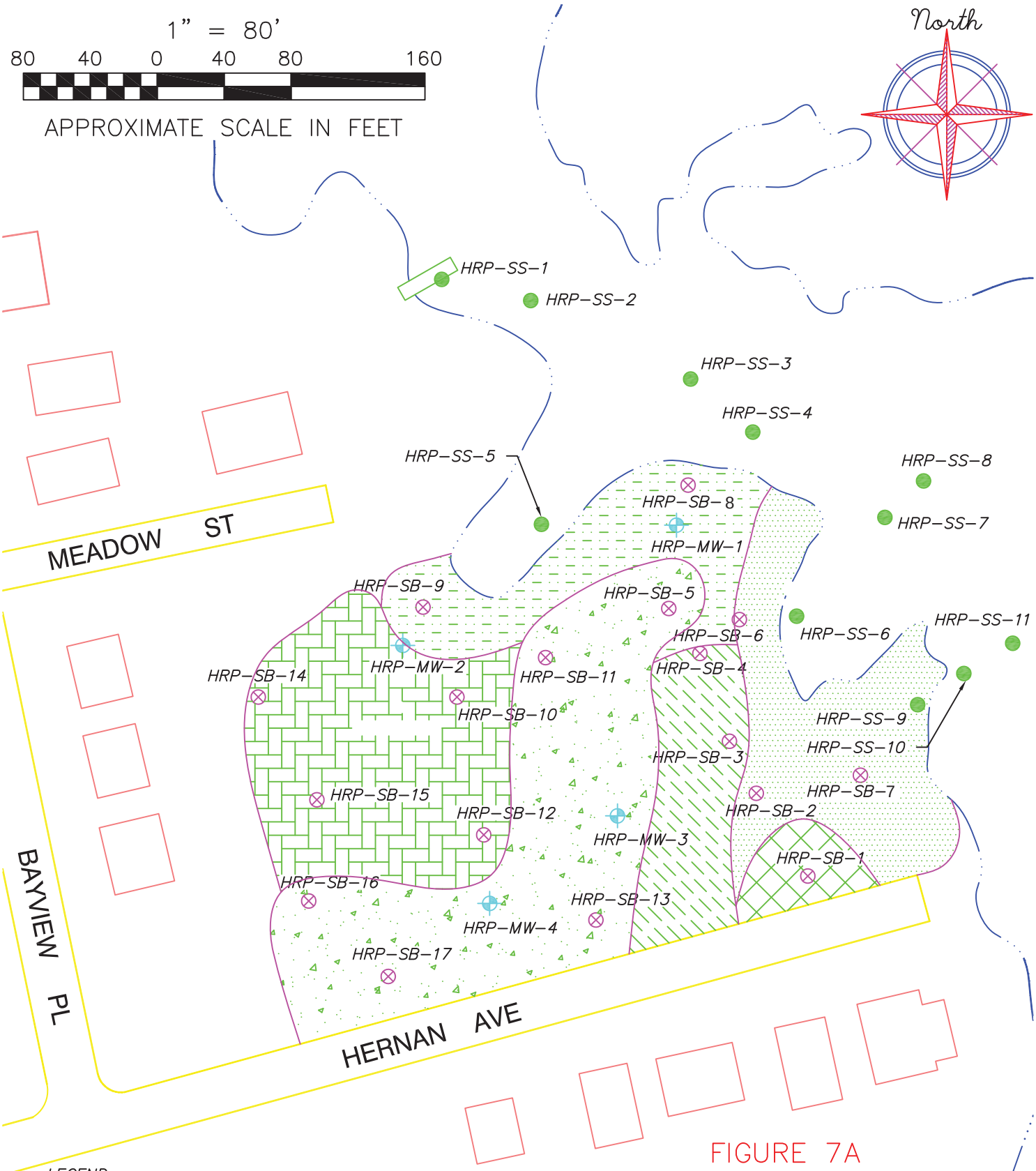
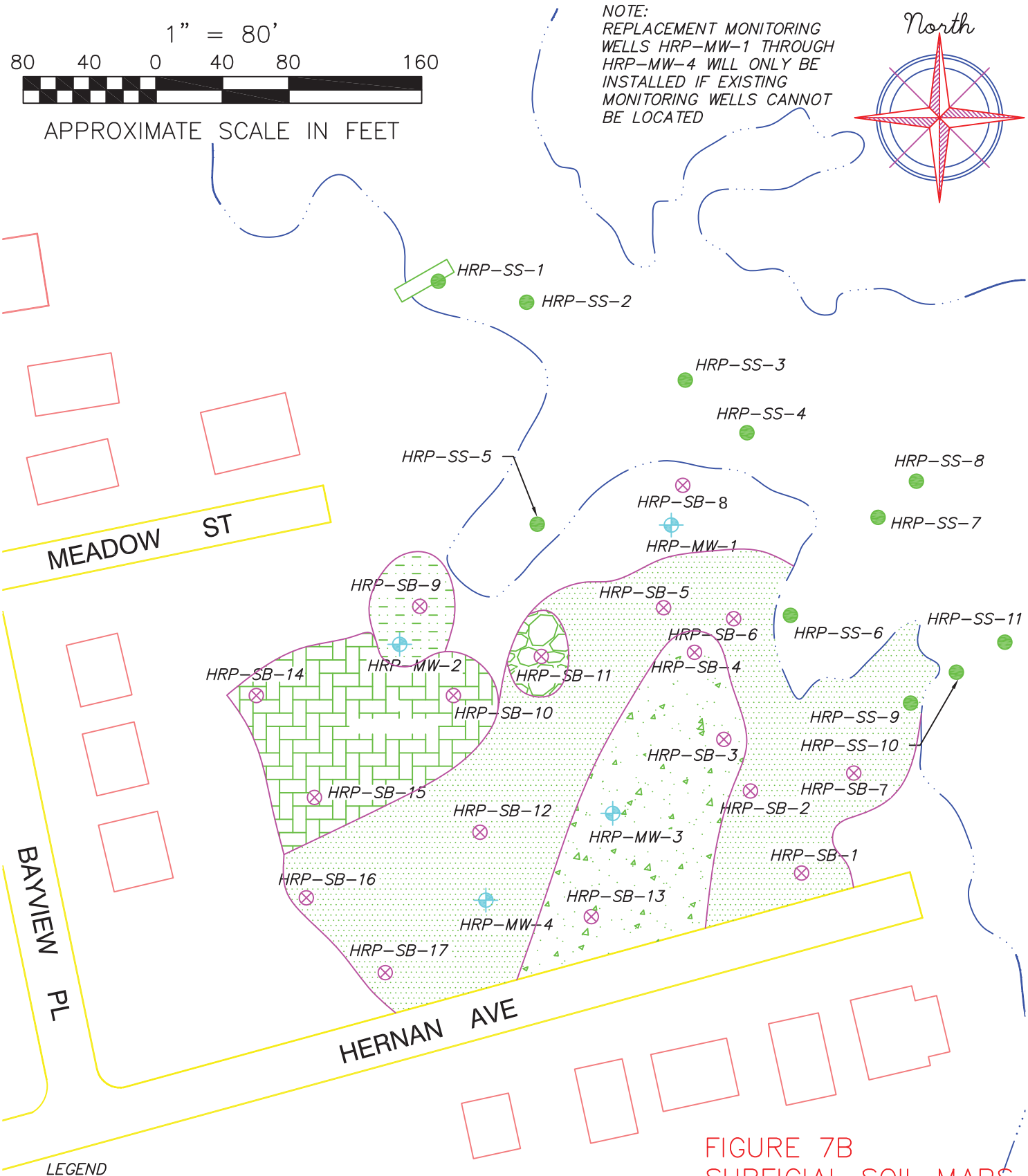


LEGEND

- –SEDIMENT SAMPLE
- –MONITORING WELL
- –SOIL SAMPLE/ GROUNDWATER SAMPLE
- –GRAVEL, SILT
- –SAND AND GRAVEL
- –MUCK
- –SAND, SOME SILT, SOME GRAVEL
- –SAND–GRAVEL AND SILT
- –SAND

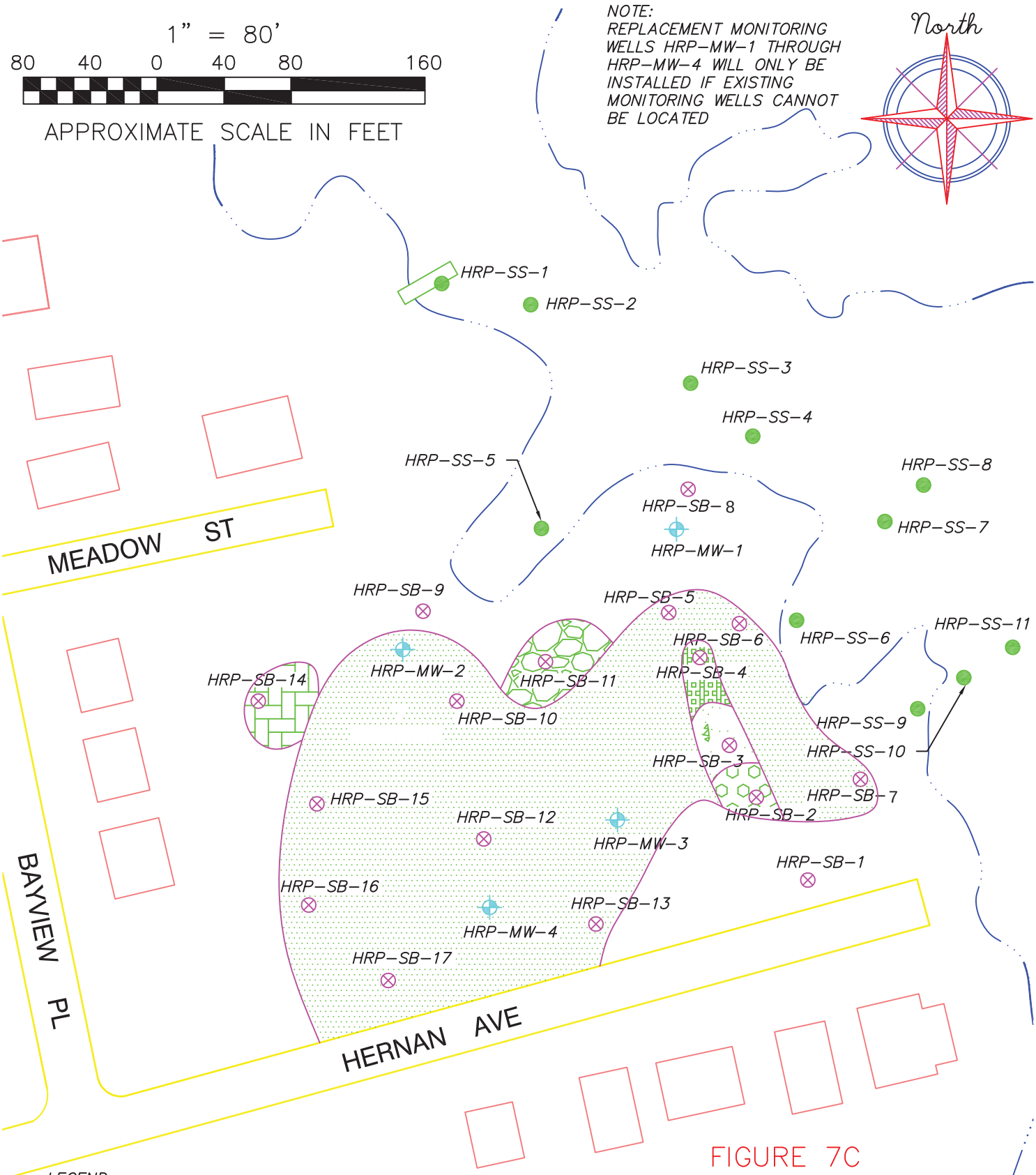
FIGURE 7A
SURFICIAL SOIL MAPS – SURFACE
MILL NECK
MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 80'



LEGEND

- –SEDIMENT SAMPLE
- –MONITORING WELL
- –SOIL SAMPLE/ GROUNDWATER SAMPLE
- –SAND
- –SAND AND GRAVEL
- –GRAVEL, SILT
- –SAND, SOME SILT, SOME GRAVEL
- –SAND AND COBBLES

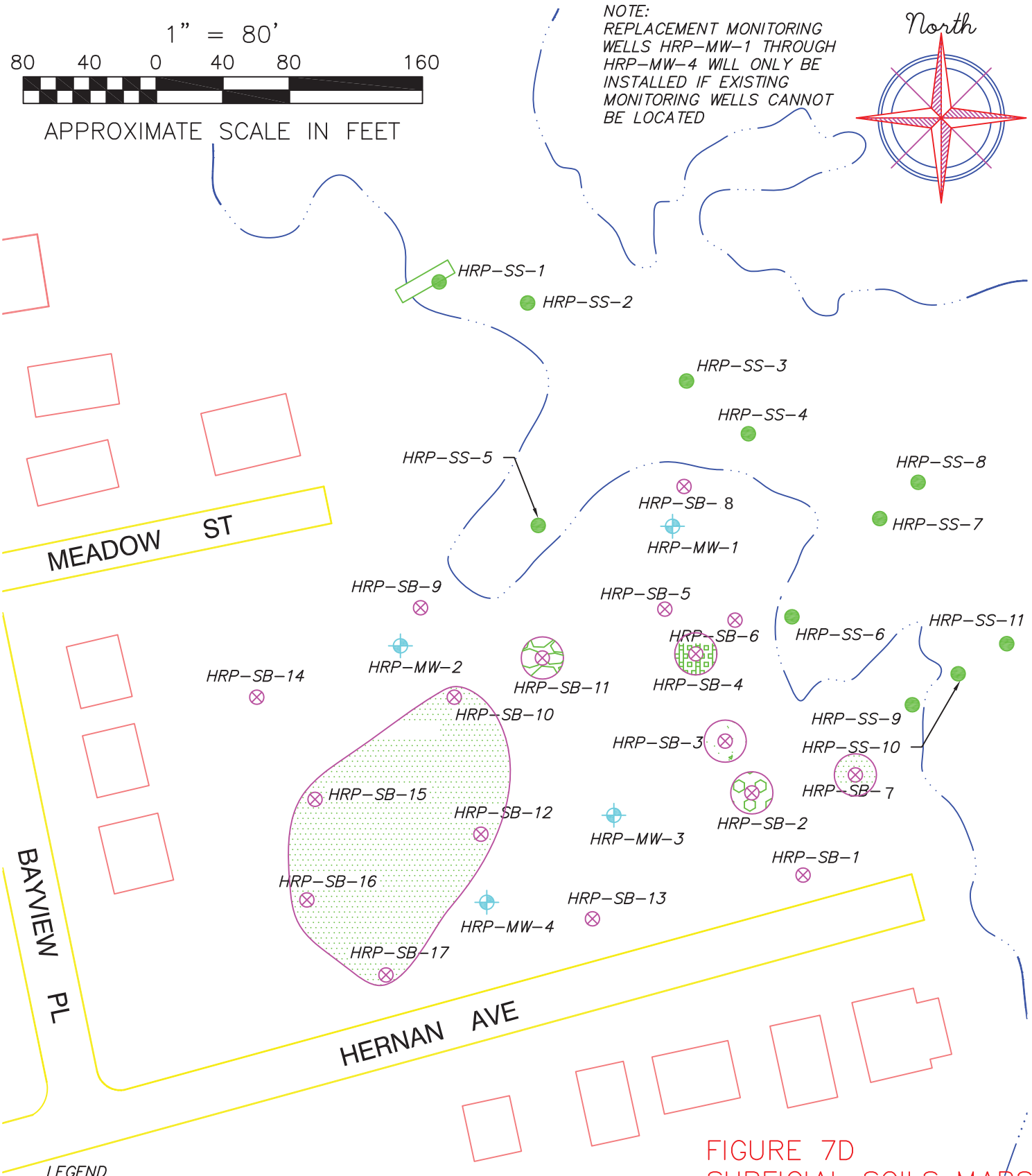
FIGURE 7B
SURFICIAL SOIL MAPS – 1 FOOT
MILL NECK MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 80'



LEGEND

- –SEDIMENT SAMPLE
- –MONITORING WELL
- –SOIL SAMPLE/ GROUNDWATER SAMPLE
- –SAND
- –SAND AND GRAVEL
- –GRAVEL, SILT
- –SAND AND COBBLES
- –GRAVEL, SOME SAND
- –BLACK GRAVEL

FIGURE 7C
SURFICIAL SOIL MAPS – 2 FOOT
MILL NECK
MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 80'



LEGEND

- –SEDIMENT SAMPLE
- –MONITORING WELL
- –SOIL SAMPLE/ GROUNDWATER SAMPLE
- –SAND
- –GRAVEL, SOME SAND
- –SAND AND GRAVEL
- –BLACK GRAVEL
- –SILT AND COBBLES

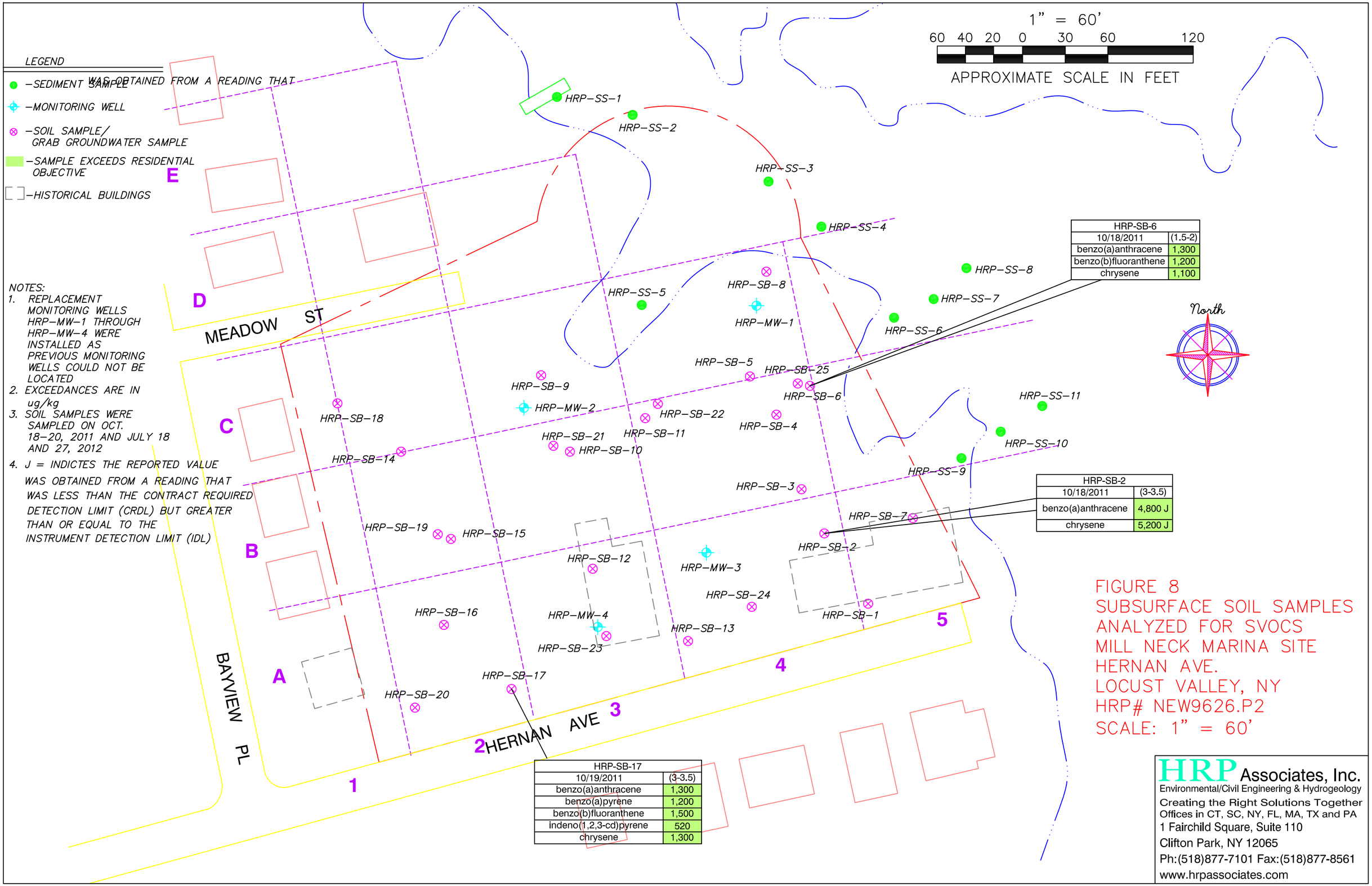
FIGURE 7D
SURFICIAL SOILS MAPS – 3 FOOT
FORMER MILL NECK MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 80'

LEGEND

- –SEDIMENT SAMPLE
- –MONITORING WELL
- –SOIL SAMPLE/ GRAB GROUNDWATER SAMPLE
- –SAMPLE EXCEEDS RESIDENTIAL OBJECTIVE
- [ ]–HISTORICAL BUILDINGS

NOTES:

1. REPLACEMENT MONITORING WELLS HRP–MW–1 THROUGH HRP–MW–4 WERE INSTALLED AS PREVIOUS MONITORING WELLS COULD NOT BE LOCATED
2. EXCEEDANCES ARE IN ug/kg
3. SOIL SAMPLES WERE SAMPLED ON OCT. 18–20, 2011 AND JULY 18 AND 27, 2012
4. J = INDICTES THE REPORTED VALUE WAS OBTAINED FROM A READING THAT WAS LESS THAN THE CONTRACT REQUIRED DETECTION LIMIT (CRDL) BUT GREATER THAN OR EQUAL TO THE INSTRUMENT DETECTION LIMIT (IDL)



HRP-SB-6	
10/18/2011	(1.5-2)
benzo(a)anthracene	1,300
benzo(b)fluoranthene	1,200
chrysene	1,100

HRP-SB-2	
10/18/2011	(3-3.5)
benzo(a)anthracene	4,800 J
chrysene	5,200 J

HRP-SB-17	
10/19/2011	(3-3.5)
benzo(a)anthracene	1,300
benzo(a)pyrene	1,200
benzo(b)fluoranthene	1,500
indeno(1,2,3-cd)pyrene	520
chrysene	1,300

FIGURE 8
SUBSURFACE SOIL SAMPLES ANALYZED FOR SVOCS
MILL NECK MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 60'

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LEGEND

- –SEDIMENT SAMPLE
- –MONITORING WELL
- –SOIL SAMPLE/ GROUNDWATER SAMPLE
- –VAPOR SAMPLE
- –SAMPLE EXCEEDS UNRESTRICTED OBJECTIVE
- [ ]–HISTORICAL BUILDINGS

NOTES:
1. D = REPORTED VALUE IS FROM SECONDARY ANALYSIS WITH A DILUTION FACTOR
N = INDICATES SPIKE SAMPLE RECOVERY IS NOT WITH IN CONTROL LIMITS
* = REDUCED VALUE BY 10X FOR ULTRA LOW SENSITIVTY OPTION
2. EXCEEDANCES ARE IN mg/kg
3. SOIL SAMPLES WERE SAMPLED ON OCT. 18–20, 2011 AND JULY 18 AND 27, 2012

1" = 60'
60 40 20 0 30 60 120
APPROXIMATE SCALE IN FEET

North

MEADOW ST
BAYVIEW PL
HERNAN AVE
A B C D E 1 2 3 4 5

HRP-SS-1
HRP-SS-2
HRP-SS-3
HRP-SS-4
HRP-SS-5
HRP-SS-6
HRP-SS-7
HRP-SS-8
HRP-SS-9
HRP-SS-10
HRP-SS-11
HRP-SB-1
HRP-SB-2
HRP-SB-3
HRP-SB-4
HRP-SB-5
HRP-SB-6
HRP-SB-7
HRP-SB-8
HRP-SB-9
HRP-SB-10
HRP-SB-11
HRP-SB-12
HRP-SB-13
HRP-SB-14
HRP-SB-15
HRP-SB-16
HRP-SB-17
HRP-SB-18
HRP-SB-19
HRP-SB-20
HRP-SB-21
HRP-SB-22
HRP-SB-23
HRP-SB-24
HRP-SB-25
HRP-MW-1
HRP-MW-2
HRP-MW-3
HRP-MW-4

HRP-SB-11	
10/19/2011	(2.5-3)
ARSENIC	24.4
COPPER	329 N
LEAD	148 N
ZINC	111
MERCURY	3.12 D

HRP-SB-22		
7/18/2012	(4-5)	(5-6)
LEAD	153	
MERCURY	0.292	

HRP-SB-6	
10/18/2011	(1.5-2)
COPPER	71.3
LEAD	71.9
MERCURY	1.13*D

HRP-SB-21		
7/18/2012	(4-5)	(5-6)
COPPER	114	
LEAD	101	
MERCURY	1.21	0.284

HRP-SB-3	
10/18/2011	(2-2.5)
MERCURY	0.184*

HRP-SB-18		
7/27/2012	(3-4)	(4-5)
COPPER	52.5	81.1
LEAD	144	

HRP-SB-10	
10/19/2011	(2.5-3)
COPPER	180
LEAD	66.4
ZINC	118
MERCURY	4.53*D

HRP-SB-15	
10/20/2011	(2.5-3)
LEAD	92.9 N

HRP-SB-16	
	(2.5-3)
LEAD	430 N
MERCURY	0.494

HRP-SB-24		
7/18/2012	(4-5)	(5-6)
MERCURY	0.5	

HRP-SB-23		
7/18/2012	(4-5)	(5-6)
COPPER	55.3	74.3
LEAD		77.7
MERCURY	0.508	2.9

HRP-SB-13	
10/19/2011	(2-2.5)
MERCURY	0.482

HRP-SB-20		
7/18/2012	(3-4)	(4-5)
Mercury		0.188
Lead	7.83	27.3

HRP-SB-17	
10/20/2011	(2-2.5)
MERCURY	0.507

HRP-SB-12	
10/19/2011	(2.5-3)
COPPER	120 N
LEAD	127 N
MERCURY	3.52 D

FIGURE 9
SUBSURFACE SOIL SAMPLES ANALYZED FOR METALS
MILL NECK MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 60'

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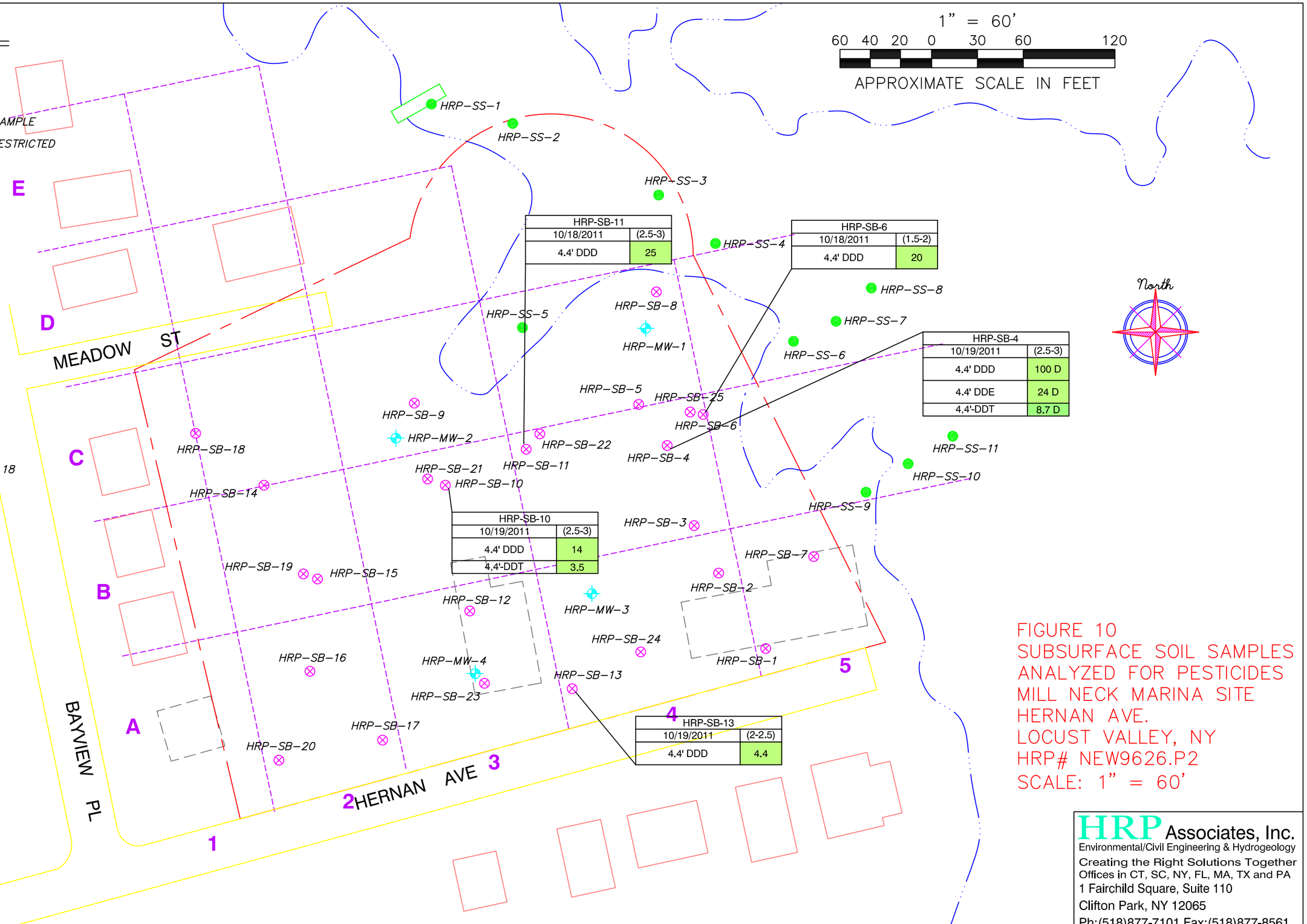
LEGEND

- –SEDIMENT SAMPLE
- –MONITORING WELL
- –SOIL SAMPLE/ GRAB GROUNDWATER SAMPLE
- –SAMPLE EXCEEDS UNRESTRICTED OBJECTIVE
- –HISTORICAL BUILDING

NOTES:

1. REPLACEMENT MONITORING WELLS HRP–MW–1 THROUGH HRP–MW–4 WERE INSTALLED AS PREVIOUS MONITORING WELLS COULD NOT BE LOCATED
2. EXCEEDANCES ARE IN ug/kg
3. SOIL SAMPLES WERE SAMPLED ON OCT. 18–20, 2011 AND JULY 18 AND 27, 2012
4. D = REPORTED VALUE IS FROM A SECONDARY ANALYSIS WITH A DIFFUSION FACTOR



HRP-SB-11	
10/18/2011	(2.5-3)
4.4' DDD	25

HRP-SB-6	
10/18/2011	(1.5-2)
4.4' DDD	20

HRP-SB-4	
10/19/2011	(2.5-3)
4.4' DDD	100 D
4.4' DDE	24 D
4,4'-DDT	8.7 D

HRP-SB-10	
10/19/2011	(2.5-3)
4.4' DDD	14
4,4'-DDT	3.5

HRP-SB-13	
10/19/2011	(2-2.5)
4.4' DDD	4.4

FIGURE 10
SUBSURFACE SOIL SAMPLES ANALYZED FOR PESTICIDES
MILL NECK MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 60'

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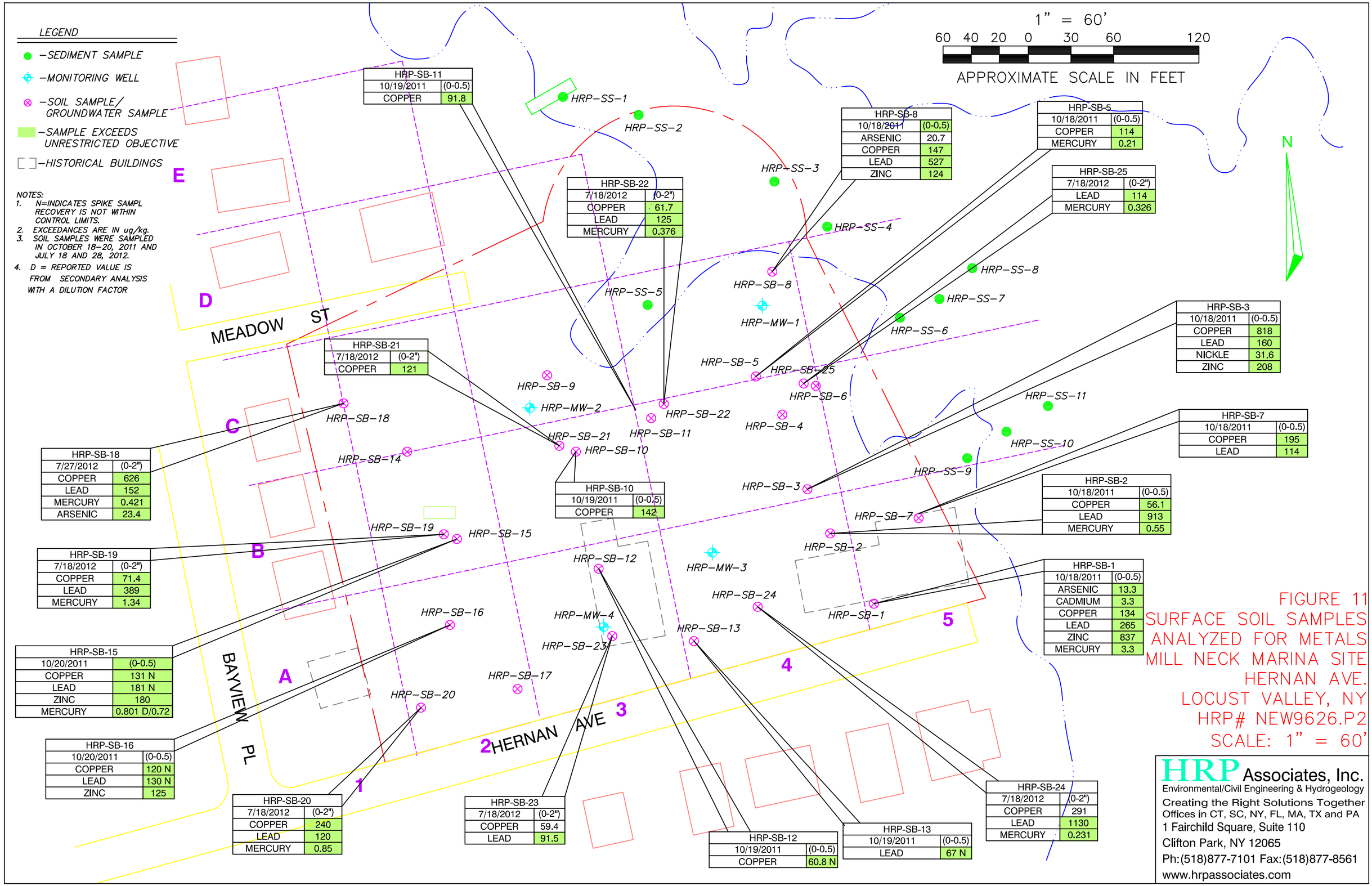

FIGURE 11
SURFACE SOIL SAMPLES ANALYZED FOR METALS
MILL NECK MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 60'

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LEGEND

- –SEDIMENT SAMPLE
- –MONITORING WELL
- –SOIL SAMPLE/ GRAB GROUNDWATER SAMPLE
- –SAMPLE EXCEEDS UNRESTRICTED OBJECTIVE
- –HISTORICAL BUILDINGS

NOTES:

1. REPLACEMENT MONITORING WELLS HRP–MW–1 THROUGH HRP–MW–4 WERE INSTALLED AS PREVIOUS MONITORING WELLS COULD NOT BE LOCATED
2. EXCEEDANCES ARE IN ug/kg
3. SOIL SAMPLES WERE SAMPLED ON OCT. 18–20, 2011 AND JULY 18 AND 27, 2012
4. P = >25 % DIFFERENCE FOR DETECTED CONCENTRATIONS BETWEEN THE 2 GC COLUMNS

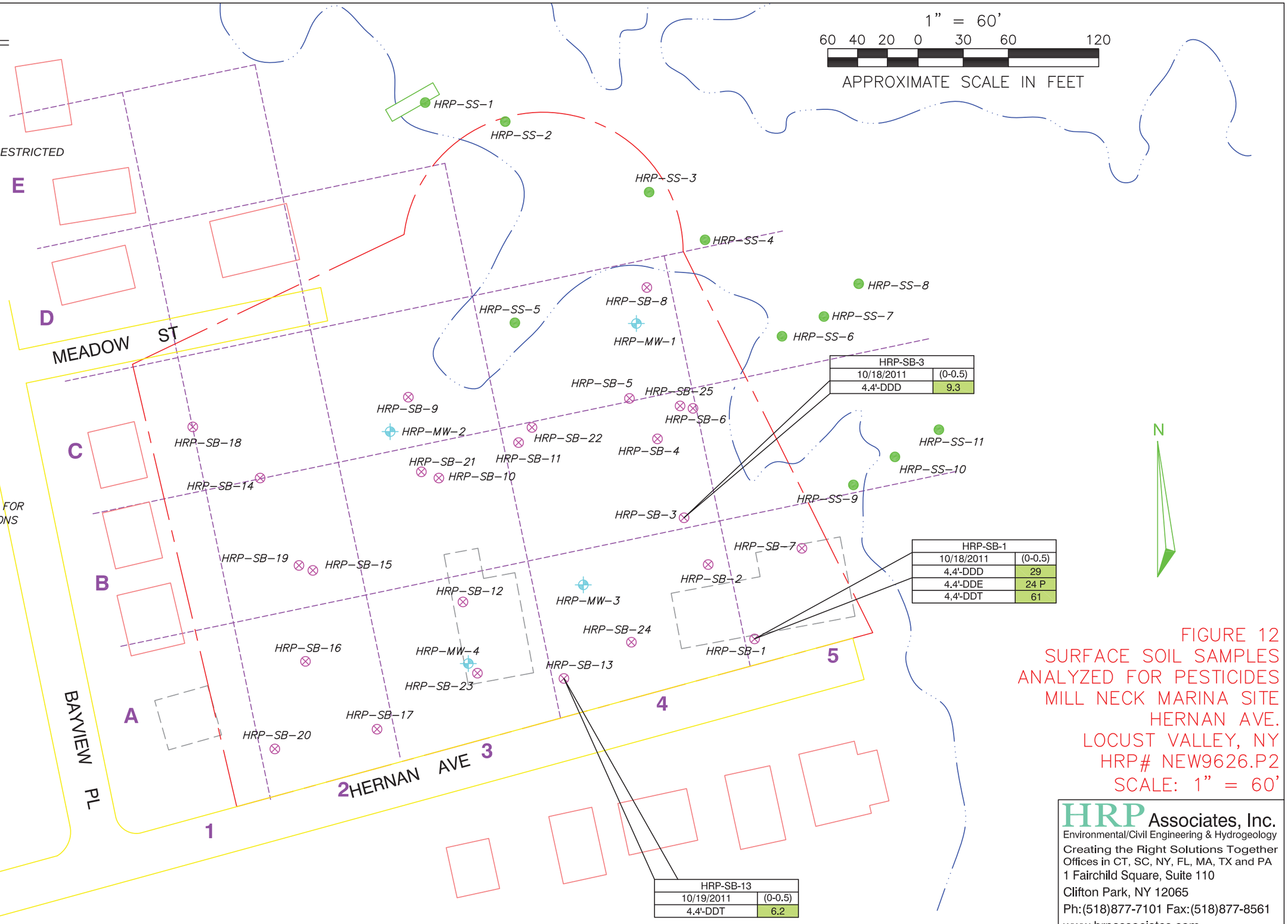

FIGURE 12
SURFACE SOIL SAMPLES ANALYZED FOR PESTICIDES
MILL NECK MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 60'

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LEGEND

- –SEDIMENT SAMPLE
- –MONITORING WELL
- –SOIL SAMPLE/ GROUNDWATER SAMPLE
- –DIV. OF FISH AND WILDLIFE – CRITERIA FOR EFFECT RANGE LOW ug/kg
- –DIV. OF FISH AND WILDLIFE – CRITERIA FOR EFFECT RANGE MEDIAN ug/kg

NOTES:
1. BORING DEPTHS ARE MEASURED IN FEET
2. EXCEEDANCES ARE IN mg/kg
3. SEDIMENT SAMPLES WERE SAMPLED ON NOV. 8, 2011

HRP-SS-1		
	(0-0.5)	(0.5-1)
BENZO(A)ANTHRACENE	2100	450
BENZO(A)PYRENE	1500	
CHRYSENE	2000	420
ACENAPHTHENE	340	
ANTHRACENE	860	
FLUORANTHENE	4100	720
FLUORENE	320	

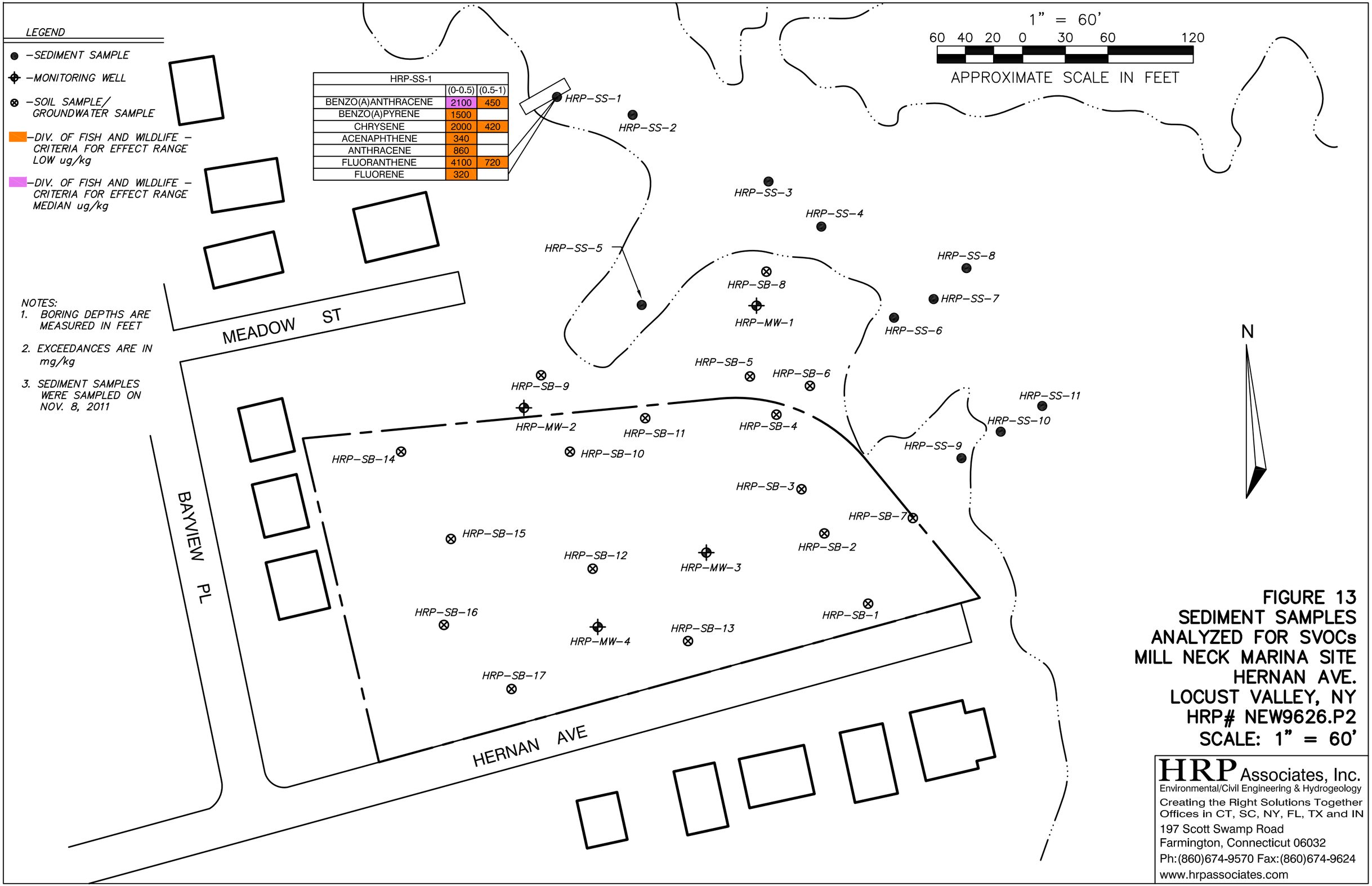

FIGURE 13
SEDIMENT SAMPLES ANALYZED FOR SVOCs
MILL NECK MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 60'

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S:\data\NYNEWEN – NY STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION\MILL NECK MARINA, HERNAN AVENUE, OYSTER BAY, NY\NEW9626P2\CADV16 13 – SEDIMENT SAMPLES – SVOCs.dwg, 11X17 LANDSCAPE, 5/15/2013 3:26:02 PM

LEGEND

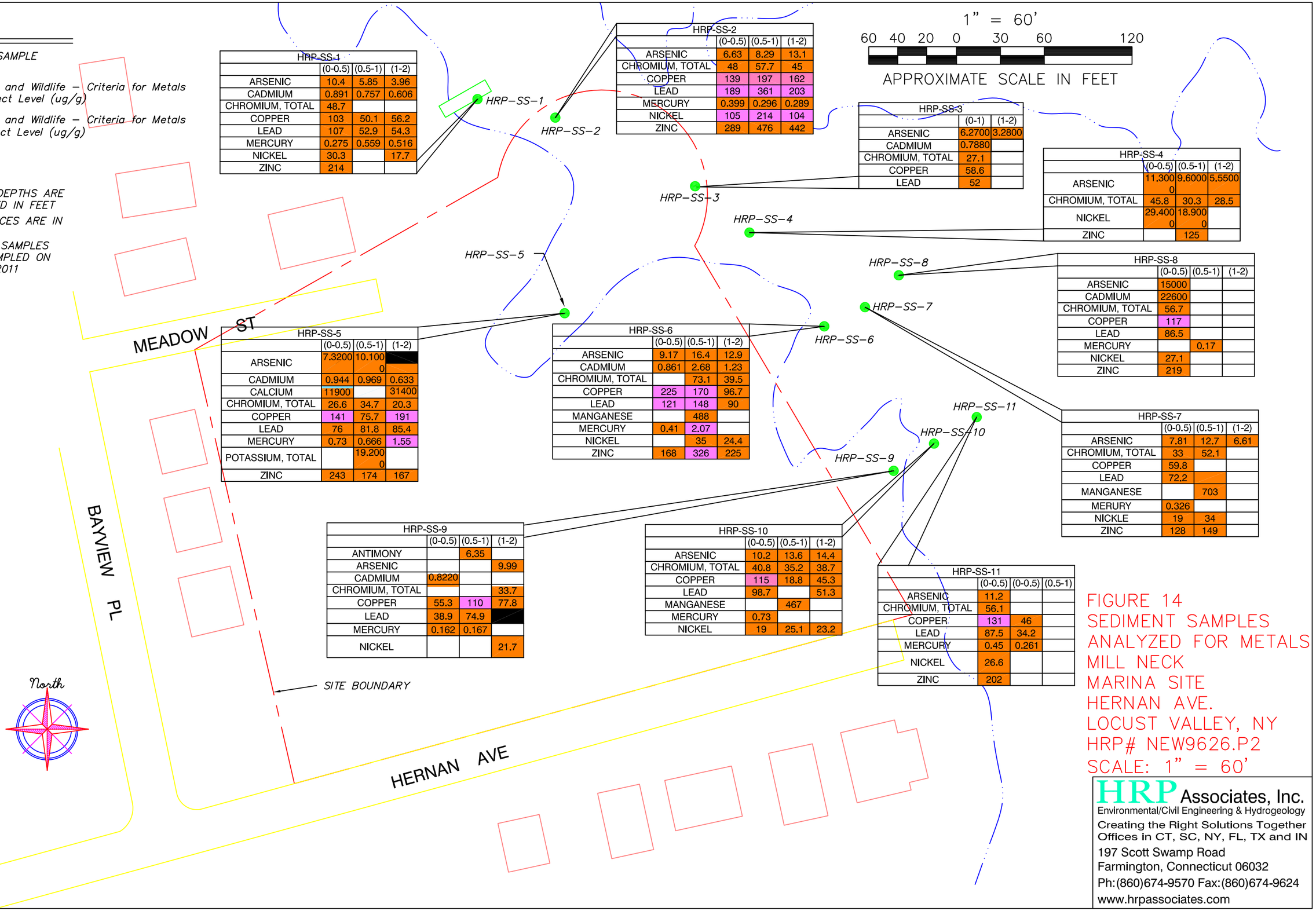
- –SEDIMENT SAMPLE
- Div of Fish and Wildlife – Criteria for Metals Lowest Effect Level (ug/g)
- Div of Fish and Wildlife – Criteria for Metals Severe Effect Level (ug/g)

NOTES:
1. BORING DEPTHS ARE MEASURED IN FEET
2. EXCEEDANCES ARE IN mg/kg
3. SEDIMENT SAMPLES WERE SAMPLED ON NOV. 8, 2011

1" = 60'

60 40 20 0 30 60 120

APPROXIMATE SCALE IN FEET



HRP-SS-1	(0-0.5)	(0.5-1)	(1-2)
ARSENIC	10.4	5.85	3.96
CADMIUM	0.891	0.757	0.606
CHROMIUM, TOTAL	48.7		
COPPER	103	50.1	56.2
LEAD	107	52.9	54.3
MERCURY	0.275	0.559	0.516
NICKEL	30.3		17.7
ZINC	214		

HRP-SS-2	(0-0.5)	(0.5-1)	(1-2)
ARSENIC	6.63	8.29	13.1
CHROMIUM, TOTAL	48	57.7	45
COPPER	139	197	162
LEAD	189	361	203
MERCURY	0.399	0.296	0.289
NICKEL	105	214	104
ZINC	289	476	442

HRP-SS-3	(0-1)	(1-2)
ARSENIC	6.2700	3.2800
CADMIUM	0.7880	
CHROMIUM, TOTAL	27.1	
COPPER	58.6	
LEAD	52	

HRP-SS-4	(0-0.5)	(0.5-1)	(1-2)
ARSENIC	11.3000	9.6000	5.5500
CHROMIUM, TOTAL	45.8	30.3	28.5
NICKEL	29.4000	18.9000	
ZINC		125	

HRP-SS-5	(0-0.5)	(0.5-1)	(1-2)
ARSENIC	7.3200	10.1000	
CADMIUM	0.944	0.969	0.633
CALCIUM	11900		31400
CHROMIUM, TOTAL	26.6	34.7	20.3
COPPER	141	75.7	191
LEAD	76	81.8	85.4
MERCURY	0.73	0.666	1.55
POTASSIUM, TOTAL		19.2000	
ZINC	243	174	167

HRP-SS-6	(0-0.5)	(0.5-1)	(1-2)
ARSENIC	9.17	16.4	12.9
CADMIUM	0.861	2.68	1.23
CHROMIUM, TOTAL		73.1	39.5
COPPER	225	170	96.7
LEAD	121	148	90
MANGANESE		488	
MERCURY	0.41	2.07	
NICKEL		35	24.4
ZINC	168	326	225

HRP-SS-7	(0-0.5)	(0.5-1)	(1-2)
ARSENIC	7.81	12.7	6.61
CHROMIUM, TOTAL	33	52.1	
COPPER	59.8		
LEAD	72.2		
MANGANESE		703	
MERURY	0.326		
NICKLE	19	34	
ZINC	128	149	

HRP-SS-8	(0-0.5)	(0.5-1)	(1-2)
ARSENIC	15000		
CADMIUM	22600		
CHROMIUM, TOTAL	56.7		
COPPER	117		
LEAD	86.5		
MERCURY		0.17	
NICKEL	27.1		
ZINC	219		

HRP-SS-9	(0-0.5)	(0.5-1)	(1-2)
ANTIMONY		6.35	
ARSENIC			9.99
CADMIUM	0.8220		
CHROMIUM, TOTAL			33.7
COPPER	55.3	110	77.8
LEAD	38.9	74.9	
MERCURY	0.162	0.167	
NICKEL			21.7

HRP-SS-10	(0-0.5)	(0.5-1)	(1-2)
ARSENIC	10.2	13.6	14.4
CHROMIUM, TOTAL	40.8	35.2	38.7
COPPER	115	18.8	45.3
LEAD	98.7		51.3
MANGANESE		467	
MERCURY	0.73		
NICKEL	19	25.1	23.2

HRP-SS-11	(0-0.5)	(0-0.5)	(0.5-1)
ARSENIC	11.2		
CHROMIUM, TOTAL	56.1		
COPPER	131	46	
LEAD	87.5	34.2	
MERCURY	0.45	0.261	
NICKEL	26.6		
ZINC	202		

FIGURE 14
SEDIMENT SAMPLES
ANALYZED FOR METALS
MILL NECK
MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 60'

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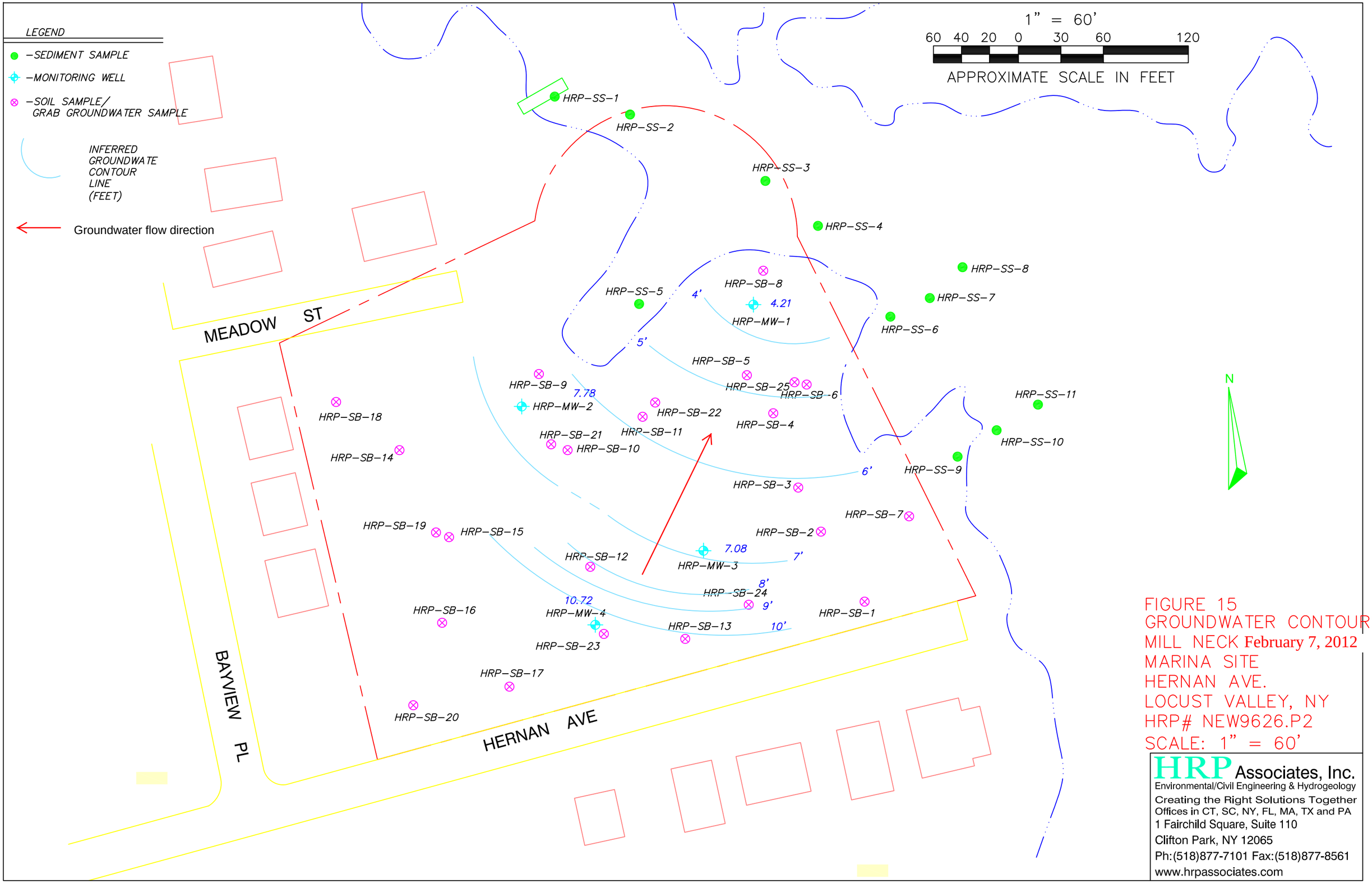

FIGURE 15
GROUNDWATER CONTOURS
MILL NECK February 7, 2012
MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 60'

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LEGEND

- –SEDIMENT SAMPLE
- –MONITORING WELL
- –SOIL SAMPLE/ GRAB GROUNDWATER SAMPLE

NOTES:
1. REPLACEMENT MONITORING WELLS HRP–MW–1 THROUGH HRP–MW–4 WERE INSTALLED AS PREVIOUS MONITORING WELLS COULD NOT BE LOCATED
2. CONCENTRATIONS ARE IN ug/L
3. GROUNDWATER SAMPLES WERE SAMPLED ON FEBRUARY 7, 2012.
4. 2-PENTANONE, 4-HYDROXY-4-METHYL HAS NO NYSDEC CLASS GA CRITERIA

1" = 60'

60 40 20 0 30 60 120

APPROXIMATE SCALE IN FEET

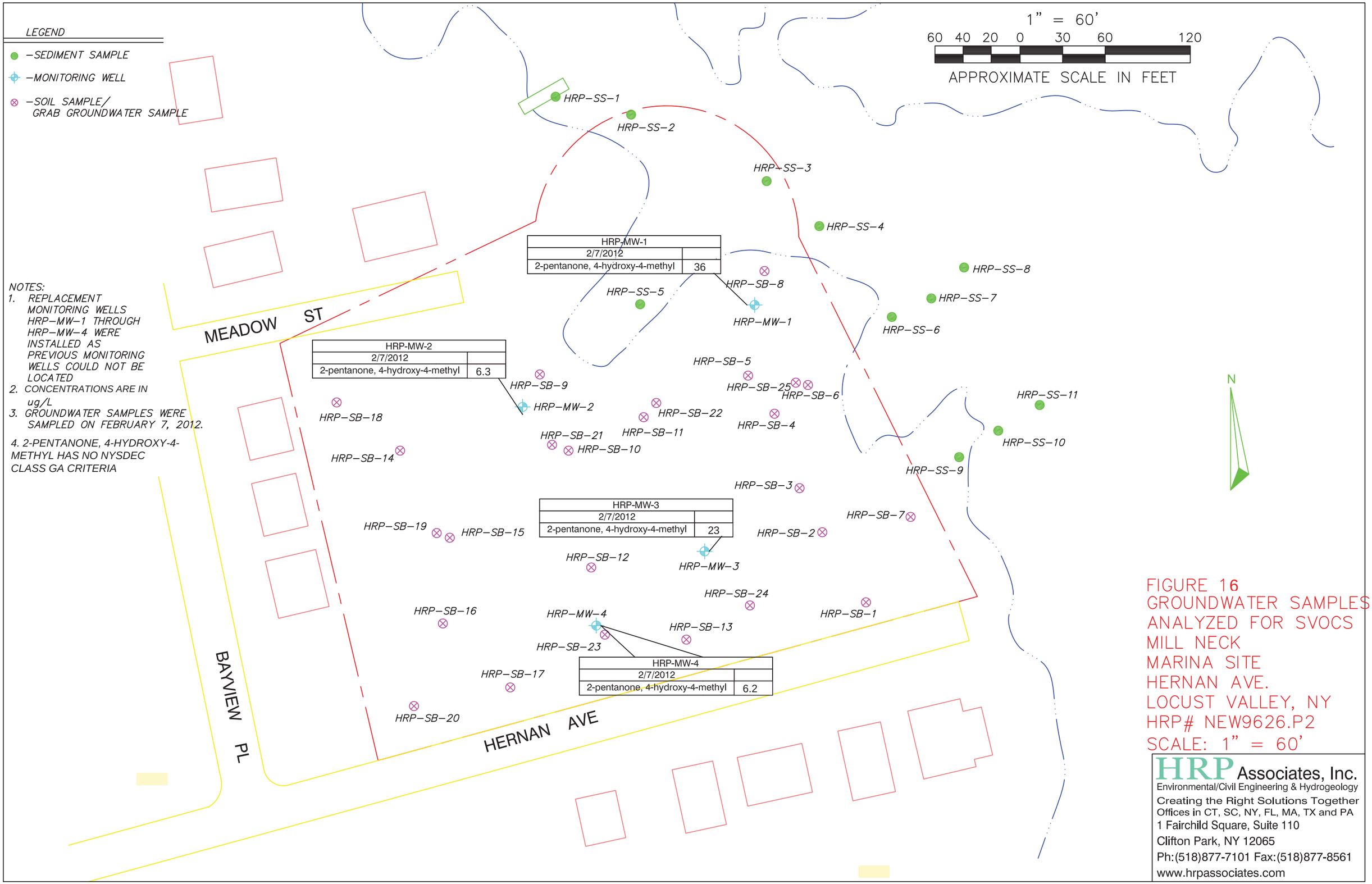

FIGURE 16
GROUNDWATER SAMPLES ANALYZED FOR SVOCS
MILL NECK MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 60'

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LEGEND

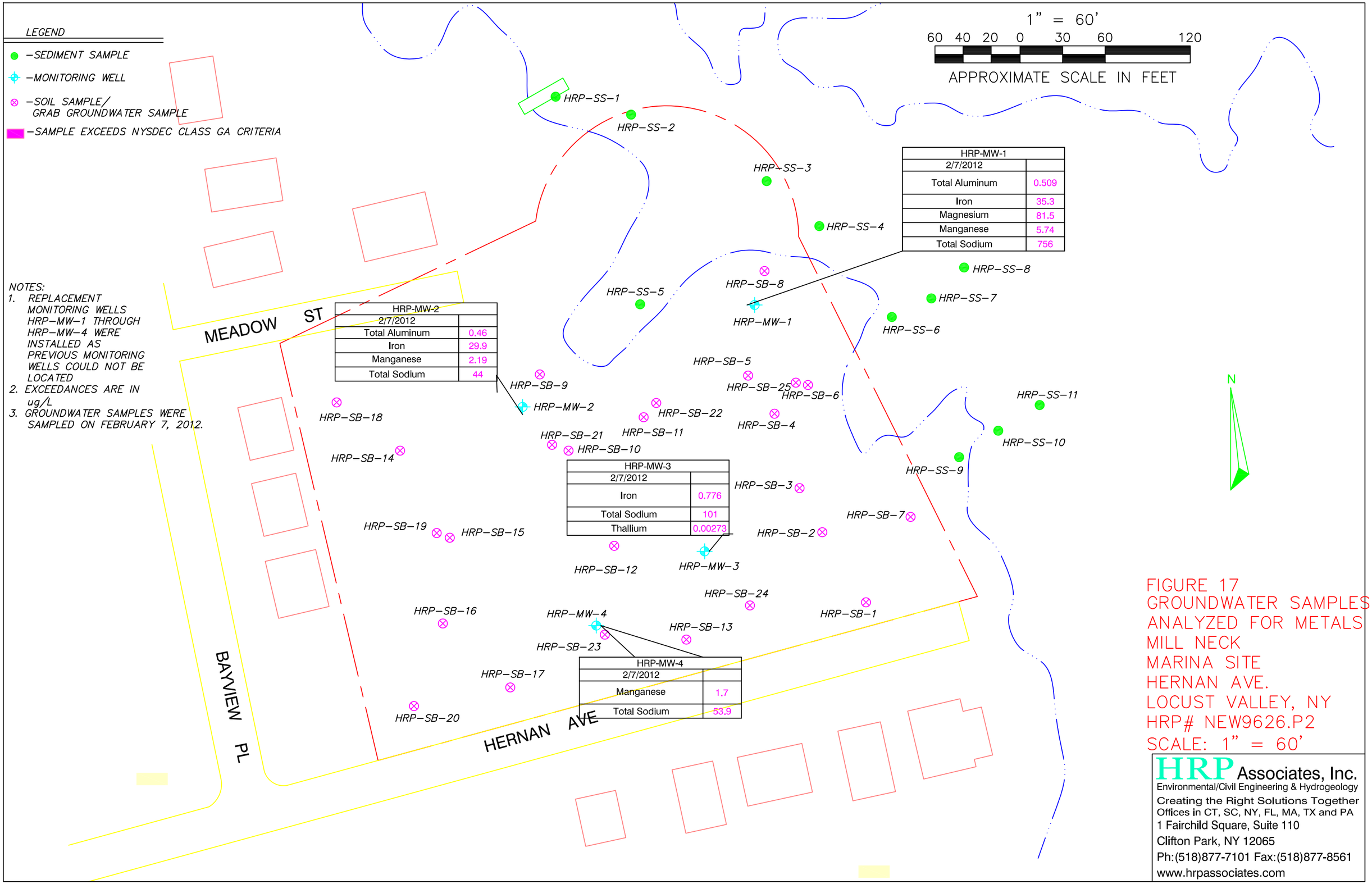
- –SEDIMENT SAMPLE
- –MONITORING WELL
- –SOIL SAMPLE/ GRAB GROUNDWATER SAMPLE
- –SAMPLE EXCEEDS NYSDEC CLASS GA CRITERIA

NOTES:
1. REPLACEMENT MONITORING WELLS HRP–MW–1 THROUGH HRP–MW–4 WERE INSTALLED AS PREVIOUS MONITORING WELLS COULD NOT BE LOCATED
2. EXCEEDANCES ARE IN ug/L
3. GROUNDWATER SAMPLES WERE SAMPLED ON FEBRUARY 7, 2012.

1" = 60'

60 40 20 0 30 60 120

APPROXIMATE SCALE IN FEET



HRP-MW-1	
2/7/2012	
Total Aluminum	0.509
Iron	35.3
Magnesium	81.5
Manganese	5.74
Total Sodium	756

HRP-MW-2	
2/7/2012	
Total Aluminum	0.46
Iron	29.9
Manganese	2.19
Total Sodium	44

HRP-MW-3	
2/7/2012	
Iron	0.776
Total Sodium	101
Thallium	0.00273

HRP-MW-4	
2/7/2012	
Manganese	1.7
Total Sodium	53.9

FIGURE 17
GROUNDWATER SAMPLES ANALYZED FOR METALS
MILL NECK
MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 60'

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LEGEND

- –SEDIMENT SAMPLE
- –MONITORING WELL
- –SOIL SAMPLE/ GROUNDWATER SAMPLE
- –VAPOR SAMPLE
- –HISTORICAL BORINGS (SAMPELD BY OTS ASSOCIATES, 2005)
- –HISTORICAL SOIL SAMPLES (SAMPLED BY CASHIN ASSOCIATES, 2004)
- –CONCENTRATION OF COPPER IN mg/kg

NOTES:
1. EXCEEDANCES ARE IN mg/kg

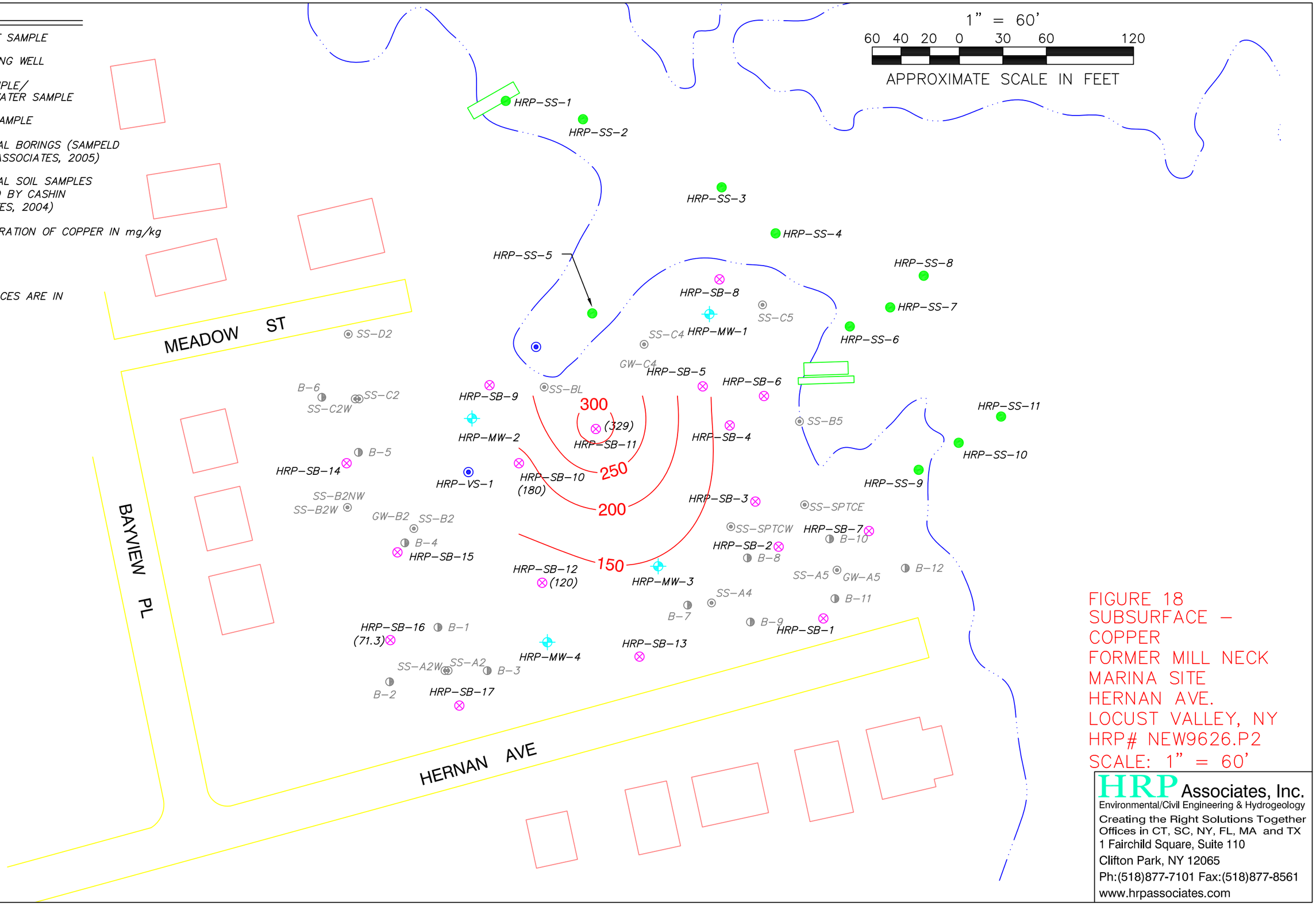

FIGURE 18
SUBSURFACE – COPPER
FORMER MILL NECK MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 60'

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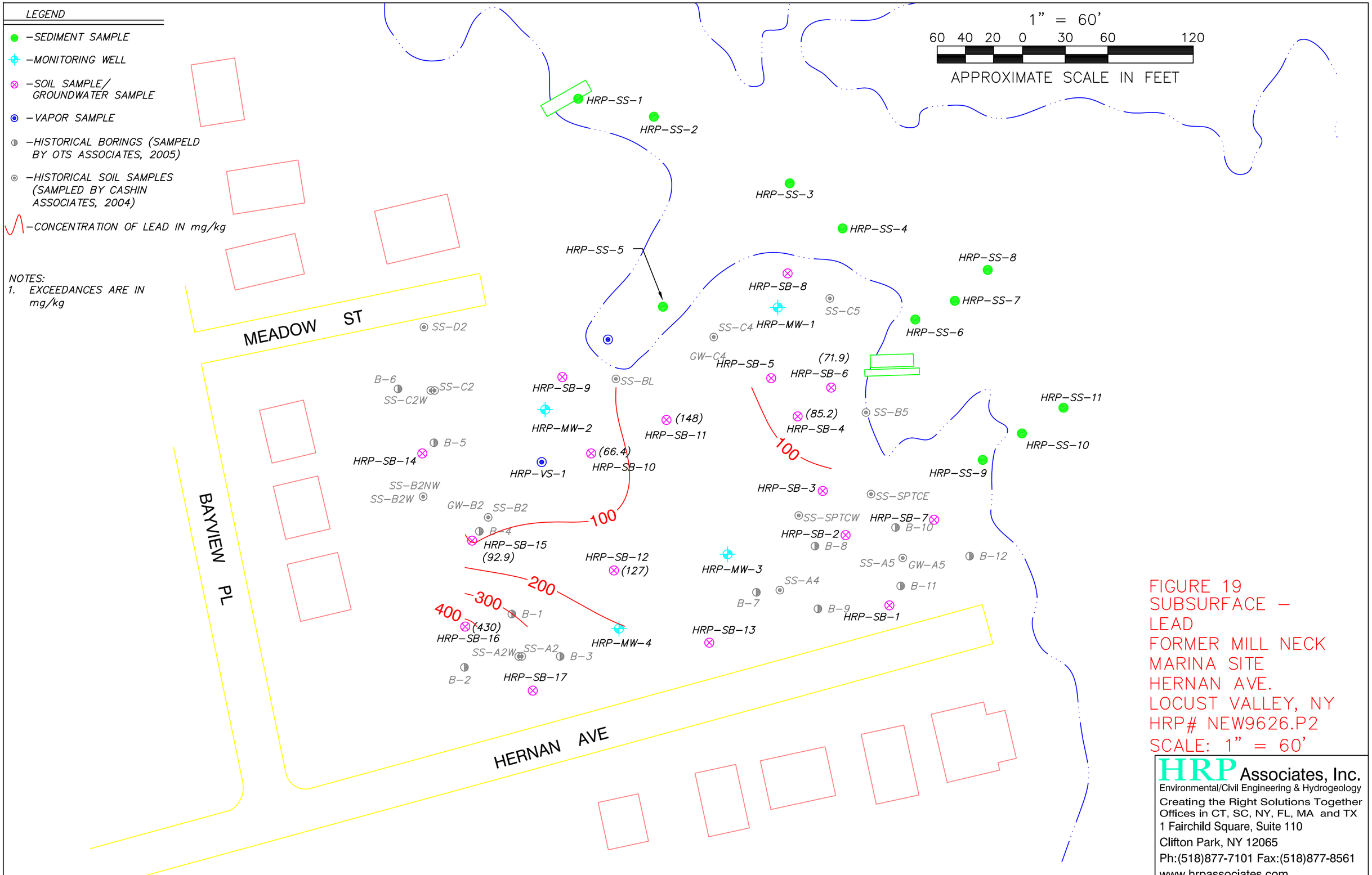

FIGURE 19
SUBSURFACE – LEAD
FORMER MILL NECK MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 60'

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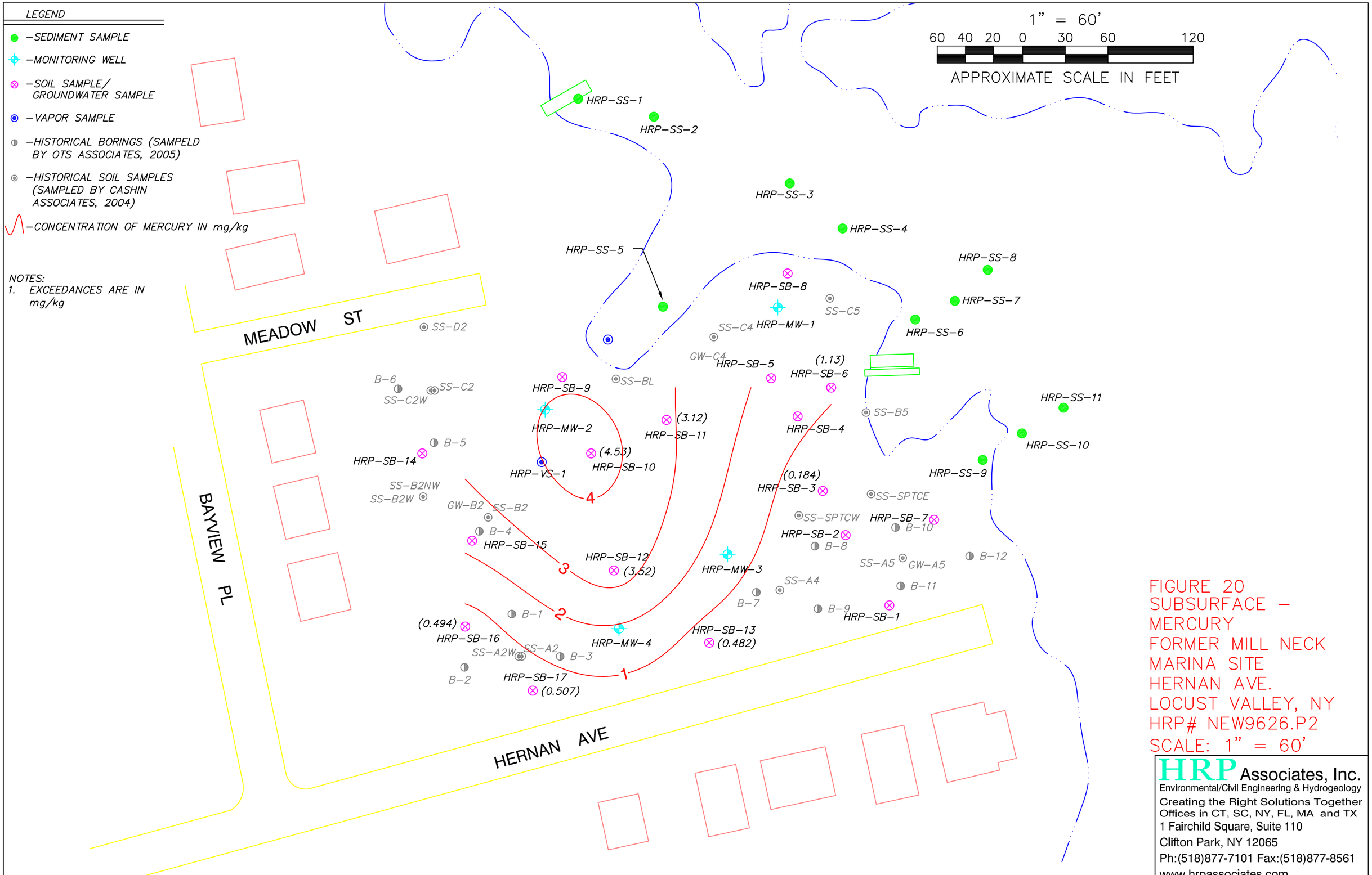

FIGURE 20
SUBSURFACE – MERCURY
FORMER MILL NECK MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 60'

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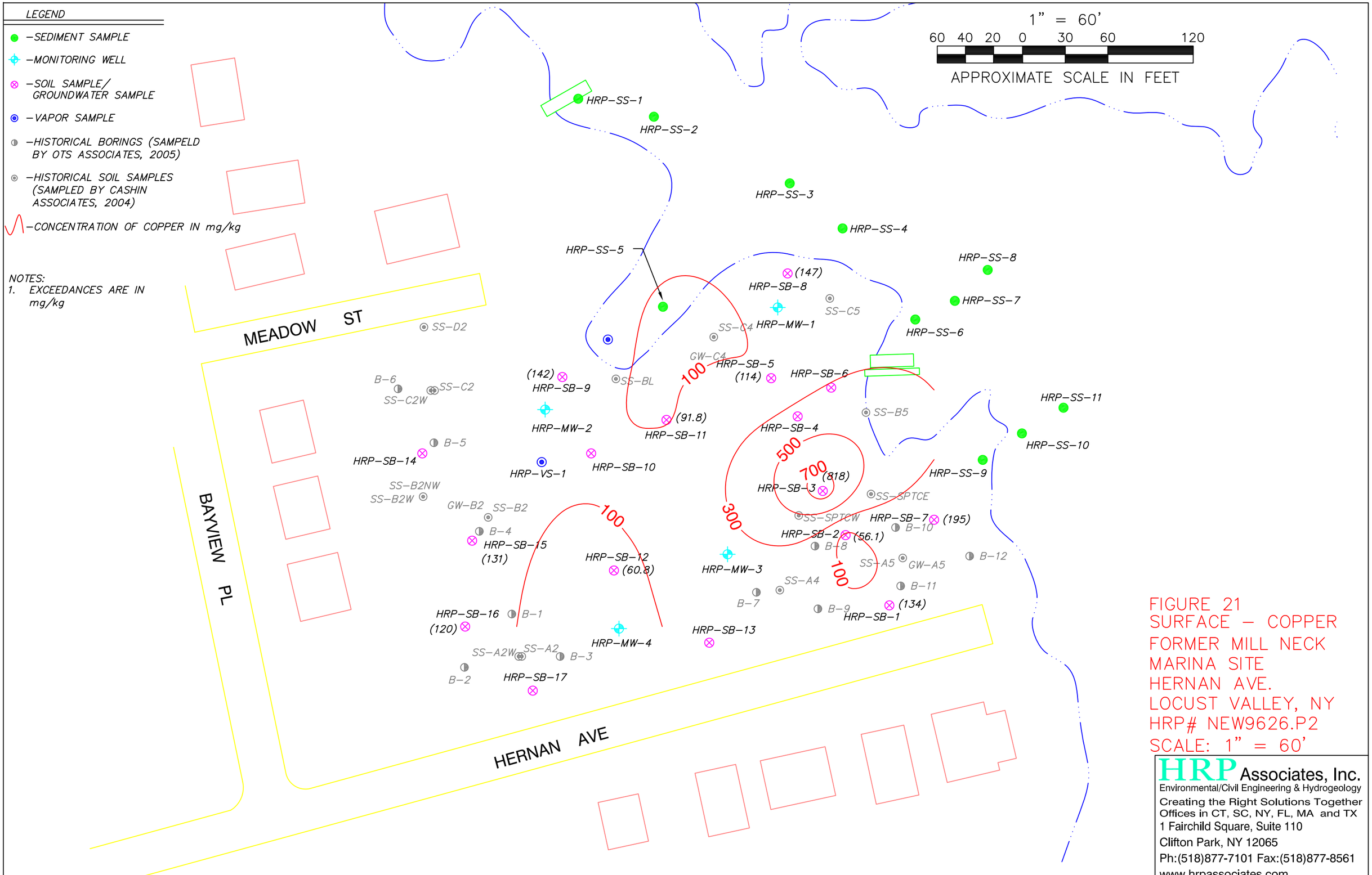

FIGURE 21
SURFACE – COPPER
FORMER MILL NECK
MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 60'

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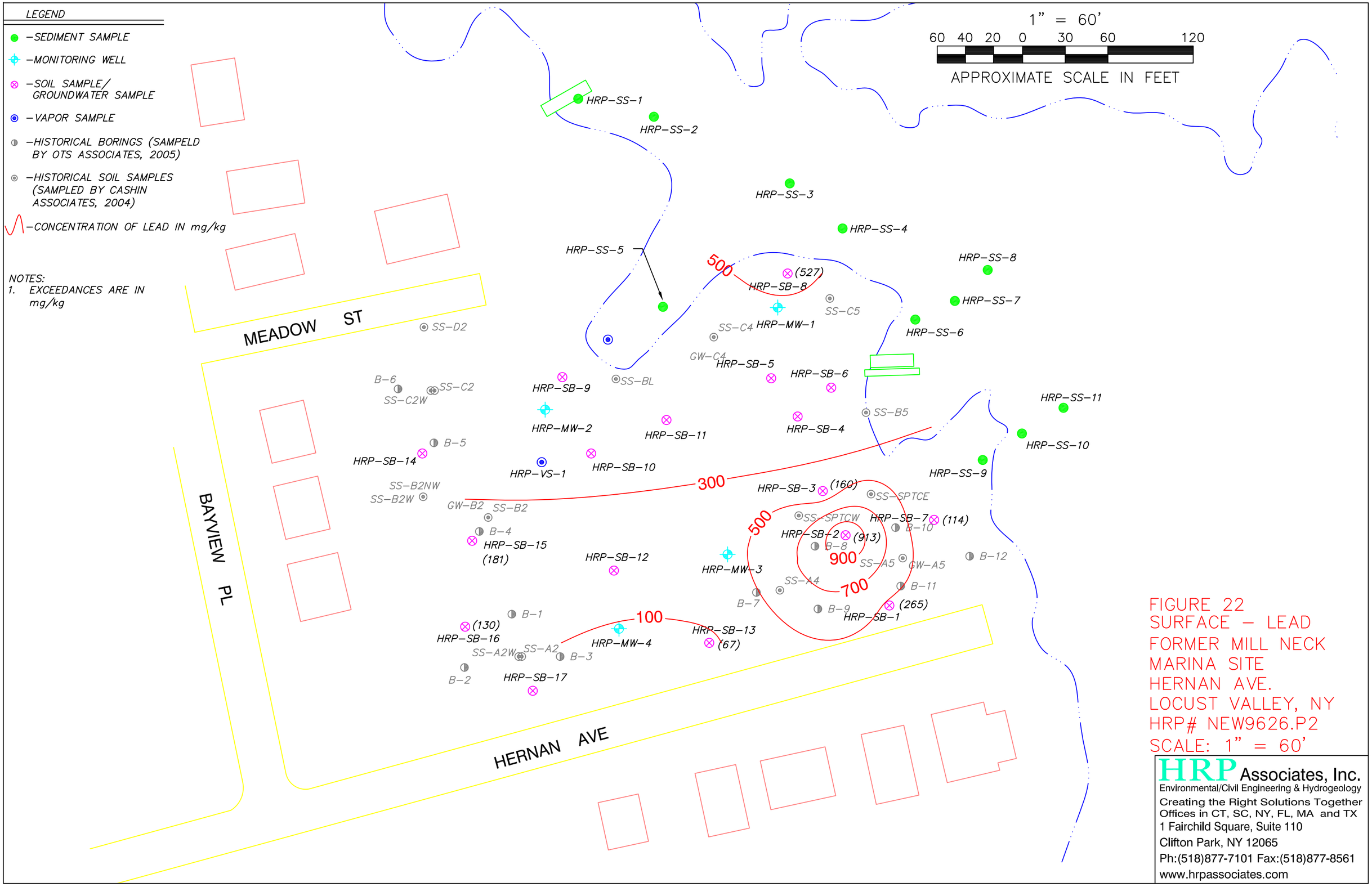

FIGURE 22
SURFACE – LEAD
FORMER MILL NECK
MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 60'

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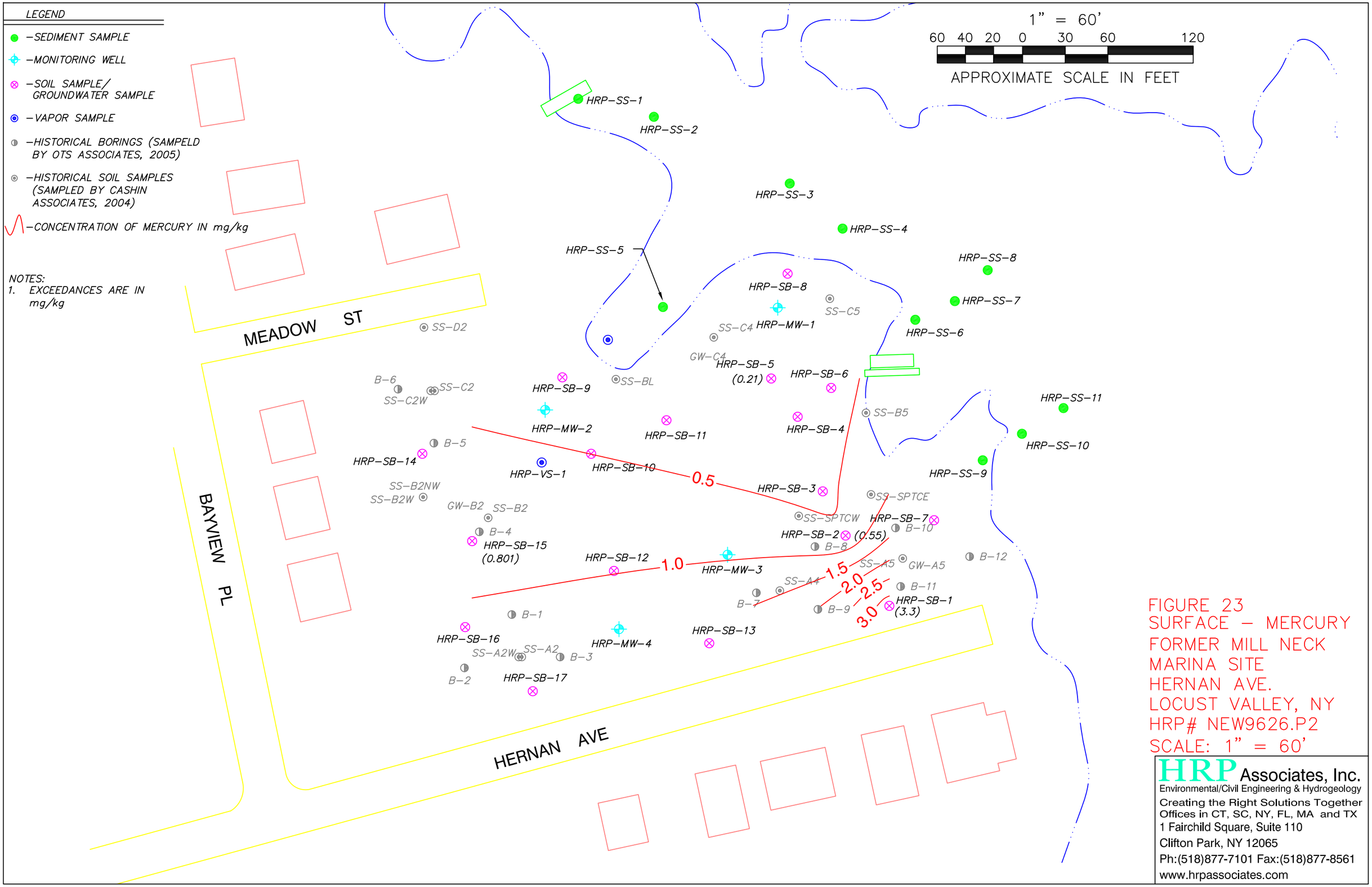

FIGURE 23
SURFACE – MERCURY
FORMER MILL NECK
MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 60'

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Table 1
Mill Neck Marina (Site # 130166)
Hernan Avenue
Locust Valley (Oyster Bay), New York
October 18 through October 20, 2011
375-6 SCO - Protection of Public Health - Unrestricted and Residential, Restricted
Subsurface Soil Samples -Analyzed for Volatile Organic Compounds (VOCs) and Semi-Volatile Organic Compounds (SVOCs)
(Only detected constituents are listed)

Soil-VOCs, SVOCs	CAS #	HRP-SB-2	HRP-SB-2	HRP-SB-3	HRP-SB-4	HRP-SB-5	HRP-SB-6	HRP-SB-8	HRP-SB-10	HRP-SB-11	HRP-SB-12	HRP-SB-13	HRP-SB-15	HRP-SB-16	HRP-SB-17	375-6 SCO - Unrestricted	Protection of Public Health Residential
Sample Depth (feet)		(1-1.5)	(3-3.5)	(2-2.5)	(2-2.5)	(2-2.5)	(1.5-2)	(4.5-5)	(2.5-3)	(2.5-3)	(2.5-3)	(2-2.5)	(2.5-3)	(2.5-3)	(3-3.5)		
Date Collected		10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/19/2011	10/19/2011	10/19/2011	10/19/2011	10/20/2011	10/20/2011	10/20/2011		
Volatile Organic Compounds (VOCs) ug/kg																	
1,1,2,2-Tetrachloroethane	79-34-5	ND<5.7	ND<5.6	ND<5.9	**2.8 J**	**2.3 J**	ND<6.5	**6.7 J**	ND<5.6	**2.5 J**	**6.6**	**4.8 J**	**15**	**49**	**7.8**	**NE**	**NE**
Acetone	67-64-1	ND<28	**21 J**	**13 J**	**12 J**	ND<28	ND<33	ND<35	ND<28	ND<27	ND<29	ND<28	**20 J**	**19 J**	ND<27	**50**	**100,000**
Carbon disulfide	75-15-0	ND<5.7	ND<5.6	ND<5.9	ND<5.5	ND<5.6	ND<6.5	**29**	ND<5.6	ND<5.4	ND<5.7	ND<5.5	ND<5.9	**3.9 J**	ND<5.4	**NE**	**NE**
Trichloroethylene	79-01-6	ND<5.7	ND<5.6	ND<5.9	ND<5.5	ND<5.6	ND<6.5	ND<6.9	ND<5.6	ND<5.4	ND<5.7	ND<5.5	**2.5 J**	**6 J**	ND<5.4	**470**	**10,000**
Semi-Volital Organic Compounds (SVOCs) ug/kg																	
Benzo(a)anthracene	56-55-3	**230 J**	**4,800 J**	**160 J**	ND<360	ND<370	**1300**	ND<460	ND<370	ND<360	ND<380	ND<360	ND<390	ND<480	**1300**	**1,000**	**1,000**
Benzo(a)pyrene	50-32-8	**220 J**	ND<11000	ND<380	ND<360	ND<370	**910**	ND<460	ND<370	ND<360	ND<380	ND<360	ND<390	ND<480	**1200**	**1,000**	**1,000**
Benzo(b)fluoranthene	205-99-2	**280 J**	ND<11000	**220 J**	**160 J**	ND<370	**1200**	ND<460	ND<370	ND<360	ND<380	ND<360	ND<390	ND<480	**1500**	**1,000**	**1,000**
Chrysene	218-01-9	**230 J**	**5,200 J**	**170 J**	ND<360	ND<370	**1100**	ND<460	ND<370	ND<360	ND<380	ND<360	ND<390	ND<480	**1,300**	**1,000**	**1,000**
Indeno(1,2,3-cd)pyrene	193-39-5	ND<380	ND<11,000	ND<380	ND<360	ND<370	**350 J**	ND<460	ND<370	ND<360	ND<380	ND<360	ND<390	ND<480	**520**	**500**	**500**

Bold	Sample is Above Non-Detect Value but Below Objective
Bold	Sample Exceeds Unrestricted Objective
Bold	Sample Exceeds Residential Objective
NE	Not Established
ND<###	Sample is Non-Detect at Laboratory
ug/kg	Micrograms per Kilogram
J	Indicates the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL), but greater than or equal to the Instrument Detection Limit (IDL)
CAS #	Chemical Abstract Service Number

Table 2
Mill Neck Marina (Site # 130166)
Hernan Avenue
Locust Valley (Oyster Bay), New York
October 2011 and July 2012
375-6 SCO - Protection of Public Health - Unrestricted and Residential
Subsurface Soil Samples - Analyzed for TAL Metals
(Only detected constituents are listed)

Soil-Metals	CAS #	HRP-SB-2	HRP-SB-2	HRP-SB-3	HRP-SB-4	HRP-SB-5	HRP-SB-6	HRP-SB-8	HRP-SB-10	HRP-SB-11	HRP-SB-12	HRP-SB-13	HRP-SB-15	HRP-SB-16	HRP-SB-17	HRP-SB-18	HRP-SB-18	HRP-SB-19	HRP-SB-19	HRP-SB-20	HRP-SB-20	HRP-SB-21	HRP-SB-21	HRP-SB-22	HRP-SB-22	HRP-SB-23	HRP-SB-23	HRP-SB-24	HRP-SB-24	HRP-SB-25	HRP-SB-25	375-6 SCO - Unrestricted	Protection of Public Health Residential
Sample Depth (feet)		(1-1.5)	(3-3.5)	(2-2.5)	(2-2.5)	(2-2.5)	(1.5-2)	(4.5-5)	(2.5-3)	(2.5-3)	(2.5-3)	(2-2.5)	(2.5-3)	(2.5-3)	(3-3.5)	(3-4)	(4-5)	(4-5)	(5-6)	(3-4)	(4-5)	(4-5)	(5-6)	(4-5)	(5-6)	(4-5)	(5-6)	(4-5)	(5-6)	(4-5)	(5-6)		
Date Collected		10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/19/2011	10/19/2011	10/19/2011	10/19/2011	10/20/2011	10/20/2011	10/20/2011	7/27/2012	7/27/2012	7/18/2012	7/18/2012	7/18/2012	7/18/2012	7/18/2012	7/18/2012	7/18/2012	7/18/2012	7/18/2012	7/18/2012	7/18/2012	7/18/2012	7/18/2012	7/18/2012		
Metals (mg/kg)																																	
Aluminum, Total	7429-90-5	2,750	1,960	3,490	1,520	5,760	6,450	4,940	1,880	2,850*	2,490 *	839 *	1,890 *	6,330 *	3,540 *	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NE	NE
Antimony	7440-36-0	ND<2.83	ND<2.57	ND<2.02	ND<2.3	ND<2.3	0.731 J	ND<2.62	1.97 J	1.94 J	3.08	ND<2.31	0.595 J	ND<3.17	ND<2.05	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NE	NE
Arsenic	7440-38-2	4.31	3.41	2.77	18.8	3.22	5.25	1.66	5.82	24.4	4.16	4.89	3.02	7.35	3.12	NA	6.89	NA	NA	NA	NA	NA	NA	9.21	<1.03 U	NA	NA	NA	NA	NA	NA	13	16
Barium	7440-39-3	15.7	9.5	26.9	17	33	45.7	6.81	68	66.9	48.2	8.75	40.2	43.7	20.7	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	350	350
Beryllium	7440-41-7	0.199 J	0.164 J	0.229 J	0.14 J	0.326	0.361	0.181 J	0.118 J	0.176 J	0.188 J	0.16 J	0.199 J	0.416	0.231 J	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	7.2	14
Cadmium	7440-43-9	0.311 J	0.303 J	0.452	0.381	0.663	0.73	0.446	0.326	0.475	0.457	0.559	0.42	0.565	1.82	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	2.5	2.5
Calcium	7440-70-2	39,900	17,100	11,300	4,430	1,380	1,760	625	869	764*	997 *	89,400 *	530 *	2,190 *	6,720 *	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NE	NE
Chromium, Total	7440-47-3	5.51	4.32	6.95	4.81	8.65	12.7	6.69	7.3	9.71	6.56	3.67	5.51	14.6	20.4	13.4	8.26	7.75	7.38	7.54	13.4	17.9	13.4	16.8	6.75	6.53	8.07	3.52	12.6	10.4	7.55	30	36
Cobalt	7440-48-4	2.09	1.38 J	2.57	1.52	3.66	4.83	2.52	2.11	3.09	2.72	1.26 J	2.14	3.41	2.33	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NE	NE
Copper	7440-50-8	8.75	5.62	11.7	34.1	11.9	71.3	5.03	180	329 N	120 N	22.3 N	26.3 N	33.2 N	14.6 N	52.5	81.1	12.4	8.67	9.35	10.9	114	49.7	27.8	3.29	55.3	74.3	12.9	14.9	18.3	4.59	50	270
Iron	7439-89-6	4,280	4,640	5,900	5,440	8620	10,900	4,580	4,760	7,750*	7,150 *	5,940 *	4,070 *	7,830 *	8,740 *	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NE	NE
Lead	7439-92-1	20	24.2	50.1	85.2	40	71.9	7.81	66.4	148 N	127 N	28.6 N	92.9 N	430 N	41.7 N	144	62.6	13.9	26.6	7.83	27.3	101	21.1	153	5.27	42.7	77.7	16.6	29.5	16.4	9.5	63	400
Magnesium	7439-95-4	23,300	9,190	6,630	2,380	1,290	1840	1260	711	874*	667 *	55,600 *	482 *	,1540 *	4,080 *	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NE	NE
Manganese	7439-96-5	107	47.7	118	118	149	132	46.4	67.7	84.3	99.5	119	32.3	70.8	89.9	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	1600	2,000
Nickel	7440-02-0	3.77	4	5.91	3.92	6.81	8.98	6.26	4.73	6.83	6.14	3.43	4.67	11.2	12	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	30	140
Potassium, Total	7440-09-7	351	196	362	189	429	681	492	263	471	356	193	202	296	223	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NE	NE
Selenium	7782-49-2	ND<1.13	ND<1.03	ND<0.808	ND<0.919	ND<0.921	0.554 J	ND<1.05	ND<1.04	ND<0.816	ND<0.882	ND<0.925	0.619 J	ND<1.27	ND<0.82	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	3.9	36
Sodium, Total	7440-23-5	404	437	696	513	361	427	1760	117	195	212	226	141	221	154	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NE	NE
Vanadium	7440-62-2	9.62	16.8	8.8	6.3	12.9	17.4	6.69	5.97	8.81 N	8.41 N	4.11 N	6.21 N	13 N	9.7 N	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NE	NE
Zinc	7440-66-6	21.2	19.6	60.1	33.1	68.5	64.8	58.7	118	111	47.5	24.4	89.8	77.5	43.7	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	109	2,200
Mercury	7439-97-6	0.163*	0.034*	0.184*	0.051*	0.06*	1.13* D	0.028*	4.53*D	3.12 D	3.52 D	0.482	0.105	0.494	0.507	0.102	<0.014 U	0.128	0.095	0.03	0.188	1.21	0.284	0.292	<0.013 U	0.508	2.9	0.5	0.164	0.05	0.029	0.18	0.81

Bold	Sample is Above Non-Detect Value but Below Objective
Bold	Sample Exceeds Unrestricted Objective
Bold	Sample Exceeds Residential Objective
NE	Not Established
NS	Not Sampled
NA	Not Eavailable
ND<###	Sample is Non-Detect at Laboratory
mg/kg	Milligrams per Kilogram
Chromium, Total	Chromium DEC standards as shown are for Trivalent Chromium.

J	Indicates the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL), but greater than or equal to the Instrument Detection Limit (IDL)
N	Indicates spiked sample recovery is not within control limits.
D	Indicates the reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.
*	Indicates the duplicate analysis is not within control limits.
CAS #	Chemical Abstract Service Number

Table 3
Mill Neck Marina (Site # 130166)
Hernan Avenue
Locust Valley (Oyster Bay), New York
October 18 through October 20, 2011
375-6 SCO - Protection of Public Health - Unrestricted and Residential
Subsurface Soil Samples - Analyzed for Pesticides and Polychlorinated Biphenoyl's (PCBs)

Soil-Pesticides, PCBs	CAS #	HRP-SB-2	HRP-SB-2	HRP-SB-3	HRP-SB-4	HRP-SB-5	HRP-SB-6	HRP-SB-8	HRP-SB-10	HRP-SB-11	HRP-SB-12	HRP-SB-13	HRP-SB-15	HRP-SB-16	HRP-SB-17	375-6 SCO - Unrestricted	Protection of Public Health Residential
Sample Depth (feet)		(1-1.5)	(3-3.5)	(2-2.5)	(2-2.5)	(2-2.5)	(1.5-2)	(4.5-5)	(2.5-3)	(2.5-3)	(2.5-3)	(2-2.5)	(2-2.5)	(2-2.5)	(3-3.5)		
Date Collected		10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/19/2011	10/19/2011	10/19/2011	10/19/2011	10/20/2011	10/20/2011	10/20/2011		
Pesticides ug/kg																	
4,4'-DDD	72-54-8	ND<2	ND<5.6	**3**	100 D	**2.5**	20	ND<2.3	14	25	**1.5 JP**	4.4	ND<2	**2.7 P**	ND<1.9	3.3	2,600
4,4'-DDE	72-55-9	ND<2	ND<5.6	ND<2	24 D	ND<1.9	ND<2.2	ND<2.3	ND<1.9	ND<1.8	ND<2	ND<1.9	ND<2	ND<1.9	ND<1.9	3.3	1,800
4,4'-DDT	50-29-3	ND<2	ND<5.6	ND<2	8.7 D	ND<1.9	ND<2.2	ND<2.3	3.5	ND<1.8	ND<2	ND<1.9	ND<2	ND<1.9	ND<1.9	3.3	1,700
Alpha-chlordane	5103-71-9	ND<2	ND<5.6	ND<2	ND<2.1	ND<1.9	**5.3**	ND<2.3	**4.7 P**	**1.4 J**	ND<2	ND<1.9	ND<2	ND<1.9	ND<1.9	94	910
Dieldrin	60-57-1	ND<2	ND<5.6	ND<2	ND<2.1	ND<1.9	ND<2.2	ND<2.3	ND<2.3	**3.6 P**	ND<2	ND<1.9	ND<2	ND<1.9	ND<1.9	5	39
trans-Chlordane	5103-74-2	ND<2	ND<5.6	ND<2	ND<2.1	ND<1.9	**4.1**	ND<2.3	**5.4**	**1.6 JP**	ND<2	ND<1.9	ND<2	ND<1.9	ND<1.9	NE	NE
PCBs ug/kg																	
PCB-1254	11097-69-1	ND<20	ND<56	ND<23	ND<23	ND<23	ND<23	ND<23	**50 P**	**27**	ND<23	ND<23	ND<23	ND<23	ND<23	NE	NE
PCB-1260	11096-82-5	ND<20	ND<56	ND<23	ND<23	ND<23	ND<23	ND<23	<19	<18	ND<23	ND<23	ND<23	ND<23	ND<23	NE	NE
PCBs-Total		ND<20	ND<56	ND<23	ND<23	ND<23	ND<23	ND<23	**50 P**	**27**	ND<23	ND<23	ND<23	ND<23	ND<23	100	1,000

Bold	Sample is Above Non-Detect Value but Below Objective
Bold	Sample Exceeds Unrestricted Objective
Bold	Sample Exceeds Residential Objective
NE	Not Established
ND<###	Sample is Non-Detect at Laboratory
ug/kg	Micrograms per Kilogram
J	Indicates the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL), but greater than or equal to the Instrument Detection Limit (IDL)
P	This flag is used for Pesticide/PCB target analyte when there is >25% difference for detected concentrations between the two GC columns.
D	Indicates the reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.
CAS #	Chemical Abstract Service Number

Table 4
Mill Neck Marina (Site # 130166)
Hernan Avenue
Locust Valley (Oyster Bay), New York
October 18 through October 20, 2011
375-6 SCO - Protection of Public Health - Unrestricted and Residential
Surface Soil Samples - Analyzed for Volatile Organic Compounds (VOCs) and Semi-Volatile Organic Compounds (SVOCs)
(Only detected constituents are listed)

Soil-VOCs, SVOCs	CAS #	HRP-SB-1	HRP-SB-2	HRP-SB-3	HRP-SB-4	HRP-SB-5	HRP-SB-6	HRP-SB-7	HRP-SB-8	HRP-SB-9	HRP-SB-10	HRP-SB-11	HRP-SB-12	HRP-SB-13	HRP-SB-14	HRP-SB-15	HRP-SB-16	HRP-SB-17	375-6 SCO - Unrestricted	Protection of Public Health Residential
Sample Depth (feet)		(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)		
Date Collected		10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/19/2011	10/19/2011	10/19/2011	10/19/2011	10/19/2011	10/20/2011	10/20/2011	10/20/2011	10/20/2011		
Volatile Organic Compounds (VOCs) ug/kg																				
1,1,2,2-Tetrachloroethane	79-34-5	ND<13	ND<5.8	ND<6.6	**3.9 J**	**16**	ND<6.4	ND<6.2	**3.1 J**	ND<6	ND<6.3	ND<6	**4.9 J**	**23**	ND<6.7	ND<6	ND<5.7	**5.2 J**	**NE**	**NE**
Acetone	67-64-1	ND<65	ND<29	ND<33	**30 J**	ND<31	ND<32	ND<31	ND<29	ND<30	**200**	**11 J**	**27 J**	ND<33	**20**	**22 J**	**81**	ND<29	**50**	**100,000**
Toluene	108-88-3	ND<13	ND<5.8	ND<6.6	ND<6.2	ND<6.1	ND<6.4	ND<6.2	ND<5.9	ND<6	**12**	ND<6	ND<6.3	ND<6.6	ND<6.7	ND<6	ND<5.7	ND<5.8	**700**	**100,000**
Trichloroethylene	79-01-6	ND<13	ND<5.8	ND<6.6	ND<6.2	ND<6.1	ND<6.4	ND<6.2	ND<5.9	ND<6	ND<6.3	ND<6	ND<6.3	**4.3 J**	ND<6.7	ND<6	ND<5.7	ND<5.8	**470**	**10,000**
Semi-Volatile Organic Compounds (SVOCs) ug/kg																				
Anthracene	83-32-9	ND<4300	ND<390	ND<440	ND<400	ND<400	ND<420	ND<400	ND<390	ND<390	ND<2100	ND<400	ND<410	**300 J**	ND<450	ND<390	ND<370	ND<380	**100,000**	**100,000**
Benzo(a)anthracene	56-55-3	ND<4300	ND<390	ND<440	ND<400	ND<400	ND<420	ND<400	ND<390	ND<390	ND<2100	ND<400	ND<410	**530**	ND<450	ND<390	ND<370	**570**	**1,000**	**1,000**
Benzo(a)pyrene	50-32-8	ND<4300	ND<390	ND<440	ND<400	ND<400	ND<420	ND<400	ND<390	ND<390	ND<2100	ND<400	ND<410	**420 J**	ND<450	ND<390	ND<370	**720**	**1,000**	**1,000**
Benzo(b)fluoranthene	205-99-2	ND<4300	ND<390	ND<440	ND<400	**190 J**	ND<420	ND<400	ND<390	ND<390	ND<2100	ND<400	ND<410	**510**	ND<450	ND<390	ND<370	**850**	**1,000**	**1,000**
Benzo(ghi)perylene	191-24-2	ND<4300	ND<390	ND<440	ND<400	ND<400	ND<420	ND<400	ND<390	ND<390	ND<2100	ND<400	ND<410	**220 J**	ND<450	ND<390	ND<370	**380 J**	**100,000**	**100,000**
Benzo(k)fluoranthene	207-08-9	ND<4300	ND<390	ND<440	ND<400	ND<400	ND<420	ND<400	ND<390	ND<390	ND<2100	ND<400	ND<410	**230 J**	ND<450	ND<390	ND<370	**330**	**800**	**1000**
Bis(2-ethylhexyl)phthalate	117-81-7	ND<4300	**210 J**	**180 J**	**210 J**	**240 J**	ND<420	**280 J**	ND<390	**160 J**	ND<2100	**330 J**	**360 J**	**280 J**	ND<450	**260 J**	**230 J**	ND<380	**NE**	**NE**
Chrysene	218-01-9	ND<4300	ND<390	ND<440	ND<400	ND<400	ND<420	ND<400	ND<390	ND<390	ND<2100	ND<400	ND<410	**480 J**	ND<450	ND<390	ND<370	**600**	**1,000**	**1,000**
Fluoranthene	206-44-0	ND<4300	ND<390	ND<440	ND<400	**170 J**	ND<420	ND<400	ND<390	ND<390	ND<2100	ND<400	**190 J**	**1,300**	ND<450	**200 J**	ND<370	**770**	**100,000**	**100,000**
Indeno(1,2,3-cd)pyrene	193-39-5	ND<4300	ND<390	ND<440	ND<400	ND<400	ND<420	ND<400	ND<390	ND<390	ND<2100	ND<400	ND<410	**200 J**	ND<450	ND<390	ND<370	**360 J**	**500**	**500**
Phenanthrene	85-01-8	ND<4300	ND<390	ND<440	ND<400	ND<400	ND<420	ND<400	ND<390	ND<390	ND<2100	ND<400	ND<410	**1,100**	ND<450	ND<390	ND<370	**340 J**	**100,000**	**100,000**
Pyrene	129-00-0	**2,100 J**	ND<390	ND<440	ND<400	**210 J**	ND<420	ND<400	ND<390	ND<390	ND<2100	ND<400	ND<410	**1,000**	ND<450	**170 J**	ND<370	**670**	**100,000**	**100,000**

Bold	Sample is Above Non-Detect Value but Below Objective
Bold	Sample Exceeds Unrestricted Objective
Bold	Sample Exceeds Residential Objective
NE	Not Established
NA	Not Analyzed
ND<###	Sample is Non-Detect at Laboratory
ug/kg	Micrograms per Kilogram
J	Indicates the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL), but greater than or equal to the Instrument Detection Limit (IDL)
CAS #	Chemical Abstract Service Number

Table 5
Mill Neck Marina (Site # 130166)
Hernan Avenue
Locust Valley (Oyster Bay), New York
October 2011 and July 2012
375-6 SCO - Protection of Public Health - Unrestricted and Residential
Surface Soil Samples - Analyzed for TAL Metals
(Only detected constituents are listed)

Soil-Metals	CAS #	HRP-SB-1	HRP-SB-2	HRP-SB-3	HRP-SB-4	HRP-SB-5	HRP-SB-6	HRP-SB-7	HRP-SB-8	HRP-SB-9	HRP-SB-10	HRP-SB-11	HRP-SB-12	HRP-SB-13	HRP-SB-14	HRP-SB-15	HRP-SB-16	HRP-SB-17	HRP-SB-18	HRP-SB-19	HRP-SB-20	HRP-SB-21	HRP-SB-22	HRP-SB-23	HRP-SB-24	HRP-SB-25	375-6 SCO - Unrestricted	Protection of Public Health Residential
Sample Depth (feet)		(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.2)	(0-0.2)	(0-0.2)	(0-0.2)	(0-0.2)	(0-0.2)	(0-0.2)	(0-0.2)		
Date Collected		10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/19/2011	10/19/2011	10/19/2011	10/19/2011	10/19/2011	10/20/2011	10/20/2011	10/20/2011	10/20/2011	7/27/2012	7/18/2012	7/18/2012	7/18/2012	7/18/2012	7/18/2012	7/18/2012	7/18/2012		
Metals (mg/kg)																												
Aluminum, Total	7429-90-5	3270	2560	3900	4890	2960	5390	5690	5450	6170	5210	6850	3250*	3670 *	4050	5630 *	2820 *	1690 *	NS	NS	NS	NS	NS	NS	NS	NS	NE	NE
Antimony	7440-36-0	1.37	1.2 J	1.3 J	ND<2.18	ND<2.63	ND<2.5	ND<2.95	2.05 J	ND<2.56	ND<2.76	ND<2.97	ND<2.35	ND<2.57	ND<3.37	ND<2.99	ND<2.3	ND<2.26	NS	NS	NS	NS	NS	NS	NS	NS	NE	NE
Arsenic	7440-38-2	13.3	3.91	4.47	2.71	2.4	3.19	6.41	20.7	4	3.37	4.07	2.18	2.89	2.21	7.97	3.4	4.15	23.4	NA	NA	NA	NA	NA	NA	NA	13	16
Barium	7440-39-3	52	61	37	26	16.1	35.6	21.4	208	35.5	28.8	30.8	21.6	27.6	35.8	131	56.1	11.1	NS	NS	NS	NS	NS	NS	NS	NS	350	350
Beryllium	7440-41-7	0.197 J	0.299 J	0.655	0.313	0.207 J	0.358	0.327 J	0.315 J	0.342	0.309 J	0.335 J	0.223 J	0.197 J	0.23 J	0.409	0.208 J	0.174 J	NS	NS	NS	NS	NS	NS	NS	NS	7.2	14
Cadmium	7440-43-9	3.3	0.926	0.764	0.387	0.35	0.809	0.626	0.474	0.6	0.609	0.596	0.409	0.655	0.341 J	1.33	0.697	0.315	NS	NS	NS	NS	NS	NS	NS	NS	2.5	2.5
Calcium	7440-70-2	61800	1100	994	1410	595	1290	635	381	902	9500	6510	20300 *	2410 *	1030	3560 *	12600 *	61300 *	NS	NS	NS	NS	NS	NS	NS	NS	NE	NE
Chromium, Total	7440-47-3	9.68	5.8	13.7	7.18	4.87	12.6	17.9	11.6	12.1	9.9	9.75	6.85	7.78	7	12.3	6.19	3.39	10.5	10.2	14.9	5.94	15.5	11.7	11.9	6.68	30	36
Cobalt	7440-48-4	3.69	2.91	5.39	2.88	1.63	5.24	3.54	2.95	3.91	3.66	4.31	2.62	3.35	2.46	4.34	3.21	1.57	NS	NS	NS	NS	NS	NS	NS	NS	NE	NE
Copper	7440-50-8	134	56.1	818	30.4	114	16.8	195	147	11.1	142	91.8	60.8 N	21.9 N	41.3	131 N	120 N	18.4 N	626	71.4	240	121	61.7	59.4	291	30.8	50	270
Iron	7439-89-6	23900	8770	8830	6300	4790	10800	10900	7860	10100	9080	10400	5910 *	7310 *	6280	13200 *	7810 *	4260 *	NS	NS	NS	NS	NS	NS	NS	NS	NE	NE
Lead	7439-92-1	265	913	160	29.8	50.1	21.4	114	527	34.6	30.5	22.2	20.5 N	67 N	8.52	181 N	130 N	20.3 N	152	389	120	27.1	125	91.5	1130	114	63	400
Magnesium	7439-95-4	36400	807	1370	1190	663	2030	1380	1320	1620	6320	4660	12000 *	1060 *	947	1480 *	7360 *	36400 *	NS	NS	NS	NS	NS	NS	NS	NS	NE	NE
Manganese	7439-96-5	361	311	76.7	83.5	38.2	148	118	111	75	104	95.9	133	234	52.5	143	153	92.9	NS	NS	NS	NS	NS	NS	NS	NS	1600	2,000
Nickel	7440-02-0	8.27	6.21	31.6	5.95	3.78	9.48	7.47	6.75	7.2	7.47	7.42	5.43	8.43	5.02	10.2	11.9	3.57	NS	NS	NS	NS	NS	NS	NS	NS	30	140
Potassium, Total	7440-09-7	372	296	543	402	202	1190	510	412	589	562	337	362	422	171	409	213	164	NS	NS	NS	NS	NS	NS	NS	NS	NE	NE
Selenium	7782-49-2	ND<1.69	0.487 J	0.454 J	0.394 J	ND<1.05	ND<1	ND<1.18	0.551 J	ND<1.02	0.545 J	ND<1.19	ND<0.94	ND<1.03	ND<1.35	ND<1.2	0.407 J	ND<0.905	NS	NS	NS	NS	NS	NS	NS	NS	3.9	36
Sodium, Total	7440-23-5	3010	488	827	919	358	549	1240	950	354	216	381	209	297	257	268	243	183	NS	NS	NS	NS	NS	NS	NS	NS	NE	NE
Vanadium	7440-62-2	16.4	7.94	11.4	10.1	7.01	15.6	17.5	10.8	17.4	12.7	14.3	9 N	9.55 N	7.96	20.3 N	8.73 N	5.07 N	NS	NS	NS	NS	NS	NS	NS	NS	NE	NE
Zinc	7440-66-6	837	86	208	35.2	60.6	33.9	81.6	124	30.1	55.7	42.3	31.5	64.4	36.5	180	125	19.8	NS	NS	NS	NS	NS	NS	NS	NS	109	2,200
Mercury	7439-97-6	3.3	0.55	0.15	0.158*	0.21	0.025	0.14	1.30	0.038	0.084	0.067	0.051	0.21	0.048	0.801 D/0.72	0.72	0.084	0.421	1.34	0.85	0.047	0.376	0.125	0.231	0.326	0.18	0.81
Methyl Mercury (ug/kg)																												
Methyl Mercury	22967-92-6	1.5	0.49	0.24	NA	0.076 J	NA	0.19	0.13	0.23	0.54 H B	0.072 J	0.091 J	0.49	0.16	3.6	0.24	0.18	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE

Bold	Sample is Above Non-Detect Value but Below Objective
Bold	Sample Exceeds Unrestricted Objective
Bold	Sample Exceeds Residential Objective
NE	Not Established
NA	Not Analyzed
ND<####	Sample is Non-Detect at Laboratory
mg/kg	Milligrams per Kilogram
ug/kg	Micrograms per Kilogram
Chromium, Total	Chromium DEC standards as shown are for Trivalent Chromium.

J	Indicates the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL), but greater than or equal to the Instrument Detection Limit (IDL)
N	Indicates spiked sample recovery is not within control limits.
D	Indicates the reported value is from a secondary analysis with a dilution factor. The original analysis exceeded the calibration range.
*	Indicates the duplicate analysis is not within control limits.
CAS #	Chemical Abstract Service Number
BGS	Below Ground Surface

Table 6
Mill Neck Marina (Site # 130166)
Hernan Avenue
Locust Valley (Oyster Bay), New York
October 18 through October 20, 2011
375-6 SCO - Protection of Public Health - Unrestricted and Residential
Surface Soil Samples - Analyzed for Pesticides and Polychlorinated Biphenoyl's (PCBs)

Soil-Pest, PCBs	CAS #	HRP-SB-1	HRP-SB-2	HRP-SB-3	HRP-SB-4	HRP-SB-5	HRP-SB-6	HRP-SB-7	HRP-SB-8	HRP-SB-9	375-6 SCO - Unrestricted	Protection of Public Health Residential
Sample Depth (feet)		(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)		
Date Collected		10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/18/2011	10/19/2011		
Pesticides ug/kg												
4,4'-DDD	72-54-8	29	**1.3 JP**	9.3	ND<2.1	ND<2.1	ND<2.2	ND<2.1	ND<2	**3 P**	3.3	2,600
4,4'-DDE	75-55-9	24 P	ND<2	ND<2.3	ND<2.1	ND<2.1	ND<2.2	ND<2.1	ND<2	ND<2	3.3	1,800
4,4'-DDT	72-54-8	61	**1.3 JP**	ND<2.3	ND<2.1	ND<2.1	ND<2.2	ND<2.1	ND<2	ND<2	3.3	1,700
Alpha-chlordane	5103-71-9	ND<4.5	ND<2	ND<2.3	ND<2.1	**4.1**	**1.7 J**	**2.5**	ND<2	ND<2	94	910
trans-Chlordane	5103-74-2	ND<4.5	ND<2	ND<2.3	ND<2.1	**3.6**	**1.2 J**	**1.6 J**	ND<2	ND<2	NE	NE
PCBs ug/kg												
PCB-1254	11097-69-1	ND<45	ND<20	ND<23	ND<23	ND<23	ND<23	ND<23	ND<23	<20	NE	NE
PCB-1260	11096-82-5	ND<45	ND<20	ND<23	ND<23	ND<23	ND<23	ND<23	ND<23	**19 JP**	NE	NE
PCBs-Total		ND<45	ND<20	ND<23	ND<23	ND<23	ND<23	ND<23	ND<23	**19 JP**	100	1,000

Soil-Pest, PCBs	CAS #	HRP-SB-10	HRP-SB-11	HRP-SB-12	HRP-SB-13	HRP-SB-14	HRP-SB-15	HRP-SB-16	HRP-SB-17		375-6 SCO - Unrestricted	Protection of Public Health Residential
Sample Depth (ft.)		(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)	(0-0.5)			
Date Collected		10/19/2011	10/19/2011	10/19/2011	10/19/2011	10/20/2011	10/20/2011	10/20/2011	10/20/2011			
Pesticides ug/kg												
4,4'-DDD	72-54-8	**1.6 J**	**1.3 J**	**1.8 JP**	ND<2.2	ND<2.3	ND<2	**2.7 P**	**1.2 J**		3.3	2,600
4,4'-DDE	75-55-9	ND<2.2	ND<2.1	<2.1	ND<2.2	ND<2.3	ND<2	ND<1.9	ND<2		3.3	1,800
4,4'-DDT	72-54-8	ND<2.2	ND<2.1	<2.1	6.2	ND<2.3	ND<2	ND<1.9	ND<2		3.3	1,700
Alpha-chlordane	5103-71-9	**5.6**	**10**	**2.2**	ND<2.2	**2.1 J**	ND<2	ND<1.9	**5.5**		94	910
trans-Chlordane	5103-74-2	**4.9**	**8.1**	**1.3 J**	ND<2.2	**1.8 JP**	ND<2	ND<1.9	**3.6 P**		NE	NE
PCBs ug/kg												
PCB-1254	11097-69-1	ND<23	ND<23	ND<23	ND<23	ND<23	ND<23	ND<23	ND<23		NE	NE
PCB-1260	11096-82-5	ND<23	ND<23	ND<23	ND<23	ND<23	ND<23	ND<23	ND<23		NE	NE
PCBs-Total		ND<23	ND<23	ND<23	ND<23	ND<23	ND<23	ND<23	ND<23		100	1,000

Bold	Sample is Above Non-Detect Value but Below Objective
Bold	Sample Exceeds Unrestricted Objective
Bold	Sample Exceeds Residential Objective
NE	Not Established
P	This flag is used for Pesticide/PCB target analyte when there is >25% difference for detected concentrations between the two GC columns.
J	Indicates the reported value was obtained from a reading that was less than the Contract Required Detection Limit (CRDL), but greater than or equal to the Instrument Detection Limit (IDL)

CAS #	Chemical Abstract Service Number
ND<###	Sample is Non-Detect at Laboratory
ug/kg	Micrograms per Kilogram

Table 7
Mill Neck Marina (Site # 130166)
Hernan Avenue
Locust Valley (Oyster Bay), New York
October 7 and October 8, 2011
Division of Fish, Wildlife, and Marine Resources (DFWMR)- Technical Guidance for Screening Contaminated Sediments
Sediment Samples - Analyzed for VOCs by EPA Method 8260B

Sediments-VOCs	CAS #	HRP-SS-1	HRP-SS-1	HRP-SS-1	HRP-SS-2	HRP-SS-2	HRP-SS-2	HRP-SS-3	HRP-SS-3	HRP-SS-4	HRP-SS-4	HRP-SS-4	HRP-SS-5	HRP-SS-5	HRP-SS-5	HRP-SS-6	HRP-SS-6	HRP-SS-6	DFWMR - Effect Range Low (ERL)	DFWMR - Effect Range Median (ERM)
Sample Depth (feet)		0-6"	6" - 12"	12" - 24"	0-6"	6" - 12"	12" - 24"	0-12"	12" - 24"	0-6"	6" - 12"	12" - 24"	0-6"	6" - 12"	12" - 24"	0-6"	6" - 12"	12" - 24"		
Date Collected		11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011		
VOCs ug / kg																				
Carbon disulfide	75-15-0	<9.3	<7.5	**10**	**5.7**	**6.2**	**9.5**	<9.4	**6.7**	**29**	**17**	**25**	<9.1	<9.3	**9**	**6.2**	**20**	**12**	NE	NE
m/p-Xylenes	179601-23-1	<19	<15	**6.4**	<21	<10	<19	<19	<16	<36	<41	<55	<18	<19	<14	<19	<24	<20	NE	NE
Methylene chloride	75-09-2	<9.3	**3.9**	<6.6	<10	<5	<9.4	<9.4	**4.1**	<18	<21	<28	<9.1	<9.3	<6.9	<9.3	<12	<10	NE	NE
Hexane	2493-44-9	NA	NA	NA	**13**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NE	NE
Xylene-Total		<28.3	<22.5	**6.4**	<31	<15	<28.4	<28.4	<24.1	<54	<62	<83	<27.1	<28.3	<20.9	<28.3	<36	<30	NE	NE

Sediments-VOCs	CAS #	HRP-SS-7	HRP-SS-7	HRP-SS-7	HRP-SS-8	HRP-SS-8	HRP-SS-8	HRP-SS-9	HRP-SS-9	HRP-SS-9	HRP-SS-10	HRP-SS-10	HRP-SS-10	HRP-SS-11	HRP-SS-11	HRP-SS-11			DFWMR - Effect Range Low (ERL)	DFWMR - Effect Range Median (ERM)
Sample Depth (feet)		0-6"	6" - 12"	12" - 24"	0-6"	12" - 24"	6" - 12"	0-6"	6" - 12"	12" - 24"	0-6"	6" - 12"	12" - 24"	0-6"	6" - 12"	12" - 24"				
Date Collected		11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011				
VOCs ug / kg																				
Carbon disulfide	75-15-0	**7.8**	**32**	**35**	**7.4**	**30**	**28**	<7.6	**2.8**	**4.2**	**26**	**10**	**7.2**	<12	**4.2**	**27**			NE	NE
m/p-Xylenes	179601-23-1	<21	<31	<22	<30	<15	<20	<15	<12	<18	<29	<23	<29	<24	<13	<20			NE	NE
Methylene chloride	75-09-2	<11	<15	**6.2**	<15	**3.1**	**4**	**4**	**3**	**5**	**6.6**	<12	<15	<12	<6.5	<10			NE	NE
Hexane	2493-44-9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA			NE	NE
Xylene-Total		<32	<46	<33	<45	<22.5	<29.8	<22.6	<18	<27.1	<44	<35	<44	<36	<19.5	<30			NE	NE

Bold	Sample is Above Non-Detect Value but Below Objective
Bold	Sample Exceeds DFWMR - Effect Range Low (ERL)
Bold	Sample Exceeds DFWMR - Effect Range Median (ERM)
CAS #	Chemical Abstract Service Number
NE	Not Established
NA	Not Analyzed
ND<###	Sample is Non-Detect at Laboratory
ug/kg	Micrograms per Kilogram

DFWMR, Technical Guidance for Screening Contaminated Sediments values taken from Appendix 4, Table 4.

Table 8
Mill Neck Marina (Site # 130166)
Hernan Avenue
Locust Valley (Oyster Bay), New York
October 7 and October 8, 2011
Division of Fish, Wildlife, and Marine Resources (DFWMR) - Technical Guidance for Screening Contaminated Sediments
Sediment Samples - Analyzed for SVOCs by EPA Method 8270C

Sediments-SVOCs	CAS #	HRP-SS-1	HRP-SS-1	HRP-SS-1	HRP-SS-2	HRP-SS-2	HRP-SS-2	HRP-SS-3	HRP-SS-3	HRP-SS-4	HRP-SS-4	HRP-SS-4	HRP-SS-5	HRP-SS-5	HRP-SS-5	HRP-SS-6	HRP-SS-6	DFWMR - Effect Range Low (ERL)	DFWMR - Effect Range Median (ERM)
Sample Depth (inches)		0-6"	6" - 12"	12" - 24"	0-6"	6" - 12"	12" - 24"	0-12"	12" - 24"	0-6"	6" - 12"	12" - 24"	0-6"	6" - 12"	12" - 24"	0-6"	6" - 12"		
Date Collected		11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011		
SVOCs (ug/kg)																			
Acenaphthene	83-32-9	**340**	<480	<440	<690	<610	<610	<620	<520	<1200	<1400	<1800	<610	<610	<450	<610	<780	**16**	**500**
Anthracene	120-12-7	**860**	<480	<440	<690	<610	<610	<620	<520	<1200	<1400	<1800	<610	<610	<450	<610	<780	**85**	**1,100**
Benzo(a)anthracene	56-55-3	**2100**	**450**	<440	<690	<610	<610	<620	<520	(<1200)	(<1400)	(<1800)	<610	<610	<450	<610	<780	**261**	**1,600**
Benzo(a)pyrene	50-32-8	**1,500**	<480	<440	<690	<610	<610	<620	<520	(<1200)	(<1400)	(<1800)	<610	<610	<450	<610	<780	**430**	**1,600**
Chrysene	218-01-9	**2,000**	**420**	<440	<690	<610	<610	<620	<520	<1200	<1400	<1800	<610	<610	<450	<610	<780	**384**	**2,800**
Fluoranthene	206-44-0	**4,100**	**720**	<440	<690	<610	<610	<620	<520	<1200	<1400	<1800	<610	<610	**220**	<610	<780	**600**	**5,100**
Fluorene	86-73-7	**320**	<480	<440	<690	<610	<610	<620	<520	<1200	<1400	<1800	<610	<610	<450	<610	<780	**19**	**540**

Sediments-SVOCs	CAS #	HRP-SS-6	HRP-SS-7	HRP-SS-7	HRP-SS-7	HRP-SS-8	HRP-SS-8	HRP-SS-8	HRP-SS-9	HRP-SS-9	HRP-SS-9	HRP-SS-10	HRP-SS-10	HRP-SS-10	HRP-SS-11	HRP-SS-11		DFWMR - Effect Range Low (ERL)	DFWMR - Effect Range Median (ERM)
Sample Depth (inches)		12" - 24"	0-6"	6" - 12"	12' - 24"	0-6"	6" to 12"	12' - 24"	0-6"	6" to 12"	12' - 24"	0-6"	6" to 12"	12' - 24"	0-6"	6" to 12"			
Date Collected		11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/7/2011	11/7/2011	11/7/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011			
SVOCs (ug/kg)																			
2-Pentanone, 4-hydroxy-4-methyl-	123-42-2	<670	<700	<1000	**770**	**990**	**620**	**480**	**490**	**460**	**640**	**750**	**720**	**730**	**510**	**370**		**NE**	**NE**
Acenaphthene	83-32-9	<670	<700	<1000	<730	<1000	<630	<500	<510	<2000	<600	<970	<770	<970	<670	<430		**16**	**500**
Anthracene	120-12-7	<670	<700	<1000	<730	<1000	<630	<500	<510	<2000	<600	<970	<770	<970	<670	<430		**85**	**1,100**
Benzo(a)anthracene	56-55-3	<670	<700	<1000	<730	<1000	<630	<500	<510	(<2000)	<600	<970	<770	<970	<670	<430		**261**	**1,600**
Benzo(a)pyrene	50-32-8	<670	<700	<1000	<730	<1000	<630	<500	<510	(<2000)	<600	<970	<770	<970	<670	<430		**430**	**1,600**
Benzo(b)fluoranthene	205-99-2	<670	<700	<1000	<730	<1000	<630	<500	<510	(<2000)	<600	<970	<770	<970	<670	<430		**NE**	**NE**
Benzo(ghi)perylene	191-24-2	<670	<700	<1000	<730	<1000	<630	<500	<510	<2000	<600	<970	<770	<970	<670	<430		**NE**	**NE**
Benzo(k)fluoranthene	207-08-9	<670	<700	(<1000)	<730	<1000	<630	<500	<510	<2000	<600	<970	<770	<970	<670	<430		**NE**	**NE**
Benzoic acid, 2-ethylhexyl ester	5444-75-7	NA	NA	NA	**550**	**430**	**310**	**330**	**310**	NA	**450**	**500**	**350**	**510**	**380**	**210**		**NE**	**NE**
Bis(2-chloroethoxy)methane	111-91-1	**220**	NA	NA	<730	<1000	<630	<500	<510	<2000	<600	<970	<770	<970	<670	<430		**NE**	**NE**
Chrysene	218-01-9	<670	<700	<1000	<730	<1000	<630	<500	<510	<2000	<600	<970	<770	<970	<670	<430		**384**	**2,800**
Diethylene Glycol Monobutyl Ether	112-34-5	<670	<700	<1000	**760**	**330**	NA	**330**	**340**	NA	**470**	NA	**240**	**310**	**200**	**90**		**NE**	**NE**
Di-n-octyl phthalate	117-84-0	<670	<700	<1000	<730	<1000	<630	<500	<510	<2000	**490**	<970	<770	<970	<670	<430		**NE**	**NE**
Ethanol, 2-(2-butoxyethoxy)-, acet	124-17-4	NA	NA	NA	**3200**	**2000**	**1000**	**1600**	**1600**	**1400**	**2000**	**2900**	**1200**	**1800**	**1200**	**650**		**NE**	**NE**
Fluoranthene	206-44-0	<670	<700	<1000	<730	<1000	<630	<500	<510	<2000	<600	<970	<770	<970	<670	<430		**600**	**5,100**
Fluorene	86-73-7	<670	<700	<1000	<730	<1000	<630	<500	<510	<2000	<600	<970	<770	<970	<670	<430		**19**	**540**
Indeno(1,2,3-cd)pyrene	193-39-5	(<670)	(<700)	(<1000)	(<730)	(<1000)	(<630)	<500	(<510)	(<2000)	(<600)	(<970)	(<770)	(<970)	(<670)	<430		**NE**	**NE**
Phenol	108-95-2	<670	<700	<1000	<730	<1000	<630	<500	<510	<2000	<600	<970	<770	<970	<670	<430		**NE**	**NE**

Bold	Sample is Above Non-Detect Value but Below Objective	ND<###	Sample is Non-Detect at Laboratory
Bold	Sample Exceeds DFWMR - Effect Range Low (ERL)	ug/kg	Micrograms per Kilogram
Bold	Sample Exceeds DFWMR - Effect Range Median (ERM)	NE	Not Established
CAS #	Chemical Abstract Service Number	NA	Not Analyzed

DFWMR, Technical Guidance for Screening Contaminated Sediments values taken from Appendix 4, Table 4.

Table 9
Mill Neck Marina (Site # 130166)
Hernan Avenue
Locust Valley (Oyster Bay), New York
October 7 and October 8, 2011
Division of Fish, Wildlife, and Marine Resources (DFWMR)- Technical Guidance for Screening Contaminated Sediments
Sediment Samples - Analyzed for Metals

Sediments-Metals	CAS #	HRP-SS-1	HRP-SS-1	HRP-SS-1	HRP-SS-2	HRP-SS-2	HRP-SS-2	HRP-SS-3	HRP-SS-3	HRP-SS-4	HRP-SS-4	HRP-SS-4	HRP-SS-5	HRP-SS-5	HRP-SS-5	HRP-SS-6	HRP-SS-6	HRP-SS-6	Division of Fish and Wildlife - Sediment Criteria for Metals - Lowest Effect Level (ug/g) (ppm)	Division of Fish and Wildlife - Sediment Criteria for Metals - Severe Effect Level (ug/g) (ppm)
Sample Depth (inches)		0-6"	6" - 12"	12" - 24"	0-6"	6" - 12"	12" - 24"	0-12"	12" - 24"	0-6"	6" - 12"	12" - 24"	0-6"	6" - 12"	12" - 24"	0-6"	6" - 12"	12" - 24"		
Date Collected		11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011		
Metals (mg/kg) (ppm)																				
Aluminum, Total	7429-90-5	9770	5340	4680	9320	11800	11200	7010	3310	21100	10400	10000	7280	11700	5220	6850	18800	14300	NE	NE
Antimony	7440-36-0	<4.31	<3.11	<3.22	<5.17	<4.6	<3.83	<4.23	<2.79	<7.4	<9.84	<11.6	<3.86	<3.93	<2.47	<3.57	<5.11	<3.92	2.0	25
Arsenic	7440-38-2	10.4	5.85	3.96	6.63	8.29	13.2	6.27	3.28	11.3	9.6	5.55	7.32	10.1	6.28	9.17	16.4	12.9	6	33
Barium	7440-39-3	32.8	22.1	21.4	31.8	38.3	38.2	22.2	3.28	53.3	30.1	26.8	35.2	55.2	34.8	33	65	50.3	NE	NE
Beryllium	7440-41-7	2.12	0.365	0.682	0.912	1.21	1.72	0.403	0.075	1.16	0.552	0.664	0.483	0.678	0.336	0.413	1.1	0.81	NE	NE
Cadmium	7440-43-9	0.891	0.757	0.606	0.507	0.276	0.485	0.788	<0.335	<0.888	<1.18	<1.4	0.944	0.969	0.633	0.861	2.68	1.23	0.6	9
Calcium	7440-70-2	11000	15900	10400	8200	2450	3010	2760	688	2700	2480	3480	11900	3250	31400	2320	3000	2670	NE	NE
Chromium, Total	7440-47-3	48.7	21.1	19.1	48	57.7	45	27.1	5.66	45.8	30.3	28.5	26.6	34.7	20.3	24.9	73.1	39.5	26	110
Cobalt	7440-48-4	8.96	4.83	4.32	13	23.5	15.7	4.78	1.18	13.8	9.02	4.62	5.36	7.86	4.3	5.74	13.4	10.1	NE	NE
Copper	7440-50-8	103	50.1	56.2	139	197	162	58.6	1.26	15.2	14.6	14.9	141	75.7	191	225	170	96.7	16	110
Iron	7439-89-6	28700	13000	11100	20300	25200	26000	15800	6700	40600	30600	18800	22800	24500	14200	18400	40000	29700	2%	4%
Lead	7439-92-1	107	52.9	54.3	189	361	203	52.6	3.53	14.4	9.75	8.82	76	81.8	85.4	121	148	90	31	110
Magnesium	7439-95-4	7280	10300	7360	4820	5720	5330	3350	768	11000	6100	5960	7100	5300	3920	3480	8780	6640	NE	NE
Manganese	7439-96-5	313	151	132	265	335	295	187	21.5	410	202	129	202	266	136	209	488	360	460	1,100
Methyl Mercury -(ug/kg)	22967-92-6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.2 HB	NA	NA	0.81 H	NA	NA	NE	NE
Mercury	7439-97-6	0.275	0.559	0.516	0.399	0.296	0.289	<0.018	<0.014	0.015	0.015	<0.051	0.73	0.666	1.55	0.41	2.07	<0.018	0.15	1.3
Nickel	7440-02-0	30.3	14.4	17.7	105	214	104	13	2.23	29.4	18.9	13.3	15.4	19.2	12.4	15.3	35	24.4	16	50
Potassium, Total	7440-09-7	2950	1370	1350	2770	3540	3360	1940	292	6480	3810	3570	1860	2900	1270	1640	4940	3830	NE	NE
Selenium	7782-49-2	<1.73	<1.24	<1.29	<2.07	<1.84	<1.53	<1.69	<1.12	<2.96	1.85	(<4.66)	<1.54	<1.57	<0.989	<1.43	<2.04	<1.57	NE	NE
Sodium, Total	7440-23-5	7330	774	959	7150	6040	6260	1930	650	16000	14000	15700	1910	887	917	2430	3860	2210	NE	NE
Vanadium	7440-62-2	28.8	16.5	14.4	27.7	32.2	32.9	22	11.1	65.8	56.7	45.9	21.6	34.2	16.2	21.1	53.9	38.5	NE	NE
Zinc	7440-66-6	214	99.7	113	289	476	442	116	8.1	87.8	125	51	243	174	167	168	326	225	120	270

Sediments-Metals	CAS #	HRP-SS-7	HRP-SS-7	HRP-SS-7	HRP-SS-8	HRP-SS-8	HRP-SS-8	HRP-SS-9	HRP-SS-9	HRP-SS-9	HRP-SS-10	HRP-SS-10	HRP-SS-10	HRP-SS-11	HRP-SS-11	HRP-SS-11			Division of Fish and Wildlife - Sediment Criteria for Metals - Lowest Effect Level (ug/g) (ppm)	Division of Fish and Wildlife - Sediment Criteria for Metals - Severe Effect Level (ug/g) (ppm)
Sample Depth (inches)		0-6"	6" - 12"	12' - 24"	0-6"	6" to 12"	12' - 24"	0-6"	6" to 12"	12' - 24"	0-6"	6" to 12"	12' - 24"	0-6"	6" to 12"	12' - 24"				
Date Collected		11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/7/2011	11/7/2011	11/7/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011				
Metals (mg/kg) (ppm)																				
Aluminum, Total	7429-90-5	13200	25200	3930	15000	8020	6970	4010	2880	14900	11900	16000	14700	14900	6390	3430			NE	NE
Antimony	7440-36-0	<3.92	<6.65	<4.48	<6.61	<4.26	<2.43	0.968	6.35	1.26	<7.44	<4.23	<6.7	<5.35	<4.52	<2.17			2.0	25
Arsenic	7440-38-2	7.81	12.7	6.61	11.7	5.69	5.92	3.81	4.45	9.99	10.2	13.6	14.4	11.2	4.61	0.656			6	33
Barium	7440-39-3	49.3	68.8	4.22	44.9	26.6	21.8	19.9	25.7	42.2	47.2	40.8	42.5	48.8	19.6	5.74			NE	NE
Beryllium	7440-41-7	0.775	1.34	0.316	0.908	0.478	0.368	0.223	0.199	0.793	0.62	0.872	0.685	0.808	0.374	0.137			NE	NE
Cadmium	7440-43-9	0.428	0.198	<0.538	1.17	0.169	0.098	0.822	0.282	0.225	0.198	0.465	0.215	0.95	0.374	<0.26			0.6	9
Calcium	7440-70-2	1660	4900	2170	22600	2650	1530	7330	4080	1820	2330	2650	1870	2460	1670	618			NE	NE
Chromium, Total	7440-47-3	33	52.1	6.98	56.7	20.5	16.8	13.5	11	33.7	40.8	35.2	38.7	56.1	20.2	6.64			26	110
Cobalt	7440-48-4	8.28	16.5	1.4	10.6	5.8	4.86	2.84	2.44	10.5	8	12.5	10.2	10.8	4.06	1.19			NE	NE
Copper	7440-50-8	59.8	21.1	2.88	117	10.5	6.67	55.3	110	77.8	115	18.8	45.3	131	46	4.52			16	110
Iron	7439-89-6	23600	40900	11700	34100	19500	15600	9450	6850	29100	19400	33600	32400	33200	13300	3600			2%	4%
Lead	7439-92-1	72.2	19.7	4.53	86.5	7.23	5.86	38.9	74.9	27.1	98.7	21.9	51.3	87.5	34.2	5.63			31	110
Magnesium	7439-95-4	6210	11100	1540	7810	3800	3270	2670	3200	7040	6860	8170	7480	8580	3300	1050			NE	NE
Manganese	7439-96-5	292	703	19.5	438	188	204	105	72.8	391	236	467	329	435	159	30.3			460	1,100
Methyl Mercury -(ug/kg)	22967-92-6	NA	NA	NA	0.28 H	NA	NA	NA	NA	NA	6.9 H	NA	NA	NA	NA	NA			NE	NE
Mercury	7439-97-6	0.326	0.018	0.012	0.86	0.17	0.012	0.162	0.167	0.067	0.73	0.016	0.121	0.45	0.261	0.007			0.15	1.3
Nickel	7440-02-0	19	34	2.89	27.1	13	10.7	7.6	6.47	21.7	19	25.1	23.2	26.6	10.1	3.46			16	50
Potassium, Total	7440-09-7	3960	7420	601	4450	2060	2030	1270	590	4020	4000	5080	4950	4650	2030	417			NE	NE
Selenium	7782-49-2	<1.57	<2.66	<1.79	<2.64	<1.71	<0.973	<1.03	<1.1	<1.34	<2.98	<1.69	<2.68	<2.14	<1.81	<0.868			NE	NE
Sodium, Total	7440-23-5	6430	5460	1730	6960	712	514	3890	1880	6100	14800	11500	13100	12500	3500	921			NE	NE
Vanadium	7440-62-2	38.4	65.8	28.4	43.1	23.6	19.9	12.3	13.6	38.6	40.9	44.9	49.7	42.8	18.8	6.01			NE	NE
Zinc	7440-66-6	128	149	9.56	219	50	32.6	70.9	89.9	72.2	118	90.6	98	202	82.5	16.9			120	270

Bold	Sample is Above Non-Detect Value but Below Objective
Bold	Sample Exceeds Division of Fish and Wildlife - Sediment Criteria for Metals - Lowest Effect Level (ug/g)
Bold	Sample Exceeds Division of Fish and Wildlife - Sediment Criteria for Metals - Severe Effect Level (mgkg)
NE	Not Established
NA	Not Analyzed
ND<###	Sample is Non-Detect at Laboratory
mg/kg	Milligrams per Kilogram
CAS #	Chemical Abstract Service Number

DFWMR	Division of Fish, Wildlife, and Marine Resources
DFWMR, Technical Guidance for Screening Contaminated Sediments values taken from Appendix 4, Table 4.	
Chromium, Total	Chromium DEC standards as shown are for Hexavalent Chromium.
H	Sample was prepped or analyzed beyond the specific holding time
B	Compound was found in the blank and sample

DFWMR, Technical Guidance for Screening Contaminated Sediments values taken from Table 2.

Table 10
Mill Neck Marina (Site # 130166)
Hernan Avenue
Locust Valley (Oyster Bay), New York
October 7 and October 8, 2011
Division of Fish, Wildlife, and Marine Resources (DFWMR) - Technical Guidance for Screening Contaminated Sediments
Sediment Samples - Analyzed for Pesticides by EPA Method 8081A

Sedminet-Pesticide	CAS #	HRP-SS-1	HRP-SS-1	HRP-SS-1	HRP-SS-2	HRP-SS-2	HRP-SS-2	HRP-SS-3	HRP-SS-3	HRP-SS-4	HRP-SS-4	HRP-SS-4	HRP-SS-5	HRP-SS-5	HRP-SS-5	HRP-SS-6	DFWMR - Effect Range Low (ERL)	DFWMR - Effect Range Median (ERM)
Sample Depth (inches)		0-6"	6" - 12"	12" - 24"	0-6"	6" - 12"	12" - 24"	0-12"	12" - 24"	0-6"	6" - 12"	12" - 24"	0-6"	6" - 12"	12" - 24"	0-6"		
Date Collected		11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011		
Pesticides - ug/kg																		
4,4'-DDD	72-54-8	<3.2	<2.5	<2.3	(<3.5)	<3.1	<3.1	<3.2	<2.7	(<6.1)	(<7)	(<9.3)	<3.1	<3.2	<2.3	<3.2	NE	NE
4,4'-DDT	50-29-3	<3.2	<2.5	<2.3	(<3.5)	<3.1	<3.1	<3.2	<2.7	(<6.1)	(<7)	(<9.3)	<3.1	<3.2	<2.3	<3.2	NE	NE
Alpha-chlordane	5103-71-9	<3.2	<2.5	<2.3	<3.5	<3.1	<3.1	<3.2	<2.7	<6.1	<7	<9.3	<3.1	<3.2	<2.3	<3.2	NE	NE
trans-Chlordane	5103-74-2	<3.2	<2.5	<2.3	<3.5	<3.1	<3.1	<3.2	<2.7	<6.1	<7	<9.3	<3.1	<3.2	<2.3	<3.2	NE	NE

Sedminet-Pesticide	CAS #	HRP-SS-6	HRP-SS-6	HRP-SS-7	HRP-SS-7	HRP-SS-8	HRP-SS-8	HRP-SS-8	HRP-SS-9	HRP-SS-9	HRP-SS-9	HRP-SS-10	HRP-SS-10	HRP-SS-10	HRP-SS-11	HRP-SS-11	DFWMR - Effect Range Low (ERL)	DFWMR - Effect Range Median (ERM)
Sample Depth (inches)		6" - 12"	12" - 24"	0-6"	12' - 24"	0-6"	6" to 12"	12' - 24"	0-6"	6" to 12"	12' - 24"	0-6"	6" to 12"	12' - 24"	0-6"	6" to 12"		
Date Collected		11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/7/2011	11/7/2011	11/7/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011		
Pesticides - ug/kg																		
4,4'-DDD	72-54-8	(<4.1)	**3.8**	(<3.7)	**3.1**	<5.1	<3.3	<2.6	<2.6	<2	<3.1	<5	<4	<5	<3.5	<2.2	NE	NE
4,4'-DDT	50-29-3	(<4.1)	(<3.5)	(<3.7)	**11**	<5.1	<3.3	<2.6	<2.6	<2	<3.1	<5	<4	<5	<3.5	<2.2	**1.58**	**46.1**
Alpha-chlordane	5103-71-9	<4.1	**7**	<3.7	<5.1	<5.1	<3.3	<2.6	<2.6	<2	<3.1	<5	<4	<5	<3.5	<2.2	NE	NE
trans-Chlordane	5103-74-2	<4.1	**9.8**	<3.7	<5.1	<5.1	<3.3	<2.6	<2.6	<2	<3.1	<5	<4	<5	<3.5	<2.2	NE	NE

Bold	Sample is Above Non-Detect Value but Below Objective
Bold	Sample Exceeds DFWMR - Effect Range Low (ERL)
Bold	Sample Exceeds DFWMR - Effect Range Median (ERM)
NE	Not Established
NA	Not Analyzed
ND<###	Sample is Non-Detect at Laboratory
ug/kg	Micrograms per Kilogram

DFWMR, Technical Guidance for Screening Contaminated Sediments values taken from Appendix 4, Table 4.

Standard Value for DDT taken from total DDT value

Table 11
Mill Neck Marina (Site # 130166)
Hernan Avenue
Locust Valley (Oyster Bay), New York
October 7 and October 8, 2011
375-6 SCO - Protection of Public Health - Unrestricted, Residential, Restricted- Residential, Protection of Ecological Recourses and DFWMR Technical Guidance for Screening Contaminated Sediments
Sediment Samples - Analyzed for Polychlorinated Biphenoyl's (PCBs)

Sediment-PCBs	CAS #	HRP-SS-1	HRP-SS-1	HRP-SS-1	HRP-SS-2	HRP-SS-2	HRP-SS-2	HRP-SS-3	HRP-SS-3	HRP-SS-4	HRP-SS-4	HRP-SS-4	HRP-SS-4	HRP-SS-5	HRP-SS-5	HRP-SS-5	HRP-SS-6	HRP-SS-6	DFWMR - Effect Range Low (ERL)	DFWMR -Effect Range Median (ERM)
Sample Depth (inches)		0-6"	6" - 12"	12" - 24"	0-6"	6" - 12"	12" - 24"	0-12"	12" - 24"	0-6"	6" - 12"	6" - 12"	12" - 24"	0-6"	6" - 12"	12" - 24"	0-6"	6" - 12"		
Date Collected		11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011		
PCBs - ug/kg																				
PCB-1254	11097-69-1	<32	<25	<23	<35	<31	<31	<32	<27	<61	<71	<71	<94	<31	<31	<23	<31	<40	NE	NE
PCB-1260	11096-82-5	<32	<25	<23	<35	<31	<31	<32	<27	<61	<71	<71	<94	<31	<31	<23	<31	<40	NE	NE
PCBs-Total		(<224)	(<175)	(<161)	(<245)	(<217)	(<217)	(<224)	(<189)	(<427)	(<497)	(<497)	(<658)	(<217)	(<217)	(<161)	(<217)	(<280)	22.7	180
TOC (mg/kg)	10-35-5	8000	7300	9800	8700	8100	8200	7200	7800	9100	17000	NA	24000	7900	10000	13000	7600	8500	1 %	10 %

Sediment-PCBs	CAS #	HRP-SS-6	HRP-SS-7	HRP-SS-7	HRP-SS-7	HRP-SS-8	HRP-SS-8	HRP-SS-8	HRP-SS-9	HRP-SS-9	HRP-SS-9	HRP-SS-10	HRP-SS-10	HRP-SS-10	HRP-SS-11	HRP-SS-11	HRP-SS-11		DFWMR - Effect Range Low (ERL)	DFWMR -Effect Range Median (ERM)
Sample Depth (inches)		12" - 24"	0-6"	6" - 12"	12' - 24"	0-6"	12' - 24"	6" to 12"	0-6"	6" to 12"	12' - 24"	0-6"	6" to 12"	12' - 24"	0-6"	6" to 12"	12" - 24"			
Date Collected		11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/7/2011	11/7/2011	11/7/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011	11/8/2011			
PCBs - ug/kg																				
PCB-1254	11097-69-1	<35	<37	<51	<38	<51	<26	<33	<26	<20	66	<50	<40	<50	<41	<22	<35		NE	NE
PCB-1260	11096-82-5	<35	<37	<51	<38	<51	<26	<33	<26	37	<31	<50	<40	<50	<41	<22	<35		NE	NE
PCBs-Total		(<245)	(<259)	(<357)	<266	<357	<182	<231	<182	37	66	<350	<280	<350	<287	<154	<245		22.7	180
TOC (mg/kg)	10-35-5	12000	9300	9200	13000	15000	13000	NA	8200	9500	15000	18000	17000	18000	17000	13000	15000		1 %	10 %

Bold	Sample is Above Non-Detect Value but Below Objective
Bold	Sample Exceeds DFWMR - Effect Range Low (ERL)
Bold	Sample Exceeds DFWMR - Effect Range Median (ERM)
TOC	Total Organic Carbon
CAS #	Chemical Abstract Service Number
DFWMR	Division of Fish, Wildlife, and Marine Resources
ND<###	Sample is Non-Detect at Laboratory
ug/kg	Micrograms per Kilogram

Table 12
Mill Neck Marina (Site # 130166)
Hernan Avenue
Locust Valley (Oyster Bay), New York
October 20, 2011
Groundwater Samples - Analyzed for VOCs by EPA Method 8260

Groundwater -VOC's	CAS #	HRP-SB-2W	HRP-SB-3W	HRP-SB-4W	HRP-SB-6W	HRP-SB-8W	HRP-SB-11W	HRP-SB-12W	HRP-SB-13W	HRP-SB-14W	HRP-SB-15W	HRP-SB-16W	NYSDEC Class GA Criteria
Date Collected		10/20/2011	10/20/2011	10/20/2011	10/20/2011	10/20/2011	10/20/2011	10/20/2011	10/20/2011	10/20/2011	10/20/2011	10/20/2011	
Volatile Organic Compounds (VOCs) - ug/L													
2-Butanone (MEK)	78-93-3	<5	<5	<5	<5	<5	<5	**13**	<5	<5	**9.2**	**2.5**	**50**
Acetone	67-64-1	**8.5***	**4.2***	**0.75***	**<5***	**1***	**6.8***	**12***	**8***	**17***	**210***	**24***	**50**
Chloromethane	74-87-3	<1	**0.47**	<1	<1	<1	**0.66**	<1	**0.67**	**0.45**	<1	<5	**NE**
Methylene chloride	75-09-2	**10***	**11***	**11***	**8.7***	**14***	<1*	**6.1***	**13***	**5.4***	**10***	**8.9***	**5**

Bold	Sample is Above Non-Detect Value but Below Objective
Bold	Sample Exceeds Unrestricted Objective
<###	Sample is Non-Detect at Laboratory
CAS #	Chemical Abstract Service Number
NA	Not Available
ug/L	micrograms per liter
*	Result was disqualified by the DUSR

Table 13
Mill Neck Marina (Site # 130166)
Hernan Avenue
Locust Valley (Oyster Bay), New York
February 7, 2012
Groundwater Samples - Analyzed for VOCs by EPA Method 8260

Groundwater - VOC's	CAS #	HRP-MW-1	HRP-MW-2	HRP-MW-3	HRP-MW-4	NYSDEC Class GA Criteria
Date Collected		2/7/2012	2/7/2012	2/7/2012	2/7/2012	
Volatile Organic Compounds (VOCs) - ug/L						
Methyltertbutyl ether	1634-04-4	**2**	<1	<1	<1	**10**
Naphthalene	91-20-3	NA	**1.8**	NA	NA	**10**

Bold	Sample is Above Non-Detect Value but Below Objective
Bold	Sample Exceeds Unrestricted Objective
<###	Sample is Non-Detect at Laboratory
CAS #	Chemical Abstract Service Number
NA	Not Available
ug/L	micrograms per liter

Table 14
Mill Neck Marina (Site # 130166)
Hernan Avenue
Locust Valley (Oyster Bay), New York
February 7, 2012
Groundwater Samples - Analyzed for SVOCs by EPA Method 8270

Groundwater - SVOC's	CAS #	HRP-MW-1	HRP-MW-2	HRP-MW-3	HRP-MW-4	NYSDEC Class GA Criteria
Date Collected		2/7/2012	2/7/2012	2/7/2012	2/7/2012	
Semi-Volatile Organic Compounds (SVOCs) - ug/L						
2-Pentanone, 4-hydroxy-4-methyl-	123-42-2	**36**	**6.3**	**23**	**6.2**	**NE**
Propane, 1,1-dimethoxy-	4744-10-9	**2.3**	**3.6**	**2.4**	NA	**NE**
Benzoic Acid	65-85-0	**45**	NA	NA	NA	**NE**
Cyclic octaatomic sulfur	10544-50-0	**47**	NA	NA	NA	**NE**
Sulfur	13798-23-7	**3.6**	NA	NA	NA	**NE**

Bold	Sample is Above Non-Detect Value but Below Objective
Bold	Sample Exceeds Unrestricted Objective
<###	Sample is Non-Detect at Laboratory
CAS #	Chemical Abstract Service Number
NE	Not Established
ug/L	micrograms per liter

Table 15
Mill Neck Marina (Site # 130166)
Hernan Avenue
Locust Valley (Oyster Bay), New York
February 7, 2012
Groundwater Samples - Analyzed for Target Analyte List (TAL) Metals

Groundwater - Metals	CAS #	HRP-MW-1	HRP-MW-2	HRP-MW-3	HRP-MW-4	NYSDEC Class GA Criteria
Date Collected		2/7/2012	2/7/2012	2/7/2012	2/7/2012	
TAL Metals - mg/L						
Aluminum, Total	7429-90-5	**0.509**	**0.46**	**0.0363**	**0.0116**	**0.1**
Arsenic	7440-38-2	**0.00631**	<0.01	<0.01	<0.01	**0.025**
Barium	7440-39-3	**0.0899**	**0.611**	**0.104**	**0.0567**	**1**
Beryllium	7440-41-7	**0.000562**	**0.000654**	<0.003	**0.000464**	**0.003**
Cadmium	7440-43-9	**0.0024**	**0.0018**	<0.003	<0.003	**0.005**
Calcium	7440-70-2	**60.9**	**84.4**	**33.7**	**33.5**	**NE**
Chromium, Total	7440-47-3	**0.00692**	**0.00192**	<0.005	<0.005	**0.05**
Cobalt	7440-48-4	**0.0168**	<0.015	<0.015	<0.015	**NS**
Copper	7440-50-8	**0.00326**	**0.00364**	<0.01	<0.01	**0.2**
Iron	7439-89-6	**35.3**	**29.9**	**0.776**	**0.148**	**0.3**
Lead	7439-92-1	**0.00293**	**0.00459**	**0.00247**	<0.006	**0.025**
Magnesium	7439-95-4	**81.5**	**13.9**	**8.14**	**7.4**	**35**
Manganese	7439-96-5	**5.74**	**2.19**	**0.074**	**1.7**	**0.3**
Mercury	7439-97-6	<0.0002	<0.0002	<0.0002	<0.0002	**0.0007**
Nickel	7440-02-0	**0.00492**	<0.02	<0.02	<0.02	**0.1**
Potassium, Total	7440-09-7	**44.6**	**3.92**	**4.57**	**3.26**	**NE**
Silver	7440-22-4	<0.005	<0.005	**0.00155**	**0.00162**	**0.05**
Sodium, Total	7440-23-5	**756**	**44**	**101**	**53.9**	**20**
Thallium	7440-28-0	(<0.02)	(<0.02)	**0.00273**	(<0.02)	**0.0005**
Vanadium	7440-62-2	**0.00946**	<0.02	<0.02	<0.02	**NE**
Zinc	7440-66-6	**0.04**	**0.044**	**0.0143**	**0.0215**	**2**

Bold	Sample is Above Non-Detect Value but Below Objective
Bold	Sample Exceeds Unrestricted Objective
<###	Sample is Non-Detect at Laboratory
CAS #	Chemical Abstract Service Number
NE	Not Established
mg/L	Milligrams per liter
Chromium, Total	Chromium DEC standards as shown are for Hexavalent Chromium.

APPENDIX A

TECHNICAL CORRESPONDENCE ON FIELD ACTIVITIES

New York State Department of Environmental Conservation

FACT SHEET

State Superfund Program

Receive Site Fact Sheets by *Email.* See "For More Information" to Learn How.

Site Name: Mill Neck Marina **February 2012**
DEC Site #: 130166
Site Address: Hernan Avenue
Oyster Bay (Locust Valley), New York 11560

Field Investigation Underway at State Superfund Site; Results Will Help to Evaluate Ways to Address Contamination

The NYS Department of Environmental Conservation (NYSDEC), on October 18, 2011, began a detailed environmental study at Mill Neck Marina ("site") located at Hernan Avenue, Oyster Bay (Locust Valley), Nassau County, New York. Please see the map for the site location. Documents related to the cleanup of this site can be found at the location(s) identified below under "Where to Find Information". The site is listed as a Class "2" site in the State Registry of Inactive Hazardous Waste Sites (list of State Superfund sites). A Class 2 site represents a significant threat to public health or the environment; action is required. NYS DEC has posted warning signs on the property boundaries to notify the public of the site hazards and deter trespassing onto the site.

State Superfund Program: New York's State Superfund Program (SSF) identifies and characterizes suspected inactive hazardous waste disposal sites. Sites that pose a significant threat to public health and/or the environment go through a process of investigation, evaluation, cleanup and monitoring.

NYSDEC attempts to identify parties responsible for site contamination and require cleanup before committing State funds.

For more information about the SSF, visit: http://www.dec.ny.gov/chemical/8439.html

Investigation Work Plan

The investigation work plan, the "Site Specific Field Activity Plan for the Remedial Investigation /Feasibility Study at Former Mill Neck Marina," was approved on September 27, 2011. The NYS DEC is conducting the investigation under New York's State Superfund Program. The investigation will assess conditions on-site (and if appropriate, off-site).

Highlights of the Site Investigation

The site investigation has several goals:
1) Define the nature and extent of contamination in soil (surface and subsurface), sediment, groundwater and any other parts of the environment that may be affected;
2) Identify the source(s) of the contamination;
3) Assess the impact of the contamination on public health and the environment; and
4) Provide information to support the development of a proposed remedy to address the contamination.

Investigation Activities Performed

1.) Soil borings and temporary well points were installed on-site for the purpose of collection of soil and groundwater samples for analysis;
2.) Sediment samples were collected for analysis from the Oak Neck Creek; and
3.) A Fish and Wildlife Impact Analysis is being conducted.

Health Exposure Assessment

Contact with contaminated soil is possible if people dig into the ground surface below the grass level. People are not drinking contaminated water as a public water supply serves the area. People may come into contact with contaminants present in the shallow creek sediments while entering or exiting the creek during recreational activities. Volatile organic compounds in the groundwater or soil may move into the soil vapor (air spaces within the soil), which in turn may move into overlying buildings and affect the indoor air quality. This process, which is similar to the movement of radon gas from the subsurface into the indoor air of buildings, is referred to as soil vapor intrusion. Sampling does not indicate soil vapor intrusion is a concern on or off-site.

Next Steps

Four (4) groundwater monitoring wells are to be installed on-site to identify possible contaminant source areas.

The information collected during the investigation will be summarized in a “Remedial Investigation Report”. After the remedial investigation has been completed, the NYSDEC will conduct a “Feasibility Study”. The feasibility study uses information developed during the investigation to develop and evaluate potential ways to clean up contamination related to the site. Clean up alternatives will be screened and analyzed in accordance with NYSDEC regulations, standards, and guidance. Another possibility is that the information collected during the site investigation may support the conclusion that no action is needed to address site-related contamination.

NYSDEC then develops a draft cleanup plan, called a "Proposed Remedial Action Plan". This plan describes the remedy preferred by NYSDEC, or a no action alternative. The draft cleanup plan summarizes the decision that led to the preferred remedy by discussing each alternative and the reasons for choosing or rejecting it. The goal of the plan will be to ensure the protection of public health and the environment. NYSDEC will present the draft cleanup plan to the public for its review and comment during a 30-day comment period and at a public meeting.

The NYSDEC will keep the public informed throughout the investigation and cleanup of the site.

Background

The site is approximately 1.4 acres in size and compromises 23 individual tax lots, according to the Nassau County Assessor’s office. The site was a marina from at least 1953 until its abandonment in 2001. The site is currently vacant. The marina reportedly contained boat storage, maintenance, and painting areas, gasoline storage, and dispensing facilities resulting in onsite soil and groundwater being contamination with heavy metals, including mercury and lead. A 2004 sub-surface

investigation determined the presence of heavy metal contamination in the soil and groundwater on site which met the definition for characteristic hazardous waste.

Preliminary Findings

Soil samples collected in October 2011 confirmed elevated levels of heavy metals in surface and subsurface soils, as well as in sediments at Oak Neck Creek. Soil data confirmed copper, mercury, arsenic, zinc and lead exceeded Unrestricted Soil Cleanup Objectives (SCOs) levels at the site. Semi-volatile organic compounds (SVOCs) also exceeded Unrestricted SCOs in the on-site soils. No volatile organic compounds (VOCs) were detected in the soil above SCOs with one exception of Acetone, a known lab artifact, detected in one VOC sample interval. Groundwater data confirmed two VOCs, methylene chloride and acetone, that exceeded NYSDEC Class GA Criteria at the site. Acetone, a known lab artifact, was detected in one temporary monitoring well. Please see the attached map (Figure 1) for sample locations.

Additional site details are available on NYSDEC's website at:
http://www.dec.ny.gov/cfmx/extapps/derexternal/haz/details.cfm?pageid=3&progno=130166

FOR MORE INFORMATION

Where to Find Information
Project documents are available at the following location(s) to help the public stay informed. These documents include the investigation site specific field activities plan for the Remedial Investigation / Feasibility Study at Former Mill Neck Marina.

Oyster Bay – East Norwich Public Library
89 East Main Street
Oyster Bay, New York 11771
Phone = (516) 922-1212
Hours: Mon, Tue, Thur 9:30am-9pm
Wed 10am-9pm, Fri 9:30am-6pm
Sun 1pm-5pm (Closed Sun in Jul and Aug)

Who to Contact
Comments and questions are always welcome and should be directed as follows:

Project Related Questions
Kuldeep Gupta
Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, New York 12233
kxgupta@gw.dec.state.ny.us

Site-Related Health Questions
Sharon McLelland
New York State Department of Health
Bureau of Environmental Exposure Investigation
Flanigan Square, 547 River Street
Troy, New York 12180-2216
(518) 402-7880
beei@health.state.ny.us

We encourage you to share this fact sheet with neighbors and tenants, and/or post this fact sheet in a prominent area of your building for others to see.

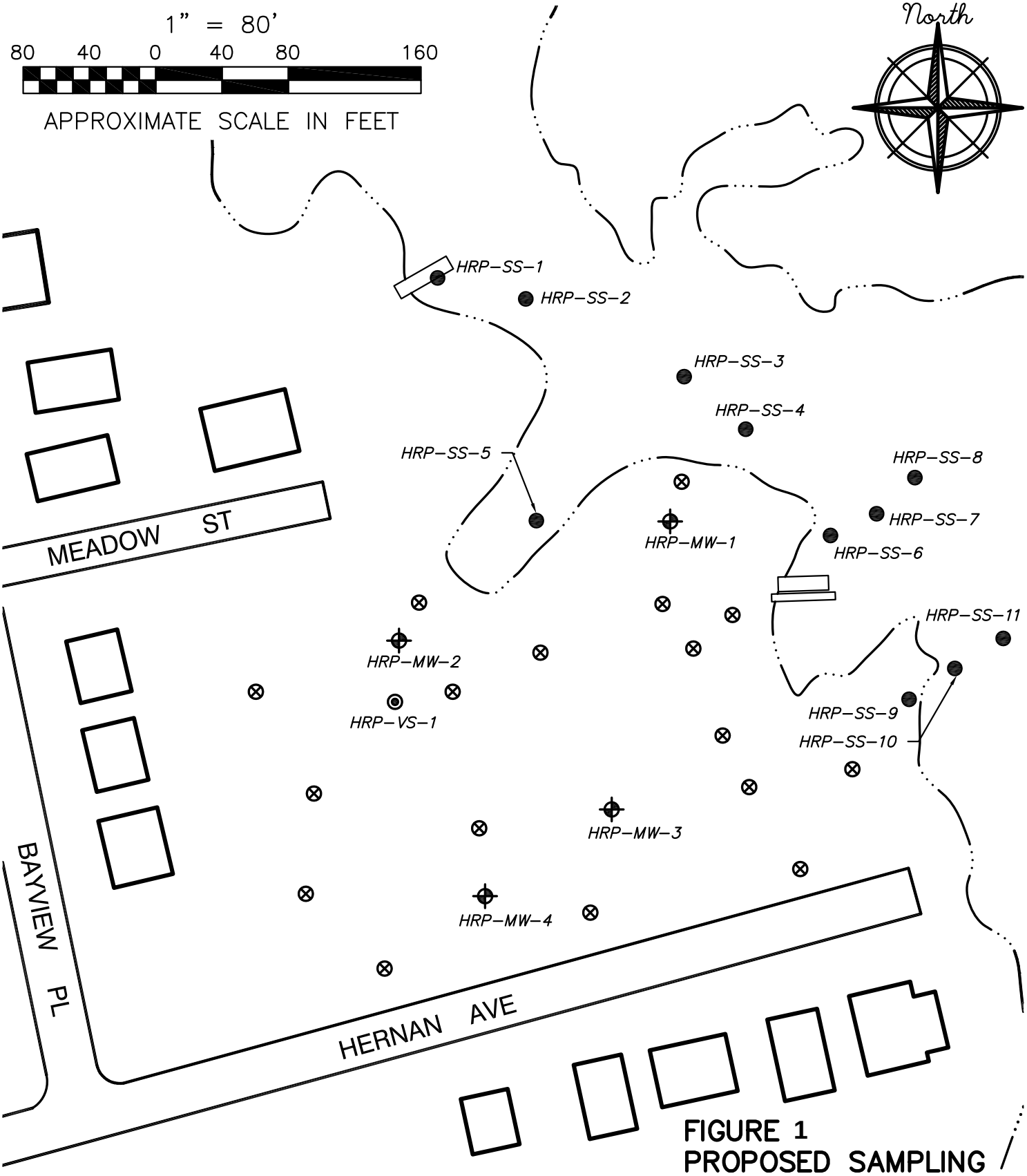
Receive Site Fact Sheets by Email

Have site information such as this fact sheet sent right to your email inbox. NYSDEC invites you to sign up with one or more contaminated sites county email listservs available at the following web page: http://www.dec.ny.gov/chemical/61092.html. It's quick, it's free, and it will help keep you *better informed*.

As a listserv member, you will periodically receive site-related information/announcements for all contaminated sites in the county(ies) you select.

You may continue also to receive paper copies of site information for a time after you sign up with a county listserv, until the transition to electronic distribution is complete.

Note: Please disregard if you already have signed up and received this fact sheet electronically.



LEGEND

- ● –SEDIMENT SAMPLE
- ⊕ –MONITORING WELL
- ⊗ –SOIL SAMPLE/ GROUNDWATER SAMPLE
- ◉ –VAPOR SAMPLE

NOTE:
REPLACEMENT MONITORING WELLS HRP-MW-1 THROUGH HRP-MW-4 WILL ONLY BE INSTALLED IF EXISTING MONITORING WELLS CANNOT BE LOCATED

FIGURE 1
PROPOSED SAMPLING LOCATIONS
FORMER MILL NECK MARINA SITE
HERNAN AVE.
LOCUST VALLEY, NY
HRP# NEW9626.P2
SCALE: 1" = 80'

S:\Data\N\NEWEN - NY STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION\MILL NECK MARINA, HERNAN AVEUNE, OYSTER BAY, NY\NEW9626P2\CAD\proposed samples.dwg, 8X11 PORTR,

HRP Associates, Inc.

Creating the Right Solutions Together

October 28, 2011

NYSDEC-DFWMR
NY Natural Heritage Program-Information Services
625 Broadway, 5th Floor
Albany, NY 12233-4757

RE: REQUEST FOR NEW YORK STATE HERITAGE PROGRAM ECOLOGICAL DATA

To Whom It May Concern:

HRP Associates, Inc. (HRP) is performing a Remedial Investigation / Feasibility Study of Mill Neck Marina, Hernan Avenue, Oyster Bay, Nassau County, NY (NYSDEC Site Code: 130166), under the supervision of the NYSDEC Inactive Hazardous Waste Disposal Site Program. The former Mill Neck Marina is located in a residential area of Oyster Bay. The site building has historically been utilized as a marina. Land use in the surrounding area consists of mixed commercial and residential properties. As part of the investigation, HRP is required to complete a Fish and Wildlife Impact Analysis (FWIA). Therefore, HRP is requesting the following information to facilitate the completion of the FWIA:

- Within a 1.0-mile radius from the site, a map and description of 1) NYSDEC Significant Habitats, 2) habitats supporting endangered, threatened, or rare species, or species of special concern, 3) wild, scenic, or recreational rivers, and 4) significant coastal zone areas.
- Within a 0.5-mile radius from the site, a map and description of major vegetative communities including wetlands, aquatic habitats, NYSDEC Significant Habitats, and areas of special concern.

Enclosed is a site location figure to aid in locating the Former Mill Neck Marina site. If you have any questions or comments, please do not hesitate to contact me at (518) 877-7101 ext 115.

Sincerely,

HRP ASSOCIATES, INC.

Jennifer Kotch
1 Fairchild Square, Suite 110
Clifton Park, NY 12065
Jennifer.Kotch@hrpassociates.com

CONNECTICUT

Corporate Headquarters
197 Scott Swamp Road
Farmington, CT 06032
800-246-9021
860-674-9570
FAX 860-674-9624

999 Oronoque Lane
Second Floor
Stratford, CT 06614
203-380-1395
FAX 203-380-1438

FLORIDA

2435 U.S. Highway 19
Suite 550
Holiday, FL 34691
727-942-2115
FAX 727-942-2113

MASSACHUSETTS

241 Boston Post Rd West
First Floor
Marlborough, MA 01752
508-630-0300
FAX 508-786-1901

NEW YORK

1 Fairchild Square
Suite 110
Clifton Park, NY 12065
888-823-6427
518-877-7101
FAX 518-877-8561

SOUTH CAROLINA

1327 Miller Road
Suite D
Greenville, SC 29607
800-752-3922
864-289-0311
FAX 864-281-9846

TEXAS

5601 Bridge Street
Suite 300
Fort Worth, TX 76112
817-492-7092

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
625 Broadway, 5th Floor, Albany, New York 12233-4757
Phone: (518) 402-8935 • **Fax:** (518) 402-8925
Website: www.dec.ny.gov

Joe Martens
Commissioner

November 22, 2011

Jennifer Kotch
H R P Associates, Inc
One Fairchild Square, Suite 110
Clifton Park, NY 12065

Dear Ms. Kotch:

In response to your recent request, we have reviewed the New York Natural Heritage Program database with respect to an Environmental Assessment for the proposed Remedial Investigation/Feasibility Study of Mill Neck Marina, area as indicated on the map you provided, including a 1.0 Mile Radius, located on Herman Avenue, Town of Oyster Bay, Nassau County.

Enclosed is a report of rare or state-listed animals and plants, significant natural communities, and other significant habitats, which our databases indicate occur, or may occur, on your site or in the immediate vicinity of your site. For most sites, comprehensive field surveys have not been conducted; the enclosed report only includes records from our databases. We cannot provide a definitive statement as to the presence or absence of all rare or state-listed species or significant natural communities. This information should not be substituted for on-site surveys that may be required for environmental impact assessment.

The enclosed report may be included in documents that will be available to the public. However, any enclosed maps displaying locations of rare species are considered sensitive information, and are intended only for the internal use of the recipient; they should not be included in any document that will be made available to the public, without permission from the New York Natural Heritage Program.

The presence of the plants and animals identified in the enclosed report may result in this project requiring additional review or permit conditions. For further guidance, and for information regarding other permits that may be required under state law for regulated areas or activities (e.g., regulated wetlands), please contact the appropriate NYS DEC Regional Office, Division of Environmental Permits, as listed at www.dec.ny.gov/about/39381.ht ml.

Our databases are continually growing as records are added and updated. If this proposed project is still under development one year from now, we recommend that you contact us again so that we may update this response with the most current information.

Sincerely,

Jean Pietrusiak

Jean Pietrusiak, Information Services
NYS Department Environmental Conservation

Enc.
cc: Region 1

1138

Fish 631 444 0280
Wildlife 631 444 0310

Natural Heritage Report on Rare Species and Ecological Communities

NY Natural Heritage Program, NYS DEC, 625 Broadway, 5th Floor,
Albany, NY 12233-4757
(518) 402-8935

~The information in this report includes only records entered into the NY Natural Heritage databases as of the date of the report. This report is not a definitive statement on the presence or absence of all rare species or significant natural communities at or in the vicinity of this site.
~Refer to the User's Guide for explanations of codes, ranks and fields.
~Location maps for certain species and communities may not be provided 1) if the species is vulnerable to disturbance, 2) if the location and/or extent is not precisely known, 3) if the location and/or extent is too large to display, and/or 4) if the animal is listed as Endangered or Threatened by New York State.

Natural Heritage Report on Rare Species and Ecological Communities

BIRDS

Charadrius melodus

Piping Plover
Breeding

Office Use 10800 ESU

NY Legal Status: Endangered
Federal Listing: Endangered/Threatened
Last Report: **
NYS Rank: S3B - Vulnerable
Global Rank: G3 - Vulnerable
EO Rank: **
County: Nassau
Town: Oyster Bay
Location: At, or in the vicinity of, the project site.
General Quality and Habitat: **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager for the Region where the project is located.

Sterna hirundo

Common Tern
Breeding

Office Use 11880 ESU

NY Legal Status: Threatened
Federal Listing:
Last Report: **
NYS Rank: S3B - Vulnerable
Global Rank: G5 - Secure
EO Rank: **
County: Nassau
Town: Oyster Bay
Location: At, or in the vicinity of, the project site.
General Quality and Habitat: **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager for the Region where the project is located.

Sternula antillarum *(formerly Sterna antillarum)*

Least Tern
Breeding

Office Use 11372 ESU

NY Legal Status: Threatened
Federal Listing:
Last Report: **
NYS Rank: S3B - Vulnerable
Global Rank: G4 - Apparently secure
EO Rank: **
County: Nassau
Town: Oyster Bay
Location: At, or in the vicinity of, the project site.
General Quality and Habitat: **For information on the population at this location and management considerations, please contact the NYS DEC Regional Wildlife Manager for the Region where the project is located.

MARINE RESOURCES
631 444 0430

3 Records Processed

More detailed information about many of the rare and listed animals and plants in New York, including biology, identification, habitat, conservation, and management, are available online in Natural Heritage's Conservation Guides at www.acris.nynhp.org, from NatureServe Explorer at http://www.natureserve.org/explorer, from NYSDEC at http://www.dec.ny.gov/animals/7494.html (for animals), and from USDA's Plants Database at http://plants.usda.gov/index.html (for plants).

More detailed information about many of the natural community types in New York, including identification, dominant and characteristic vegetation, distribution, conservation, and management, is available online in Natural Heritage's Conservation Guides at www.acris.nynhp.org. For descriptions of all community types, go to http://www.dec.ny.gov/animals/29384.html and click on Draft Ecological Communities of New York State.

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Fish, Wildlife & Marine Resources
Bureau of Habitat
625 Broadway, 5th Floor, Albany, New York 12233-4756
Phone: (518) 402-8924 • **Fax:** (518) 402-8925
Website: www.dec.ny.gov

Joseph Martens
Commissioner

MEMORANDUM

To: Kuldeep Gupta, DER Remedial Bureau A

From: Rebecca Quail, DFWMR Natural Resource Restoration Unit

Re: Mill Neck Marina (1-30-166), Nassau County, Oyster Bay
Mill Neck Marina overview, prepared by HRP associates, April 5, 2012

Date: May 14, 2012

The site is an old marina that contains fill and some soil contamination. The sediments surrounding the site in Oak Neck Creek demonstrate some contamination that may or may not be attributable to the site. The site is located in an area that contains important tidal marsh habitat.

Recommendations: The sediment sampling at the site has indicated some elevated metals over DFWMR criteria, however there are no consistent patterns of distribution or concentration that clearly link the metals to the site. Additionally, the exceedence of LEL criteria are not consistent therefore providing very little basis for remediation. While remediation for contaminants to protect fish and wildlife is not necessary based on these data, the entire site, including sediments and upland soils, is subject to Article 25 and 6 NYCRR Part 661 Tidal wetlands land-use regulations. Therefore, any remedial or re-development action must meet the substantive requirements of these regulations or obtain a permit before action occurs. The Region 1 Habitat program ((631) 444-0275) should be contacted before any action is taken to obtain substantive permit requirements.

Comment:
The contractor on this site has consistently compared sediment data to the Part 375 Soil cleanup objectives (SCOs) for differing land uses. These standards, including the protection of ecological resources, were not developed for and do not apply to sediments. All columns and comparisons of sediment data to SCOs must be removed from site-related docments.

Thank you for the opportunity to comment. If you have any questions please call me at (518) 402-8889.

ecc: C. Dowd, Bureau of Habitat Chief
W. Richter, Environmental Monitoring Section Leader
NRRU (A.L./S.M./C.G./M.J.C./J.D.)
R. Marsh, Natural Resource supervisor Region 1

APPENDIX B

QA/QC EVALUATION RESULTS (DUSRs)
(on enclosed CD)

APPENDIX C

FIELD DATA (SOIL BORING LOGS, GROUNDWATER SAMPLING SHEETS, WELL LOGS, etc.)

HRP *Associates, Inc.*

Creating the Right Solutions Together

Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-1
Job Number: NEW9626.P2	**Date:** October 18, 2011
Drilling Company: HRP (Hand Auger)	**Time:** 9:30

Location:

GPS Coordinates **N:** 40° 54.087' **W:** 73° 34.689'

Sample Interval (ftbg)		Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
Top	Bottom				
0	0.5	0.5	Wet	Roots, muck, black, loose.	0.0
0.5	1	0.5	Wet	Roots, muck, black, loose.	0.0
	1			Auger refusal, End of Boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-1 (0-0.5)	9:40
Sampling Method:			
Description of Water:			

HRP *Associates, Inc.*

Creating the Right Solutions Together

Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-2
Job Number: NEW9626.P2	**Date:** October 18, 2011
Drilling Company: HRP (Hand Auger)	**Time:** 10:00

Location:

GPS Coordinates **N:** 40° 54.096' **W:** 73° 34.697'

Sample Interval (ftbg)		Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
Top	Bottom				
0	0.5	0.5	Moist	SAND, medium; some silt; some gravel; roots; brown; loose; no odor; no staining.	0.0
0.5	1	0.5	Moist	SAND; medium; some silt; trace gravel; brown; loose; no odor; no staining.	0.0
1	1.5	0.5	Wet	SAND; medium; brown; loose; no odor; no staining.	0.0
1.5	2	0.5	Wet	SAND; medium; brown; loose; no odor; no staining.	0.0
2	2.5	0.5	Wet	Gravel; medium; black; petroleum odor; loose.	0.0
2.5	3	0.5	Wet	Gravel; medium; black; petroleum odor; loose.	0.0
3	3.5	0.5	Wet	Gravel; medium; black; petroleum odor; loose.	0.0
	3.5			Augur refusal. End of Boring	

Well Screen: 0 to 3 feet bg		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-2 (0-0.5)	10:15
HRP-SB-2W and Duplicate	10:20	HRP-SB-2 (1-1.5)	11:10
Sampling Method: Bailer		HRP-SB-2 (3-3.5)	11:40
Description of Water: Silty.	NOTE: Water sample collected on 10/20/11		

HRP *Associates, Inc.*

Creating the Right Solutions Together

Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-3
Job Number: NEW9626.P2	**Date:** October 18, 2011
Drilling Company: HRP (Hand Auger)	**Time:** 12:00

Location:

GPS Coordinates **N:** 40° 50.098' **W:** 73° 34.697'

Sample Interval (ftbg)		Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
Top	**Bottom**				
0	0.5	0.5	Moist	Medium sand and gravel and silt; roots; brown; loose; no odor; no staining,	0.0
0.5	1	0.5	Wet	SAND; fine; trace gravel brown; loose; no odor; no staining.	0.0
1	1.5	0.5	Wet	SAND; fine; and gravel brown; loose; no odor; no staining.	0.0
1.5	2	0.5	Wet	SAND; fine; and gravel brown; loose; no odor; no staining.	0.0
2	2.5	0.5	Wet	SAND; fine; and gravel brown/grey; loose; slight petroleum odor.	0.0
2.5	3	0.5	Wet	SAND; fine; and gravel brown/grey; loose; slight petroleum odor.	0.0
	3			Augur refusal. End of Boring	

Well Screen: 0 to 3 feet bg		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-3 (0-0.5)	12:00
HRP-SB-3W	10:30	HRP-SB-3 (2-2.5)	12:35
Sampling Method: Bailer			

Description of Water: Silty.
NOTE: Water sample collected on 10/20/11, soil samples collected on 10/18/11

HRP *Associates, Inc.*

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-4
Job Number: NEW9626.P2	**Date:** October 18, 2011
Drilling Company: HRP (Hand Auger)	**Time:** 12:50

Location:

GPS Coordinates **N:** 40° 50.107' **W:** 73° 34.704'

Sample Interval (ftbg)		Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
Top	Bottom				
0	0.5	0.5	Wet	Medium sand and gravel and silt; roots; brown; loose; no odor; no staining,	0.0
0.5	1	0.5	Wet	Medium sand and gravel and silt; roots; brown; loose; no odor; no staining,	0.0
1	1.5	0.5	Wet	SAND; fine; and gravel brown; loose; no odor; no staining.	0.0
1.5	2	0.5	Wet	GRAVEL, medium; some sand brown; loose; no odor; no staining.	0.0
2	2.5	0.5	Wet	GRAVEL, medium; some sand brown; loose; no odor; no staining.	0.0
2.5	3	0.5	Wet	GRAVEL, medium; some sand brown; loose; no odor; no staining.	0.0
	3			Augur refusal. End of Boring	

Well Screen: 0 to 3 feet bg		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-4 (0-0.5)	12:55
HRP-SB-4W	10:35	HRP-SB-4 (2-2.5)	13:00
Sampling Method: Bailer			

Description of Water: Silty.
NOTE: Water sample collected on 10/20/11, soil samples collected on 10/18/11

HRP *Associates, Inc.*

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-5
Job Number: NEW9626.P2	**Date:** October 18, 2011
Drilling Company: HRP (Hand Auger)	**Time:** 14:10

Location:

GPS Coordinates **N:** 40° 54.107' **W:** 73° 34.704'

Sample Interval (ftbg)		Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
Top	**Bottom**				
0	0.5	0.5	Moist	Medium sand and gravel some blue mesh; brown; loose; no odor; no staining, Fill	0.0
0.5	1	0.5	Moist	Medium sand and gravel some blue mesh; brown; loose; no odor; no staining, Fill	0.0
1	1.5	0.5	Moist	SAND; fine; some gravel; trace silt; brown; loose; no odor; no staining.	0.0
1.5	2	0.5	Moist	SAND; fine; some gravel; trace silt; brown; loose; slight petroleum odor; no staining.	0.0
2	2.5	0.5	Moist	SAND; fine; some gravel; trace silt; brown; loose; slight petroleum odor; no staining.	0.0
	2.75			Augur refusal. End of Boring	

Well Screen: None		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-5 (0-0.5)	14:15
		HRP-SB-5 (2-2.5)	14:25
Sampling Method:			
Description of Water: Silty.			

HRP *Associates, Inc.*

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-6
Job Number: NEW9626.P2	**Date:** October 18, 2011
Drilling Company: HRP (Hand Auger)	**Time:** 14:35

Location:

GPS Coordinates **N:** 40° 54.110' **W:** 73° 34.707'

Sample Interval (ftbg)		Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
Top	**Bottom**				
0	0.5	0.5	Moist	SAND, medium; some silt; roots; brown; loose; no odor; no staining.	0.0
0.5	1	0.5	Moist	SAND, medium; some silt; roots; brown; loose; no odor; no staining.	0.0
1	1.5	0.5	Wet	SAND, medium; some silt; roots; brown; loose; no odor; no staining.	0.0
1.5	2	0.5	Wet	SAND, fine; brown/grey; loose; no odor; no staining.	0.0
	2.25			Augur refusal. End of Boring	

Well Screen: 0-5 ftbg		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-6 (0-0.5)	14:35
HRP-SB-6W	10:45	HRP-SB-6 (1.5-2)	14:50
Sampling Method: Bailer			

Description of Water: Silty.
NOTE: Water sample collected on 10/20/11, soil samples collected on 10/18/11

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Project: Mill Neck Marina	**Boring I.D.:** HRP-SB-7
Job Number: NEW9626.P2	**Date:** October 18, 2011
Drilling Company: HRP (Hand Auger)	**Time:** 15:10
Location:	
GPS Coordinates **N:** 40° 54.121'	**W:** 73° 34.718'

Sample Interval (ftbg)		**Recovery (ft)**	**Moisture**	**Description (grain size, color, compaction, staining, odor)**	**PID (PPM)**
Top	**Bottom**				
0	0.5	0.5	Moist	SAND, medium; some silt; some gravel; brown; loose; no odor; no staining.	0.0
0.5	1	0.5	Moist	SAND, medium; some silt; some gravel; brown; loose; no odor; no staining.	0.0
	1			Auger refusal, End of Boring	

Well Screen: None		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-7 (0-0.5)	15:15
Sampling Method:			
Description of Water:			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-8
Job Number: NEW9626.P2	**Date:** October 18, 2011
Drilling Company: HRP (Hand Auger)	**Time:** 15:40

Location:

GPS Coordinates **N:** 40° 54.091' **W:** 73° 34.679'

Sample Interval (ftbg)		Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
Top	**Bottom**				
0	0.5	0.5	Moist	SAND, medium; some silt; some gravel; roots; brown; loose; no odor; no staining.	0.0
0.5	1	0.5	Moist	SAND, medium; some silt; some gravel; roots; brown; loose; no odor; no staining.	0.0
1	1.5	0.5	Wet	SAND, fine; brown/grey; loose; no odor; no staining.	0.0
1.5	2	0.5	Wet	SAND, fine; brown/grey; loose; no odor; no staining.	0.0
2	2.5	0.5	Wet	SAND, fine; brown/grey; loose; no odor; no staining.	0.0
2.5	3	0.5	Wet	SAND, fine; brown/grey; loose; no odor; no staining.	0.0
3	3.5	0.5	Wet	SAND, fine; brown/grey; loose; no odor; no staining.	0.0
3.5	4	0.5	Wet	SAND, fine; brown/grey; loose; no odor; no staining.	0.0
4	4.5	0.5	Wet	SAND, fine; brown/grey; loose; no odor; no staining.	0.0
4.5	5	0.5	Wet	SAND, medium; some clay; organic matter; black; loose; sulfur odor.	0.0
	5			Augur refusal. End of Boring	

Well Screen: 0-5 ftbg		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-8 (0-0.5)	15:40
HRP-SB-8W+MS/MSD	10:55	HRP-SB-8 (4.5-5)	15:55
Sampling Method: Bailer			

Description of Water: Silty.
NOTE: Water sample collected on 10/20/11, soil samples collected on 10/18/11

HRP *Associates, Inc.*

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-9
Job Number: NEW9626.P2	**Date:** October 19, 2011
Drilling Company: HRP (Hand Auger)	**Time:** 14:35

Location:

GPS Coordinates **N:** 40° 54.109' **W:** 73° 34.731'

Sample Interval (ftbg)		Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
Top	**Bottom**				
0	0.5	0.5	Moist	SAND, medium; some silt; some gravel roots; brown; loose; no odor; no staining.	0.0
0.5	1	0.5	Moist	SAND, medium; some silt; some gravel roots; brown; loose; no odor; no staining.	0.0
1	1.5	0.5	Moist	SAND, medium; some silt; some gravel roots; brown; loose; no odor; no staining.	0.0
	1.5			Augur refusal. End of Boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-9 (0-0.5)	8:05
Sampling Method:			

Description of Water:
NOTE: Water sample collected on 10/20/11, soil samples collected on 10/19/11

HRP *Associates, Inc.*

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-10
Job Number: NEW9626.P2	**Date:** October 19, 2011
Drilling Company: HRP (Hand Auger)	**Time:** 8:30

Location:

GPS Coordinates **N:** 40° 54.106' **W:** 73° 34.730'

Sample Interval (ftbg)		Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
Top	**Bottom**				
0	0.5	0.5	Moist	GRAVEL and SILT; brown; loose; no odor; no staining.	0.0
0.5	1	0.5	Moist	GRAVEL and SILT; brown; loose; no odor; no staining.	0.0
1	1.5	0.5	Wet	GRAVEL and SILT; brown; loose; no odor; no staining.	0.0
1.5	2	0.5	Wet	SAND, fine; some gravel; brown/grey; loose; no odor; no staining.	0.0
2	2.5	0.5	Wet	SAND, fine; some gravel; brown/grey; loose; no odor; no staining.	0.0
2.5	3	0.5	Wet	SAND, fine; some gravel; brown/grey; loose; no odor; no staining.	0.0
	3			Augur refusal. End of Boring	

Well Screen: 0-3 ftbg		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-10 (0-0.5)	8:35
HRP-SB-10W	11:10	HRP-SB-10 (2.5-3)	8:50
Sampling Method: Bailer			

Description of Water: Silty.
NOTE: Water sample collected on 10/20/11, soil samples collected on 10/19/11

HRP *Associates, Inc.*

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-11
Job Number: NEW9626.P2	**Date:** October 19, 2011
Drilling Company: HRP (Hand Auger)	**Time:** 9:01

Location:

GPS Coordinates **N:** 40° 54.107' **W:** 73° 34.723'

Sample Interval (ftbg)		Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
Top	**Bottom**				
0	0.5	0.5	Moist	SAND and GRAVEL; some silt; brown; loose; no odor; no staining.	0.0
0.5	1	0.5	Moist	SAND and GRAVEL; some silt; brown; loose; no odor; no staining.	0.0
1	1.5	0.5	Wet	SAND and COBBLES; brown/grey; loose; no odor; no staining.	0.0
1.5	2	0.5	Wet	SAND and COBBLES; brown/grey; loose; no odor; no staining.	0.0
2	2.5	0.5	Wet	SAND and COBBLES; brown/grey; loose; no odor; no staining.	0.0
2.5	3	0.5	Wet	SAND and COBBLES; brown/grey; loose; no odor; no staining.	0.0
	3			Augur refusal. End of Boring	

Well Screen: 0-3 ftbg		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-11 (0-0.5)	9:10
HRP-SB-11W	11:15	HRP-SB-11 (2.5-3)	9:20
Sampling Method: Bailer			

Description of Water: Silty.
NOTE: Water sample collected on 10/20/11, soil samples collected on 10/19/11

HRP *Associates, Inc.*

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-12
Job Number: NEW9626.P2	**Date:** October 19, 2011
Drilling Company: HRP (Hand Auger)	**Time:** 9:33

Location:

GPS Coordinates **N:** 40° 54.091' **W:** 73° 34.723'

Sample Interval (ftbg)		Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
Top	**Bottom**				
0	0.5	0.5	Moist	GRAVEL medium; some silt; trace brick; brown; loose; no odor; no staining.	0.0
0.5	1	0.5	Moist	SAND and GRAVEL; brown; loose; no odor; no staining.	0.0
1	1.5	0.5	Wet	SAND medium to fine; little gravel brown; loose; no odor; no staining.	0.0
1.5	2	0.5	Wet	SAND medium to fine; little gravel brown; loose; no odor; no staining	0.0
2	2.5	0.5	Wet	SAND medium to fine; little gravel brown; loose; no odor; no staining	0.0
2.5	3	0.5	Wet	SAND medium to fine; little gravel dark brown; loose; organic odor; no staining	0.0
	3			Augur refusal. End of Boring	

Well Screen: 0-3 ftbg		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-11 (0-0.5)	9:40
HRP-SB-12W	11:20	HRP-SB-11 (2.5-3)	9:55
Sampling Method: Bailer			

Description of Water: Silty.
NOTE: Water sample collected on 10/20/11, soil samples collected on 10/19/11

HRP *Associates, Inc.*

Creating the Right Solutions Together

Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-13
Job Number: NEW9626.P2	**Date:** October 19, 2011
Drilling Company: HRP (Hand Auger)	**Time:** 10:00

Location:

GPS Coordinates **N:** 40° 54.079' **W:** 73° 34.719'

Sample Interval (ftbg)		Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
Top	Bottom				
0	0.5	0.5	Moist	SAND and GRAVEL; trace brick; brown; compact; no odor; no staining.	0.0
0.5	1	0.5	Moist	SAND and GRAVEL; trace brick; brown; compact; no odor; no staining.	0.0
1	1.5	0.5	Wet	SAND and GRAVEL; some silt; brown; compact; no odor; no staining.	0.0
1.5	2	0.5	Wet	SAND and GRAVEL; some silt; brown; compact; no odor; no staining.	0.0
2	2.5	0.5	Wet	SAND medium to fine; little gravel brown; loose; no odor; no staining	0.0
	2.5			Augur refusal. End of Boring	

Well Screen: 0-2.5 ftbg		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-13 (0-0.5)	10:05
HRP-SB-13W	11:30	HRP-SB-13 (2.5-3)	10:25
Sampling Method: Bailer			

Description of Water: Silty.
NOTE: Water sample collected on 10/20/11, soil samples collected on 10/19/11

HRP *Associates, Inc.*

Creating the Right Solutions Together

Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-14
Job Number: NEW9626.P2	**Date:** October 20, 2011
Drilling Company: HRP (Hand Auger)	**Time:** 8:30

Location:

GPS Coordinates **N:** 40° 54.095' **W:** 73° 34.747'

Sample Interval (ftbg)		Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
Top	Bottom				
0	0.5	0.5	Moist	GRAVEL; some silt; little sand; brown; compact; no odor; no staining.	0.0
0.5	1	0.5	Moist	GRAVEL; some silt; little sand; brown; compact; no odor; no staining.	0.0
1	1.5	0.5	Wet	GRAVEL; some silt; little sand; brown; compact; no odor; no staining.	0.0
1.5	2	0.5	Wet	GRAVEL; some silt; little sand; brown; compact; no odor; no staining.	0.0
	2			Augur refusal. End of Boring	

Well Screen: 0-2.5 ftbg		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-14 (0-0.5)	8:45
HRP-SB-14W	11:35		
Sampling Method: Bailer			
Description of Water: Silty.			

HRP *Associates, Inc.*

Creating the Right Solutions Together

Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-15
Job Number: NEW9626.P2	**Date:** October 20, 2011
Drilling Company: HRP (Hand Auger)	**Time:** 8:55

Location:

GPS Coordinates **N:** 40° 54.093' **W:** 73° 34.746'

Sample Interval (ftbg)		Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
Top	**Bottom**				
0	0.5	0.5	Moist	GRAVEL and SILT; brown/grey; compact; no odor; no staining.	0.0
0.5	1	0.5	Moist	GRAVEL and SILT; brown/grey; compact; no odor; no staining.	0.0
1	1.5	0.5	Wet	GRAVEL and SILT; brown/grey; compact; no odor; no staining.	0.0
1.5	2	0.5	Wet	GRAVEL and SILT; brown/grey; compact; no odor; no staining.	0.0
2	2.5	0.5	Wet	SAND, medium; some gravel; brown/grey; compact; no odor; no staining.	0.0
2.5	3	0.5	Wet	SAND, medium; some gravel; brown/grey; compact; no odor; no staining.	0.0
	3			Augur refusal. End of Boring	

Well Screen: 0-2.5 ftbg		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-15 (0-0.5)	9:00
HRP-SB-15W	11:40	HRP-SB-15 (2.5-3)	9:15
Sampling Method: Bailer			

Description of Water: Silty.

HRP *Associates, Inc.*

Creating the Right Solutions Together

Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-16
Job Number: NEW9626.P2	**Date:** October 20, 2011
Drilling Company: HRP (Hand Auger)	**Time:** 9:25
Location:	
GPS Coordinates **N:** 40° 54.086'	**W:** 73° 34.742'

Sample Interval (ftbg) Top	Sample Interval (ftbg) Bottom	Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
0	0.5	0.5	Moist	GRAVEL; some sand; brown/grey; compact; no odor; no staining.	0.0
0.5	1	0.5	Moist	GRAVEL; some sand; brown/grey; compact; no odor; no staining.	0.0
1	1.5	0.5	Wet	SAND, medium; some gravel; brown/grey; compact; no odor; no staining.	0.0
1.5	2	0.5	Wet	SAND, medium; some gravel; brown/grey; compact; no odor; no staining.	0.0
2	2.5	0.5	Wet	SAND, medium; some gravel; brown/grey; compact; no odor; no staining.	0.0
2.5	3	0.5	Wet	SAND, medium; some gravel; brown/grey; compact; no odor; no staining.	0.0
	3			Augur refusal. End of Boring	

Well Screen: 0-2.5 ftbg		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-16 (0-0.5) & Duplicate 1	9:30
HRP-SB-16W	11:45	HRP-SB-16 (2.5-3)	9:35
Sampling Method: Bailer			
Description of Water: Silty.			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-17
Job Number: NEW9626.P2	**Date:** October 20, 2011
Drilling Company: HRP (Hand Auger)	**Time:** 9:25
Location:	
GPS Coordinates **N:** 40° 54.086'	**W:** 73° 34.742'

Sample Interval (ftbg) Top	Sample Interval (ftbg) Bottom	Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
0	0.5	0.5	Dry	SAND and GRAVEL; trace concrete trace brick; brown/grey; compact; no odor; no staining.	0.0
0.5	1	0.5	Dry	SAND and GRAVEL; trace concrete trace brick; brown/grey; compact; no odor; no staining.	0.0
1	1.5	0.5	Dry	SAND, medium; some gravel; brown/grey; compact; no odor; no staining.	0.0
1.5	2	0.5	Dry	SAND, medium; some gravel; brown/grey; compact; no odor; no staining.	0.0
2	2.5	0.5	Dry	SAND, medium; some gravel; brown/grey; compact; no odor; no staining.	0.0
2.5	3	0.5	Dry	SAND, medium; some gravel; black; compact; petroleum odor; no staining.	0.0
3	3.5	0.5	Dry	SAND, medium; some gravel; black; compact; petroleum odor; no staining.	
	3			Augur refusal. End of Boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-17 (0-0.5) – Duplicate 2	9:45
		HRP-SB-17 (3-3.5)	9:50
Sampling Method:			
Description of Water: Dry			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-19
Job Number: NEW9626.P2	**Date:** July 17, 2012
Drilling Company: ADT	**Time:** 1500
Location:	
GPS Coordinates **N:** 40° 54.090’	**W:** 73° 34.749’

Sample Interval (ft bgs)		**Recovery (ft)**	**Moisture**	**Description (grain size, color, compaction, staining, odor)**	**PID (PPM)**
Top	**Bottom**				
0	0.5	0.5	Moist	Medium sand and gravel and silt; roots; brown; loose; no odor; no staining,	0.0
0.5	3’	2.5	Wet	SAND; fine; and gravel brown/grey; loose; no odor; no staining.	0.0
3’	4’	1	Wet	GRAVEL & SAND; fine; and gravel brown; loose; no odor; no staining.	0.0
4’	9’	5	Wet	SAND; fine; and gravel brown; loose; wood, slight organic odor; no staining.	0.0
9’	15’	6	Wet	SAND; fine; grey; loose, organics noted; slight petroleum odor.	0.0
	15			End of Boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-19 (0-2”)	1502
NA		HRP-SB-19 (4-5’)	1500
Sampling Method:			
Description of Water:			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-20
Job Number: NEW9626.P2	**Date:** July 17, 2012
Drilling Company: ADT	**Time:** 1000
Location:	
GPS Coordinates **N:** 40° 54.087’	**W:** 73° 34.689’

Sample Interval (ft bgs)		**Recovery (ft)**	**Moisture**	**Description (grain size, color, compaction, staining, odor)**	**PID (PPM)**
Top	**Bottom**				
0	0.5	0.5	Moist	Medium sand and gravel and silt; roots; brown; loose, organics; no odor; no staining,	0.0
0.5	18”	1	Wet	SAND; fine; and gravel brown/grey; loose; no odor; no staining.	0.0
18”	5’	3.5	Wet	SAND and COBBLES; brown/grey; loose; no odor; no staining.	0.0
5’	10’’	5	Wet	SAND; fine; and gravel brown; loose; wood, slight organic odor; no staining.	0.0
10’	15’	5	Wet	SAND, medium; some clay (marbling); organic matter; black; no odor; no staining..	0.0
	15			End of Boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-20 (0-2”)	1002
NA		HRP-SB-20 (3-4’)	1000
Sampling Method:			
Description of Water:			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-21
Job Number: NEW9626.P2	**Date:** July 17, 2012
Drilling Company: ADT	**Time:** 1200
Location:	
GPS Coordinates **N:** 40° 54.106'	**W:** 73° 34.789'

Sample Interval (ft bgs)		**Recovery (ft)**	**Moisture**	**Description (grain size, color, compaction, staining, odor)**	**PID (PPM)**
Top	**Bottom**				
0	0.5	0.5	Moist	Medium sand and gravel and silt; roots; brown; loose, organics; no odor; no staining,	0.0
0.5	18"	1	Moist	SAND; fine; and gravel brown/grey; loose; no odor; no staining.	0.0
18"	5'	3.5	Wet	SAND and COBBLES; brown/grey; loose; no odor; no staining.	0.0
5'	10''	5	Wet	SAND; fine; and gravel brown; loose; wood, slight organic odor; no staining.	0.0
10'	15'	5	Wet	SAND, medium; some clay (marbling); organic matter; black; no odor; no staining..	0.0
	15			End of Boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-21 (0-2")	1202
NA		HRP-SB-21 (4-5')	1200
Sampling Method:			
Description of Water:			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-22
Job Number: NEW9626.P2	**Date:** July 17, 2012
Drilling Company: ADT	**Time:** 1300
Location:	
GPS Coordinates **N:** 40° 54.107'	**W:** 73° 34.719'

Sample Interval (ft bgs)		**Recovery (ft)**	**Moisture**	**Description (grain size, color, compaction, staining, odor)**	**PID (PPM)**
Top	**Bottom**				
0	0.5	0.5	Moist	Medium sand and gravel and silt; roots; brown; loose, organics; no odor; no staining,	0.0
0.5	18"	1	Wet	SAND; fine; and gravel brown/grey; loose; no odor; no staining.	0.0
18"	5'	3.5	Wet	SAND and COBBLES; brown/grey; loose; no odor; no staining.	0.0
5'	10''	5	Wet	SAND; fine; and gravel brown/grey; loose; wood, slight organic odor; no staining.	0.0
10'	15'	5	Wet	SAND; fine; and gravel brown/grey; loose; wood, no odor; no staining.	0.0
	15			End of Boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-22 (0-2")	1302
NA		HRP-SB-22 (4-5')	1300
Sampling Method:			
Description of Water:			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-23
Job Number: NEW9626.P2	**Date:** July 17, 2012
Drilling Company: ADT	**Time:** 1030
Location:	
GPS Coordinates **N:** 40° 50.107'	**W:** 73° 34.709'

Sample Interval (ft bgs)		**Recovery (ft)**	**Moisture**	**Description (grain size, color, compaction, staining, odor)**	**PID (PPM)**
Top	**Bottom**				
0	0.5	0.5	Moist	Medium sand and gravel and silt; roots; brown; loose, organics, brick, and glass; no odor; no staining,	0.0
0.5	18"	1	Wet	SAND; fine; and gravel brown/grey; loose; no odor; no staining.	0.0
18"	5'	3.5	Wet	SAND and COBBLES; brown/grey; loose; no odor; no staining.	0.0
5'	10''	5	Wet	SAND; fine; and gravel brown/grey; loose; wood, slight petroleum odor; no staining.	2.3
10'	15'	5	Wet	SAND; fine; and gravel brown/grey; loose; wood, no odor; no staining.	0.0
	15			End of Boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-23 (0-2")	1032
NA		HRP-SB-23 (4-5')	1030
Sampling Method:			
Description of Water:			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-24
Job Number: NEW9626.P2	**Date:** July 17, 2012
Drilling Company: ADT	**Time:** 1030
Location:	
GPS Coordinates **N:** 40° 54.087’	**W:** 73° 34.689’

Sample Interval (ft bgs)		**Recovery (ft)**	**Moisture**	**Description (grain size, color, compaction, staining, odor)**	**PID (PPM)**
Top	**Bottom**				
0	0.5	0.5	Moist	Medium sand and gravel and silt; roots; brown; loose, organics, brick, and glass; no odor; no staining,	0.0
0.5	18”	1	Moist	SAND; fine; and gravel brown/grey; loose; no odor; no staining.	0.0
18”	5’	3.5	Wet	SAND and COBBLES; brown/grey; loose; no odor; no staining.	0.0
5’	10’’	5	Wet	SAND; fine; and gravel brown/grey; loose; wood, slight petroleum odor; no staining.	1.8
10’	15’	5	Wet	SAND; fine; and gravel brown/grey; loose; wood, no odor; no staining.	0.0
	15			End of Boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-24 (0-2”)	1117
NA		HRP-SB-24 (4-5’)	1115
Sampling Method:			
Description of Water:			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SB-25
Job Number: NEW9626.P2	**Date:** July 17, 2012
Drilling Company: ADT	**Time:** 1400
Location:	
GPS Coordinates **N:** 40° 54.110'	**W:** 73° 34.709'

Sample Interval (ft bgs)		**Recovery (ft)**	**Moisture**	**Description (grain size, color, compaction, staining, odor)**	**PID (PPM)**
Top	**Bottom**				
0	0.5	0.5	Moist	Medium sand and gravel and silt; roots; brown; loose, organics, brick, and glass; no odor; no staining,	0.0
0.5	18"	1	Moist	SAND; fine; and gravel brown/grey; loose; no odor; no staining.	0.0
18"	5'	3.5	Wet	SAND and COBBLES; brown/grey; loose; no odor; no staining.	0.0
5'	10''	5	Wet	SAND; fine; and gravel brown/grey; loose; wood, no odor; no staining.	1.8
10'	15'	5	Wet	SAND; fine; and gravel brown/grey; loose; wood, no odor; no staining.	0.0
	15			End of Boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SB-25 (0-2")	1402
NA		HRP-SB-25 (4-5')	1400
Sampling Method:			
Description of Water:			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SS-1
Job Number: NEW9626.P2	**Date:** November 8, 2011
Drilling Company: HRP (Hand Probe)	**Time:** 10:20
Location:	
GPS Coordinates **N:** 40°.902418	**W:** 73° 34.241'

Sample Interval (ftbg) Top	Sample Interval (ftbg) Bottom	Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
0	2	2	Wet	0-0.5: ORGANIC MUCK; black; loose.	0.0
				0.5-1: ORGANIC MUCK; little gravel; little shells; black; loose.	0.0
				1-2: ORGANIC MUCK; some sand; medium to fine; trace gravel; trace shells; black; loose.	0.0
	2			End of boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SS-1 (0-0.5)	10:20
		HRP-SS-1 (0.5-1)	10:20
Sampling Method:		HRP-SS-1 (1-2)	10:20
Description of Water:			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SS-2
Job Number: NEW9626.P2	**Date:** November 8, 2011
Drilling Company: HRP (Hand Probe)	**Time:** 7:55

Location:

GPS Coordinates **N:** 40° 90.2392' **W:** 73° 34.731'

Sample Interval (ftbg) Top	Sample Interval (ftbg) Bottom	Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
0	2	2	Wet	0-0.5: ORGANIC MUCK; black; loose.	0.0
				0.5-1: ORGANIC MUCK; little gravel; little shells; black; loose.	0.0
				1-2: ORGANIC MUCK; some sand; medium to fine; trace gravel; trace shells; black; loose.	0.0
	2			End of boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SS-2 (0-0.5)	7:55
		HRP-SS-2 (0.5-1)	7:55
Sampling Method:		HRP-SS-2 (1-2)	7:55
Description of Water:			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SS-3
Job Number: NEW9626.P2	**Date:** November 8, 2011
Drilling Company: HRP (Hand Probe)	**Time:** 8:35

Location:

GPS Coordinates **N:** 40° 90.220' **W:** 73° 34.699'

Sample Interval (ftbg) Top	Sample Interval (ftbg) Bottom	Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
0	2	1	Wet	0-0.5: ORGANIC MUCK; black; loose.	0.0
				0.5-1: ORGANIC MUCK; little gravel; little shells; black; loose.	0.0
				1-2: ORGANIC MUCK; some sand; medium to fine; trace gravel; trace shells; black; loose.	0.0
	2			End of boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SS-3 (0-1)	8:35
		HRP-SS-3 (1-2)	8:35
Sampling Method:			
Description of Water:			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SS-4
Job Number: NEW9626.P2	**Date:** November 8, 2011
Drilling Company: HRP (Hand Probe)	**Time:** 8:55

Location:

GPS Coordinates **N:** 40° 90.217' **W:** 73° 34.711'

Sample Interval (ftbg) Top	Sample Interval (ftbg) Bottom	Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
0	2	2	Wet	0-0.5: ORGANIC MUCK; black; loose.	0.0
				0.5-1: ORGANIC MUCK; little gravel; little shells; black; loose.	0.0
				1-2: ORGANIC MUCK; some sand; medium to fine; trace gravel; trace shells; black; loose.	0.0
	2			End of boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SS-4 (0-0.5)	8:55
		HRP-SS-4 (0.5-1)	8:55
Sampling Method:		HRP-SS-4 (1-2)	8:55
Description of Water:			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SS-5
Job Number: NEW9626.P2	**Date:** November 8, 2011
Drilling Company: HRP (Hand Probe)	**Time:** 9:30

Location:

GPS Coordinates **N:** 40° 90.101' **W:** 73° 34.718'

Sample Interval (ftbg) Top	Sample Interval (ftbg) Bottom	Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
0	2	2	Wet	0-0.5: ORGANIC MUCK; black; loose.	0.0
				0.5-1: ORGANIC MUCK; little gravel; little shells; black; loose.	0.0
				1-2: ORGANIC MUCK; some sand; medium to fine; trace gravel; trace shells; black; loose.	0.0
	2			End of boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SS-5 (0-0.5)	9:30
		HRP-SS-5 (0.5-1)	9:30
Sampling Method:		HRP-SS-5 (1-2)	9:30
Description of Water:			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SS-6
Job Number: NEW9626.P2	**Date:** November 8, 2011
Drilling Company: HRP (Hand Probe)	**Time:** 11:40

Location:

GPS Coordinates **N:** 40° 90.194' **W:** 73° 34.692'

Sample Interval (ftbg)		Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
Top	Bottom				
0	2	2	Wet	0-0.5: ORGANIC MUCK; black; loose. 0.5-1: ORGANIC MUCK; little gravel; little shells; black; loose. 1-2: ORGANIC MUCK; some sand; medium to fine; trace gravel; trace shells; black; loose.	0.0 0.0 0.0
	2			End of boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SS-6 (0-0.5)	11:40
		HRP-SS-6 (0.5-1)	11:40
Sampling Method:		HRP-SS-6 (1-2)	11:40
Description of Water:			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SS-7
Job Number: NEW9626.P2	**Date:** November 8, 2011
Drilling Company: HRP (Hand Probe)	**Time:** 11:15

Location:

GPS Coordinates **N:** 40° 90.201' **W:** 73° 34.695'

Sample Interval (ftbg)		Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
Top	Bottom				
0	2	2	Wet	0-0.5: ORGANIC MUCK; black; loose.	0.0
				0.5-1: ORGANIC MUCK; little gravel; little shells; black; loose.	0.0
				1-2: ORGANIC MUCK; some sand; medium to fine; trace gravel; trace shells; black; loose.	0.0
	2			End of boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SS-7 (0-0.5)	11:15
		HRP-SS-7 (0.5-1)	11:15
Sampling Method:		HRP-SS-7 (1-2)	11:15
Description of Water:			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SS-8
Job Number: NEW9626.P2	**Date:** November 8, 2011
Drilling Company: HRP (Hand Probe)	**Time:** 12:00

Location:

GPS Coordinates **N:** 40° 90.203' **W:** 73° 34.468'

Sample Interval (ftbg)		Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
Top	Bottom				
0	2	2	Wet	0-0.5: ORGANIC MUCK; black; loose. 0.5-1: ORGANIC MUCK; little gravel; little shells; black; loose. 1-2: ORGANIC MUCK; some sand; medium to fine; trace gravel; trace shells; black; loose.	0.0 0.0 0.0
	2			End of boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SS-8 (0-0.5)	12:00
		HRP-SS-8 (0.5-1)	12:00
Sampling Method:		HRP-SS-8 (1-2)	12:00
Description of Water:			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SS-9
Job Number: NEW9626.P2	**Date:** November 7, 2011
Drilling Company: HRP (Hand Probe)	**Time:** 16:00

Location:

GPS Coordinates **N:** 40° 90.168' **W:** 73° 34.676'

Sample Interval (ftbg) Top	Sample Interval (ftbg) Bottom	Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
0	2	2	Wet	0-0.5: ORGANIC MUCK; black; loose.	0.0
				0.5-1: ORGANIC MUCK; little gravel; little shells; black; loose.	0.0
				1-2: ORGANIC MUCK; some sand; medium to fine; trace gravel; trace shells; black; loose.	0.0
	2			End of boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SS-9 (0-0.5)	14:00
		HRP-SS-9 (0.5-1)	14:00
Sampling Method:		HRP-SS-9 (1-2)	14:00
Description of Water:			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SS-10
Job Number: NEW9626.P2	**Date:** November 8, 2011
Drilling Company: HRP (Hand Probe)	**Time:** 10:50

Location:

GPS Coordinates **N:** 40° 90.168' **W:** 73° 34.673'

Sample Interval (ftbg)		Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
Top	Bottom				
0	2	2	Wet	0-0.5: ORGANIC MUCK; black; loose. 0.5-1: ORGANIC MUCK; little gravel; little shells; black; loose. 1-2: ORGANIC MUCK; some sand; medium to fine; trace gravel; trace shells; black; loose.	0.0 0.0 0.0
	2			End of boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SS-10 (0-0.5)	10:50
		HRP-SS-10 (0.5-1)	10:50
Sampling Method:		HRP-SS-10 (1-2)	10:50
Description of Water:			

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Project: Former Mill Neck Marina	**Boring I.D.:** HRP-SS-11
Job Number: NEW9626.P2	**Date:** November 8, 2011
Drilling Company: HRP (Hand Probe)	**Time:** 12:30

Location:

GPS Coordinates **N:** 40° 90.162' **W:** 73° 34.672'

Sample Interval (ftbg) Top	Sample Interval (ftbg) Bottom	Recovery (ft)	Moisture	Description (grain size, color, compaction, staining, odor)	PID (PPM)
0	2	2	Wet	0-0.5: ORGANIC MUCK; black; loose.	0.0
				0.5-1: ORGANIC MUCK; little gravel; little shells; black; loose.	0.0
				1-2: ORGANIC MUCK; some sand; medium to fine; trace gravel; trace shells; black; loose.	0.0
	2			End of boring	

Well Screen:		**Soil Samples Collected:**	**Time**
Water Sample ID	Time	HRP-SS-11 (0-0.5)	12:30
		HRP-SS-11 (0.5-1)	12:30
Sampling Method:		HRP-SS-11 (1-2)	12:30
Description of Water:			

MONITORING WELL CONSTRUCTION LOG

HRP Engineering, P.C.
1 Fairchild Square, Suite 110,
Clifton Park, NY 12065 (518) 877-7101

PROJECT: Mill Neck Marina
WA #: D006130-25
LOCATION: Hernan Ave, Locust Valley, NY

DRILLING CO.: LAWES Drilling
DRILLED BY: Kevin McGourty
INSPECTED BY: James Charter

BORING NO. HRP-MW-1
PAGE 1 OF 1
DATE STARTED: 1/31/2012
DATE FINISHED: 1/31/2012
SURFACE ELEVATION:
BOTTOM OF BORING ELEVATION:
GROUNDWATER REFERENCE ELEVATION:

GROUNDWATER OBSERVATIONS

DEPTH	Post-Development
2'	4.51'

CASING
TYPE: PVC
SIZE I.D.: 2 inch

SAMPLER

DEPTH (FT.)	SAMPLING DEPTH (FT.) FROM - TO	SAMPLE DATA ID	RECOV. FEET	BLOWS PER 6 INCHES	WELL DATA	STRATA CHANGE (FT.)	LITHOLOGY (DESCRIPTION OF MATERIALS)	FIELD TEST DATA PID - 10.2 eV (ppm)
	0-5'		3.6	NA			**0-5'- Dark brown SILT with organic material, changing to gray m-f SAND at 3.5', no odor, wet.**	0.0
	5-10'		1.8	NA			**5-10'- Gray m-f SAND, trace c. sand, trace silt, no odor, wet.**	0.0
10'	10-15'		2	NA			**10-15'- Gray to brown(10.5') m-f SAND, little c-f gravel, trace silt, trace c.sand, no odor, wet.**	0.0
20'								
30'								
40'								

WELL CONSTRUCTION DATA:
Well bottom set at 15' bgs
Borehole diameter 3.75 "
Well Screen Interval 15' to 2' bgs (13' screen length)
Well Screen Slot Size 0.010 inch Material PVC Diameter 2"
Sand Filter Pack Interval 15 to 2 bgs
Sand Size Filpro #1 Quantity 1 bag (bags, lbs, gallons)
Well Riser Interaval 2' to 0' bgs (2' riser length+stickup)
Well Riser Diameter 2" Material PVC
Bentonite Seal Above Fitler Pack 2 to 1' bgs
Backfill Interval _____to _____' bgs
Backfill Material_____
Bentonite Top/Ground Surface Seal 1 to 0' bgs
Finishing/Well Protector: Standpipe (length of standpipe 4')
Surface Finishing notes:_____
Groundwater Reference Point Description: (Top of Riser, Standpipe, other)

GENERAL REMARKS:
1) ~12 gallons of water was purged from following installation on January 31, 2012
2) SAA = Same as Above / NA = Not Available
3) bgs = Below Ground Surface
4)Soil Boring_____was logged & sampled at this location on _____with by geoprobe

KEY:
Well: Filter Sand, Bentonite, Grout
Strata: Native soil, Bedrock
Indication of where groundwater begins
Roadbox
4" diameter steel casing
Open borehole

KEY TO BLOWS PER 6-INCHES:

Granular Soils (Gravel & Sand) Blows/ft	Density	Cohesive Soils (Silt & Clay) Blows/ft	Density
0-4	V. Loose	<2	V. Soft
4-10	Loose	2-4	Soft
10-30	M. Dense	4-8	M. Stiff
30-50	Dense	8-15	Stiff
>50	V. Dense	15-30	V. Stiff
		>50	Hard

PROPORTIONS OF SOIL:
And = 35 to 50%
Some = 20 to 35%
Little = 10 to 20%
Trace = 0 to 10%

MONITORING WELL CONSTRUCTION LOG

HRP Engineering, P.C.
1 Fairchild Square, Suite 110,
Clifton Park, NY 12065 (518) 877-7101

PROJECT: Mill Neck Marina
WA #: D006130-25
LOCATION: Hernan Ave, Locust Valley, NY

DRILLING CO.: LAWES Drilling
DRILLED BY: Kevin McGourty
INSPECTED BY: James Charter

BORING NO. HRP-MW-2
PAGE 1 OF 1
DATE STARTED: 1/31/2012
DATE FINISHED: 1/31/2012
SURFACE ELEVATION:
BOTTOM OF BORING ELEVATION:
GROUNDWATER REFERENCE ELEVATION:

GROUNDWATER OBSERVATIONS

DEPTH	Post-Development
2'	3.09'

CASING
TYPE: PVC
SIZE I.D.: 2 inch

SAMPLER

DEPTH (FT.)	SAMPLING DEPTH (FT.) FROM - TO	SAMPLE DATA ID	RECOV. FEET	BLOWS PER 6 INCHES	WELL DATA	STRATA CHANGE (FT.)	LITHOLOGY (DESCRIPTION OF MATERIALS)	FIELD TEST DATA PID - 10.2 eV (ppm)
	0-5'		2.3	NA			**0-5'- Brown to gray c-f SAND, little silt, little m-f gravel, no odor, wet.**	0.0
	5-10'		3.7	NA			**5-6'- Brown to gray c-f SAND, little silt, little m-f gravel, no odor, wet. 6-7'- Dark brown silty organic material, no odor, wet. 7-10'- Gray to brown fine SAND, little silt, no odor, wet**	0.0
10'								
	10-15'		2	NA			**10-15'- Brown to orange brown silty fine SAND, trace fine gravel, no odor, wet.**	0.0
20'								
30'								
40'								

WELL CONSTRUCTION DATA:
Well bottom set at _15' bgs
Borehole diameter_3.75_"
Well Screen Interval _15' to _2' bgs (_13'_screen length)
Well Screen Slot Size _0.010 inch_ Material_PVC_Diameter _2"
Sand Filter Pack Interval _15_to _2_ bgs
Sand Size_Filpro #1_ Quantity_1 bag_(bags, lbs, gallons)
Well Riser Interaval _2' to _0' bgs (_2'_riser length+stickup)
Well Riser Diameter_2"_Material_PVC_
Bentonite Seal Above Fitler Pack _2_to _1' bgs
Backfill Interval _____to _____' bgs
Backfill Material_____
Bentonite Top/Ground Surface Seal _1_to __0' bgs
Finishing/Well Protector: Standpipe (length of standpipe _4'_)
Surface Finishing notes:_____
_____
Groundwater Reference Point Description: (Top of Riser, Standpipe, other)
_____

GENERAL REMARKS:
1) ~12_ gallons of water was purged from following installation on _January 31, 2012
2) SAA = Same as Above / NA = Not Available
3) bgs = Below Ground Surface
4)Soil Boring_____was logged & sampled at this location on _____with by geoprobe

KEY:

Well	Filter Sand
	Bentonite
	Grout
Strata	Native soil
	Bedrock

Indication of where groundwater begins
Roadbox
4" diameter steel casing
Open borehole

KEY TO BLOWS PER 6-INCHES:

Granular Soils (*Gravel & Sand*) Blows/ft	Density	Cohesive Soils (*Silt & Clay*) Blows/ft	Density
0-4	V. Loose	<2	V. Soft
4-10	Loose	2-4	Soft
10-30	M. Dense	4-8	M. Stiff
30-50	Dense	8-15	Stiff
>50	V. Dense	15-30	V. Stiff
		>50	Hard

PROPORTIONS OF SOIL:
And = 35 to 50%
Some = 20 to 35%
Little = 10 to 20%
Trace = 0 to 10%

MONITORING WELL CONSTRUCTION LOG

HRP Engineering, P.C.
1 Fairchild Square, Suite 110,
Clifton Park, NY 12065 (518) 877-7101

PROJECT: Mill Neck Marina
WA #: D006130-25
LOCATION: Hernan Ave, Locust Valley, NY

DRILLING CO.: LAWES Drilling
DRILLED BY: Kevin McGourty
INSPECTED BY: James Charter

BORING NO. HRP-MW-3
PAGE 1 OF 1
DATE STARTED: 1/31/2012
DATE FINISHED: 1/31/2012
SURFACE ELEVATION:
BOTTOM OF BORING ELEVATION:
GROUNDWATER REFERENCE ELEVATION:

GROUNDWATER OBSERVATIONS

DEPTH	Post-Development
2'	3.36'

CASING
TYPE: PVC
SIZE I.D.: 2 inch

SAMPLER

DEPTH (FT.)	SAMPLING DEPTH (FT.) FROM - TO	SAMPLE DATA ID	RECOV. FEET	BLOWS PER 6 INCHES	WELL DATA	STRATA CHANGE (FT.)	LITHOLOGY (DESCRIPTION OF MATERIALS)	FIELD TEST DATA PID - 10.2 eV (ppm)
	0-5'		3.6	NA			**0-5'- Brown to gray to dark brown silty c-f SAND, little c-f angular gravel, no odor, wet.**	0.0
	5-10'		1.8	NA			**5-6'- Brown to gray to dark brown silty c-f SAND, little c-f angular gravel, no odor, wet. 6-7'- Dark brown silty organic material, no odor, wet. 7-10'- Gray to brown m-f SAND, little silt, no odor, wet.**	0.0
10'								
	10-15'		2	NA			**10-15'- Brown m-f SAND, trace fine gravel, trace silt, no odor, wet.**	0.0
20'								
30'								
40'								

WELL CONSTRUCTION DATA:
Well bottom set at _15' bgs
Borehole diameter_3.75_"
Well Screen Interval _15' to _2' bgs (_13'_screen length)
Well Screen Slot Size _0.010 inch_ Material_PVC_Diameter _2"
Sand Filter Pack Interval _15_to _2_ bgs
Sand Size_Filpro #1_ Quantity_1 bag_(bags, lbs, gallons)
Well Riser Interaval _2' to _0' bgs (_2'_riser length+stickup)
Well Riser Diameter_2"_Material_PVC_
Bentonite Seal Above Fitler Pack _2_to _1' bgs
Backfill Interval _____to _____' bgs
Backfill Material_____
Bentonite Top/Ground Surface Seal _1_to __0' bgs
Finishing/Well Protector: Standpipe (length of standpipe _4'_)
Surface Finishing notes:_____
Groundwater Reference Point Description: (Top of Riser, Standpipe, other)

GENERAL REMARKS:
1) ~20_ gallons of water was purged from following installation on _January 31, 2012
2) SAA = Same as Above / NA = Not Available
3) bgs = Below Ground Surface
4)Soil Boring___was logged & sampled at this location on ___with by geoprobe

KEY:

Well	Filter Sand
	Bentonite
	Grout
Strata	Native soil
	Bedrock

Indication of where groundwater begins
Roadbox
4" diameter steel casing
Open borehole

KEY TO BLOWS PER 6-INCHES:

Granular Soils (Gravel & Sand) Blows/ft	Density	Cohesive Soils (Silt & Clay) Blows/ft	Density
0-4	V. Loose	<2	V. Soft
4-10	Loose	2-4	Soft
10-30	M. Dense	4-8	M. Stiff
30-50	Dense	8-15	Stiff
>50	V. Dense	15-30	V. Stiff
		>50	Hard

PROPORTIONS OF SOIL:
And = 35 to 50%
Some = 20 to 35%
Little = 10 to 20%
Trace = 0 to 10%

MONITORING WELL CONSTRUCTION LOG

HRP Engineering, P.C.
1 Fairchild Square, Suite 110,
Clifton Park, NY 12065 (518) 877-7101

PROJECT: Mill Neck Marina
WA #: D006130-25
LOCATION: Hernan Ave, Locust Valley, NY

DRILLING CO.: LAWES Drilling
DRILLED BY: Kevin McGourty
INSPECTED BY: James Charter

BORING NO. HRP-MW-4
PAGE 1 OF 1
DATE STARTED: 1/31/2012
DATE FINISHED: 1/31/2012
SURFACE ELEVATION:
BOTTOM OF BORING ELEVATION:
GROUNDWATER REFERENCE ELEVATION:

GROUNDWATER OBSERVATIONS

DEPTH	Post-Development
2'	2.18'

CASING
TYPE: PVC
SIZE I.D.: 2 inch

SAMPLER

DEPTH (FT.)	SAMPLING DEPTH (FT.) FROM - TO	SAMPLE DATA ID	RECOV. FEET	BLOWS PER 6 INCHES	WELL DATA	STRATA CHANGE (FT.)	LITHOLOGY (DESCRIPTION OF MATERIALS)	FIELD TEST DATA PID - 10.2 eV (ppm)
	0-5'		2.5	NA			**0-5'- Gray to dark brown silty c-f SAND, little m-f rounded to angular gravel, no odor**	0.0
	5-10'		4	NA			**5-10'- Brown m-f SAND, trace c. sand, trace fine gravel (natural material), no odor, wet.**	0.0
10'								
	10-15'		1	NA			**10-15'- Brown m-f SAND, no odor, wet.**	0.0
20'								
30'								
40'								

WELL CONSTRUCTION DATA:
Well bottom set at 15' bgs
Borehole diameter 3.75 "
Well Screen Interval 15' to 2' bgs (13' screen length)
Well Screen Slot Size 0.010 inch Material PVC Diameter 2"
Sand Filter Pack Interval 15 to 2 bgs
Sand Size Filpro #1 Quantity 1 bag (bags, lbs, gallons)
Well Riser Interaval 2' to 0' bgs (2' riser length+stickup)
Well Riser Diameter 2" Material PVC
Bentonite Seal Above Fitler Pack 2 to 1' bgs
Backfill Interval _____to _____' bgs
Backfill Material_____
Bentonite Top/Ground Surface Seal 1 to 0' bgs
Finishing/Well Protector: Standpipe (length of standpipe 4')
Surface Finishing notes:_____
Groundwater Reference Point Description: (Top of Riser, Standpipe, other)

GENERAL REMARKS:
1) ~15 gallons of water was purged from following installation on January 31, 2012
2) SAA = Same as Above / NA = Not Available
3) bgs = Below Ground Surface
4)Soil Boring_____was logged & sampled at this location on _____with by geoprobe

KEY:
Well: Filter Sand, Bentonite, Grout
Strata: Native soil, Bedrock
Indication of where groundwater begins
Roadbox
4" diameter steel casing
Open borehole

KEY TO BLOWS PER 6-INCHES:

Granular Soils (Gravel & Sand) Blows/ft	Density	Cohesive Soils (Silt & Clay) Blows/ft	Density
0-4	V. Loose	<2	V. Soft
4-10	Loose	2-4	Soft
10-30	M. Dense	4-8	M. Stiff
30-50	Dense	8-15	Stiff
>50	V. Dense	15-30	V. Stiff
		>50	Hard

PROPORTIONS OF SOIL:
And = 35 to 50%
Some = 20 to 35%
Little = 10 to 20%
Trace = 0 to 10%

HRP Engineering, P.C. 1 Fairchild Square, Suite 110 Clifton Park, NY 12065 (518) 877-7101	GROUNDWATER WELL SAMPLING FORM	

Project: Mill Neck Marina	WAS #: D006130-25	Field Personnel: James Charter
Location: Hernan Ave. Locust Valley, New York	Well ID.: HRP-MW-1	Weather: Sunny 50F
Sounding Method: Interface Meter	Gauge Date: 2/7/2012	Measurement Ref: Black Mark on top of PVC
Stick Up/Down (ft): Stick up~4ft.	Gauge Time: 10:16	Well Diameter (in): 2 inches

Purge Date:	2/7/2012	Purge Time:	10:39
Purge Method:	Perestaltic Pump	Field Technician:	James Charter

1) Well Depth (ft): 17.86 ft.	4) Well Diameter (in): 2 inch	7) Five Well Volumes (gal):
2) Depth to Water (ft): 4.51 ft.	5) Well Volume / Foot (gal) (d^2x.0408): 0.163	Depth/Height of Top of PVC:
3) Height of H_2O Column (1-2) (ft): 13.35 ft.	6) Total Well Volume (gal) (3x5): 2.18 gallons	Pump Type: Perestaltic Pump

Water Quality Parameters

Time (hrs)	DTW (ft btoc)	Volume (liters)	Rate (mL/m)	pH (pH units)	ORP (mV)	remperatur (oC)	Gonductivit: (uS/cm)	DO (ug/L)	Turbidity (ntu)
10:47	5.92	2L		6.31	-33	12.91	5.02	13.29	9.9
10:50	6.05	3L		6.3	-40	12.53	5.07	4.08	9.1
10:53	6.2	4L		6.29	-47	12.35	5.1	3.22	12.3
10:56	6.25	5L		6.29	-52	12.39	5.12	2.66	12.9
10:59	6.27	6L		6.3	-54	12.42	5.13	2.31	12.9
11:02	6.3	7L		6.29	-57	12.48	5.14	2.3	15.6

Total Quantity of Water Removed (Liters):	8 L	Sampling Time:	11:05
Samplers:	James Charter	Split Sample With:	
Sampling Date:	2/7/2012	Sample Type:	

COMMENTS AND OBSERVATIONS:	Well developed on 2/1/12 using a whale pump. No parameters taken. At least 6 well volumes were purged until purge water was clear.

HRP Engineering, P.C. 1 Fairchild Square, Suite 110 Clifton Park, NY 12065 (518) 877-7101	GROUNDWATER WELL SAMPLING FORM	

Project: Mill Neck Marina	WAS #: D006130-25	Field Personnel: James Charter
Location: Hernan Ave. Locust Valley, New York	Well ID.: HRP-MW-2	Weather: Sunny 50F
Sounding Method: Interface Meter	Gauge Date: 2/7/2012	Measurement Ref: Black Mark on top of PVC
Stick Up/Down (ft): Stick up~4ft.	Gauge Time: 12:10	Well Diameter (in): 2 inches

Purge Date:	2/7/2012	Purge Time:	12:17
Purge Method:	Perestaltic Pump	Field Technician:	James Charter

1) Well Depth (ft): 17.86 ft.	4) Well Diameter (in): 2 inch	7) Five Well Volumes (gal):
2) Depth to Water (ft): 3.09 ft.	5) Well Volume / Foot (gal) (d^2x.0408): 0.163	Depth/Height of Top of PVC:
3) Height of H_2O Column (1-2) (ft): 14.77 ft.	6) Total Well Volume (gal) (3x5): 2.41 gallons	Pump Type: Perestaltic Pump

Water Quality Parameters

Time (hrs)	DTW (ft btoc)	Volume (liters)	Rate (mL/m)	pH (pH units)	ORP (mV)	remperatur (oC)	Gonductivit: (uS/cm)	DO (ug/L)	Turbidity (ntu)
12:20	3.94	1L		6.72	-62	10.5	0.921	6.99	2.6
12:23	3.95	2L		6.77	-81	9.34	0.9	2.73	3.6
12:26	4	3L		6.8	-88	9.43	0.899	1.47	2.4
12:29	4.02	4L		6.81	-91	9.47	0.899	1.25	2.5
12:32	4.04	5L		6.81	-92	9.5	0.899	1.19	2.3

Total Quantity of Water Removed (Liters):	8 L	Sampling Time:	12:40
Samplers:	James Charter	Split Sample With:	FD 2/7/2012
Sampling Date:	2/7/2012	Sample Type:	

COMMENTS AND OBSERVATIONS:	Duplicate sample taken here. Well developed on 2/1/12 using a whale pump. No parameters taken. At least 6 well volumes were purged until purge water was clear.

HRP Engineering, P.C. 1 Fairchild Square, Suite 110 Clifton Park, NY 12065 (518) 877-7101	GROUNDWATER WELL SAMPLING FORM	

Project: Mill Neck Marina	WAS #: D006130-25	Field Personnel: James Charter
Location: Hernan Ave. Locust Valley, New York	Well ID.: HRP-MW-3	Weather: Sunny 50F
Sounding Method: Interface Meter	Gauge Date: 2/7/2012	Measurement Ref: Black Mark on top of PVC
Stick Up/Down (ft): Stick up~4ft.	Gauge Time: 11:32	Well Diameter (in): 2 inches

Purge Date:	2/7/2012	Purge Time:	10:39
Purge Method:	Perestaltic Pump	Field Technician:	James Charter

1) Well Depth (ft): 17.85 ft.	4) Well Diameter (in): 2 inch	7) Five Well Volumes (gal):
2) Depth to Water (ft): 3.36 ft.	5) Well Volume / Foot (gal) (d^2x.0408): 0.163	Depth/Height of Top of PVC:
3) Height of H_2O Column (1-2) (ft): 14.49 ft.	6) Total Well Volume (gal) (3x5): 2.36 gallons	Pump Type: Perestaltic Pump

Water Quality Parameters

Time (hrs)	DTW (ft btoc)	Volume (liters)	Rate (mL/m)	pH (pH units)	ORP (mV)	remperatur (oC)	Gonductivit: (uS/cm)	DO (ug/L)	Turbidity (ntu)
11:37	3.65	1L		7.03	-63	13.66	1.17	7.62	0
11:40	3.74	2L		6.55	16	11	1.04	3.23	0
11:43	3.88	3L		6.34	37	11.02	0.99	2.16	0
11:46	3.89	4L		6.25	49	11.04	0.943	1.64	0
11:49	3.9	5L		6.21	59	11.05	0.93	1.35	0
11:52	3.91	6L		6.18	61	11.02	0.925	1.28	0
11:55	3.91	7L		6.17	63	11.03	0.921	1.21	0

Total Quantity of Water Removed (Liters):	8 L	Sampling Time:	12:00
Samplers:	James Charter	Split Sample With:	
Sampling Date:	2/7/2012	Sample Type:	

COMMENTS AND OBSERVATIONS:	Well developed on 2/1/12 using a whale pump. No parameters taken. At least 6 well volumes were purged until purge water was clear.

HRP Engineering, P.C. 1 Fairchild Square, Suite 110 Clifton Park, NY 12065 (518) 877-7101	GROUNDWATER WELL SAMPLING FORM	

Project: Mill Neck Marina	WAS #: D006130-25	Field Personnel: James Charter
Location: Hernan Ave. Locust Valley, New York	Well ID.: HRP-MW-4	Weather: Sunny 50F
Sounding Method: Interface Meter	Gauge Date: 2/7/2012	Measurement Ref: Black Mark on top of PVC
Stick Up/Down (ft): Stick up~4ft.	Gauge Time: 13:06	Well Diameter (in): 2 inches

Purge Date:	2/7/2012	Purge Time:	13:07
Purge Method:	Perestaltic Pump	Field Technician:	James Charter

1) Well Depth (ft): 17.80 ft.	4) Well Diameter (in): 2 inch	7) Five Well Volumes (gal):
2) Depth to Water (ft): 2.18 ft.	5) Well Volume / Foot (gal) (d^2x.0408): 0.163	Depth/Height of Top of PVC:
3) Height of H_2O Column (1-2) (ft): 15.62 ft.	6) Total Well Volume (gal) (3x5): 2.55 gallons	Pump Type: Perestaltic Pump

Water Quality Parameters

Time (hrs)	DTW (ft btoc)	Volume (liters)	Rate (mL/m)	pH (pH units)	ORP (mV)	remperatur (oC)	Gonductivit: (uS/cm)	DO (ug/L)	Turbidity (ntu)
13:10	2.4	1L		6.8	-55	11.1	0.605	9.87	0
13:13	2.4	2L		6.62	-19	9.94	0.606	4.93	0
13:16	2.41	3L		6.43	45	9.69	0.6	2.11	0
13:19	2.41	4L		6.34	66	9.61	0.597	1.08	0
13:22	2.41	5L		6.32	70	9.53	0.596	0.99	0
13:25	2.41	6L		6.31	73	9.46	0.595	0.87	0

Total Quantity of Water Removed (Liters):	9 L	Sampling Time:	13:35
Samplers:	James Charter	Split Sample With:	MS/MSD
Sampling Date:	2/7/2012	Sample Type:	

COMMENTS AND OBSERVATIONS:	MS/MSD taken here. Well developed on 2/1/12 using a whale pump. No parameters taken. At least 6 well volumes were purged until purge water was clear.

Tide Sun **www.saltwatertides.com** Moon Tide

Tides for Oyster Bay Harbor starting with November 3, 2011.

Day		High /Low	Tide Time	Height Feet	Sunrise Sunset	Moon	Time	% Moon Visible
Th	3	Low	12:11 AM	0.6	7:27 AM	Set	12:34 AM	52
	3	High	6:14 AM	7.1	5:48 PM	Rise	2:13 PM	
	3	Low	12:40 PM	1.0				
	3	High	6:40 PM	7.0				
F	4	Low	1:09 AM	0.8	7:28 AM	Set	1:35 AM	62
	4	High	7:13 AM	7.2	5:47 PM	Rise	2:39 PM	
	4	Low	1:41 PM	0.9				
	4	High	7:39 PM	6.9				
Sa	5	Low	2:02 AM	0.8	7:29 AM	Set	2:35 AM	71
	5	High	8:07 AM	7.3	5:46 PM	Rise	3:04 PM	
	5	Low	2:37 PM	0.8				
	5	High	8:34 PM	6.9				
Su	6	Low	2:51 AM	0.8	6:31 AM	Set	2:33 AM	79
	6	High	7:56 AM	7.6	4:45 PM	Rise	2:29 PM	
	6	Low	2:26 PM	0.5				
	6	High	8:23 PM	7.0				
M	7	Low	2:35 AM	0.8	6:32 AM	Set	3:31 AM	86
	7	High	8:40 AM	7.7	4:44 PM	Rise	2:54 PM	
	7	Low	3:11 PM	0.3				
	7	High	9:08 PM	7.0				
Tu	8	Low	3:16 AM	0.6	6:33 AM	Set	4:29 AM	92
	8	High	9:21 AM	7.8	4:43 PM	Rise	3:21 PM	
	8	Low	3:52 PM	0.2				
	8	High	9:50 PM	7.1				
W	9	Low	3:56 AM	0.6	6:34 AM	Set	5:27 AM	96
	9	High	10:00 AM	7.9	4:42 PM	Rise	3:52 PM	
	9	Low	4:31 PM	0.1				
	9	High	10:30 PM	7.1				
Th	10	Low	4:34 AM	0.6	6:35 AM	Set	6:25 AM	99
	10	High	10:37 AM	7.9	4:41 PM	Rise	4:26 PM	
	10	Low	5:09 PM	0.1				
	10	High	11:08 PM	7.1				
F	11	Low	5:11 AM	0.6	6:36 AM	Set	7:23 AM	99
	11	High	11:14 AM	7.8	4:40 PM	Rise	5:06 PM	
	11	Low	5:46 PM	0.1				
	11	High	11:47 PM	7.1				
Sa	12	Low	5:49 AM	0.8	6:38 AM	Set	8:18 AM	99
	12	High	11:51 AM	7.8	4:39 PM	Rise	5:52 PM	
	12	Low	6:24 PM	0.1				
Su	13	High	12:25 AM	7.0	6:39 AM	Set	9:10 AM	96
	13	Low	6:28 AM	0.9	4:38 PM	Rise	6:43 PM	
	13	High	12:29 PM	7.7				
	13	Low	7:04 PM	0.2				

M	14	High	1:05 AM	6.9	6:40 AM	Set	9:57 AM	91
	14	Low	7:10 AM	0.9	4:37 PM	Rise	7:41 PM	
	14	High	1:09 PM	7.6				
	14	Low	7:46 PM	0.3				
Tu	15	High	1:48 AM	6.9	6:41 AM	Set	10:39 AM	85
	15	Low	7:54 AM	1.0	4:36 PM	Rise	8:42 PM	
	15	High	1:53 PM	7.5				
	15	Low	8:32 PM	0.3				
W	16	High	2:34 AM	6.8	6:42 AM	Set	11:16 AM	77
	16	Low	8:44 AM	1.0	4:35 PM	Rise	9:46 PM	
	16	High	2:43 PM	7.3				
	16	Low	9:22 PM	0.4				

Return to the New York selection page, the FAQs/definitions page, the region selection page, the script licensing page, or to the home page.

For information on regulations for fishing in New York contact:

Division of Fish, Wildlife and Marine Resources

Typhoons, Hurricanes, etc., are NOT included in the predictions. Tidal current direction changes and tide high and low time predictions can be very different. Tide predictions are PREDICTIONS, they can be wrong so use common sense.

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Oyster Bay Weather

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Updated: Oct 31, 2011, 10:25am

Video: New York's 60 Second Forecast | Surfer attacked by great white shark

Today | Hourly | Tomorrow | Weekend | 5 day | **10 day** | Monthly | Map

Detailed Forecast Text Forecast

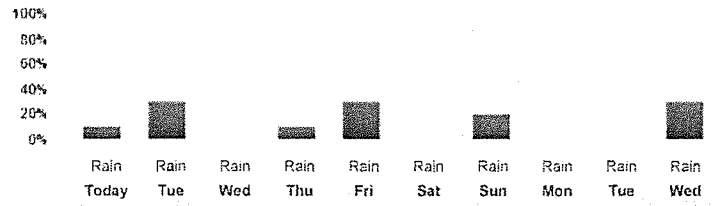
Today Oct 31	Tue Nov 1	Wed 2	Thu 3	Fri 4	Sat 5	Sun 6	Mon 7	Tue 8	Wed 9
Partly Cloudy	AM Showers	Sunny	Partly Cloudy	Few Showers	Sunny	Partly Cloudy	Sunny	Sunny	Showers
53°F High	54°	56°	57°	56°	54°	60°	57°	51°	52°
45° Low	40°	42°	46°	46°	49°	48°	44°	46°	51°
Rain: 10%	Rain: 30%	Rain: 0%	Rain: 10%	Rain: 30%	Rain: 0%	Rain: 20%	Rain: 0%	Rain: 0%	Rain: 30%

EXPAND GRAPH

◄ 5-Day Month ►

Chance of:

Chance of Precip / Rain / Snow



Wind From (mph):

SE at 8	NE at 12	N at 6	W at 6	NNE at 7	ENE at 9	S at 10	NW at 8	NNW at 8	SSE at 9

Cold and Flu Season

Traveling in Flu season

Children Common Cold Myths

Find a Flu Shot Clinic

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- Northeast overnight lows
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- Crash Sends Siblings Over Barrier, Kills 1
- Dramatic Photos: October Snowstorm
- Good, Bad & Ugly of NY's Football Weekend
- Jewish Florist From Brooklyn Was Khaddafy's Pen Pal
- **More News From WNBC**

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On The Weather Channel

On Now	**Wake up with Al**
11:00 am ET	**Day Planner**
5:00 pm ET	**Storm Stories**

FULL SCHEDULE

APPENDIX D

PREVIOUS REPORTS
(Included on enclosed CD)

APPENDIX E

ENIVONRONMENTAL DATA REPORTS (EDR)
(on enclosed CD)