



EA Engineering, P.C.  
EA Science and Technology

6712 Brooklawn Parkway, Suite 104  
Syracuse, New York 13211-2158  
Telephone: 315-431-4610  
[www.eaest.com](http://www.eaest.com)

6 May 2016

## MEMORANDUM

**TO:** David Gardner, P.E.                      **LOCATION:** NYSDEC-Albany, New York

**FROM:** James Hayward, P.E.

**SUBJECT:** Groundwater Plume Delineation Work Plan  
National Heatset Printing Co. Site  
Babylon, New York  
Contract/WA No: D007624-16

---

EA Engineering, P.C., and its affiliate EA Science and Technology (EA) were tasked by the New York State Department of Environmental Conservation (NYSDEC) under Work Assignment Number (No.) D007624-16 to perform site management activities at the National Heatset Printing Company (Co.) State Superfund Site. At the request of the NYSDEC, EA has prepared this memorandum to serve as a work plan for the groundwater plume delineation activities the National Heatset Printing Co. site. This work plan is being prepared based on historical data and the onsite meeting held with the NYSDEC representative in January 2016.

## BACKGROUND AND RATIONALE

### Site Description

The National Heatset Printing Co. site is currently a Class 2 site listed on the NYSDEC Registry of Inactive Hazardous Waste Sites (Site No. 152140). The site is located at 1 Adams Boulevard in the Hamlet of Farmingdale, Town of Babylon, Suffolk County, New York and is identified as Block 1.00 and Lot 20.001 on the Town of Babylon Tax Map No. 132.20-1-3.2. A site location map is provided in **Figure 1**. The site is currently owned by One Adams Boulevard Realty Corporation, managed by Finkelstein Realty and leased by Sun Dial Corporation. The site contains one multi-tenant industrial building and is 4.5 acres in size. The site is located in an industrial area and is bounded by railroad tracks to the north, Adams Boulevard and an industrial property to the south, an industrial property to the east, and an industrial property to the west (**Figure 2**).

In early 2014, the interior of the industrial building was remodeled in order to accommodate a new tenant. The remodeling consisted of sealing the concrete floor and installing pallet-racking throughout the building. The new tenant's warehouse is very active, and the floor is used for storage of loaded pallets, which are moved in/out of the facility using forklifts. As a result, the original soil vapor monitoring points inside the building became inaccessible and potentially compromised due to the floor sealing.

## Remedial Investigation/Selected Remedy

A remedial investigation (RI)/feasibility study (FS) was performed at the site in 1999 (H2M 1999)<sup>1</sup>. Potential remedial alternatives for the site were identified, screened, and evaluated in the FS. Based on the RI and FS, the NYSDEC issued the Record of Decision (ROD) document which identified the selected remedy for the site (NYSDEC 1999)<sup>2</sup>. The remedy included groundwater treatment using pump and treat, or an alternate technology (i.e., in-well stripping [IWS]) for three locations: (1) source area, (2) downgradient edge of the site, and (3) downgradient edge of the offsite plume.

The remedy in the ROD was refined during the remedial design. Additional investigation performed during the remedial design concluded that injection of sodium and potassium permanganate would be the most effective source area remedy. Sampling during the remedial design (obtained in 2001) revealed the presence of contaminated soil beneath the slab of the onsite building (1 Adams Boulevard).

Based on the results of indoor air samples collected from the onsite commercial building in July 2001, the NYSDEC installed a soil vapor extraction (SVE) system to remediate the contaminated soil beneath the building slab and address potential vapor intrusion (**Figure 3**). The SVE system began running in September 2002 using a single vertical extraction well. Based on quarterly field monitoring results from the influent air stream, volatile organic compound (VOC) concentrations have declined during the performance of SVE operations. During startup in 2002, the influent vapor stream VOC concentration typically ranged from 1,000 to 2,000 parts per million (ppm). Within the first year of operation, influent contaminants dropped below 100 ppm. Since 2002, the vapor stream concentrations have generally decreased, ranging from 0 to 62 ppm in 2013.

A complete history of the site can be found in the National Heatset Printing Co. State Superfund Site Suffolk County, Babylon, New York, Final Engineering Report (EA 2013)<sup>3</sup>.

In July 2014, the vertical extraction well was converted to a buried horizontal screen in order to increase capacity for extraction and to reduce impacts to daily operations in the building. Immediately following restart of the SVE system in August 2014, VOC concentrations as high as 200 ppm were observed in soil vapor recovered from beneath the building slab, which were among the highest levels observed since 2002. By October 2014, VOC concentrations in the recovered soil vapor had decreased to less than 10 ppm.

In February 2016, 15 sub-slab soil borings were installed at 1 Adams Boulevard. Prior to soil boring installation, a geophysical survey was completed within the building to identify possible subsurface utilities; no utilities were encountered beyond a depth of 4 feet (ft) below ground surface (bgs). All soil borings were advanced to 10-ft bgs and were screened in the field with a

---

<sup>1</sup>H2M. 1999. RI/FS Report.

<sup>2</sup>NYSDEC. 1999. Record of Decision. June.

<sup>3</sup>EA. 2013. National Heatset Printing Co. State Superfund Site, Suffolk County, Babylon, New York, Final Engineering Report. August.

photoionization detection (PID) meter. One soil sample was collected from each soil boring at the interval which exhibited the highest PID readings. Eleven out of 15 soil samples exhibited CVOCs. All detections were below Table 375-6.8(a): Unrestricted Use Soil Cleanup Objectives. The table below summarizes detected parameter frequency and concentration ranges.

Parameter	Detections	Concentration Range milligrams per kilogram (mg/kg)
Tetrachloroethene	9 / 15	0.0022 – 0.2600
Trichloroethylene	5 / 15	0.0024 – 0.0087
<i>Cis</i> -1,2-dichloroethene	3 / 15	0.0029 – 0.0310

Five soil borings were converted to soil vapor points and sampled on 16 February 2016. In addition, two indoor air samples were collected from within 1 Adams Boulevard (**Figure 4**). Concentrations of Tetrachloroethene (PCE) in soil vapor points ranged from 4,600 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) (VP-19) to 36,000  $\mu\text{g}/\text{m}^3$  (VP-16). Trichloroethene was detected at concentrations ranging from non-detect (VP-16) to 190  $\mu\text{g}/\text{m}^3$  (VP-15). Indoor air sample IA-01 had detections of PCE at 6.4  $\mu\text{g}/\text{m}^3$ , below the New York State Department of Health standard of 30  $\mu\text{g}/\text{m}^3$ . No other chlorinated volatile organic compounds (CVOCs) were detected from the indoor air samples. **Figure 4** depicts the interpolated extent of soil vapor impacts.

## SCOPE OF WORK

EA's subcontractor, Cascade Drilling (formerly Stone Environmental) will perform groundwater and soil profiling at the site to further define site-related impacts (CVOCs). Cascade will provide direct-push drilling services to complete membrane interface probe (MIP) screening at up to 25 locations and *in situ* groundwater sampling using a hydraulic profiling tool (HPT) at a minimum 10 locations downgradient of the 1 Adams Boulevard building. The 25 MIP direct-push points will be installed at the locations detailed on **Figure 5**. The 10 HPT locations will be determined based on the data collected during the MIP investigation and in conjunction with the NYSDEC representative. Up to 3 groundwater samples will be collected at each HPT location for laboratory analysis of VOCs via United States Environmental Protection Agency (EPA) Method 8260C by Hampton Clarke Veritech Laboratories. The direct-push points will be advanced to refusal or to the confining layer which is expected to be approximately 80 to 85 ft bgs.

Field activities described in this section will be documented in a dedicated field logbook that will be maintained for all site activities. Field forms including groundwater stabilization forms will be used during onsite work. Photographs will also be taken to document field activities, as appropriate.

## Project Coordination and Utility Mark

The proposed MIP and HPT locations will be marked out with survey paint by EA prior to contacting Dig Safe for the utility one-call. In addition, EA and the NYSDEC will coordinate with the local municipalities to obtain any required permits and local utility mark outs.

## **Membrane Interface Probe**

The MIP is a rapid screening tool for locating volatile organic compounds in the subsurface. Invented and manufactured by Geoprobe®, the MIP collects real-time, vertically continuous data on the distribution of VOCs, as well as an electrical conductance (EC) log that is indicative of gross stratigraphy. The MIP uses a number of detectors (electron capture detector [ECD], PID, flame ionization detector [FID], and halogen specific detector [XSD™] at the surface.

EA will complete MIP profiling at up to 25 locations using a direct-push rig. The profiling will be advanced at each location until the confining layer is encountered, which is anticipated to be at depths ranging from 80 to 85 ft bgs. Real time, continuous MIP data shall be recorded during advancement of the borehole. Following completion of profiling, the borehole will be backfilled to the ground surface with a bentonite grout mixture.

## **Hydraulic Profiling Tool**

EA will install a minimum of 10 HPT profiling locations. The HPT locations will be selected based on the results of the MIP in the field in conjunction with the NYSDEC. The total depths of each profiling location are anticipated to be 80–85 ft bgs, with the water table estimated to be at 12.5–15 ft bgs. Three discrete groundwater samples will be collected from each HPT location; highest MIP reading interval with additional samples being collected above and below this depth. Groundwater samples will be sent offsite for analysis of VOCs using EPA Method 8260B.

EA will utilize the Waterloo Advanced Profiling System (Waterloo<sup>APS</sup>) during HPT installation. The Waterloo<sup>APS</sup> is a subsurface data acquisition system that collects both groundwater samples and an integrated set of companion data in a single, continuous direct push. Integrated sensors provide hydrostratigraphic and physiochemical data displayed graphically as the tooling is advanced. Data will be collected using KPRO, a custom software that provides real-time visual display of Index of Hydraulic Conductivity to determine site stratigraphy in vadose and saturated zones. The depth to potentiometric surface (hydraulic head), rate of penetration and continuous Index of Hydraulic Conductivity record vs depth will also be reported at each location. Physiochemical properties – pH, specific conductance, dissolved oxygen, and oxidation/reduction potential, will be recorded during sample collection.

Real time, continuous conductivity shall be recorded during advancement of the borehole. Following completion of profiling, the borehole will be backfilled to the ground surface with a bentonite grout mixture.

## **Decontamination**

All downhole equipment will be decontaminated between drilling locations. Any fluids produced during decontamination will be stored in 55-gallon DOT drums. EA does not expect soil waste to be generated during these field activities.



## Conceptual Site Model Update

An updated site survey will be completed by a licensed surveyor at the end of the groundwater delineation event which will include a survey of completed MIP and HPT locations. EA currently anticipates 25 MIP locations and 10 HPT locations; the totals could change based on field conditions and resulting data obtained during this sampling event.

Graphic logs will be provided for each MIP and HPT boring location. All data collected during MIP and HPT activities will be used to generate a 3-D model which will be incorporated into the conceptual site model (CSM). The CSM will be used to locate the additional 6 monitoring wells that will be installed during the next phase of work.

## Site Restoration

Topsoil and grassy areas will be restored following completion of the work (e.g., track marks raked and seeded, depressions backfilled and seeded, etc.). Paved areas will be restored with asphalt cold-patch or concrete, as appropriate.

## PROJECT SCHEDULE

This scope of work is to be completed in one mobilization and is estimated to take 5 weeks to complete (3 weeks MIP and 2 weeks HPT) during Spring 2016. A preliminary schedule of milestones is provided in the following project schedule table. Key milestones are identified in order to monitor work progress throughout the duration of the project.

Investigation Milestone	Estimated days from Submittal of Work Plan
Groundwater Plume Delineation Work Plan to NYSDEC	—
Receive comments from NYSDEC	15
Submit Final Plume Delineation Work Plan to NYSDEC	5
Initiate field activities	25
Submit Summary Report to NYSDEC	90

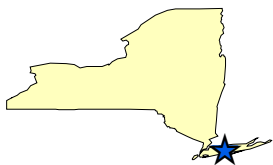
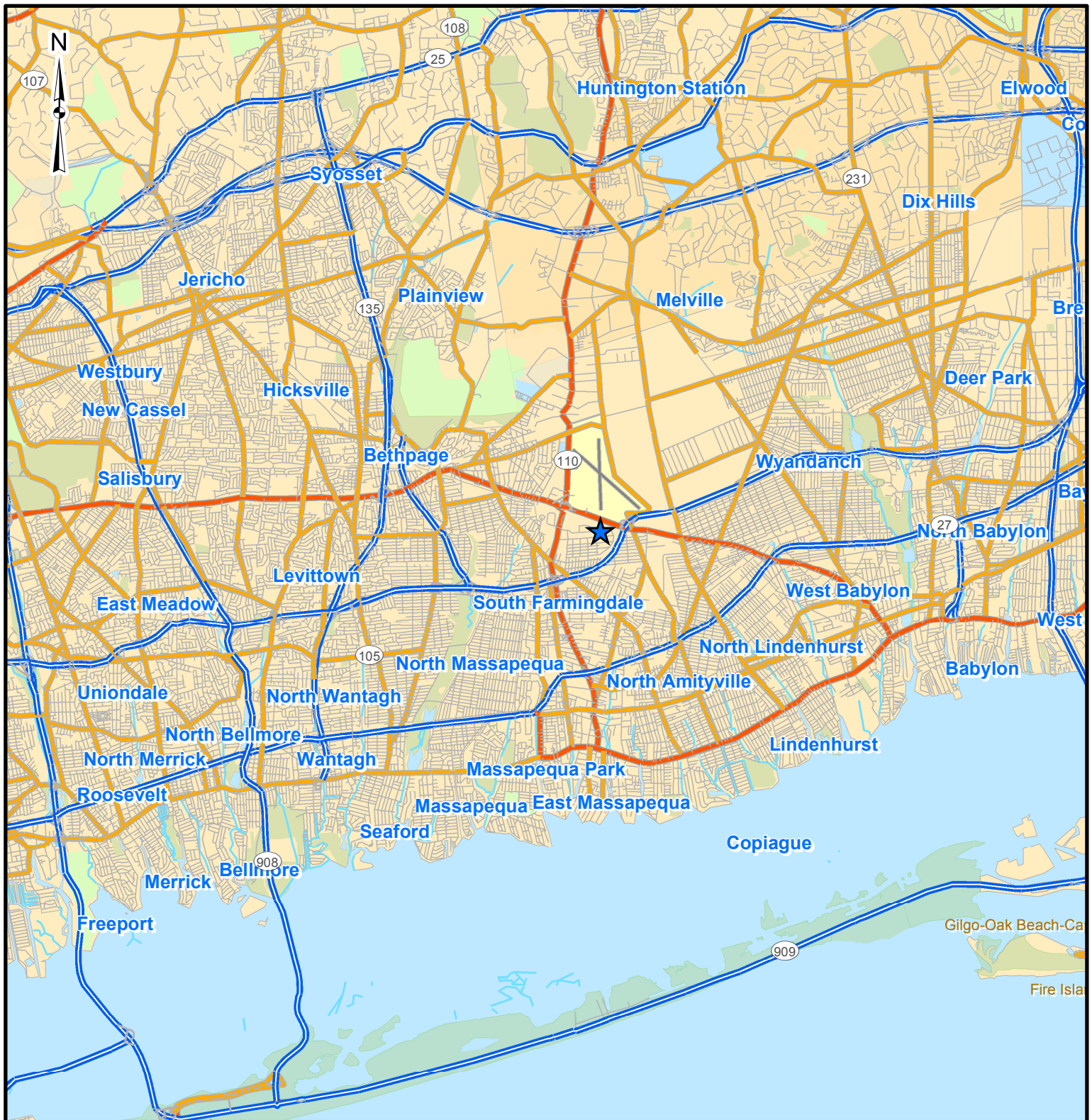
If you have any questions or require additional information, please do not hesitate to contact James Hayward at 315-565-6555.

JH/dml

cc: S. Edwards (NYSDEC)  
R. Casey (EA)  
D. Conan (EA)  
J. Vonuderitz (EA)

## Figures





#### LEGEND

★ Site Location

0 1 2 4 Miles

1 inch = 2 miles

Source: StreetMap USA



Department of  
Environmental  
Conservation

NATIONAL HEATSET SITE (152140)  
HORIZONTAL SOIL VAPOR WELL  
INSTALLATION WORK PLAN  
BABYLON, NEW YORK  
SUFFOLK COUNTY

FIGURE 1  
Site Location Map

PROJECT MGR:  
JCH

DESIGNED BY:  
CJS

CREATED BY:  
CJS

CHECKED BY:  
JCH

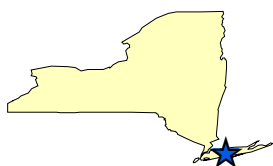
SCALE:  
AS SHOWN

DATE:  
MAY 2016

PROJECT NO:  
14907.16

FILE NO:  
GIS/PROJECTS/  
FIGURE1.MXD





### Legend

- DDC Well Cluster
- Groundwater Monitoring Well
- Vapor Extraction Point

0 450 900 1,800 Feet  
1 inch = 900 feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



Department of  
Environmental  
Conservation

NATIONAL HEATSET SITE (152140)  
HORIZONTAL SOIL VAPOR WELL  
INSTALLATION WORK PLAN  
BABYLON, NEW YORK  
SUFFOLK COUNTY

FIGURE 2  
Site, Surrounding Area, and  
Monitoring Well Network

PROJECT MGR:  
JCH

DESIGNED BY:  
CJS

CREATED BY:  
HAW

CHECKED BY:  
JCH

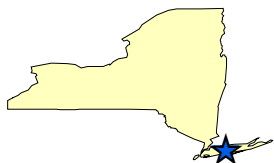
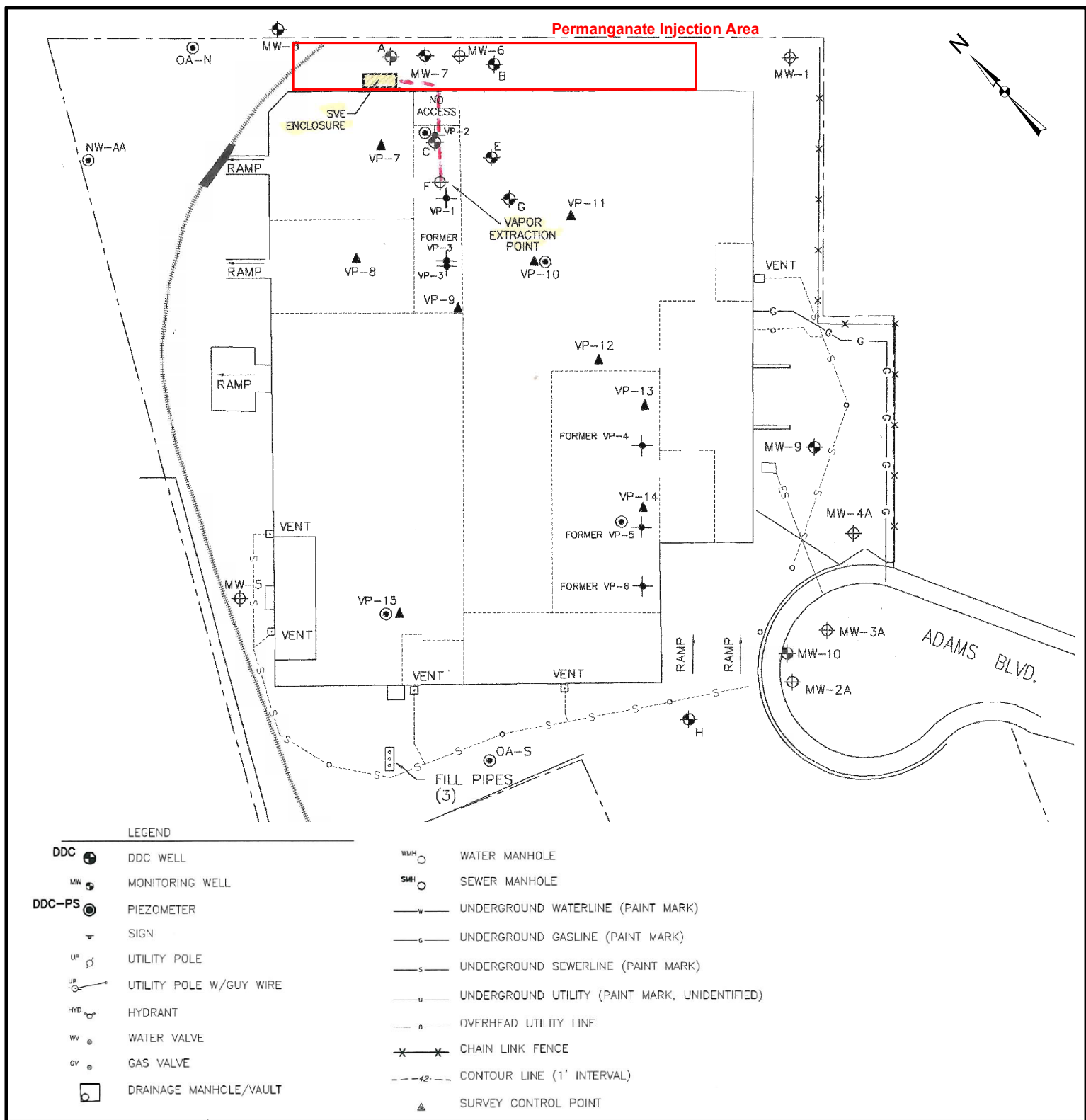
SCALE:  
AS SHOWN

DATE:  
MAY 2016

PROJECT NO:  
14907.16

FILE NO:  
GIS/PROJECTS/  
FIGURE2.MXD





Reprinted from: Figure developed by Shaw Environmental, Inc.  
and adapted by O'Brien & Gere Engineers, Inc. & EA Engineering, PC



NATIONAL HEATSET SITE (152140)  
HORIZONTAL SOIL VAPOR WELL  
INSTALLATION WORK PLAN  
BABYLON, NEW YORK  
SUFFOLK COUNTY

FIGURE 3  
EXISTING SOIL  
VAPOR EXTRACTION  
SYSTEM

PROJECT MGR:  
JCH

DESIGNED BY:  
CJS

CREATED BY:  
EGC

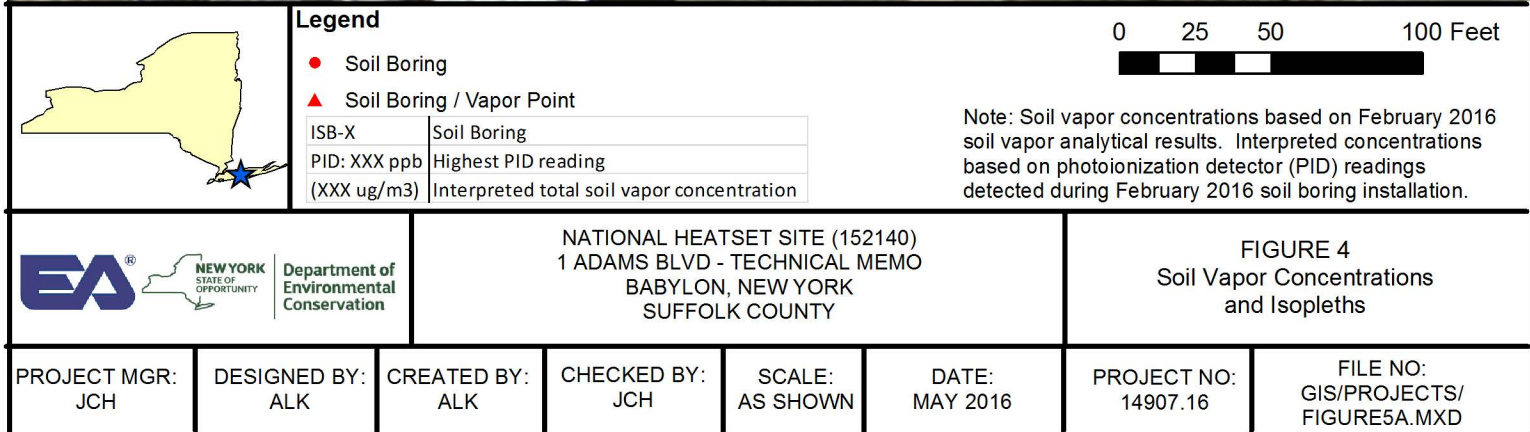
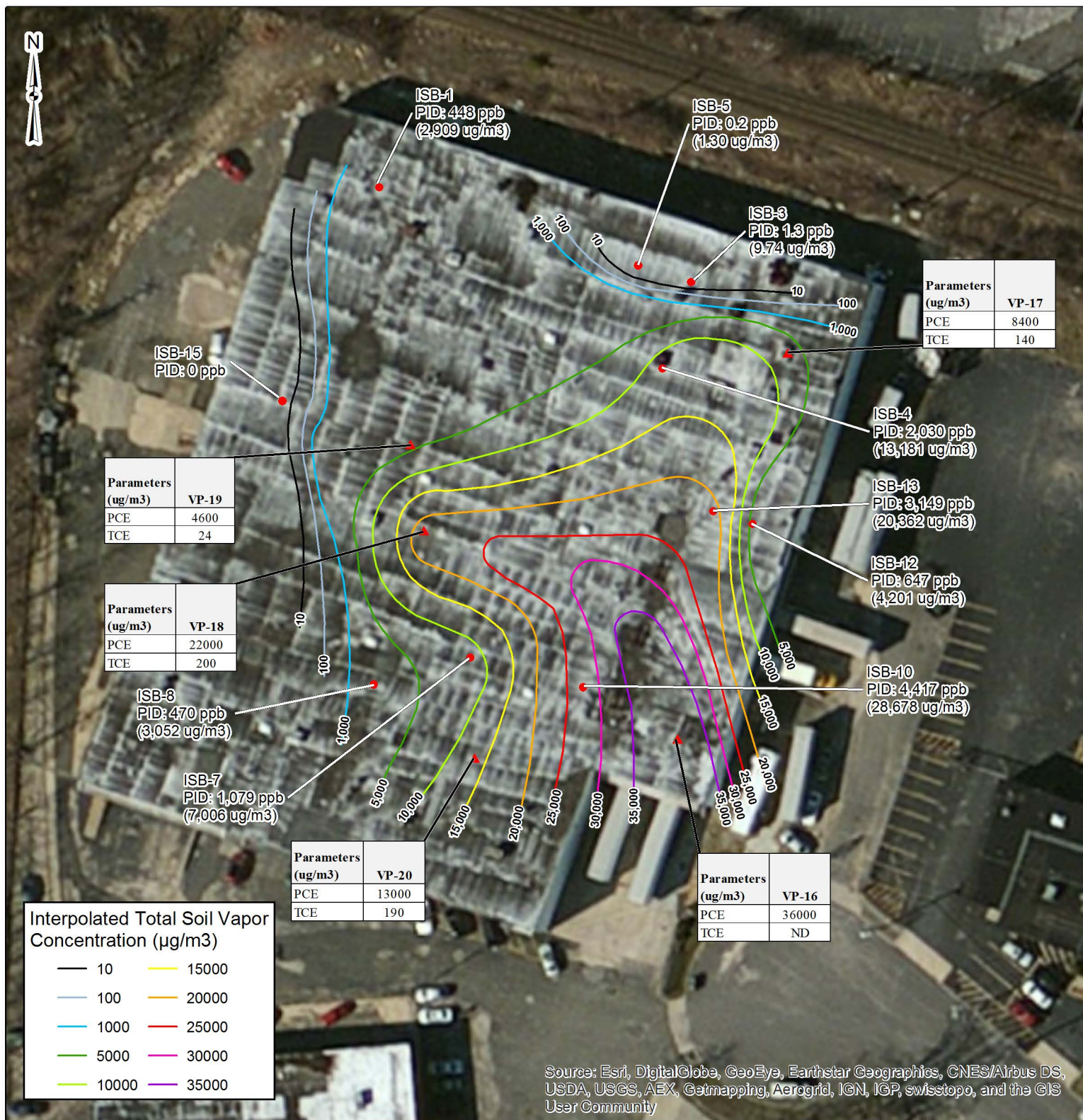
CHECKED BY:  
JCH

SCALE:  
AS SHOWN

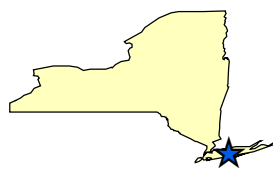
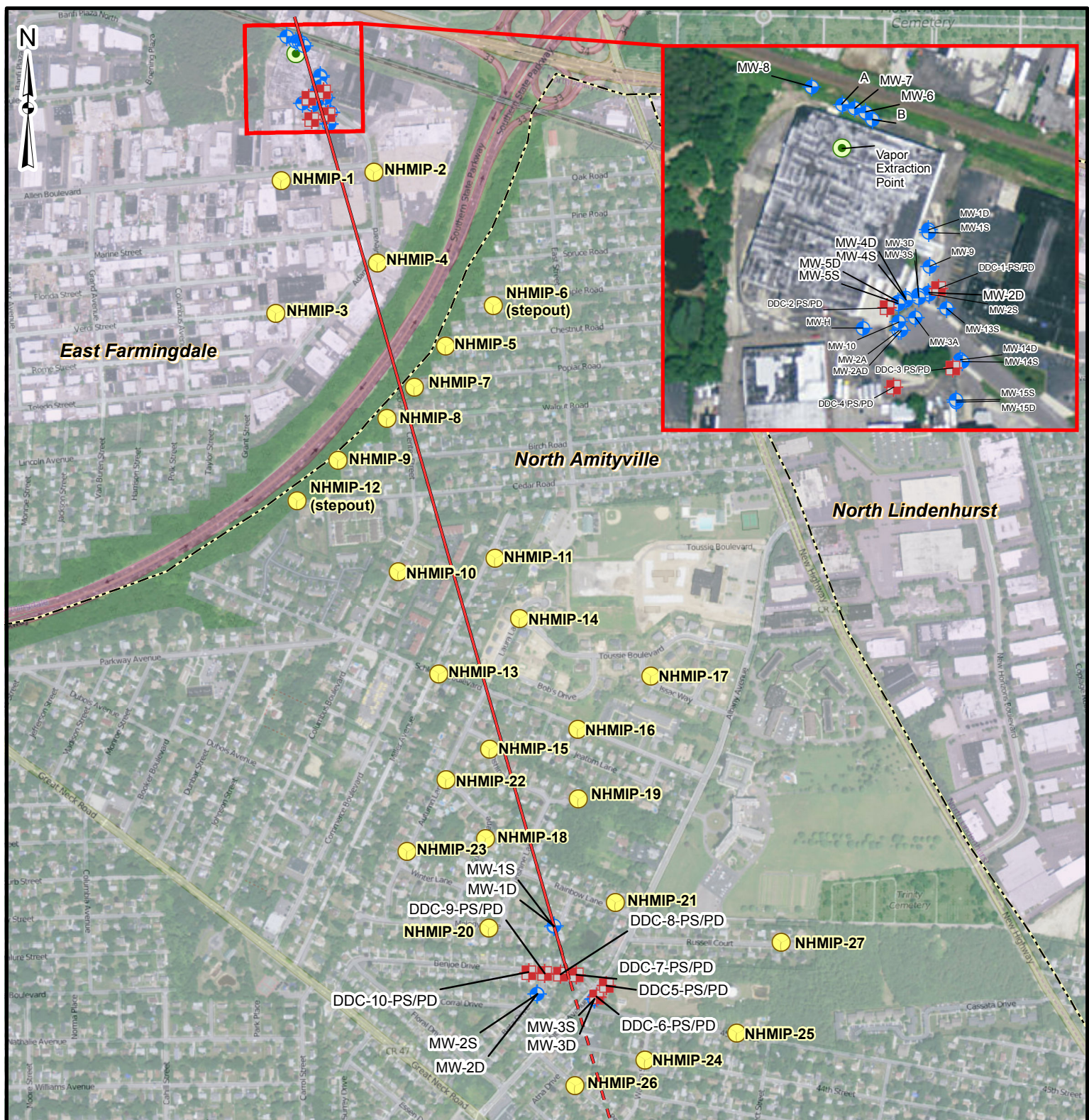
DATE:  
MAY 2016

PROJECT NO:  
14907.16

FILE NO:  
GIS/PROJECTS/  
FIGURE2.MXD







#### Legend

- DDC Well Cluster
- Groundwater Monitoring Well
- Vapor Extraction Point
- Proposed Profiling Location

— Interpreted Axis of Dissolved-Phase Plume

0 450 900 1,800 Feet

1 inch = 900 feet

Note: Proposed locations as of April 2016



Department of  
Environmental  
Conservation

NATIONAL HEATSET SITE (152140)  
1 ADAMS BLVD - TECHNICAL MEMO  
BABYLON, NEW YORK  
SUFFOLK COUNTY

FIGURE 5  
Proposed Profiling Locations

PROJECT MGR:  
JCH

DESIGNED BY:  
ALK

CREATED BY:  
ALK

CHECKED BY:  
JCH

SCALE:  
AS SHOWN

DATE:  
MAY 2016

PROJECT NO:  
14907.16

FILE NO:  
GIS/PROJECTS/  
FIGURE5A.MXD