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Containment

**GROUND RULES
APRIL 2015 RESTORATION ADVISORY BOARD (RAB)**

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**NAVAL WEAPONS INDUSTRIAL
RESERVE PLANT BETHPAGE
LONG ISLAND, NEW YORK**

04/01/2015

Naval Weapons Industrial Reserve Plant

Bethpage RAB Ground Rules



- **Respect others:**
 - One Speaker at a time
 - No interruptions
 - No side conversations
 - Ask questions at designated times

- **Listen and stay open to all points of view.**

- **Stay focused on the topics; avoid digressions.**

- **Turn cell phones and /or pagers off, or on vibrate, and respond during breaks, except for emergencies.**



OVERVIEW
APRIL 2015 RESTORATION ADVISORY BOARD (RAB)

NWIRP BETHPAGE
LONG ISLAND, NEW YORK

4/01/2015

Facility Background



- **1940s - Naval Weapons Industrial Reserve Plant (NWIRP) Bethpage**

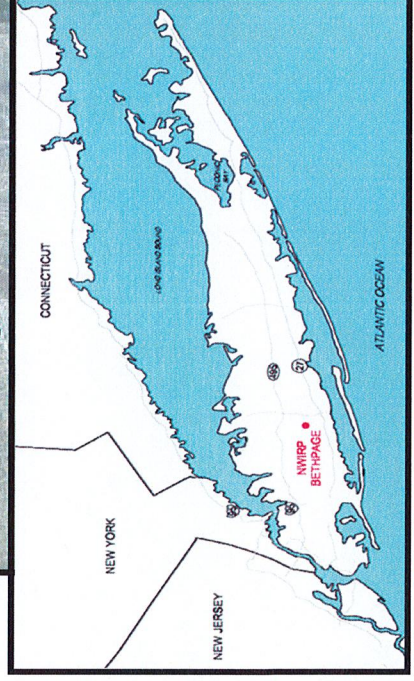
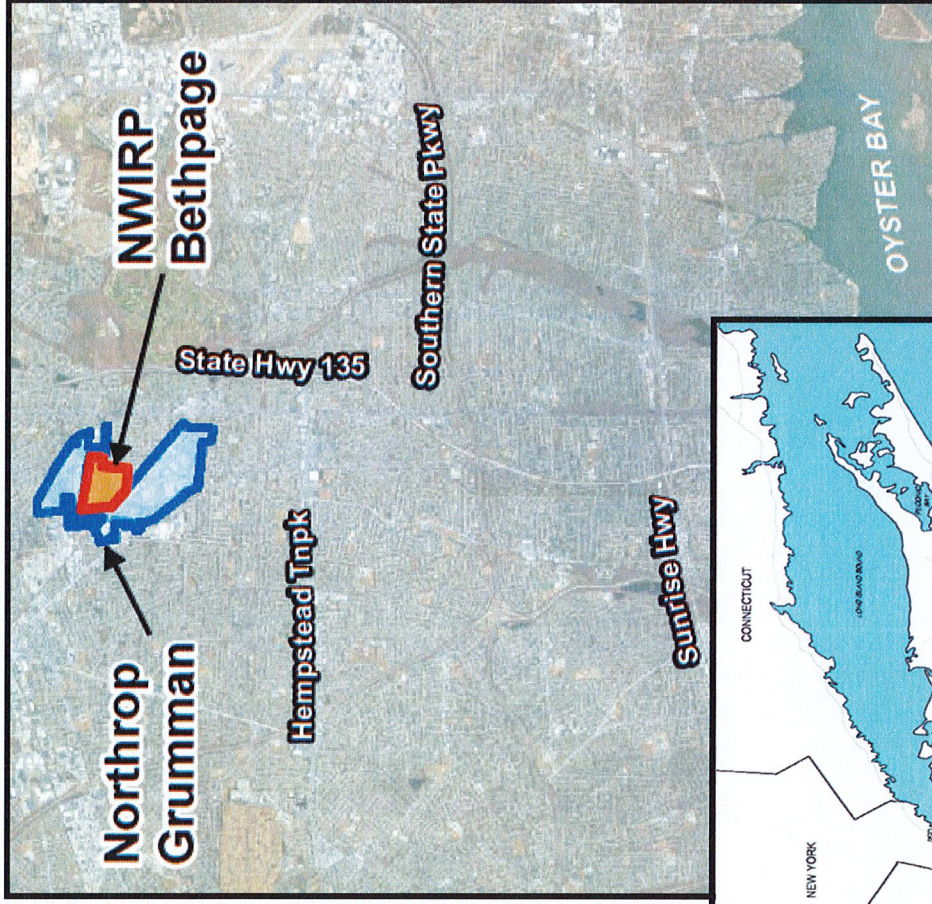
- established to build Navy aircraft (originally 109 acres)
- government-owned contractor-operated (GOCO) facility

- **Northrop Grumman (NG)**

- operated the NWIRP as contractor;
- also owned and operated its own facility adjacent to NWIRP – (500 +/- acres)

- **1996**

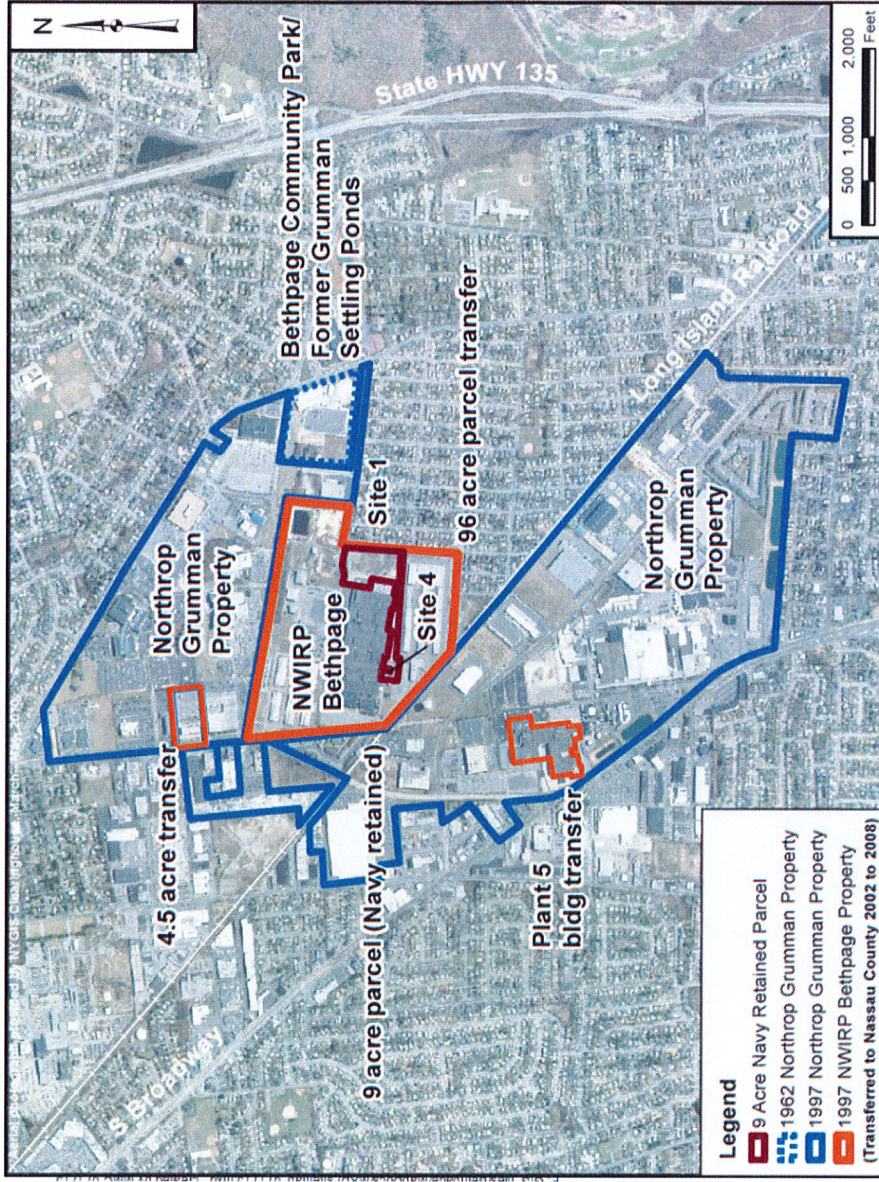
- NG terminated manufacturing activities on NWIRP





Facility Background

- **Feb 2008 Transfer**
 - 100 acres transferred to Nassau County
 - Included Environmental Restoration Sites 2 and 3 – cleanup complete
- **Current Navy property**
 - 9 acres retained by Navy for environmental cleanup (*ER Sites 1 and 4 and offsite groundwater OU2*)
 - 500-foot boundary with a residential neighborhood along the east
 - Remainder mostly bounded by Nassau County and Steel-Los III, LP properties (formerly Navy property).



Environmental Cleanup Program



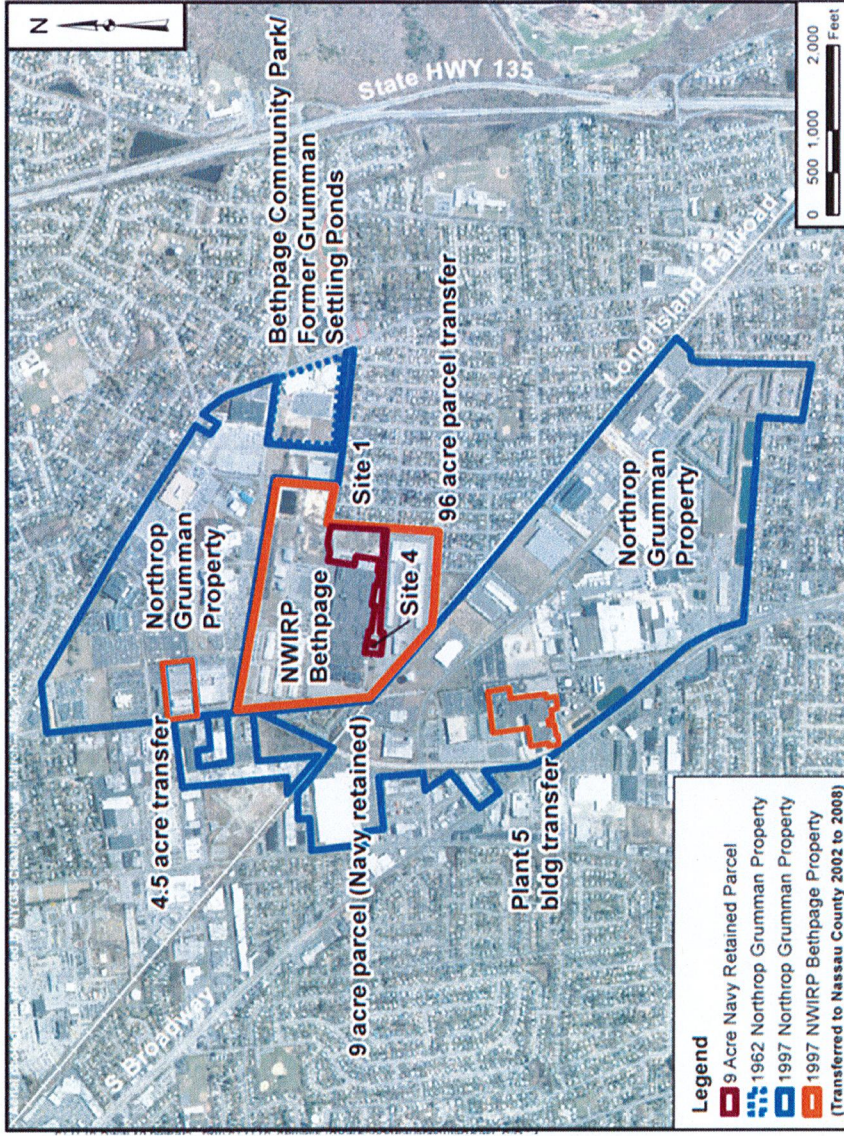
Environmental Restoration Program conducted to meet requirements of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)

- **Navy**
 - *is the Lead Federal Agency under EPA's CERCLA regulations*
- **Regulator Involvement**
 - *New York State Department of Environmental Conservation (NYSDEC)* provides regulatory review of Navy actions with assistance from the *New York State Department of Health (NYSDOH)*.
 - **United States Environmental Protection Agency (USEPA)** has had limited involvement since NWIRP Bethpage is not a federal National Priorities List (NPL) site.
 - **United States Geological Survey (USGS)** provides technical support on groundwater issues
- **Bethpage Restoration Advisory Board (RAB)**
 - Community members review official documents and attend routine meetings
 - Provide information on local concerns, issues and advise on cleanup goals and plans to the Navy
 - *Discussions/interactions limited to Navy environmental restoration site work*



Northrop Grumman

- Point of Contact
 - Henry Wilkie, NYSDEC
 - Steve Scharf, NYSDEC



The Navy has no control over or involvement in environmental cleanup decisions for the Northrop Grumman Property

Site 1 – Former Drum Marshalling Area



- Used by Northrop Grumman for staging waste solvents, liquid plating wastes (metals), and autoclave (PCB fluid) wastes.
- Volatile Organic Compounds (VOCs) in soil and shallow groundwater – **cleanup complete**
- VOCs in soil vapor – **cleanup in progress**
 - Ongoing monitoring of soil vapor extraction system
 - Reports available
- Polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs) and metal in soil – **planning cleanup**
 - Estimate 60,000 cubic yards of PCB impacted soil
 - Contamination down to 65 feet deep
 - 2015 – Remedial Investigation Addendum



Site 4 – Former UST Site



Former underground storage tanks for No. 6 Fuel Oil

- Tanks were likely removed in the 1980s.
- Petroleum in soils 30 to 71 feet deep, near the water table
- Impacted soil covers an area of approximately 0.14 acre
- Minimal groundwater impacts

Proposed Plan

- Free Product Recovery
- Biodegradation Polishing
- Groundwater Monitoring

Timeline

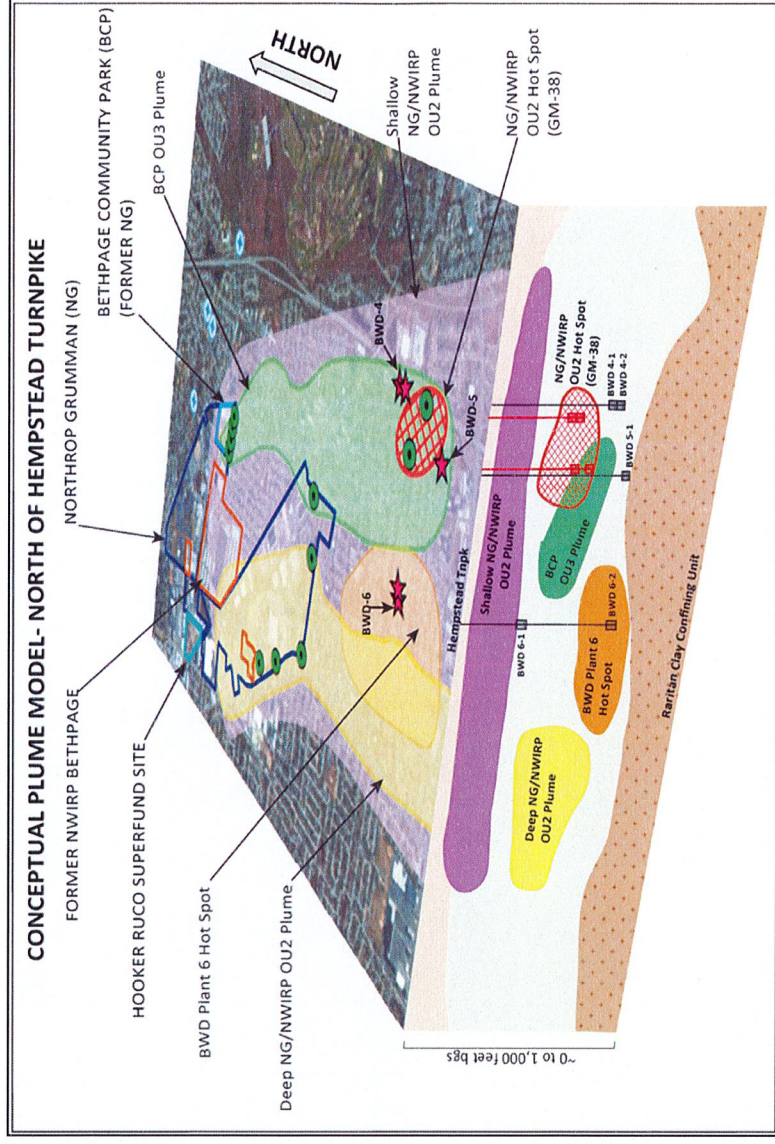
- Nov - Dec 2014 - Proposed Plan and Public Comment Period
- Summer 2015 - Record of Decision
- 2015/2016 – Start Cleanup
 - Anticipated to operate for 2 to 4 years
 - Groundwater Monitoring to continue for more than 10 years



OU2 Groundwater Investigation



- **Commingled contamination**
 - source area on both NWIRP property and Northrop Grumman property
 - Other properties may be contributing
- **Covers approximately 3,000 acres**
- **Not uniformly distributed**
 - Multiple widely dispersed plumes or “fingers”
 - VOCs are present at different concentrations and different depths in different areas of OU2.

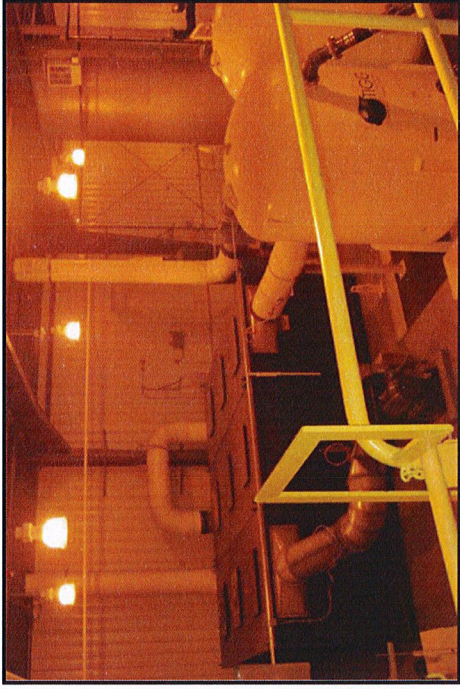


OU2 Off-Property Treatment



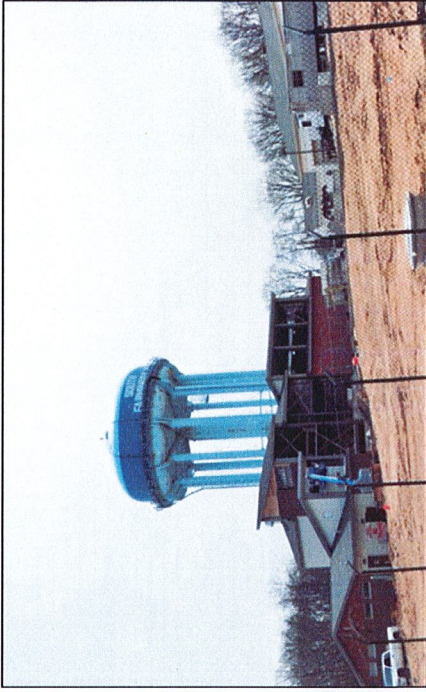
- GM38 Treatment System

- System started operation in 2009
- Treated approximately 2.43 billion gallons since December 2014
- Approximately 4 tons of VOCs removed from the aquifer since startup
- Groundwater concentrations have decreased by 80 to 95 percent
- USGS provided modeling support



- Wellhead Treatment Systems Funded by U.S.

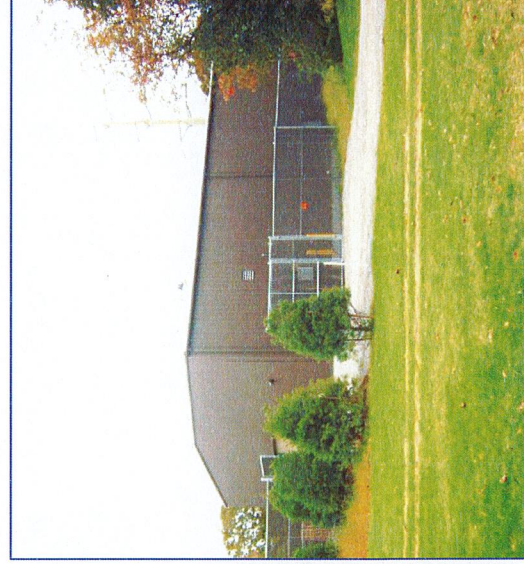
- Bethpage Water District (BWD)
 - Plant 5 - 1996
 - Plant 6 - upgrades, 2011
- South Farmingdale Water District (SFWD)
 - Plant 1 - 2011
 - Plant 3 - 2013
- New York American Water (NYAW) Seamans Neck Rd,
 - Interim system, 2012
 - Full scale system, 2015



2003 OU2 Groundwater Record of Decision (ROD)

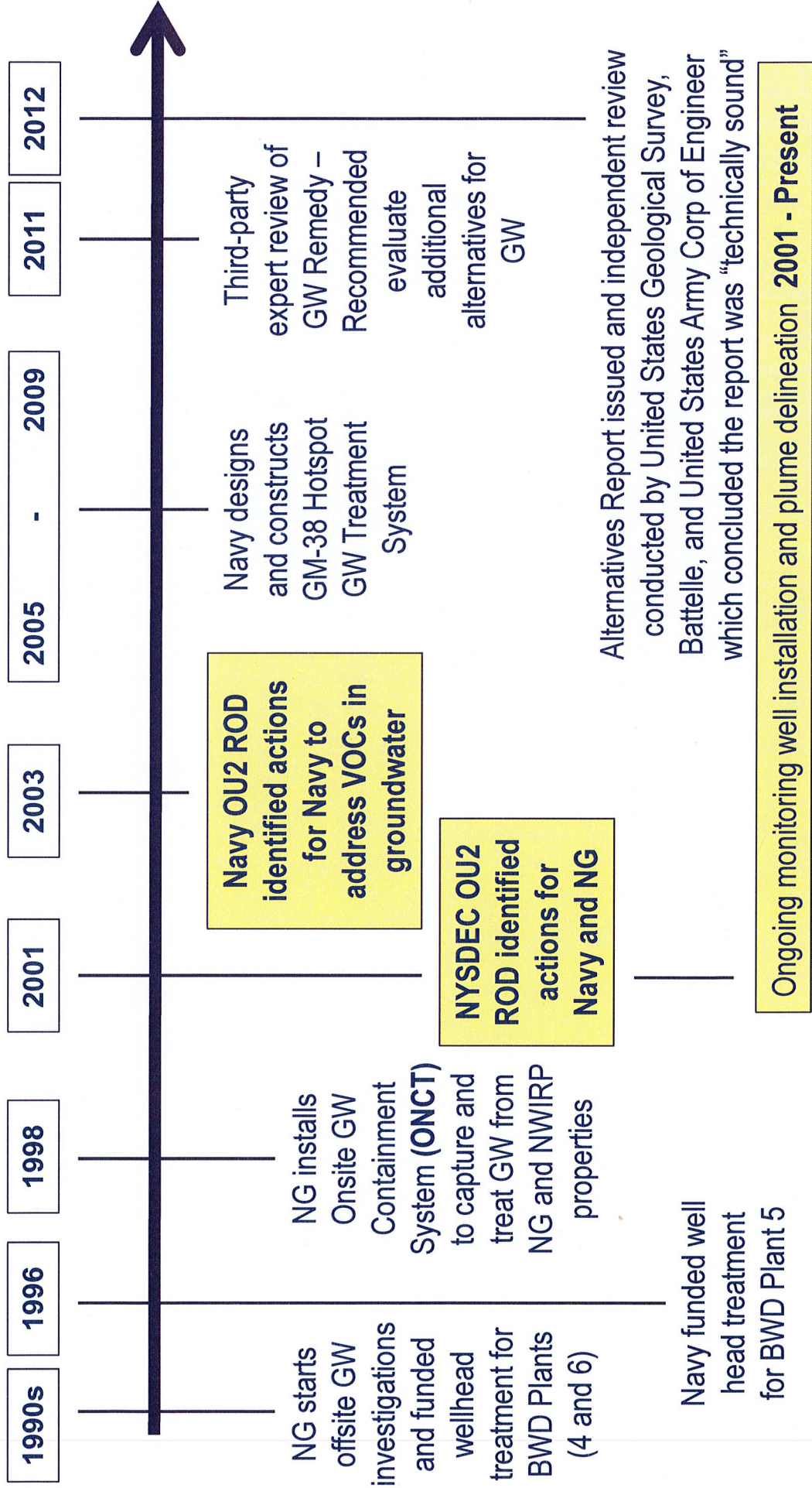


- Full containment of the off-site groundwater contamination is not feasible
- Restrictions on future use of NWIRP groundwater
- Groundwater Monitoring – Plume Delineation
 - Identify and treat groundwater “hot spots”
 - Predict potential impacts to public water supply
- Public Water Supply Protection





Groundwater Investigation Timeline





**REMEDIAL INVESTIGATION ADDENDUM
SITE 1 – FORMER DRUM MARSHALLING
AREA**

**NWIRP BETHPAGE
LONG ISLAND, NEW YORK**

04/01/2015

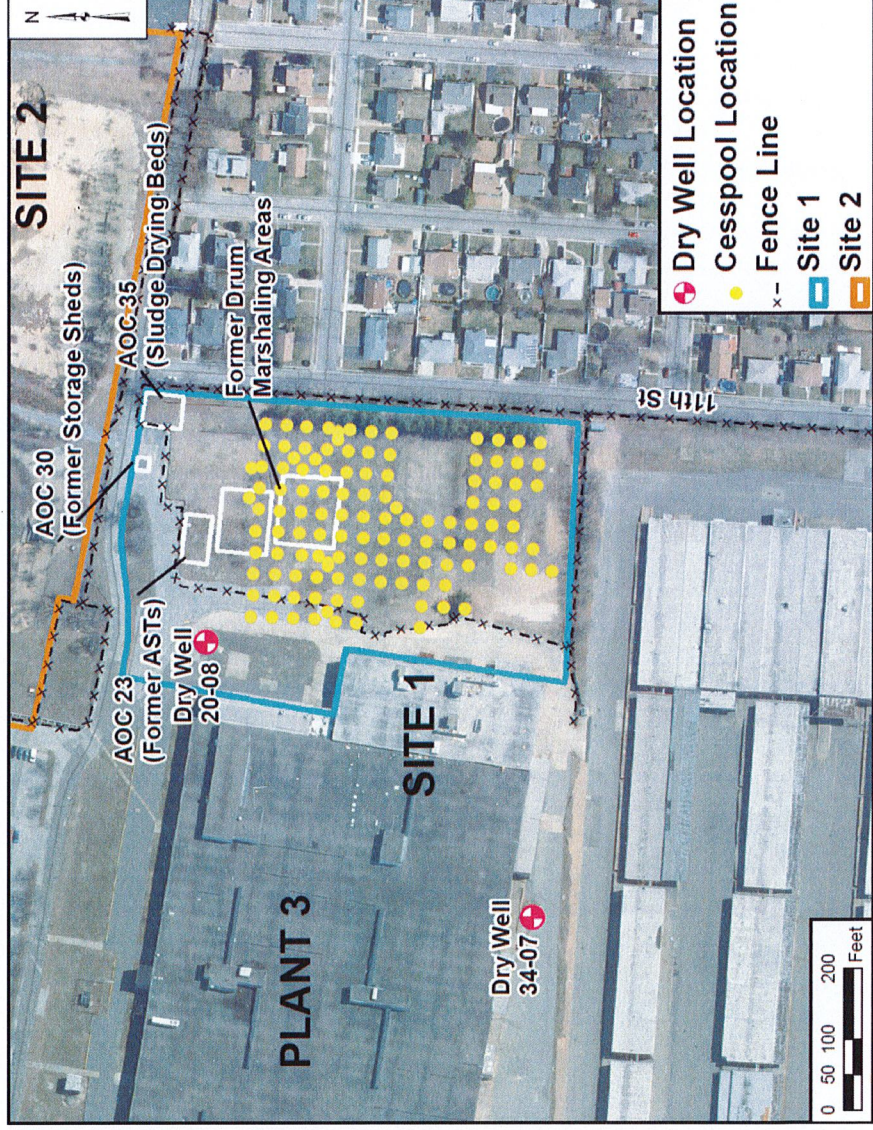
Outline



- Introduction
- History
- Remedial Investigation Addendum Results
- Path Forward

Site 1 History

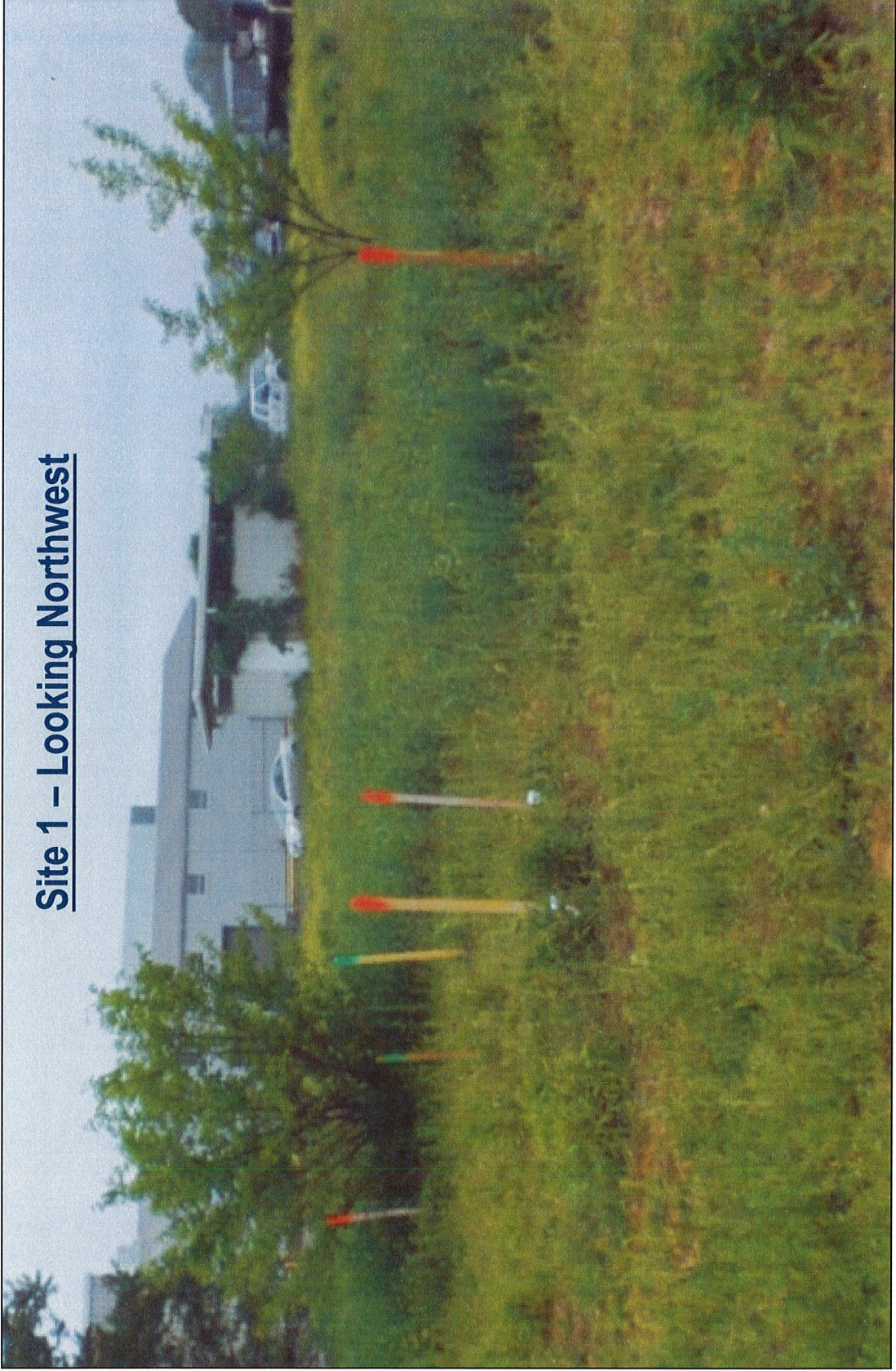
- Two former drum marshaling pads
- 120 abandoned cesspools for sanitary waters from Plant 3
- Drywells – Area of Concern (AOC) 34-07 and AOC 20-08 for storm water
- AOC 23-Former Aboveground Storage Tanks (ASTs),
- AOC 35-Former Sludge Drying Beds, and
- AOC 30-Storage Sheds



Site 1 History



Site 1 – Looking Northwest



Site 1 History

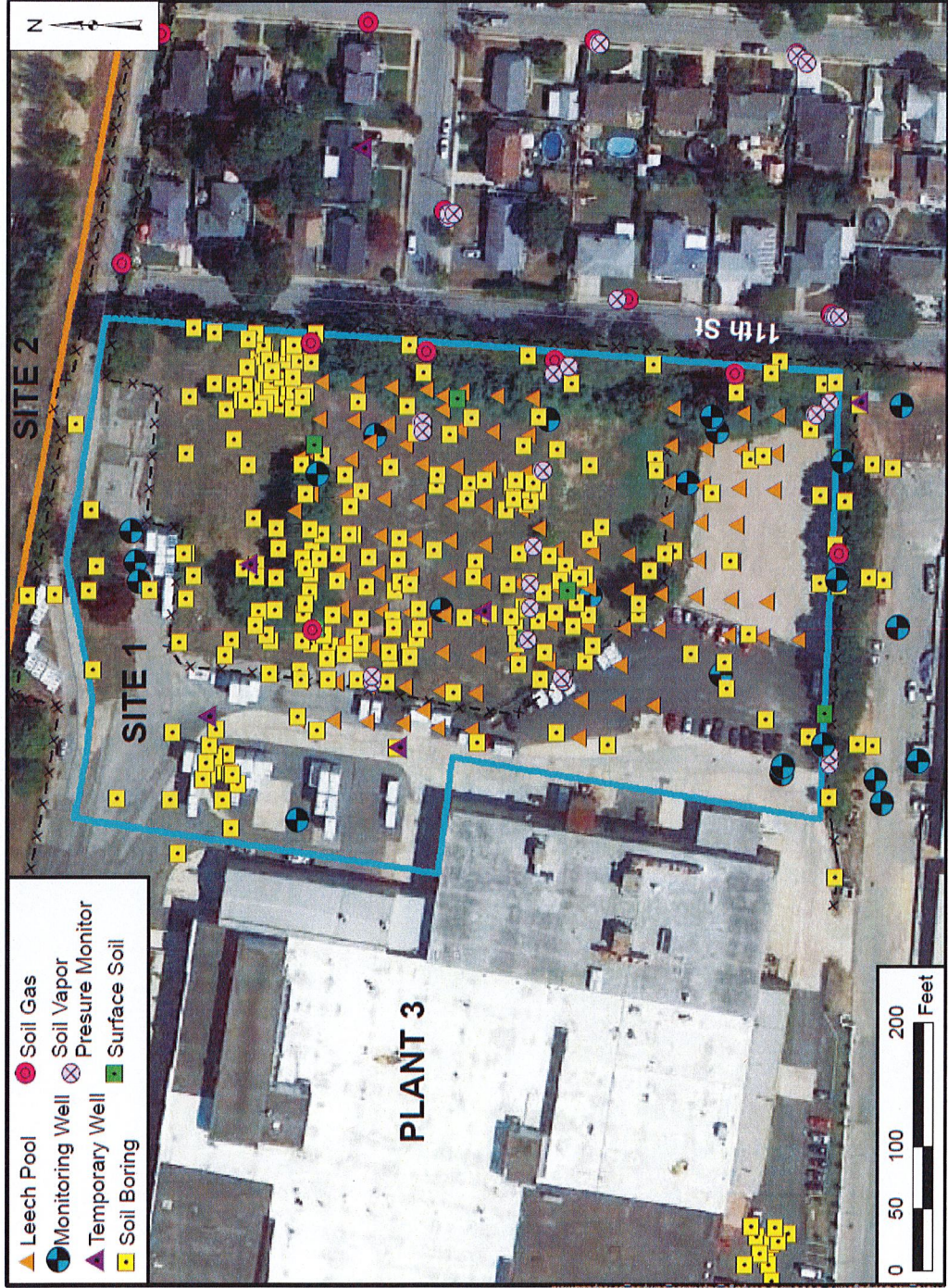


Remedial Site Activities

- 1992 to 1995- Initial investigations and Remedial Decision
- 1995 to 2008- Additional investigations conducted, volume increased from 1,400 cubic yards for to over 38,000 cubic yards
- 1997 to 2002- Source area cleanup volatile organic compound (VOC)-contaminated soil and shallow local groundwater
 - Air Sparging/Soil Vapor Extraction Remediation System
 - 4,520 pounds of VOCs had been extracted and treated
 - Achieved greater than 95% reduction of VOCs in groundwater
- 2009 to 2013- Supplemental soil and groundwater investigations
- 2010 to 2015- Soil Vapor Extraction Containment System operates to address vapor intrusion

Site 1 Remedial Investigation Addendum

Field Activities (1991 to present)



Site 1 Remedial Investigation Addendum

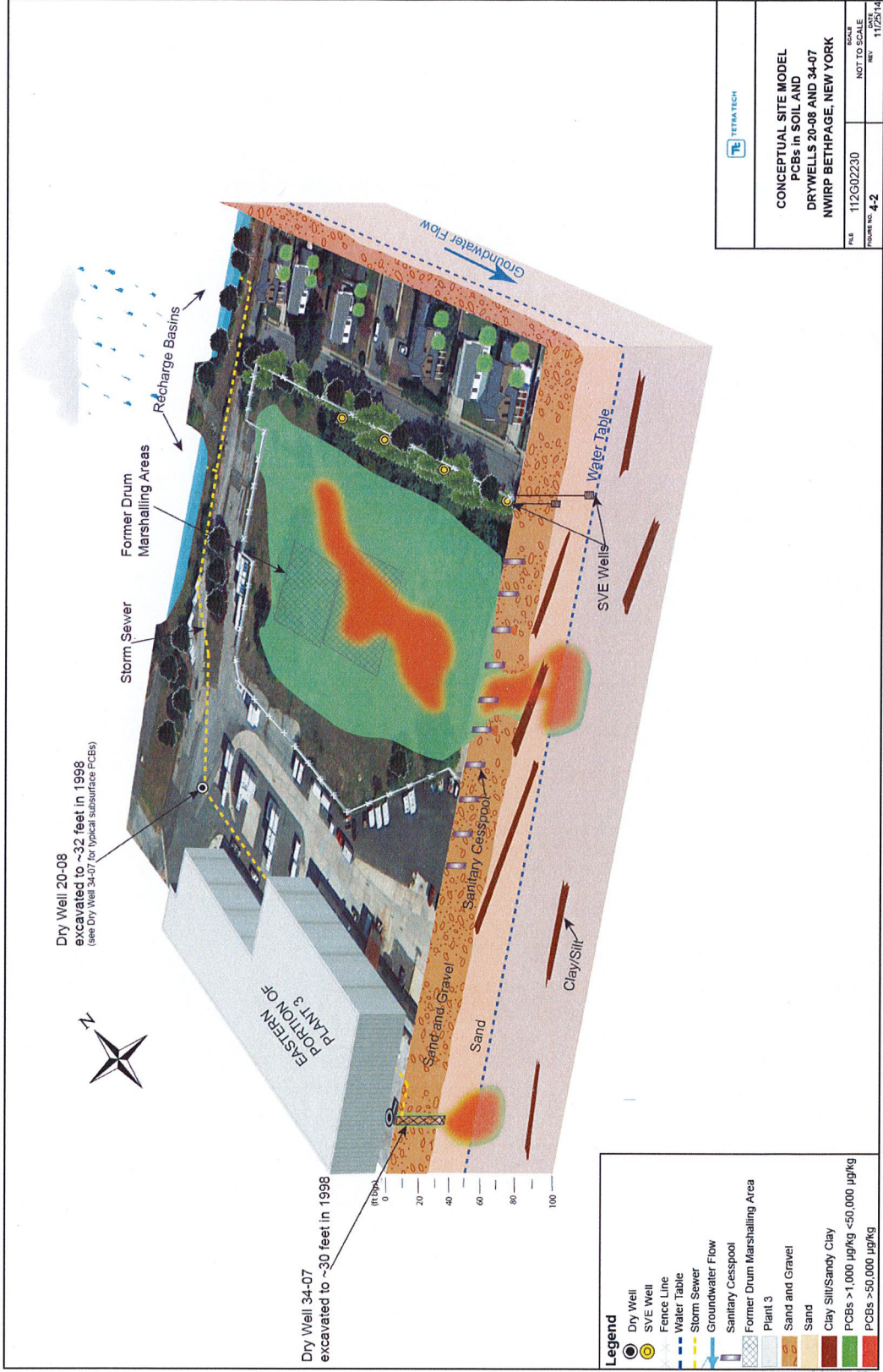
Groundwater Field Activities (2009 to 2013)





Site 1 Remedial Investigation Addendum

Results - PCBs in Soil

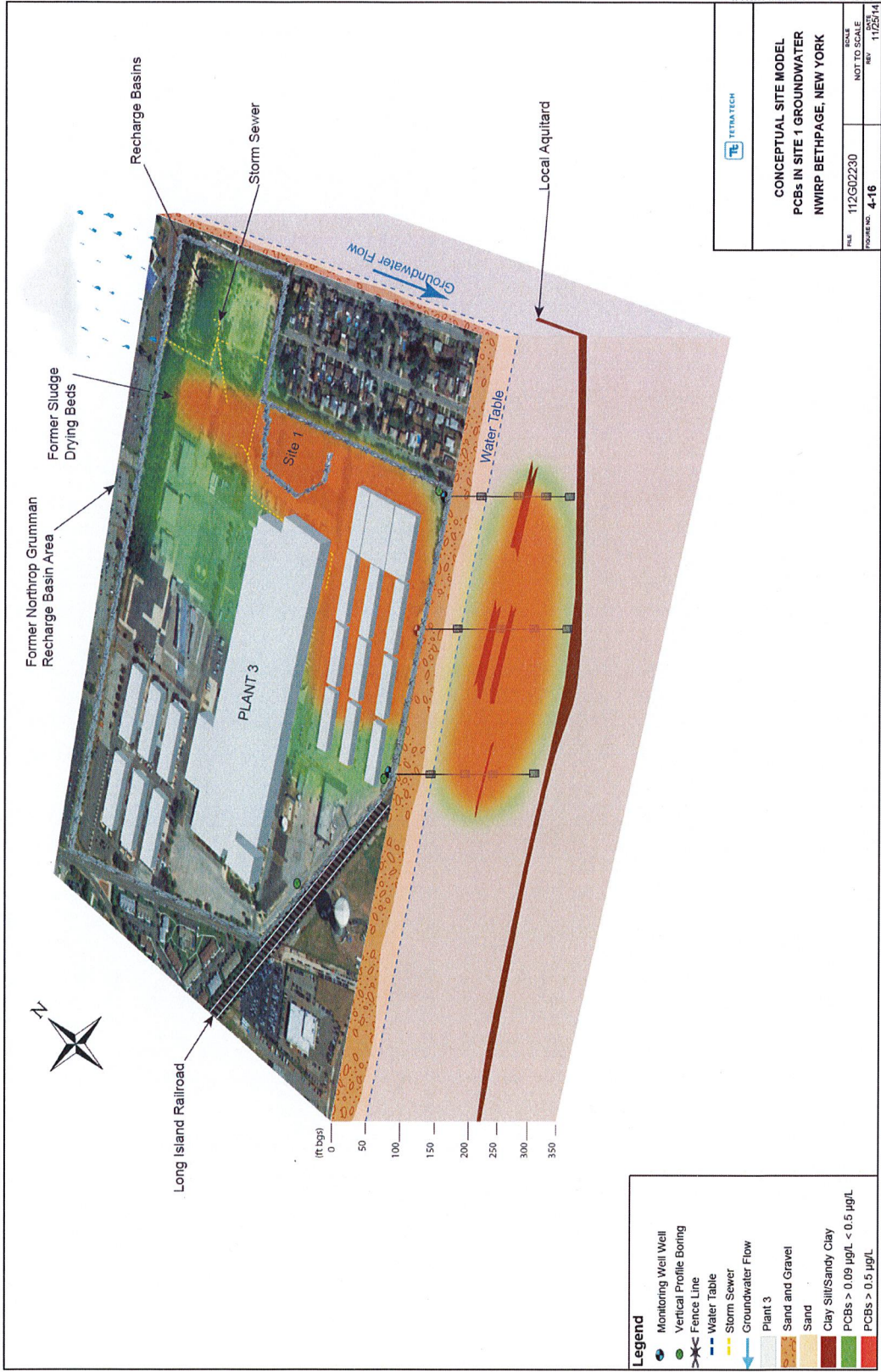


04/01/2015



Site 1 Remedial Investigation Addendum

Results – PCBs in Groundwater



Site 1 Remedial Investigation Addendum



Remedial Site Results

- Media and chemicals to be addressed:
 - Soil: Polychlorinated biphenyls (PCBs), chlordane, polynuclear aromatic hydrocarbons
 - Groundwater: PCBs, arsenic, and hexavalent chromium
 - Soil Vapor: Tetrachloroethene and trichloroethene

Path Forward



- 2015/2016 Feasibility Study
- 2016 Proposed Plan (45-day public comment period)
- 2016 OU1 Record of Decision (ROD) Amendment or new ROD
- 2017 Start of Remedy



**OPERABLE UNIT 2 - OFFSITE GROUNDWATER
INVESTIGATION**

APRIL 2015 RESTORATION ADVISORY BOARD

**NAVAL WEAPONS INDUSTRIAL
RESERVE PLANT BETHPAGE
LONG ISLAND, NEW YORK**

04/01/2015



PRESENTATION LAYOUT

- 1 - Program Overview
- 2 - Local Groundwater Geology and Applicability to Bethpage Plume
- 3 - 2009 – 2014 Vertical Profile Borings and Wells
- 4 - Recent Work (Performed since last Restoration Advisory Board)
- 5 - Future Work
- 6 - Assessing Results and Recent Reports and Findings



PROGRAM OVERVIEW

Purpose: Delineate groundwater contamination in areas south of Naval Weapons Industrial Reserve Plant Bethpage

Program Components:

- **Vertical Profile Borings (VPB)** - used to quickly screen areas for the presence, depth, and concentration of contamination; drilling can take 4-8 weeks to complete
- **Permanent Monitoring Wells** - to confirm presence/absence of contamination and develop trends; drilling can take 2-6 weeks to complete
- **Data logging of water levels** - to support United States Geological Survey modeling and capture zone analysis for wells

VERTICAL PROFILE BORINGS (VPB)



- **12-inch** diameter hole drilled into the ground
- Final boring is **860 to 1000 feet deep** (extending to the Raritan Clay Layer)
 - Drilling is stopped at selected depths and a device is lowered to sample the groundwater
 - **36 groundwater samples** are collected per boring and analyzed for Volatile Organic Compounds
- **4 to 8 weeks** to complete a boring/well

VPB AND WELL INSTALLATION PROCESS



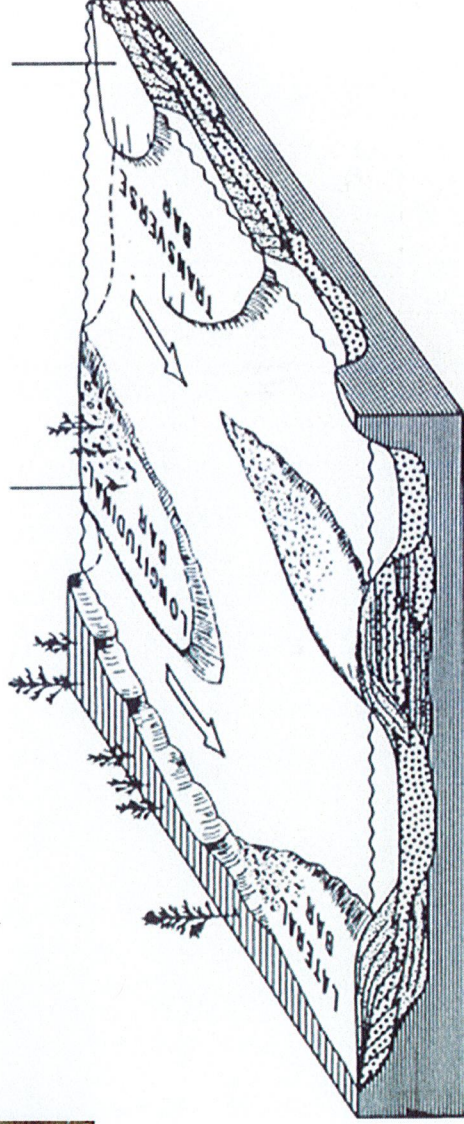
- **Process:**
 - Ideal map location selected by Navy and State;
 - Location is then ground-proofed by the Navy;
 - Drilling rig requires minimum of 100 feet with no overhead obstructions;
 - Generally on township right-of-ways;
 - Considerations to minimize inconvenience to residents nearby:
 - Health and Safety of Public and Navy contractors
 - Ingress and egress
 - Noise
 - Advanced notification to nearest residence



LOCAL GROUNDWATER GEOLOGY

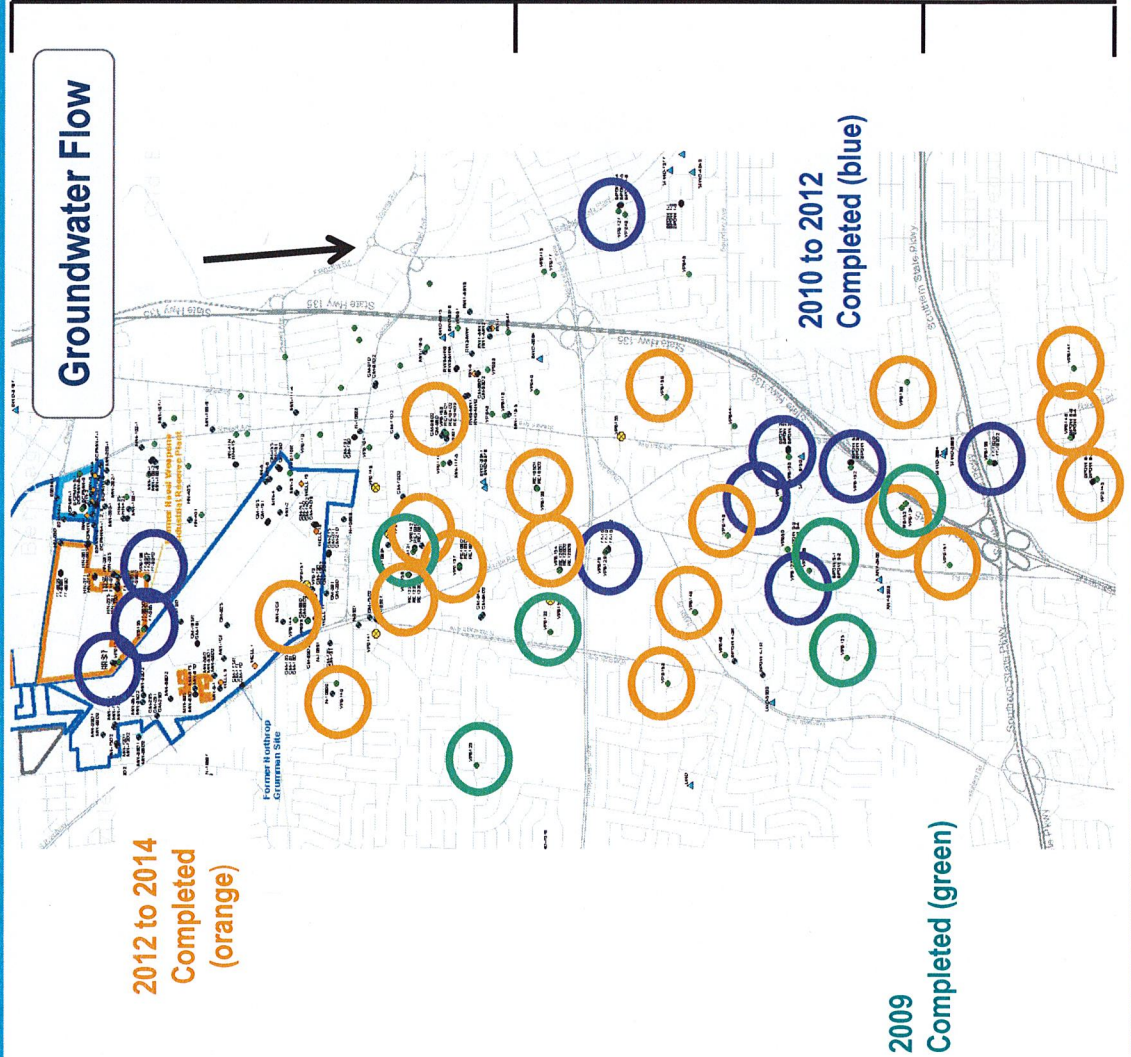


MAGOTHY AQUIFER





2009 - 2014 VERTICAL PROFILE BORINGS AND WELLS



North of Hempstead
Turnpike Area

North of Southern State
Parkway Area

South of Southern State
Parkway Area

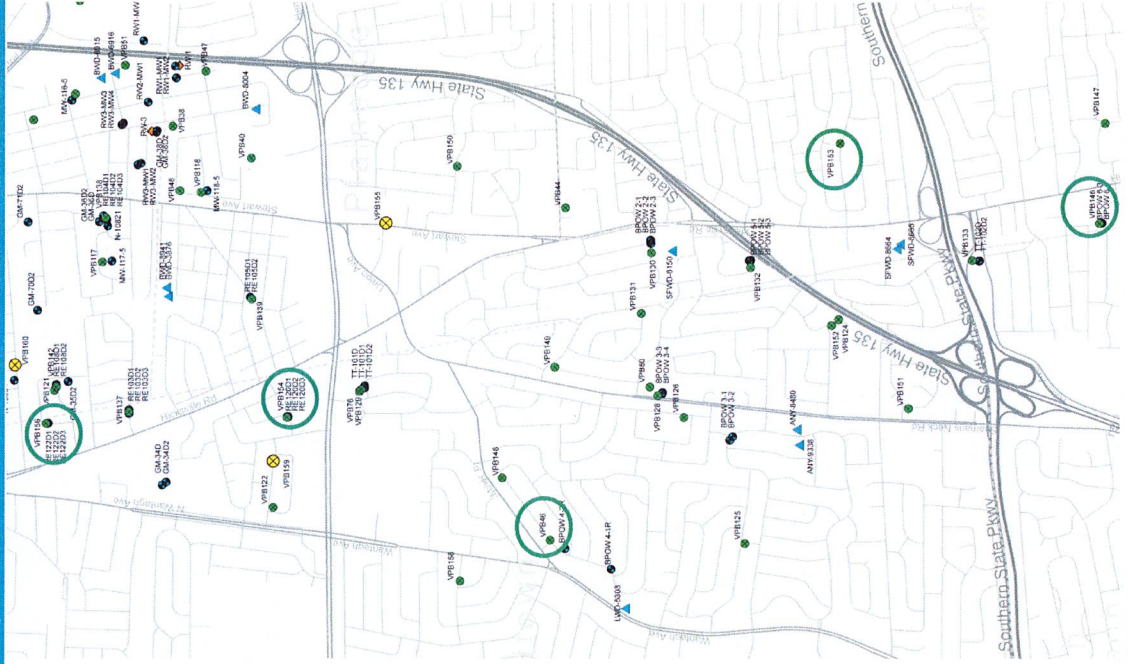
RECENT WORK

VERTICAL PROFILE BORINGS AND MONITORING WELLS



- **Since last Restoration Advisory Board (November 2014)**
 - Operation of 3 drilling rigs
 - Installation of Vertical Profile Borings 153, and 158 located North of Southern State Parkway Area
 - Installation of 8 Monitoring Wells associated with VPB 154, 156 and 146
 - Completion of 1 round of groundwater sampling of 13 wells

RODUM - Investigation

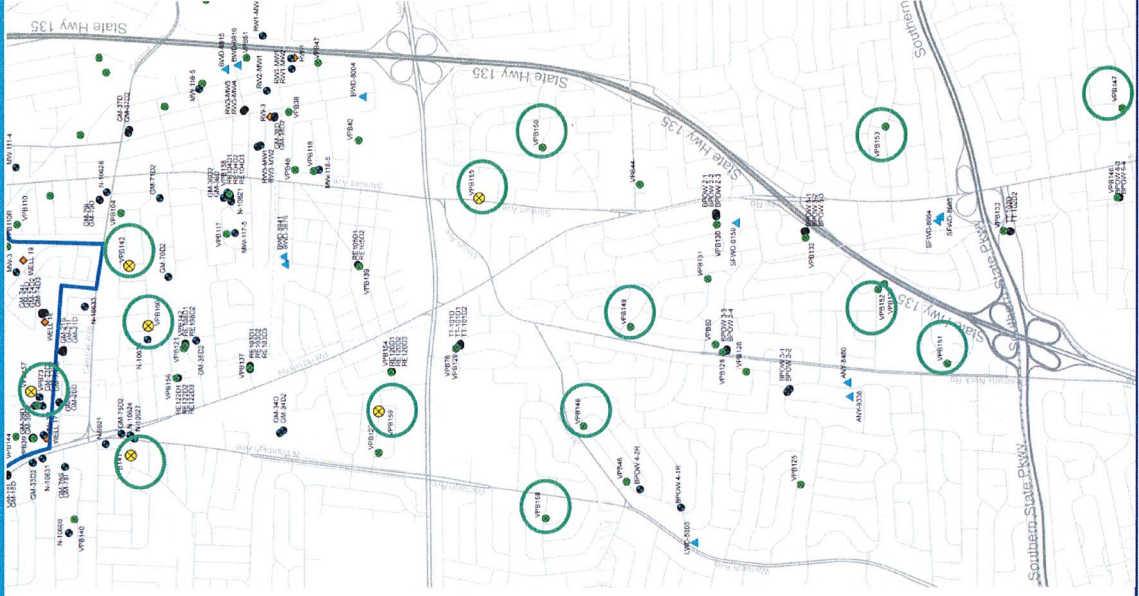




FUTURE WORK

VERTICAL PROFILE BORINGS AND MONITORING WELLS

- **Work through April 2016:**
 - Operation of 3 drilling rigs
 - Installation of Vertical Profile Borings
 - 5 North of Hempstead Turnpike Area
 - 1 North of Southern State Parkway Area
 - Installation of Monitoring Wells
 - 2 South of Southern State Parkway Area
 - 24 North of Southern State Parkway Area
 - 8 North of Hempstead Turnpike Area
 - Continue regular groundwater sampling



OU2 OFFSITE GROUNDWATER INVESTIGATION



Any Immediate QUESTIONS?

ASSESSING GROUNDWATER RESULTS



- The primary organic contaminant being investigated is trichloroethylene, a volatile organic compound
 - Acceptable Maximum Contaminant Limit is a health-based regulatory limit established by the NYSDEC
 - The Maximum Contaminant Limit for trichloroethylene is 5 parts per billion
- Hotspot Identification
 - Area with >1000 parts per billion trichloroethylene
 - Criteria defined in the Operable Unit 2 Offsite Groundwater 2003 Record of Decision

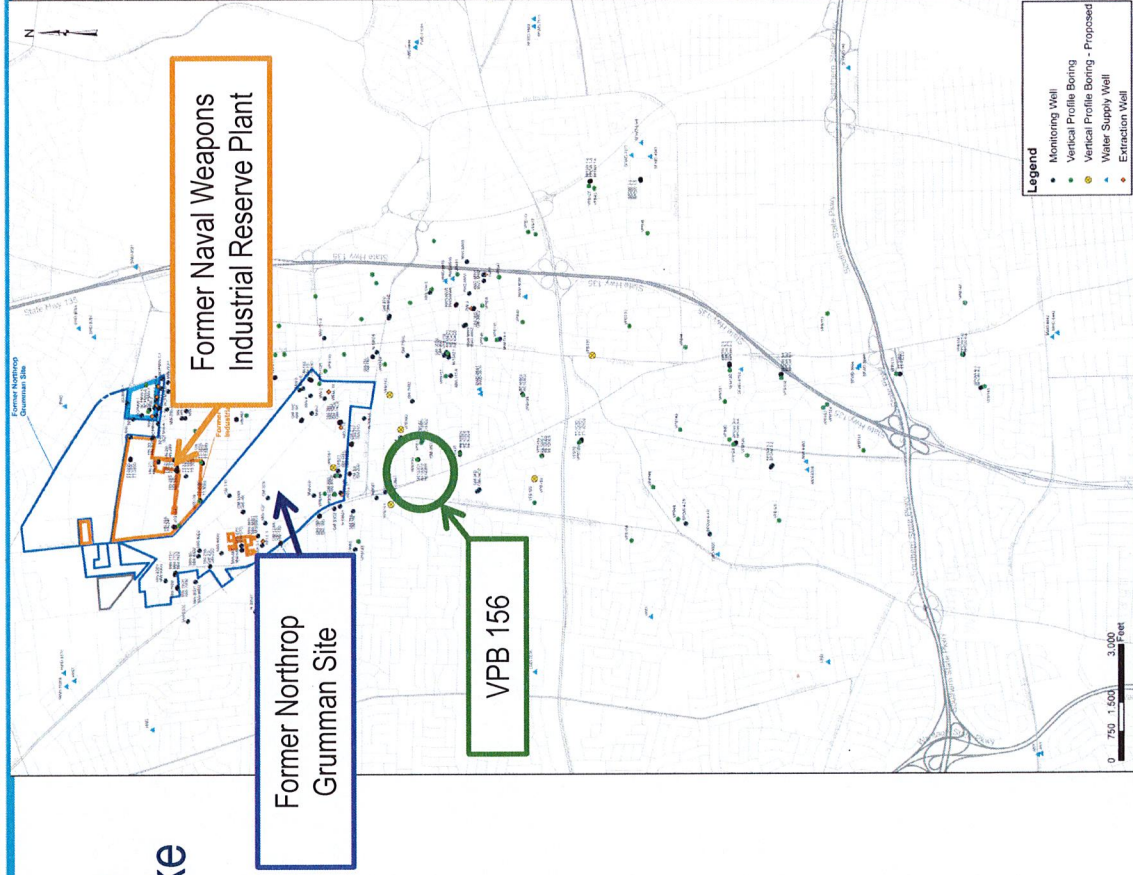
RECENT REPORT – VPB 156



Data Summary Report Vertical Profile Boring 156 (North of Hempstead Turnpike Area) submitted December 17, 2014.

Findings:

- Results showed elevated trichloroethylene (>1000 parts per billion)
- Maximum concentration:
 - 8200 parts per billion trichloroethylene
 - 598-600 feet below ground surface.
- Associated wells will be sampled the last week of March.



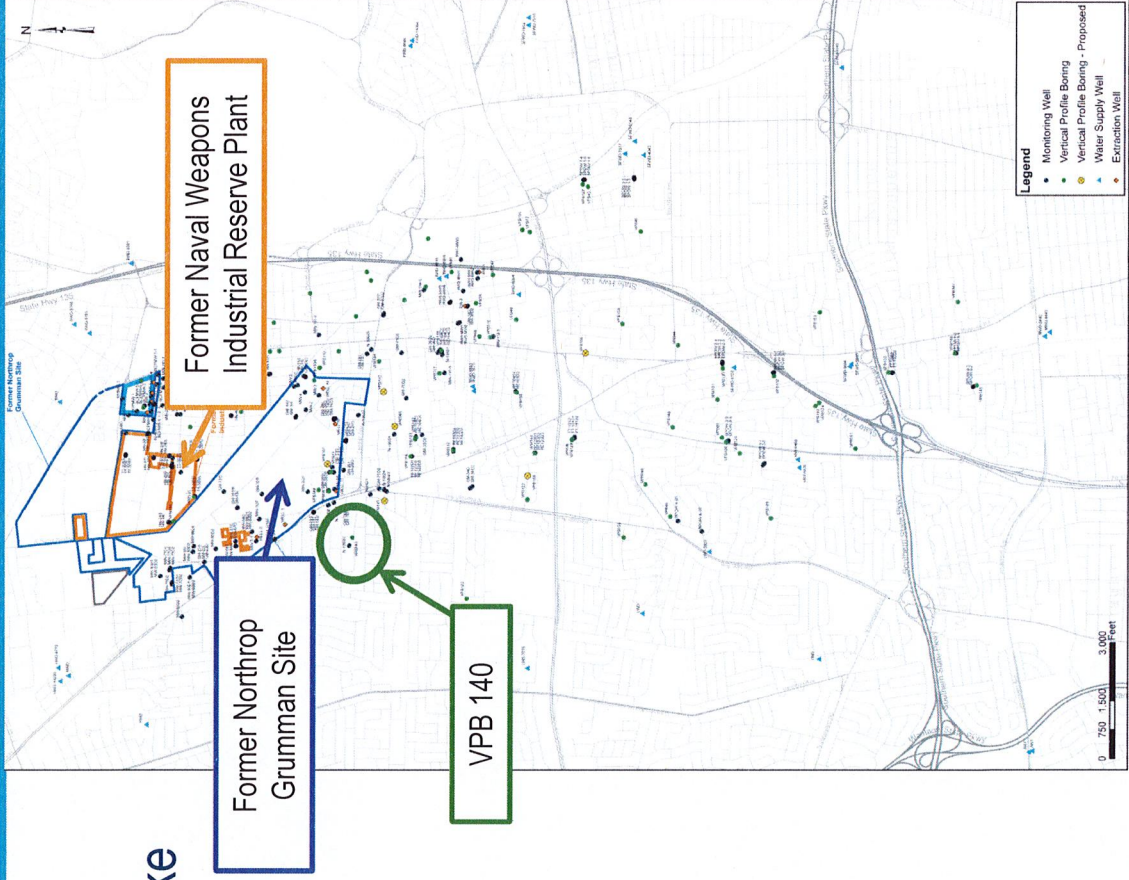
RECENT REPORT – VPB 140



Data Summary Report Vertical Profile Boring 140 (North of Hempstead Turnpike Area) submitted November 24, 2014.

Findings:

- Results showed trichloroethylene (<1000 parts per billion).
- Maximum concentration:
 - 120 parts per billion trichloroethylene
 - 485-457 feet below ground surface.



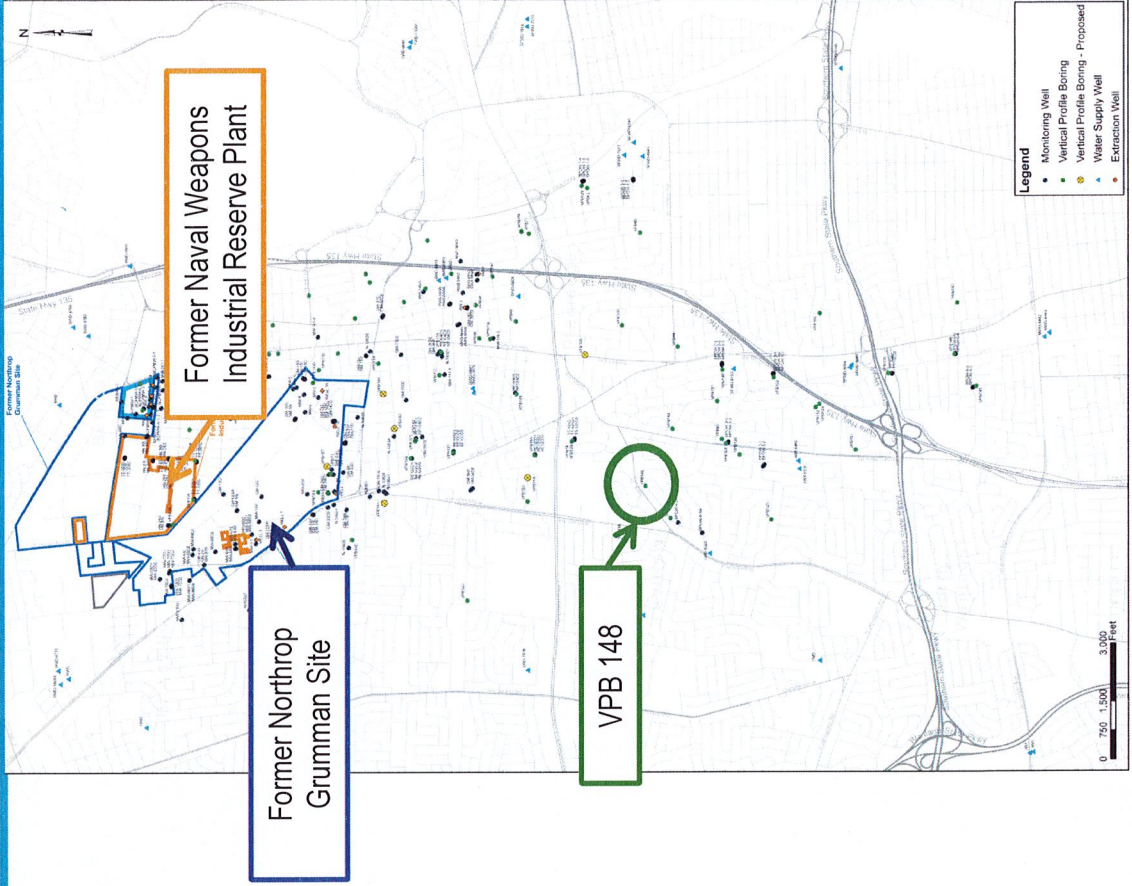
RECENT REPORT – VPB 148



Data Summary Report Vertical Profile Boring 148 (North of Southern State Parkway Area) submitted November 14, 2014.

Findings:

- Results showed trichloroethylene (<1000 parts per billion)
- Maximum concentration:
 - 520 parts per billion trichloroethylene
 - 538-540 feet below ground surface.



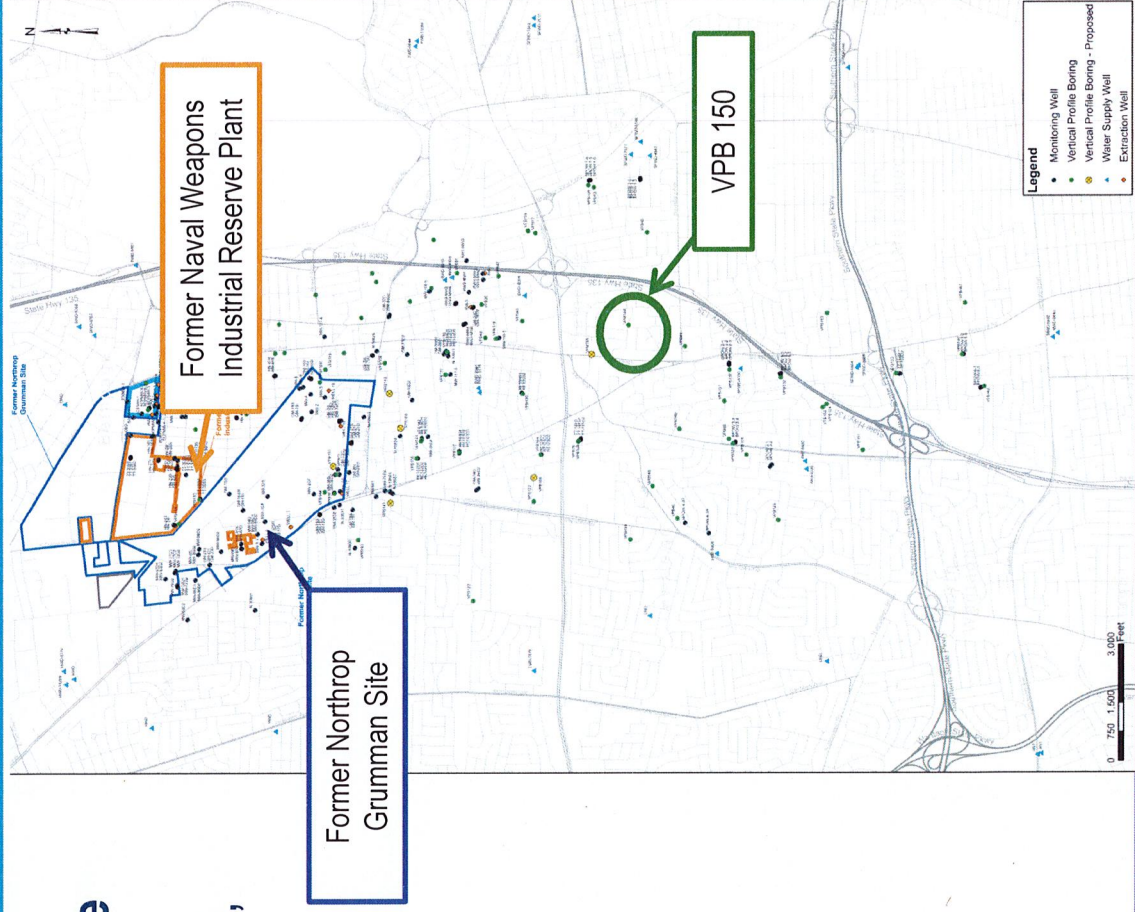
RECENT REPORT – VPB 150



Data Summary Report Vertical Profile Boring 150 (North of Southern State Parkway Area) submitted November 24, 2014.

Findings:

- Results showed trichloroethylene (<1000 parts per billion).
- Maximum concentration
 - 26 parts per billion trichloroethylene
 - 243-245 feet below ground surface.



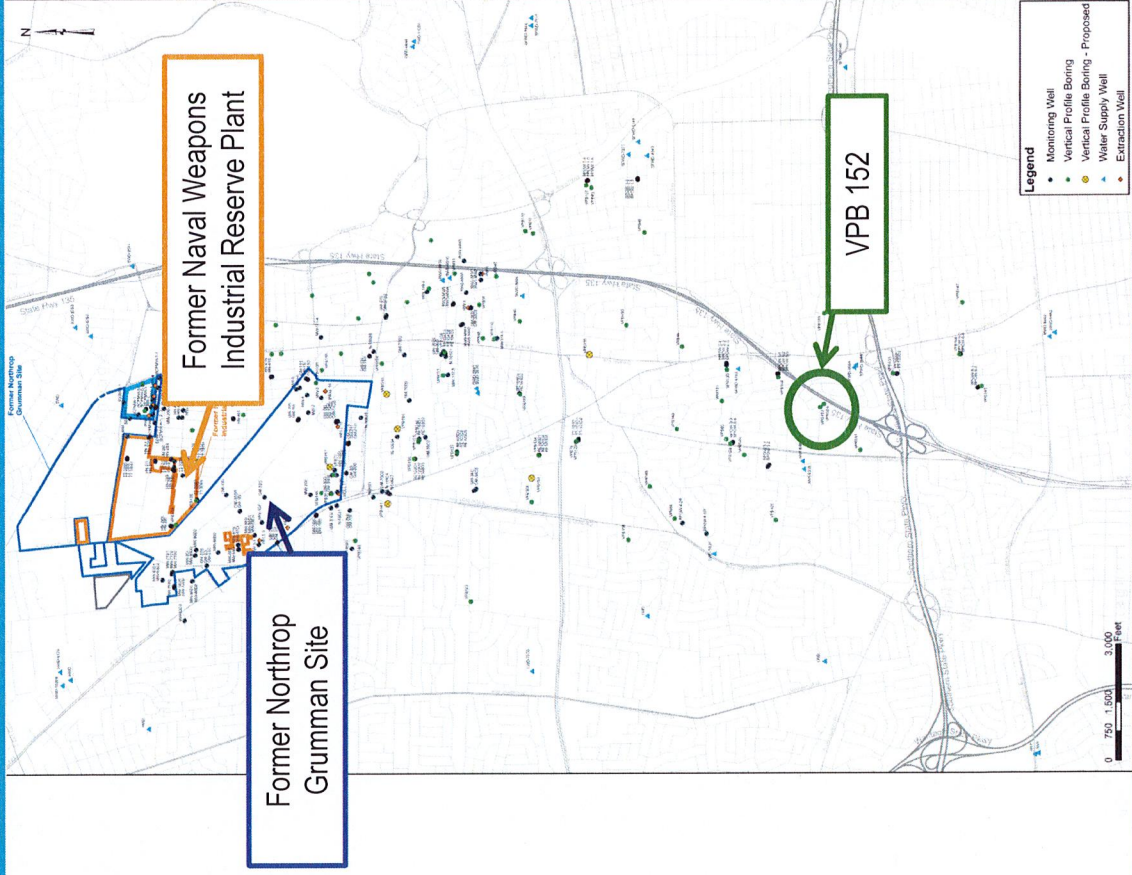
RECENT REPORT – VPB 152



Data Summary Report Vertical Profile Boring 152 (North of Southern State Parkway Area) submitted December 17, 2014.

Findings:

- Results showed trichloroethylene as not detected.



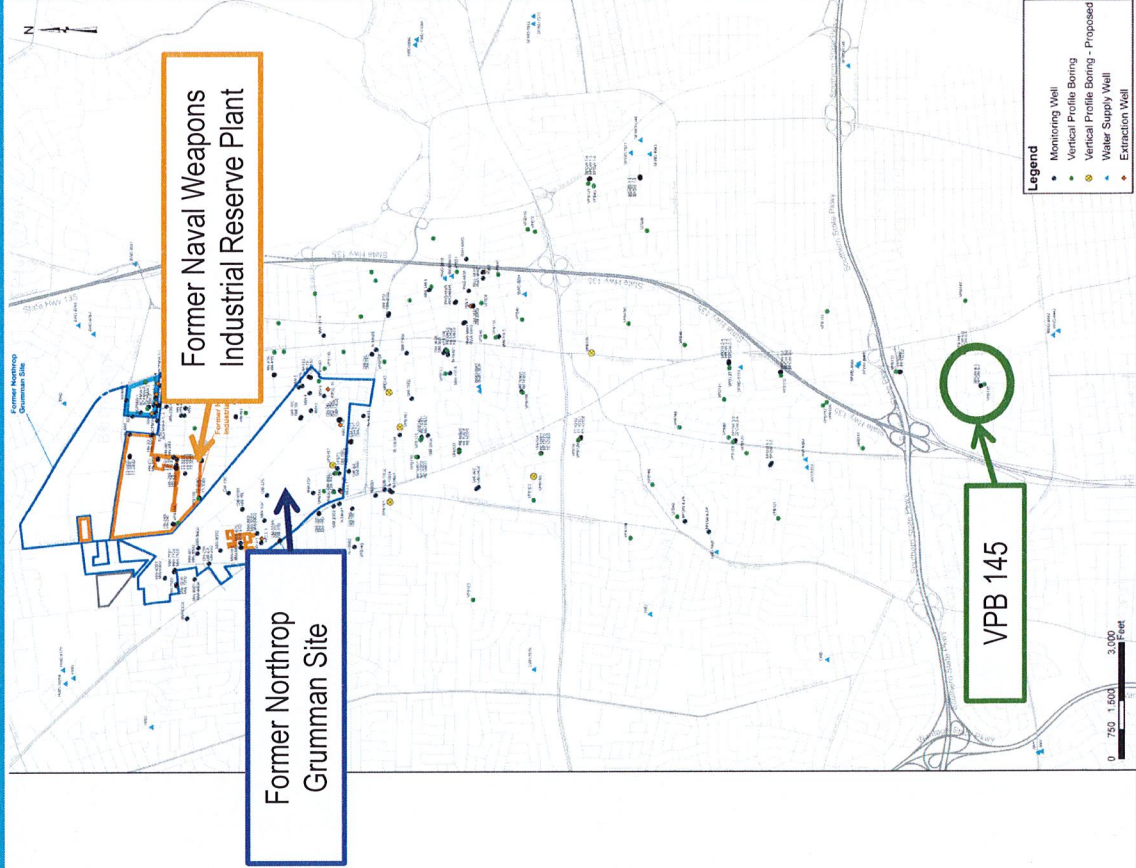
RECENT REPORT – VPB 145



Data Summary Report Vertical Profile Boring 145 (South of Southern State Parkway Area) submitted November 24, 2014

Findings:

- Results showed trichloroethylene as not detected.
- Associated wells will be sampled the last week of March.



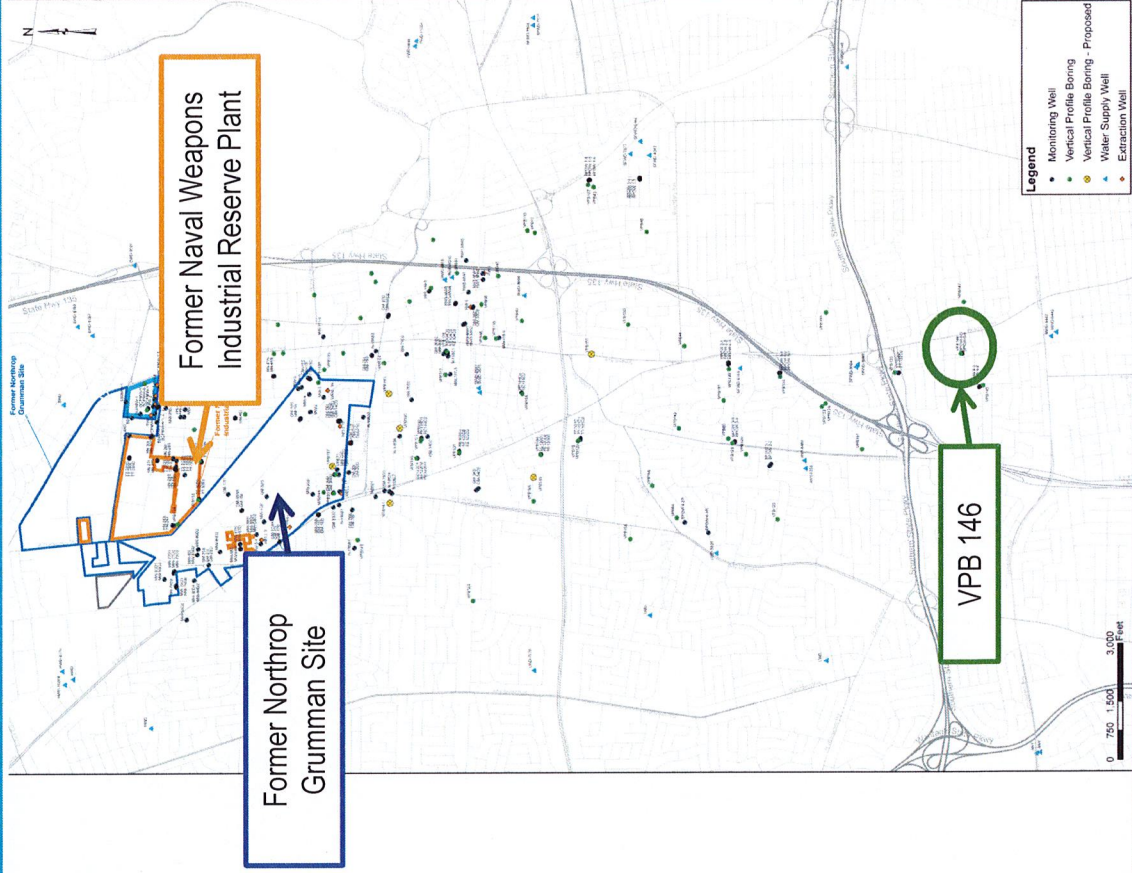
RECENT REPORT – VPB 146



Data Summary Report Vertical Profile Boring 146 (South of Southern State Parkway Area) submitted November 14, 2014.

Findings:

- Results showed trichloroethylene as not detected.
- Associated wells will be sampled the last week of March.



RECENT GROUNDWATER SAMPLING SUMMARIES



Groundwater Sampling Data Summary Report – September 2014

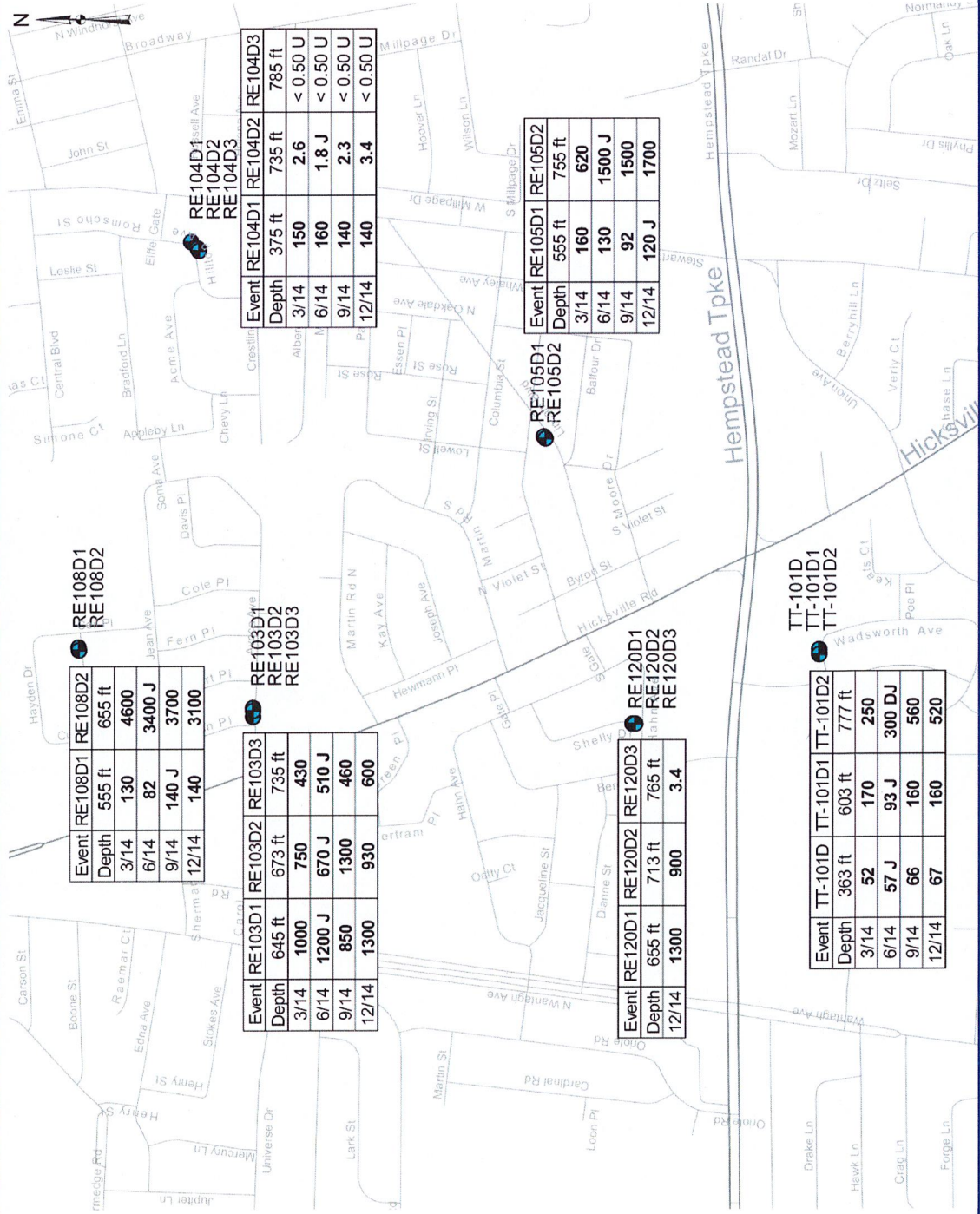
–submitted to NYSDEC November 11, 2014

Groundwater Sampling Data Summary Report – December 2014

–submitted to NYSDEC March 2015



QUARTERLY GROUNDWATER SAMPLING 2014 TRICHLOROETHYLENE RESULTS

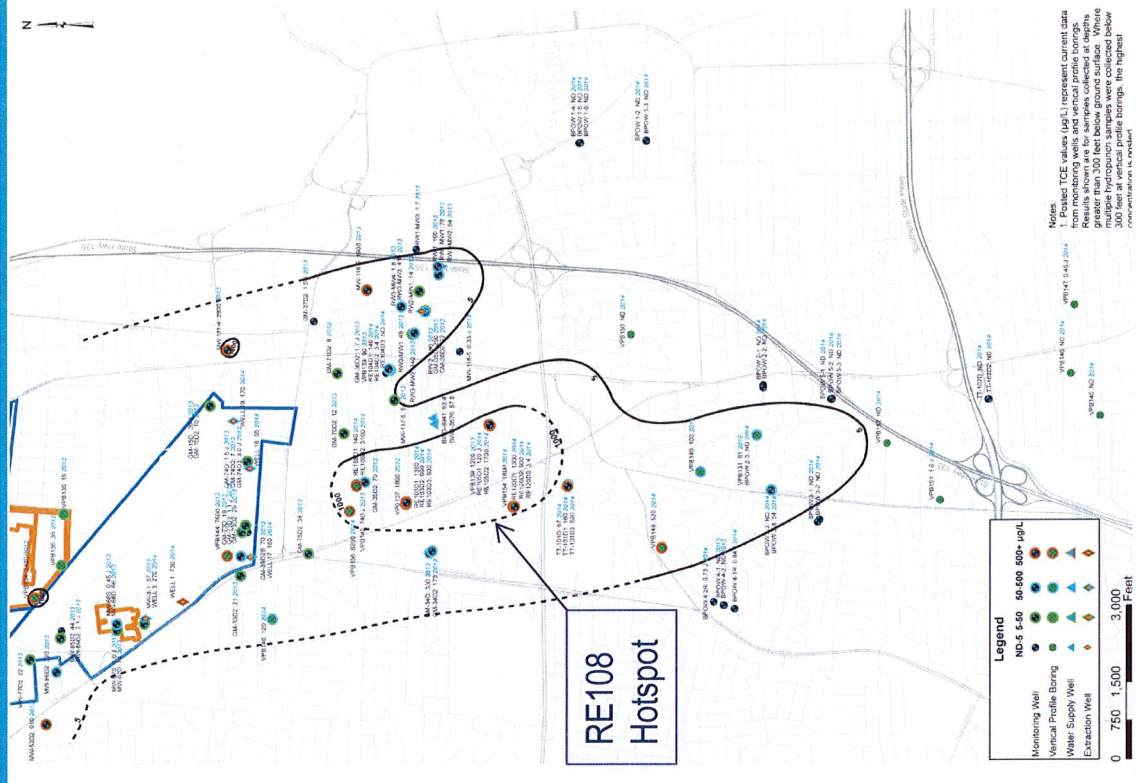


GROUNDWATER SAMPLING RECENT RESULTS



• Conclusions:

- New hotspot area has been identified by latest phase of Navy drilling program
 - trichloroethylene found above 1000 parts per billion in the North of Hempstead Turnpike Area
 - greater than 600 feet deep
- Hotspot previously identified to the east has been defined
- Additional drilling is planned to the north, south and west
- Treatment options are being evaluated to mitigate potential impacts to public water supply wells
- Groundwater monitoring will continue so concentration trends, if any, over time can be assessed



OU2 – OFFSITE GROUNDWATER



QUESTIONS?