Resolution Consultants
A Joint Venture of AECOM & EnSafe
1500 Wells Fargo Building
440 Monticello Avenue
Norfolk, Virginia 23510

Agenda for Restoration Advisory Board

Naval Weapons Industrial Reserve Plant Bethpage

Date: October 29, 2015

Time: 6:30 PM

Location: Bethpage Community Center-103 Grumman Road West, Bethpage NY

Time: 6:30 PM to 7:00 PM

- Open house - general questions from the public

Time 7:00 PM to 8:00 PM

- Ground Rules – *The Management Edge*
- Introduction of RAB members and Regulators - *Navy*
- Distribution of minutes – *Navy*
- OU-2 Offsite Groundwater Investigation– *Resolution*
- RE108 Hot Spot update – *Tetra Tech*

Time 8:00 PM to 8:30 PM

- Questions – *RAB Members*
- Closing remarks – *Navy*

Copies of information can be found at the document repository located at the Bethpage Public Library, 47 Powell Avenue, Bethpage NY 11714 (516 931 9307) or online at http://go.usa.gov/DyXF.

RESOLUTION
CONSULTANTS

RAB Members
David Sobolov – Community Co-Chair
Charles Bevilacqua
Tim Cook
Sandra D'Arcangelo
Robert Horan
Ethan Irwin
Jeanne O'Conner
Eugenia Mazzara
Rosemary Styne
Roy Tringali
Rose Walker

NYSDEC
Jim Harrington
Steve Scharf
Henry Wilkie

NYSDOH
Steve Karpinski

NCDOH
Joe DeFranco

Definitions and Clarification of Terms, Acronyms and Abbreviations

For the Bethpage Restoration Advisory Board (RAB)

- **Basic:**
  - VOC--Volatile Organic Compounds:
    - Chlorinated solvents (typically used as degreasers in manufacturing)
  - Effluent
    - Is an outflow of water from a treatment source
  - Free Product
    - Substance (usually oil or gasoline) that exists in its own state-it is not dissolved in water.
  - Soil Vapors
    - Gases contained in the pore spaces of soil
  - Capture Zone
    - Area of water whose flow direction is influenced by pumping
  - Ground Water
    - Water flows through open pore spaces of soil
  - Down gradient
    - The direction of groundwater flow
  - Plume
    - An area that impacts from chemicals are detected in
  - Raritan Clay Layer
    - A geologic horizon - Clay that is approximately 800-100 feet below ground surface – accepted to be the bottom of the Magothy aquifer
  - Aquifer
    - an underground layer of water-bearing permeable rock or unconsolidated materials
  - Trichloroethylene-
    - Volatile organic compound of concern (used as a degreaser in manufacturing)
  - OU- Operable Unit
  - BGS - Below Ground Surface
  - PCB- Polychlorinated Biphenols (used as transformer cooling fluid)
  - NG- Northrop Grumman
  - NWIRP-Naval Weapons Industrial Reserve Plant
  - No. 6 Fuel Oil- tar
  - Hot spot
    - Area where trichloroethylene is at a concentration greater than 1000 parts per billion
  - BWD Plants- Bethpage Water District Plants

- **Data Gathering:**
  - Gauging- measurement of ground water levels from top of ground surface
  - In-situ – in place
  - Delineate- define boundaries
  - VPB- Vertical Profile Boring
  - Monitoring Well- (typically 2-6 inches in diameter) a well used to provide a "snapshot" of water quality when sampled

- **Treatment Technologies:**
  - Biosparging
    - Removal of chemicals by breaking them down with bacteria
  - Steam Injection/Free Product Recovery
    - Heating of oil that has a tar like consistency with steam to make it flowable (syrup like consistency) so that it may be removed
  - Air Stripping
    - Removal of dissolved volatile organic compounds from water by transferring it into air
  - Land Use Controls
    - Action that restricts what land can be used for
  - Vapor Phase treatment-
    - Removal of a chemical from gas; used to remove trichloroethylene from air vapor
  - Biodegradation
    - Reduce a chemical by changing conditions so that bacteria can break down the chemical
  - On-site Containment Treatment System (ONCT)
    - Series of wells that remove and treat groundwater at the southern edge of the former Northrop Grumman property
  - SVECS—Soil Vapor Extraction Containment System
    - Vacuum for volatile chemicals trapped in the air between soil particles; used to remove trichloroethylene
  - Equalization Tank
    - Tank for mixing
  - Liquid Phase Granular Activated Carbon Polishing
    - Removal of remnants of a volatile chemical by passing liquid through carbon; used to remove trichloroethylene

- Recharge basin
  - Sandy basin that receives storm water and allows water to filter down into the ground
- Recovery Well
  - (Typically larger diameter 12 to 36 inches) a well used to recover oil or water containing chemicals

- **Regulatory:**
  - Proposed Plan- Plan of action that is sent to the state for approval prior to the Final Record of Decision
  - Feasibility Study- collection of data used to determine if a remedy will work
  - ROD –Record of Decision
  - Compliance sampling- collection of samples to demonstrate that chemicals are below regulatory levels
  - CERCLA- **Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)** – the legal mechanism for cleaning up inactive hazardous waste sites at DOD (Depart of Defense) facilities, this is the defining regulation for the Navy's Environmental Restoration (ER) Program at NWIRP Bethpage under NYSDEC authority.
  - RCRA- **Resource Conservation and Recovery Act (RCRA) Corrective Action** – a statutorily required cleanup program, similar to CERCLA, that addresses active solid waste management units and contaminated media as a condition of RCRA permits - NWIRP Bethpage has a RCRA Permit with NYSDEC
  - NYSDEC- **New York State Department of Environmental Conservation (NYSDEC)** provides regulatory review and approval of Navy actions at NWIRP Bethpage
  - NYSDOH- **New York State Department of Health (NYSDOH)** assists NYSDEC.
  - USEPA- **United States Environmental Protection Agency (USEPA)** Provides federal review of the Navy actions.

GROUND RULES
AUGUST 2015 RESTORATION ADVISORY BOARD (RAB)

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT BETHPAGE LONG ISLAND, NEW YORK

10/29/2015

Naval Weapons Industrial Reserve Plant Bethpage RAB Ground Rules

- Respect others:
  - –One Speaker at a time
  - –No interruptions
  - –No side conversations
  - –Listen and stay open to all points of view
- Ask questions or make statements after all the presentations are given: (approximately 8:30)
  - –During the presentations, write any questions on the cards on your table and pass them forward, or raise them and they will be picked up and taken to the RAB Community Co-Chair.
  - –They will be answered after presentations are completed.
- Stay focused on the topics; avoid digressions.
- Turn cell phones and /or pagers off, or on vibrate, and respond outside or during breaks, except for emergencies.

The Management Edge

OPERABLE UNIT 2 - OFFSITE GROUNDWATER INVESTIGATION

OCTOBER 2015 RESTORATION ADVISORY BOARD

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT BETHPAGE
LONG ISLAND, NEW YORK

10/29/2015

PRESENTATION LAYOUT

1 - Program Objectives

2 - Local Groundwater Geology and Applicability to Bethpage Plume

3 - 2009 – 2015 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

OBJECTIVES

1. **Protection of public water supply wells –**
   All currently planned outpost wells are in place and being monitored quarterly
2. **Assessment of RE108 Hotspot –**
   Installation of Monitoring Wells and Vertical Profile Borings to Delineate the Hotspot
3. **Address Hotspot –**
   Pilot Study in cooperation with Bethpage Water District to use one of their wells
   Area to the southwest of Bethpage Water District Plant 6 for a separate treatment system

GROUNDWATER INVESTIGATION

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 modeling and capture zone analysis for wells

VERTICAL PROFILE BORINGS (VPB)

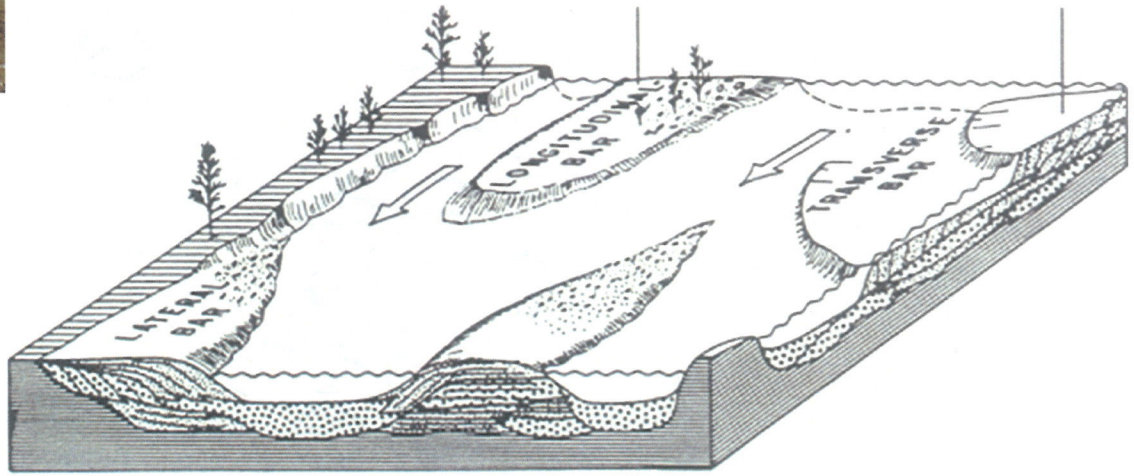
- **12-inch** diameter hole drilled into the ground
- Final boring is **860 to 1,000 feet deep** (extending to the Raritan Clay Layer)
- Drilling is stopped at selected depths and a device is lowered to sample the groundwater
- **44 groundwater samples** are collected per boring and analyzed for Volatile 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 (visual check onsite) 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 Concerns
    - Ingress and egress
    - Noise
  - –Advanced notification to nearest residence

LOCAL GROUNDWATER GEOLOGY

MAGOTHY AQUIFER

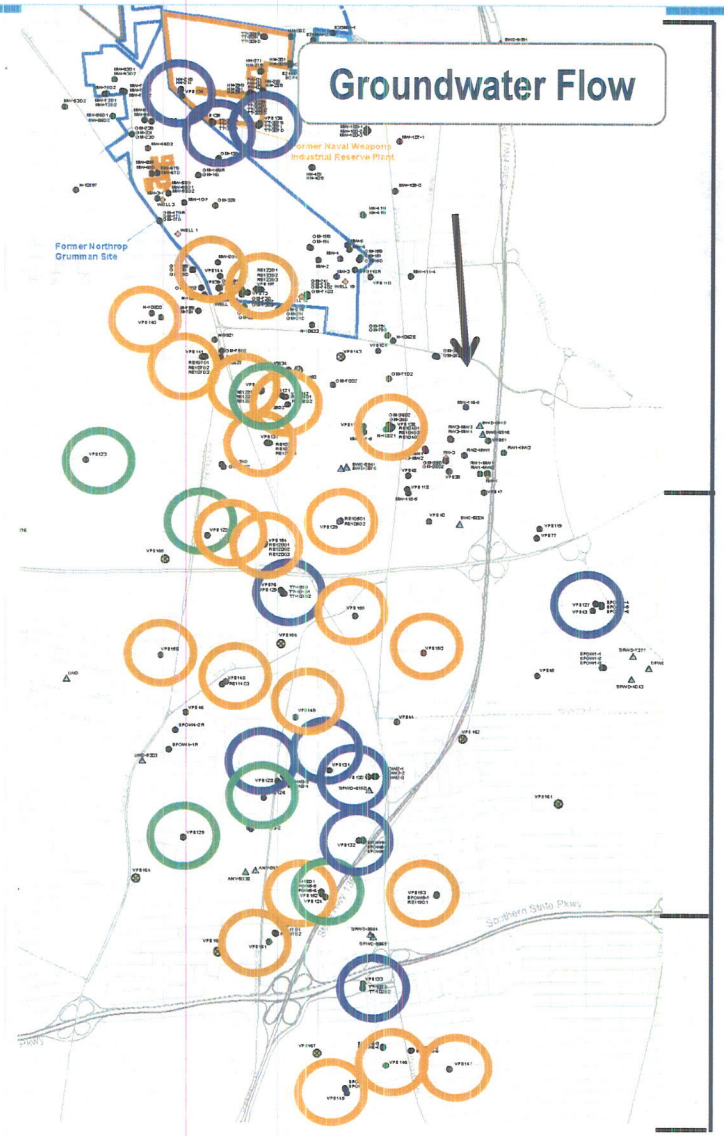


2009 – 2015
VERTICAL PROFILE BORINGS AND WELLS

2009
Completed (green)

2010 to 2012
Completed (blue)

2012 to 2015
Completed (orange)



North of Hempstead Turnpike Area

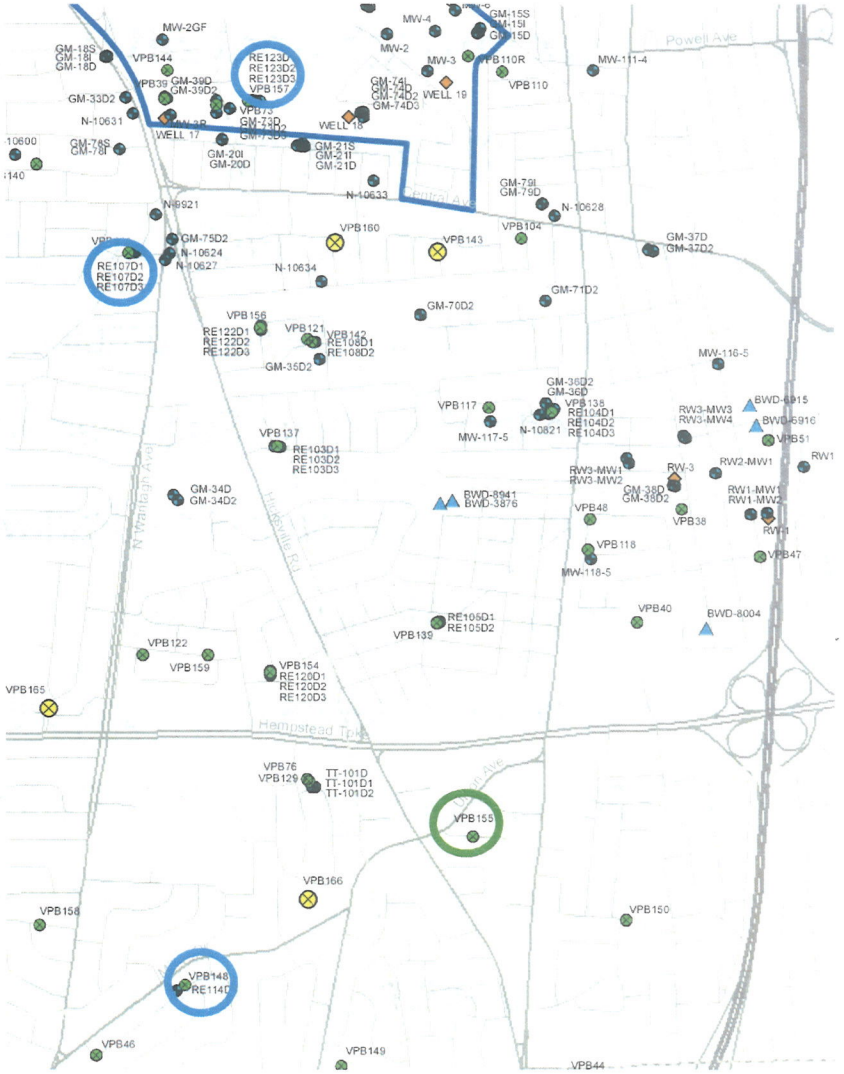
North of Southern State Parkway Area

South of Southern State Parkway Area

RECENT WORK
VERTICAL PROFILE BORINGS AND MONITORING WELLS

From August 2015 to present

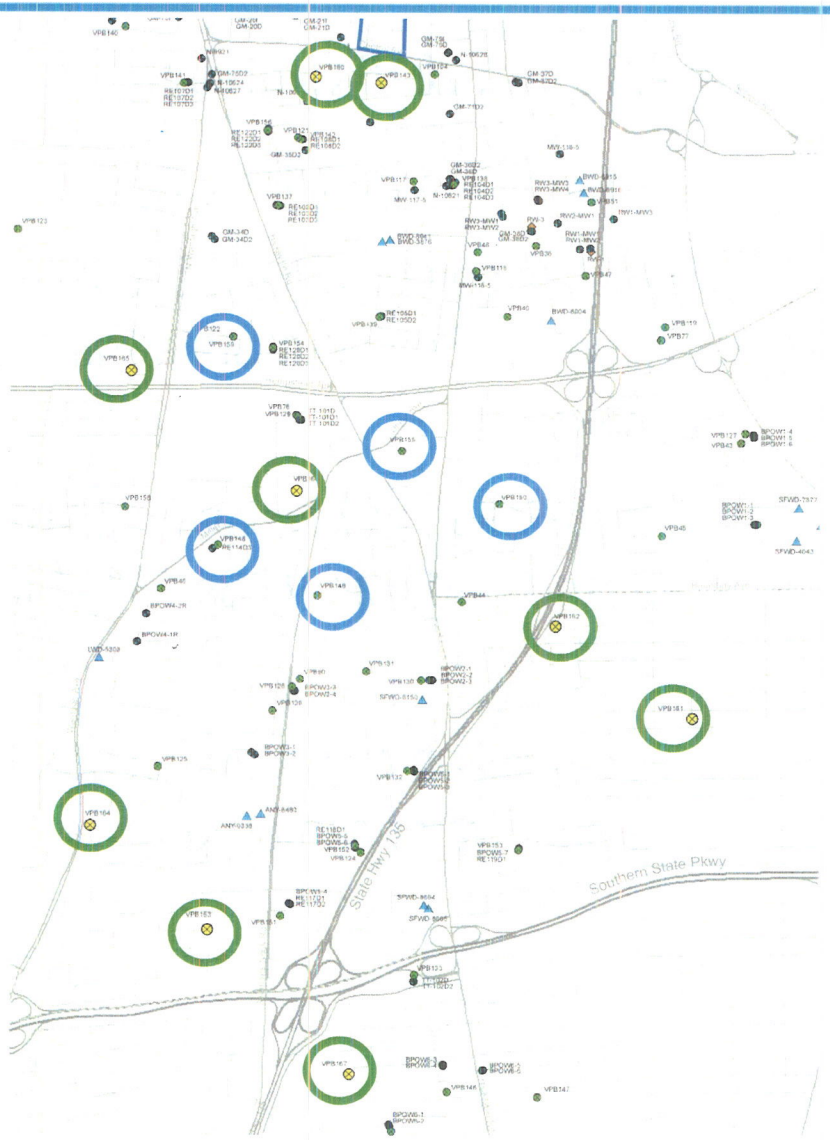
- –Operation of 3 drilling rigs
- –Installation of VPB 155 located North of Southern State Parkway Area
- –Installation of 6 Monitoring Wells associated with VPBs 141, 148, and 157
- –Completion of 1 round of quarterly groundwater sampling



FUTURE WORK
VERTICAL PROFILE BORINGS AND MONITORING WELLS

Planned work through April 2017:

- Operation of 3 drilling rigs
- Installation of Vertical Profile Borings
  - 4 north of Hempstead Turnpike Area
  - 5 north of Southern State Parkway Area
  - 1 south of Southern State Parkway Area
- Installation of Monitoring Wells
  - 14 north of Hempstead Turnpike Area
  - 26 north of Southern State Parkway Area
  - 2 South of Southern State Parkway Area
- Continue quarterly groundwater sampling



ASSESSING GROUNDWATER RESULTS

Laboratory analysis is performed for multiple volatile organic compounds.

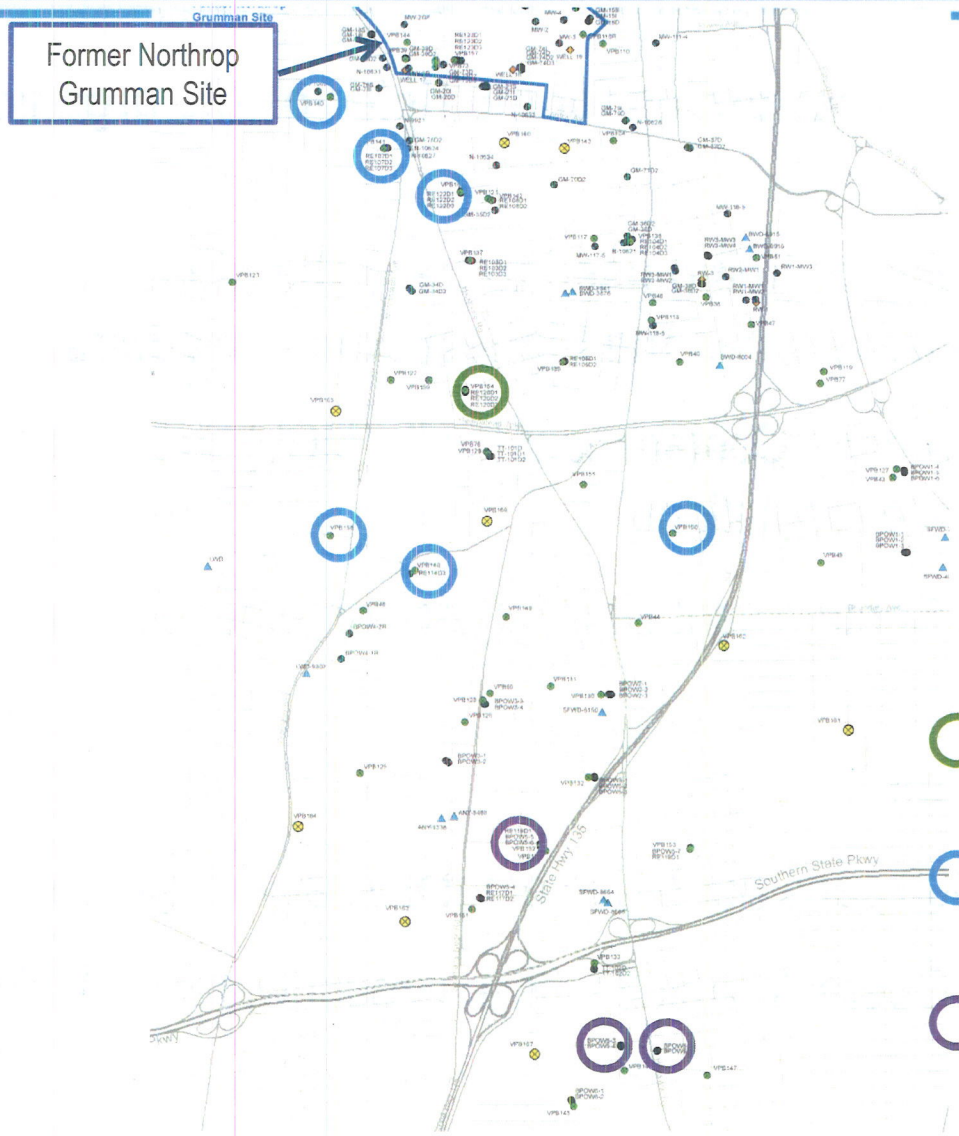
The primary contaminant being used to track the plume is trichloroethene because it has the highest concentrations.

- Acceptable Maximum Contaminant Limit (MCL) is a limit established by Federal and State regulations
- The Maximum Contaminant Limit for trichloroethene is 5 parts per billion

Hotspot Identification

- Area with >1,000 parts per billion of total volatile organic compounds
- Defined in the Operable Unit 2 Offsite Groundwater 2003 Record of Decision

RECENT VPB RESULTS

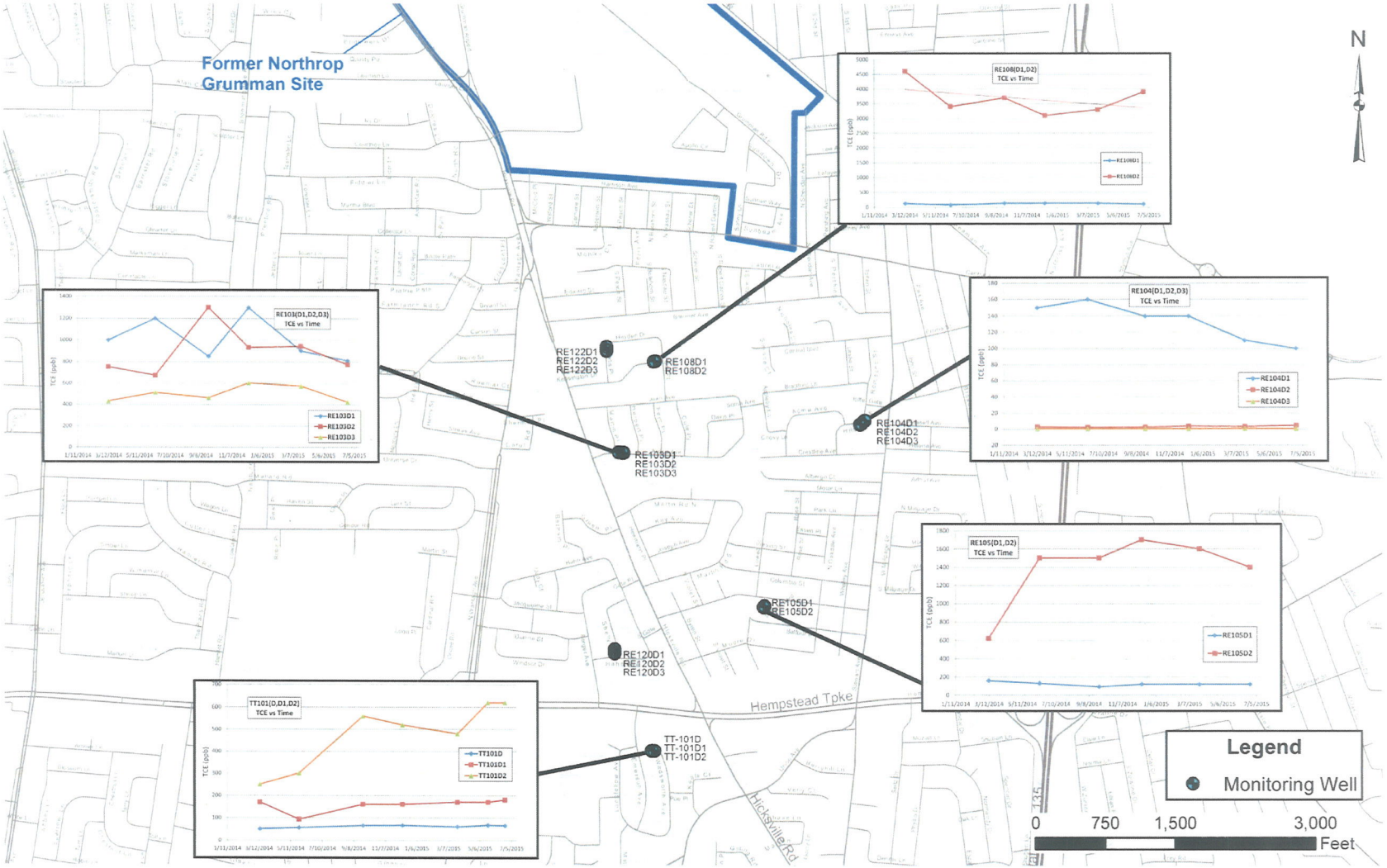


> 1,000 parts per billion trichloroethene

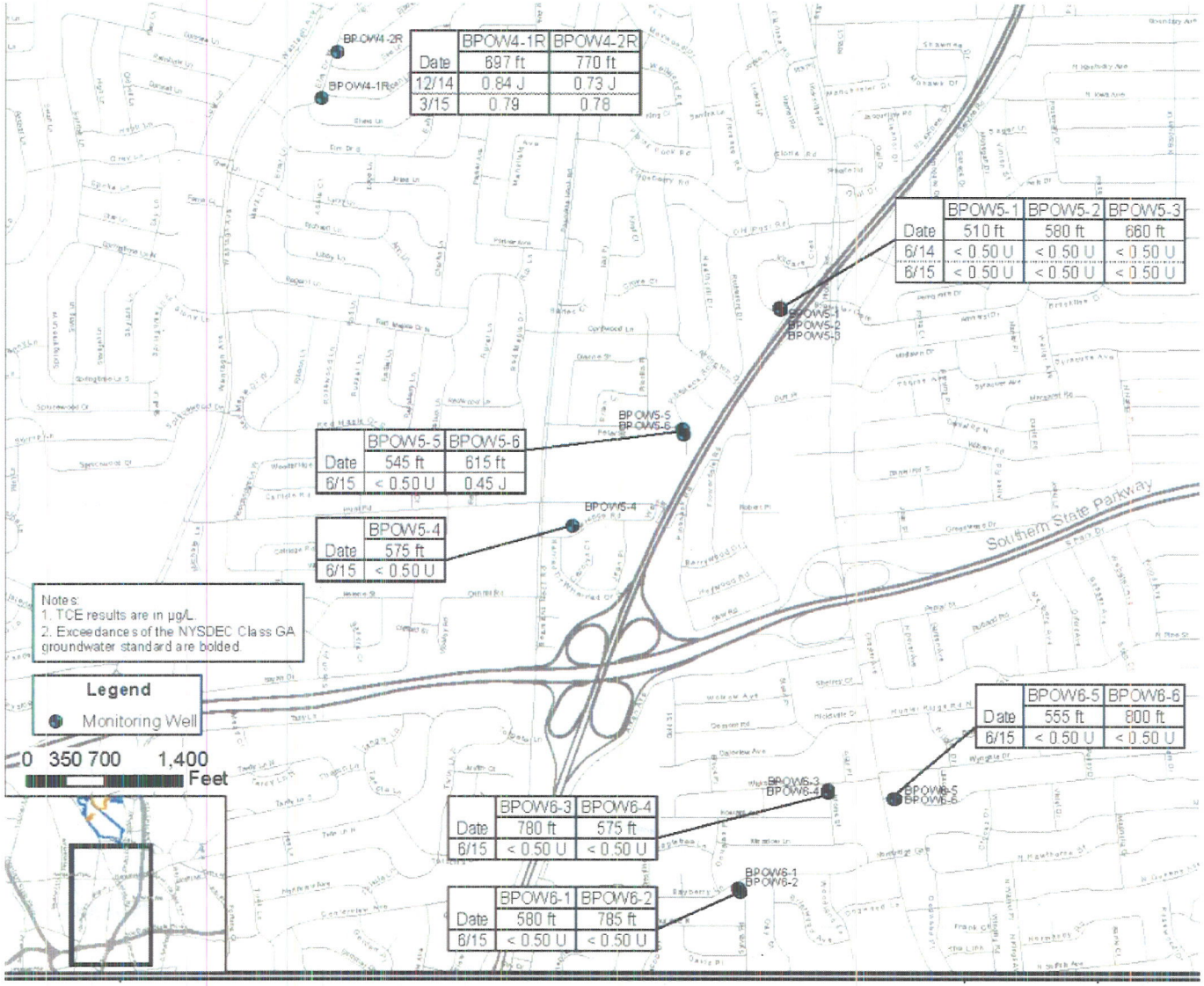
<1,000 parts per billion trichloroethene

Trichloroethene not detected

RECENT TRENDS FROM QUARTERLY SAMPLING



RECENT QUARTERLY GROUNDWATER SAMPLING TRICHLOROETHENE RESULTS



GROUNDWATER SAMPLING RECENT RESULTS

•Conclusions:

Objective 1 -Outpost wells recently installed

– BPOW 6-4, BPOW 6-5, BPOW 6-6, BPOW 5-4, BPOW 5-5, BPOW 5-6, and BPOW 5-7

Objective 2 -Assessment of hotspots

– New hotspot (RE108) has been identified by latest phase of Navy drilling program

- Trichloroethylene found above 1,000 parts per billion in the North of Hempstead Turnpike Area at depths greater than 600 feet
- Additional drilling is planned to the north, south and west

– GM-38 Hotspot previously identified to the east has been undergoing treatment since 2009

Objective 3 – Address Hot Spot

– Treatment options are being evaluated to mitigate potential impacts to public water supply wells; Pilot study has been started in cooperation with Bethpage Water District

– Groundwater monitoring will continue so concentration trends, if any, over time can be assessed