RESTORATION ADVISORY BOARD MEETING
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP), BETHPAGE
TOWN OF OYSTER BAY BETHPAGE COMMUNITY ROOM AT THE ICE SKATING CENTER
103 GRUMMAN ROAD WEST, BETHPAGE, NEW YORK
WEDNESDAY, NOVEMBER 5, 2014

The Thirty-fourth (34th) meeting of the Restoration Advisory Board (RAB) was held at the Bethpage Community Room at the Ice Skating Center in Bethpage, New York. Meeting attendees included representatives from the Navy (Lora Fly), Management Edge (Gayle Waldron), New York State Department of Environmental Conservation (NYSDEC) (Steven Scharf, Jim Harrington, John Swartout, Walter Parish), New York State Department of Health (NYSDOH) (Steve Karpinski), United States Environmental Protection Agency (USEPA) (Robert Alvey), Town of Oyster Bay (John Ellsworth), H&S Environmental (Al Taormina and Jennifer Good), Bethpage Water District (Michael Boufis, Gary Brosen, Mike Inqham, Bill Ellinger, and John Hirt), Massapequa Water District (Stan Carey), Hicksville Water District (WM Schukmann), South Farmingdale Water District (Ralph Atoria), H2M (Rich Humann) BWD, (Paul Grainger) MWD, David Brayack (Tetra Tech), and Resolution Consultants (Brian Caldwell, Eleanor Vivaudou, Vincent Varrichio, Gordon Hicks, Kachirayan Saravanan, Jeff Parillo and Michael Zobel). RAB members in attendance were Sandra D'Arcangelo, Robert Horan, Ethan Irwin, Tim Cook, Jeanne O'Connor, Eugenia M., and Rosemary Styne. There were 70 residents from Bethpage and neighboring towns in attendance. The meeting sign-in sheet is provided as Appendix A.

WELCOME AND AGENDA REVIEW

The Navy representative, Ms. Lora Fly, welcomed everyone to the RAB meeting and presented the meeting agenda and the introduction of the new RAB members. Ms. Fly also introduced Gayle Waldron (Management Edge, serving the role of facilitator in support of the RAB), who then went over the Rules of Conduct to ensure that the meeting follows the agenda, and that everyone is allowed the opportunity to comment. The Rules of Conduct are provided in Appendix A. The agenda for the meeting is included in Appendix B. The Navy presentations for the meeting are included in Appendix C. Ms. Fly informed the attendees about navigation of the public website for NWIRP Bethpage (http://go.usa.gov/DyXF).

COMMUNITY UPDATE AND REVIEW AND APPROVAL OF MEETING MINUTES

Ms. Fly asked if there was a quorum of RAB members so that the prior meeting minutes (5 April 2014) could be approved. The meeting minutes were said to be finalized.

ENVIRONMENTAL RESTORATION PROGRAM REVIEW

Ms. Fly (Navy), provided an overview presentation introducing NWIRP Bethpage including: facility background, the environmental clean-up program, investigation and response, Site 1-Former Drum Marshalling Area, Site 4-Former UST site, and the OU-2 Groundwater Investigation. Ms. Fly also outlined the path forward for each of the sites. The presentation is included in Appendix C.

Discussion during the presentation is as follows:

1. **Is the proposed plan for Site 4 available to the public and where is it located**? The plan is located in the Bethpage Public Library.
2. **Why was my area picked for drilling, and is there a problem with the water?** The areas were picked to either install sentry wells that will be used as an early warning if contamination is present or to track the current plume. There is not a problem with the water supplied by the water districts to your home; this investigation is intended to supply the districts with information regarding the movement of the plume and ensure that the water supply remains safe**.**
3. **Why aren't you drilling in the recharge basins?** Generally the recharge basins are difficult to get drill rigs into due to the slopes and vegetation, and can pose a significant health and safety risk. In addition, the basins are typically not in the correct locations for the investigation purposes – a few hundred feet can make a big difference in the investigation results because of the complex geology in the aquifer**.**
4. **Does the drill rig test the water?** No, the drill rig collects the samples. The samples are then sent to a laboratory where the testing is done.
5. **How will I find out about the results from the report and will I understand it?** The validated results will be available approximately two months after collection of the samples, and these will be provided to the State, the EPA, and water districts. A full report will be available in the administrative record online and in the library within approximately 45 days after receiving the validated results. Any questions you may have regarding the report can be directed to the NYSDEC contact (Henry Wilke) or the Navy contact (Lora Fly).
6. **How many holes have been drilled in the community of Bethpage?** Over the years, approximately 150.
7. **Why did the rig come back to my area?** Vertical Profile Borings (VPBs) are drilled first. After the VPB results are reviewed, the rig returns to drill wells at the same location to track the plume or to serve as outpost wells for the water district supply wells.
8. **What is the allowable level of contamination?** The allowable level for trichloroethylene (TCE) is 5 parts per billion (ppb).
9. **Why is the drilling being done if you are claiming that we are safe?** There are two reasons: First, to determine if the contamination is traveling towards the water district's supply wells and how quickly, and second, provide this information to the water districts so that they can treat the water more effectively through knowing the levels and areas of contamination.
10. **Does this plume affect all water districts?** This plume affects Bethpage, South Farmingdale, and New York American water districts primarily.
11. **How fast does the plume move?** It moves about 285-300 feet per year.
12. **What is the cost to treat it?** The costs for treatment are very high, and are being funded by the Navy for the protection of the groundwater supply.

SITE 1 SOIL VAPOR EXTRACTION CONTAINMENT SYSTEM (SVECS) OPERATION

Jennifer Good with H&S provided a presentation on Site 1 Soil Vapor Extraction Containment System (SVECS) operation that included an overview, operational activities and system performance, and future activities. The presentation is included in Appendix C.

In the Site 1 project overview, Ms. Good noted that the chlorinated volatile organic compounds (VOCs) in soil vapor can migrate and that the purpose of the SVECS system is to contain soil vapor to and prevent offsite migration of VOC vapors. Under certain conditions, vapors can migrate upward and into buildings; however, the SVECS contains the vapors by creating a vacuum in the deep soil to control migration.

The SVECS began operation in January 2010 and consists of soil vapor extraction, soil vapor monitoring, and soil vapor treatment. It extracts 300 to 400 cubic feet (cf) per minute of soil gas from 12 wells located along the Site 1 fence line. Five additional extraction wells were added in October 2011 to address potential on property sources for a total of 17 soil vapor extraction (SVE) wells. Eighteen soil vapor pressure monitors (SVPM) are located throughout the neighborhood. Various air sample collection occurs monthly, quarterly and annually. To date 163.5 pounds of VOCs have been recovered. So far, during the 2014 calendar year, 20.5 pounds of VOCs were recovered as of the end of September.

Site 1 performance and future activities include: runtime above 95% with minimal downtime due to power outages and scheduled maintenance, quarterly/annual operation reports and maintain compliance with air permit guidelines. The SVECS is expected to operate as is for approximately two more years and the path forward is to be identified in a future Decision Document.

Discussion during the presentation is as follows:

1. **Is the 20.5 pounds you reported bad?** This number is not considered good or bad, it is just the amount of VOCs recovered by the SVE system.
2. **Have you gone back into homes on 11th and 12th Street to make sure contamination is no longer present?** There is no plan to go back as long as the pressure field is maintained and the soil gas samples in the street are OK.
3. **As someone who lives on Tenth Street, why wasn't I asked to be tested?** If your home was not tested it is because the VOC levels in soil vapor were at acceptable levels.
4. **If VOCs are both in water and soil vapor how are you tracking it?** Tracking of the VOCs in soil vapor is done through quarterly and annual monitoring of the SVE system. Reports are available in the administrative record. Based on the quarterly SVE system reports, the system is pulling the soil vapors back from the neighborhood area and back on site. The water contamination associated with the offsite groundwater is deep, and there is a clean layer of water on top of this contamination that separates it from the soil vapors.
5. **If we are in an area of concern for soil vapor and ground water contamination where may we find the data?** Data can be found in the administrative record on the Navy website or the public library.

6 **What happens to the vapors once they are treated?** The vapors are treated by granular activated carbon which remove the contaminants and then are emitted into the air. The discharge of vapors complies with the air guidelines.

7 **Does the soil vapor extraction system run for 24 hours and is there a backup generator for it?** Yes the system runs 24/7. There is not a back-up generator, but there is a buffer zone of time that will allow for minor repairs to be competed on the system so that no contaminated vapor will escape. If major repairs are required a backup generator is brought in.

GM-38 GROUNDWATER TREATMENT PLANT OPERATION

David Brayack of Tetra Tech provided a presentation identifying the objective, overview construction and operation, and path forward for GM-38 Hotspot Groundwater Treatment Plant. The presentation is included in Appendix C.

Mr. Brayack noted that the main objective of the GM-38 well area remedy is additional protection of human health by reducing the future elevated mass contamination load to the down gradient public water supplies, and to reduce hotspot concentrations to those in the surrounding lower concentration plume. The remedy will also enhance the long-term natural process of aquifer restoration.

GM-38 Treatment System consists of the following components: two groundwater recovery wells (RW-1 and RW-3), equalization tank, air stripping tower, liquid phase granular activated carbon polishing, discharge to a recharge basin, and vapor phase treatment using granular activated carbon and a permanganate-based resin.

Since startup in 2009, the system has treated 2.3 billion gallons of water and has removed more than 7,500 pounds of volatile organics. As of Sept 2014 this year the system had treated 324 million gallons of water and removed 670 pounds of VOCs. Normal runtime is 95% with most downtimes associated with power outages and schedule maintenance. Monitoring requirements are consistently achieved with monthly sampling of water and air. Sampling of groundwater wells occurred in March 2014 and September 2014. The next sampling event is scheduled for March 2015. Recent maintenance activities included the replacement of existing ductwork with stainless steel to allow the optimization of the air stripper in late 2013, as well as liquid and vapor phase carbon change outs. In addition, the piping for RW-1 and RW-3 was repaired, the air stripper tower was repaired and the pump for RW-1 was replaced in 2014.

Recovery well RW-1 extracts from the upper and middle portions of the GM-38 Hotspot (less than 435 feet deep) and has seen a 75% reduction in VOCs since start up. Recovery well RW-3 extracts from middle and lower portion of GM-38 Hotspot (392-504 feet deep) and has seen a 75% reduction in trichloroethene (TCE) since startup.

The groundwater monitoring summary shows TCE concentrations in deeper groundwater currently at concentrations of approximately 60µg/L; this is a significant decrease when compared to TCE concentrations that were originally 1,200µg/L. In shallower groundwater (320-435 feet), TCE concentrations decreased shortly after startup of the GM-38 system and have remained relatively steady since startup. The sustained concentration of TCE in up-gradient wells suggests a continuing source of VOCs from the north.

The conclusions and path forward for the GM-38 Area indicate that well RW-1 provides the majority of mass removal because of its central location, its high pumping rate and a screen depth that is better matched to the bulk of GM-38 Area groundwater contamination. Well RW-3 is not optimally located in the northwest corner of the GM-38 Hotspot, the shallow screen zone is redundant with RW-1, and the deeper screen zone is no longer located within significant contaminant mass. It is recommended to discontinue operations of RW- 3 and increase the flow at RW-1.

Discussion during the presentation is as follows:

1. **What are the pumping rates of the wells?** RW-1 pumps approximately 800 gallons per minute and RW-3 pumps at 200 gallons per minute.
2. **Why is well RW-3 only recovering TCE?** TCE is the primary chemical. Groundwater from RW-3 treats all the volatile organic compounds.
3. **Are you checking for soil vapor?** Due to the depth of the groundwater contamination, soil vapors are not the focus of the treatment at GM-38.
4. **Have you checked for Radon?** Radon has not been tested for because the system is treating VOCs in the deep groundwater.
5. **What about the air and soil quality in this area?** GM-38 is addressing the groundwater emanating from NWIRP Bethpage. Soil and air quality were only addressed during the installation of the borings and wells.
6. **When VOCs are stripped out of the water, is it going into the air**? No, VOCs level are low or at non-detect by the time it passes through the granular activated carbon into the atmosphere. Emissions from the treatment plant are monitored to ensure they are at or below acceptable guidelines.
7. **Who is paying for all of this?** This is funded by the Navy**.**

SITE 4 AREA of CONCERN (AOC 22) UPDATE

David Brayack with Tetra Tech provided an update presentation on Site 4-Former UST for No.6 Fuel Oil. The presentation is included in Appendix C.

Tetra Tech reviewed Site 4 activities and site history indicating that the UST's were removed between 1980 and 1984. There is an estimated 47 tons of petroleum present in the soil. Petroleum was found in soils 30 to 71 feet below ground surface (bgs) and there is evidence of groundwater effects. All groundwater from this area is ultimately captured by the onsite Containment System located at the southern boundary for the facility.

In 2013, the Navy prepared a Feasibility Study to develop and evaluate potential remedial alternatives. The alternatives included: Land Use Controls (LUC), groundwater monitoring, steam injection/free product recovery, solvent extraction and biosparging.

The public comment period for the proposed plan started on 24 October 2014 and it will end on 10 December 2014. Tetra Tech noted the proposed alternative for remediation is: In-situ Biodegradation via aeration (in saturated soils greater than 1,000mg/kg of Total Petroleum Hydrocarbons (TPH)) and Steam Injection and Free Product Recovery (in unsaturated soils greater than 10,000 mg/kg). The plan can be found at http://go.usa.gov/DyDF.

The path forward includes: Completion of the Record of Decision (ROD) (expected early 2015), remedial design is expected to start in 2015, and remedial construction is expected to begin in 2015/2016 with anticipated operation for 2 to 4 years. Groundwater monitoring is planned to continue for more than 10 years.

Discussion during the presentation is as follows:

1. **Is there still a problem with the baseball field at the Bethpage Community Park?** The baseball field area is not associated with Site 4 or the Navy, and is being addressed with Northrup Grumman under the Operable Unit 3 ROD.
2. **Are soil vapor contaminates escaping from the offsite plume as it moves south?** No - soil vapor contamination is being contained on site by the SVE system. The offsite plume contamination in the plume is separated from the soil by a layer of clean groundwater, and does not impact soil or soil vapor.

OU-2 OFFSITE GROUNDWATER INVESTIGATION-INSTALLLATION of VERTICAL PROFILE BORINGS (VPBs)

Brian Caldwell with Resolution Consultants provided a presentation addressing the description and purpose of the offsite investigation program, conceptual site model and applicability to Bethpage plume, maps of existing vertical profile borings and wells, description of work performed since last restoration advisory board, description of future work, and recent reports. The presentation is included in Appendix C.

The purpose of the OU-2 offsite groundwater investigation is to delineate groundwater contamination in areas south of NWIRP Bethpage. The program consists of: vertical profile borings, permanent monitoring wells and data logging of water levels to support the USGS modeling and capture zone analysis for wells.

Boring and well locations are initially selected on a map by the Navy and then the State is notified as to their locations. It is then ground proofed to make sure there is enough room for the drill rig and the support equipment as well as the absence of overheard obstructions. During the field proofing, all locations, including recharge basins and township right-of-ways are evaluated for the drill site. For discussion purposes, the areas of investigation have been divided into three geographic zones and are referred to as north of Hempstead Turnpike, north of Southern State Parkway, and south of Southern State Parkway.

Work performed since the last Restoration Advisory Board (April 2014) includes mobilization of four drilling rigs, installation of Vertical Profile Borings (140, 154 and 156 north of Hempstead Turnpike; 150, 151, and 152 located north of Southern State Parkway Area; and 145 and 147 located south of Southern State Parkway Area). It also included installation of BPOW6-1 and 6-2 located south of Southern State Parkway and BPOW4-1R and 4-2R located north of the Southern State Parkway. Future work includes: continued mobilization of three drilling rigs, installation of additional Vertical Profile Borings (VPBs) (six north of Hempstead Turnpike, and two north of Southern State Parkway Area), and installation of 35 wells associated with both the completed and planned VPBs in the three geographic areas.

The groundwater in the area north of Hempstead Turnpike was investigated after the installation of VBPs 137-139, and 142 and their associated monitoring wells. It was confirmed with three rounds of groundwater sampling that there is a hot spot in the area north of Hempstead Turnpike. VBP 144, which is located to the north of the On Site Containment System (ONCT) operated by Northrup Grumman also had TCE greater than 1000 ppb, but this groundwater is captured by the ONCT.

Following the Resolution Consultants presentation, Rich Human, an engineer for the Bethpage Water District, described the plume in relation to Bethpage water district Plant 6 and how monitoring wells are

installed to give the water district enough time to have treatment in place.

Stan Carey of the MWD expressed his thanks for the work that the Navy has done and expressed concern that the hot spot values are 1000 ppb and not 5 ppb.

Joseph Saladino, a NY state assemblyman, spoke about the history of what was done and the future plans for the site with regard to pending legislation requiring evaluation by NYSDEC.

Jim Harrington of the NYSDEC stated that there are two RODs that apply to groundwater from NWIRP and Northrop Grumman (NG). OU 3 is separate and NG is responsible for it. The ROD for OU3 was issued March 2013 as a consent order and it takes time to implement. There is no exposure associated with the groundwater because all groundwater is treated prior to human consumption and the soil vapor has been contained on site with the current systems in place.

Discussion during the presentation is as follows:

1. **Is the plume generally moving south?** Yes, the natural groundwater gradient causes the plume to move south.
2. **Why aren't VPB borings converted to a monitoring well?** The VPB results are evaluated to determine the best well depth placement. It takes a minimum of five days to receive lab results and specify the well screen in coordination with the geologists' log. It is generally not feasible to leave the boring open this long due to the potential for collapse.
3. **Why is the plume moving south?** Groundwater on Long Island generally moves either north or south, towards the ocean, with a divide that runs along the spine of the Island. Since Bethpage is on the south side, groundwater moves naturally to the south.
4. **Are there plans on putting in wells west and north of the Hempstead Turnpike?** Yes, there are currently plans for two VPBs in this area.
5. **If more contamination is found further south do you plan to go further south?** Yes, the investigation will be modified as necessary depending on results.
6. **Are the wells monitored monthly?** No, they are monitoring on a quarterly basis because changes in groundwater quality are very slow.
7. **Is there any data on the effects of contamination on the community residents?** NYSDOH responded that there is no exposure potential of the contamination to residents as the water districts continually test and treat the water to non-detect levels for all contamination. Because there is no potential for exposure, there are no effects to residents from this contamination**.**
8. **Has any data on the residents been collected?** NYSDOH responded affirmatively, no linked health concerns were noted above what is seen across the state.
9. **Why do you develop a well?** A well is developed to clear out the drilling mud and allow representative groundwater to enter the well.
10. **Are cancer rates at Bethpage typical for other areas?** NYSDOH responded that they have done studies on this matter and found no evidence of higher cancer rates at Bethpage. Any additional inquiries should be directed to the NYSDOH.
11. **Why aren't the two plumes (eastern and western) being treated as one?** NYSDEC responded that the two plumes were sourced by activities associated with two different entities, the Navy and Northrup Grumman. Because the plume sources are different, they are treated differently.

12. **If you are containing the plume with the ONCT, how is it moving offsite**? Northrup Grumman, who operates and evaluates the ONCT system, evaluates it quarterly to ensure it is functioning properly. Based on the Northrup Grumman quarterly reports, there is no further contamination leaving the site. The plume represents contamination that was released prior to the ONCT operating in 1998. Some contamination may also be associated with other sources upgradient of NWIRP Bethpage.
13. **Concerns were expressed over the trigger values on outpost wells being much higher than the drinking water standard in order to implement hot spot treatment.** There are 2 two types of trigger values. One is designed to identify "hotspots", which are defined in the ROD as concentrations of VOCs above 1,000 ppb. The other type of trigger value is used for outpost monitoring wells to provide an early warning of VOC migration toward one or more of the public supply wells. This value incorporates a five year groundwater travel time from the outpost well to the supply well to allow well head treatment to be designed and constructed. The outpost trigger values are based on the time for VOCs to be first detections in water supply well, and are approximately 1/10th of the MCLs.
14. **Why is it taking so long to investigate and remediate the plume?** The plume is large and complex and has developed over several decades. There is no simple or quick answer to plume remediation. The primary objective is to ensure protection of public health, and at this site, this means protection of the public water supplies. The Navy is actively working with each of the impacted water districts to provide treatment. Beyond this primary objective, the Navy is taking steps to minimize future potential impacts, which are identified in the Record of Decision for the site. These additional steps target small areas with higher concentrations that can effectively be treated.
15. **Citizens expressed concerns about the progress of the Northrup Grumman investigation and remediation.** The NYSDEC responded that the EPA did not have authority to pressure Northrup Grumman as it is not a listed Federal Superfund site. NYSDEC did indicate that they are pursuing a consent order agreement with Northrup Grumman that will facilitate the investigation and remediation.

CLOSING REMARKS

Ms. Fly asked whether there were any other questions or comments. There were no other questions or comments. Ms. Fly indicated that the next RAB meeting would be held in April 2015. Ms. Fly thanked everyone for coming to the meeting and the meeting was adjourned.

APPENDIX A

5 NOVEMBER 2014 RAB MEETING SIGN-IN SHEET AND RULES OF CONDUCT

34th RAB Meeting for NWIRP Bethpage
November 5, 2014
Sign-in List

Name (Print)
Michael Boufis
Stan Carey
Jim Hackwell
Jennifer Barnes
Brian Caldwell
Gordon Hicks
Tom Fosorile
Terry Candito
PAUL GRANGER
Marie Pustorino
LORI LEISTMAN
EDWARD OLMSTED
Mike Zobel
Paula DiMango
Theresa Schull
Keri Masterson

34th RAB Meeting for NWIRP Bethpage
November 5, 2014
Sign-in List

Name (Print)
Laura Gramstad
Susan Gramstad
Lora Fly
Lee Gardner
Lora DalBo
CAROL TETA
Ahren Tatro
Eleonor Vivado
Vincent Varricchio
Vincent Maroldo
Janet Maroldo
Sarah Kozlowski
Denise Florio
Sharon McIntyre
Lori Masterson
M. Eugenia Mazzar

34th RAB Meeting for NWIRP Bethpage
November 5, 2014
Sign-in List

Name (Print)
Mike Nofi
Richard Bergin
Giovanniello, Jame
Thomas Ng
Gary Brosan
John Hart
Ralph Atorin
Maureen B
Diana Alati
Carol Zito
Pamela O'Britis
Karl Schweitzer
Tim Cook
John Ellsworth
Mary Papadopoulos
J. Perico
Marie Goodwin

34th RAB Meeting for NWIRP Bethpage
November 5, 2014
Sign-in List

Name (Print)
Mike Ingham
Rich Humann
Sol J. Greco
Anthony Sabino
Wm Schuckmann
Bill Ellis
K - Saravanan
J. Palla
B. Hodahan
Juan C. Lizarazo
Alice Stern
Steve Karpinski
AL TADRMINA
Gayle Woldron
Gina McGovern
Jeanne O'Connor

34th RAB Meeting for NWIRP Bethpage
November 5, 2014
Sign-in List

Name (Print)
Steven Scharf
Michael Steiniger
John Swartwout
Robert Horan
Carign Hale
Sandra D'Arcangelo
Tad Goldstein
John Sullivan
Brian Wellbrock
Laura Schreiner
Deanna Vechousen
Mike Shulman
Mayra DiDomenico
Susan Kofarani
Donna Patsos
Mary Macaluso

Joyce Marinaccio

34th RAB Meeting for NWIRP Bethpage
November 5, 2014
Sign-in List

Name (Print)
Robert E. Murphy
Robert F. Murphy
Lauren M. Murphy
Walter Pavlick
MARTYN HAECKER
Roseann Lewandowski
Gertrud Louwers
Lou Deresthyne
Rosemary Styne
Connor Skib
THOMAS SCOTTO
ROBERT M ALVEY
JOHN R SULLIVAN
Michael MALONEY
Dave Brezack

34th RAB Meeting for NWIRP Bethpage
November 5, 2014
Sign-in List

Name (Print)
MARY KUBICKI

34th RAB Meeting for NWIRP Bethpage
November 5, 2014
Sign-in List

Name (Print)
Lewis Peoples
Anthony Scarantino
Michele Devine
Carole Jay Rogoff
Ethan Irwin
Elayne Candiotte

Home

K.

GROUND RULES
NOVEMBER 2014 RESTORATION ADVISORY BOARD (RAB)

NAVAL WEAPONS INDUSTRIAL
RESERVE PLANT BETHPAGE
LONG ISLAND, NEW YORK

11/05/2014

Naval Weapons Industrial Reserve Plant Bethpage RAB Ground Rules

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

The Management Edge

APPENDIX B

RAB MEETING AGENDA AND DEFINITIONS

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: November 5, 2014

Time: 7:00 PM

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

- General overview – *Navy*
- Distribution of minutes – *All members*
- Status Update – *Navy*
- Site 1 Soil Vapor Extraction Containment System Performance – *H & S*
- GM-38 Operations – *H & S*
- Site 4 Former Underground Storage Tanks, Area of Concern 22, Proposed Plan – *Tetra Tech*
- OU-2 Offsite Groundwater Investigation, Installation/Sampling of VPBs and Wells – *Resolution*
- Closing remarks – *Navy*

RESOLUTION CONSULTANTS

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
    - Rain water and snow melt that trickles down through the ground and forms a subsurface pool. This water then flows towards the ocean. Some of this water is captured by the local water districts for public use.
  - Down gradient
    - The direction in which groundwater flows. In this case south towards the Atlantic Ocean.
  - Plume
    - An area of groundwater that has been impacted by chemicals
  - 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.

APPENDIX C

PRESENTATIONS

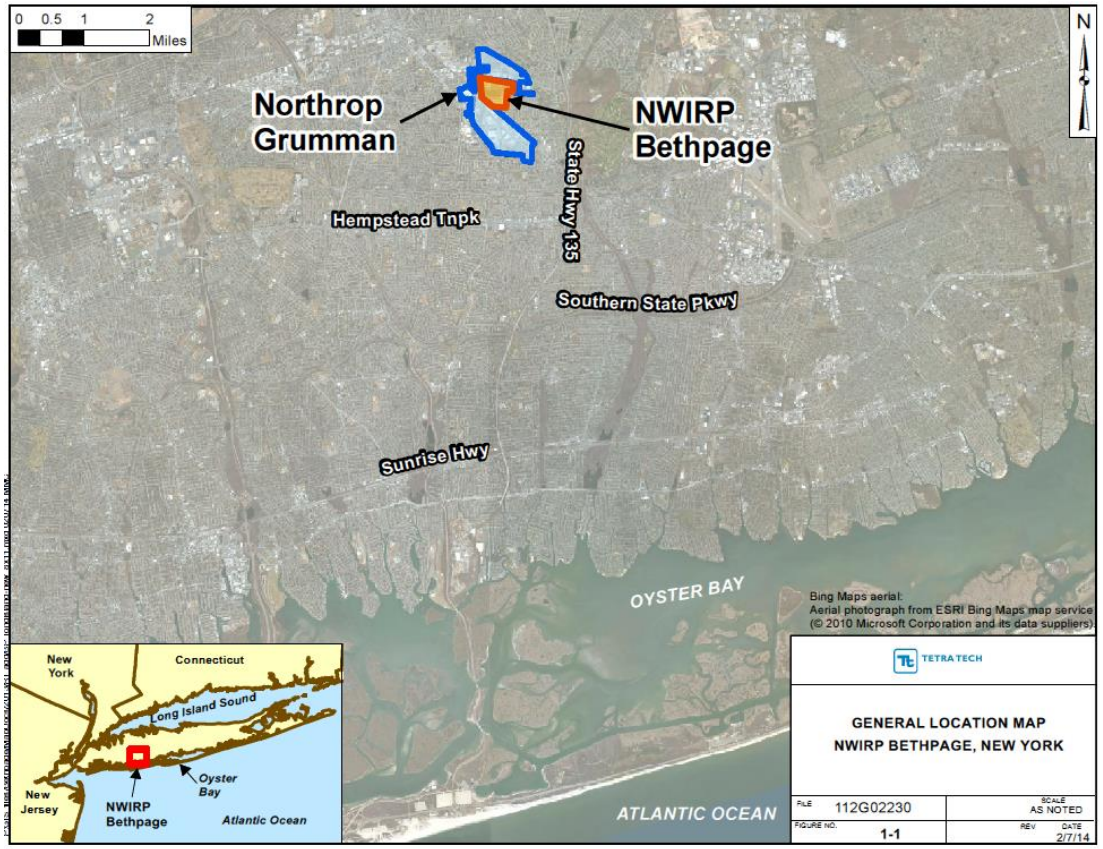
OVERVIEW
NOVEMBER 2014 RESTORATION ADVISORY BOARD (RAB)

NWIRP BETHPAGE
LONG ISLAND, NEW YORK

11/05/2014

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)
- **1998**
  - –NG terminated activities
  - –NWIRP property owned by Navy

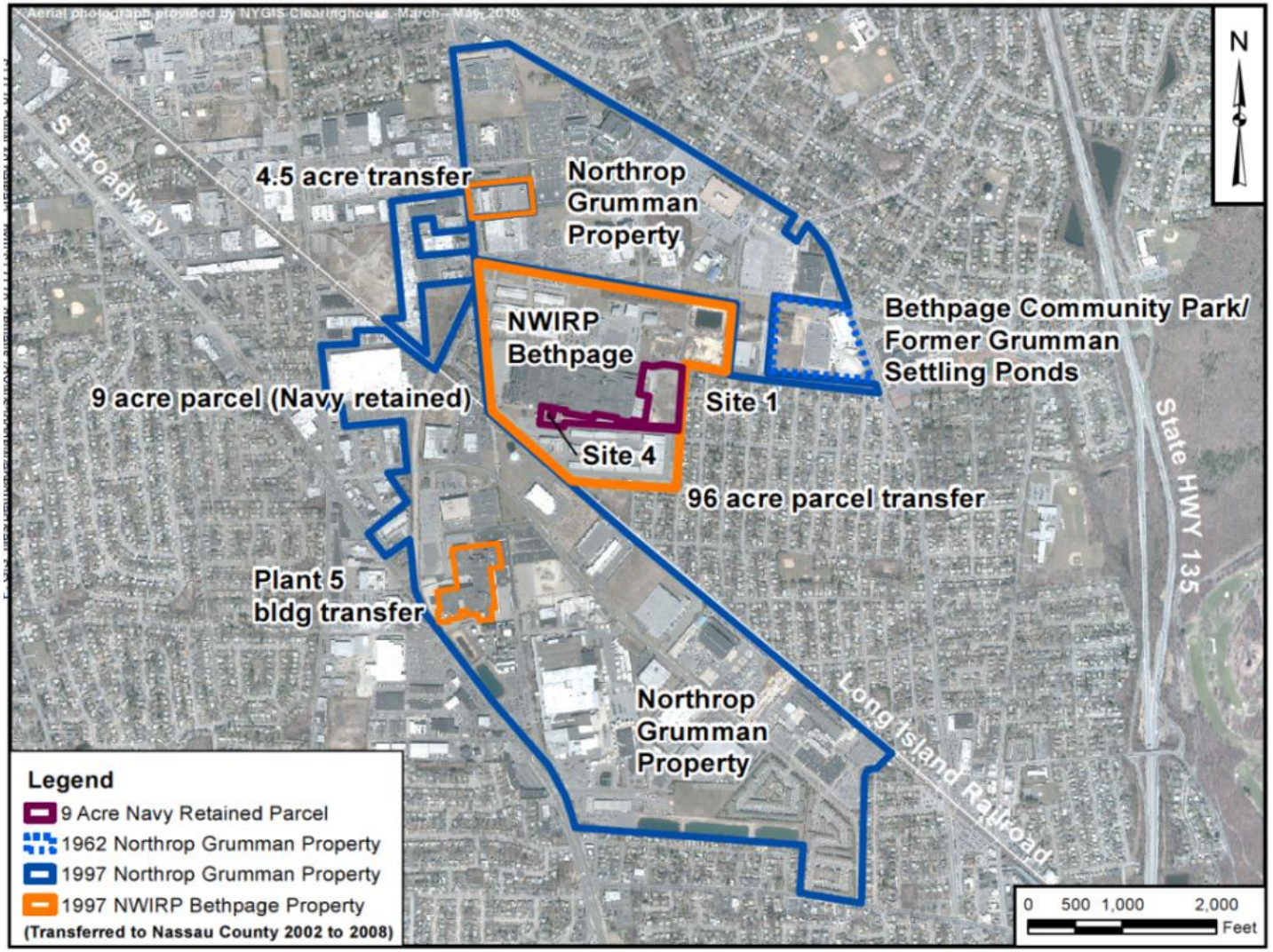


Facility Background (continued)

Property Transfer/Description:

- **1998 -** Special Legislation enacted to transfer facility to Nassau County for economic redevelopment
  - Prior to transfer – Environmental cleanup conducted as needed by **Naval Facilities Engineering Command (NAVFAC)** Mid-Atlantic under the **Environmental Restoration (ER)** Program
- **Feb 2008**
  - –transfer complete to Nassau County for most of the facility (100 acres)
  - –9 acres retained by Navy for environmental cleanup (ER Sites 1 and 4)
- **Current Navy property**
  - –500-foot boundary with a residential neighborhood along the east
  - –Remainder mostly bounded by Nassau County and Steel-Los III, LP properties (both former Navy property).
  - –Multiple businesses utilizing the Steel-Los III, LP property

Facility Background



Environmental Cleanup Program

- **Regulatory Compliance**
  - **Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)** – the legal mechanism for cleaning up abandoned or uncontrolled hazardous waste sites at DOD, Navy's Environmental Restoration (ER) Program
  - **Resource Conservation and Recovery Act (RCRA) Corrective Action** – a statutorily required cleanup program, similar to CERCLA, that addresses solid waste management units and contaminated media as a condition of RCRA permits, NWIRP Bethpage has a RCRA Permit with NYSDEC
  - **Title 6 of the New York Codes, Rules, and Regulations (NYCRR)**, Part 375 through the Applicable or Relevant and Appropriate Requirements (ARARs) process of CERCLA
- **The Navy is the lead federal agency for CERCLA**
  - the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300, and Executive Order 12580, as amended by Executive Order 13016, for CERCLA response activities at Bethpage.

Environmental Cleanup Program

- **Regulator Involvement CERCLA Sites**
  - **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.
- **Regulator Involvement RCRA Sites**
  - NYSDEC is the lead regulatory agency in accordance with the requirements of the New York State RCRA Hazardous Waste Permit for the facility.

Investigation and Response

Soil and Shallow Groundwater:

- –Onsite Response Actions conducted:
  - Sites 2 and 3 (2002)
  - Site 1 Volatile Organic Compounds (VOC)-contaminated soil and shallow GW (2002)
  - Soil Vapor migration (2010)
- –Onsite Response Actions to be completed:
  - Site 1 - Polychlorinated biphenyls (PCBs) soil,
  - Site 4 – Former USTs contained No. 6 Fuel Oil

Site 1 – Former Drum Marshalling Area

Site 1 Issues:

- Site was used by Northrop Grumman for staging waste solvents, liquid plating wastes (metals), and autoclave (PCB fluid) wastes.
- PCB-contaminated soil original estimate: 1,400 cubic yards and less than 10 feet deep
- 1995 Record of Decision (ROD) Operable Unit (OU) 1 identified excavation and offsite disposal
- Additional testing found PCBs to 65 feet deep
- Current volume estimate increased to 60,000 cubic yards

Path Forward:

- 2014 Remedial Investigation Addendum
- 2014 Feasibility Study Addendum
- 2016 OU1 ROD Amendment or new ROD
- 2017 Start of Remedy

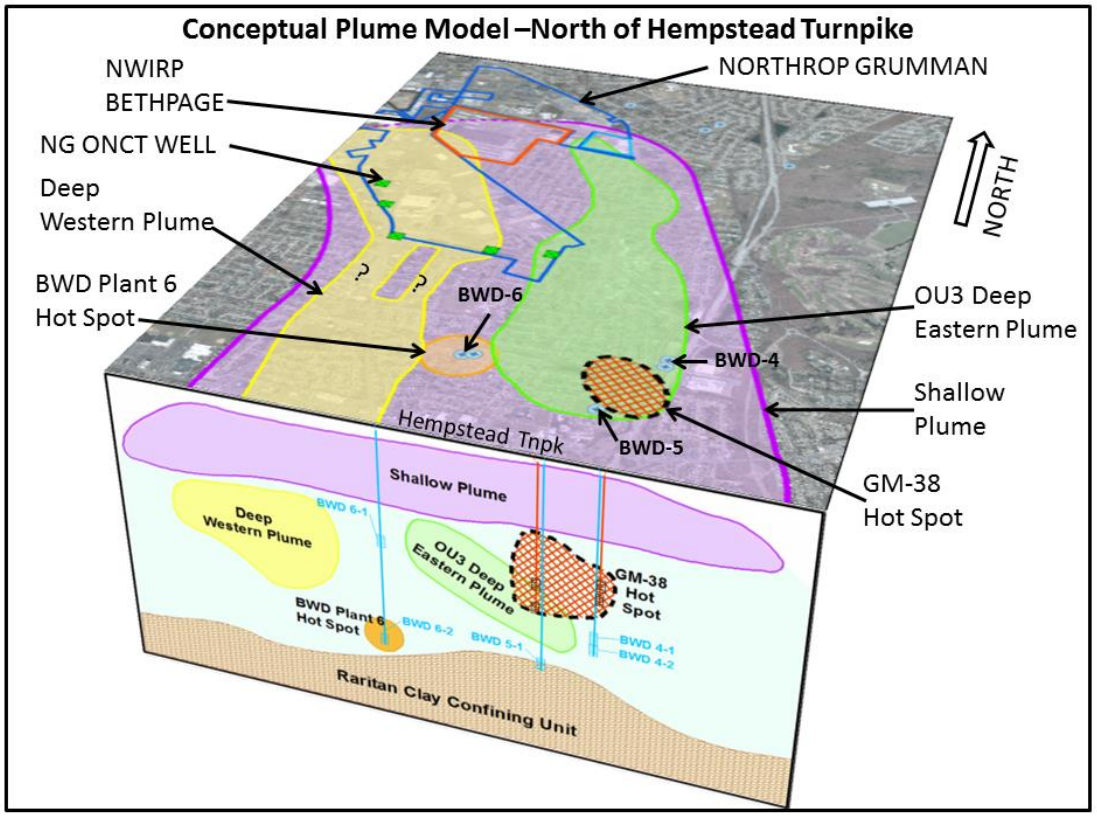
Site 4 – Former UST Site

- Former location of underground storage tanks for No. 6 Fuel Oil (tar).
  - Tanks were likely removed in the 1980s.
  - Groundwater sampling found minimal or no impact.
  - Site boundaries are constrained by 20-acre building, limits excavation
- In-situ bio pilot study attempted in 2004 to 2006, limited success
- Treatment options limited
- Navy has issued a Proposed Plan for public comment

OU2 Groundwater Investigation

Groundwater contamination that originated on NWIRP property and co-mingled with contamination that originated on Northrop Grumman property, such that the source of the contamination cannot be identified.

- **Shallow Plume**
  - 30 to 300 feet deep; less than 10 parts per billion (ppb) of each contaminant
- **GM-38 Hot Spot**
  - 250 to 500 feet; 50 to 1,500 ppb
- **Deep Eastern Plume, OU 3 groundwater**
  - 50 to 600 feet: 50 to 10,000 ppb
- **Deep Western Plume**
  - 300 to 750 feet; 50 to 400 ppb
- **Plant 6 Plume, source uncertain**
  - Screen interval 700 feet; 1,200 ppb

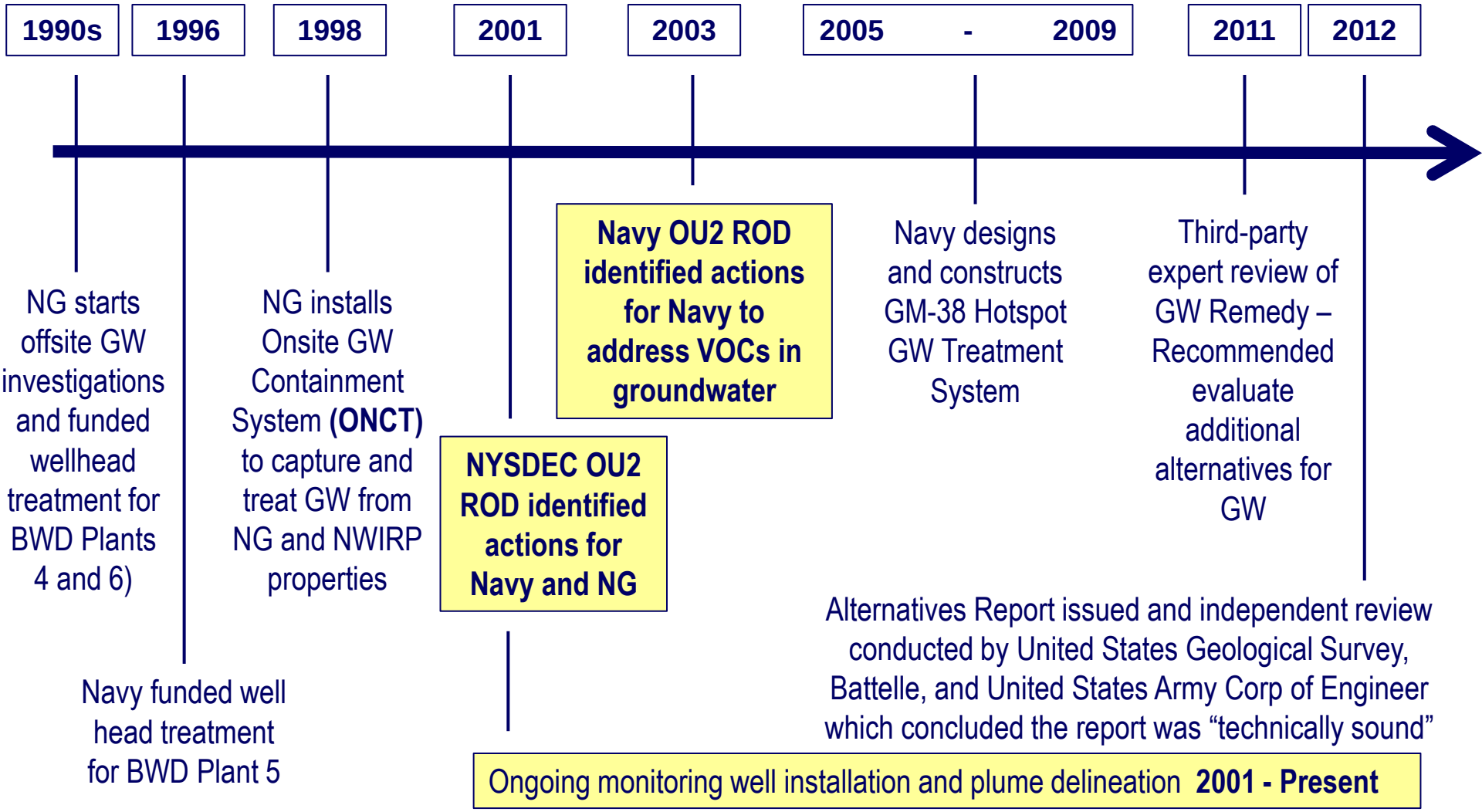


OU2 Groundwater ROD

2003 OU2 Groundwater ROD:

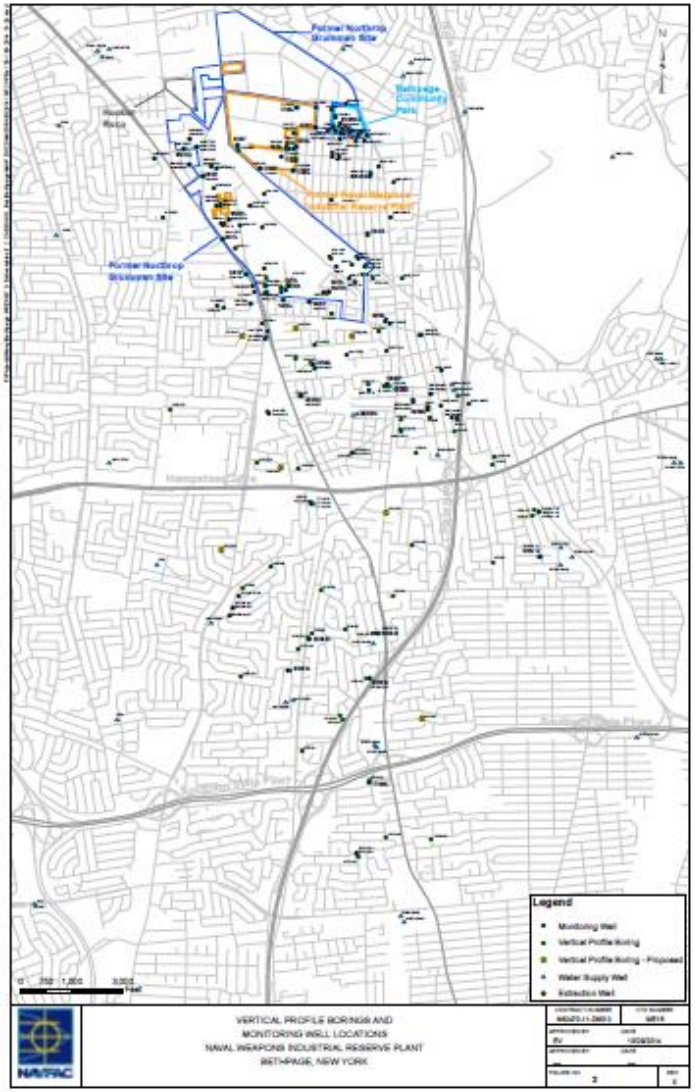
- –GM-38 Hot Spot treatment system
- –Public Water Supply Protection
- –Groundwater Monitoring

Groundwater Investigation Timeline



Groundwater

Groundwater remediation wells and public water supplies



SITE 1 SOIL VAPOR EXTRACTION CONTAINMENT SYSTEM (SVECS) OPERATION
NOVEMBER 2014 RESTORATION ADVISORY BOARD (RAB)

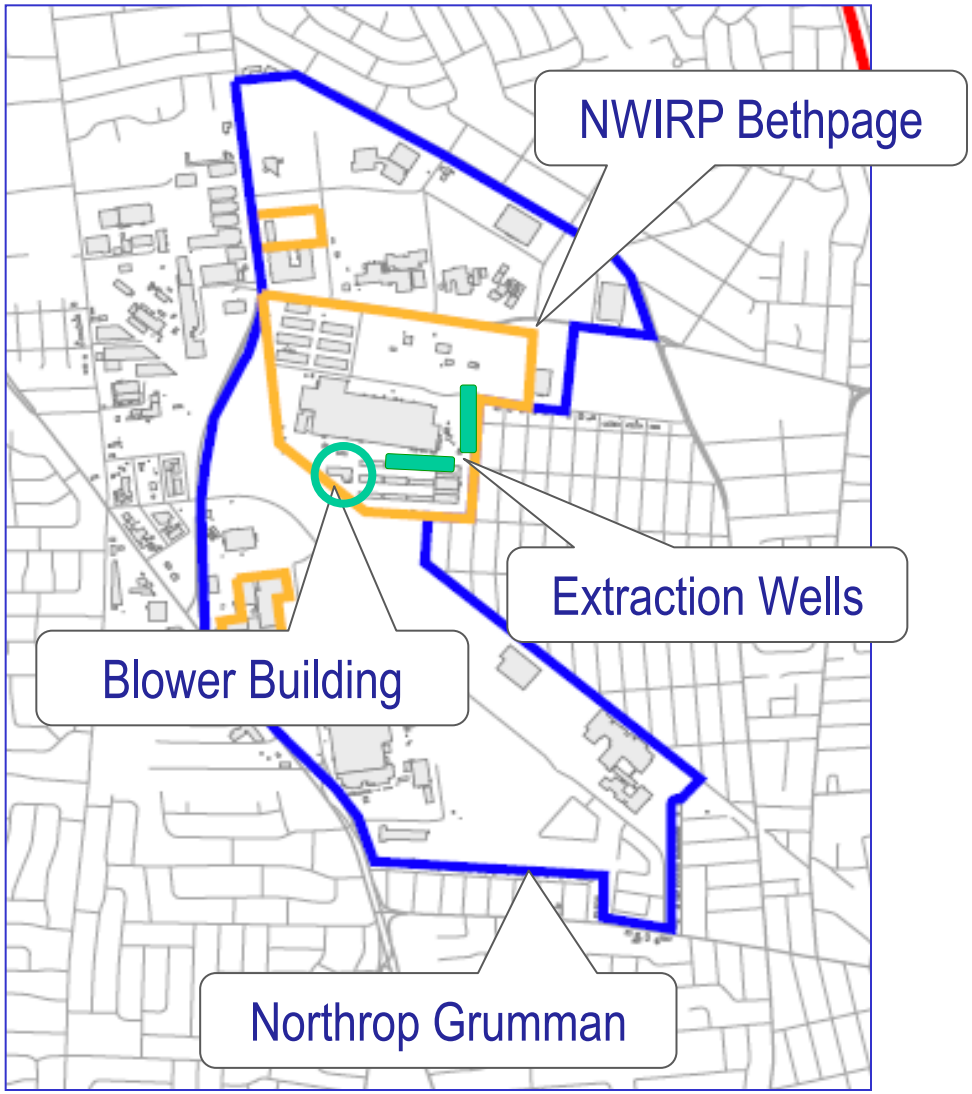
NWIRP BETHPAGE
LONG ISLAND, NEW YORK

11/05/2014

Introduction

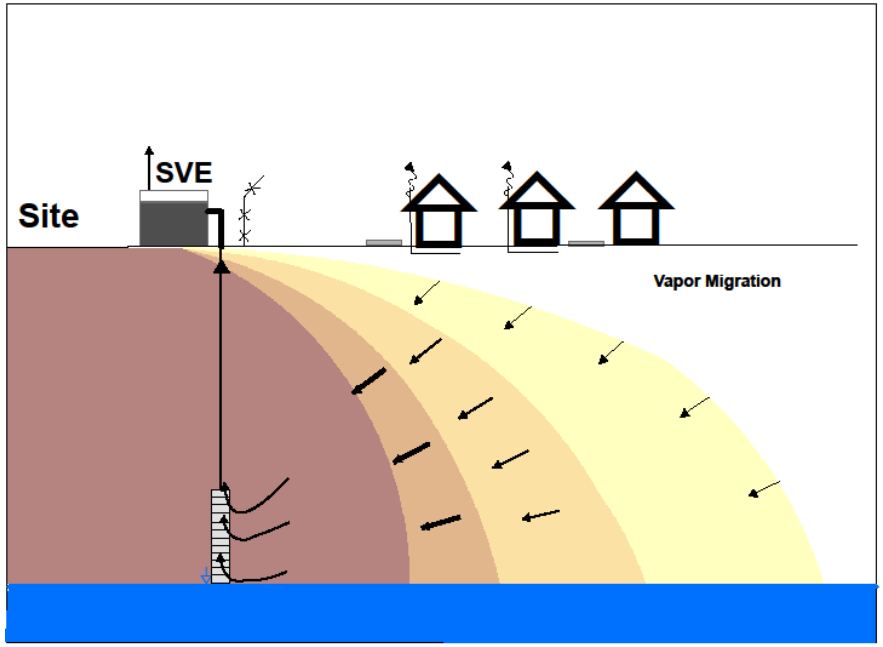
- Site 1 Soil Vapor Extraction Containment System (SVECS)
  - Overview
  - Operational Activities
  - System performance and future activities

Introduction



SITE 1 SVECS Project Overview

- Background: Chlorinated solvents (volatile organic compounds) in underlying soil migrate into overlying soil gas.
- Purpose of system is to contain soil vapor and prevent offsite migration of volatile organic compound (VOC) vapors.
  - Soil vapor – Air found in the space between soil particles.
  - Under certain conditions, vapors can migrate upward and into buildings.
  - Treatment system purges off-site vapors and creates a vacuum to control migration.

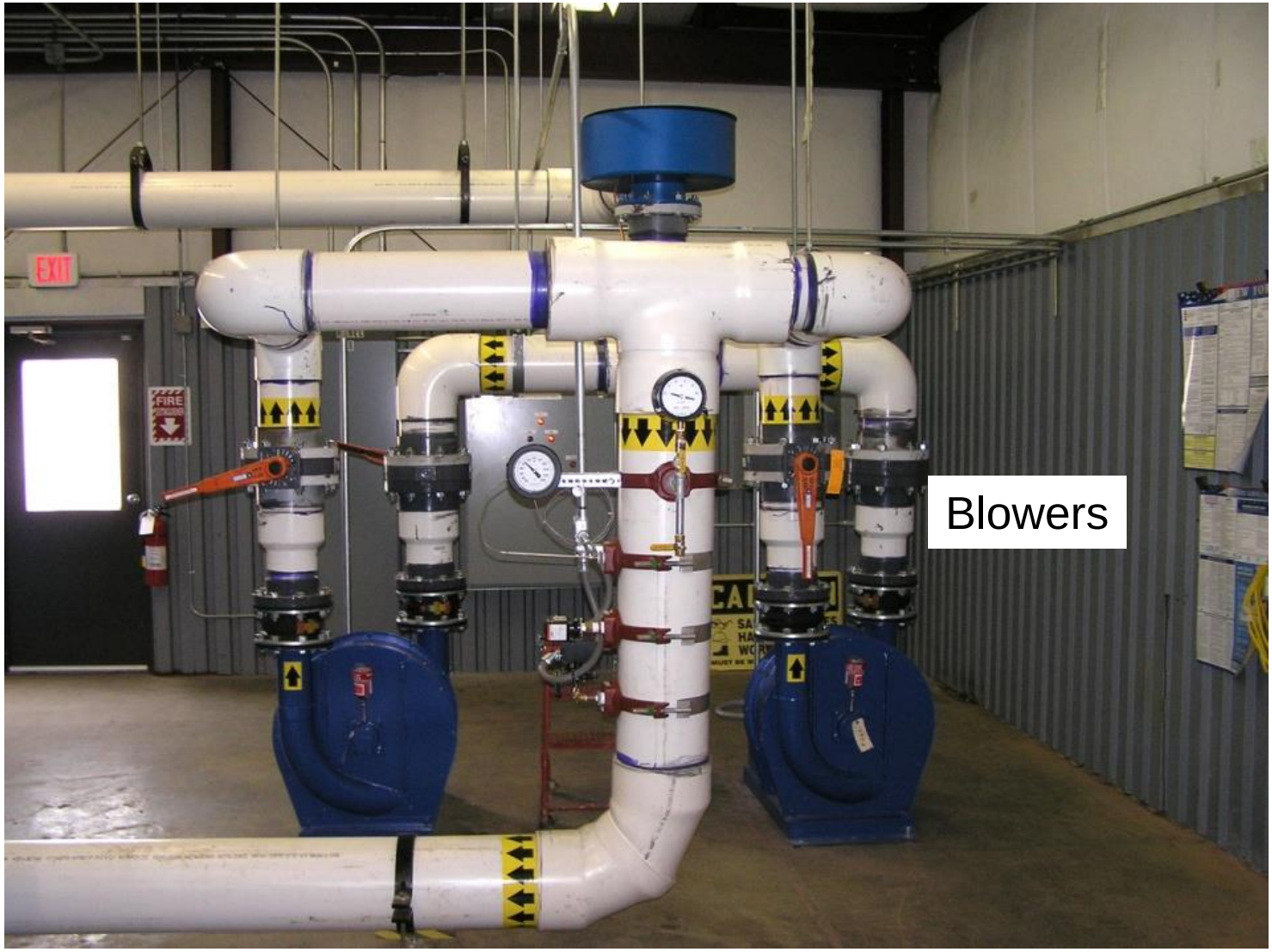


SITE 1 SVECS Project Overview

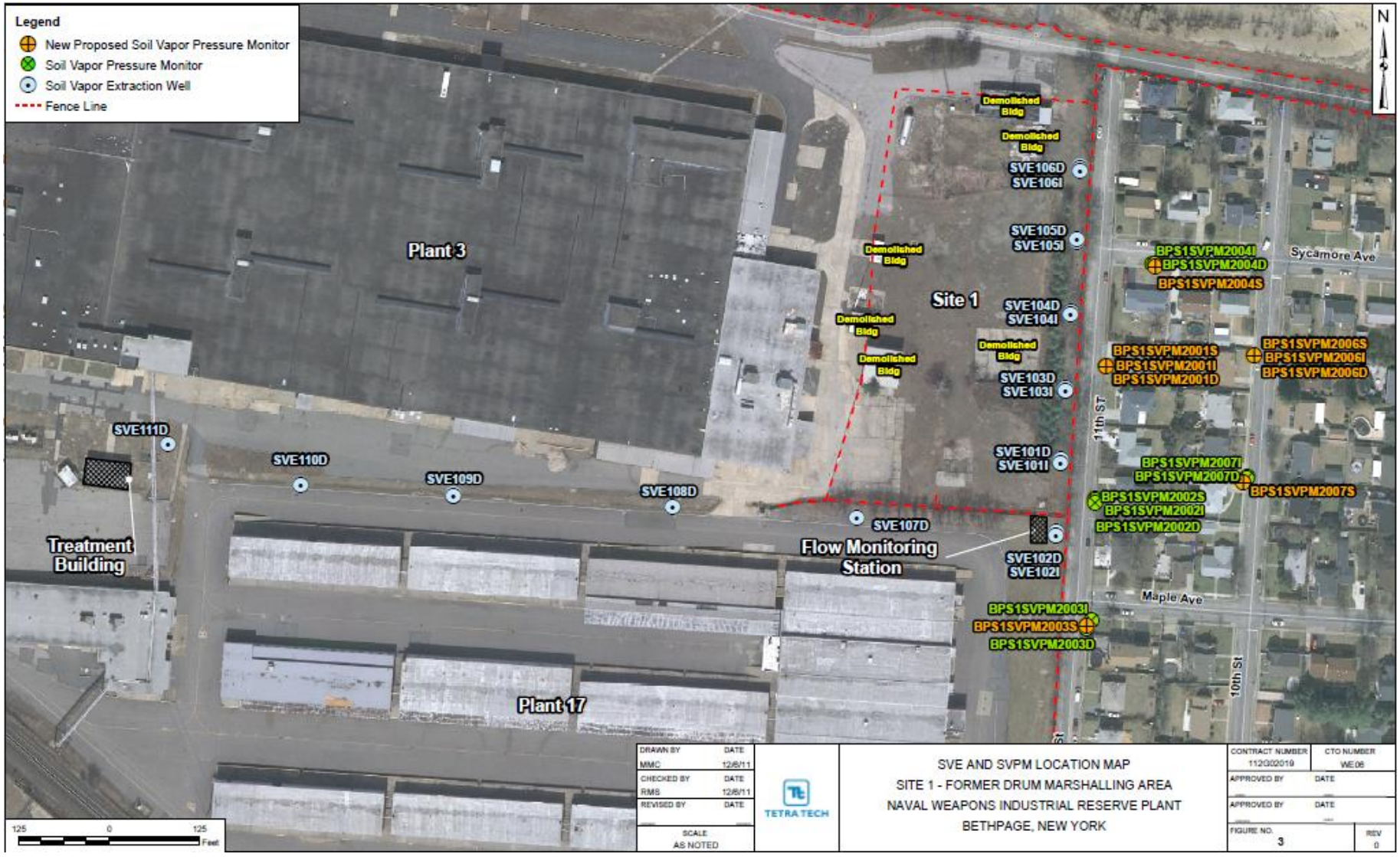
- System began operation in January 2010.
- Consists of soil vapor extraction, soil vapor monitoring, and soil vapor treatment.
- System extracts 300 to 400 cubic feet per minute of soil gas from 12 wells located along Site 1 fence line. Five additional extraction wells added in October 2011 to address potential on property sources.

SITE 1 SVECS Project Overview

SITE 1 SVECS Project Overview



SITE 1 SVECS Site Layout



SITE 1 SVECS Operational Activities

- Total of 17 soil vapor extraction (SVE) wells.
- Total of 18 soil vapor pressure monitor (SVPM) locations throughout neighborhood.
- Various sample collection and monitoring performed monthly, quarterly, and annually.
  - Process system samples - Ensure continued compliance with permit guidelines.
  - Soil vapor extraction wells (SVEWs) - Monitor system operations/operational efficiency.
  - Soil vapor pressure monitors (SVPMs) - Monitor vacuum field/potential for vapor intrusion.

SITE 1 SVECS Performance and Future Activities

- Since startup, 163.5 pounds of volatile organic compounds have been recovered.
- During 2014 calendar year (Jan 2014 – Sept 2014), 20.5 pounds of volatile organic compounds were recovered.
- Plant operates in compliance with air permit guidelines.
- Runtime is above 95% with minimal downtime due to power outages and scheduled maintenance.
- Continue to operate system and monitor system operations.
  - Submit quarterly/annual operations reports.

GM-38 GROUNDWATER TREATMENT PLANT OPERATION
NOVEMBER 2014 RESTORATION ADVISORY BOARD (RAB)

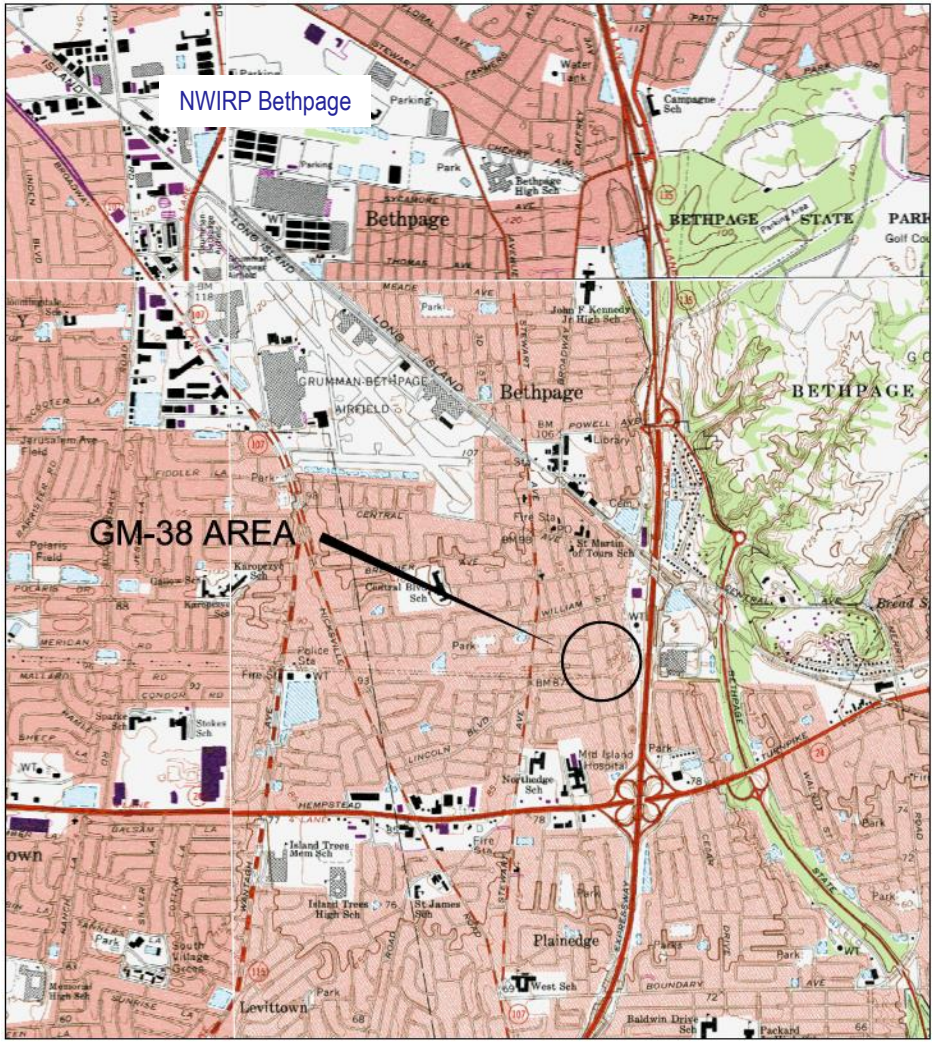
NWIRP BETHPAGE
LONG ISLAND, NEW YORK

11/05/2014

Introduction

GM-38 Groundwater Treatment System

- Objective
- Construction and Operation
- Operational Activities
- System Performance
- Future Activities / Path Forward



Construction and Operation

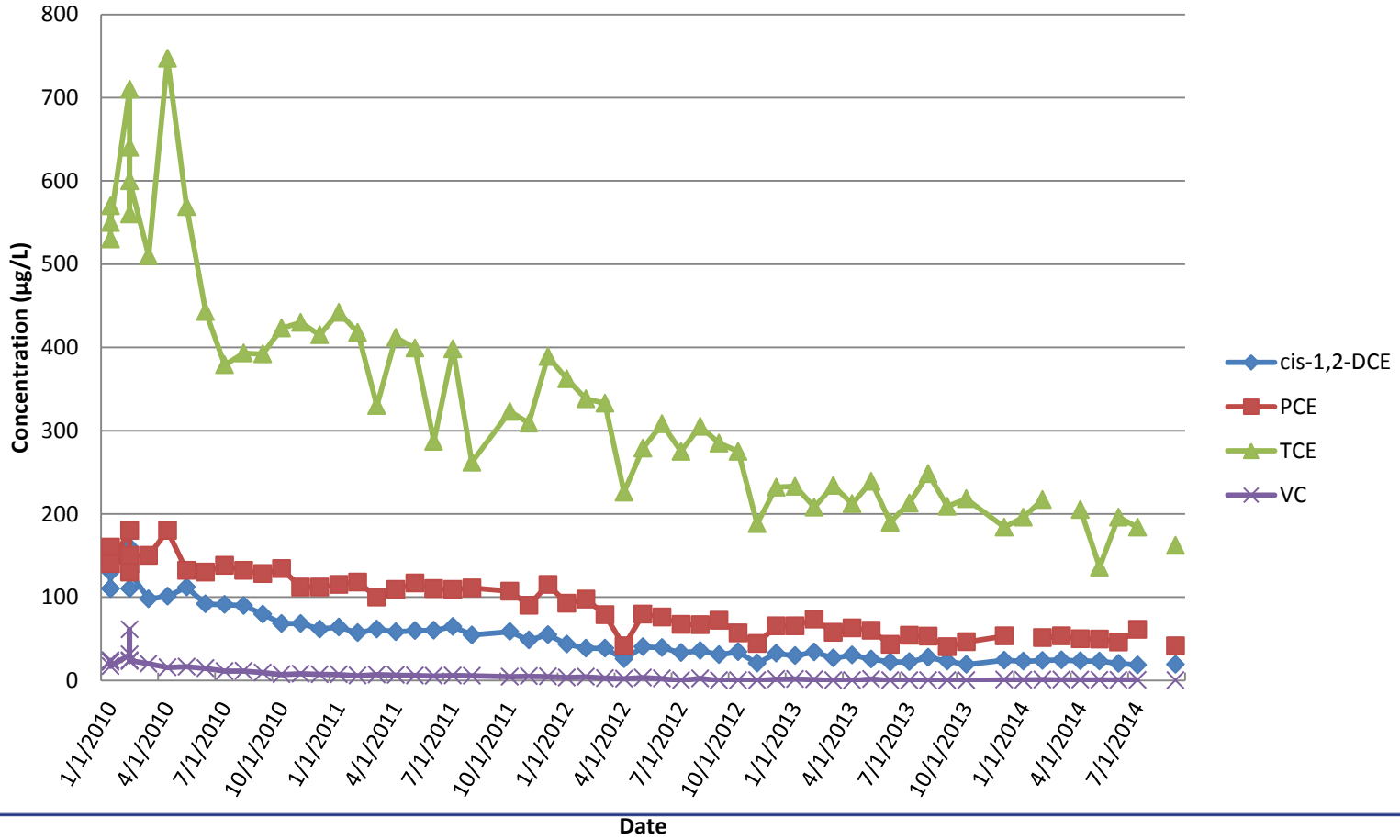
- Background: GM-38 Groundwater Treatment System – Hotspot treatment to remove contaminant mass and reduce volatile organic compound concentrations
- System consists of the following components:
  - Two groundwater recovery wells: RW01 and RW03
  - Equalization Tank
  - Air Stripping Tower
  - Particulate Filtration
  - Carbon Filtration - Liquid and Vapor
  - Discharge to a Recharge Basin
- System began operation in October 2009

Operation


2003 GM-38 Area
16-5
VPB-42
GM-36D
GM-36D2
BWD 4-1
BWD 4-2
Recharge Basin
GM-38D2
GM-38D
VPB-51
Treatment Plant
GM-38RW03
GM-38 RW2-MW2
VPB-48
GM-38RW02
VPB-38
Recovery Well RW03
GM-38RW01
GM-38 RW1-MW1
MW-118-5
Miller Rd
Recovery Well RW01
VPB-47
VPB-40
BWD 5-1

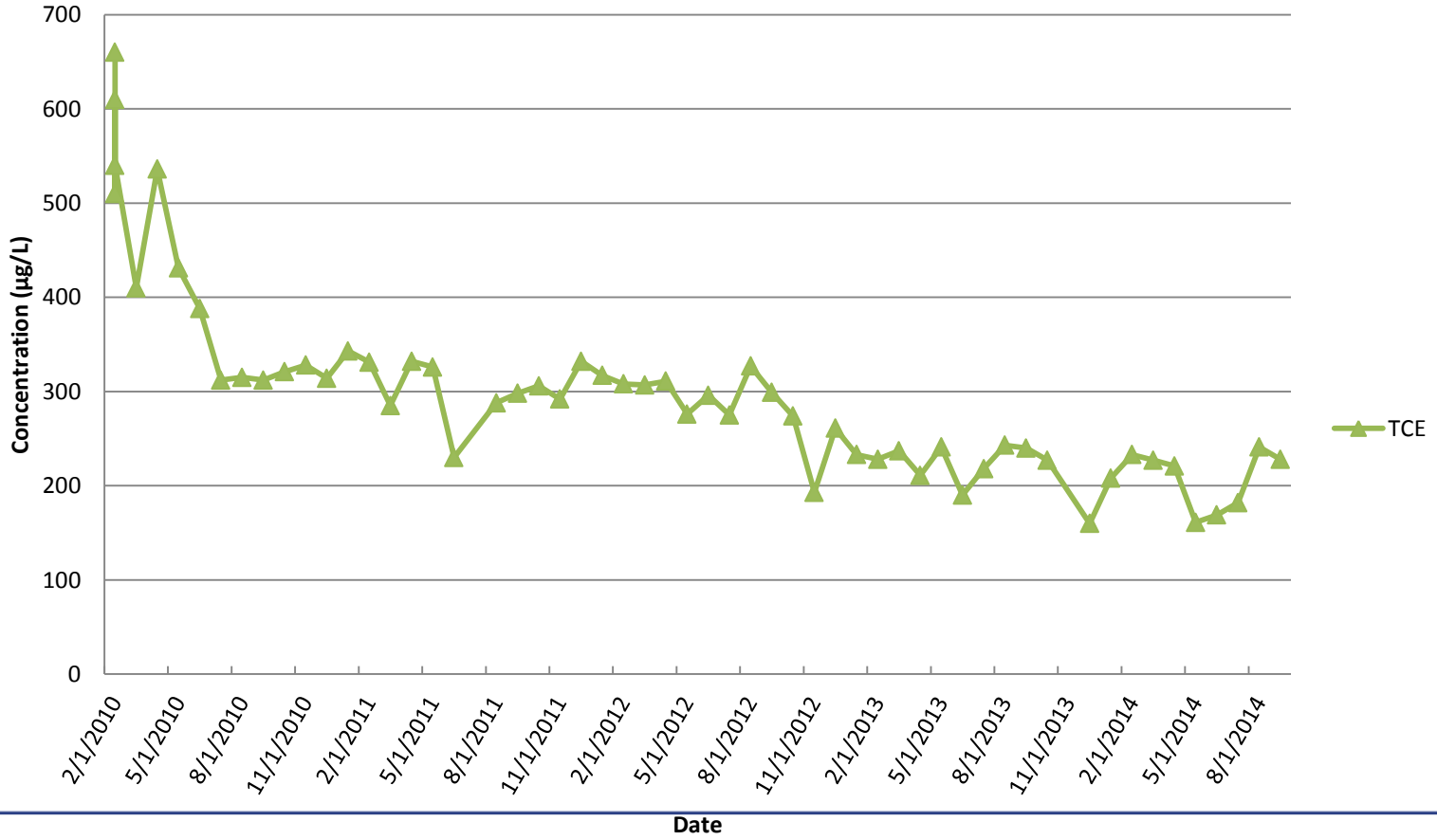
Operation – Recovery Well RW01

- Well extracts groundwater from upper and middle portion of hotspot – less than 435 feet deep (screened intervals: 335-395 feet deep, 410-435 feet deep)
- 75% reduction in volatile organics since system startup



Operation – Recovery Well RW03

- Well extracts groundwater from middle and lower portion of hotspot – 392 to 504 feet deep (screened intervals: 392-412 feet deep, 442-504 feet deep)
- 75% reduction in trichloroethene (TCE) since system startup



Operational Activities

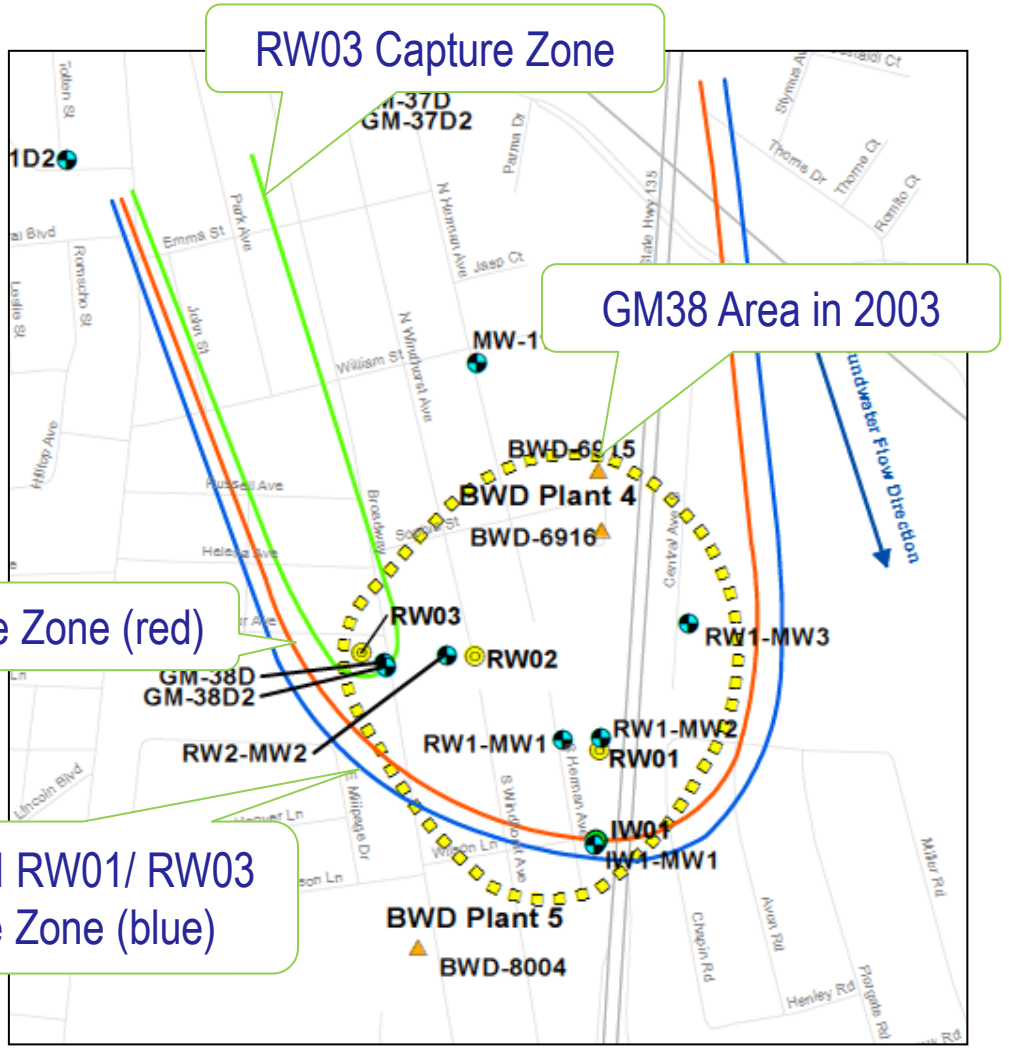
- Monthly compliance sampling of water and air
- Bi-annual sampling of groundwater monitoring wells
  - March 2014 and September 2014
  - Next event: March 2015
- Quarterly measurement of groundwater levels in surrounding monitoring wells
- Recent maintenance activities:
  - Late 2013 - Replaced existing duct work with stainless steel duct to allow optimization of air stripper performance
  - April 2014 – Repaired RW01 and RW03 piping
  - May 2014 - Repaired air stripper tower
  - July 2014 – Replaced RW01 pump and re-developed well
  - Sept / Oct 2014 – Air stripper effluent pump testing / maintenance

System Performance

- During 2014 calendar year (Jan 2014 – Sept 2014), system has treated:
  - 324 million gallons of water
    - Avg. 36 million gallons/month
  - 670 pounds volatile organic compounds
    - Avg. 74 lb/month
- Since start-up, system has treated:
  - 2.3 billion gallons of water
  - 7,500 pounds of volatile organic compounds
- Monthly compliance sampling of water and air
  - Consistently achieves requirements
- Normal runtime is 95%
  - Downtime due to power outages and maintenance activities
  - Runtime reduced recently due to major overhauls of treatment equipment

System Performance

- RW01 and RW03 Capture Zones based on original (2003) areal extent of hotspot
- Residual VOCs are found mostly 300 to 430 feet deep, up to 350 µg/L (parts per billion)
- Greater than 450 feet deep, maximum TCE concentration is 60 µg/L (parts per billion)



Future Activities / Path Forward

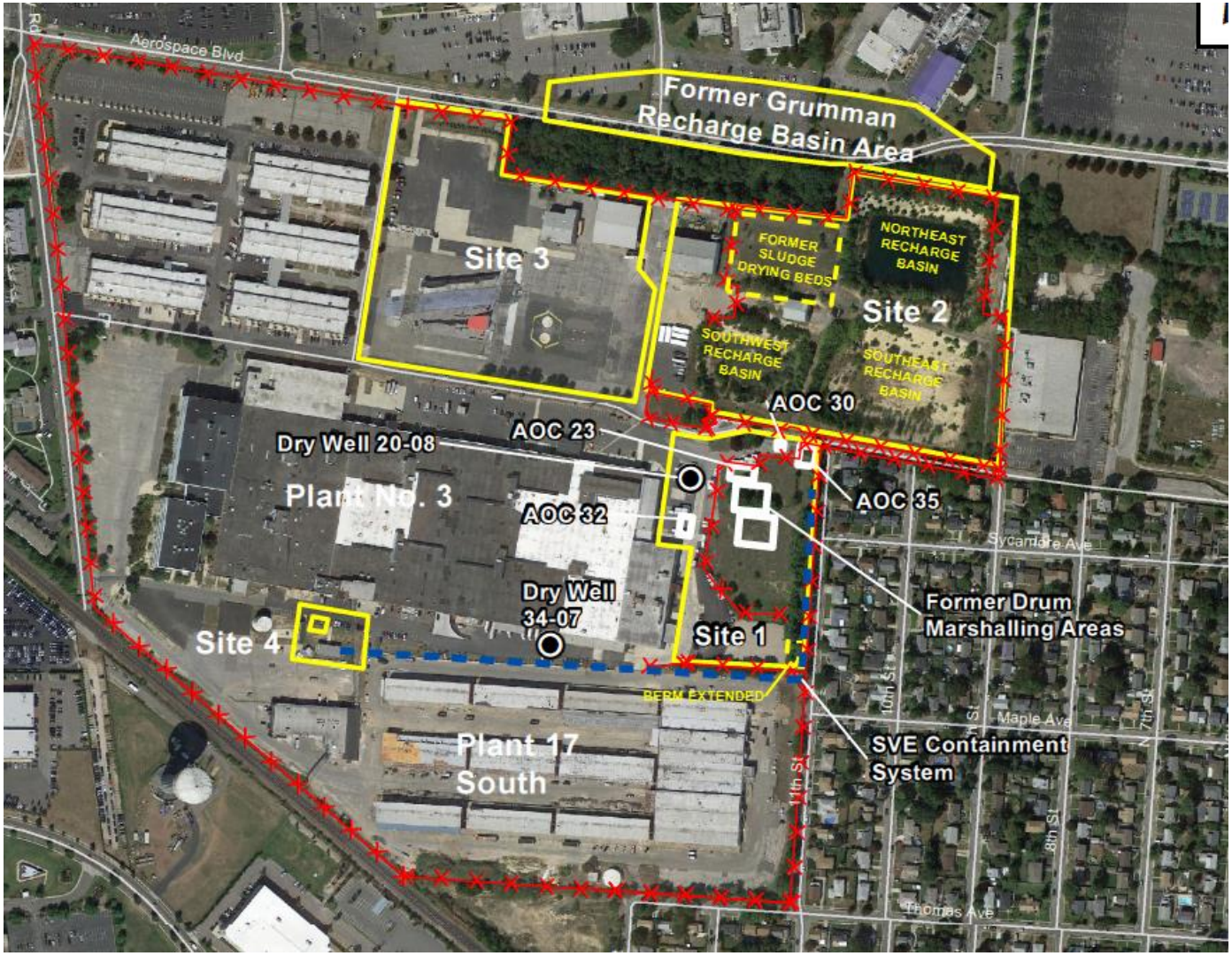
- Continue to collect monthly and semi-annual samples to monitor system performance
- Optimization activities currently in progress
  - Evaluate and improve system performance
  - Shut down RW03, increase flow at RW01

SITE 4 (AOC 22) PROPOSED PLAN
NOVEMBER 2014 RESTORATION ADVISORY BOARD (RAB)

NWIRP BETHPAGE
LONG ISLAND, NEW YORK

11/05/2014

Site 4 - Location Map



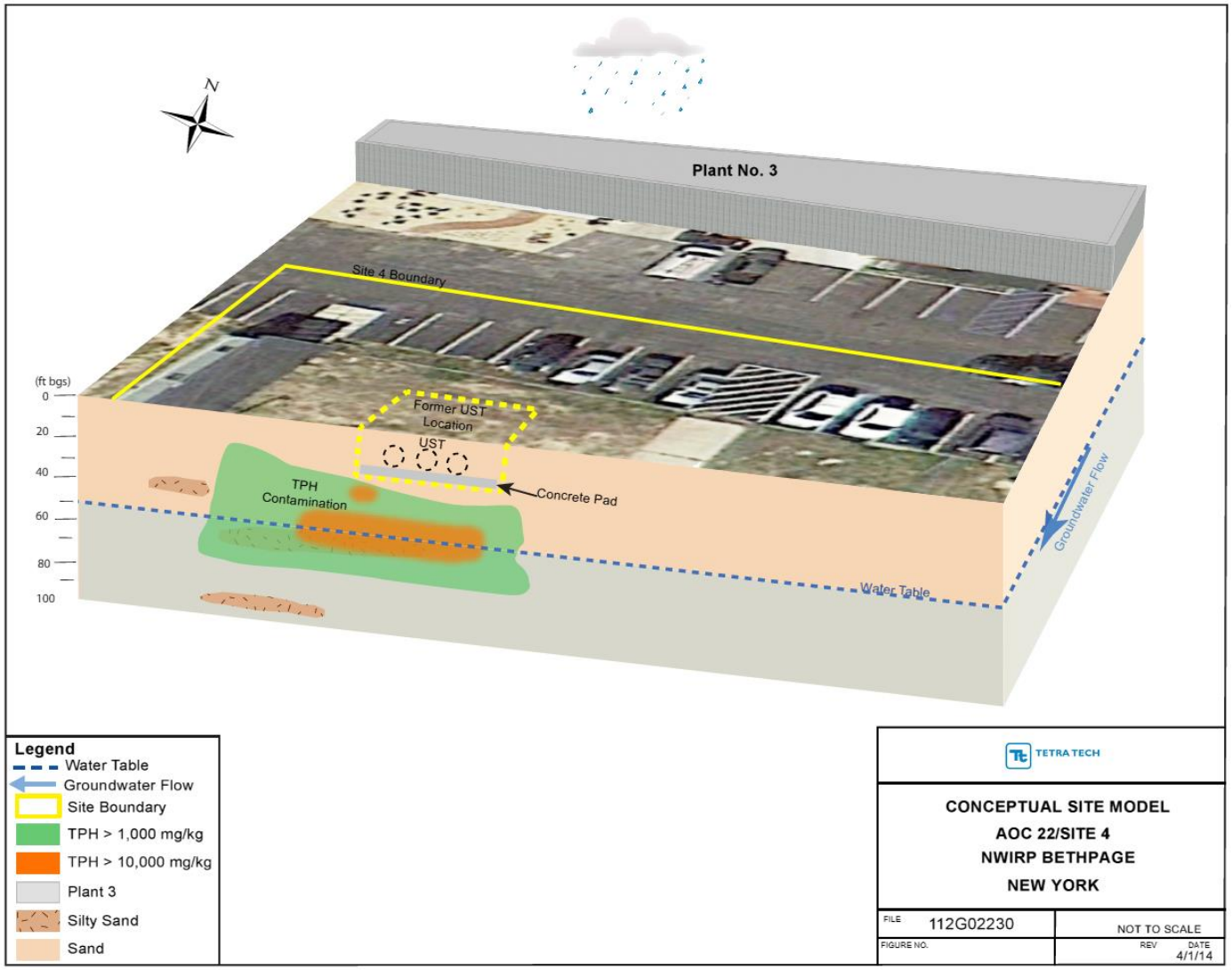
SITE 4 (AOC 22) ACTIVITIES

- Former Underground Storage Tanks (USTs) for No. 6 Fuel Oil – Tar-like material
- Tanks were removed around 1980 to 1984
- Approximately 6,800 cubic yards and 47 tons of petroleum present
- Petroleum found in the soils 30 to 71 feet deep
- Impacted soil covers an area of approximately 0.14 acre
- Some evidence of groundwater effects
- Groundwater ultimately captured by Containment System to south

SITE 4 (AOC 22) ACTIVITIES

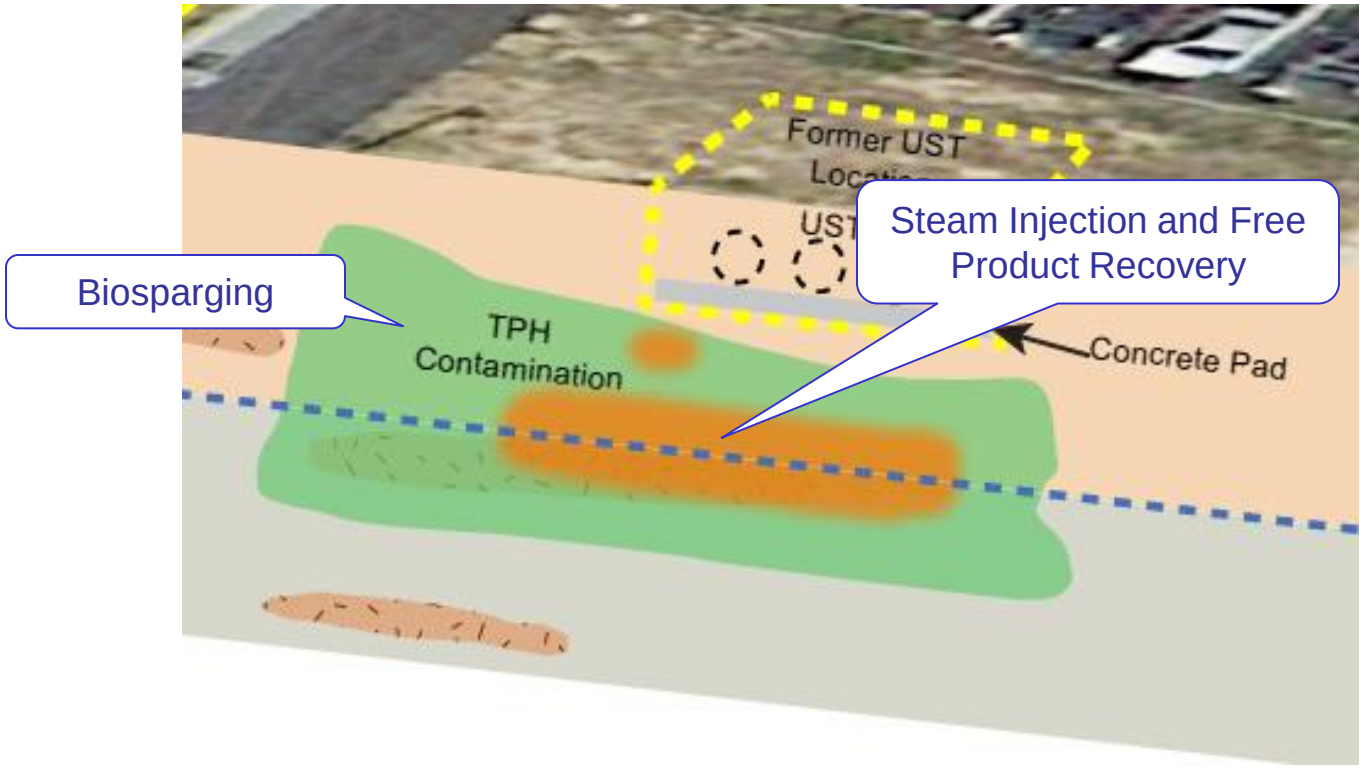
- Navy prepared a Feasibility Study to develop and evaluate potential remedial alternatives (2013)
- Alternatives included:
  - Land Use Controls – Admin. steps to control contact with wastes
  - Groundwater Monitoring – Evaluate impacts to the aquifer
  - Steam Injection/Free Product Recovery – Injection of steam to heat up the soil and mobilize the petroleum to allow its recovery
  - Solvent Extraction – Use of solvents to remove the petroleum from the soil
  - Biosparging – Injection of air to promote natural biodegradation of petroleum products

SITE 4 (AOC 22) – CONCEPTUAL SITE MODEL

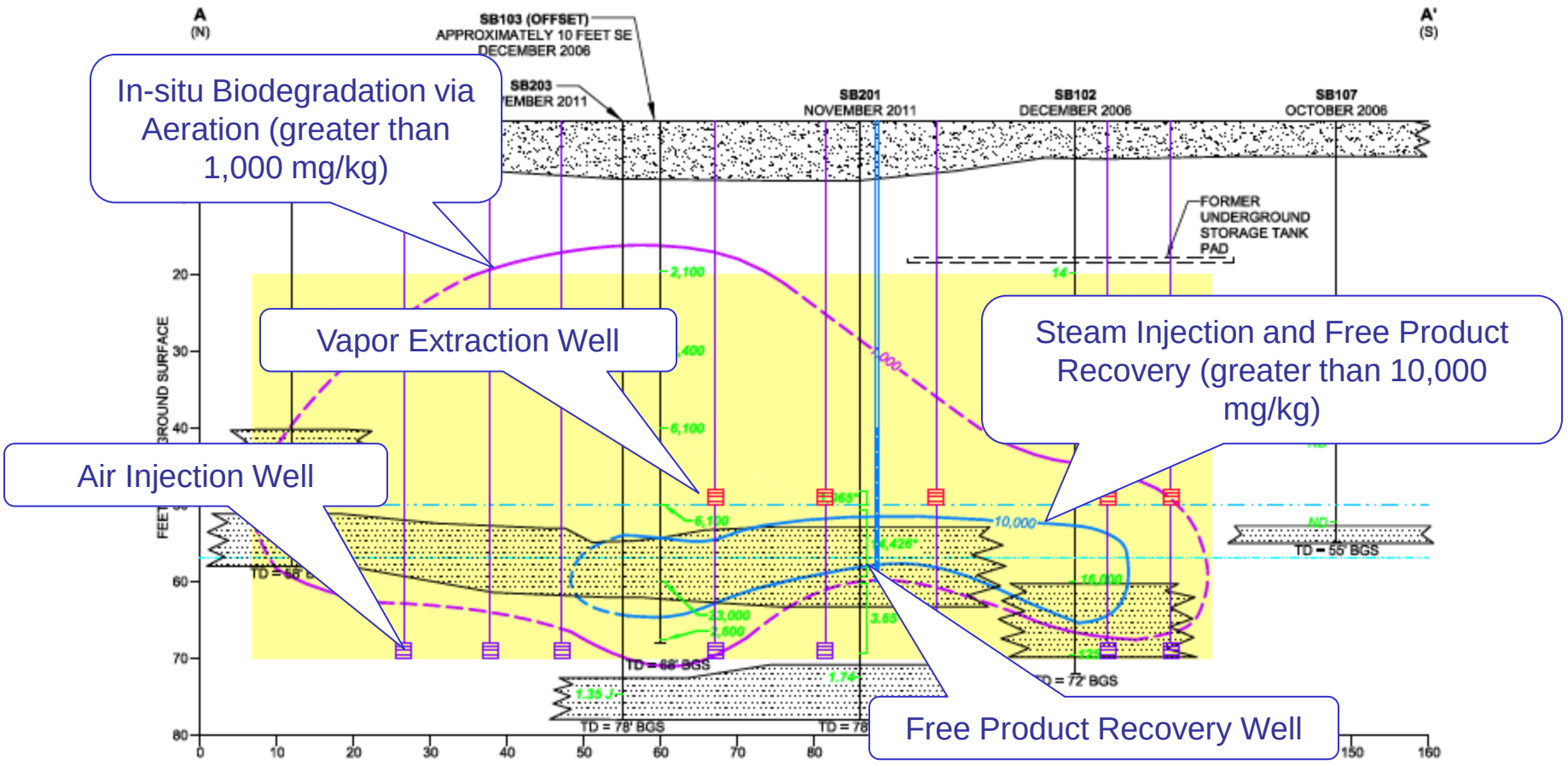


SITE 4 (AOC 22) – PROPOSED REMEDIAL ACTION PLAN

- Proposed Alternative includes treatment:
  - –Steam Injection/Free Product Recovery
  - –Biosparging
  - –Monitoring



SITE 4 (AOC 22) PROPOSED ALTERNATIVE



SITE 4 (AOC 22) PROPOSED PLAN

- Public comment period started on October 24, 2014 and will end on December 10, 2014
- Proposed Plan identifies the preferred remedial alternative for cleaning up soil and groundwater at the Site
- Submit written comments to Public Affairs Officer – See Proposed Plan
- Administrative Record can be accessed at

http://go.usa.gov/DyXF

SITE 4 (AOC 22) ACTIVITIES

- Path forward
  - –Record of Decision (early 2015)
  - –Design to start in 2015
  - –Cleanup to start in 2015/2016
  - –Anticipated to operate for 2 to 4 years
  - –Groundwater Monitoring to continue for more than 10 years

OPERABLE UNIT 2 - OFFSITE GROUNDWATER INVESTIGATION

NOVEMBER 2014 RESTORATION ADVISORY BOARD

NAVAL WEAPONS INDUSTRIAL
RESERVE PLANT BETHPAGE
LONG ISLAND, NEW YORK

11/05/2014

OFFSITE INVESTIGATION PROGRAM PRESENTATION

1 - Description of Purpose and Program

2 - Conceptual Site Geology Model and Applicability to Bethpage Plume

3 - Maps of Existing and Planned Vertical Profile Borings and Wells

4 - Description of Work Performed since last Restoration Advisory Board

5 - Description of Future Work

6 - Recent Reports and Findings

OPERABLE UNIT 2 GROUNDWATER INVESTIGATION - PURPOSE

- Delineate groundwater contamination in areas south of Naval Weapons Industrial Reserve Plant Bethpage
- Program consists of:
  - Vertical profile borings - 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

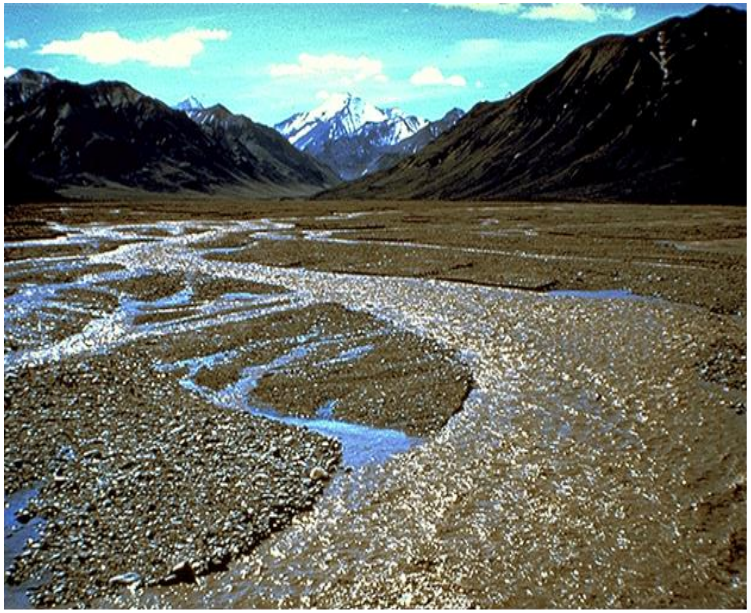
OPERABLE UNIT 2 INVESTIGATION - VERTICAL PROFILE BORING PROGRAM

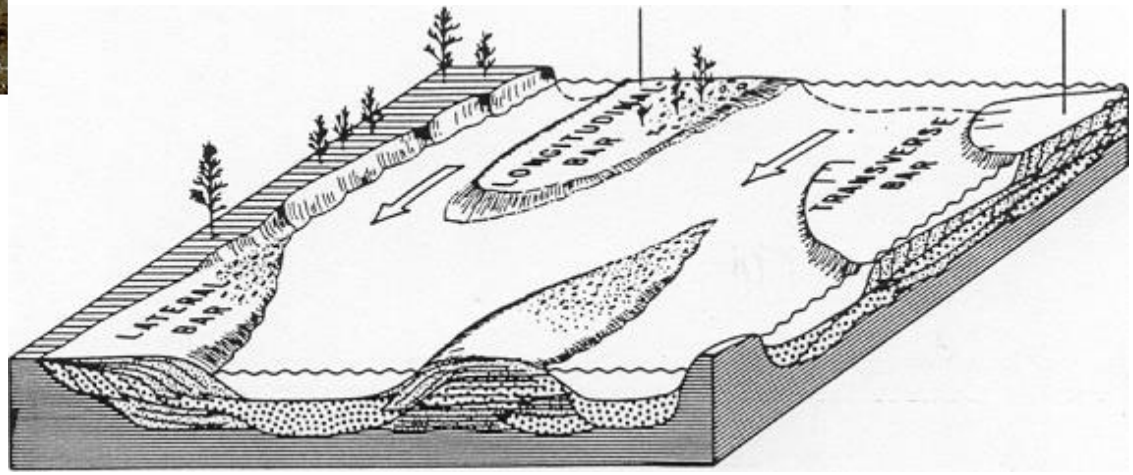
- A vertical profile boring is a 12-inch diameter hole drilled into the ground. At select depths, the drilling is stopped, a device is lowered to depth, and a sample of the water is collected;
- The borings will extend to the Raritan Clay Layer at a depth up to 860 to 1000 feet below ground surface.
- 36 groundwater samples are collected per boring and analyzed for Volatile Organic Compounds
- Generally it takes 4 to 8 weeks to complete a boring/well

VPB and WELL INSTALLATION PROCESS

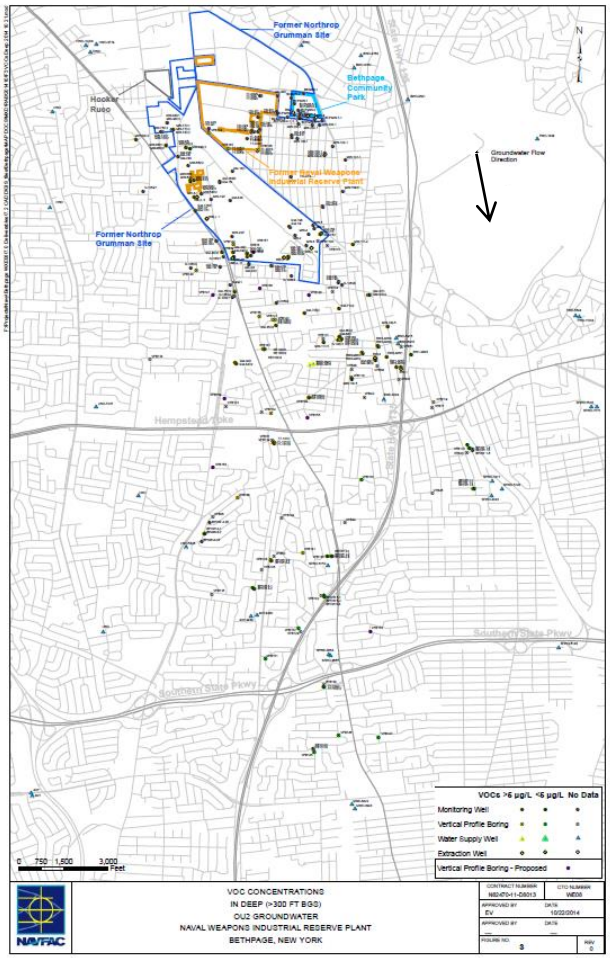
- **Process:**
  - –Ideal map location selected by Navy; concurrence given by State;
  - –Location is then ground-proofed by the Navy;
  - –Drilling rig requires minimum of 100 feet with no overhead obstructions;
  - –Generally on township right-of-ways;
  - –Considerations to minimize inconvenience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

CONCEPTUAL SITE MODEL
MAGOTHY AQUIFER





OU2 - OFFSITE ASSESSMENT AREAS



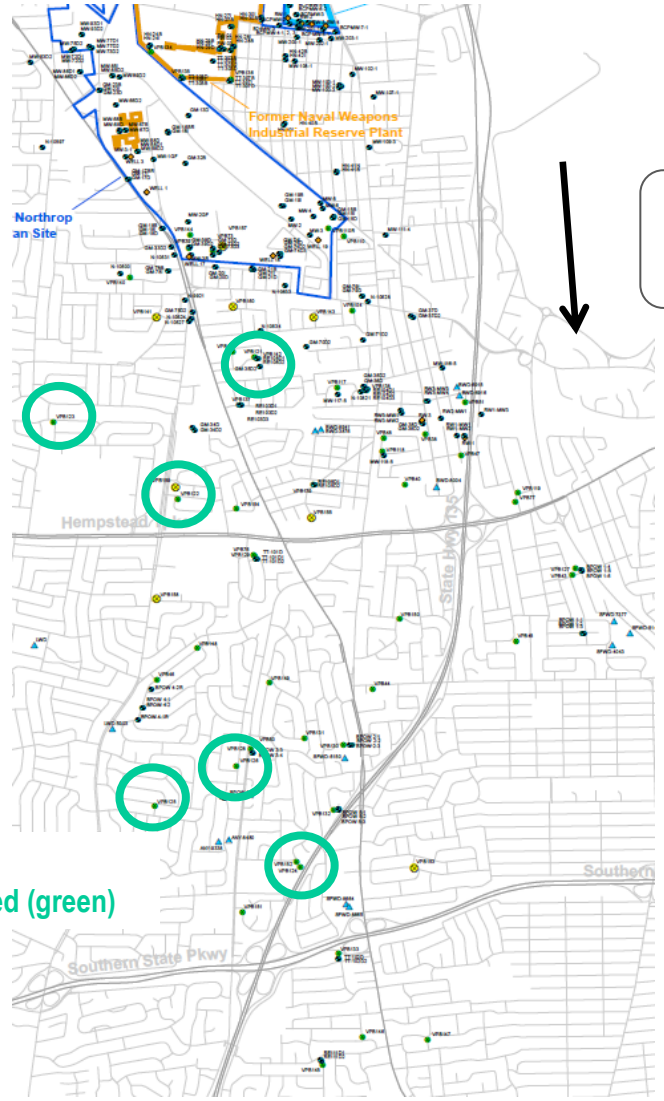
North of Hempstead Turnpike Area

North of Southern State Parkway Area

South of Southern State Parkway Area

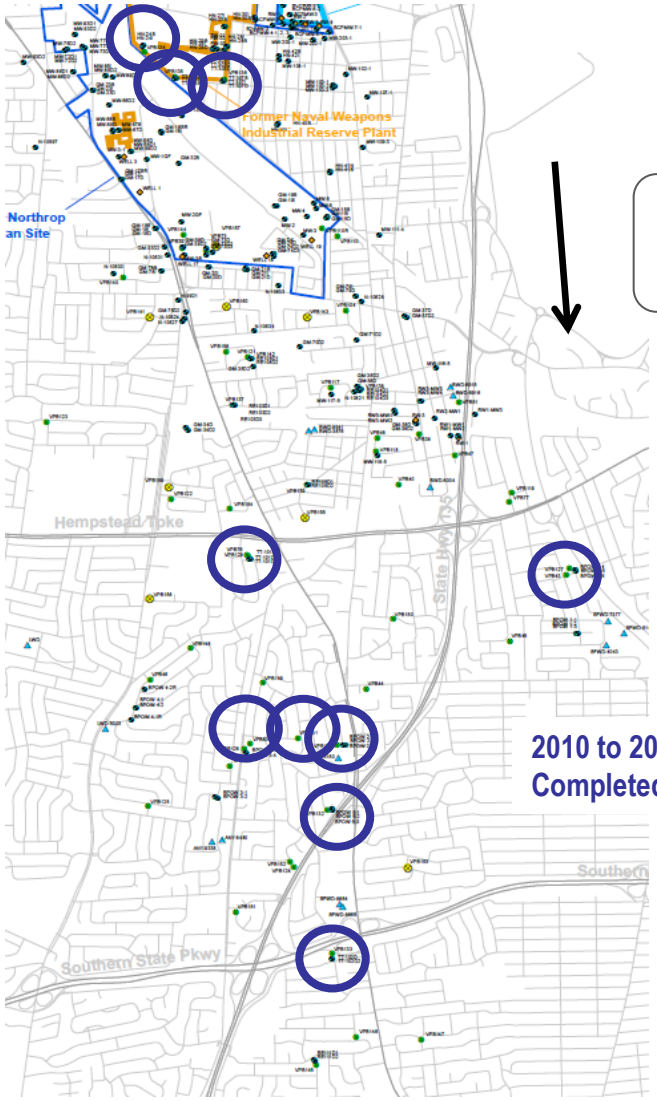
OU2 – OFFSITE VPBs COMPLETED

2009 Vertical Profile Borings and Monitoring Wells



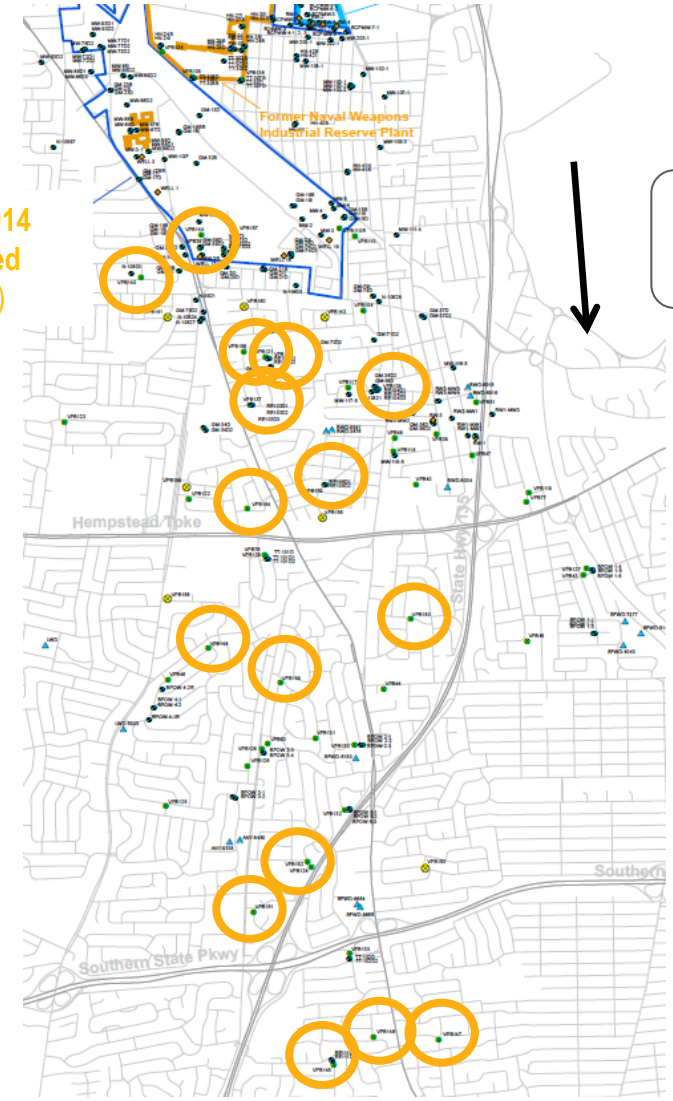
OU2 – OFFSITE VPBs COMPLETED

2010 to 2012 Vertical Profile Borings and Monitoring Wells



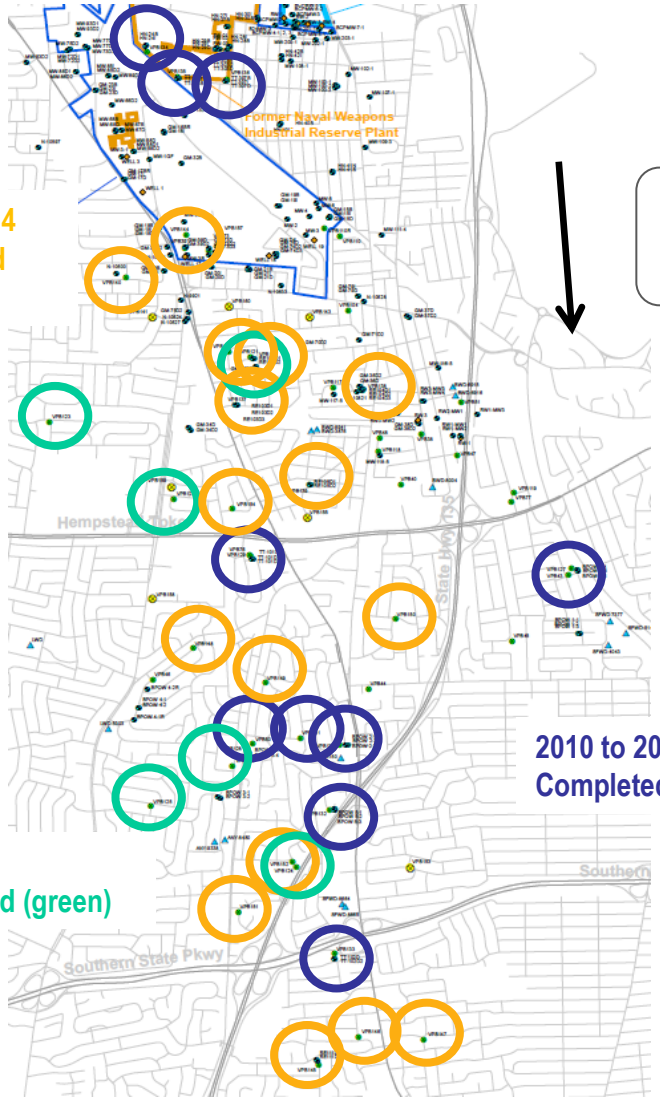
OU2 – OFFSITE VPBs COMPLETED

2012 to 2014 Vertical Profile Borings and Monitoring Wells



2009 – 2014 BORING PROGRAM – COMPILED VPB LOCATIONS

2009 to 2014 Vertical Profile Borings and Monitoring Wells



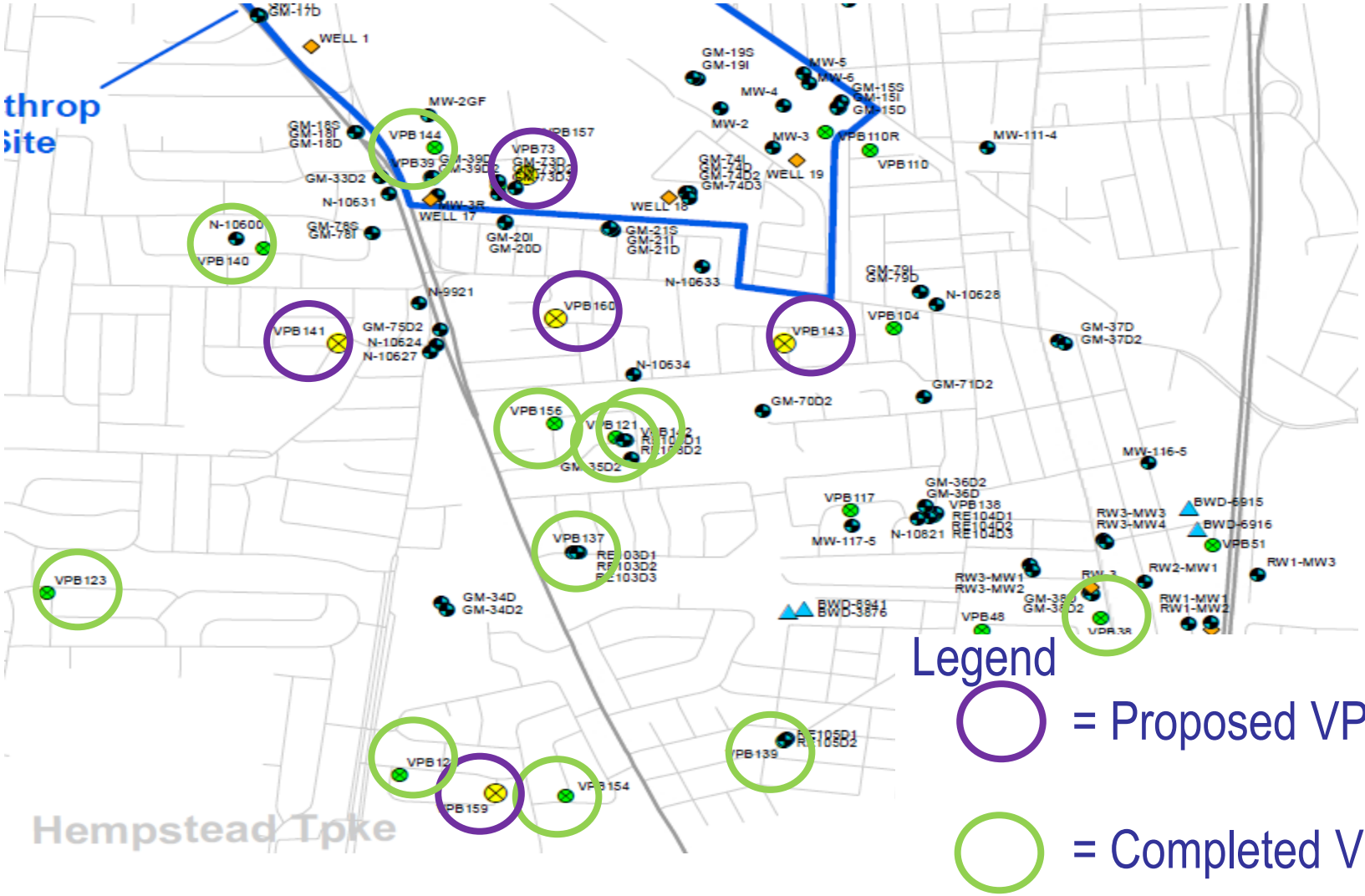
OPERABLE UNIT 2 – CURRENT AND FUTURE VERTICAL PROFILE BORINGS AND MONITORING WELLS

- Work performed since last Restoration Advisory Board (April 2014)
  - Operation of 4 drilling rigs
  - Installation of Vertical Profile Borings:
    - Three located North of Hempstead Turnpike Area
    - Three located North of Southern State Parkway Area
    - Two located South of Southern State Parkway Area
  - Installation of Monitoring Wells:
    - Two located South of Southern State Parkway Area
    - Two located North of Southern State Parkway Area
  - Completion of 3 rounds of groundwater sampling of 13 wells

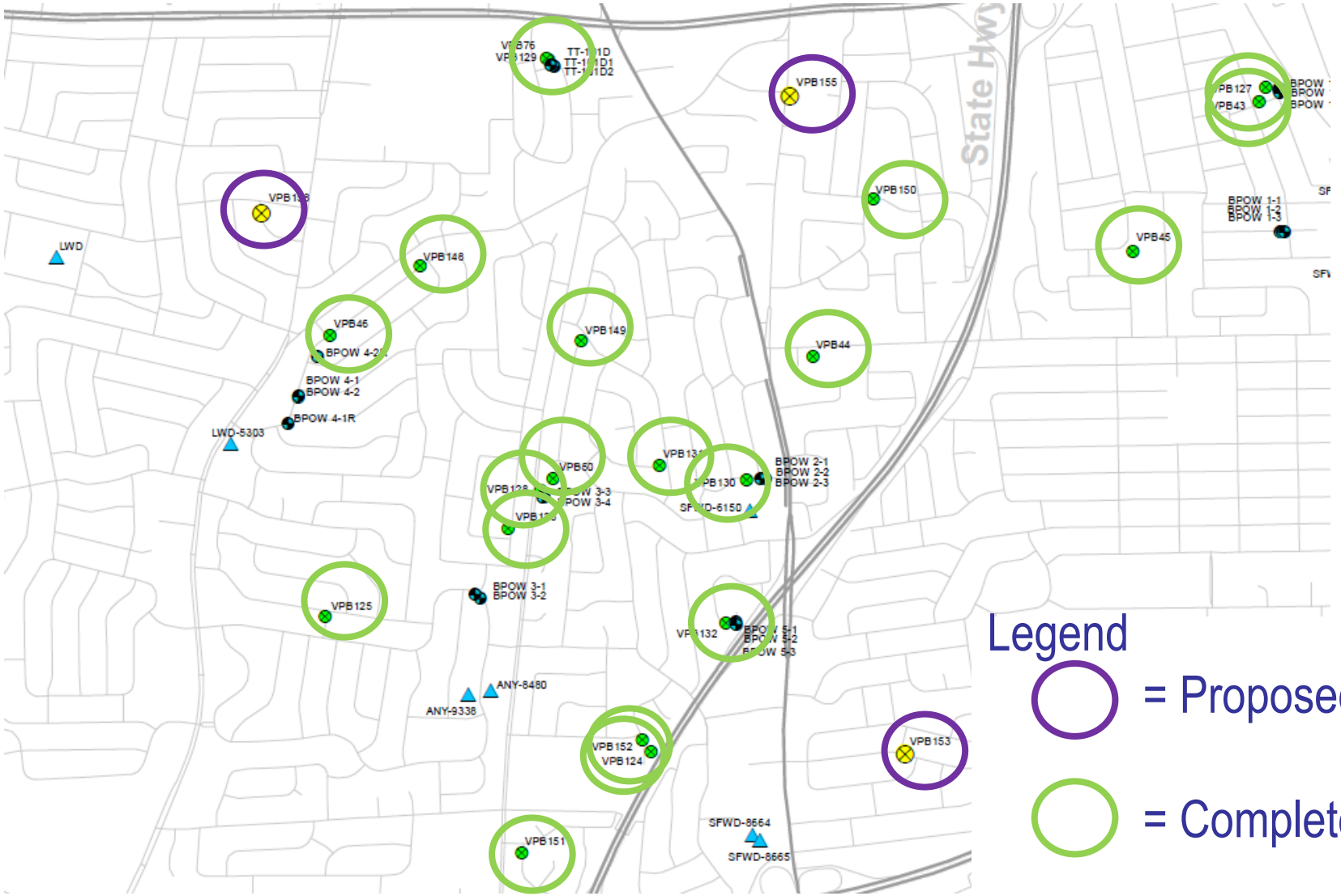
OPERABLE UNIT 2 – CURRENT AND FUTURE VERTICAL PROFILE BORINGS AND MONITORING WELLS

- **Future work:**
  - Operation of 3 drilling rigs
  - Installation of Vertical Profile Borings
    - 6 North of Hempstead Turnpike Area
    - 2 North of Southern State Parkway Area
  - Installation of 4 monitoring wells South of Southern State Parkway Area
  - Installation of 10 monitoring wells North of Southern State Parkway Area
  - Installation of 18 monitoring wells North of Hempstead Turnpike Area
  - Continue regular groundwater sampling

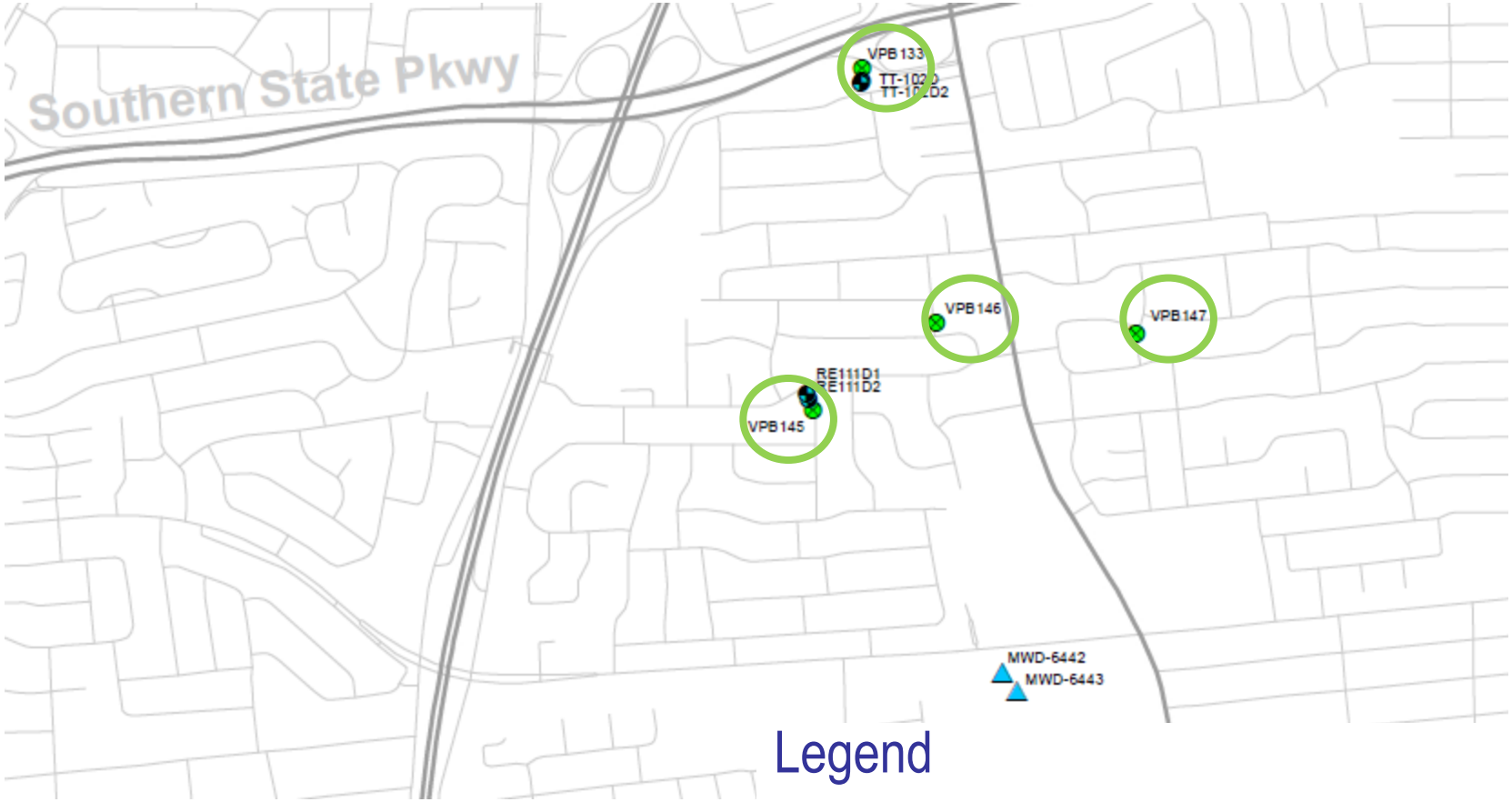
CURRENT AND PLANNED VERTICAL PROFILE BORINGS – NORTH OF HEMPSTEAD TURNPIKE AREA



CURRENT AND PLANNED VERTICAL PROFILE BORINGS – NORTH OF SOUTHERN STATE PARKWAY AREA



CURRENT AND PLANNED VERTICAL PROFILE BORINGS – SOUTH OF SOUTHERN STATE PARKWAY AREA



QUESTIONS?

OU2 OFFSITE GROUNDWATER INVESTIGATION

- **How do we assess results?**
  - The primary chemical being investigated is trichloroethylene (TCE), a volatile organic compound commonly used as a degreaser in manufacturing
  - Acceptable Maximum Contaminant Limit is a health-based regulatory limit established by the NYSDOH
  - The Maximum Contaminant Limit for TCE is 5 parts per billion
  - As defined in the OU 2 Record of Decision, a “Hotspot” is >1000 parts per billion

RECENT REPORTS

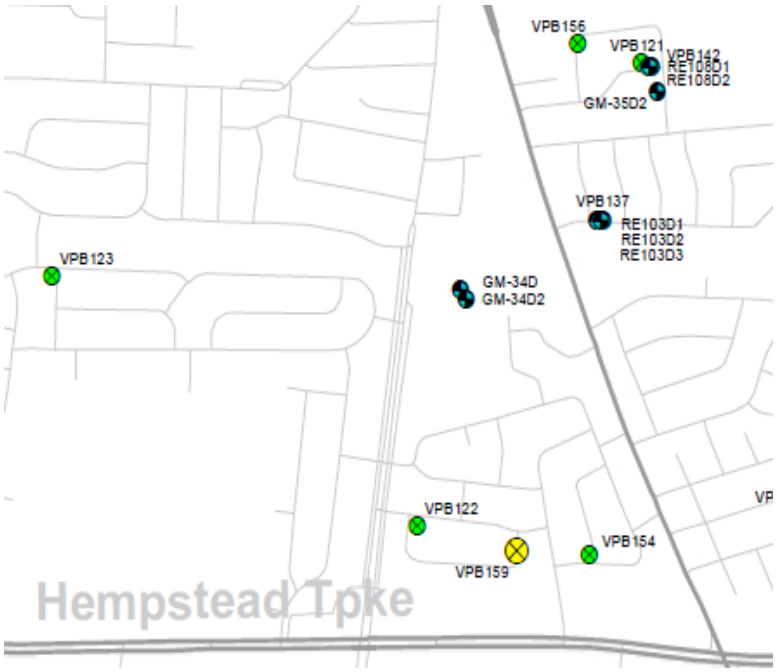
2013 – 2014 OU2 Groundwater Investigation VPB 142 (North of Hempstead Turnpike Area) submitted August 24, 2014

Objective -

- Installation of VPB and two associated monitoring wells to address data gaps south of the On-site Containment Treatment system (ONCT)and north of Hempstead Turnpike.

Findings –

- TCE in groundwater grab samples <1000 parts per billion
- Groundwater sampling from monitoring wells performed as part of quarterly sampling



RECENT REPORTS

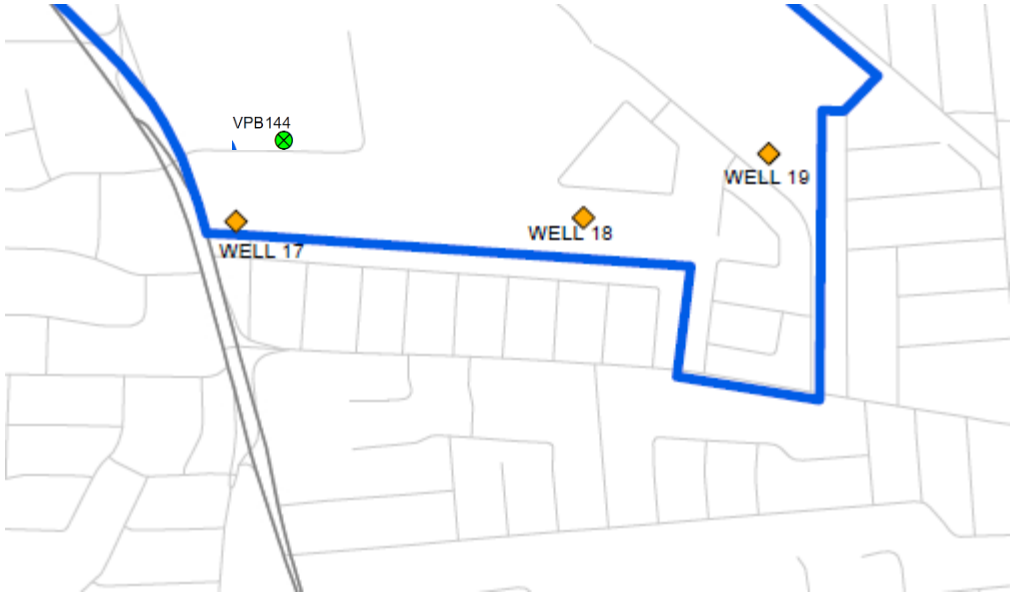
2013 – 2014 OU2 Groundwater Investigation VPB 144 (North of Hempstead Turnpike Area) submitted September 10, 2014

Objective –

- Installation of one VPB to ascertain contaminant levels and depths immediately upgradient of the On-site Containment Treatment (ONCT) system.

Findings –

- TCE in groundwater grab sample >1000 parts per billion at 600 feet
- TCE is in the capture zone of the On-Site Containment Treatment System



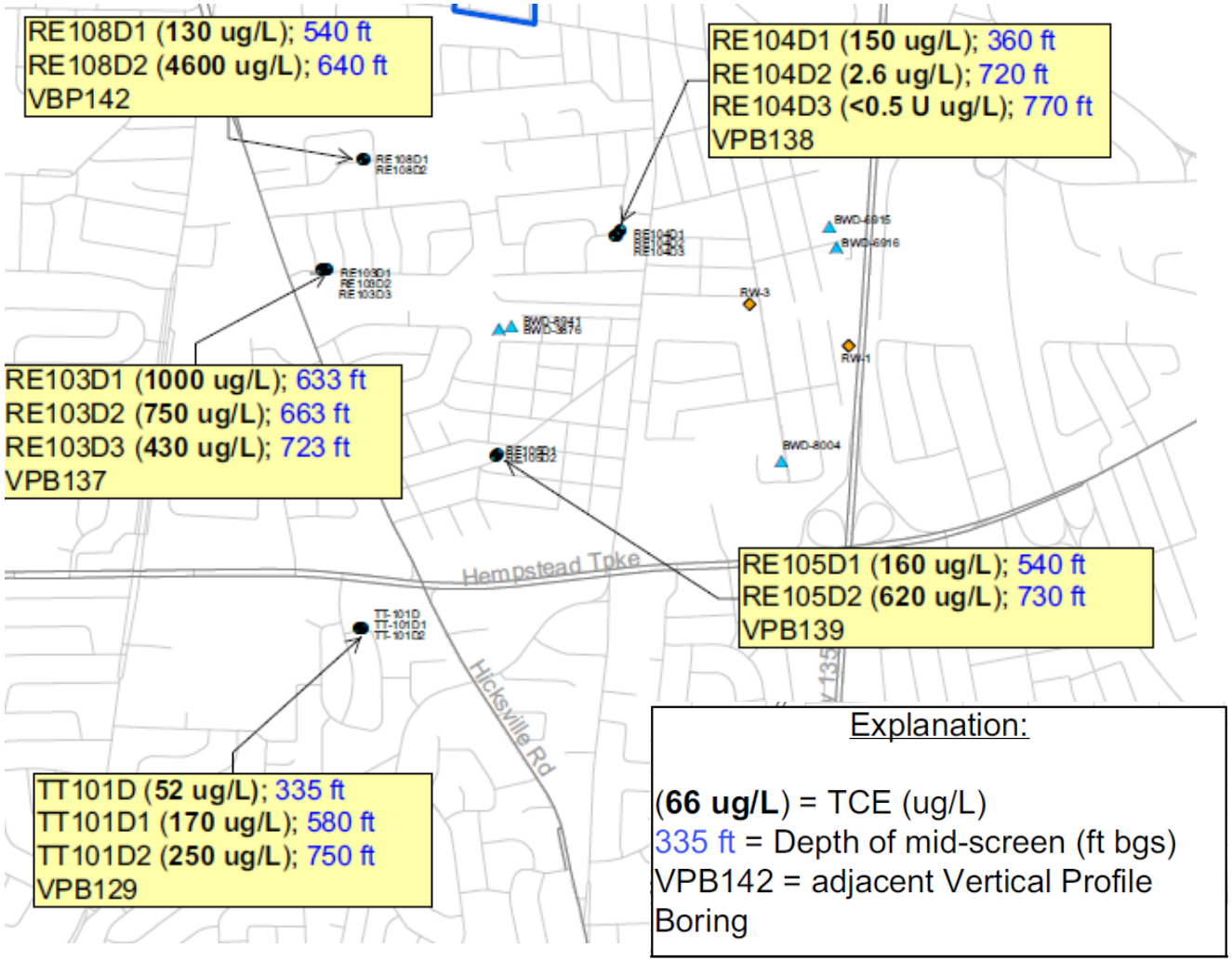
RECENT REPORTS – GROUNDWATER SAMPLING

March 2014 Groundwater Sampling Data Summary Report –submitted to NYSDEC August 18, 2014

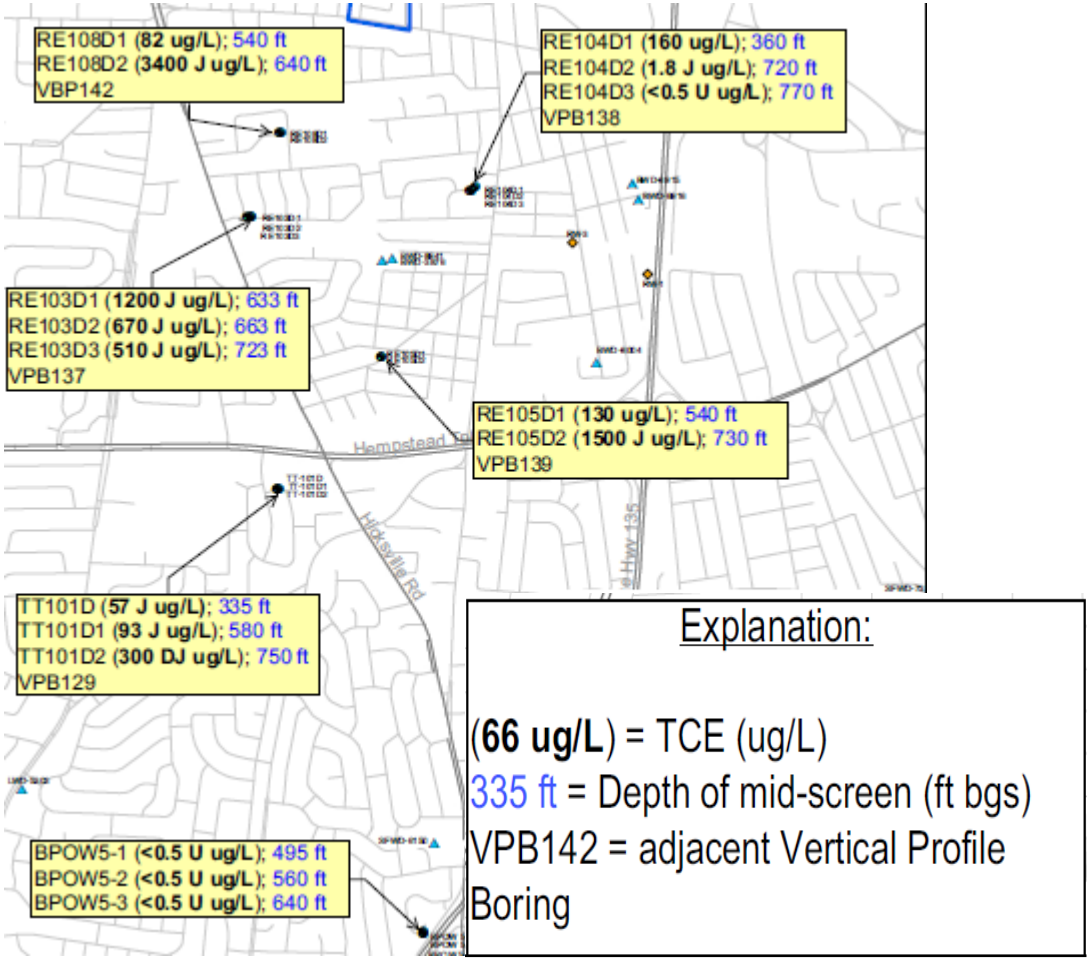
June 2014 Groundwater Sampling Data Summary Report – submitted to NYSDEC October 24, 2014

September 2014 Groundwater Sampling Data Summary Report – (Pending validation)

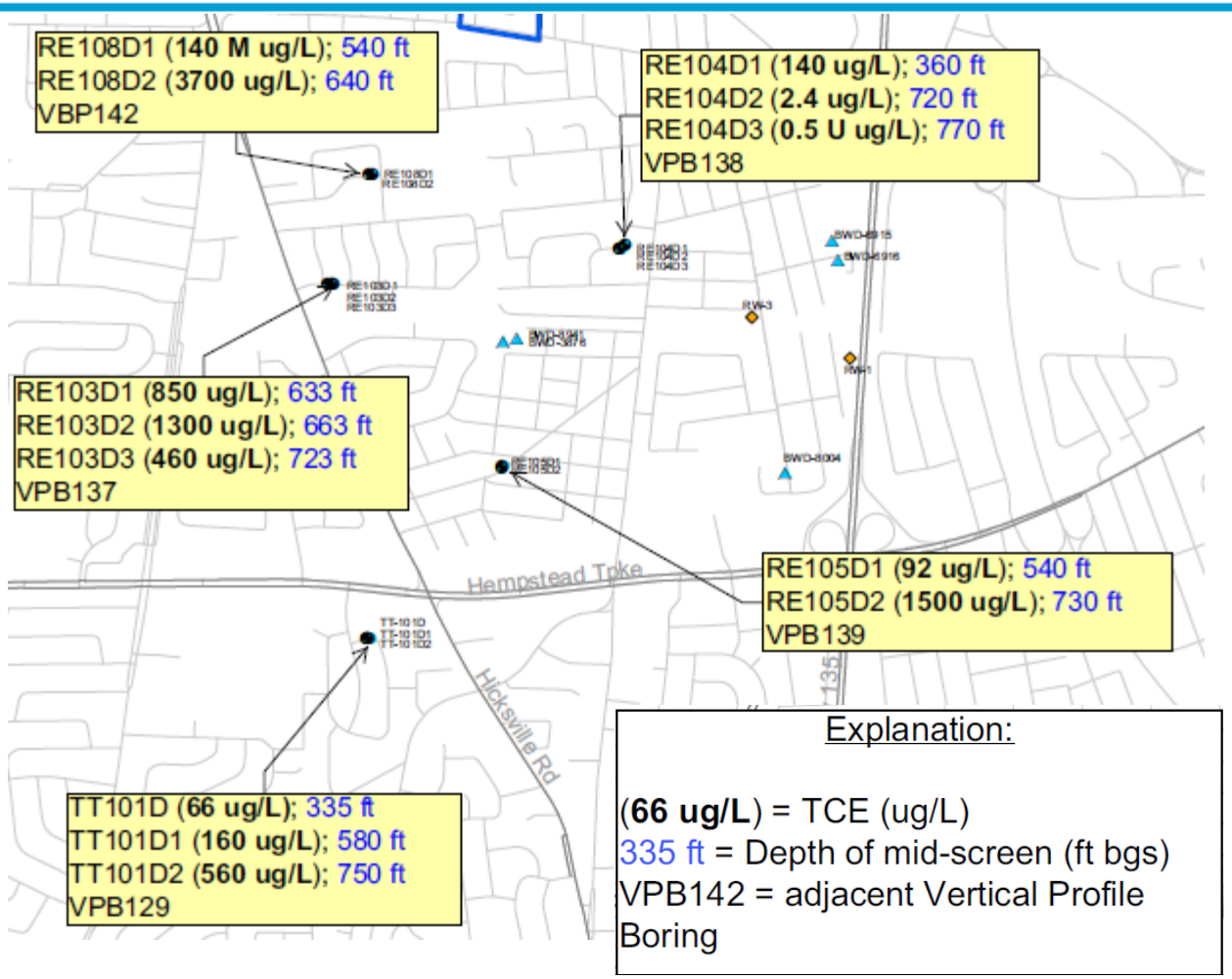
MARCH 2014-TCE RESULTS



JUNE 2014-TCE RESULTS



SEPTEMBER 2014- DRAFT TCE RESULTS



RECENT RESULTS – GROUNDWATER SAMPLING

- **CONCLUSIONS:**
  - –TCE above 1000 parts per billion in the “North of Hempstead Turnpike Area”
  - –OU 2 Record of Decision defines a “Hotspot” as >1000 parts per billion
  - –The hotspot area defined to the south and east
  - – Additional drilling planned to the north and west
  - – Navy currently evaluating this area
  - – Continue groundwater monitoring to assess concentration trends over time

QUESTIONS?