RESTORATION ADVISORY BOARD MEETING
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP), CALVERTON
RIVERHEAD SENIOR CENTER, RIVERHEAD, NEW YORK
TUESDAY, APRIL 16, 2019

The fiftieth (50th) meeting of the Restoration Advisory Board (RAB) was held at the Riverhead Senior Center. Meeting attendees included representatives from the Navy (Lora Fly and JC Kreidel), New York State Department of Environmental Conservation (NYSDEC) (Henry Wilkie), New York State Department of Health (NYSDOH) (Steve Karpinski), Suffolk County Department of Health Services (SCDHS) (Andrew Rapiejko and Amy Juchatz), Town of Riverhead (Frank Messina), Suffolk County Legislature (Al Krupski), Suffolk County Wading River Civic Representative (Steve Shapiro), RAB Community Members (Adrienne Esposito, Lou Cork and Vincent Racaniello), Arcadis (Robert Porsche), Resolution Consultants (Robert Forstner), Tetra Tech (Kristi Francisco, David Brayack and Melissa Cushing), and Koman Government Solutions (Stephane Roy). The sign-in sheet is included as Attachment 1.

WELCOME AND AGENDA REVIEW

The Navy representative, Ms. Lora Fly, welcomed everyone to the RAB meeting and introduced the meeting agenda. Ms. Fly shared a brief update of the environmental restoration sites.

-Site 2- Record of Decision (ROD) that addresses munitions of explosive concern (MEC) has been signed. The remedial action work plan has been completed and construction started in October 2018. Fieldwork conducted through March 2019 included excavation and screening, investigation of previously identified anomalies and site restoration.

-Site 6A - Land Use Control (LUC) inspections were conducted in November 2018.

-Site 7 - Remedial Design is in progress and the semi-annual monitoring groundwater sampling event was conducted for VOCs and lead. Concentrations of ethylbenzene and xylenes still exceed cleanup goals. Site 7 was included in the LUC Inspection conducted in November 2018.

-Site 10A - LUC inspections were conducted in November 2018.

The agenda for the meeting is included as Attachment 2. The Navy presentations are included in Attachment 3.

Mr. Rapiejko inquired if drums were found during the recent excavation at Site 2. Ms. Fly responded that drums were not encountered during the recent excavation.

Mr. Rapiejko inquired about the cleanup process for lead at Site 7. Ms. Fly replied that lead concentrations have diminished during monitoring and there is no active cleanup for lead.

DISTRIBUTION AND APPROVAL OF MINUTES

RAB members Adrienne Esposito, Lou Cork, and Vincent Racaniello were present. The November 2018 minutes were approved. Approval of the April 2018 minutes were delayed because they were not reviewed by the RAB members and will resume with the approval during the next RAB meeting in November 2019.

COMMUNITY UPDATE

There was a brief discussion about the location of the RAB meetings and how the Navy tried to reserve the other locations mentioned in the previous RAB meeting, Captain's School, Riverhead Charter School, Riley Avenue School and the Riverhead Recreation Center. The schools did not respond to voice messages left and the Riverhead Recreation Center was currently leased out and not available.

In addition, RAB member Mr. Racaniello discussed the new state regulations for PFAS and 1,4-dioxane. Ms. Fly commented that the Navy is aware of the new regulations. Mr. Karpinski noted that the new regulations would be posted on the NYSDOH website.

TECHNICAL PROGRESS – GENERAL OVERVIEW OF INSTALLATION RESTORATION SITES

Ms. Fly introduced the technical portion of the meeting, which consisted of presentations on the upcoming remedial action at the Site 7 - Fuel Depot, a summary of investigations and refinement of the plume boundary at the Site 6A - Southern Area, a summary of the 1,4-dioxane groundwater investigations at Site 2 – Former Fire Training Area and Site 6A – Southern Area, and a summary of the Facility Wide PFAS Preliminary Assessment (PA) and Site Inspection (SI). The Navy presentations are included in Attachment 3.

TECHNICAL PROGRESS – SITE 7 FUEL DEPOT UPDATE

Mr. Forstner (Resolution Consultants) provided an update on the status of Site 7 - Former Fuel Depot. The presentation is included in Attachment 3. A summary of remedial history, system performance, post shutdown activities, design, and path forward were provided.

The Site 7 air sparge soil vapor extraction system (AS\SVE) system operated from 2005 to 2013 and was demolished in 2015. Post shutdown sampling results showed a

rebound in VOCs. In addition, non-aqueous phase liquid (NAPL) was observed at the site in October 2016. The NAPL was removed with a bailer and was no longer observed after March 2017. This NAPL was associated with underground storage tanks, which were anchored to a concrete slab approximately 17 feet below ground surface (bgs).

A design was completed and the excavation of the concrete slab and soil above and beneath the slab is planned for the summer/fall of 2019. Potential future implementation of targeted Air Sparge system is possible if dissolved VOC concentrations persist. Monitored natural attenuation (MNA) would continue to address the remaining dissolved-phase VOCs outside of excavation area.

Mr. Rapiejko inquired about the direction of the groundwater flow and if the plume was further east of Site 7. Mr. Forstner replied that the groundwater flow was to the east and Site 7 was located on the groundwater divide. Mr. Brayack added that vertical profile borings were installed to the east and to the depth of the clay unit at approximately 60 feet bgs. The plume has not migrated horizontally to the east and vertically to the clay layer. Mr. Rapiejko further inquired about why the product has not migrated. Mr. Forstner replied that product has a greater affinity to stick to soil and it can dissolve over time.

A Community member inquired if the NAPL at Site 7 contained MTBE. Mr. Forstner indicated the NAPL at site 7 did not contain MTBE. Mr. Brayack added that Site 7 was a diesel refueling station and may have had one gasoline tank, which would have been the source of lead.

Ms. Adrienne Esposito asked what the plan was for Site 7. Mr. Forstner replied that the soil and slab would be excavated and disposed off property.

Mr. Rapiejko inquired if the Navy was going to test soil eight feet below the water table to determine if contamination remained at the site. Ms. Fly replied that groundwater is approximately 16 to 17 feet bgs and samples would not be collected at the bottom of the excavation. The Navy is considering an option to install an air sparging system if VOCs persist.

Mr. Racaniello inquired about dewatering the excavation. Ms. Fly replied that the contractor is designing a treatment system to remove water during excavation. Mr. Racaniello also inquired about 1,4-dioxane or PFAS in Site 7 groundwater. Ms. Fly replied that they have not sampled groundwater for 1,4-dioxane or PFAS at Site 7.

Ms. Esposito inquired if there were ROD triggers for further action. Ms. Fly replied that the ROD remains in effect and the Navy would consider additional action if COCs in groundwater did not decrease below the cleanup levels.

TECHNICAL PROGRESS – SITE 6A - SOUTHERN AREA FENCE LINE GROUNDWATER EXTRACTION TREATMENT SYSTEM

Mr. Roy provided an update on the operation of the Fence Line Treatment System (FLTS). The presentation is included in Attachment 3. The FLTS was constructed pursuant to the OU3 ROD that was signed in May 2012. The selected remedy is comprised of LUCs and a system to extract, treat, and infiltrate groundwater within the Site 6A – Southern Area plume.

The FLTS system uses extraction wells, air stripping equipment, and infiltration galleries, in order to control the VOC plume. Construction started in October 2012 and was completed in October 2013, and system start-up occurred on October 8, 2013. Because of declining productivity in extraction well (EW)-2, it was taken off-line and a new well (EW-3) was installed and was brought on-line in February 2016. In order to address persistent elevated VOC concentrations in the vicinity of SA-MW127I, the FLTS extraction system was temporarily connected to an existing, adjacent pump test well (SA-PTW1) in July 2017 and pumping at EW-1 and EW-3 was suspended because VOC concentrations were below the maximum contaminant levels (MCLs).

Mr. Krupski inquired how the removal of VOCs in pounds is quantified. Mr. Roy replied that pounds of VOCs are calculated using mass calculations based on known concentrations and flow rate.

Mr. Rapiejko inquired if air stripping treatment removes 1,4-dioxane and PFAS and was concerned that the effluent water would release the contaminants back into groundwater. Ms. Fly replied that air stripping does not treat 1,4-dioxane and PFAS and the Navy does not test for these compounds at the treatment plant because standards have not been promulgated.

Ms. Esposito inquired if it would be better to evaluate PFAS and 1,4-dioxane in groundwater before criteria is promulgated. Mr. Brayack replied that the Navy is collecting 1,4-dioxane and PFAS data at the Southern Area and will be presenting the data this evening. Ms. Francisco added that a sample was collected from effluent for PFAS analysis and total PFOA and PFOS was approximately 35 ng/L. Ms. Fly added that the technologies to treat PFAS and 1,4-dioxane have not been fully developed yet and the Navy must make sure the treatment systems are going to be effective. Mr. Krupski inquired if the current infrastructure for the fence line groundwater extraction treatment system at Site 6A could be used to treat 1,4-dioxane and PFAS. Mr. Brayack replied that the treatment system treated VOCs and the contaminants have decreased by over 90%. He further added that if standards for 1,4-dioxane and PFAS are promulgated, the Navy will follow the investigation process and evaluate alternatives for treatment.

Community members who reside south of the golf course inquired as to why their drinking water has not been tested when they live by the Peconic River and further commented that they did not receive bottled water from the county. The community members also noted that their drinking water wells are part of the MTBE study by NYSDEC. Ms. Fly replied that their wells are not located downgradient of the Navy's areas of concern (AOCs) in the Preliminary Assessment, so the county needed to answer the question about drinking water.

A community member inquired about the status of the fence line treatment system. Mr. Roy stated the FLTS is currently shutdown because the Navy has met standards and are only treating clean water.

TECHNICAL PROGRESS - SITE 6A –SOUTHERN AREA LONG TERM MONITORING AND PLUME SHIFT EVALUATION

Ms. Francisco then presented results from the fall 2018 long term monitoring (LTM) and the 2018/2019 on property plume shift evaluation. The presentation is included in Attachment 3.

Annual LTM was conducted at Site 6A – Southern Area in Fall 2018. VOCs in two groundwater monitoring wells on property exceeded the NYSDOH MCLs. Concentrations of VOCs in off-property groundwater continue to exceed NYSDOH MCLs but are less than those observed in 2011. VOCs in pore water and surface water did not exceed ecological benchmark values.

During the 2018/2019 on property plume shift evaluation, VOCs were detected above the NYSDOH MCLs on-property east of the 2011 plume boundary and north of the property boundary. VOCs in this area were observed in groundwater at a depth of 30 to 40 feet bgs near monitoring well SA-MW30I and 40 to 50 feet bgs further downgradient. However, VOCs were not detected close to the property boundary/ Fence Line Area. From 2011 to 2018, the plume reduced from 375 pounds of VOCs to 42 pounds of VOCs. Of note, the 500 µg/L contour has been removed from the 2018 plume boundary.

A community member inquired that if the 2018 plume boundary on property has not reached the fence line area yet, is there a time line of when VOCs will migrate off property. Ms. Francisco replied that VOCs have not been detected downgradient of 2018 plume boundary at the fence line and that VOCs could migrate towards this area or attenuate on property.

Mr. Racaniello inquired whether the infiltration galleries caused the plume to shift. Mr. Brayack replied that concentrations in wells have varied in the past, possibly due to droughts and other regional changes. Off property, Donahue Pond acts as a dam and

forces the plume to flow around it. Flow net studies show the plume will not flow past river.

Mr. Krupski inquired about if there is a known quantity of contamination that was released to the source area. Mr. Brayack replied that it was most likely 15 gallons over a 40 to 50 year time period or equivalent to someone spilling one cup per month over 40 years. VOCs are very persistent at Site 6A – Southern Area.

TECHNICAL PROGRESS - 1,4-DIOXANE GROUNDWATER INVESTIGATION AT SITE 2 – FORMER FIRE TRAINING AREA AND SITE 6A – SOUTHERN AREA

Ms. Francisco then presented groundwater sampling results for 1,4-dioxane from 2018 at Site 2 – Former Fire Training Area and Site 6A- Southern Area. The presentation is included in Attachment 3.

Groundwater samples for 1,4-dioxane analysis were collected during the Fall 2018 VOC sampling events. The current NYSDOH MCL for 1,4-dioxane defaults to 50 µg/L. The New York State Drinking Water Quality Control Council recommended the State to adopt an MCL of 1.0 µg/L. At Site 2 and Site 6A, 1,4-dioxane concentrations did not exceed the current MCL of 50 µg/L. Results for 1,4-dioxane in groundwater from 7 of 25 wells exceed the recommended MCL of 1.0 µg/L.

TECHNICAL PROGRESS – PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) FACILITY WIDE PRELIMINARY ASSESSMENT (PA) AND SITE INSPECTIONS (SI)

Ms. Francisco provided an update on the Facility-Wide Preliminary Assessment (PA) and the Site Inspections (SIs). The PA and SIs are used to evaluate the presence or absence of PFAS throughout the facility. The presentation is included in Attachment 3.

As part of the PA process, background research including literature searches, interviews of site personnel and site reconnaissance were conducted to evaluate potential PFAS AOCs. The PA recommended further action at 10 areas, in addition to the previously identified Aircraft Paint Hangars and Site 2 – Former Fire Training Area. During the PA, potential off property private drinking water wells were identified downgradient of the 10 AOCs. In Fall 2018, 14 wells were tested for PFAS, and results were all below the EPA lifetime health advisories. A general description of the sampling plan at the AOCs was discussed.

Ms. Esposito inquired if the Navy has tested south of the 1-mile buffer line. Ms. Francisco replied it is Navy policy to test to the 1-mile buffer unless the results within the study area exceed the EPA lifetime health advisories.

Ms. Esposito commented that foam (AFFF) rooms that do not have documented releases could still be a source of PFAS contamination as it has been seen at other facilities. Ms. Fly concurred and replied that the buildings with foam rooms were being retained for further PFAS investigation under the Facility Wide SI.

Mr. Shapiro inquired if hoses were hooked up to the tanks of AFFF in the foam room and if a release could occur further from the building. Mr. Brayack replied that the piping extending from the foam rooms to areas throughout the hangars where fires would be expected to occur.

Community members discussed plane crashes that occurred in the southeast buffer area in 1972 and the early 1960s. Ms. Francisco commented that the exact location of these crashes is unknown and may not have been accessible by crash crews equipped with AFFF. She further explained that AFFF containing PFAS was not routinely used by the military until the 1970s.

Mr. Rapiejko inquired about the number of sites that were part of the PA but were not being investigated for PFAS. Ms. Francisco replied the Navy has reviewed available information for buildings and areas throughout the entire facility and the Navy is moving forward with investigations at 10 areas where AFFF has been stored or released to the environment. Mr. Brayack confirmed that all sites that were potentially impacted by PFAS are included in the PA and will be investigated during the Facility Wide PFAS SI.

A community member inquired about the number of parcels identified in the PFAS buffer area for the drinking water investigation and if drinking water samples can still be collected from private wells. Ms. Francisco replied that 53 parcels were identified in the study area and of those parcels, 20 parcels have private drinking water wells. A total of 14 drinking water wells were tested for PFAS in 2018. If property owners within the study area would like their well tested, they can contact the Navy. Ms. Fly added that the Navy will be offering to test the drinking water from private wells within the 1-mile designated area again in the fall of 2019. Ms. Fly added that the decision to extend the 1-mile boundary will be based on the results. If the PFAS results exceed the EPA lifetime health advisories of 70 ng/L the Navy will step out to private drinking water wells in half-mile increments. All the 2018 results were below the EPA lifetime health advisories. If a PFAS standard is promulgated in New York, then the Navy policy will be reevaluated.

Mr. Krupski further inquired if it would be beneficial to test homes outside the 1-mile buffer to verify the absence of PFAS. Ms. Fly replied that the Navy is focusing on investigating the areas of concern and confirming the direction of groundwater flow.

A community member inquired if businesses located on the former Northrop Grumman facility have city water. Ms. Fly replied that businesses on former NWIRP property

(Northrop Grumman) and the Peconic River Sportsman's Club is on Town of Riverhead water.

Mr. Krupski inquired if the Navy is collecting sediment samples in Peconic River. Ms. Fly replied the Navy is not collecting sediment samples at the Peconic River at this time.

A community member inquired about origin of the 1-mile radius. Ms. Francisco replied that the 1-mile boundary is Navy policy and was based on the areas identified in the PA.

A community member inquired about the water being pumped at the Site 6A – Southern Area treatment plant and if the concentrations of VOCs were below the MCLs. Mr. Brayack replied that influent results were non-detect and that the treated groundwater was discharged back to the aquifer through infiltration galleries.

Mr. Shapiro inquired if AFFF was used at the Aircraft Paint Hangars. Mr. Brayack replied that the Aircraft Paint Hangars were equipped with a deluge system that contained AFFF. Ms. Fly also responded that the work plan for the Facility Wide SI included the Aircraft Paint Hangars and work would be conducted beginning in the spring.

Community members commented that they lived south of Swan Pond and inquired about why their drinking water was not tested for PFAS. Ms. Fly replied that their homes are not downgradient of the potential PFAS areas and therefore outside of the drinking water testing area. Ms. Francisco briefly explained that groundwater flow from Site 2 has been studied and flows to the south east. Further studies would be conducted facility wide to confirm the location of the groundwater divide and where the groundwater flows to the east and north east. Ms. Fly explained that wells would be installed along River Road to investigate PFAS off property and downgradient of Site 2 – Former Fire Training Area. Mr. Karpinski added that the NYSDOH reviews all the data and if there was any indication these homes would be impacted; the Navy would be required to test the drinking water for PFAS.

Mr. Krupski inquired about testing 1-mile from Site 2 – Former Fire Training Area. Ms. Fly replied that there was one private drinking water well and the result was non-detect during the past five rounds of sampling.

GENERAL DISCUSSION AND CLOSING REMARKS

At the conclusion of the meeting, an opportunity to ask general questions about the site was provided. No further questions were posed. Ms. Fly thanked the attendees for their participation. The next RAB meeting was planned for Fall 2019, with a final date and location to be confirmed. The meeting was then adjourned.

LIST OF ACRONYMS AND ABBREVIATIONS

AFFF	Aqueous Film Forming Foam
AOC	Area of Concern
AS/SVE	Air Sparge/Soil Vapor Extraction
bgs	Below ground surface
EPA	Environmental Protection Agency
FLTS	Fence Line Treatment System
LTM	Long Term Monitoring
LUC	Land Use Control
MCL	Maximum Contaminant Level
MEC	Munitions and Explosives of Concern
ng/L	Nanograms per Liter
NAPL	Non-aqueous phase liquid
NWIRP	Naval Weapons Industrial Reserve Plant
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OU	Operable Unit
PA	Preliminary Assessment
PFAS	Per- and Polyfluoroalkyl Substance
PFBS	Perfluorobutane Sulfonic Acid
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonate
PRSC	Peconic River Sportsman’s Club
RAB	Restoration Advisory Board
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
RSL	Regional Screening Level
SCDHS	Suffolk County Department of Health Services
SI	Site Inspection
TCA	1,1,1-Trichloroethane
TCE	Trichloroethene
µg/L	micrograms per Liter
UST	Underground Storage Tank
VOC	Volatile Organic Compound

ATTACHMENT 1

APRIL 16, 2019 RAB MEETING SIGN-IN SHEET

Sign-in List

Name (Print)	Phone and/or email or address if interested in being on the mailing list	Affiliation	How did you hear about meeting?
Al Krupski	[redacted]	S.C. Legislature	
Morgan McDonnell		Arcadis	
Melissa Cushing		TT	
JC Kreidler		Navy	
Lora Fly		Navy	
Kristi Francisco		TT	
Dave Brayack		TT	
Chris Morris		GET	
Adrienne Esposito		BAB	
May Zegarelli		TOR	
Bess Bethel		TT	
Drew Dillingham		TOR	
Amy Tuckett		SCDHS	
Toni Pawson		Resident	

50th RAB Meeting for NWIRP Calverton
April 16, 2019
Sign-in List

Name (Print)	Phone and/or email or address if interested in being on the mailing list	Affiliation	How did you hear about the meeting?
David Raymond DEC Region 1 (for Walter Parish)		DEC (Stony Brook	
Robert Forstner		Reslien	
Lou Cork		R.A.B	
Henry Wilkie		DEC	
Steve Karpinski		DOH	
Andrew Rapiejko		SCDHS	
Stephen Fury		KGS	
Katherine Garaendi	[redacted]	SCHD	
Robert Coraendi	[redacted]	Exeav	
[illegible]			
Ron Mattz			
Steve Shapiro	[redacted]	WR Civic Assoc	
Vincent Rocandelli	[redacted]	RAB	
Robert Porsche	[redacted]	ARCADIS	
Kelly Mc Clinchy	[redacted]	community member	

ATTACHMENT 2

APRIL 16, 2019 RAB MEETING AGENDA

Agenda

Restoration Advisory Board
Naval Weapons Industrial Reserve Plant Calverton

April 16, 2019

Riverhead Seniors Center, Riverhead NY

7:00 p.m.

Welcome and Agenda Review
Lora Fly, NAVFAC Mid-Atlantic

Distribution of Minutes
All Members

Community Update
Vincent Racaniello, RAB Co-chair

Technical Progress

General Overview of ER Sites
Lora Fly, NAVFAC Mid-Atlantic

Site 7 – Fuel Depot Update
Robert Forstner PE, Resolution Consultants

Site 6A – Southern Area, Fence Line Groundwater Extraction Treatment System Update
Stephane Roy, KOMAN Government Solutions

Site 6A – Southern Area, Long Term Monitoring and Plume Shift Evaluation Summary
Kristi Francisco, Tetra Tech

1,4-Dioxane Groundwater Investigation
Kristi Francisco, Tetra Tech

Facility Wide Per- and Polyfluoroalkyl Substances (PFAS) Preliminary Assessment (PA) and Site Inspections (SI) Summary
Kristi Francisco, Tetra Tech

Closing Remarks
Lora Fly, NAVFAC Mid-Atlantic

Presenters will be available after the program for questions.

ATTACHMENT 3

NAVY PRESENTATIONS – APRIL 16, 2019 RAB MEETING

Agenda

Restoration Advisory Board
Naval Weapons Industrial Reserve Plant Calverton

April 16, 2019

Riverhead Seniors Center, Riverhead NY

7:00 p.m.

Welcome and Agenda Review
Lora Fly, NAVFAC Mid-Atlantic

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Vincent Racaniello, RAB Co-chair

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Lora Fly, NAVFAC Mid-Atlantic

Site 7 – Fuel Depot Update
Robert Forstner PE, Resolution Consultants

Site 6A – Southern Area, Fence Line Groundwater Extraction Treatment System Update
Stephane Roy, KOMAN Government Solutions

Site 6A – Southern Area, Long Term Monitoring and Plume Shift Evaluation Summary
Kristi Francisco, Tetra Tech

1,4-Dioxane Groundwater Investigation
Kristi Francisco, Tetra Tech

Facility Wide Per- and Polyfluoroalkyl Substances (PFAS) Preliminary Assessment (PA) and Site Inspections (SI) Summary
Kristi Francisco, Tetra Tech

Closing Remarks
Lora Fly, NAVFAC Mid-Atlantic

Presenters will be available after the program for questions.

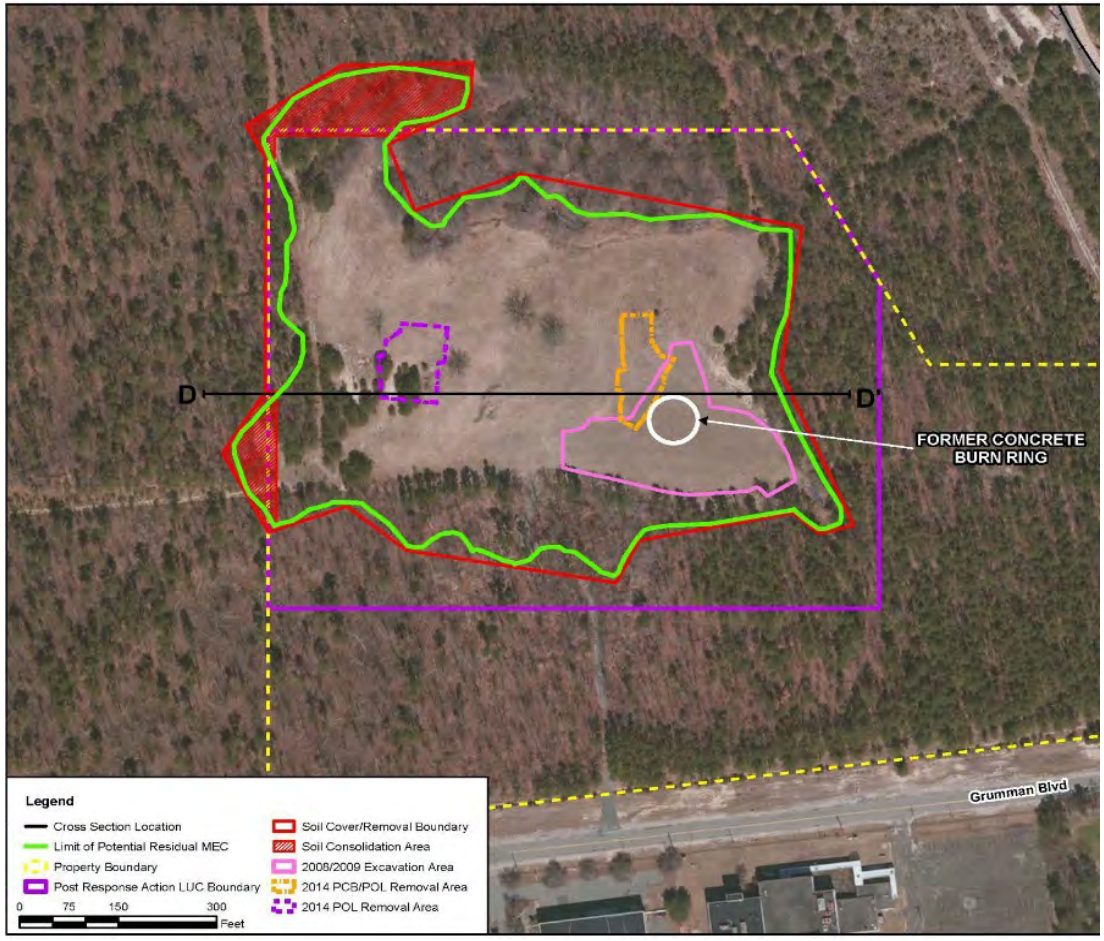
Environmental Restoration
Program Status and Update

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP)
CALVERTON, LONG ISLAND, NEW YORK

4/16/2019

Site 2 – Former Fire Training Area
Remedial Action for Potential Munitions

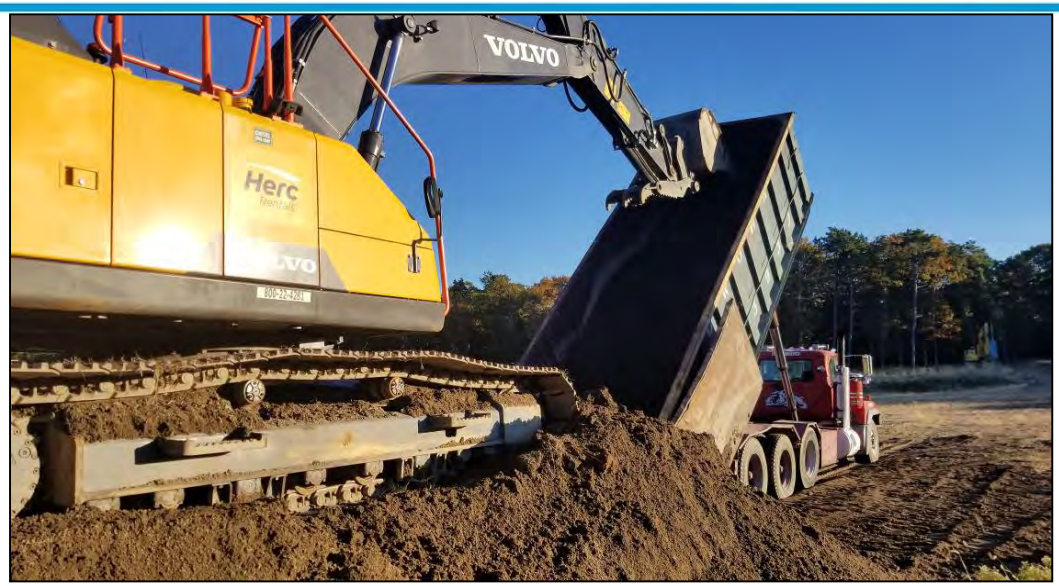
- Record of Decision (ROD) (Summer 2018)
- Remedial Action Work Plan (Summer 2018)
- Construction (Started end of October 2018)
- Fieldwork concluded in March 2019 which included:
  - –Excavation and Screening
    - Western Removal Area
    - Northern Removal Area
  - –Investigation of previously identified anomalies located outside of the cover
  - –Site restoration



Site 2 – Former Fire Training Area

Remedy:

- Consolidation of off-property material
- Regrading, surface, clearance, and addition of top soil, and vegetation to stabilize the surface
- Land Use Controls to restrict future use of the site
- Maintenance as required for erosion control



Site 2 – Former Fire Training Area Photos

- Digital Geophysical Mapping performed to confirm the presence or absence of munitions

Site 2 – Former Fire Training Area

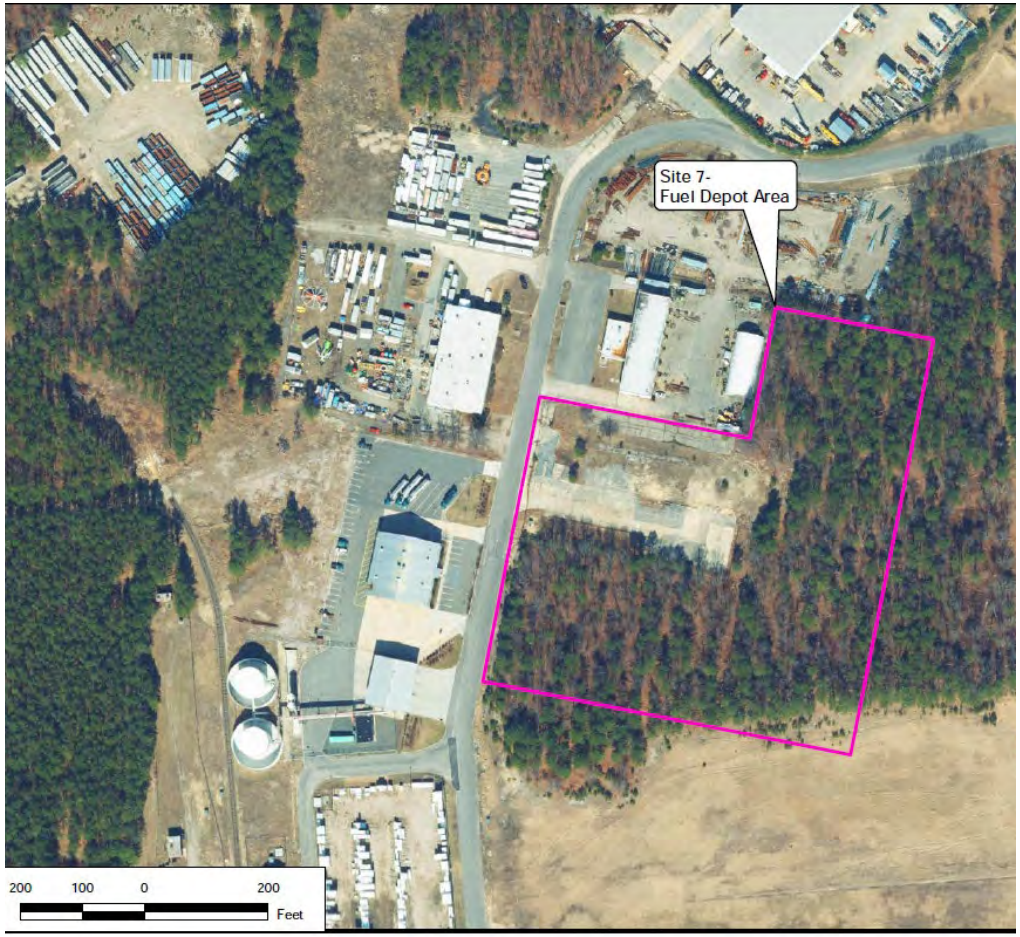
- During the excavation of the central portion of Northern Removal Area, a 12-foot deep pit filled with metal and concrete debris was encountered

Site 2 – Former Fire Training Area

- After recontouring the southern embankment with fill, the drop-off is now a gradual slope

Site 7 Semi-Annual Groundwater Monitoring Program

- 2003 ROD selected remedy was the installation and operation of an air sparge and soil vapor extraction (AS/SVE) system.
- November 2013 the system was shut down
- Long Term Monitoring Program for groundwater in place
- Currently 11 monitoring wells are sampled each Spring and Fall
  - –7 monitoring and SVE wells to evaluate if cleanup goals are met
  - –4 sentry monitoring wells to confirm contaminant is not migrating offsite



Site 7 Semi-Annual Groundwater Monitoring Program

- Benzene, freon 113, naphthalene, 2-methyl-naphthalene, toluene, and total lead were not detected above the cleanup goals at any monitoring location during either event
- The following constituents were detected above the cleanup goals
  - –Ethylbenzene was detected at four locations in October
  - –Ethylbenzene was detected at four locations in April
  - –Xylenes were detected at three locations in October
  - –Xylenes were detected at four locations in April

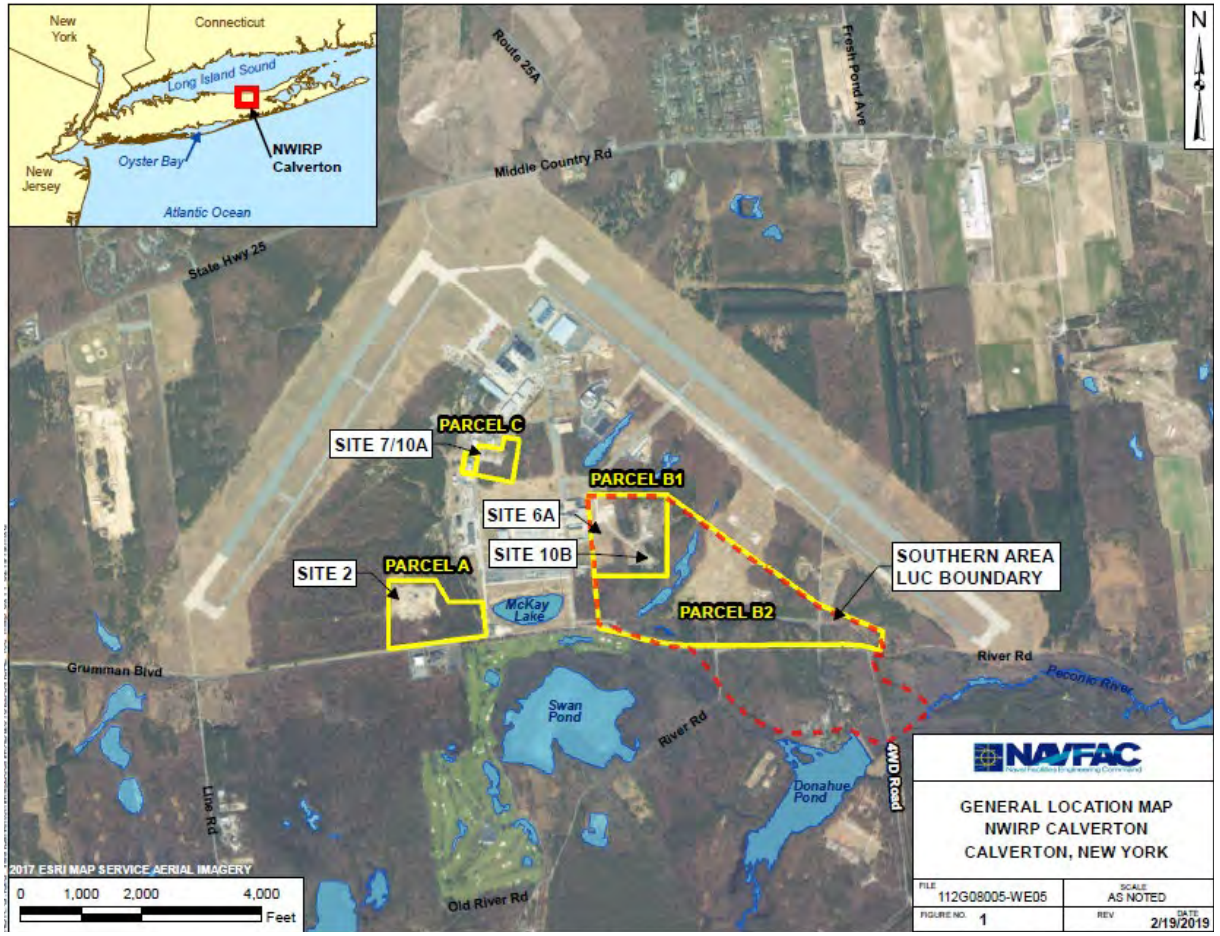
Cleanup Goals

Benzene	Ethyl-benzene	Freon 113	Naph-thalene	Toluene	Total Xylenes	2-Methyl-naphthalene	Total Lead
5	*5*	*5*	*50*	*5*	*5*	*50*	*15*

Land Use Control Inspections

- LUCs are used at sites where contaminants are left in place at levels that do not allow for unrestricted use or unlimited exposure and ensure that any remaining contaminants do not pose an unacceptable risk to human health

- LUCs are inspected annually to support the Five-Year Review that is required by statute



Land Use Control Inspections

Site 6A, Looking North West

Site 7 – Former Fuel Depot, Looking East

- Property owners were contacted to determine if groundwater extraction wells for potable water use or buildings were constructed
- No new construction of potable wells or buildings in 2018

Site 10A, Concrete Cap

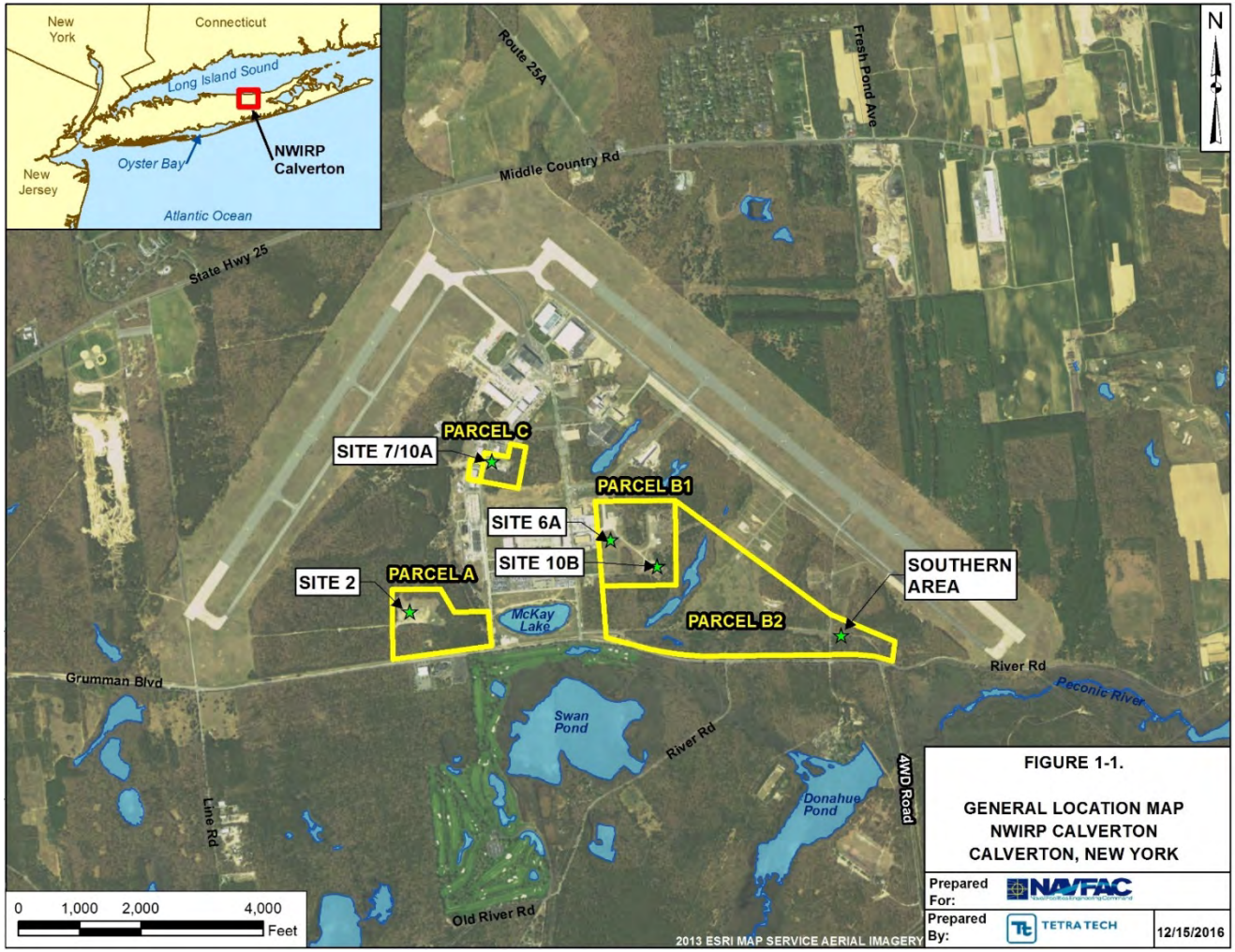
- LUC inspections conducted November 2018
- All LUCs were properly implemented
- Next LUC: Fall 2019

SITE 7 – FUEL DEPOT UPDATE

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT
(NWIRP) CALVERTON, LONG ISLAND, NEW YORK

April 16, 2019

Introduction

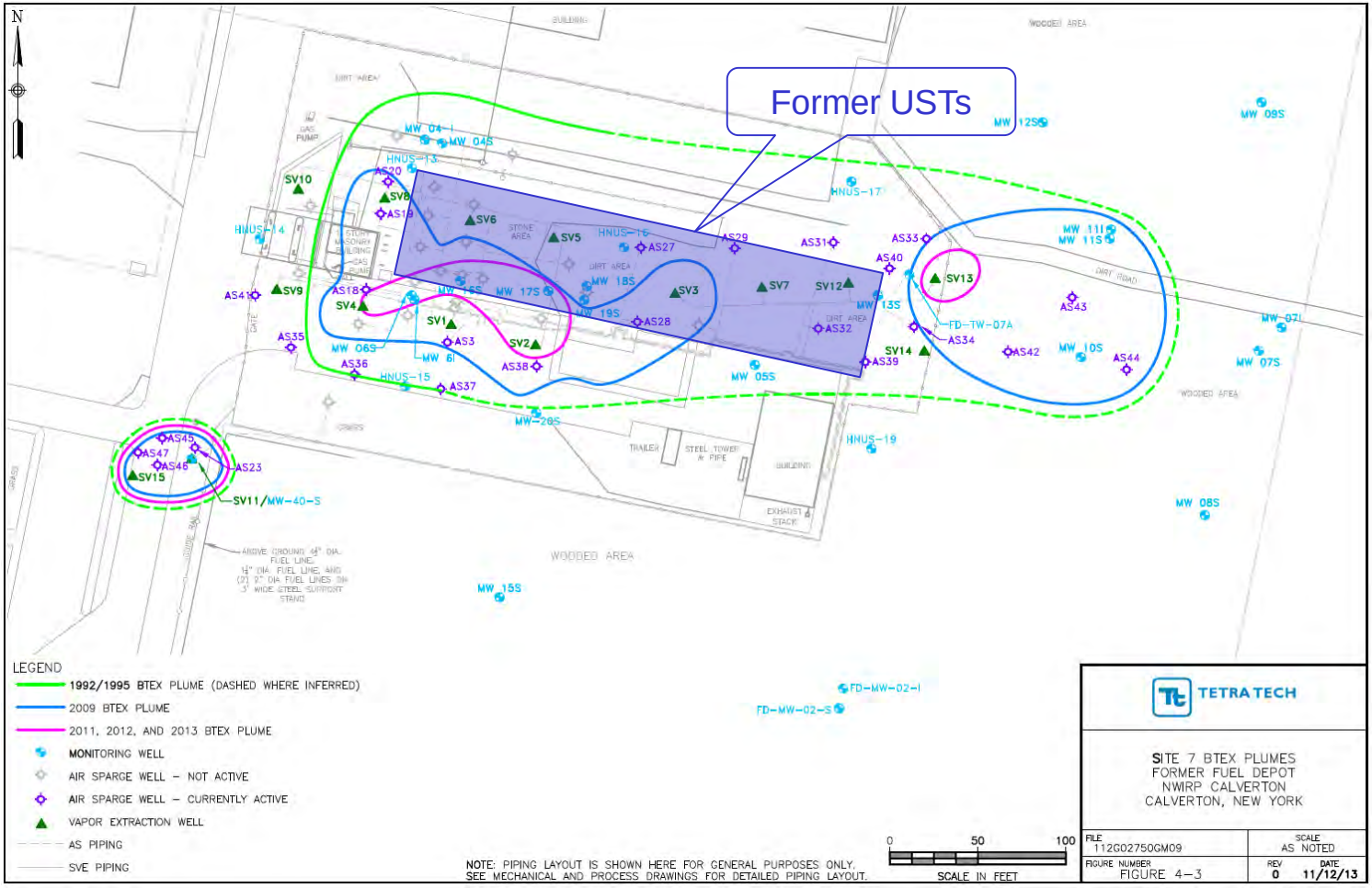


Site 7 Remedial History

- Air sparge (AS) and Soil Vapor Extraction (SVE) system started operation in 2005 (pilot)/2006 (full scale)
- Operated seasonally (April to December)
- Three modifications made to the system to improve performance
- System reached end of its functional life November 2013
- Shutdown and monitoring began per the Performance and Shutdown Evaluation document (November 2013)

System Performance

1992/1995, 2009, and 2011 to 2013 Plume Boundaries



Post-Shutdown Activities

- Quarterly and then semiannual sampling continued as required
- Rebound and persistent VOC observations led to consideration of supplemental options
- Observation of NAPL during October 2016 sampling event
  - MW-17S – 1.12 ft. observed in October 2016, decreased to 0.14 ft. in February 2017, and 0.21 ft. in March 2017
  - MW-19S – 1.05 ft. observed in November 2016, not encountered in February/March 2017
  - MW-16S – 0.60 ft. observed in January 2017, not encountered in February/March 2017
  - No NAPL observed in any wells since March 2017

Post-Shutdown Activities (cont'd)

- Fingerprinting identified NAPL as weathered fuel
- Reappearance of NAPL correlated to drop in groundwater table
  - Indicates NAPL was retained in a "smear zone" extending from approximately 16 feet (bottom of the foundation slab) to 23 feet below existing grade (historic low groundwater elevation)
- Remedial options reconsidered
  - Monitored natural attenuation (MNA)
  - Targeted AS or AS/SVE
  - Excavation
  - Excavation with AS or AS/SVE
- Presence of UST foundation slab at depth limits options
  - Targeted AS or AS/SVE on its' own constrained by buried slab
  - Excavation considered most reliable option

Design and Path Forward

- Excavation design includes:
  - Temporary excavation and stockpiling of clean backfill placed after UST removal action
  - Removal of the buried UST foundation slab (top of slab ~15 feet below ground)
  - Removal and treatment and/or disposal of NAPL-impacted soil (the “smear zone”); estimated volume 1,250 CY
  - Replacement of NAPL-impacted soil with new clean fill and oxidants (to address residual NAPL), and replacement of stockpiled backfill for remainder of excavation
  - Surface restoration
  - Temporary sheeting and on-site water treatment for dewatering to allow for excavation of impacted soil “in the dry”
- Design has been completed and bid out
- Discussions with regulators under way to finalize action plan

Design and Path Forward (cont'd)

- Summer/fall 2019 for excavation
- Continuation of MNA with long-term monitoring to address remaining dissolved-phase VOCs outside of excavation area
- If needed, targeted AS or AS/SVE will be considered if dissolved VOC concentrations persists
  - Improved air flow after removal of UST foundation slab would increase effectiveness of AS or AS/SVE

SITE 6A - SOUTHERN AREA FENCE LINE GROUNDWATER EXTRACTION TREATMENT SYSTEM

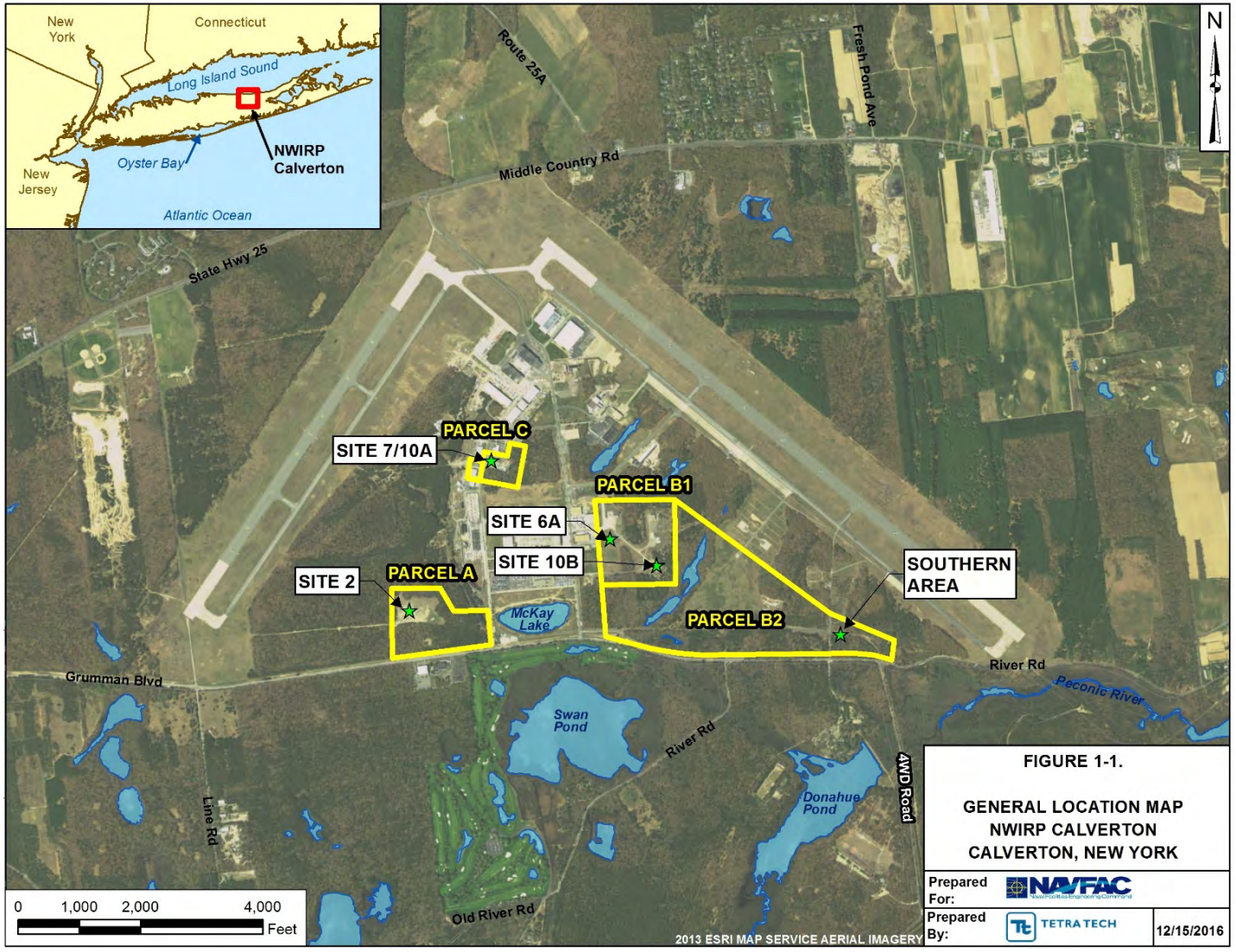
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP) CALVERTON, LONG ISLAND, NEW YORK

April 16, 2019

Presentation Agenda

- System Overview
- System Performance and Summary Activities

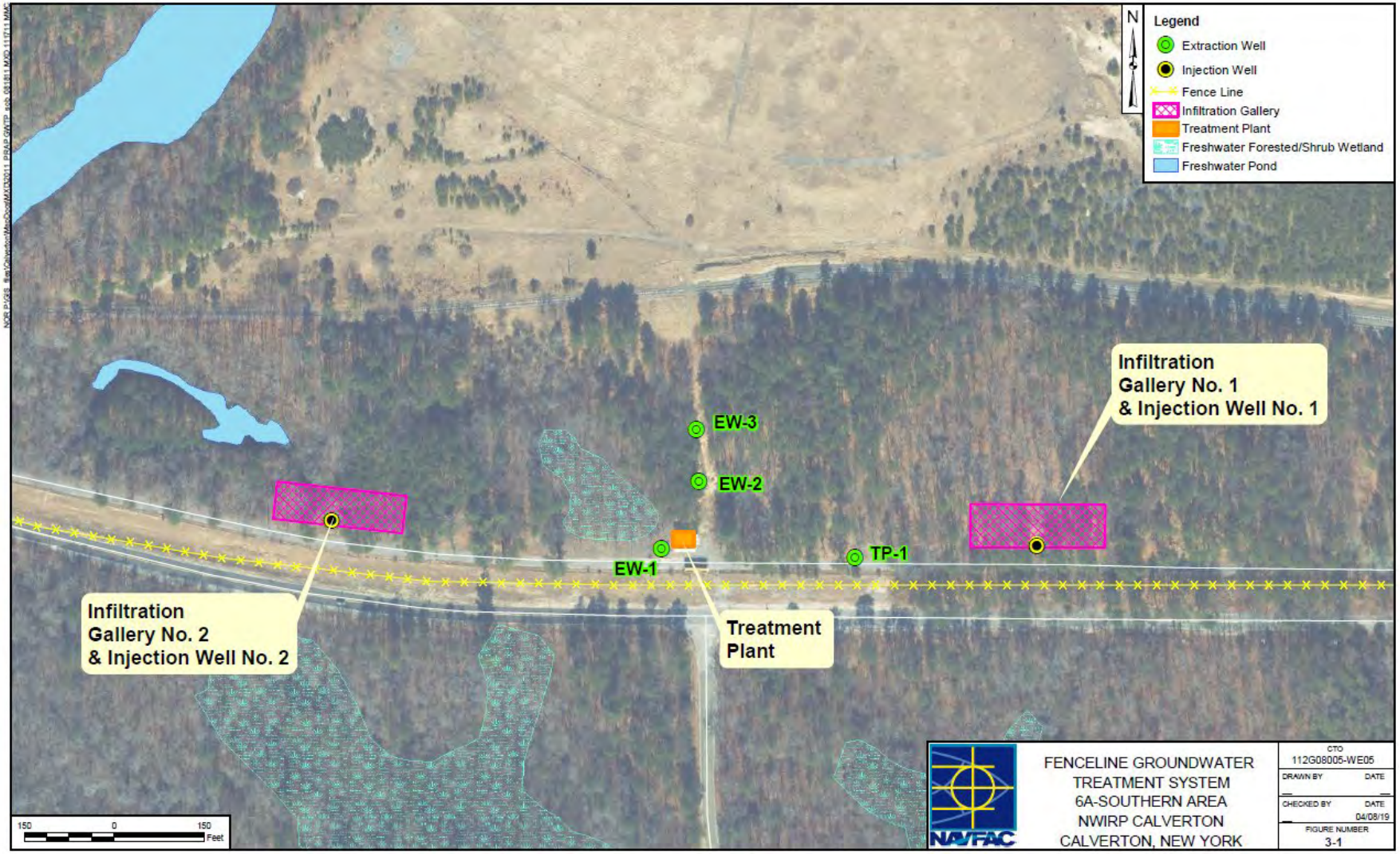
Site Layout


New York
Connecticut
Long Island Sound
NWIRP Calverton
Oyster Bay
New Jersey
Atlantic Ocean
Route 25A
Fresh Pond Ave
Middle Country Rd
State Hwy 25
PARCEL C
SITE 7/10A
PARCEL B1
SITE 6A
SITE 10B
SITE 2
PARCEL A
SOUTHERN AREA
McKay Lake
PARCEL B2
Grumman Blvd
River Rd
Peconic River
Swan Pond
River Rd
Donahue Pond
4WD Road
Line Rd
Old River Rd
N
0 1,000 2,000 4,000 Feet
2013 ESRI MAP SERVICE AERIAL IMAGERY
FIGURE 1-1.
GENERAL LOCATION MAP
NWIRP CALVERTON
CALVERTON, NEW YORK
Prepared For: NAVFAC
Prepared By: TETRA TECH
12/15/2016

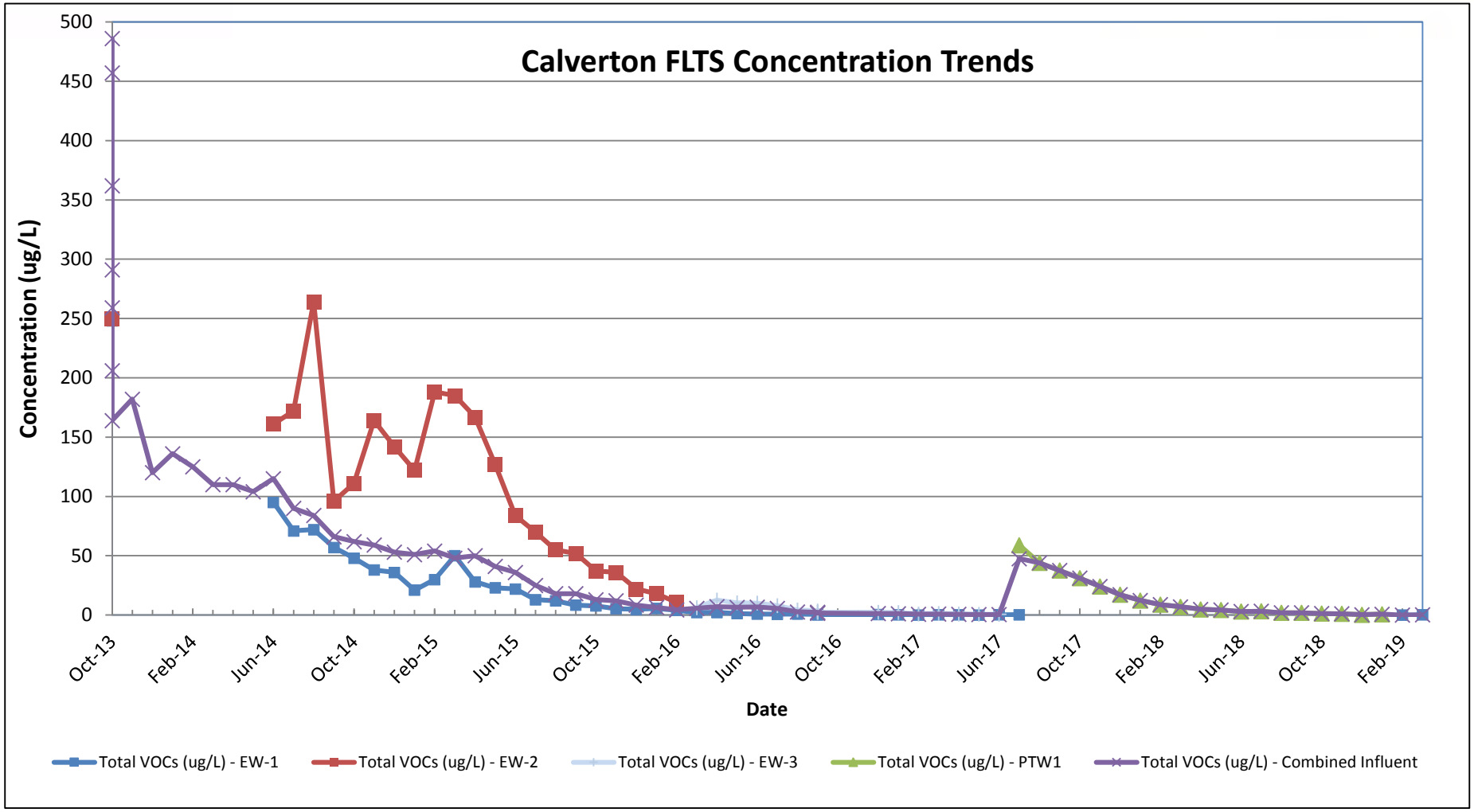
Fence Line Treatment System Overview

- Record of Decision in May 2012.
- Selected remedy for Fence Line Area – Land use controls and monitoring with extraction, treatment, and infiltration. System started up on 8 October 2013.
- Fence Line Treatment System (FLTS) overview:
  - Four extraction wells (EW-1, EW,2, EW-3 and SA-PTW1), design capacity up to 100 gpm.
  - Volatile Organic Compounds (VOCs) removed via air stripping -Treated groundwater injected into subsurface meeting Maximum Contaminant Levels (MCLs).
- Pumping at EW-1/EW-2/EW-3 suspended as VOC concentrations are below MCLs.
- SA-PTW1 temporary connection to FLTS in July 2017 to treat persisting VOCs in the vicinity of nearby well SA-MW127i.
- Groundwater extraction suspended at SA-PTW1 in January 2019 and extraction well EW-1 reactivated to determine whether VOC concentrations have reemerged at this location.

Fence Line Treatment System Overview



Fence Line Treatment System Operation



Fence Line Treatment System Performance Summary Activities

- System is in compliance with all discharge goals.
  - VOC removal efficiencies of >99%.
  - 54.49 lbs of VOCs removed since system start up in October 2013.

- Groundwater concentrations in Area have met shut-down criteria.
  - FLTS Influent - individual Site-related concentrations < 5ug/L.
  - FLTS Area Monitoring wells - individual Site-related concentration < 50 ug/L.
  - Influent analytical results below MCLs since April 2018.
  - 1,1-DCA = ND (March 2019).

SITE 6A – SOUTHERN AREA
LONG TERM MONITORING AND PLUME SHIFT EVALUATION

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP)
CALVERTON, LONG ISLAND, NEW YORK

04/16/2019

Site 6A – Southern Area
2018 / 2019 Field Activities

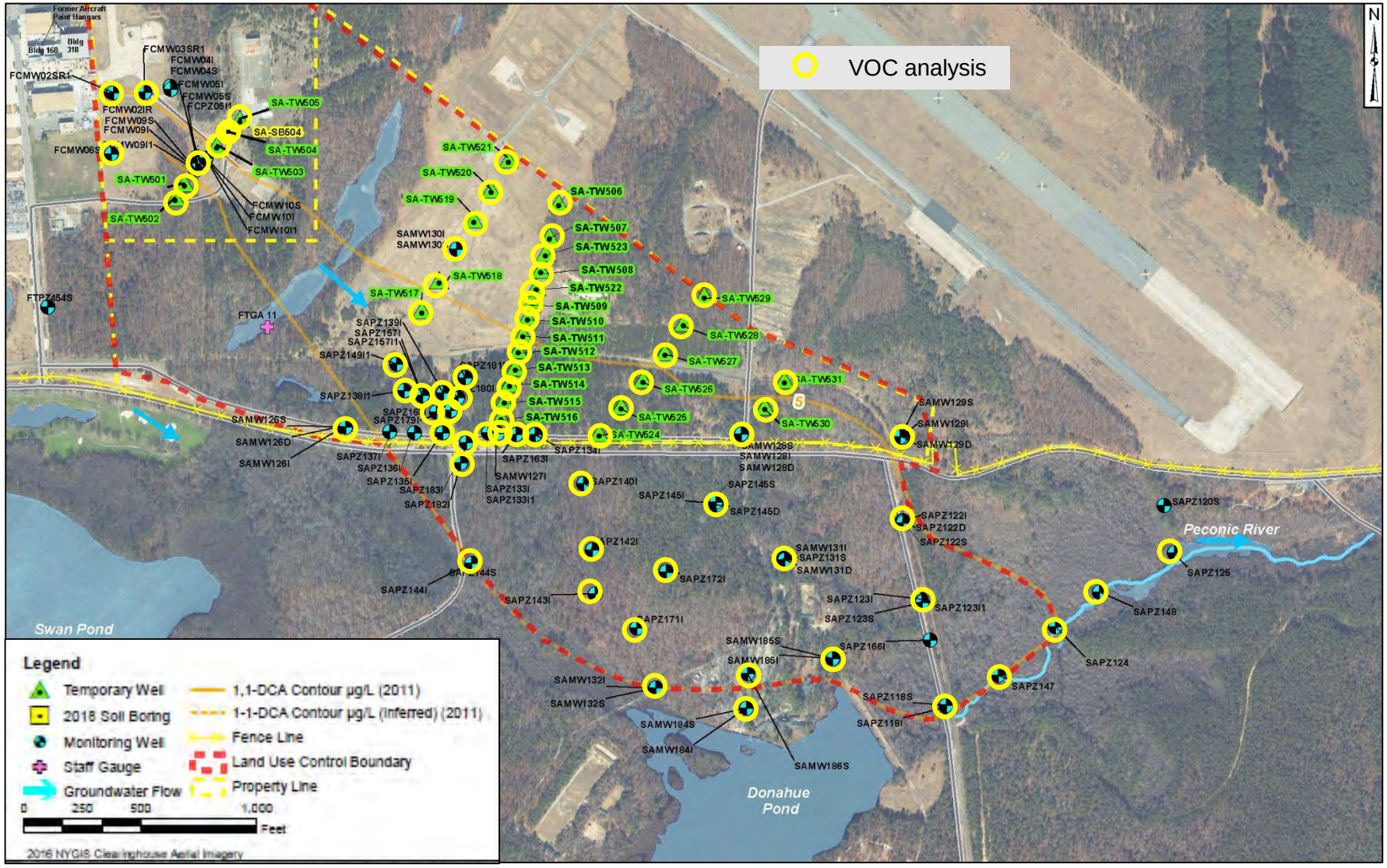
Fall 2018 – Long Term Monitoring for volatile organic compounds (VOCs)

- Water Level Measurements
  - 73 monitoring wells throughout Site 6A – Southern Area to evaluate groundwater flow direction
- Groundwater Sampling
  - 60 monitoring wells; monitor migration and attenuation of VOCs
- Surface Water/Porewater Sampling
  - 4 surface water and 4 porewater sample locations along the Peconic River

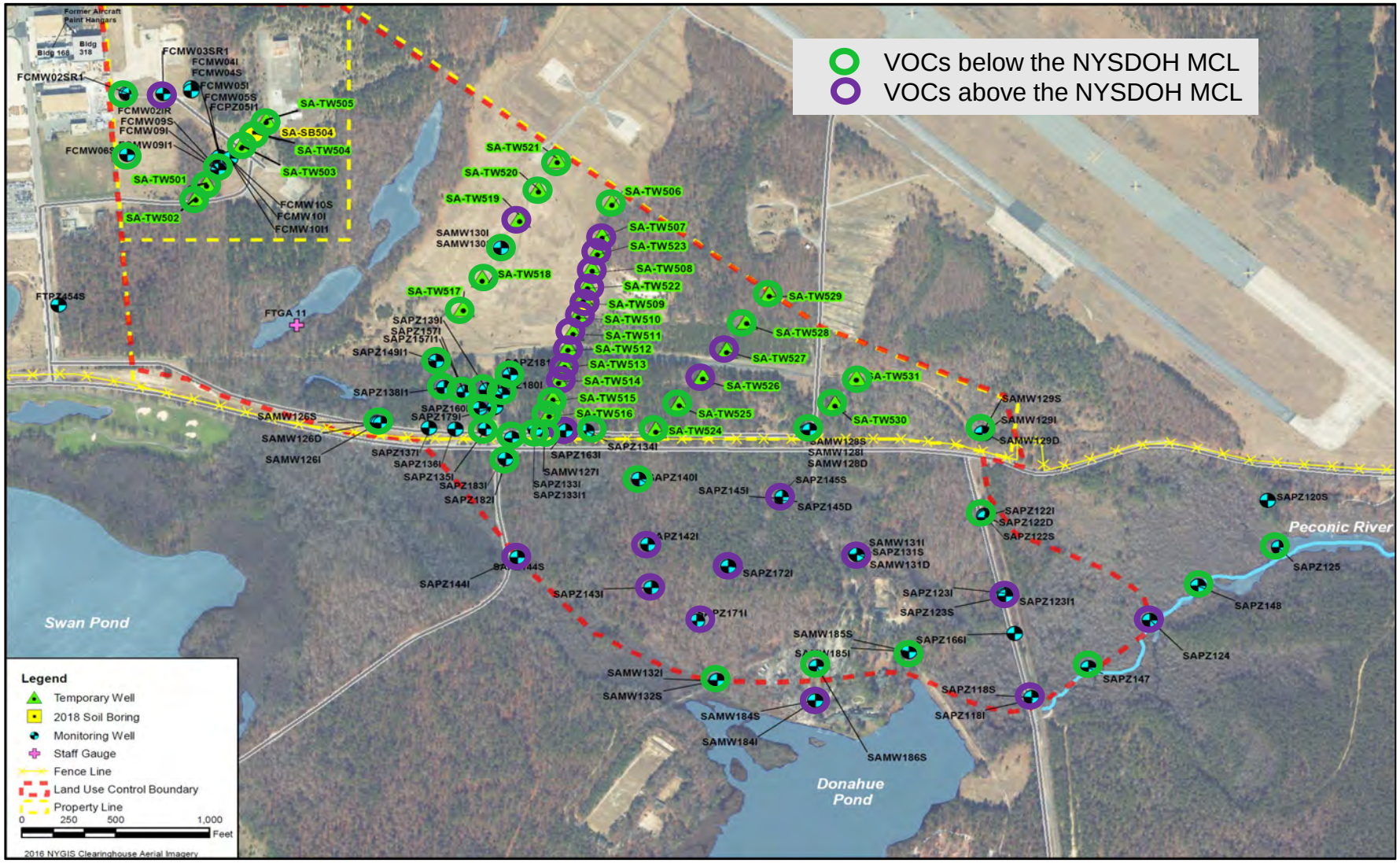
Winter 2018/2019 – Plume Shift Evaluation

- Groundwater Sampling
  - 14 monitoring wells; monitor VOCs at the property boundary
- Groundwater Grab Sampling
  - 95 VOC samples from 31 locations (1 to 4 depths)

Site 6A – Southern Area
2018 and 2019 VOC Sample Locations



Site 6A – Southern Area
VOC Results

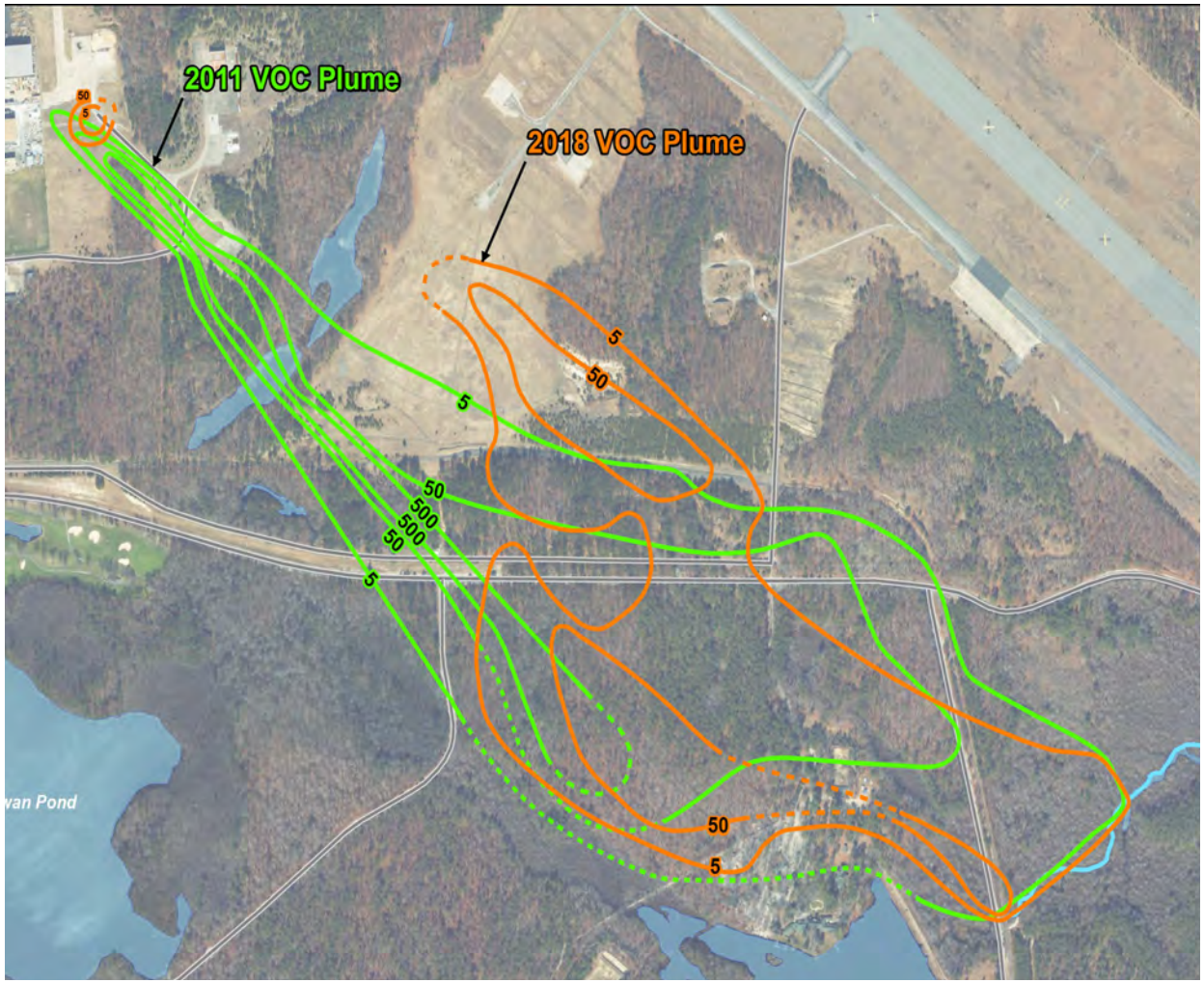


Site 6A – Southern Area
VOC Results

- Former Fuel Calibration Area
  - In one monitoring well, VOCs exceed New York State Department of Health Services (NYSDOH) Maximum Contaminant Levels (MCLs)
- On Property and Downgradient
  - In one monitoring well, VOCs exceed the NYSDOH MCL
  - VOCs in groundwater grab samples exceed the MCLs at a depth of 30 to 40 feet below ground surface (bgs) and 40 to 50 feet bgs further downgradient
- Off Property
  - VOCs in groundwater exceed MCLs
  - VOCs in pore water and surface water do not exceed ecological benchmark values

Site 6A – Southern Area
2011 and 2018 VOC Plume

- 2011 Plume (375 pounds)
  - On property: 93 pounds
  - Off property: 282 pounds
- 2018 Plume (42 pounds)
  - On Property: 14 Pounds
  - Off Property: 28 Pounds
- Reduction
  - Reduced by 333 pounds through source area removal, biostudy, the treatment system, and attenuation
  - 500 micrograms per liter (µg/L): 11.6 to 0 acres
  - 50 µg/L: 95 to 20 acres
  - 5 µg/L: 121 to 86 acres



Site 6A – Southern Area

- Questions?

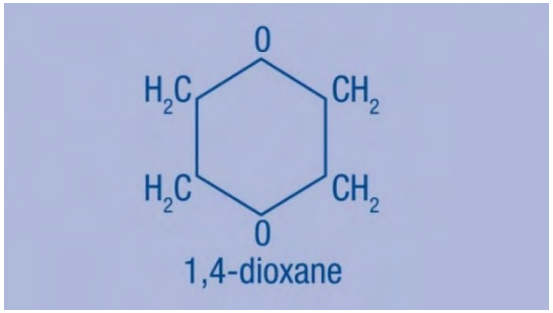
1,4-DIOXANE GROUNDWATER INVESTIGATION
SITE 2 – FORMER FIRE TRAINING AREA
SITE 6A – SOUTHERN AREA

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP)
CALVERTON, LONG ISLAND, NEW YORK

4/16/2019

1,4-Dioxane

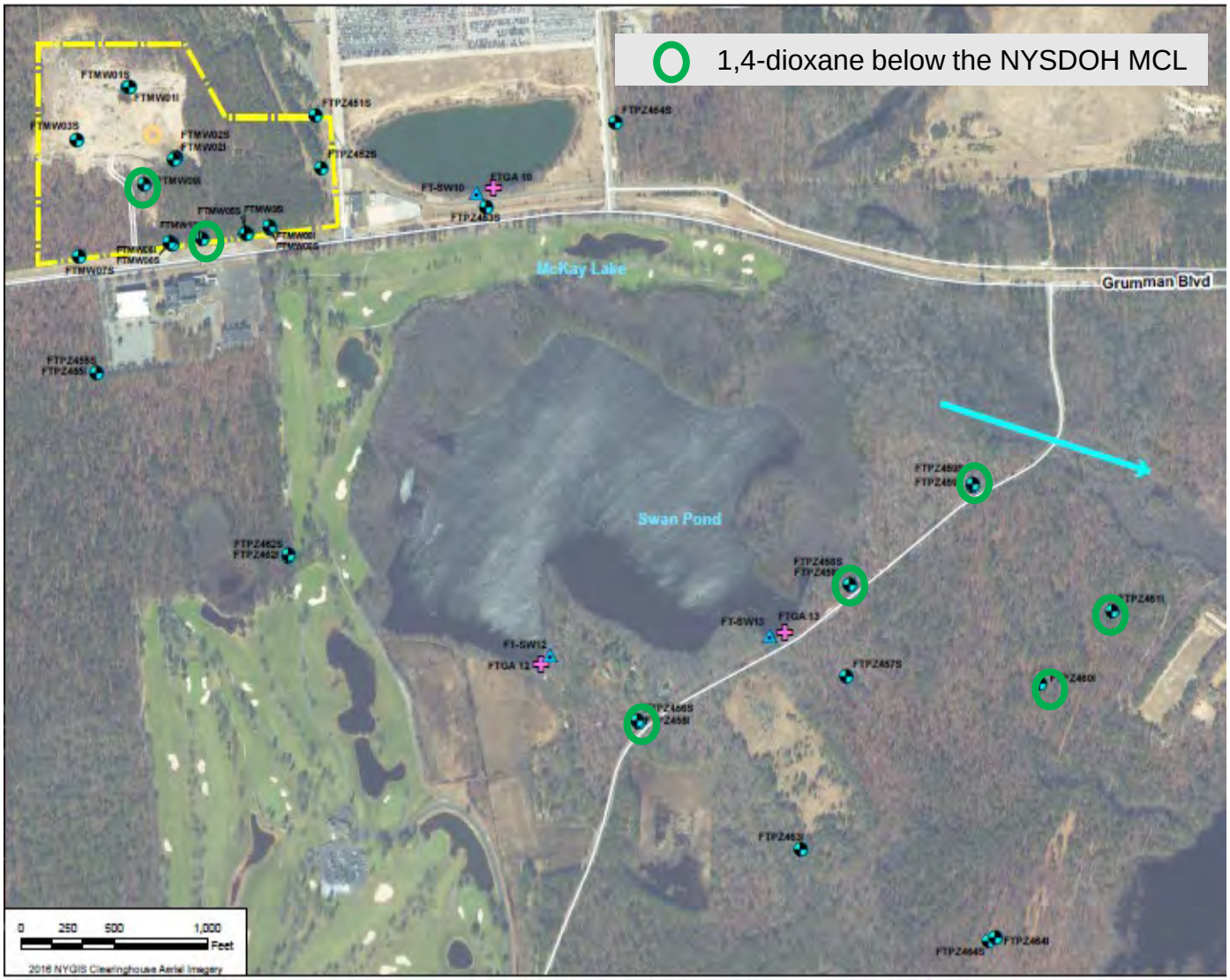
- 1,4-Dioxane
  - Synthetic industrial chemical
  - Consumer products: deodorants, shampoo, and cosmetics
  - Industrial uses: paint strippers, dyes, greases, varnishes, and waxes
  - Useful properties: stabilizer for chlorinated solvents such as 1,1,1-trichloroethane (TCA)
  - Highly mobile and does not readily biodegrade in the environment
  - Frequently found within previously delineated chlorinated solvent plumes and existing monitoring well networks
- Criteria
  - New York State Department of Health (NYSDOH) Maximum Contamination Level (MCL) defaults to 50 micrograms per liter (µg/L)
  - Drinking Water Quality Control Council recommended to adopt an MCL of 1.0 µg/L
- Wells at Site 2 and Site 6A tested in 2018 during VOC sampling
- Methods of analysis
  - SW846 8270 SIM – Groundwater
  - EPA Method 522 – Drinking water



1,4-dioxane

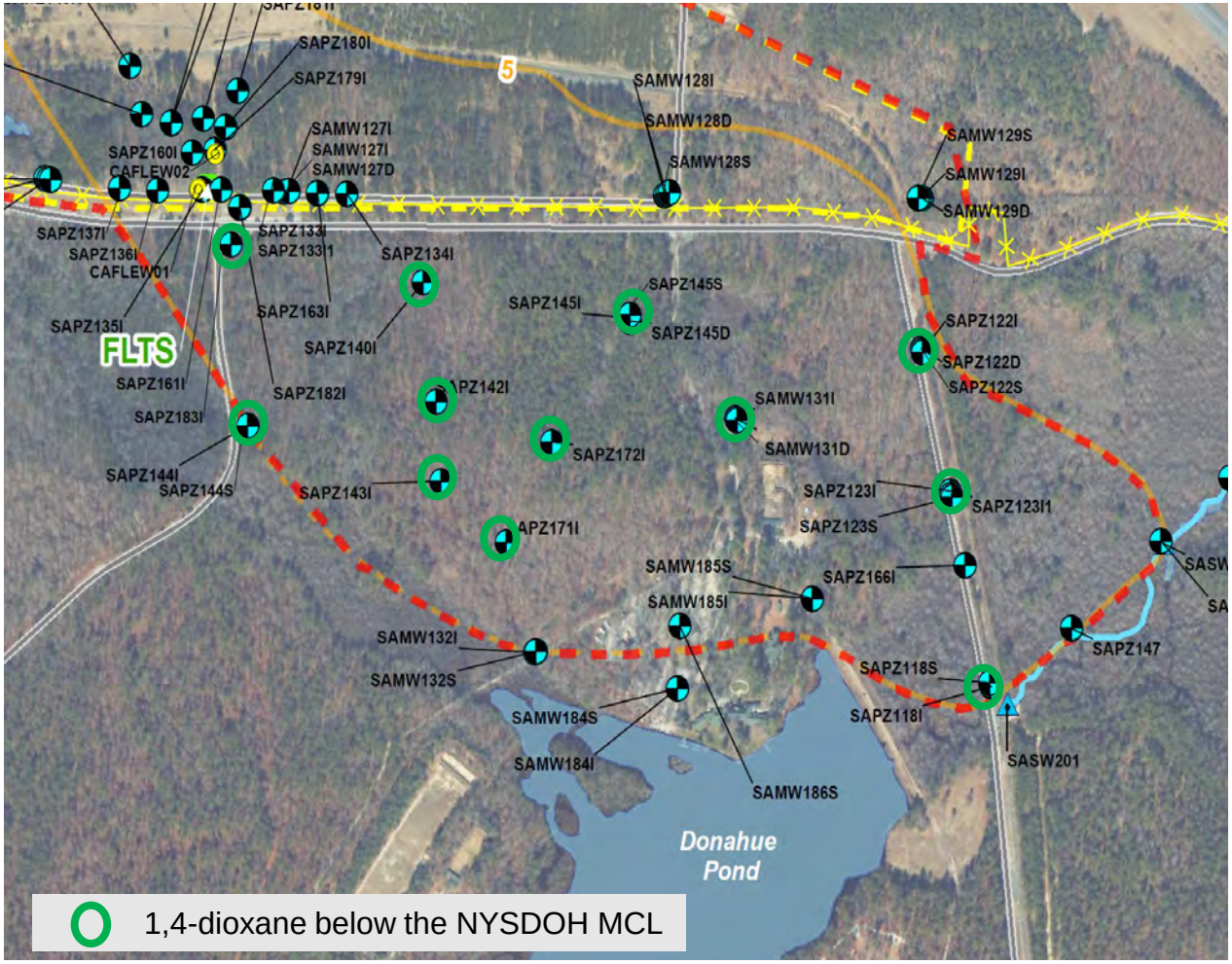
Site 2 – Former Fire Training Area
2018 1,4-Dioxane Results

- 1,4-dioxane detected in groundwater from 6 of 9 monitoring wells
- Results did not exceed the NYSDOH MCL
- For 2 wells, results exceed the recommended MCL of 1.0 µg/L



Site 6A – Southern Area
2018 1,4-Dioxane Results

- 1,4-dioxane detected in groundwater from 12 of 16 monitoring wells
- Results did not exceed the NYSDOH MCL
- For 5 wells, results exceed the recommended MCL of 1.0 µg/L



1,4-Dioxane

- Questions?

PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) FACILITY WIDE PRELIMINARY ASSESSMENT (PA) and SITE INSPECTIONS (SI)

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP) CALVERTON, LONG ISLAND, NEW YORK

04/16/2019

Per- and Polyfluoroalkyl Substances (PFAS)

- Man-made compounds, not found in nature
- Useful properties: fire resistance and oil, stain, grease, and water repellency
- Lasts a long time in the environment
- Mobile in groundwater
- Health impacts:
  - Increased cholesterol levels
  - Changes in growth, learning, and behavior of the developing fetus and child
  - Immune system changes
  - Decreased fertility
  - Altered hormone function
  - Increased risk of cancer

aqueous fire fighting foam

stain-resistant carpets

water-resistant fabrics

electroplating

nonstick cookware

food packaging

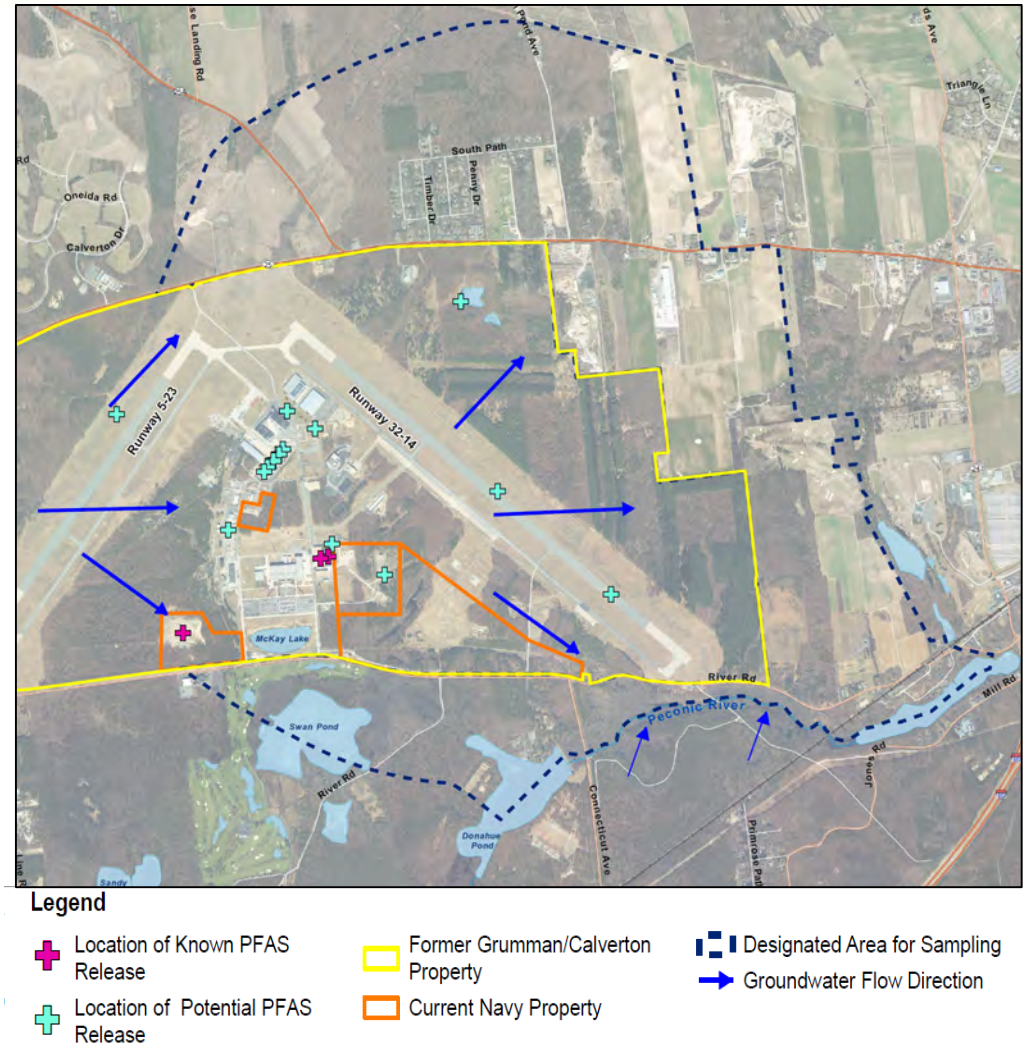
PFAS GUIDELINES

Guidelines

- EPA Lifetime Health Advisories for drinking water
  - Concern with two long-chain PFAS: perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA)
  - PFOS: 70 nanograms per liter (ng/L)
  - PFOA: 70 ng/L
  - If both are present: PFOS and PFOA should not exceed 70 ng/L
- EPA Regional Screening Level (RSL):
  - One PFAS with an EPA RSLs: PFBS
  - Tap Water: 400,000 ng/L (400 µg/L or 0.4 mg/L)
  - Residential Soil: 1,300,000,000 ng/kg (1,300,000 µg/kg or 1,300 mg/kg)
- New York State Department of Environmental Conservation (NYSDEC) identified PFOA and PFOS as a hazardous substance (6 NYCRR Part 597, March 2017)
- New York State has no criteria specific to PFAS
  - Drinking Water Quality Council recommended to adopt an Maximum Contaminant Level (MCL) of 10 ng/L for PFOA and 10 ng/L for PFOS

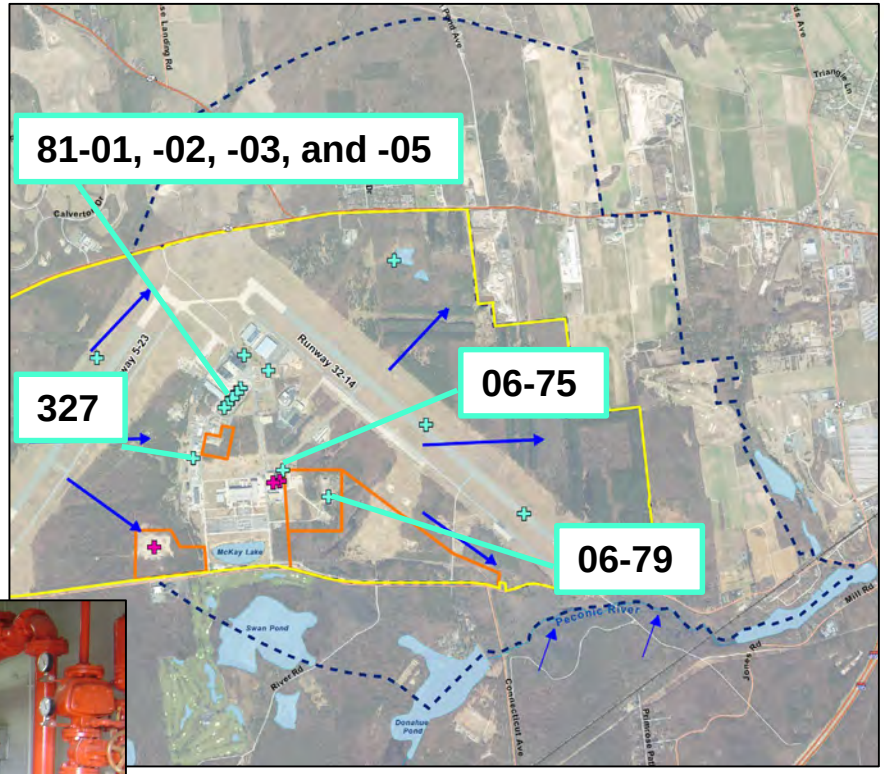
Facility Wide Preliminary Assessment

- Literature searches
  - –Naval Information Restoration Information Solution (NIRIS)
  - –Public databases (EPA and State of New York)
- Site interviews and site reconnaissance
- Identified potential for off property private drinking water wells
  - –September 25, 2018: Public Meeting
  - –14 drinking water wells tested: Results were below the EPA Lifetime Health Advisories
- PA Report: Summarizes findings and recommendations for Site Inspections at 10 locations



Preliminary Assessment

- Buildings previously equipped with an aqueous firefighting foam (AFFF) suppression system
  - Building 06-75, Paint Stripping Building
  - Building 327, Aircraft Fuel Storage Terminal
  - Building 06-79, Noise Suppression Hush House
  - Building 81-01, -02, -03, -04, and -05, Hangars
- AFFF removed from systems in 1990s
- No documented releases



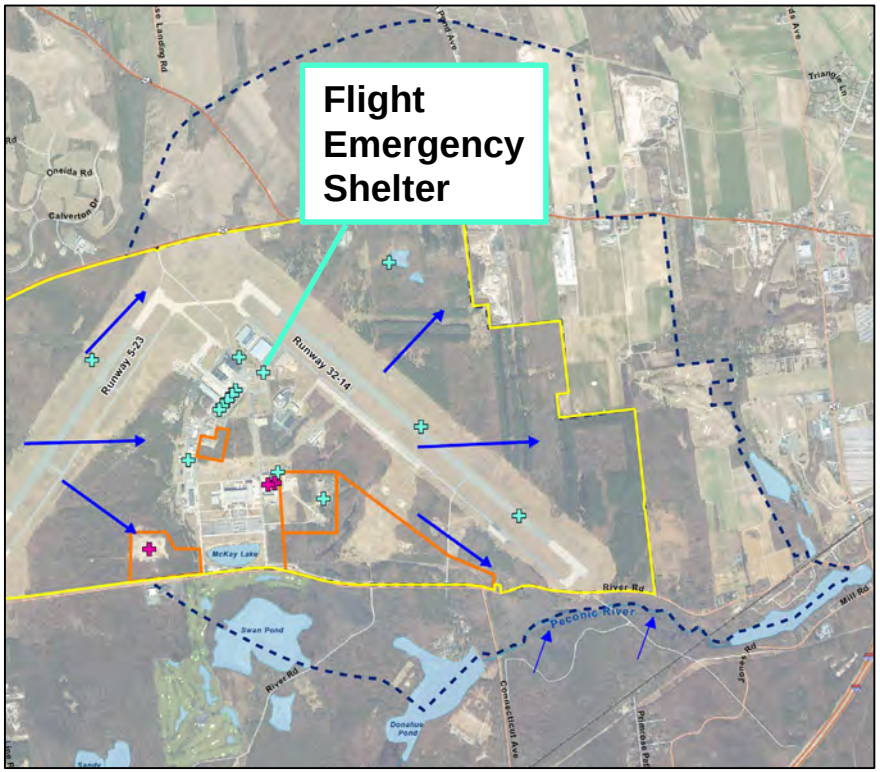
Building 81-01, -02, -03, -04, and -05 – Foam Room

Building 327 – Foam Room

Preliminary Assessment

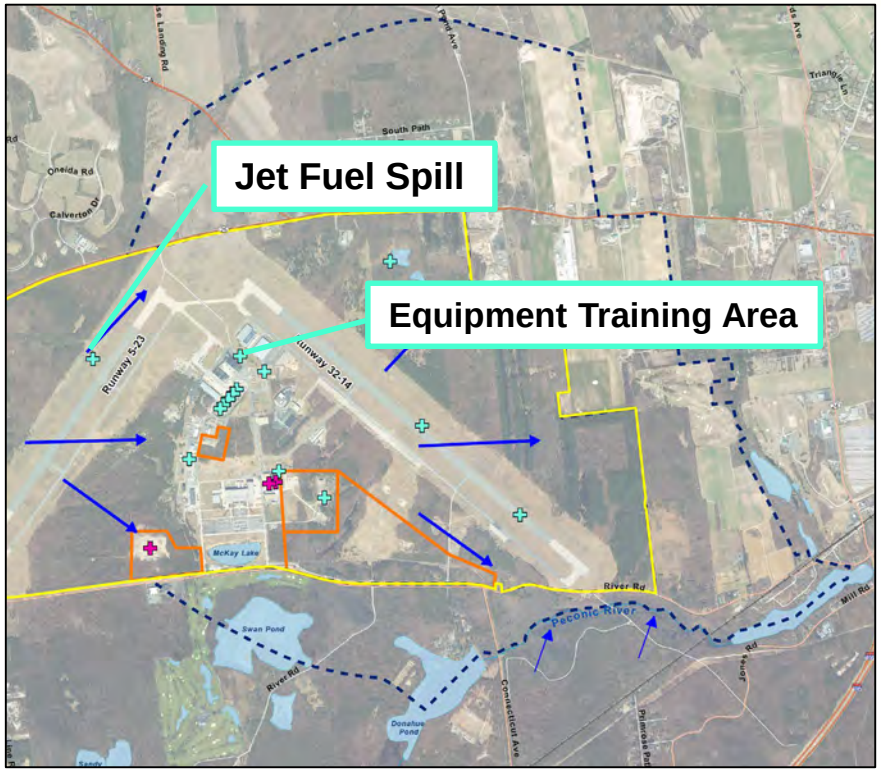
- Building 283 - Flight Emergency Shelter (Fire House)
  - –Station for housing fire fighting and emergency rescue vehicles
  - –“Buckets” (less than 55-gallons) were stored inside the building
  - –No knowledge of release

Building 283 – Flight Emergency Shelter



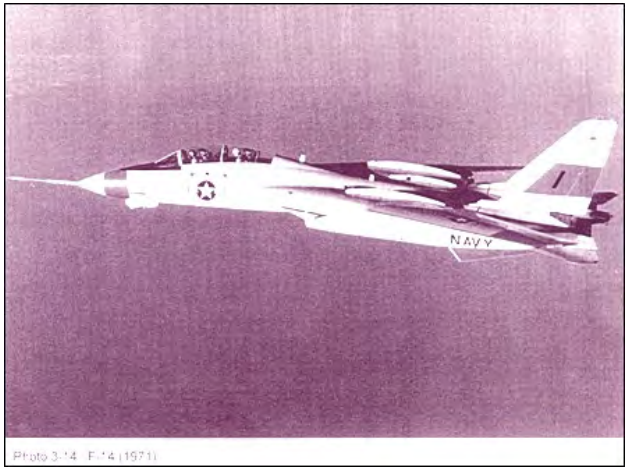
Preliminary Assessment

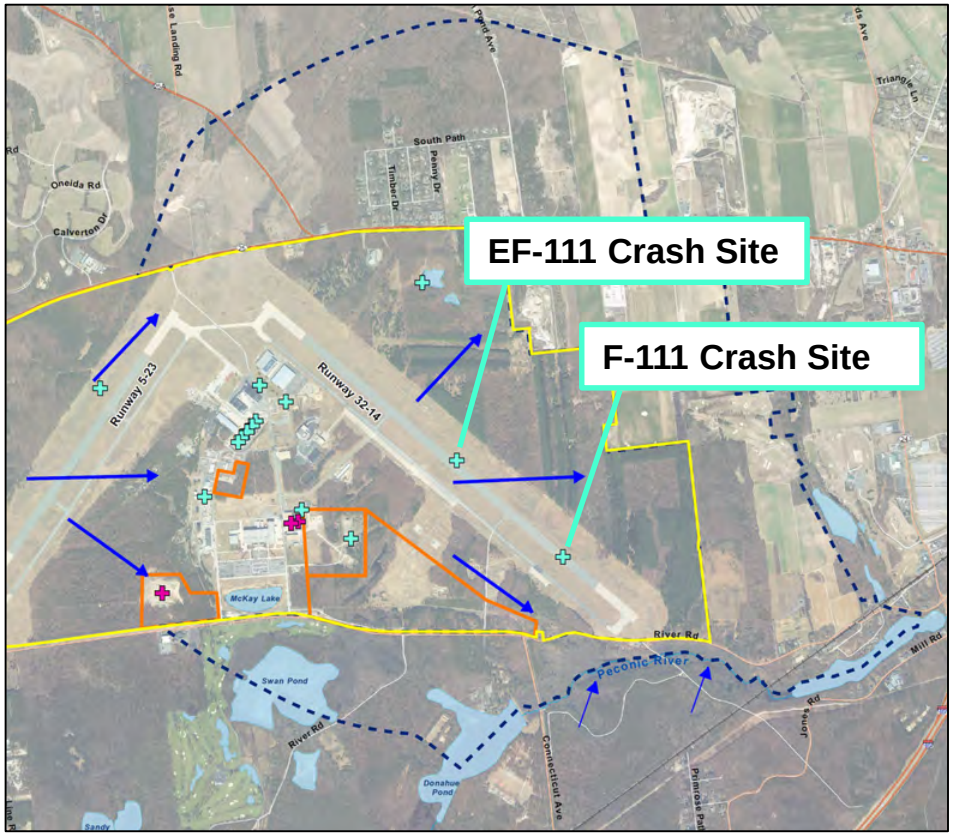
- Jet Fuel Spill (June 1985)
  - Tire on EF-111 aircraft blew out on the northwest runway
  - Jet fuel oil spilled on the ground to the side of the runway
  - AFFF used to address spill
  - Contaminated soil was removed
- Equipment Training Area
  - Training occurred once sometime between 1996 to 1998
  - Aircraft Parking Area
  - Training exercise where AFFF was discharged from fire trucks
  - Water used to dilute and wash away foam to grassy area



Preliminary Assessment

- Two plane crashes accessible to crash crew vehicles equipped with AFFF
- No record of AFFF use at these crashes
  - –F-111 Crash Site (1967)
  - –EF-111 Crash Site (1983)





- Note: crash locations are estimated

Preliminary Assessment

- Site 1 – Northeast Pond Disposal Area
  - –Landfill disposal of nonhazardous materials
  - – Undocumented materials may have included: petroleum, oils, and lubricants, asphalt, solvents, and paint sludge
  - –2002 to 2004, approximately 50,000 cubic yards of material excavated and disposed off property
  - –2006 - Site 1 was environmentally suitable for transfer from the Navy to the Town of Riverhead
  - –AFFF may have been present in undocumented petroleum impacted soils that was suspected to have been disposed in the landfill

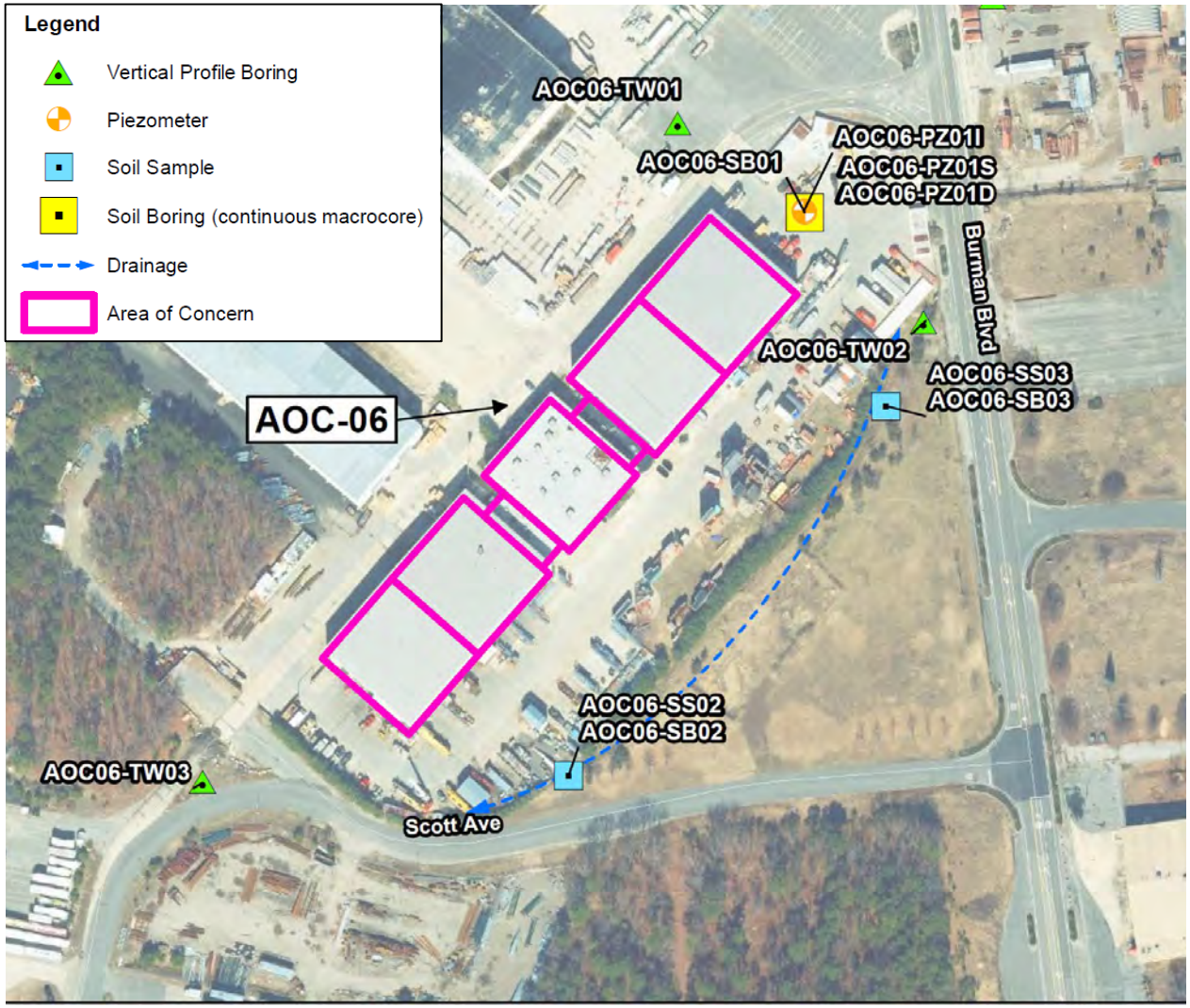
Site 1 – Post 2004 Excavation

What's Next?
Facility Wide PFAS Site Inspection

- Site Inspections (SI) field activities begin in Spring 2019
- Schedule depends on access to former Navy property
- SI components
  - Soil borings: record soil lithology and confirm depths of the water table and first clay layer
  - Vertical profile borings (groundwater grab sampling): sample collection every ten feet beginning at the water table and ending at the first clay layer
  - Piezometer installation: water level collection to better understand groundwater flow throughout the facility and groundwater sampling
  - Soil sampling: target two depths (0 to 2 and 2 to 4 feet below ground surface) at drainage pathways
  - Surface water and sediment sampling at Northeast Pond
  - Drinking water sampling if private drinking water wells are identified on property

Example
Facility Wide PFAS SI

- Area of Concern (AOC)-06: 81-01 through -05 hangars
- Soil boring for lithology
- Groundwater sampling locations: 1 upgradient and 2 to 3 downgradient locations
- Soil sampling in drainage areas

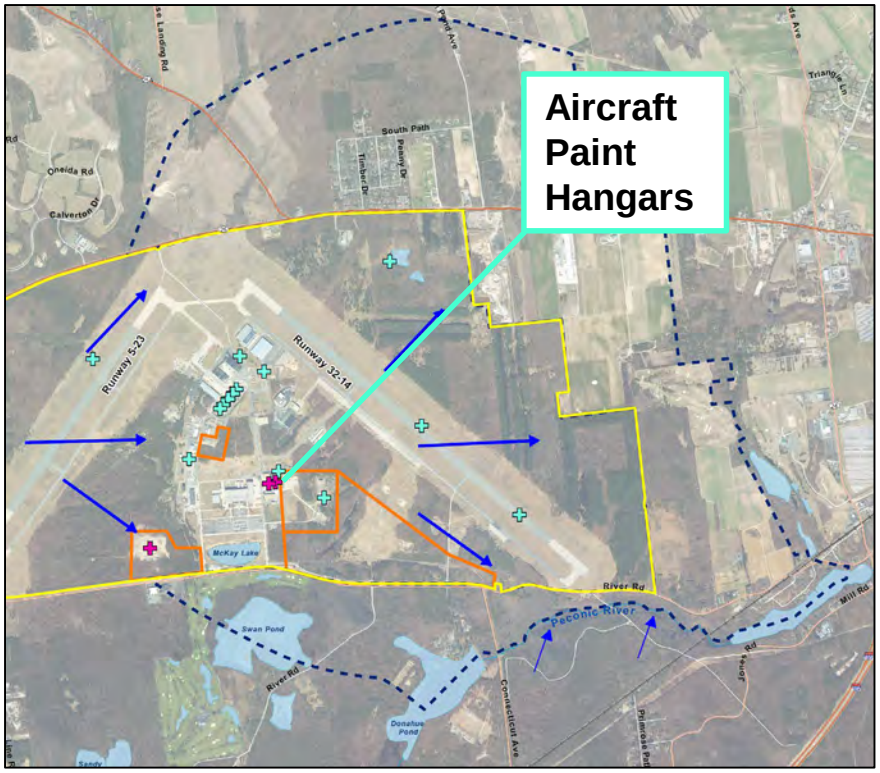


Questions
Facility Wide PFAS PA and SI

- Questions about the PFAS Facility Wide PA and SI?

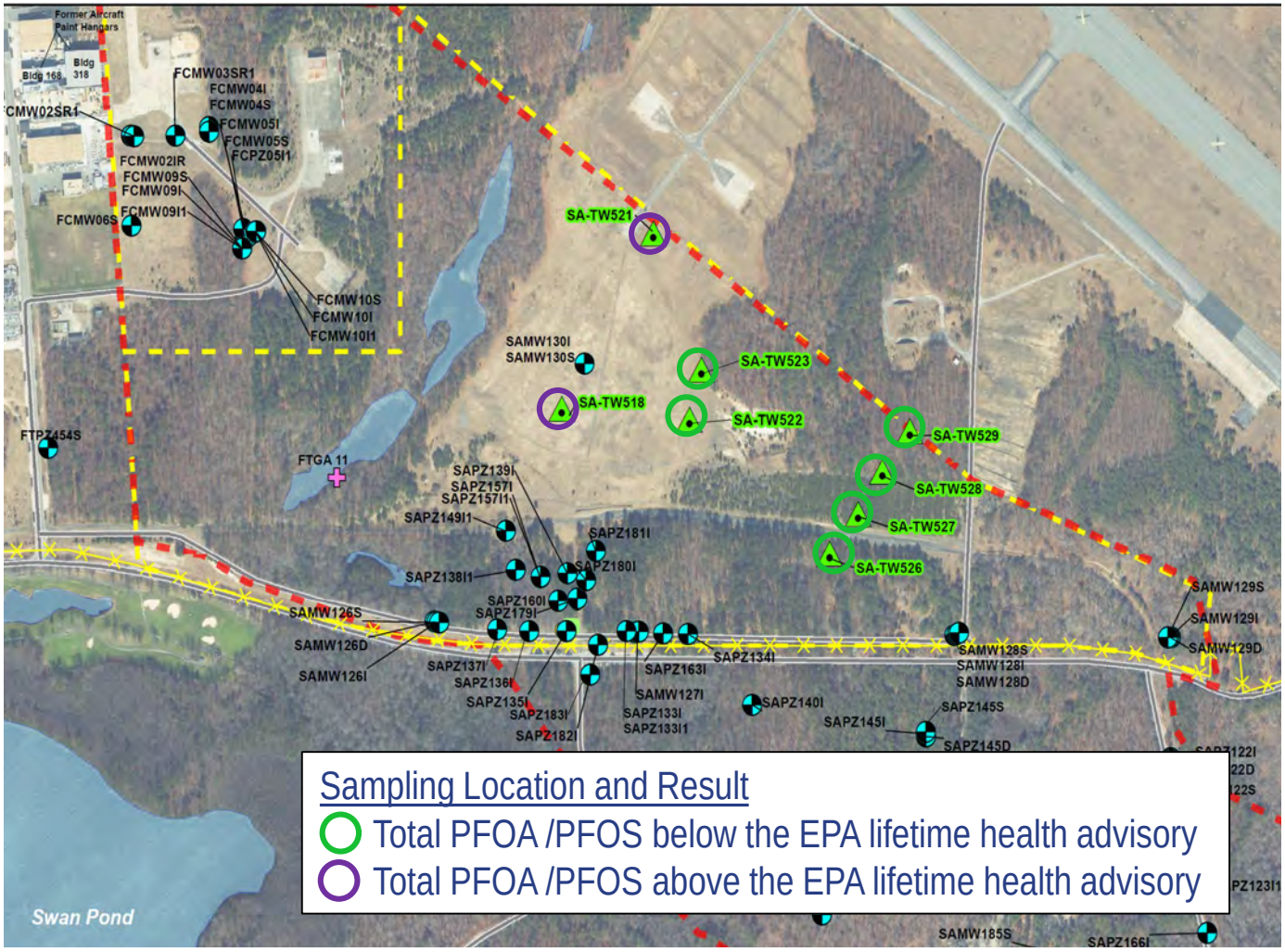
Aircraft Paint Hangars
PFAS SI

- Aircraft paint hangars north and west of Site 6A were identified as having fire suppression systems that contained AFFF
- 1980's: the deluge system was tested
- Hangars were equipped with trough drains, which would have routed water/material to an Industrial Waste Treatment Plant (IWTP)
- AFFF could have flowed through drainage swales at Site 6A or discharged to McKay Lake
- Site investigations began in 2016 using the Site 6A – Southern Area monitoring well network
- Results from groundwater testing at 7 of 33 monitoring wells exceed an EPA lifetime health advisory
- 2019: Opportunistic groundwater grab samples collected during the plume shift evaluation



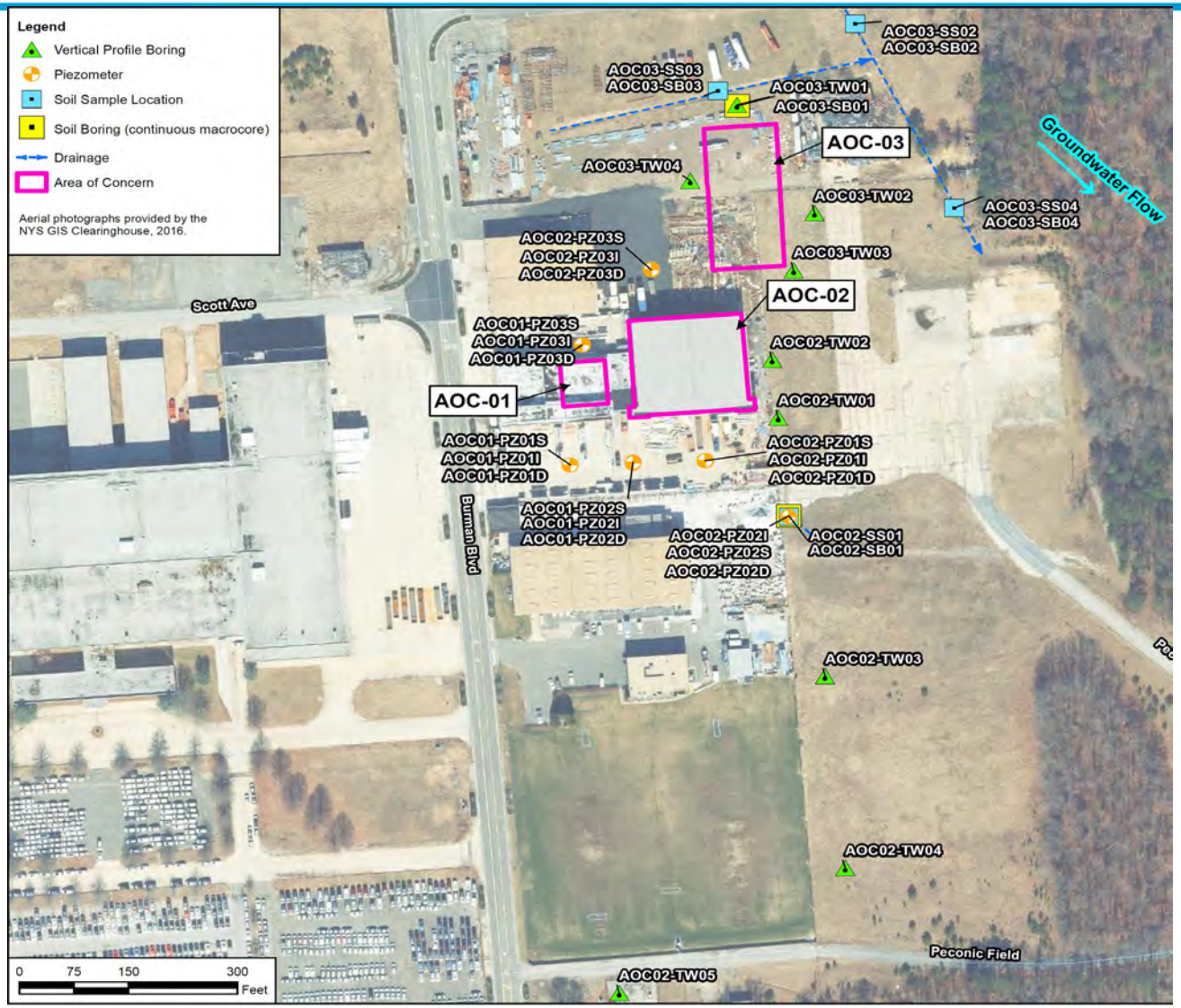
Aircraft Paint Hangar Results
PFAS Results

- As part of the Site 6A plume shift evaluation, 20 samples from 8 locations were collected to evaluate PFAS
- Total PFOA and PFOS exceeds the EPA lifetime health advisory of 70 ng/L at 2 temporary wells at a depth of 33 to 37 feet below ground surface



Aircraft Paint Hangars
Facility Wide PFAS SI

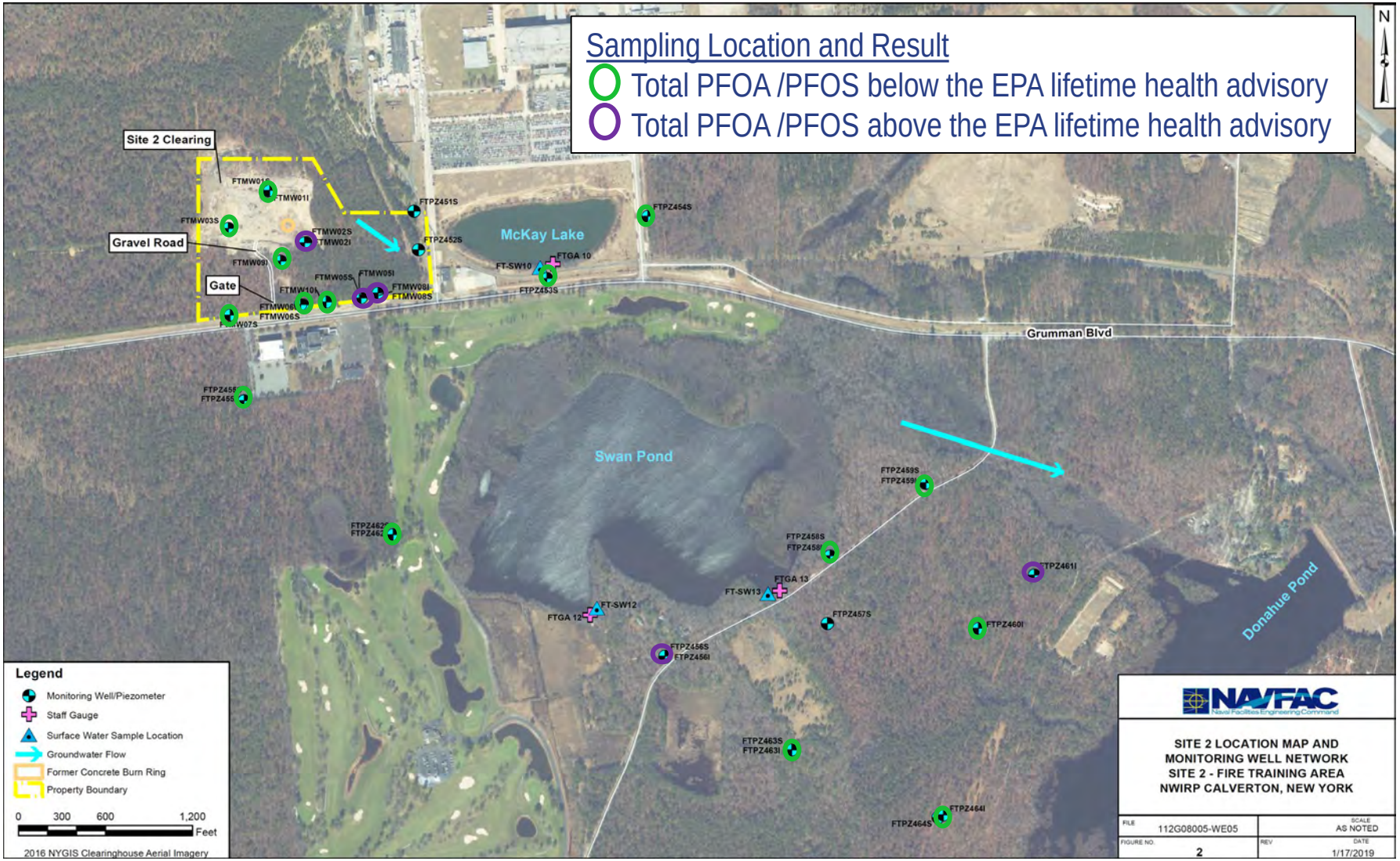
- Area of Concern (AOC) - 01 and -02: Aircraft Paint Hangars
- AOC-03: Paint Stripping Building



Aircraft Paint Hangars
Facility Wide PFAS SI

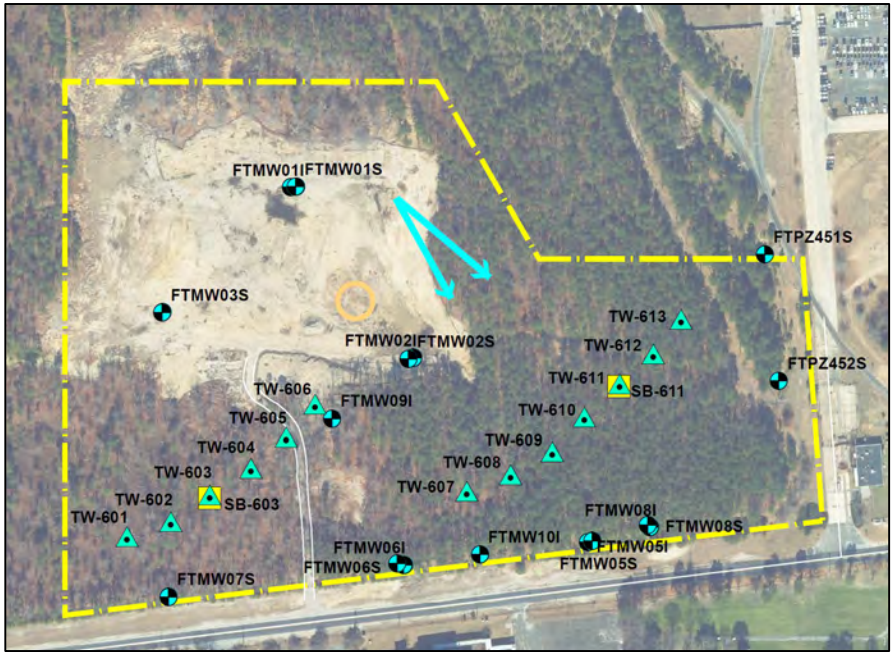
- Questions about Aircraft Paint Hangars?

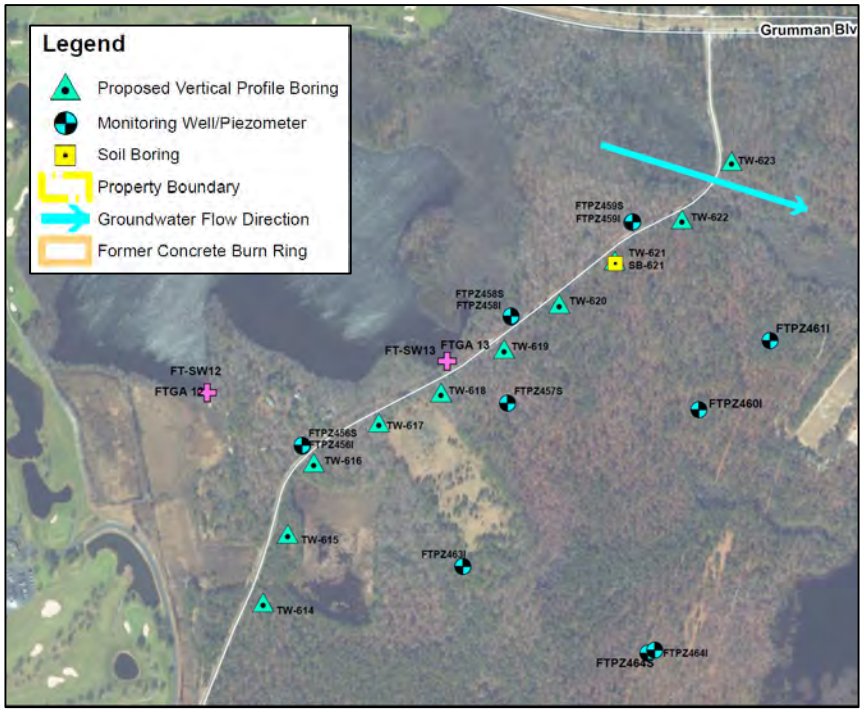
Site 2 – Former Fire Training Area
PFAS Site Inspection



Site 2 – Former Fire Training Area
PFAS Site Inspection

- Continue SI field activities on and off property at Site 2 (Spring 2019)
- Schedule depends on access to Suffolk County property





- SI components: soil borings and vertical profile borings (groundwater grab sampling)

Site 2 – Former Fire Training Area
PFAS Site Inspection

- Questions about Site 2?