RESTORATION ADVISORY BOARD MEETING NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP), CALVERTON RIVERHEAD SENIOR CENTER, RIVERHEAD, NEW YORK TUESDAY, NOVEMBER 13, 2018

The forty-ninth (49th) 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 and Karen Gomez), 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 (Lou Cork and Vincent Racaniello), Arcadis (Robert Porsche), Resolution Consultants (Robert Forstner), Tetra Tech (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. Also, a remedial action work plan has been completed and construction has begun.
- -Site 6A- Existing monitoring wells are being used for the Aircraft Paint Hangar per- and polyfluoroalkyl substance (PFAS) investigation, semi-annual long-term monitoring for volatile organic compounds (VOCs), and 1,4-dioxane investigation and plume shift evaluation.
- -Site 7- Remedial Design is in progress, semi-annual monitoring groundwater sampling for select VOCs, ethylbenzene, benzene, and xylene still exceed cleanup goals.
- -Site 10B- Long-term VOC monitoring demonstrated that all sample results are below cleanup goals. Shallow groundwater was also sampled for PFAS with results below the health advisory. The Remedial Action Completion Report was completed in July 2018.

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

Mr. Krupski inquired about the difference between the drinking water and groundwater methods for 1,4-dioxane. Mr. Rapiejko noted that Suffolk County used the drinking water method to analyze 1,4-dioxane, which is different from the method that the Navy used for analysis. Ms. Fly responded that the drinking water method is used to analyze samples from potable wells. The Navy uses the groundwater method.

DISTRIBUTION AND APPROVAL OF MINUTES

Only one RAB member was present. Therefore, Ms. Fly delayed approval of the minutes and will resume with the approval during the next RAB meeting in April 2019.

COMMUNITY UPDATE

Mr. Vincent Racaniello (RAB co-chair) suggested alternate meeting locations. The new community center and surrounding elementary schools were mentioned as alternate meeting locations. Ms. Fly responded that the Navy will look into alternate meeting locations for the next RAB.

TECHNICAL PROGRESS – GENERAL OVERVIEW OF INSTALLATION RESTORATION SITES

Ms. Fly introduced the technical portion of the meeting, which consisted of presentations on Site 7 Fuel Depot, a summary of the spring 2018 groundwater sampling at the Fence Line and Peconic River Areas, current activities at Site 6A - Southern Area Fence Line Groundwater Extraction Treatment System, and Site 2 and Aircraft Paint Hangars PFAS Site Inspections (SIs), Preliminary Assessment (PA), and community relations updates. 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 (the former Fuel Depot). The presentation is included in Attachment 3. Remedial history, system performance, post shutdown activities, design, and path forward were provided.

The 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. Bailing of the wells was conducted and the NAPL was no longer observed after March 2017. This NAPL was associated with a concrete slab at the site.

A design is in progress to evaluate excavation options for the concrete slab and soil located under the existing slab. Potential future implementation of targeted air sparge or Air Sparge/Soil Vapor Extraction (AS/SVE) is possible if dissolved VOC concentrations

persist. Monitored natural attenuation (MNA) would continue to address the remaining dissolved-phase VOCs outside of excavation area.

A community member inquired about the size of the slab. Mr. Forstner stated the slab is 40 x 80 feet and about 1 foot thick. The concrete slab is approximately 15 to 16 feet below the ground surface and supported 3 tanks that contained 50,000 gallons of fuel.

Mr. Racaniello inquired about the excavation option most suitable for the area. Mr. Forstner stated the excavation will most likely consist of digging 7 to 8 feet below the concrete slab, which would be approximately 23 feet deep. The excavation will be sloped back and would require dewatering. The slab will be broken up and the excavation will continue down through the smear zone. Oxygen Releasing Compound (ORC) will be applied to the smear zone prior to backfilling with clean soil.

A community member inquired about the process for disposing contaminated material. Mr. Forstner stated contaminated material guidelines will be up to the contractor; however, the most common method is thermal treatment.

Mr. Carey inquired about Fingerprinting and if it was the CSIA specific isotope. Mr. Forstner stated that Fingerprinting using the CSIA analytical method was not conducted.

TECHNICAL PROGRESS – SPRING 2018 GROUNDWATER SAMPLING SUMMARY

Mr. Forstner then presented results from an investigation of the Fence Line Area and Peconic River Area from May 2018. The presentation is included in Attachment 3.

Of the 15 groundwater samples collected from the Fence Line Area, no MCLs were exceeded. In addition, no VOCs were detected in 10 of the 15 groundwater samples. Of the four surface water samples, two in-river porewater locations, and two piezometers samples collected from the Peconic River area, no operable unit (OU) 3 Remedial Design Benchmarks were exceeded, and VOCs were not detected in the surface water samples.

Mr. Carey inquired if 1,4-dioxane was tested. Mr. Forstner stated there is a separate program for 1,4-dioxane.

Mr. Carey inquired if the Fence Line Treatment System (FLTS) is removing 1,4-dioxane from the groundwater. Mr. Forstner stated 1,4-dioxane is not removed by the FLTS. Mr. Carey then inquired where the 1,4-dioxane flows. Mr. Brayack stated the 1,4-dioxane flows into the discharge.

Mr. Rapiejko inquired about additional sampling in the fall, and if other areas, besides the Peconic River and the fence line, were sampled. Mr. Forstner confirmed that in the fall, other areas were sampled in addition to the Peconic River and the fence line.

TECHNICAL PROGRESS - SITE 6A SOUTHERN AREA FENCELINE GROUNDWATER EXTRACTION TREATMENT SYSTEM OVERVIEW

Mr. Roy, provided an update on the operation of the FLTS. The presentation is included in Attachment 3. The FLTS was constructed pursuant to the OU3 ROD for Site 6A/10B that was completed in May 2012. The selected remedy is comprised of LUCs and a system to extract, treat, and infiltrate groundwater in order to achieve the remedial goal of containing the VOC plume from leaving the site.

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. To address declining productivity in extraction well EW-2, it was taken off-line and well EW-3 was brought on-line in February 2016. In order to address persistent VOC concentrations observed in the vicinity of SA-MW127I, the FLTS 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 since VOC concentrations were below maximum contaminant levels (MCLs).

Ms. Juchatz inquired if there were any detections of 1,4-dioxane. Ms. Fly stated the Navy is not sampling the FLTS discharge for 1,4-dioxane because it is not part of the ROD COCs. 1,4-dioxane was sampled in groundwater monitoring wells in the area and results were below the current standards.

Ms. Juchatz inquired if the Navy was discharging 1,4-dioxane back into the ground via the infiltration gallery. Mr. Krupski inquired if the Navy knew what levels of 1,4-dioxane that was being discharged back into the ground. Ms. Fly stated that at the last RAB the Navy presented the 1,4-dioxane levels that were around the FLTS and they were at levels below the current standards.

TECHNICAL PROGRESS – POLY- AND PERFLUOROALKYL SUBSTANCES (PFAS) SITE 2 AND AIRCRAFT PAINT HANGAR SITE INSPECTION (SI), FACILITY WIDE PRELIMINARY ASSESSMENT (PA), AND COMMUNITY RELATIONS

Mr. Brayack provided an update on the Site Inspections (SI) and facility-wide Preliminary Assessment (PA), which are used to evaluate the presence of PFAS in relation to Sites 2 and Aircraft Paint Hangars. 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 are underway to evaluate potential PFAS release points. Release points may include runways and flight lines, fire training

areas, hangars and crash sites, among others. Regarding crashes, the project team is aware of several crashes over the years.

The Navy is investigating historical use of firefighting foam on the former Grumman/Calverton property. The Navy conducted off-property drinking water well sampling of residents with private wells one-mile downgradient of the potential PFAS areas in September 2018.

Community relations activities included: notification letters and questionnaires mailed to residents and businesses, a public meeting held September 25, 2018, private drinking water sampling that started September 26, 2018, second chance request letters for sampling mailed the week of October 1, 2018, and a door-to-door survey conducted on October 23, 2018. A total of 14 drinking water samples were collected from residents and all results were below the EPA Lifetime Health Advisory.

The path forward consists of responding to property owners and continuing to keep the community informed. In addition to the current PA, site investigations are also planned for suspected PFAS sources.

Mr. Carey inquired if PFAS is used in firefighting now. Ms. Gomez replied that AFFF is not currently used in firefighting. Mr. Brayack noted that there are no MCLs for PFAS. Mr. Carey further inquired if there were state standards. Ms. Gomez replied that there was a default MCL of 50 μ g/L for PFAS and added that fire departments used AFFF up until a year ago.

Mr. Carey inquired if the PFAS results could be affected by water table fluctuation. Mr. Brayack responded that the water table fluctuation could affect results, but differences in the results are most likely due to Teflon tubing that was in each of these wells. Mr. Brayack added that the Navy will be collecting more data to resolve this question.

Mr. Racaniello inquired if temporary well sampling has been conducted. Mr. Brayack replied, that temporary well sampling was conducted on property at Site 6A – Southern Area during the plume shift evaluation, and the results will be presented in April. He added the Navy is still in the SI stage and some of these activities are RI activities.

Mr. Carey commented that New Jersey just set their PFAS standard at 14 ppt, and New York State is ready to do something similar within the next couple months.

Mr. Carey inquired about the sampling depth. Mr. Brayack replied that the wells are various depths. The shallow wells are at the water table from 5 to 15 feet below ground surface (bgs) and the intermediate wells are generally on top of clay unit at approximately 60 feet bgs. At Site 6A – Southern Area, deep wells are approximately 80

feet bgs and temporary wells have been installed below the clay unit at approximately 120 feet bgs (Peconic River Area).

Mr. Rapiejko commented that the Hangars are near where the VOC discharges, but PFAS may not correlate with the plume path of the VOCs. He inquired about drainage pathways, the location of the wastewater treatment plant, and whether PFAS in McKay Lake may be residuals from the operation of the treatment plant. Mr. Brayack responded that he was correct about the drainage to the treatment plant and McKay Lake. He further agreed that surface water flowing through pipes and ponds is a much quicker migration pathway than groundwater flowing through the aquifer.

Mr. Rapiejko inquired if there was a continuing source. Mr. Brayack responded that the existing monitoring wells were used for the initial investigation and the next step is to complete the SI and make recommendations for the path forward.

Mr. Rapiejko inquired if the Navy has sampled for PFAS in effluent at the FLTS. Mr. Brayack respond that the influent was sampled for PFAS and would not expect any significant removal of these compounds by the FLTS. Mr. Rapiejko inquired if a SPDES permit would be required if the results for PFAS rapidly increased. Mr. Brayack replied that it is unlikely, because the LHA is very specific to drinking water supply wells and not to groundwater.

Ms. Juchatz inquired about the recreational exposure and if skin is exposed to PFAS in surface water at the Peconic River. Mr. Brayack replied yes.

Mr. Krupski inquired about the distance of the surface water samples. Mr. Brayack replied surface water samples were collected at the approximate location of the DEC hiking trail.

A community member inquired if the Navy was going to expand testing for Site 2. Mr. Brayack replied that we are going to perform an SI.

A community member stated that predominant groundwater flow is toward the river, are you [the Navy] going to expand testing in that area. Mr. Brayack replied there are no plans to expand testing.

A community member commented that the Navy will not test her drinking water well and inquired if the well could be tested. Mr. Brayack replied that the Navy can only test areas that are associated with their operations. If there were detections of PFAS to the south, the Navy is attributing them to another source.

Mr. Krupski inquired if the Navy tested anything south of the golf course. Mr. Rapiejko noted that the County has tested for PFAS and had some detections. Mr. Rapiejko also

noted that the DEC is testing for MTBE in this area. Mr. Brayack confirmed that the Navy has not tested for PFAS south of the golf course.

A community member inquired why the Navy is hesitant to test residential wells for PFAS. Ms. Fly replied that the Navy is focusing the investigation on former NWIRP property and then will determine if investigations should continue further out from the facility.

Mr. Carey inquired if DEC knows of any documented discharges of AFFF material and inquired if the resident could get her drinking water well tested. He continued to state there have been wildfires, and it is unknown what was used to put them out. NYSDEC responded that AFFF usage stopped in the past year.

Ms. Civiletti inquired if the Navy has asked fire departments if they have used AFFF. Ms. Fly replied that the PA is being prepared, and that they are planning to talk to the Suffolk County fire department.

A community member inquired if the Navy uses Suffolk County data in their analysis. Ms. Fly confirmed that they did use Suffolk County data. Mr. Rapiejko added that there were some residential wells that had some detections south of the golf course that were below 70 ng/L but they were only sampled once.

Mr. Rapiejko inquired about the map locations of the potential AFFF from crashes where AFFF could have been used. He also inquired about the location of the F-14 crash found on Utube near a neighborhood and further inquired why it is not on the map. Mr. Brayack replied that crash was off property and the exact location is unknown.

Ms. Civiletti inquired about the target area for the PFAS drinking water sampling confirming there were 53 homes. The Navy looked at tax maps to identify property owners and worked with Riverhead Water District to narrow down the properties. Of the 53 original properties that were thought to have private wells, some were found to be on public water supply. The Navy confirmed 19 private wells, and 14 of these wells were tested for PFAS.

Ms. Civiletti inquired if results were below the LHA if the Navy was going to sample other homes. Ms. Fly replied that they are talking to management now about resampling at the private wells to verify that these residents are protected. She added that the decision to sample further out would be based on the conclusion of the SI.

A community member inquired about groundwater flow and the different agencies sampling for PFAS. Mr. Karpinski replied that the primary reason why they are not testing in her area is because of the direction of groundwater flow. He added that they understand her concerns and things may change in the future.

A community member stated that there is no one that lives where you are testing and requested testing of their well. Mr. Rapiejko replied that they have tested along River Road for PFOA and PFOS, and results show low detections of PFAS.

Mr. Carey inquired about the ranges of the detections of PFAS in the 4 of the 14 private drinking water wells and further stated that New Jersey has created a PFAS standard at 14 ppt. He also inquired if the Navy was going to extend public water supply to that area. Ms. Fly replied that the Navy would comply with standards when they are in place. Ms. Fly noted that a letter went out to the residents to notify them that results were below the LHA.

Ms. Civiletti inquired about the Navy's standard to test drinking water wells within 1 mile of the areas of concern and if the Navy would step out and sample more homes. Ms. Fly replied that the Navy policy is to step out further than 1 mile only if a drinking water sample exceeds the LHA of 70 ppt.

Mr. Rapiejko inquired about the contaminant fate and transport time for PFAS from crashes that occurred in the 1960s and 1970s. Mr. Brayack replied that when the Navy performs the RI, they will calculate the time and distance that PFAS may have migrated from the facility.

Mr. Carey inquired about why the Navy did not test for 1,4 dioxane in the private wells. Ms. Fly replied that results for 1,4-dioxane in groundwater have not been high and there are no promulgated standards for the contaminant.

Mr. Carey inquired about the travel pathway in groundwater for PFAS and 1,4-dioxane. Mr. Brayack replied that PFAS travels without much resistance and bioaccumulates. Prior to 2016 not much was known about these chemicals. He further responded that 1,4, dioxane does not bioaccumulate.

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 Spring 2019, with a final date and location to be confirmed. The meeting was then adjourned.

8

LIST OF ACRONYMS AND ABBREVIATIONS

AFFF Aqueous Film Forming Foam
AS/SVE Air Sparge/Soil Vapor Extraction

bgs Below ground surface DCA 1,1-Dichloroethane

EPA Environmental Protection Agency FLTS Fence Line Treatment System

gpm Gallons per Minute

ISCO In-Situ Chemical Oxidation
LHA Lifetime Health Advisory
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

ppt parts per trillion

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

UFP-SAP Unified Federal Policy Sampling and Analysis Plan

μg/L micrograms per Liter

UST Underground Storage Tank VOC Volatile Organic Compound

ATTACHMENT 1 NOVEMBER 13, 2018 RAB MEETING SIGN-IN SHEET

49th RAB Meeting for NWIRP Calverton November 13, 2018 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?
Andy Freleng			
Low Cork			
ROBERT BESCHE			
Ardrew Projecto			
Robert Forstoner			
Stephan Roy			
Sevelarginsk			
HENRY WILKE			
Steve Shapins			
Karen Gowez			
Alkr-pski			
Dave Breyak			
Vinne Ra canullo			
Amy Juckate Ton, Pauson			
IVIII VAUSON			

ATTACHMENT 2 NOVEMBER 13, 2018 RAB MEETING AGENDA

Agenda

Restoration Advisory Board Naval Weapons Industrial Reserve Plant Calverton

November 13, 2018
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

<u>Site 6A – Southern Area, Spring 2018 Groundwater Sampling</u> <u>Summary</u>

Robert Forstner PE, Resolution Consultants

Fence Line Treatment System Update

Stephane Roy, KOMAN Government Solutions

PFAS, Site 2 and Aircraft Hangar Site Inspection, Community Relations, and Preliminary Assessment

David Brayack, Tetra Tech

Closing Remarks

Lora Fly, NAVFAC Mid-Atlantic

Presenters will be available after the program for questions.

ATTACHMENT 3 NAVY PRESENTATIONS – NOVEMBER 13, 2018 RAB MEETING



GENERAL OVERVIEW OF ENVIRONMENTAL RESTORATION SITES

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

11/13/2018

Site 2 – Former Fire Training Area



2018 Sampling

- Poly- and Perfluoroalkyl Substances (PFAS) groundwater and surface water sampling and analysis
- Groundwater sampling with volatile organic compound (VOC) and 1,4dioxane analysis

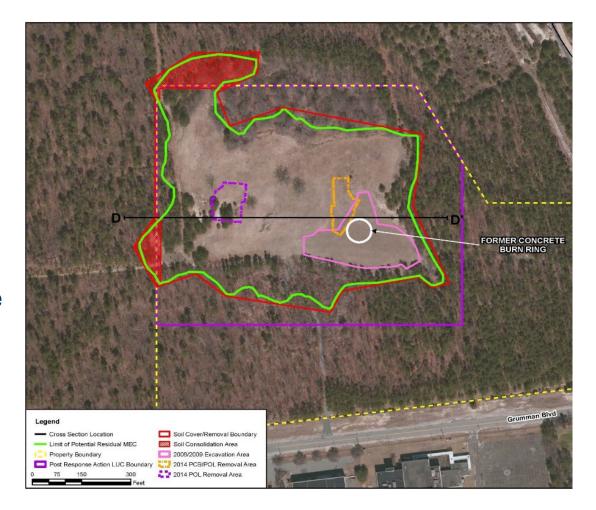
Interim Remedy for Potential Munitions and Explosives of Concern (MEC)

- Record of Decision (Summer 2018)
- Remedial Action Work Plan (Summer 2018)
- Construction (Started end of October 2018)

Site 2 – Former Fire Training Area Remedy for Potential MEC



- Potential MEC are present and likely originated at another location at the NWIRP (i.e., firing stop butt 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 6A – Southern Area



- Semi-annual Long Term Monitoring (LTM) for VOCs
- 1,4-Dioxane investigation
- Plume shift evaluation
- Site 6A monitoring network is also in use for the Aircraft Paint Hangar PFAS investigation

Site 7 – Former Fuel Depot



Semiannual Groundwater Sampling

- Select VOCs, 2-methylnaphthalene, and lead
- Currently 11 monitoring wells are sampled each Spring and Fall
- Annual Monitoring Report

Remedial Design in Progress

Addresses residual contamination detected during LTM events

Site 10B – Engine Test House Remedial Activities and Site Closeout Progress



- Site 10B: Used in testing of aircraft engine systems (1950's to 1996)
- Remedial Action implementation:
 - —2009 and 2010: Structure demolition, VOC soil excavation and oxygen releasing compound (ORC), and polychlorinated biphenyl (PCB) soil excavation
 - Soil confirmation sampling results were below
 Cleanup Levels



Excavation



Engine Test House (demolished)

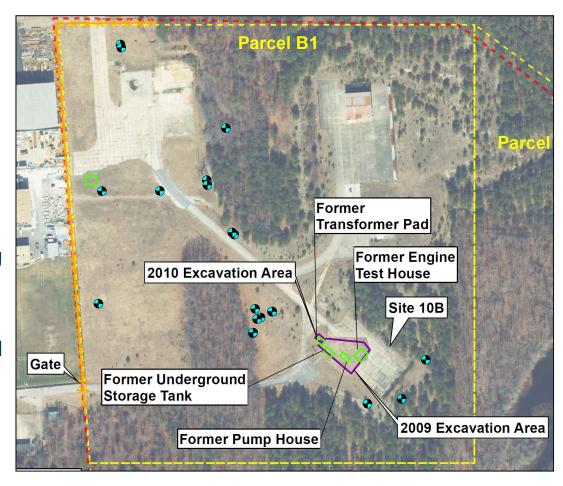


ORC Application

Site 10B – Engine Test House Remedial Activities and Site Closeout Progress



- Long term groundwater monitoring
 - VOCs below Cleanup Levels for four consecutive events
 - –2017: Another round of sampling for VOCs confirmed groundwater is below Cleanup Levels
 - —2017: PFAS sampling conducted and results were below the drinking water lifetime health advisory
 - —Site 6A Southern Area LTM is ongoing
- Remedial Action Completion Report (RACR), July 2018
 - Selected remedy has been implemented and objectives have been met
 - Allows unlimited use and unrestricted exposure





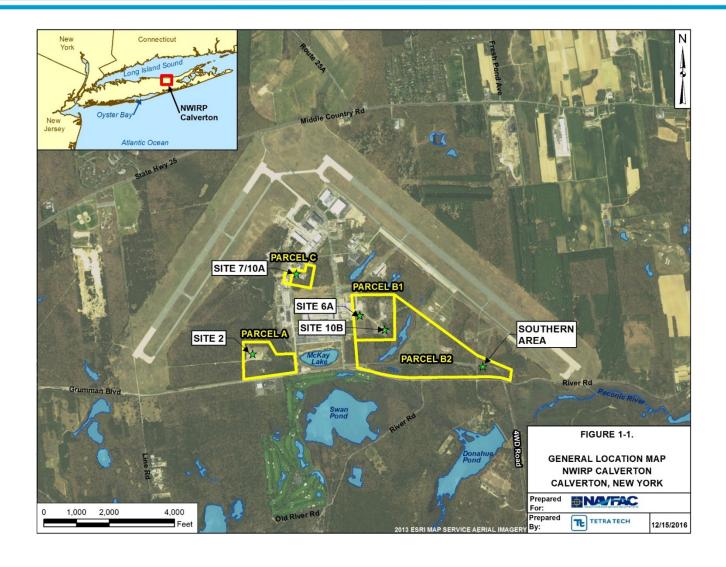
SITE 7 – FUEL DEPOT UPDATE

NWIRP CALVERTON, NEW YORK

November 13, 2018

Introduction





Site 7 Remedial History



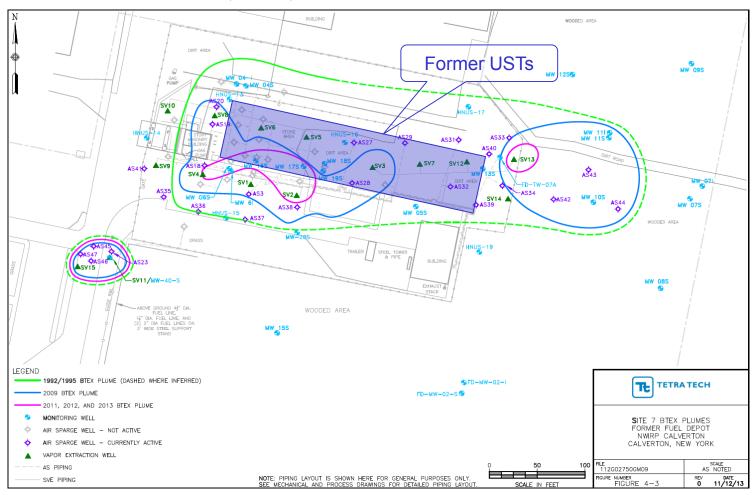
- Air sparge (AS) and Soil Vapor Extraction (SVE) system started operation in 2005 (pilot)/2006 (full scale)
- Operated seasonally (April to December)
- Three modifications made to the system to improve performance
- System reached end of its functional life November 2013
- Shutdown and monitoring began per the Performance and Shutdown Evaluation document (Nov 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
- Design for pilot study to evaluate In-situ Chemical Oxidation (ISCO) began in 2016
- Observation of Non-Aqueous Phase Liquids (NAPL) during October 2016 sampling event
 - -MW-17S 1.12 feet observed in October 2016, decreased to 0.14 foot in February 2017, and 0.21 foot in March 2017
 - –MW-19S 1.05 feet observed in November 2016, not encountered in February/March 2017
 - –MW-16S 0.60 foot observed in January 2017, not encountered in February/March 2017
 - -No NAPL observed in wells since March 2017
 - -Paused ISCO pilot design while NAPL was evaluated

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 "smear zone"
- 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 it's own constrained by buried slab
 - -Excavation considered most reliable option

Design and Path Forward



- Design under way to implement excavation option
- Excavation option includes:
 - -Temporary excavation and stockpiling of clean backfill placed after underground storage tank (UST) removal action
 - -Removal of the buried UST foundation slab
 - -Removal and treatment and/or disposal of NAPL-impacted soil (the "smear zone"); estimated volume 1,250 cubic yards
 - –Replacement of NAPL-impacted soil with gravel, and replacement of stockpiled backfill
 - –Surface restoration

Design and Path Forward (cont'd)



- Potential future implementation of targeted AS or AS/SVE possible if dissolved VOC concentrations persists
 - Improved air flow after removal of UST foundation slab would increase effectiveness of AS or AS/SVE
- Continuation of MNA with long-term monitoring to address remaining dissolved-phase VOCs outside of excavation area



SPRING 2018 GROUNDWATER SAMPLING SUMMARY

NWIRP CALVERTON, NEW YORK

November 13, 2018

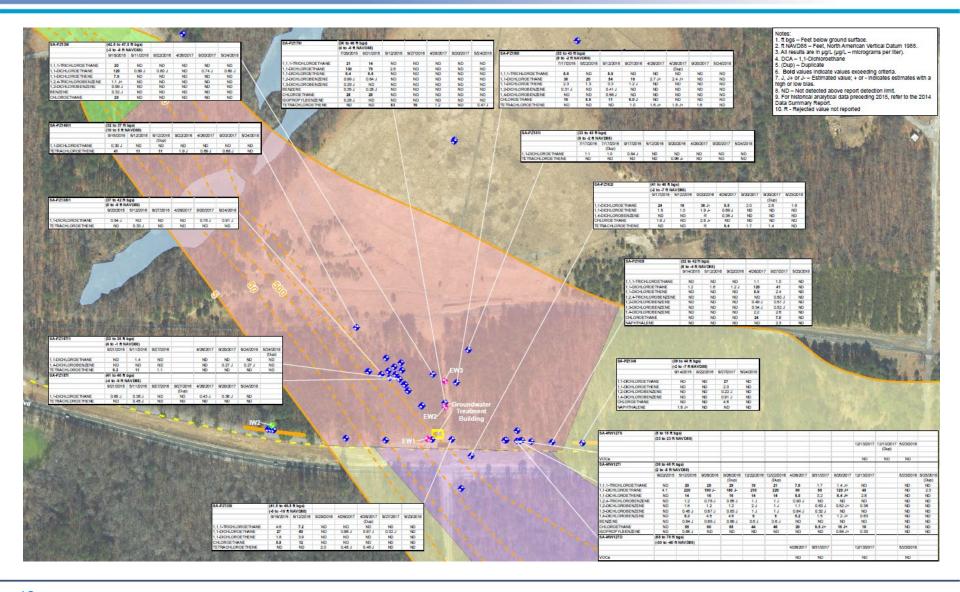
Monitoring Program – Spring 2018



- Sampling completed in May 2018
- Samples collected in accordance with existing Unified Federal Policy Sampling and Analysis Plan (UFP-SAP) requirements
- Fence Line Area
 - -15 locations, all on-site
- Peconic River surface water and porewater
 - -Four surface water and in-river porewater locations
 - -Two upland piezometers adjacent to the Peconic River

Fence Line Area – Spring 2018





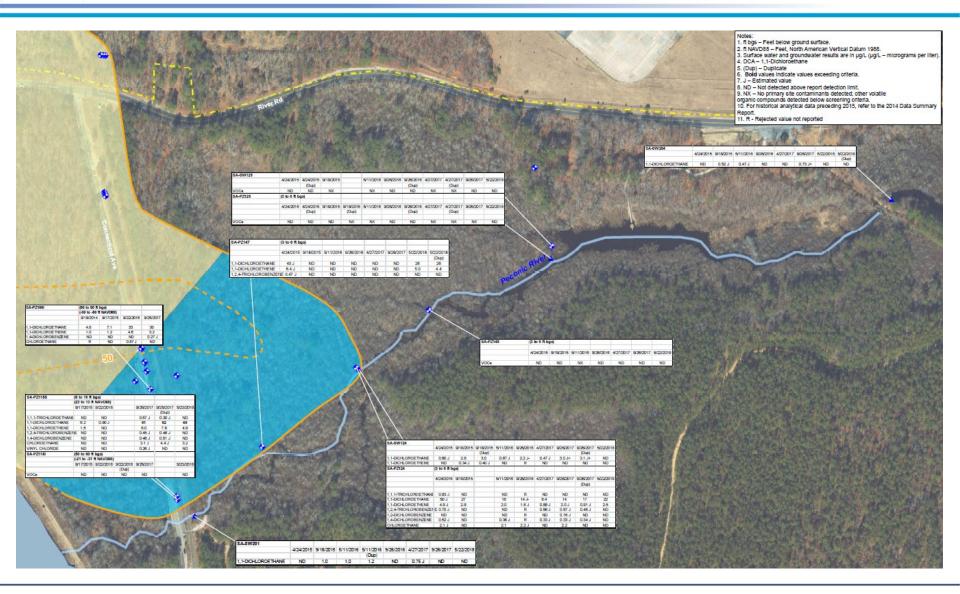
Fence Line Area – Spring 2018 (cont'd)



- Groundwater results Fence Line Area, May 2018
 - -Two VOCs detected (1,1-dichloroethane [DCA] and trichloroethene [TCE])
 - -No maximum contaminant limit (MCL) exceedances at any location sampled
 - –DCA detected at four locations SA-PZ127I (2.3 micrograms per liter [μ g/L]), SA-PZ138I1 (0.91 μ g/L), SA-PZ139I (0.60 μ g/L) and SA-PZ182I (1.9 μ g/L)
 - -TCE detected at SA-PZ179I (0.47 μg/L)
 - –No VOCs detected at 10 other locations sampled

Peconic River Area – Spring 2018





Peconic River Area – Spring 2018 (cont'd)



- Porewater results Peconic River Area, May 2018
 - -Three VOCs detected (DCA, 1,1-dichloroethene [DCE] and chloroethane [CA])
 - -No operable unit (OU) 3 Remedial Design Benchmarks exceeded
 - –DCA and DCE detected at three locations
 - Two in/near the Peconic River SA-PZ124 (22 μg/L DCA, 2.5 μg/L DCE) and SA-PZ147 (26 μg/L DCA, 5.0 μg/L DCE)
 - One adjacent upland location SA-PZ118S (49 μg/L DCA, 4.9 μg/L DCE)
 - -CA also detected at SA-PZ118S (3.2 μg/L)
 - -No VOCs detected at three other locations (SA-PZ118I, SA-PZ125, SA-PZ148)
- Surface water results Peconic River Area, May 2018
 - –No VOCs detected in any of four samples (SA-SW124, SA-SW125, SA-SW201, SA-SW204)



SITE 6A - SOUTHERN AREA FENCE LINE GROUNDWATER EXTRACTION TREATMENT SYSTEM NOVEMBER 2018 RESTORATION ADVISORY BOARD

NWIRP CALVERTON, NEW YORK

November 13, 2018

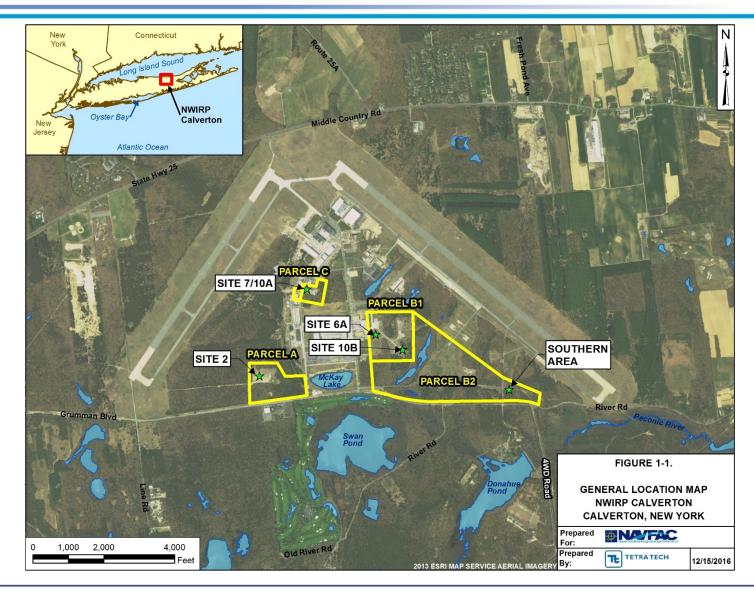
Presentation Agenda



- Introduction
- System Overview
- System Performance and Summary Activities

Site Layout





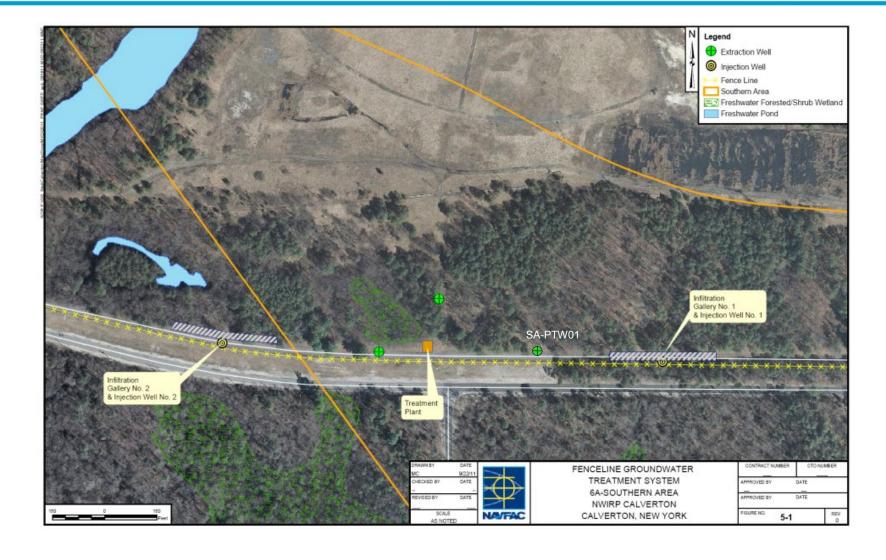
Fence Line Treatment System Overview



- 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 EW1/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.

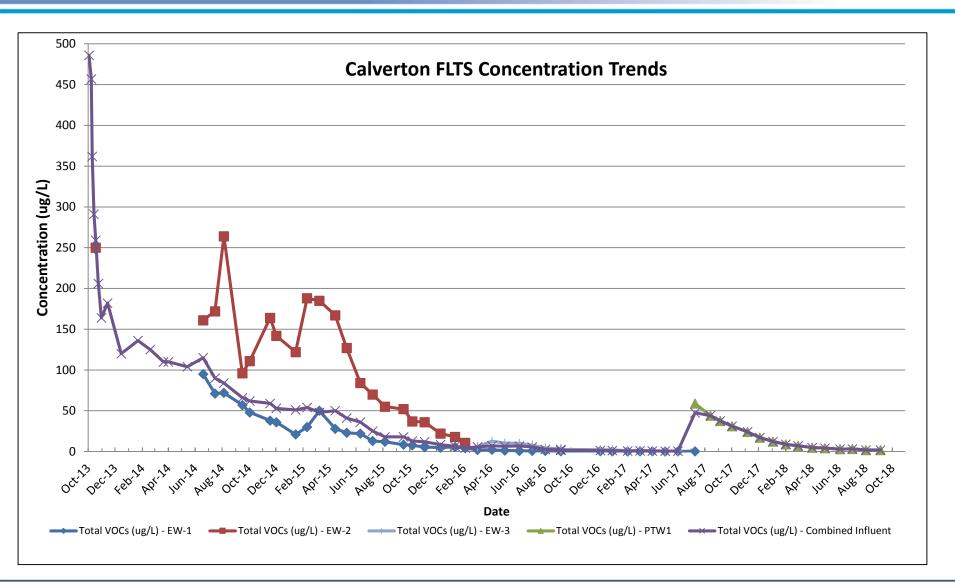
Fence Line Treatment System Overview





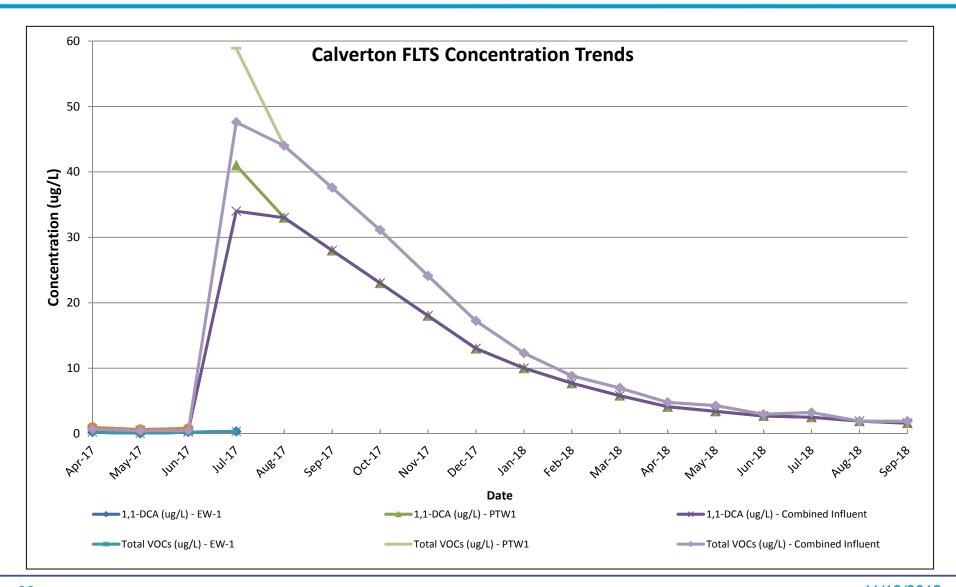
Fence Line Treatment System Operation





Fence Line Treatment System Operation





Fence Line Treatment System Performance Summary Activities



- Continued compliance with all discharge goals.
- Continued VOC removal efficiencies of >99%.
 - 1.11 lbs of VOCs removed in 2018 (Oct 2018)
- Influent analytical results below MCLs at SA-PTW1 (since April 2018)
 - •1,1-DCA = 1.6 J ug/L (Sept. 2018).
- Continue evaluating groundwater concentrations in Area / shut-down criteria.
 - FLTS Influent individual Site-related concentrations < 5ug/L
 - FLTS Area Monitoring wells individual Site-related concentration < 50 ug/L
- Continue evaluating infiltration gallery capacity and perform system modifications as needed.
- Continue to perform monthly compliance sampling and submit monthly compliance reports.



POLY- and PERFLUOROALKYL SUBSTANCES (PFAS) SITE 2 AND AIRCRAFT PAINT HANGAR SITE INSPECTION (SI), FACILITY WIDE PRELIMINARY ASSESSMENT (PA), and COMMUNITY RELATIONS

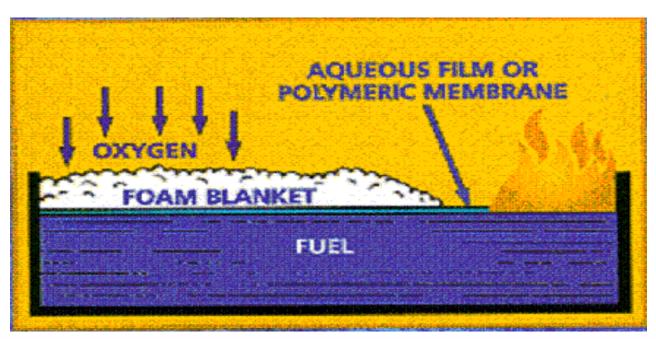
NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP)
CALVERTON, LONG ISLAND, NEW YORK

11/13/2018

Poly- and Perfluoroalkyl Substances (PFAS)



- Substances used in manufacturing, industrial, and commercial applications
- Useful properties: fire resistance and oil, stain, grease, and water repellency
- Ubiquitous in consumer products: carpets, clothing, fabric for furniture, paper packaging for food and other materials (e.g., cookware)
- Industrial uses: Firefighting foam and industrial process (e.g., coatings and cleaning additives)

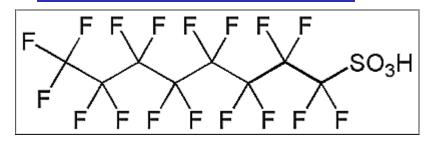


PFAS CONCERNS

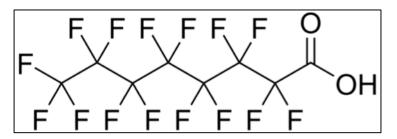


EPA is particularly concerned about two long-chain PFAS

Perfluoroctane Sulfonate (PFOS)



Perfloroocatanoic Acid (PFOA)



- Persistent in the Environment
- Mobile in groundwater
- Biocumulative in wildlife and humans
- Toxic to laboratory animals
- Produces reproductive, developmental, and systemic effects in laboratory tests
- Toxicity values are also available for perfluorobutane sulfonic acid (PFBS)

PFAS GUIDELINES



Guidelines

- EPA Drinking Water Lifetime Health Advisories
 - –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 hazardous substances (6 NYCRR Part 597, March 2017)
- New York State has no criteria specific to PFAS

nanogram

What is a ng/L?

1 milligram per liter (mg/L) = 1,000 micrograms per liter (μ g/L) = 1,000,000 ng/L

33

Site 2 – Former Fire Training Area



- Used as an active Fire Training Area from the 1950's until 1996
- Aqueous Film Forming Foams (AFFF) used to extinguish fires
- PFAS was used to manufacture AFFF from the 1960's to 2001



Looking west northwest

Site 2 – Former Fire Training Area PFAS Sampling Events



September 2016

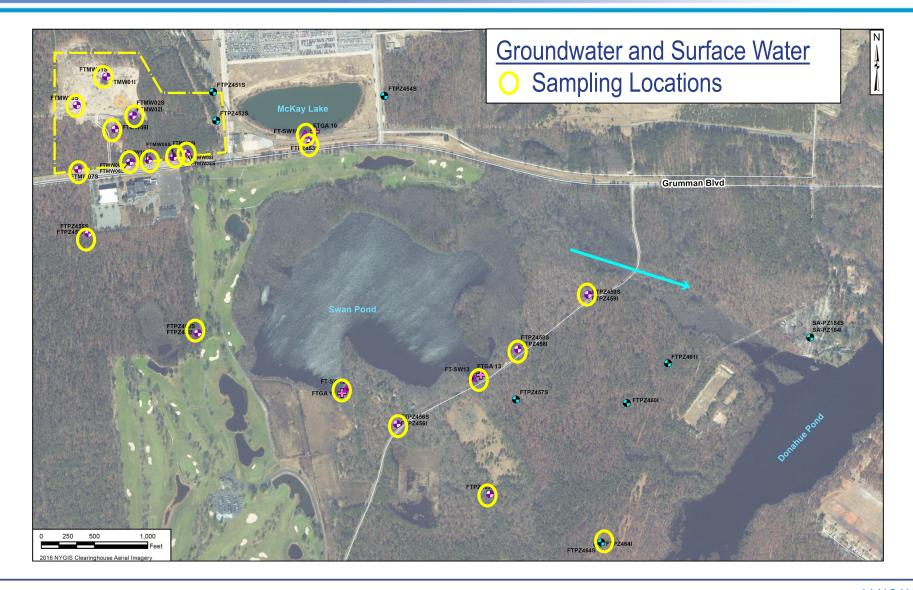
- 7 Monitoring wells and 1 drinking water well sampled and analyzed for PFOA and PFOS
 November 2017 to January 2018
- Site Inspection (SI) activities
 - —5 Surface and 12 subsurface soil samples collected at the former Fire Training Area and analyzed for PFOA, PFOS, and PFBS
 - —4 Groundwater grab samples collected at the former Fire Training Area and analyzed for 14 PFAS compounds
 - —27 Monitoring wells and 1 drinking water well sampled and analyzed for 14 PFAS compounds
 - —3 Surface water samples collected at McKay Lake and Swan Pond and analyzed for 14 PFAS compounds

June 2018 to July 2018

- Continued SI activities
 - —6 Monitoring wells (21 PFAS compounds) and 1 drinking water well (14 PFAS compounds), 21 PFAS compounds on State of New York list
 - —3 Surface water samples collected at McKay Lake and Swan Pond and analyzed for 21 PFAS compounds

Site 2 – Former Fire Training Area PFAS Groundwater Investigation

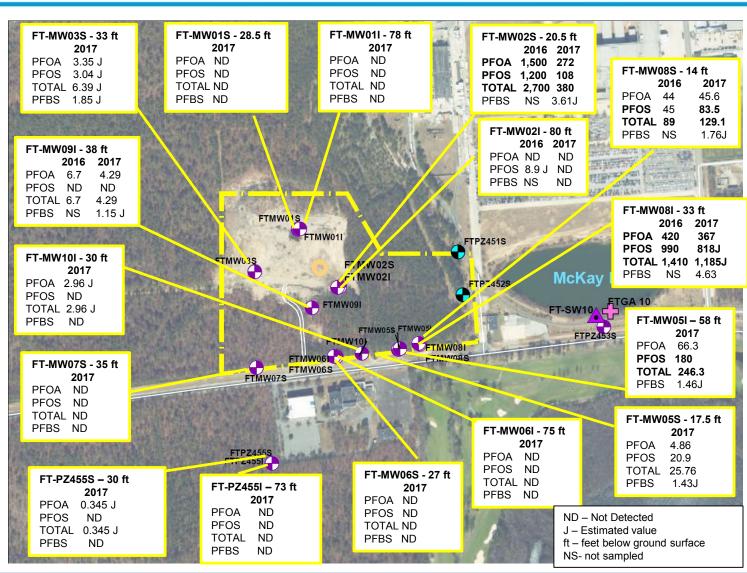




Site 2 – Former Fire Training Area PFAS Results (ng/L)



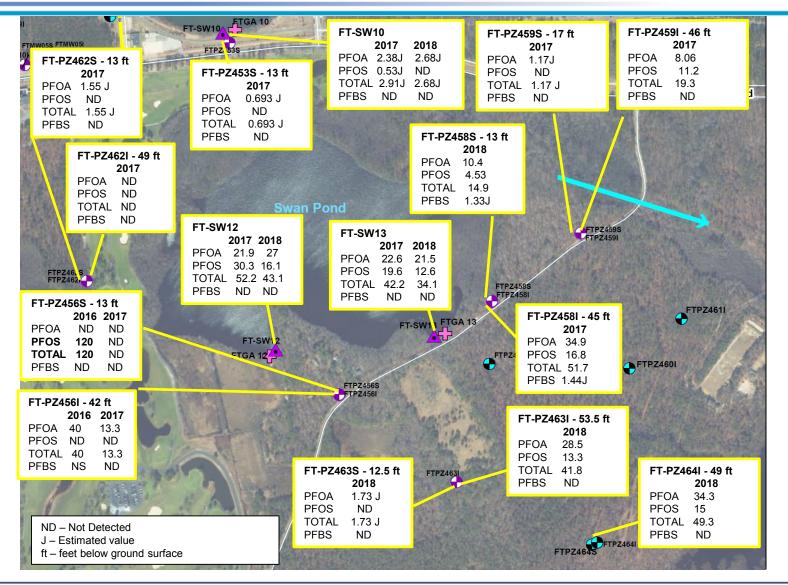
- 28 Monitoring wells tested at the Site 2 monitoring well network
- 4 On-property
 monitoring wells had
 at least one
 groundwater sample
 with an exceedance
 of the EPA drinking
 water Lifetime
 Health Advisories
- Moderate concentrations noted near and downgradient of the former Fire Training Area



Site 2 – Former Fire Training Area PFAS Results (ng/L)



 One offproperty monitoring well in 2016, had an exceedance of the EPA drinking water Lifetime Health Advisories



Aircraft Paint Hangars PFAS Investigation



- Aircraft paint hangars north and west of Site 6A were identified as having fire suppression systems that contained AFFF
- 1980's: The AFFF 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



Looking northwest

Aircraft Paint Hangars PFAS Sampling Events



September 2016

4 Monitoring wells sampled and analyzed for PFOA and PFOS

November 2017

- SI activities
 - -24 Monitoring wells sampled and analyzed for the 14 PFAS compounds
 - —1 Treatment plant effluent sample collected and analyzed for the 14 PFAS compounds
 - -5 Surface water and 2 pore water samples collected at Peconic River and analyzed for the 14 PFAS compounds

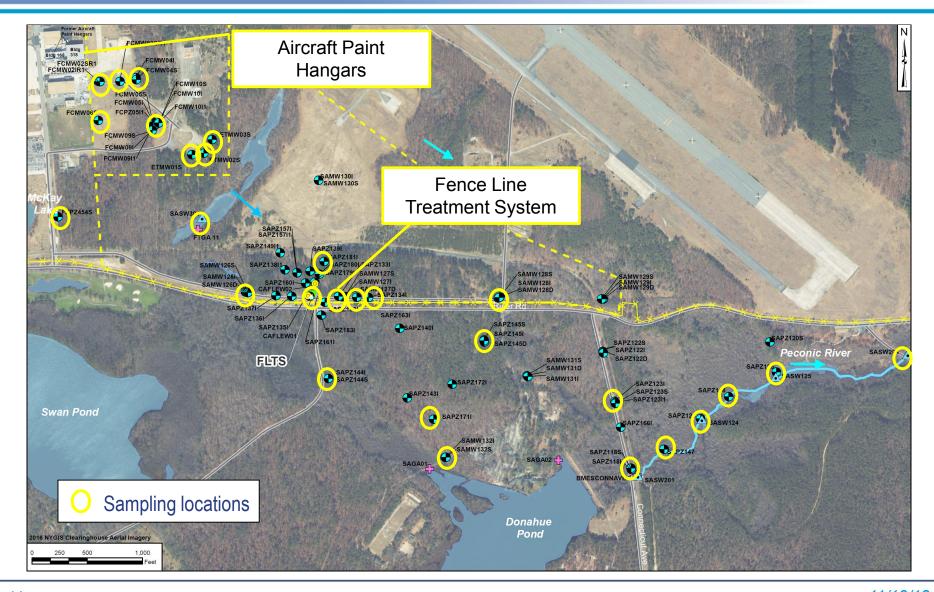
June 2018 to July 2018

- Continued SI activities
 - -10 Monitoring wells sampled and analyzed for 21 PFAS compounds
 - -5 Surface water samples collected at the on-property unnamed pond and the Peconic River and analyzed for 21 PFAS compounds

40 11/13/18

Aircraft Paint Hangars PFAS Investigation

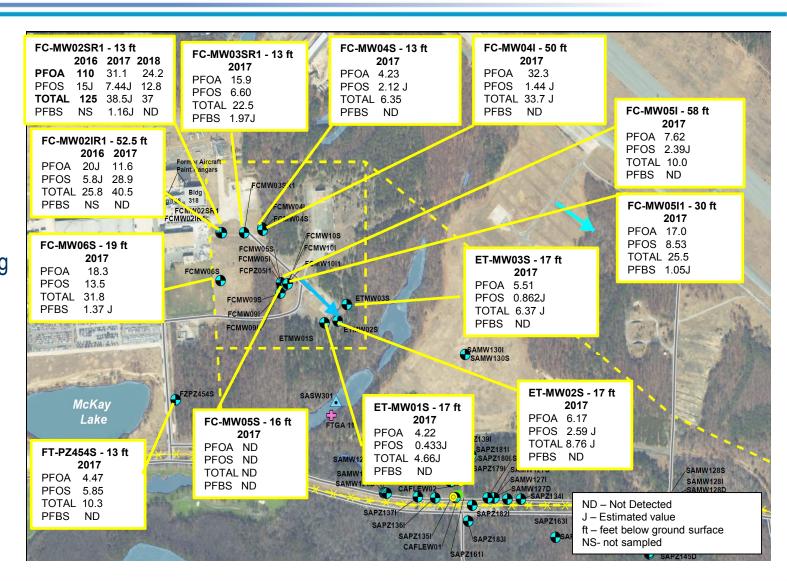




Aircraft Paint Hangars On-Property PFAS Results (ng/L)



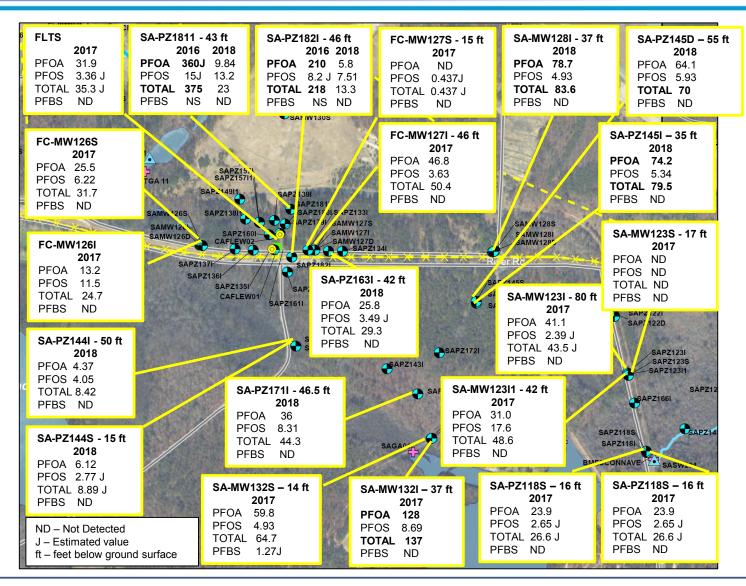
- 33 Monitoring wells tested at the Site 6A monitoring well network
- One monitoring well exceeded the EPA drinking water Lifetime Health Advisories in 2016, but is below the advisories in 2017 and 2018



Aircraft Paint Hangars On-Property PFAS Results (ng/L)



• 6 Monitoring wells at the fence line and off-property had at least one groundwater sample with an exceedance of the EPA drinking water Lifetime Health Advisories



Site 2 and Aircraft Paint Hangars Surface Water

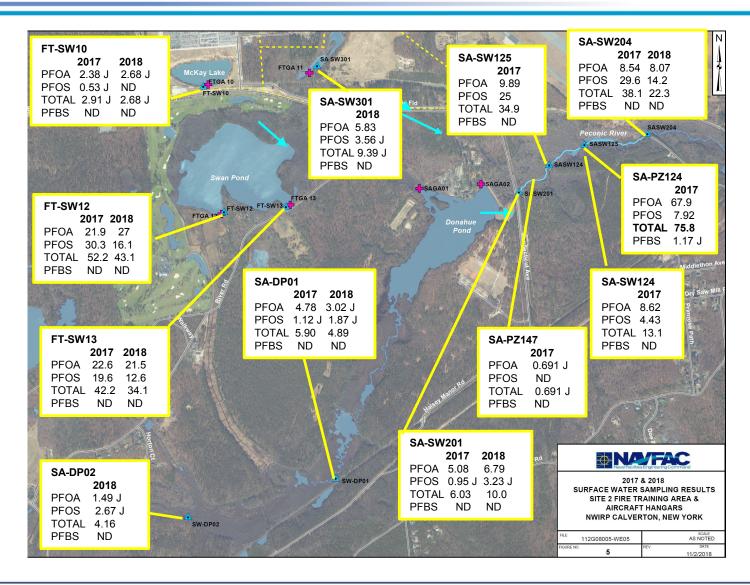


- Calculated Surface Water Screening Levels
- EPA RSL Calculator:
- Recreational exposure to PFOA and PFOS: 4,400 ng/L in surface water
 - -26 years: 6 years as a child and 20 years as an adult
 - —Considers weight and skin surface area
 - -Exposure to surface water for 4 hours a day during 52 days of the year

Site 2 and Aircraft Paint Hangars Pore Water and Surface Water Results (ng/L)



- 10 Surface water sample locations and 2 pore water sample locations
- All results are below the calculated surface water screening value
- 1 Pore water sample exceeds the EPA drinking water Lifetime Health Advisories



Site 2 and Aircraft Paint Hangars Site Inspection



Questions about Site 2 and Aircraft Paint Hangars?

Facility Wide Preliminary Assessment (PA)

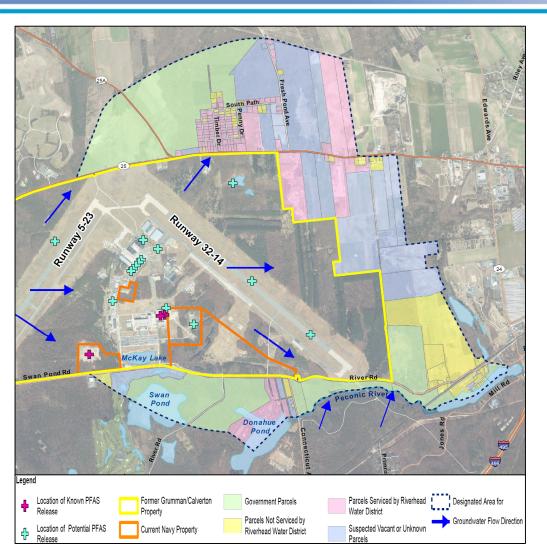


PA is currently in progress for NWIRP Calverton

- Literature Searches
 - –Naval Information Restoration Information Solution (NIRIS)
 - –Public Databases (EPA and State of New York)
- Site Interviews and Site Reconnaissance
- Potential PFAS sites
 - -Fuel Spills
 - –Fire Department Training Areas
 - -Hangars
 - -Crash Sites
- PA Report: Summarizes findings and recommendations for Site Inspections

Facility Wide Off-Property Drinking Water Well Sampling





- The Navy is investigating historical use of firefighting foam on the former Grumman/Calverton property
- Firefighting foam was used for:
 - -Crash response
 - -Equipment training
 - —Firefighting training
- Certain firefighting foams contain PFAS
- PFAS may be present in private drinking water wells in nearby locations based on:
 - —Historical releases
 - -Groundwater flow

PFAS Community Relations



Off-property Drinking Water Actions

- Notification letters and questionnaires mailed to residents and businesses.
- Public meeting held September 25, 2018
- Private drinking water sampling (September 26, 2018)
- Second chance requests for sampling mailed the week of October 1, 2018.
- Door-to-door survey conducted on October 23, 2018
- Collected 14 drinking water samples and all results are below EPA Lifetime Health Advisory

PFAS Path Forward

- Respond to property owners
- Continue to keep the community informed

Conduct PA/SI