



NAVAL AIR STATION JOINT RESERVE BASE (NAS JRB) WILLOW GROVE Restoration Advisory Board (RAB) Meeting Minutes

Meeting Date: December 13, 2017

Meeting Time: 2:00 p.m.

Meeting Place: Horsham Township Library

	<u>Name</u>	<u>Organization</u>
Attendance:	Willie Lin (R)	Navy BRAC PMO
	Brian Helland (R)	Navy, NAVFAC
	Martin Schy	NAS JRB Navy Caretaker's Office, BRAC
	Jim Rugh	NAS JRB Navy Caretaker's Office, BRAC
	Jason Speicher	Navy
	Lisa Cunningham (R)	EPA
	Larry Brown	EPA
	Mark Leipert	EPA
	Sarah Kloss	EPA
	Colin Wade (R)	PADEP
	Jessica Kasmari (R)	PADEP
	Andrew Frebowitz	Tetra Tech
	Mike Shannon	AECOM/Resolution
	Lt Col Jacqueline Siciliano	PA Air National Guard
	Major Lydia Stefanik	PA Air National Guard
	Keith Freihofer	Air National Guard
	Lt. Christine Lloyd	ATSDR
	Ana Pomales	ATSDR
	Tina O'Rourke	Horsham Water and Sewer Authority
	Tim Hagey	Warminster Township Municipal Authority
	Dave Fennimore	Earth Data/Warminster Municipal Authority
	Christian Jones	Warrington Township Water and Sewer
	Farhad Ahmed	Pennsylvania Department of Health
	Amil Nair	Pennsylvania Department of Health
	Bevin Denkins	Pennsylvania Department of Health
	Toby Kessler	Gilmore Associates/Horsham Water and Sewer
	Tom Ames	HLRA
	Mike McGee	HLRA
	Larry Burns	HLRA
	Bill Walker	Horsham Township
	Clarice Lathem	Rep. Todd Stephens' Office
	Matt Machusick	Leidos
	Jay Motwain	Weston
	Naila Hosein	BB&E (ANG Consultant)
	Jim Vetrini (R)	RAB Community Member/Resident

Carlos Cope	Resident
Joseph McGrath	Former Employee at NASJRB Willow Grove
Wendy Spector	Resident
Mark Cuker	Resident
Jim Steele	Resident
Nancy Jaeschke	Resident
Hope Grosse	Resident
Larry and Jaqueline Menkes	Residents
Joanne Stanton	Resident
Joe Heffernan	Resident
Natalie Hukins	Resident
Greg Bailey	Resident
Kevin O'Brien	Resident
Joseph Loftus	Resident
Joe Feliciani	Resident
Mary Gemmill (R)	RAB Community Member/Resident
Ted Roth (R)	RAB Community Member/Resident
Nicholas Himebaugh	Congressman Brendan Boyle's Office
Mike Morey	State Representative Watson's Office
Kyle Bagenstose	The Intelligencer
Other Unidentified Residents	
(R) Designates RAB Member	

Willie Lin, the Navy's Base Realignment and Closure (BRAC) Environmental Coordinator and RAB Co-Chair, opened the meeting by greeting the attendees. Mr. Lin noted that this meeting will include presentations from the Navy and Air National Guard (ANG). Mr. Lin acknowledged Mary Gemmill, the Community RAB Co-Chair as well as Keith Freihofer representing the ANG. Mr. Lin asked RAB members and government representatives to introduce themselves. After introductions, Mr. Lin noted that the Navy is currently disposing a 55-acre parcel in Bucks County known as Shenandoah Woods which was previously used for Navy housing. This is in addition to 26 acres already assigned to the National Park Service in September 2017.

Mr. Lin then commenced with the Navy presentation. Mr. Lin briefly discussed the purpose of RAB and gave an overview of the means in which regulatory agencies exchange information with the community. The RAB is established to address environmental restoration activities and not as a forum to discuss health issues. Mr. Lin gave a brief summary of the phases and milestones of the Environmental Restoration Process. Mr. Lin introduced Andrew Frebowitz to provide an update on the cleanup sites, including landfill Sites 3 and 12 and Site 5, the former Fire Training Area. Mr. Frebowitz provided background on Sites 3 and 12 stating that they were former landfills used by the Public Works Department at the former facility. Wastes were buried in trenches and covered. Results from the remedial investigations (RIs) at both sites showed soils with elevated levels of metals and polycyclic aromatic hydrocarbons. In addition, groundwater at Site 3 showed elevated levels of the volatile organic compound (VOC) tetrachloroethene (PCE). Feasibility studies (FSs) are in preparation to evaluate potential remedial alternatives and select a remedy for site closure.

Groundwater at Site 5 is impacted by VOCs, with the primary parent compounds of PCE and trichloroethene (TCE). The selected remedy for groundwater includes operation of an anaerobic bioremediation system which break down VOCs. The system is being maintained and monitored in accordance with approved plans. Annual monitoring for VOCs as well as quarterly monitoring of environmental conditions to maintain anaerobic conditions will continue. Injection of nutrients for the bacteria which break down the VOCs is conducted periodically. Sampling results show decreasing trends of VOC parent compounds and other indicators that remediation is occurring.

Mr. Frebowitz explained that the second five- year review is being conducted for the facility and will be completed in September 2018. The purpose is to ensure that remedies that have been implemented are effectively protecting public health and the environment. The Navy is looking at Site 5 and the Air National Guard is looking at Site 1. A public notice was published in “The Intelligencer” and included with this meetings handouts. Public input is requested by January 31, 2018; contact information is included in the notice.

Mr. Lin began the presentation for the next agenda item, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) in groundwater. Mr. Lin provided background information on these compound which are found in fire-fighting foam as well as many other consumer products. In mid-2014, PFOA and PFOS were found in drinking water wells near NASJRB Willow Grove. At that time, the health advisory levels were 0.4 micrograms per liter, or 400 parts per trillion (ppt) for PFOA, and 0.2 micrograms per liter, or 200 ppt for PFOS. In 2016, EPA established a lifetime health advisory level of 0.07 micrograms per liter, or 70 ppt, for combined PFOA and PFOS in drinking water. These levels are set as a reasonable health-based concentration above which actions should be taken to reduce exposure. The Navy’s priority is eliminating exposure to PFOA and PFOS above the lifetime health advisory levels at public and private drinking water wells.

Mr. Lin stated that if there are health concerns, they should be addressed with a health professional. Links to health information were included in the presentation handouts and representatives from the Agency for Toxic Substances and Disease Registry (ATSDR) and Pennsylvania Department of Health were present to answer questions at the end of the meeting.

Mr. Lin provided a summary of the Navy’s private well sampling activities. Tetra Tech., a Navy contractor, has assumed sampling responsibilities previously conducted by EPA. Approximately 500 wells have been sampled in the townships around the former NASJRB Willow Grove Base, of which 95 have levels above the health advisory of 70 ppt combined PFOA and PFOS. Of the wells above the health advisory, 14 remain to be connected to the public water supply. Connections are being arranged through cooperative agreements with the townships. Bottled water is being provided to locations above the health advisory where connections have not yet been completed. About 70 wells are being monitored as these wells show levels below the health advisory but above 40 ppt combined PFOA and PFOS. The Navy is also funding treatment of impacted public supply wells though the cooperative agreements. Five Horsham Water and Sewer Authority (HSWA) wells showed levels above the lifetime health advisory. The wells are being treated with a carbon filtration system. Treated water from the five wells is now below the lifetime health advisory and the wells are back to drinking water service.

Mr. Lin introduced Mike Shannon to discuss the on-site RI for perfluoroalkyl substances (PFAS). The first phase of the investigation started last year and included installation and sampling of monitoring wells and collection of surface water, sediment and soil samples. The results were summarized in a draft report submitted in November 2016. The report identified data gaps and strategies to collect the needed data. Since that time, the Navy has been working with the regulators to develop the scope of work for the additional investigation and work plans for various activities have been submitted or are in preparation. The work plan for installation of additional wells and surface water and sediment sampling is now being implemented.

An additional 18 deep wells have been installed. These new wells, in addition to a subset of existing site wells, were sampled for a total of 78 wells. Further surface water and sediment sampling was completed over the past few months. The data has been received and is undergoing validation and review. A Draft Sampling and Analysis Plan Addendum for a soil-to-groundwater evaluation has been prepared, and the field work is expected for early 2018. A Feasibility Study to evaluate remedial alternatives will be prepared after the Remedial Investigation is completed in mid-2018.

Mr. Shannon continued the presentation on the recent work on the evaluation of potential discharges of PFAS to local surface waters. Base-flow and peak (after storm) flow surface water and sediment sampling on Park Creek and Pennypack Creek was completed in August 2017. Results indicated that PFOA/PFOS concentrations in northern outfalls to Park Creek and the outfall leading to Pennypack Creek were significantly lower following rain. A series of small outfalls in the northern part of the base that discharge to Park Creek have also been sealed to minimize potential impacts. The retention basin has been modified to hold additional storm water and the storm water system is being evaluated to locate areas where contaminated groundwater may infiltrate and discharge to local surface water. Over two miles of storm sewer lines have been reviewed and several storm sewer lines have been identified for remote TV inspections planned for early 2018. A report with recommendations for possible storm sewer rehabilitation options and inlet closures will be planned by mid-2018.

Mr. Lin referred attendees to the handouts for links to additional information and resources, then asked for questions from the RAB members. Mr. Vetrini inquired about the precursor that led to the initial investigation of the PFOS and PFOA. Mr. Lin responded that a sampling event in 2013 of Horsham, Warminster Township, and Warrington municipal wells showed levels above the provisional health advisory level at that time. Sampling of private wells commenced in response to those findings.

Joseph McGrath requested that the meetings be moved to a later time in the day in order to allow more community members to attend. Ted Roth requested a budget that the Navy is using for the project and that additional members of the community be allowed on the RAB. Mr. Lin stated that he would share what the Navy has funded for the project at the next RAB meeting. Mr. Lin noted that the RAB is open to all community members but it is up to the community to place their members on the board. The Navy does not have a part in the selection of community membership.

Mike McGee asked if the outfalls near Keith Valley Road were retaining water from storm events, and if that storm water would percolate in the groundwater. Mr. Lin replied that outfalls are near

the bottom of the basin, and the basin is now retaining water. The basin allows storm water to percolate into the ground or evaporate.

Joe Feliciani asked if the Navy would follow a lower action level than 70 ppt if the state of Pennsylvania creates their own level. Mr. Lin replied that if the state promulgates a lower enforceable drinking water standard, the Navy would follow that guideline.

Kevin O'Brien inquired about the surcharges on billing for treatment of Horsham water as well as the status of the storage tanks around the perimeter of the base. Mr. Lin replied that the Navy is providing funding for actions when concentrations are 70 ppt or higher. Any costs that are associated with lower levels, the Navy does not cover. Tina O'Rourke replied that the surcharges are to treat the water to levels below 70 ppt. Mr. Lin stated that the tanks around the base were used for temporary storage of water generated during well drilling and are now empty. The tanks are waiting for transportation from the site.

An unidentified audience member asked about the removal of contaminated soil from the site. Mr. Lin explained work plans for removal of hot spots with contaminated soil are being prepared.

Toby Kessler asked about the groundwater study being performed by the USGS. Mr. Lin responded that the USGS is continuing to work on their groundwater model. USGS will present an updated model at a future RAB meeting.

Mark Cuker inquired about the date that the results for the soil analysis would be made publicly available, and what level has been identified as a removal action level. Mr. Lin responded that no current soil removal level has been established. The results of the soil investigation will be available when the RI report is completed in mid-2018.

Hope Gross asked about the availability of a report for the remediation of Shenandoah Woods and where it can be located. Mr. Lin answered that the remediation report is publicly available and can be found in the administrative record.

Larry Menkes inquired about the testing of the wells, and commented on the health effects that could result from the water. Mr. Lin reiterated that the RAB meeting is to discuss environmental restoration and not health effects but representatives from the Pennsylvania Department of Health and ATSDR were present and are available to speak with him after the meeting. Mr. McGrath suggested that the members of the ANG have additional PFAS related testing done during their periodic physicals in order to see the effects over time. Lieutenant Christine Lloyd announced that ATSDR is anticipated funding to continue PFAS health investigations at eight sites across the country.

Jennifer Humphries asked about the funding for Warminster Township. Mr. Lin responded the Air National Guard has a separate action for Warminster Township, which will be discussed later in the meeting, and the previous presentation was only in regards to the Willow Grove Air Station.

Joanne Stanton inquired about the results for public supply samples taken off base. Ms. O'Rourke responded that the public wells are sampled on a monthly basis and that the results are available

on Horsham Water and Sewer Authority website. Ms. Stanton stated that high levels have been found in areas off-base. She inquired about the process of investigating the groundwater of areas on the outer perimeter of the contamination. Mr. Lin responded that when results indicate contamination near the perimeter of the sampling area the Navy has expanded the area and looked further away.

Ms. Gross expressed her concern about the possible distance that the contamination could have reached. Mr. Lin replied that the private well sampling has been broadened and that distance covered by the contamination is determined by the groundwater flow; however, samples at distances greater than a mile from the base have been collected.

David Fennimore asked if any monitoring well drilling would be occurring off base. Mr. Lin answered that no offsite drilling is planned at this time, but other groundwater investigation including sampling of unused municipally-owned wells is being evaluated.

Mr. Menkes expressed his concern over the health advisory level for the PFCs. He stated that the testing limits should be lowered. Mr. Lin answered the Navy is following the EPA health advisory level of 70 ppt.

Mr. Lin introduced Mr. Freihofer to commence with the ANG presentation.

Mr. Freihofer began the ANG presentation with an update on Site ST01 which was a former fuel tank farm where jet fuel had leaked in the 1970s. The biosparge remediation system was discontinued in 2016. Currently injections of persulfate and Epsom salt are being used for remediation. The tanks and approximately 175 tons of contaminated soil were recently removed. The Air Force Civil Engineer Center (AFCEC) will be conducting confirmatory sampling in the area to assess if there is residual contamination. Mr. McGee inquired about the location of the plume. Mr. Freihofer stated that the extent of the plume is still offsite just outside the fenceline in a farm field north of the base. This is the area that is being treated.

Mr. Freihofer provided an update on the Privet Road Site. This was a former solid waste management area that has low levels of TCE and PCE in groundwater as of the recent sampling results of June 2016. Levels are below drinking water standards. ANG is continuing to conduct biannual groundwater monitoring and land use control inspections. A five-year review is being conducted for the Privet Road Compound Site. Public interviews can be scheduled by contacting Mr. Freihofer.

Mr. Freihofer discussed the ANG response to PFAS contamination at the Horsham Air Guard Station (HAGS). The ANG completed a preliminary assessment at HAGS and identified 10 potential PFC source areas. These include areas where PFCs may have been used or stored, such as hangars, or where firefighting foam may have been dispersed, such as the storm basin and waste water treatment plant. Mr. Freihofer introduced Matt Machusick of LEIDOS, who is the ANG consultant for this work, to provide more details on the PFAS investigation.

Mr. Machusick stated the initial investigation included sampling of soil, surface water and sediment across the Base. Samples from tanks where firefighting foam was stored were also

collected. This information is in a Technical Memorandum submitted in October 2016. Based on that information, potential source areas were targeted and shallow monitoring wells were installed and sampled. Results were then used to select locations for installation of intermediate and deep wells. ANG worked with EPA, PADEP, and USGS to select locations and where to screen the wells. More recently, perimeter wells were installed with multiple sampling ports at various depths to try to determine contamination levels at different depths. A water level study was also recently conducted. Results show that PFAS was not at high levels in soil or the rock matrix. Groundwater results indicate that PFAS levels decrease with depth in the on-Base production wells and northern boundary wells, but increase with depth in the southern portion of the ANG property. A draft Facility Investigation Report is currently with the ANG for review.

Mr. Machusick reviewed the previous round of ground water sampling results noting that widespread detections between 1,000 to 5,000 ppt were common. He noted that many of the results were similar to previous rounds of sampling. Future steps for the site include submitting a final facility investigation report, finalizing the 2nd Annual Groundwater Sampling Report, and conducting another surface water sampling event in March 2018.

Mr. Machusick stated a storm water study is currently underway. Two out of four surface water sampling events have occurred. A baseflow event with no precipitation was conducted followed by a precipitation sampling event. Leidos has also initiated National Pollutant Discharge Elimination System (NPDES) permitting and submitted a draft work plan. The NPDES permit will specify monitoring requirements for water discharges from the base.

Mr. Machusick continued the presentation with a discussion on PFAS in surface water. Results have shown levels above the drinking water health advisory levels in surface water samples with levels generally decreasing further downstream from the Base. The surface water leaving the site from the storm water basin on the northwest side of the Base contains PFAS. ANG is evaluating the source of the discharge to the basin and then to Park Creek. In the interim, a temporary carbon filtration system has been installed on the outfall. Sampling indicates that water leaving the base at this point is at 2 ppt for combined PFOS/PFOA. Leidos will continue to study the storm water basin, determine the source of dry weather flow, and propose long term engineered solutions to filter effluent from detention basin.

Ms. Gemmill inquired as to the effect of rain fall on the contamination level. Mr. Machusick responded that as of now the effects are uncertain, and the sampling events should help clarify that issue once the results have been reviewed.

Ms. Gross asked about soil sampling at the site and outcome of the results. Mr. Machusick replied that each of the potential source areas had soil borings installed and had multiple samples collected. The results were put forth in a technical memorandum that is publically available in the administrative record.

An unidentified audience member inquired about the total number of outfalls covered by the NPDES permit. Mr. Machusick replied that the base operates under a temporary permit. The scope of work is to sample at the storm basin oufall, the outfall at Easton Road, and the outfall to Park Creek.

Tom Ames asked for an update regarding the information being shared between the ANG and the Navy. Mr. Freihofner answered that a joint meeting was held in November with representatives from the ANG, Navy, and EPA.

Mr. Freihofner discussed the ANG response to drinking water contamination. A cooperative agreement with Warrington Township is in place to install and maintain carbon filters on five Township wells. The agreement also includes connecting private wells with levels above the health advisory to the public supply. Extension of water mains is being performed. The agreement also provides an interconnection with the North Wales Water Authority to ensure adequate access to water while treatment systems are being constructed. The HACS water supply wells are filtered with carbon and have extracted and treated over 20 million gallons of water; however, these wells are not used for potable supply.

An unidentified audience member asked about possible health effects from dermal contact. Lt. Lloyd replied that PFAS compounds don't readily absorb through the skin and the primary route of exposure is through ingestion.

An unidentified audience member asked for clarification about a possible surcharge on the water that residents receive in the Warrington area. Christian Jones replied that Warrington Township Water and Sewer Departments public water customers have not incurred any additional costs to their bill in relation to the contamination as it is being funded by the ANG.

Mr. Freihofner continued with an update of the private well sampling program. In Horsham Township, five wells were above the health advisory, and four have been connected to public water. The remaining well is not in use. In Warrington Township, 136 wells were sampled and 45 were above the health advisory. Connections for 29 wells have been completed with the remaining receiving bottled water until the connections are completed. In Warminster Township, 14 wells have been sampled with 11 wells being above the health advisory. Four of those wells have been connected. ANG has transitioned the sampling and bottled water deliveries from EPA to an ANG contractor.

Mr. Ames asked if the Air Guard was following the CERCLA process for the PFOS/PFOA investigation. Mr. Freihofner responded that the Air Guard is following the Safe Drinking Water Act Administrative Order. A PA was completed. Currently the Air Guard is performing a Facility Investigation in lieu of a SI. The Facility Investigation is a little bit more robust than a normal SI would be. The next step would be moving on to an RI.

Mr. McGrath reiterated that he believed the next meeting should be moved to a later time in the day to allow more residents to attend.

Mr. Lin brought the meeting to a close by thanking attendees.

Meeting adjourned.

**NASJRB
WILLOW GROVE
RESTORATION
ADVISORY BOARD
(RAB)**

December 13, 2017





RAB Agenda

- Welcome Community and RAB Members
- Environmental Restoration Status
- Five Year Review
- Perfluorinated Compounds Status
- Questions
- Closing Remarks





What is a RAB?



- A Restoration Advisory Board (RAB) is a stakeholder group that meets on a regular basis to discuss environmental restoration at a specific property that is either currently or was formerly owned by DoD, but where DoD oversees the environmental restoration process.
- RABs enable people interested in the environmental cleanup at a specific installation to exchange information with representatives of regulatory agencies, the installation, and the community.
- RABs may only address issues associated with environmental restoration activities.
- Health related issues are not addressed by the RAB.



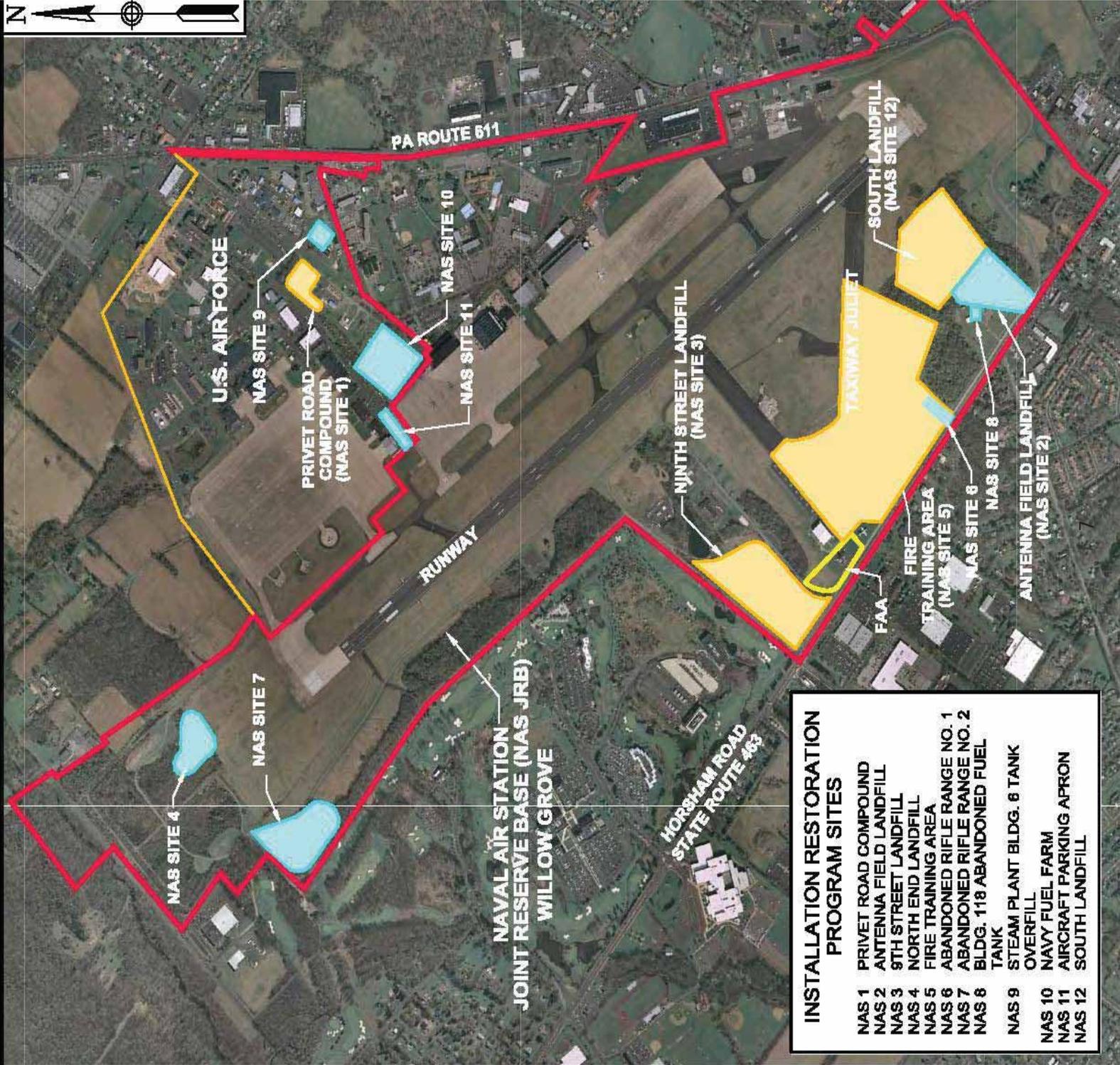
Environmental Restoration Status



NASJRB Willow Grove Environmental Restoration Sites



Site	Name	Operable Unit (OU)	Status
1	Privet Road Compound	Soil - OU 1 Groundwater - OU 3	Soil (OU 1) NFA ROD signed September 2006. Groundwater (OU 3) Interim ROD signed September 2008. Groundwater (OU-3) IRACR Signed December 2011.
2	Antenna Field Landfill	Soil - OU 5 Groundwater- OU 9	No Action ROD Signed June 17, 2010
3	Ninth Street Landfill	Soil - OU 6 Groundwater- OU 10	RI completed October 2011/FS Pending
4	North End Landfill	---	Consensus Agreement for No Action Jan. 2009
5	Fire Training Area	Soil - OU 4 Groundwater - OU 2	Soil (OU 4) NFA ROD signed Sept. 2007 Groundwater (OU 2) ROD signed Sept. 2012 Groundwater (OU2) RACR Signed September, 2014 Groundwater (OU 2) Final OPS report and OM&M Plan May 2015
6	Abandoned Rifle Range No. 1	---	Consensus Agreement for No Action December 2007
7	Abandoned Rifle Range No. 2	---	Consensus Agreement for No Action August 2008
8	Building 118 Abandoned Fuel Tank	---	NFA Agreement October 2006
9	Steam Plant Building 6 Tank Overflow	---	NFA Agreement October 2006
10	Navy Fuel Farm	---	NFA at this time Property transferred to Air Force
SSA 11	Aircraft Parking Apron	---	Eliminated From Consideration
12	South Landfill	OU 11	Final RI February 2014, FS to Follow
PFCs/PFAS	Perfluorinated Compounds/ Per- and polyfluoroalkyl substances	OU 12	TCRA Sept. 2015, Final PA/SI March 2016, RI in progress



INSTALLATION RESTORATION PROGRAM SITES	
NAS 1	PRIVET ROAD COMPOUND
NAS 2	ANTENNA FIELD LANDFILL
NAS 3	9TH STREET LANDFILL
NAS 4	NORTH END LANDFILL
NAS 5	FIRE TRAINING AREA
NAS 6	ABANDONED RIFLE RANGE NO. 1
NAS 7	ABANDONED RIFLE RANGE NO. 2
NAS 8	BLDG. 118 ABANDONED FUEL TANK
NAS 9	STEAM PLANT BLDG. 6 TANK OVERFILL
NAS 10	NAVY FUEL FARM
NAS 11	AIRCRAFT PARKING APRON
NAS 12	SOUTH LANDFILL





Site 3 and Site 12 Landfills



- Former landfills used by the Base Public Works Dept.
- Waste buried in trenches
- Remedial Investigations showed elevated levels of metals and PAHs in surface and subsurface soils
- Site 3 groundwater showed low levels of PCE
- Feasibility Studies in preparation to evaluate remedial alternatives. Drafts to be submitted to EPA/PADEP by end of 2017.



Site 5 – Fire Training Area Groundwater



LEGEND

● MONITORING WELL LOCATION

SOURCE: DELAWARE VALLEY REGIONAL PLANNING COMMISSION 2005 DIGITAL ORTHOIMAGERY



Site 5 Groundwater Remedial Action



- Anaerobic bioremediation system continues to operate
- Annual performance monitoring is being conducted in accordance with approved Operation, Maintenance, and Monitoring Plan
- Quarterly monitoring of anaerobic conditions conducted – last round completed late November 2017
- Additional injections of amendments will be conducted based on monitoring results
- Results continue to show good conditions for biodegradation of volatile organic compounds (VOCs) and decreasing trends of VOCs



FIVE YEAR REVIEW



- The Second Five Year Review for Former NAS JRB Willow Grove is being prepared for completion by September 2018.
- The Five Year Review process is required under Comprehensive Environmental Response, Compensation and Liability Act (also known as Superfund) for actions at sites where contaminants remain above levels that allow for unlimited use and unrestricted exposure.
- The purpose is to ensure that remedies selected for sites with Records of Decision (RODs) are effectively protecting public health and the environment.



FIVE YEAR REVIEW (continued)



- The Navy and Air National Guard are assessing site conditions and conducting interviews:
 - Site 1, Privet Road Compound (Air National Guard)
 - Site 5, Fire Fighting Training Area (Navy)
- A public notice was published in “The Intelligencer” on November 22, 2017, and copies available at this RAB meeting.
- Interviews are being conducted and public participation is encouraged. Your notification of interest is requested by January 31, 2018.



Perfluorinated Compounds Status



PFOA / PFOS Background



- In mid-2014, perfluorinated compounds known as Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) were found in drinking water wells near NASJRB Willow Grove.
- The health advisory levels at that time were 0.4 micrograms per liter ($\mu\text{g/L}$), or 400 parts-per trillion (ppt), for PFOA and 0.2 $\mu\text{g/L}$, or 200 ppt, for PFOS.
- PFOA/PFOS are man-made chemicals found in fire-fighting solutions known as aqueous film-forming foam (AFFF), which were used at NASJRB Willow Grove.
- In the summer of 2014, the Navy began sampling for PFOA/PFOS in private drinking water wells and worked with Horsham Water and Sewer Authority (HWSA) on the public municipal wells.



PFOA / PFOS Background



- Bottled drinking water is provided for those above the health advisory levels until connections to municipal water can be made.
- In May 2016, the Environmental Protection Agency established a Lifetime Health Advisory (HA) level of 70 parts-per-trillion (0.07 µg/L) for combined PFOA and PFOS.
- The Navy's priority continues to be eliminating exposure to PFOA/PFOS above health advisory levels in drinking water.
- Any health concerns should be addressed with your health professional. Weblinks to health information is provided at the end of this presentation.



Private Drinking Water Well Sampling



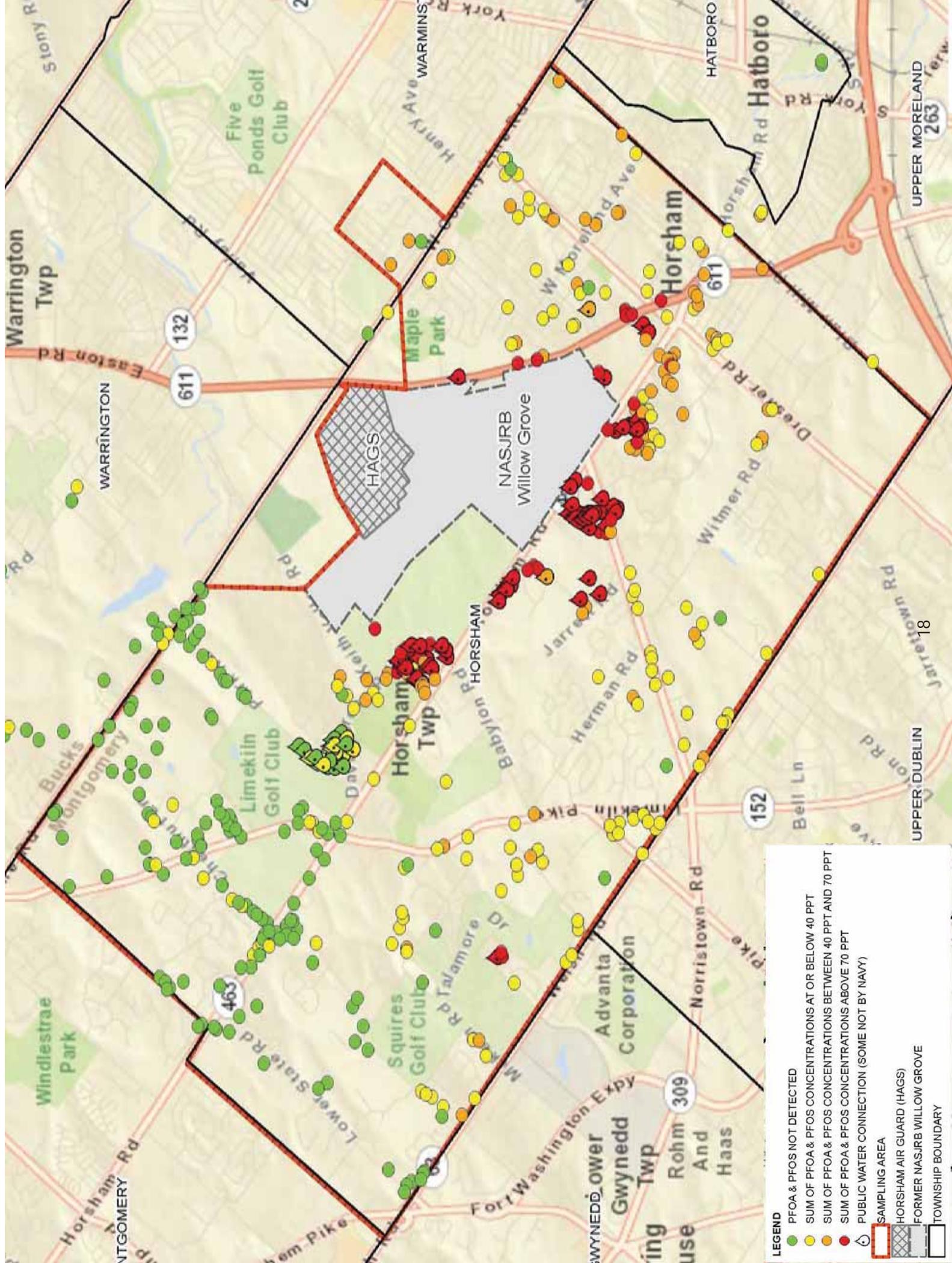
- From 2014 – mid 2017, the Navy requested support from the EPA to sample nearby private drinking water wells for PFOA and PFOS.
- Private drinking water well sampling for PFOA/PFOS and provision of bottled drinking water is now being performed by Tetra Tech, a U.S. Navy contractor.
- The primary point-of-contact is:
 - Mr. Andrew Frebowitz, Tetra Tech Project Manager
 - E-mail: andy.frebowitz@tetratech.com
 - Phone: (610) 382-1170



Summary of PFOA/PFOS Actions



- Private drinking water wells sampled for PFOA/PFOS near NASJRB Willow Grove:
 - Private wells sampled: ~ 500
 - Private wells above lifetime HA (>70 ppt): 95
 - Private wells remaining to be connected: 14
 - Private wells below HA/monitored (>40 ppt): 70
- The Navy has funded carbon filtration systems at five Horsham Water and Sewer Authority (HWSA) public wells (#10, 17, 21, 26, and 40) which are above the lifetime HA. All are filtering water below the lifetime HA and back to drinking water service.
- The Navy has provided funds to HWSA for filtration system costs and drinking water connections above the lifetime HA. The total funding is over \$16 million.



LEGEND

- PFOS & PFOA NOT DETECTED
- SUM OF PFOA & PFOS CONCENTRATIONS AT OR BELOW 40 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS BETWEEN 40 PPT AND 70 PPT
- SUM OF PFOA & PFOS CONCENTRATIONS ABOVE 70 PPT
- PUBLIC WATER CONNECTION (SOME NOT BY NAVY)
- SAMPLING AREA
- HORSHAM AIR GUARD (HAGS)
- FORMER NASJRB WILLOW GROVE
- TOWNSHIP BOUNDARY



PFAS Investigation



- The Navy is performing a Remedial Investigation (RI) to better understand the nature and extent of the PFAS contamination at the Navy base.
- Draft RI Data Report submitted November 2016
 - Identified data gaps for further investigation
 - Additional field investigation is ongoing
 - Source control actions will be developed from RI information



PFAS Investigation (cont.)



Completed Tasks for Phase II Remedial Investigation

- 18 Additional Deep Wells installed in Summer 2017.
- Sampling of new and existing wells (78 total) completed in August 2017.
- Additional surface water and sediment sampling completed in August 2017.
- Additional soil sampling conducted in October 2017.



PFAS Investigation (cont.)



Remaining Tasks for Phase II Remedial Investigation

- Draft SAP Addendum for soil-to-groundwater evaluation by the end of 2017. Field work expected in early 2018.
- Draft RI Report in mid 2018
- Feasibility Study in late 2018



PFAS Stormwater Evaluation



Outfalls/Storm Sewers

- Outfall sampling conducted in August 2017 showed PFOA/PFOS concentrations in northern outfalls to Park Creek and Pennypack Creek were significantly lower after rain event.
- Outfalls along the northern end of the base that discharge to Park Creek have been closed. The retention basin has been modified to hold additional storm water.



PFAS Stormwater Evaluation



Outfalls/Storm Sewers (continued)

- Stormwater system being evaluated to locate portions where contaminated groundwater may infiltrate and discharge to local surface water. Over two miles of storm sewer lines reviewed.
- A survey of the systems identified several storm sewer lines for remote TV inspections, planned for early 2018.
- A report with recommendations for possible storm sewer rehabilitation options and inlet closures planned by mid-2018.



PFAS Information and Resources



Department of the Navy (DON) Perfluorinated Compounds (PFC) / Perfluoroalkyl Substances (PFAS) website

<http://www.secnav.navy.mil/eie/pages/pfc-pfas.aspx#>

NAVFAC BRAC PMO Websites (includes links to environmental information and the administrative record):

- http://bracpmo.navy.mil/brac_bases/northeast/reserve_base_willow_grove/documents.html
- http://bracpmo.navy.mil/brac_bases/northeast/former_warfare_center_warminster/documents.html



PFAS Information and Resources (continued)



Environmental Protection Agency

<https://www.epa.gov/pfas>

Agency for Toxic Substances and Disease Registry

<https://www.atsdr.cdc.gov/pfc/index.html>

Pennsylvania Department of Environmental Protection

http://www.dep.pa.gov/Citizens/My-Water/drinking_water/Pages/default.aspx

Horsham Township

<http://www.Horsham.org/default.aspx>

Warminster Township

<http://warminstertownship.org/information-on-perfluorinated-chemicals-pfoa-and-pfos/>



NAS JRB Willow Grove RAB Meeting



- Questions or comments from the RAB?
- Community questions or comments?
- Next Meeting
 - March 14, 2018 @ 2:00 pm
- Closing Navy Remarks



Restoration Advisory Board Horsham Air Guard Station

Keith Freihofer

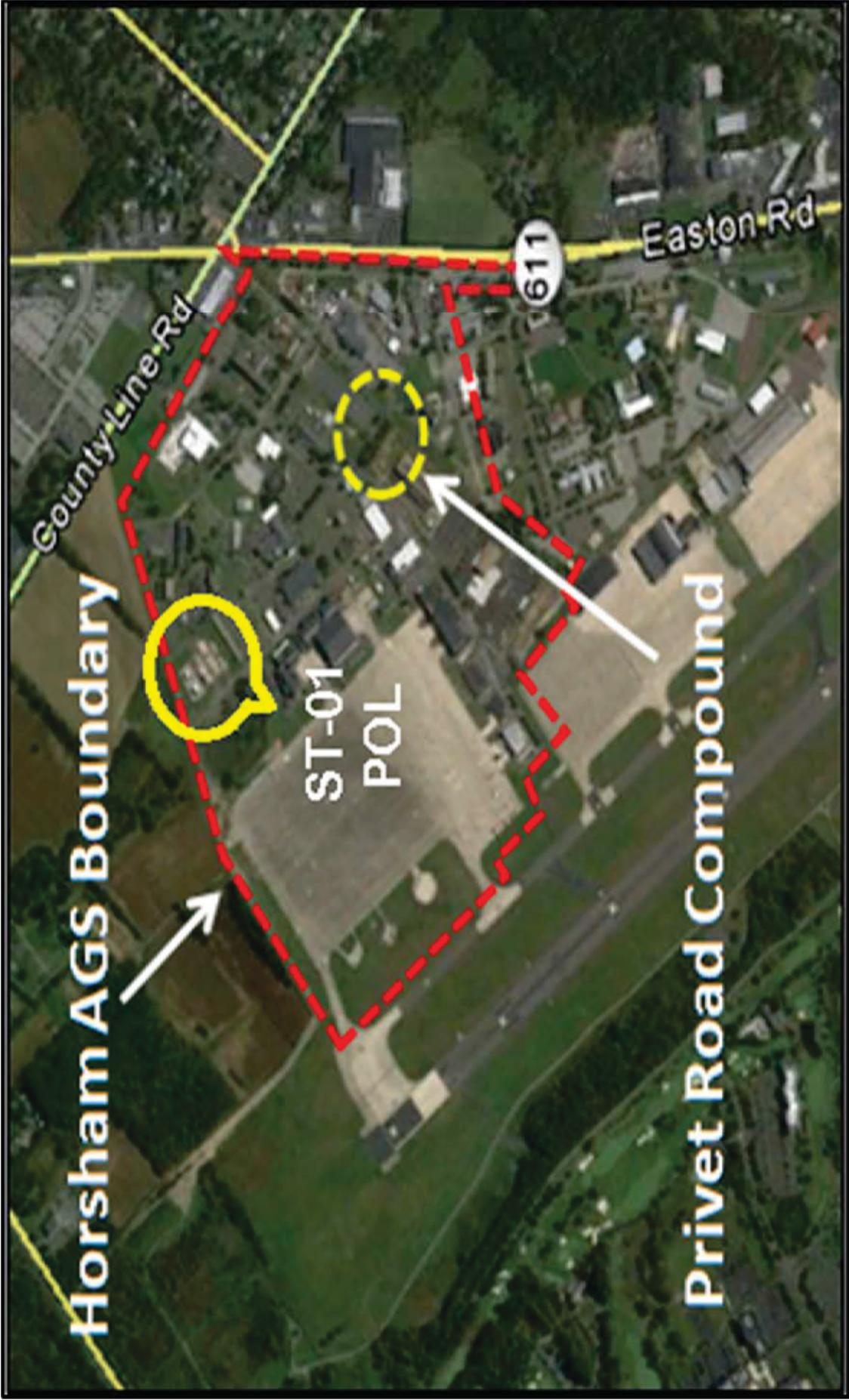
NGB/A4OR

13 December 2017

Environmental Restoration Program



Sites



Air Force Reserve ST-01 POL



- Former Air Force Reserve Petroleum Tank Area
 - Site originated from a jet fuel spill in the 1970's
 - Injections of persulfate and Epsom salt replaced the biosparge system in 2016
 - Petroleum tanks were dismantled in 2016 allowing for removal of any petroleum impacted soil that may be present under the tanks. 175 tons of presumed petroleum impacted soil removed from beneath tanks and disposed of at licensed facility.
 - Confirmatory sampling programmed in accordance with 25 Pennsylvania Code, Section 245.310 of the Department of Environmental Protection (DEP)'s Rules and Regulations.

Privet Road Compound



- Former waste management area for Naval Air Station Joint Reserve Base Willow Grove
- Sampling completed in June 2016 indicates trichloroethene (TCE) and tetrachloroethene (PCE) exist in the groundwater but levels are below maximum contaminant levels (MCL) set by the U.S. Environmental Protection Agency for drinking water quality
- Leidos, Inc. is contracted for continued long-term monitoring. Biannual groundwater sampling and land use control inspections will continue to be conducted pending a final site remedy

Privet Road Five Year Review



- Second Five-Year Review underway for Privet Road groundwater contamination by BB&E Inc. on behalf of the ANG
- The purpose is to evaluate the implementation and performance of the remedy to determine if it is and will continue to be protective of human health and the environment.
- Community was notified by advertisement placed in The Intelligencer on Nov 22, 2017
- Interviews with community members are being conducted by BB&E Inc. representative (Naila Hosein) to gather insight into current site conditions, problems, or related concerns. Interview questions include:
 - What effects have site operations had on the surrounding community?
 - Are you aware of community concerns regarding the site?
 - Do you feel well informed about the site's activities and progress?

PFOS/PFOA on Horsham AGS



- In 2015, ANG completed a Preliminary Assessment of potential PFOS/PFOA release sites at the Horsham Air Guard Station (AGS). Ten potential source areas identified in the PA include:
 - Buildings that contained foam fire suppression systems
 - Areas that may have received runoff from foam releases
 - Stormwater sediment basin
 - Former waste water treatment plant
 - Former storage area for wastewater treatment sludge
 - These potential source areas are being further investigated by Leidos in a PFOS/PFOA Facility Investigation

Potential PFOS/PFOA Source Areas



Leidos Facility Investigation Project



Scope



- Leidos tasked by the National Guard Bureau to complete a facility investigation (FI) for PFOS/PFOA at the Horsham Air Guard Station.
- The FI is being conducted in response to paragraph 41 of the Administrative Order issued by the U.S. Environmental Protection Agency (EPA) dated May 29, 2015.
- Project scope outlined in the Statement of Objectives for Perfluorinated Compound Facility Investigation at Horsham Air Guard Station for Project ZAQQA20159150 (NGB 2015) and finalized in the March 2015 work plan approved by EPA and PADEP.
- Scope includes: records review; sampling of soil, sediment, fire suppression storage tanks, surface water, and groundwater across Base.
- The scope also includes: borehole geophysics, packer testing, rock coring, water level monitoring and potentiometric mapping, stratigraphic correlation, contaminant pathway analysis and receptor evaluation.

Completed Tasks



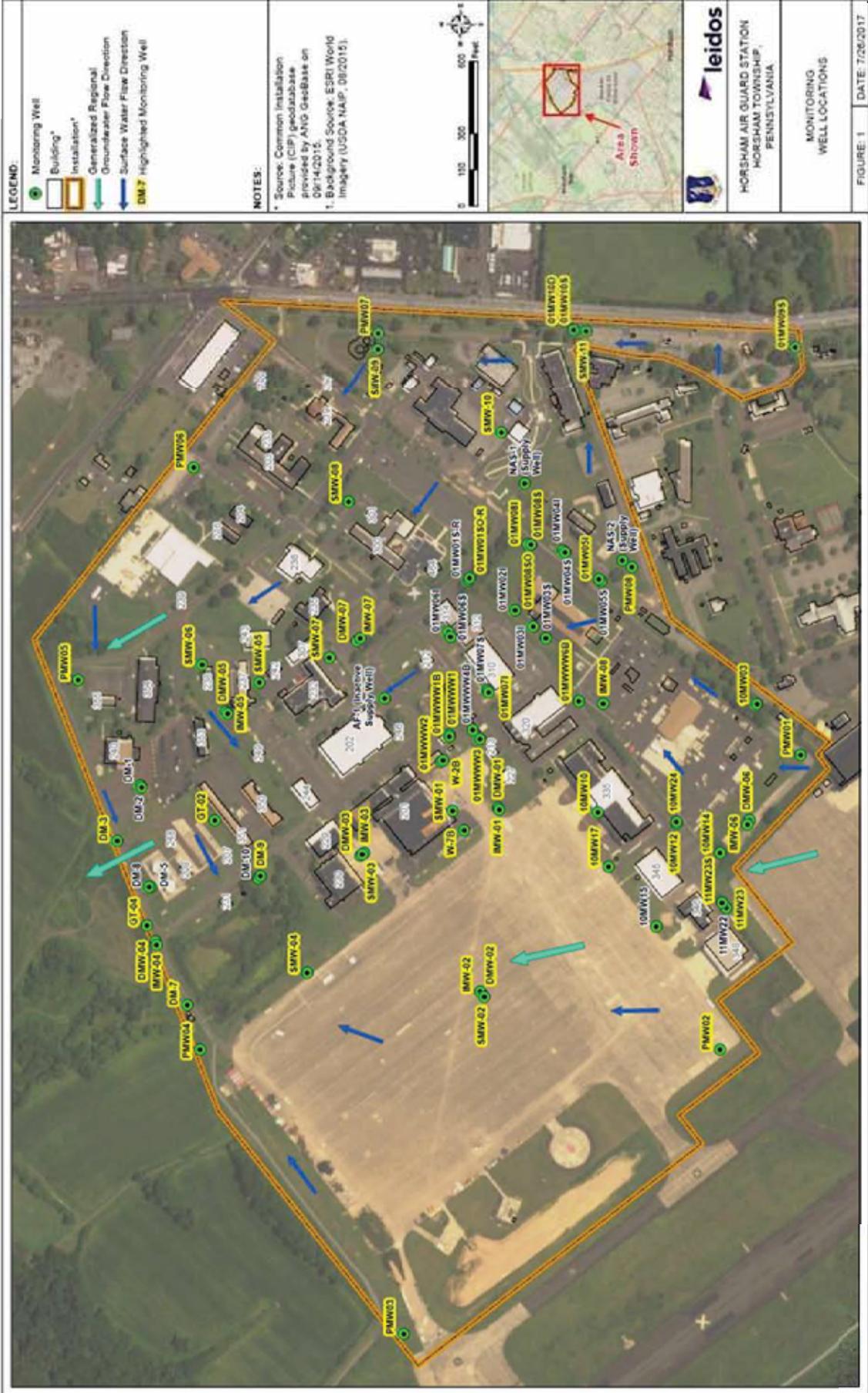
- Initial results reported in Technical Memorandum (soil, surface water, sediment, existing wells, and tank sampling). Draft Memo – June 2016, Final Memo – October 2016.
- Shallow (11), intermediate (8), deep (7), and multi-level perimeter (8) wells installed. All new wells sampled twice.
- Rock coring at PMWs and geophysical logging conducted at 15 locations
- Packer Testing conducted at base supply wells and DMW-7.
- Completed water level monitoring study.
- Submitted Draft Final Facility Investigation Report (Preparing responses to stakeholder comments)
- Selected monitoring network and completed annual GW sampling event.
- Submitted Draft GW Sampling Report (Pending Draft Final to EPA).

Completed Tasks (continued)



- Prepared Work Plan for comprehensive stormwater study
- Conducted 2 stormwater sampling events:
 - Baseflow event 4-5 October 2017 (draft results available)
 - Precipitation event 24-25 October 2017 (results not yet available)
- Initiated NPDES permitting task
 - Conducted site walk
 - Submitted draft work plan

Monitoring Network for Annual GW Sampling Events



Status Update



- Draft Final FIR reviewed by EPA, PADEP, and stakeholders
 - Responses to comments underway
 - Elevated concentrations detected at PMW-01
 - Widespread detections between 1,000 and 5,000 ng/l
 - Deep zone contained several samples below Health Advisory

- Stormwater study workplan completed
 - Reviewed by EPA/PADEP/USGS and ANG.
 - Total of 4 sampling events
 - Baseflow event during early Fall 2017 and Winter 2018
 - Precipitation event during early Fall 2017 and Winter 2018
 - Monitor surface water concentrations on-Base, off-base, entering and leaving Base.
 - Completed Fall baseflow and precipitation events.

Groundwater Sampling Results: April/May 2016

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Groundwater Sampling Results: New Wells



Groundwater Sampling Results: 2nd Annual Event



Draft Surface Water Sampling

Results: On-Base

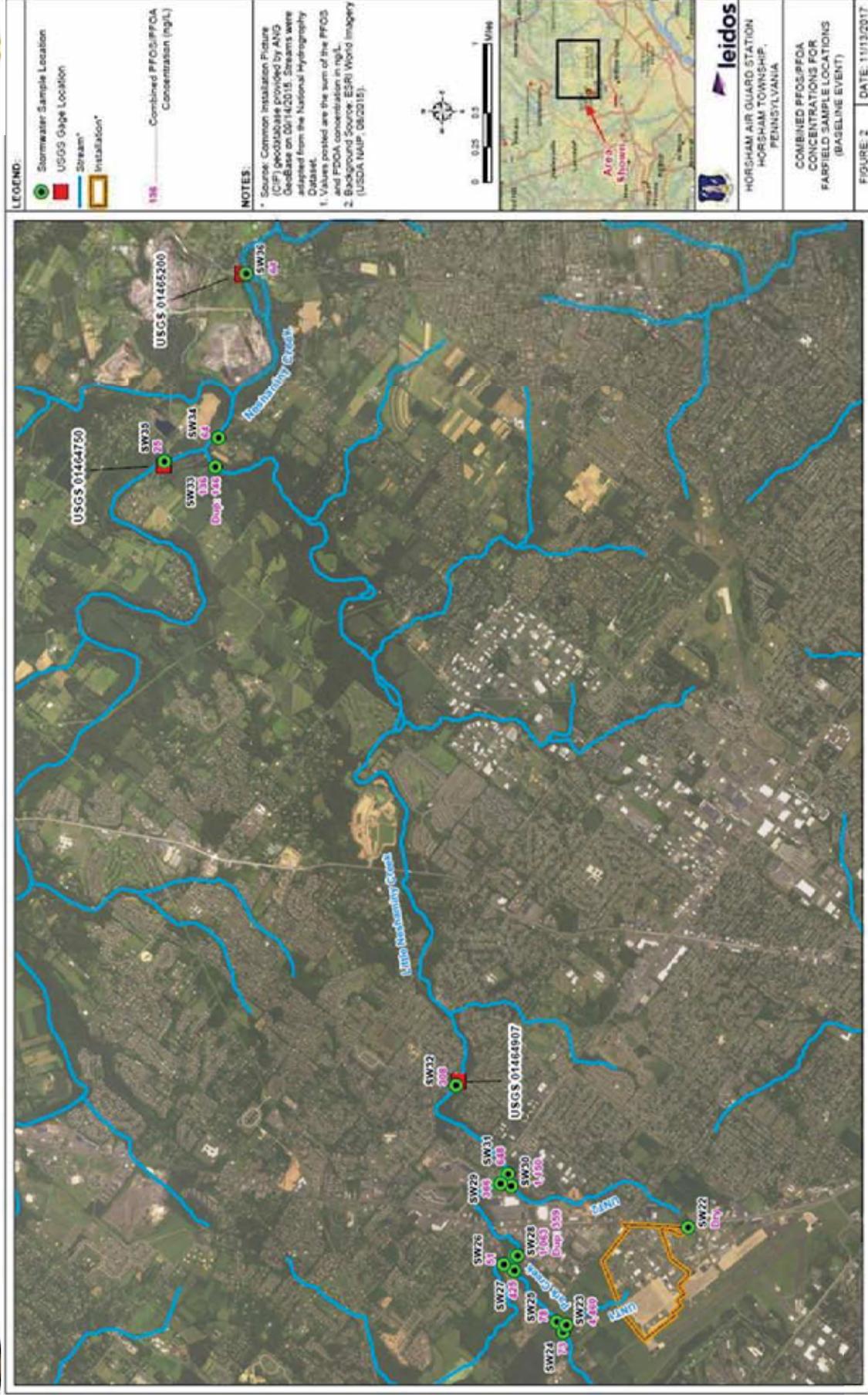
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Draft Surface Water Sampling Results: Off-Base

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Next Steps



- Provide a comment response matrix and submit Final FIR.
- Finalize 2nd Annual GW Sampling Report. Submit to EPA/PADEP
- Awaiting comments on Draft work plan for NPDES permitting and sampling.
- Submit Draft Final work plan for NPDES sampling to PADEP
- Conduct NPDES sampling in Jan/Feb 2018
- Conduct surface water sampling event in March 2018

Questions on Base PFOS/PFOA Investigation?

Matthew Vest

Leidos - Project Manager

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PFOS/PFOA in Surface Water on

Horsham AGS



- PFOS/PFOA has been detected in surface water leaving the Horsham Air Guard Station. This water flows from a storm water detention basin on the northwest boundary of the Base to Park Creek which flows to the Little Neshaminy Creek.
 - ANG is taking action to reduce this release of PFOS/PFOA to the Creek:
 - Temporary carbon filtration was installed on the outfall in September 2017. The system is designed to treat the dry weather flow; heavy storm flow will bypass the treatment. Sampling indicates the water leaving the Base at this point is 2 ng/L for combined PFOS/PFOA.
 - Leidos to study the storm water basin, determine the source of dry weather flow and propose long term engineered solutions to filter effluent from detention basin.

PFOS/PFOA in Drinking Water



- The Air National Guard has a \$13.5 million Cooperative Agreement with Warrington Township to:
 - Connect residents with PFOS/PFOA impacted drinking water wells above the Health Advisory to municipal water and abandon the impacted private wells
 - Install water mains as needed
 - Installation and maintenance of carbon filters on five Township wells
 - Install municipal water system interconnections with North Wales Water Authority to ensure Warrington Township has adequate access to water until carbon filtration is installed on municipal wells
- The Horsham AGS water supply wells are filtered with carbon and have extracted and treated over 20 million gallons of water

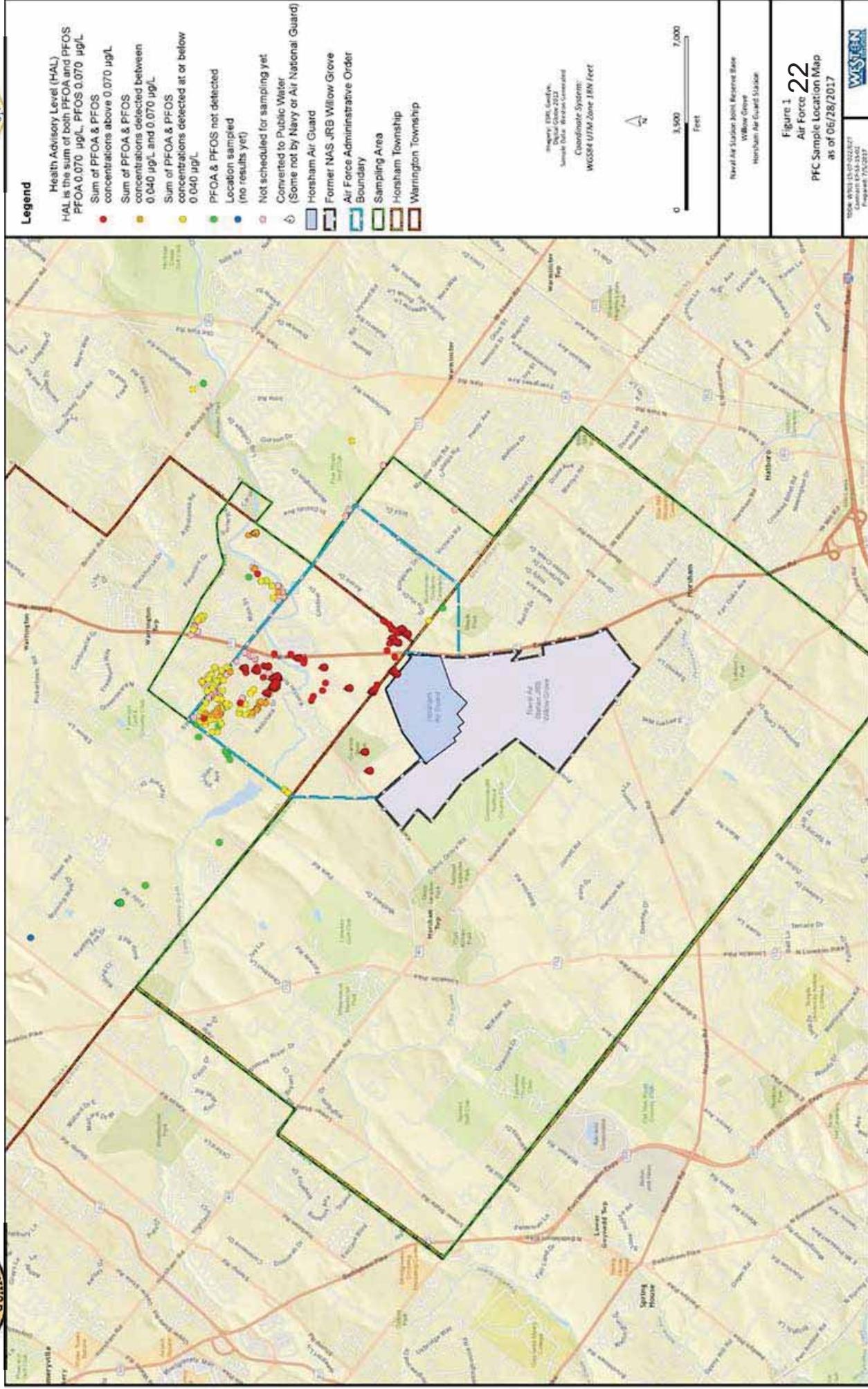
Private Well Sampling



- ANG has contract in place with Amec Foster Wheeler to provide PFOS/PFOA testing of private drinking water wells and supply bottled water to properties with PFOS/PFOA at or above the lifetime health advisory level (HAL) for residents within our area of responsibility in Horsham, Warminster, and Warrington
 - The number of private wells sampled by ANG are:
 - Horsham: 5, all above HAL; 4 have been connected to municipal water (remaining one not in use)
 - Warrington: 136, 45 are above HAL; 29 have been connected
 - Warminster: 14*, 11 are above HAL; 4 have been connected
- *Some of these properties are on Valley Road with Warminster mailing addresses but are located in Warrington Township
- Sampling contact for ANG area of responsibility: David Side at David.Side@amecfw.com or (610) 877-6111



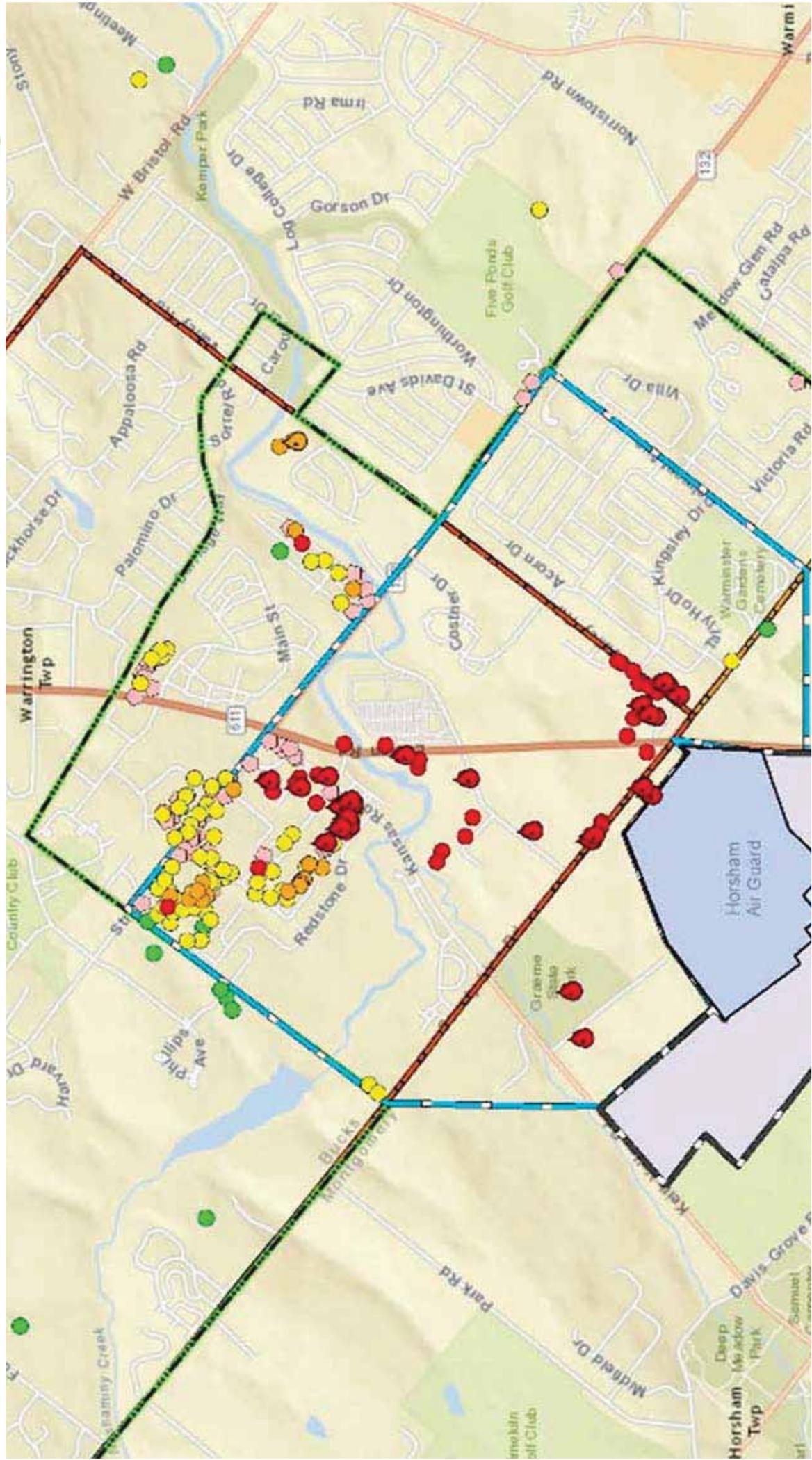
Private Well Sampling Map



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Private Well Sampling Map



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Questions?

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