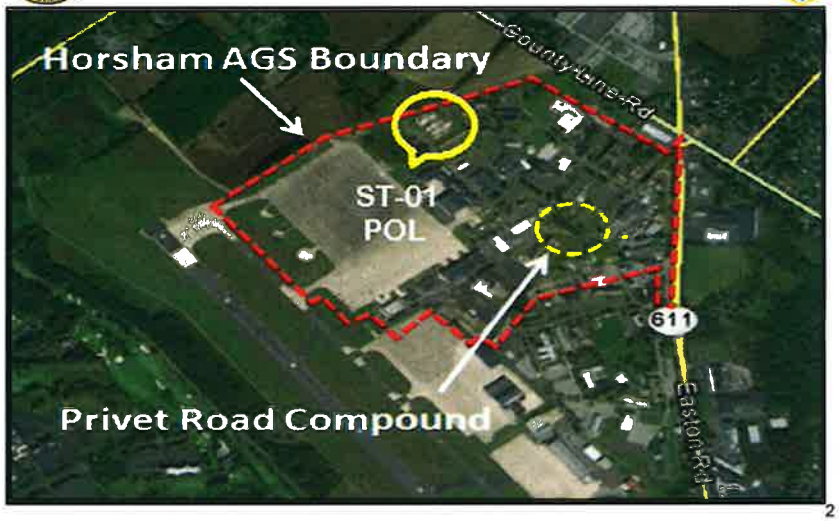
Restoration Advisory Board
Horsham Air Guard Station

Keith Freihofer
NGB/A4OR
30 May 2018

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 expected to begin Summer 2018 in accordance with 25 Pennsylvania Code, Section 245.310 of the Department of Environmental Protection (DEP)'s Rules and Regulations.
- POC: Ms. Margaret Patterson: margaret.patterson@us.af.mil

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
- Second Five-Year Review underway for Privet Road groundwater contamination by BB&E Inc. on behalf of the ANG
- The purpose of the Five-Year Review 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

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

Field Investigation Update

- GW sampling event conducted in March 2018.
- Joint gauging event conducted 8-9 March 2018.
- Baseflow SW sampling conducted 19 March 2018.
- Rain event SW sampling planned, pending suitable weather:
  - 72 hours since previous event
  - >0.25-inch in 24 hours
- Consistent with EPA Health Advisory, PFOA/PFOS concentrations are presented in nanograms/liter (ng/l), equivalent to parts per trillion (ppt)
  - 70 ng/l = 0.070 µg/l = 0.000070 mg/l
  - 70 ppt = 0.070 ppb = 0.000070 ppm

Reporting Update

- Final Facility Investigation Report approved
- Awaiting comments from EPA and PADEP on December 2017 Groundwater Monitoring Report
- Draft Groundwater Monitoring Report for March 2018 anticipated next week
- Stormwater Study Report in production
- NPDES application under way

Surface Water Data Update

- 2nd baseflow event conducted 19 March 2018
- 36 locations monitored (12 were dry)
- Flow measurements estimated via flow meter, manually, USGS gauge, or visually estimated.
- Instantaneous mass flow rate (ng/min) calculated based on observed concentration (ng/l) and measured flow rate (liter/minute)

Surface Water Data Findings

- March 2018 flow was greater than October 2017 event. USGS gauge ~5-8 times higher.
- On-Base Results:
  - Interior concentrations lower than October event (due to higher flow?)
  - Basin effluent much higher than October event (3,380 ng/l vs 2 ng/l). Due to higher flow rate and treatment system issues.
- Off-Base Results:
  - Influent to Park Creek lower than October event (3,030 vs 4,460 ng/l), but Park Creek higher (151 vs 73 ng/l)
  - Little Neshaminy locations near base had concentrations ~ ½ as high as October event
  - Main Branch Neshaminy had concentrations about 2x greater than October event even though Little Neshaminy at confluence had similar concentration.
  - Downstream Neshaminy had slightly lower concentration.
- Mass flow rates: higher than October event, except at #10 and #17.

Slides 11 and 12 are full page maps in separate handout.

Surface Water: Next Steps

- Conduct rain event sampling as soon as possible
- Compare results to October sampling data. Develop conceptual design to address stormwater discharges.
- Potential options:
  - Enhanced/expanded centralized treatment at Basin
  - Decentralized treatment at hotspots
  - Segregate stormwater from groundwater discharge
  - Infiltrate stormwater to dilute/flush groundwater towards treatment system
  - Combined approach.

Groundwater Data Update

- Gauging conducted 8-9 March 2018
  - Semi-confined multilayer aquifer system, subdivided into four zones for contouring
  - Gradients trends northwest in each zone
- Sampling event conducted 5-15 March, 2018
  - Concentrations similar to previous events
  - 78 of 85 locations exceeded 70 ng/l (combined PFOA/PFOS)
  - ~75% wells < 6,050 ng/L
  - ~ 25% wells < 820 ng/L.
  - Highest concentrations found in three general areas: along the southern boundary, near Building 335, and near Building 201.
  - Highest concentrations at PMW01, Zones A, B, and C: 329,500 ng/l, 147,400 ng/l, and 186,900 ng/l, respectively.
  - Next highest concentration at IMW-06 (49,000 ng/L) along the southern boundary).
  - Four wells near Buildings 201 and 335 contained concentrations above 10,000 ng/L.

Slides 15 to 19 are full page maps in separate handout.

Groundwater Water: Next Steps

- Draft Groundwater Monitoring Report to be submitted to ANG early June.

Questions on Base PFOS/PFOA Investigation?

Keith Freihofer
ANG – Project Manager
Office: 240-612-8762
keith.e.freihofer.civ@mail.mil

Matthew Vest
Leidos - Project Manager
Phone: 606.495.5149
vestm@leidos.com

Matthew Machusick
Leidos – Geologist
Phone: 215.292.0781
machusickm@leidos.com

Air National Guard Administrative Record:
http://afcec.publicadmin-record.us.af.mil/Search.aspx
select "Air National Guard", then "Horsham AGS", then click Search

leidos

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. Treatment system in process of being re-engineered to prevent solids from clogging the carbon filters.
    - 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

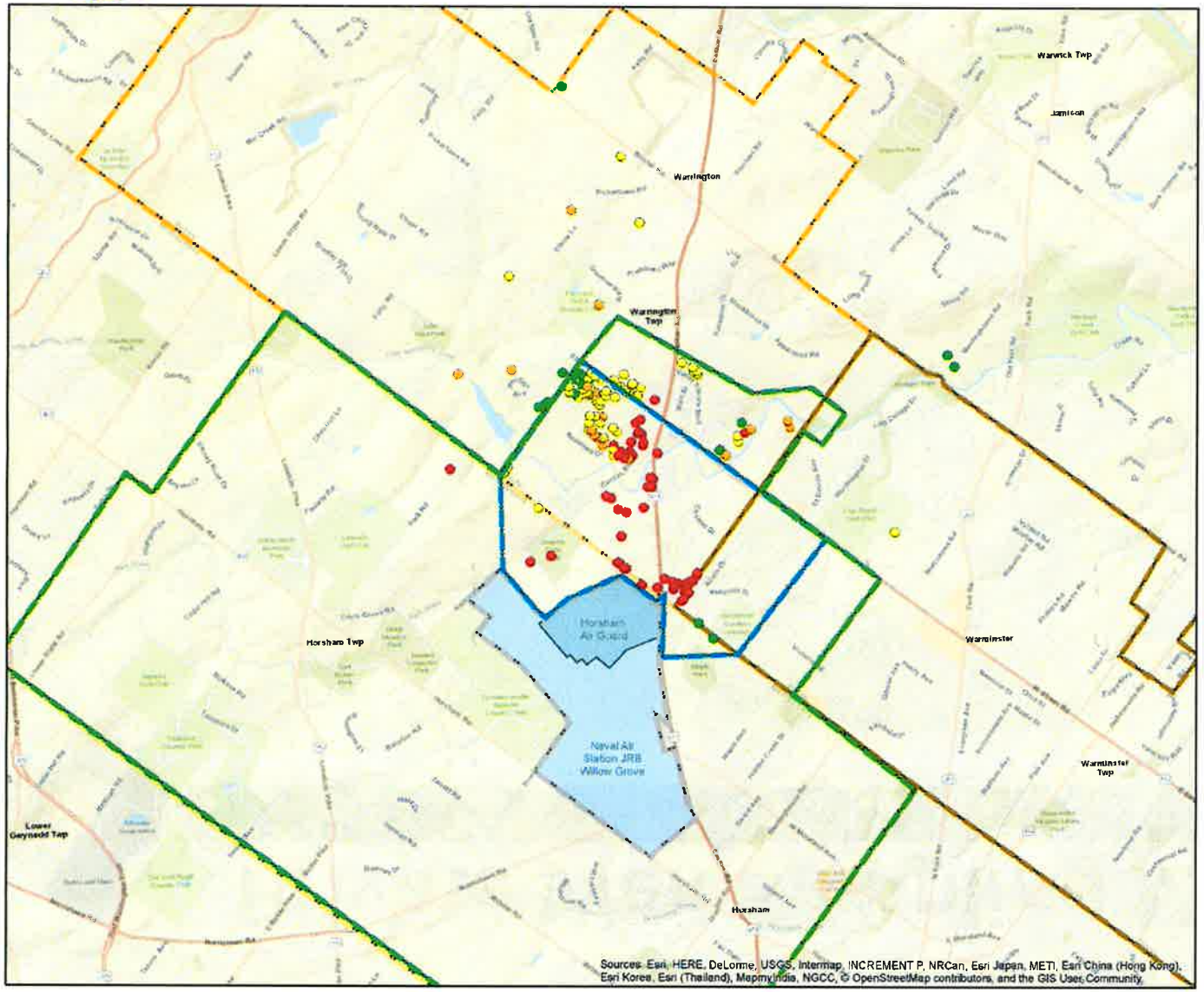
Private Well Sampling

- 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: 138, 46 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

UNCLASSIFIED

Private Well Sampling Map



PFC Sample Location Map
as of December 2017

Horsham Air Guard Station
Horsham and Warrington Township

Legend

Health Advisory Level (HAL)
HAL is the sum of both PFOA + PFOS
(PFOA 0.070 ug/L, PFOS 0.70 ug/L)

- Sum of PFOA+PFOS concentrations above 0.070 ug/L
- Sum of PFOA+PFOS concentrations detected between 0.040 ug/L and 0.070 ug/L
- Sum of PFOA+PFOS concentrations detected at or below 0.040 ug/L
- PFOA & PFOS not detected
- Horsham Air Guard
- Former NAS JRB Willow Grove
- Sampling Area
- Air Force Administrative Order Boundary
- Horsham Township
- Warrington Township
- Warminster Township

Notes & Sources

Sources:
Street Base Map hosted by ESRI.

0 1,400 2,800 5,600 8,400 11,200 Foot

N

Amec Foster Wheeler
Environment & Infrastructure, Inc.
751 Arbor Way
Blue Bell, PA 19422
(610) 828-8100

Figure 2

Private Well Sampling Map