



NAVAL AIR STATION JOINT RESERVE BASE (NAS JRB) WILLOW GROVE

Restoration Advisory Board (RAB) Meeting Minutes

RAB Meeting No. 50

Meeting Date: September 5, 2012

Meeting Time: 6:00 p.m.

Meeting Place: Horsham Township Public Library

	<u>Name</u>	<u>Organization</u>
Attendance:	Karl Pfizenmayer	Community Member
	Mary Liz Gemmill (R)	RAB Community Co-Chair
	Tom Ames	Horsham Township Authority (HLRA)
	Eric Lindhult (R)	RAB Member
	Willie Lin (R)	Navy, BRAC PMO (Co-Chair)
	Brian Helland (R)	Navy, NAVFAC
	Patrick Owens	Navy, RASO
	Martin Schy	NAS JRB Navy Caretaker's Office
	Lisa Cunningham (R)	EPA
	Jessica Kasmari (R)	PADEP
	Jon Davis	Air Force
	Tony Williams	AFCEE
	Andrew Frebowitz	Tetra Tech
	Andy Johnson	Tetra Tech
	Scott Shaw	Tetra Tech
	(R) Designates RAB Member	

Willie Lin opened the meeting by greeting the attendees. Mr. Lin referred to the agenda and noted that the meeting was a joint presentation by the Navy and Air Force. Mr. Lin also directed attendees to the Navy BRAC website for access to previous RAB meeting minutes and asked for comments on the minutes from the last meeting; there were no comments. All meeting attendees introduced themselves and Mr. Lin noted the presence of Patrick Owens from the Navy Radiological Affairs Support Office (RASO). Mr. Lin indicated that a historical radiological assessment (HRA) was initiated a few years ago and introduced Mr. Owens to provide an update.

Mr. Owens informed the RAB that RASO is the technical group for the Navy's radiological program. Mr. Owens provided an overview of the HRA process. The HRA follows the Multi-Agency Radiation Survey and Site Investigation (MARSSIM) manual, which is the guidance accepted by federal agencies for approaching investigations of potential radiologically impacted sites. Mr. Owens explained that the HRA is similar to the CERCLA Preliminary Assessment process where the first step is to research available literature, permits, and documents from the archives to determine if a site potentially had a radiological component, device, or item. If a site did, the preliminary finding was the site was impacted. This does not necessarily mean the site is contaminated, but impacted means additional data should be collected to determine if further radiological investigation is needed.

If a determination is made that the site is impacted, the initial step is a scoping survey. That is essentially a radiological survey of surface areas. For landfills, it's a bit more involved, but the Willow Grove landfills are not at that stage, yet. The HRA doesn't go into that level of detail; the HRA determines whether or not a scoping survey is needed. Mr. Owens indicated that HRAs are not performed at all naval sites; they are performed where the Navy used radioactive materials. Many of the radioactive materials used by the Navy were associated with aircraft and there was no reactor or radioactive weapons use at Willow Grove. The materials are related to gauges, dials and material that the Navy may have stored and/or disposed at Willow Grove.

Mr. Owens explained the HRA process takes a lot of time. Site visits are conducted and Base records, archived records, and RASO records are reviewed to evaluate if radiological materials were used. All portions of the Base were reviewed including open areas, buildings, training areas, and landfills and a document prepared to make a defensible case if an area or building should be considered impacted or not. Mr. Owens referred to a slide that showed the types of references and documents used in the HRA including radiological licenses, permits, and inventories. Another slide showed the impacted sites at Willow Grove; there are approximately 20 sites including some of the Installation Restoration sites such as Site 3 and Site 12. The sites/buildings colored in red on the slide show the areas where the Navy is planning to perform a scoping survey. The survey will include the use of instruments to conduct measurements to determine if the site should be recommended for release from a radiological concern or for further investigation. After the HRA is finalized, work plans will be prepared to investigate these sites, which include warehouses, hangars, training buildings, radio technician buildings, and some of the landfills that may or may not have had radiological components or materials stored or disposed at that particular area.

Mr. Owens reiterated that this process follows the MARSSIM guidance which has been approved by the Nuclear Regulatory Commission (NRC), the Navy, EPA, Department of Energy (DOE), and state agencies. The guidance provides the basis to conduct the HRA, prepare work plans, and conduct the field surveys. Mr. Owens also stated that RASO is helping the BRAC PMO move through the radiological program. If the community has any questions, they can contact Mr. Lin, Mr. Owens, or Laurie Lowman, who is Mr. Owens' supervisor. After the HRA is finalized, the survey work plans will be issued to regulators, then the general public.

Mr. Owens asked if anyone had any questions. Tony Williams asked if tritium exit signs were addressed in the RASO program. Mr. Owens replied that the Navy does dispose of them through a certified brokering service that uses licensed transporters and disposal sites. RASO tracks them as part of the permitting process. Mr. Owens also stated that there may be tritium sites at Willow Grove, but they are not solely based on tritium. There is also radium associated with altimeters and other gauges, and display boards that were part of the instrument panel in aircraft. Willow Grove was always a maintenance facility and wasn't a radium paint shop, so RASO is expecting incidental amounts of these materials. There is no indication that radiological research and development occurred. Tom Ames asked if the site surveys at the landfill areas required clear cutting to conduct the work. Mr. Owens replied that the work plan was still being developed and that level of detail has not been determined. Mr. Lin added that when the Navy moves forward with the site-specific plans, the Navy will look for input from the regulators and local

government. Mr. Lin also indicated that the Navy is close to completing the HRA for regulatory review. He then introduced Andy Frebowitz to discuss the Navy restoration sites.

Mr. Frebowitz informed the RAB that a land use controls (LUC) inspection was performed by the Navy at Site 1 in August, 2012 and no significant findings or compliance issues were identified. Eric Lindhult asked if there was anything to see in that area because the Army Reserve Center has been constructed at that location. Brian Helland replied that monitoring wells are still located in that area and the LUCs preventing new well installation must still be enforced. Mr. Lindhult asked if the wells were put in the storm water retention basin. Mr. Helland replied that the wells are in that area and Mr. Frebowitz added that the Air Force relocated wells out of the basin during the basin construction. That well was sampled last year and there was no significant contamination. Mr. Lindhult asked if that was the contamination from an off-site source; Mr. Frebowitz confirmed that was the case.

Mr. Frebowitz continued with a discussion of Site 3 – Ninth Street Landfill. Mr. Frebowitz briefly describe the site history including the use of the site as a trench landfill, the investigation by geophysical methods to identify the trenches/disposal areas, the remedial investigation (RI) that was finalized in October 2011, and the chromium speciation sampling that was performed earlier this year. Remedial alternatives and cleanup goals were developed and presented in a feasibility study (FS) that is in internal review. The FS is also pending the results of the radiological field survey which will be conducted after the HRA. Mr. Lindhult asked if alternatives other than capping and removal are being considered. Mr. Frebowitz replied that the alternatives under consideration include capping or removal or some combination of both.

The meeting continued with an update on Site 5 – Former Fire Training Area. Original solvent compounds are being reduced, intermediate compounds are declining, and end-stage products are appearing. A sampling was conducted in August 2012. Lab data are pending, but the field parameters overall indicate the reducing environment is still in place. Oxidation-reduction levels are still negative. When the lab data arrive, an evaluation will be made to determine what further work needs to be completed. Mr. Frebowitz continued with an update on the Record of Decision (ROD). The remedy introduced in the Proposed Plan and incorporated into the ROD is in-situ treatment by anaerobic bioremediation, monitored natural attenuation, and implementation of LUCs. The LUCs will prevent the use of untreated groundwater, and prevent vapor intrusion of volatile organic compounds (VOCs) from the subsurface into any existing buildings should they be reused, or into any new buildings. After the ROD is signed, two remedial designs will be prepared. A design for LUCs and a design for the installation of additional injection wells and determination of the “recipe” for amendments and monitoring the system will be prepared.

Mr. Frebowitz provided a brief summary of Site 12 – South Landfill investigation history. The Phase I RI conducted in 2010, identified the trench disposal areas at the site. The RI recommended additional sampling to further delineate the extent of contamination and installation of monitoring wells to evaluate groundwater quality at the site. The Phase II investigation was completed earlier this year and included test pits, soil borings and installation and sampling of four monitoring well clusters. Mr. Ames asked if the extent of contamination at Site 12 is pretty well defined after this investigation. Mr. Frebowitz indicated that the data

indicate the extent is well defined although some locations at the extent of sampling do show results above risk screening levels. The data evaluation process is ongoing and will determine if the full extent has been delineated. The risk assessment is almost completed and the RI report will be submitted shortly for Navy review.

Mr. Frebowitz discussed the history of lead contamination at Building 21 with the first identification of impacted soil in 1995. An October 2011 investigation conducted by the Navy confirmed the results and delineated the area of lead-impacted soils, primarily located on the southern and western sides of the building. The Navy is planning a removal action with a work plan scheduled for this fall to remove soils with lead levels exceeding 400 milligrams per kilogram (mg/kg). Mr. Ames asked to reconfirm the schedule and funding for the work. Mr. Helland replied that the removal is funded and work should be conducted in late fall or winter.

Mr. Frebowitz, referring to a slide showing Air Force contacts with regard to the Air Force POL Area, indicated that Bill Downs, as shown on the slide, is no longer the Air Force point of contact (POC) for this site. Jon Davis is now the POC and can be reached at 508-968-4670 extension 4952.

Mr. Lin turned the meeting over to the Air Force for an update on the POL Area. Scott Shaw, of Tetra Tech, provided the briefing. The POL Area is the Air Force's old tank farm at the northern end of the Base, adjacent to Graeme Park. This was the site of a spill that occurred in the late 1970's. The Air Force has been monitoring the groundwater and recently completed a biosparge operation that had been discussed at a RAB meeting in March 2012. There are 12 compliance monitoring wells distributed across the site that are regularly monitored to characterize groundwater. During the last three years, there has been no detection of jet fuel constituents in the wells. Surface water sampling has also been conducted for approximately one year, and none of the constituents of concern have been detected in surface water. These samples are collected from the creek that runs north from the Base to Graeme Park. Based on the results, surface water monitoring will be discontinued, at least for the time being; however, quarterly monitoring of groundwater will continue.

Mr. Shaw explained that a work plan has been prepared to conduct a two-phase investigation. The first phase is to identify non-aqueous phase liquid in groundwater. In this case, that is JP4 which is a mixture of gasoline and kerosene. The investigation will look for pockets of JP4 in the subsurface that would account for JP4 constituents that have been detected in some of the treatment wells that were installed for the biosparge system. The investigation will use a process called laser-induced fluorescence. Petroleum products will fluoresce when a laser is applied and instruments will detect the fluorescence. Work is scheduled to start September 10, 2012. Immediately after that, confirmation samples of soil and groundwater will be collected. The data will be evaluated to determine if there are areas of significant amounts of light non-aqueous phase liquid (LNAPL) that could affect the wells that show the elevated levels of JP4 constituents.

The next phase is the installation of air injection wells and test monitoring wells. Air will be injected into the subsurface continuously over a 72-hour period to try to determine how air flows

through the ground, if LNAPL is being impacted, and if there are chemical or physical changes. This will help prepare for the potential installation of a future air sparging system. Mr. Shaw showed the investigation location on a slide. The slide also showed the fuel farm where the discharge occurred and the biosparge treatment area. Based on the investigations associated with the biosparge installation, there are probably two areas where there is enough LNAPL that air sparging could potentially be used to remedy the groundwater contamination. These are wells MW17D and MW18D in Area D. It is thought that LNAPL could be the source of contamination in these wells because during extreme drought periods, small amounts of free product is seen in wells MW17D and P01.

Mr. Shaw explained the laser-induced fluorescence method. A direct-push tool, which is less invasive than a drill rig, guides the detector (shown in a slide) to collect the data. The tool is good at picking up LNAPL. The data will be used to prepare maps and graphics to show the higher concentrations of LNAPL. For the air injection wells, the plan is to place the screen just above the consolidated bedrock which is as deep as 23 feet. Air will be injected up through the weathered bedrock above the consolidated bedrock where various sparging techniques can hopefully remove the LNAPL. The monitoring wells will be designed as multi-level wells to monitor groundwater in the deepest zone and air in the upper zones. Ultimately an air sparging system would be installed. After the first phase the week of September 10, 2012, the next plan is to install air injection and monitoring wells in late October 2012, and conduct air sparging testing in November 2012.

Mr. Shaw concluded his presentation and there were no questions.

Mr. Lin provided an update on the air station housing units. The Shenandoah Woods Finding of Suitability to Transfer (FOST) was updated and issued in July 2012. There were a few administrative corrections and updates. Because of snow and ice damage to the roof, the mini-mart was demolished so it would not be a safety hazard. Mr. Lin also stated the Horsham Land Redevelopment Authority was recognized as the implementation local redevelopment authority and the HLRA can now take over the implementation.

Mr. Lin asked if there were any questions. Jim Ventrini asked if, when redevelopment starts in the future, there will be any conflicts between development and remediation and restoration activities. Mr. Lin replied that the restoration process is known and if there is a conflict, the HLRA would have to let the Navy know. Mr. Ames added that the Navy still owns the property and they have hired a consultant to review the HLRA redevelopment plan. That review doesn't look at what the property was used for in the past; it looks at the plan and how redevelopment will impact the environment in the way of traffic, noise, air pollution and similar impacts. That process can take 18 to 24 months. While that is happening, the HLRA will be preparing a business plan so negotiations with the Navy can take place. The Navy is expecting the reuse authority to purchase the property and there will be a negotiation to develop a price. That process will take into account the remedial sites the Navy is working on. The redevelopment plan is expected to take anywhere from 15 years to a long time after that. The LUCs such as not using groundwater will be programmed into the redevelopment plan. The HLRA is hopeful that the remedial actions to be selected for some of the restoration sites like Site 3 and Site 12 will be consistent with the redevelopment plan.

Eric Stahl asked if the cleanup goal for the Building 21 lead removal was established. It was mentioned that it was 400 mg/kg. Mr. Stahl asked if that was a residential or non-residential standard. Mr. Helland replied that is the EPA residential standard.

There were no other questions. Mr. Lin noted that the next scheduled RAB meeting was December 5, 2012. He indicated that he had some requests to try to schedule the meeting for the afternoon rather than the evening. He proposed a start time sometime between 1:00 and 3:00 at a location to be determined based on availability. Mr. Lin added that the goal of the RAB is to allow as many people as possible to participate. While this is not a permanent change, this is an opportunity for people who may not be able to make it in the evening. For now, this change is for the next meeting only. There were no dissenting votes against a schedule change and it was decided to schedule the next meeting for the afternoon of December 5, 2012.

The last item on the agenda was to set the time and date for the March 2013 RAB meeting. Mr. Lin indicated he would like to try to schedule the meeting for the next four meetings. Historically, meetings have been held on the first Wednesday of the month; therefore March 6, 2013; June 5, 2013; September 4, 2013; and December 4, 2013 were proposed. Mr. Lin asked if the RAB members were in agreement. There was a brief discussion about potential conflicts, but it was determined that these dates would be set as tentative and if there were potential conflicts, these would be discussed at the next RAB meeting.

There were no other questions. Mr. Lin reminded the attendees that the administrative record and RAB meeting minutes are available at either the Horsham Township Public Library or the Navy BRAC PMO website.

Meeting adjourned.

Historical Radiological Assessment

Naval Air Station Joint Reserve Base Willow Grove RAB

Restoration Advisory Board Meeting September, 2012
Patrick Owens , CHMM, CIH, CSP
RASO



Presentation Objectives

1. NAS JRB Willow Grove Historical Radiological Assessment (HRA)
2. Willow Grove Impacted Sites
3. MARSSIM approach/guidance
4. Project Management Team

Willow Grove HRA

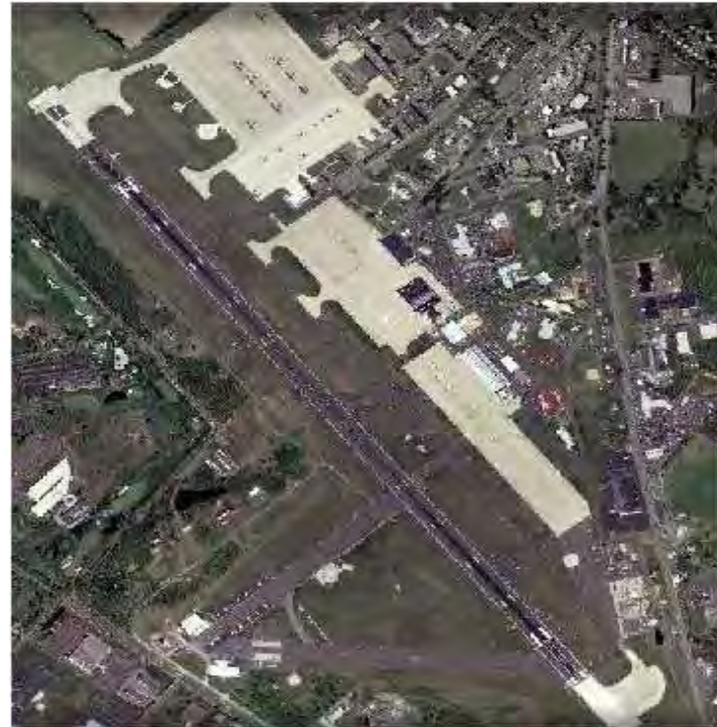
- The HRA identifies potential, likely, or known sources of radioactive material and areas where these materials were used, stored, or disposed
- The HRA classifies areas as impacted or non-impacted
 - An impacted area is one that has a potential for radioactive contamination based on historical information or is known to contain radioactive contamination. Locations immediately adjacent to the primary impacted area may be included in the designation. Impacted areas include:
 - Areas where radioactive materials were used or stored
 - Areas where known spills, discharges, or other unusual occurrences involving radioactive materials have occurred, or may have occurred, that could have resulted in the release or spread of contamination
 - Areas where radioactive materials might have been disposed of or buried
- The HRA identifies sites that need further attention
- The HRA recommends scoping survey(s)

Why an HRA was needed?

Naval Air Facility operations have historically involved the use of radioactive materials

The HRA identified areas at NAS JRB Willow Grove where previous activities involving the use, storage or disposal of radioactive materials occurred

The HRA also identified areas requiring additional actions to achieve closure to facilitate transfer of the property for non-military use



HRA Methodology

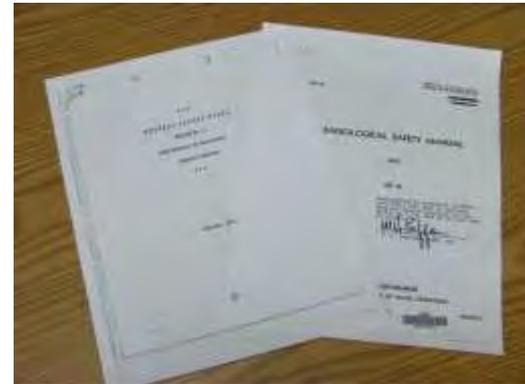
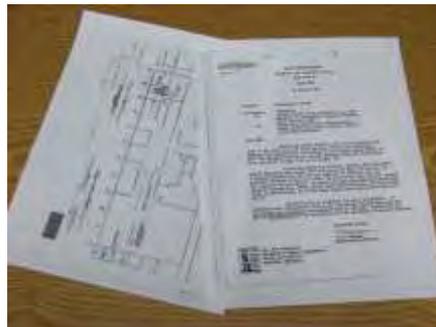
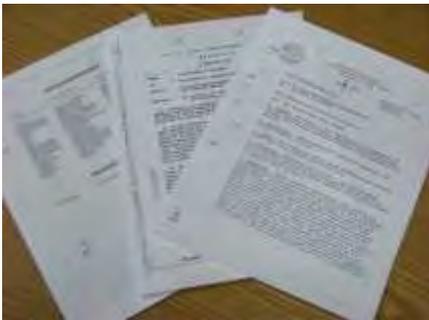
1. Visit and inspect buildings at NAS JRB Willow Grove
2. Review Base radiological records
3. Contact military authorities and search historical archives including:

National Archives and Records Administration (NARA)
College Park, MD & Regional Archives Philadelphia, PA
Naval Historical Center, Washington D.C.

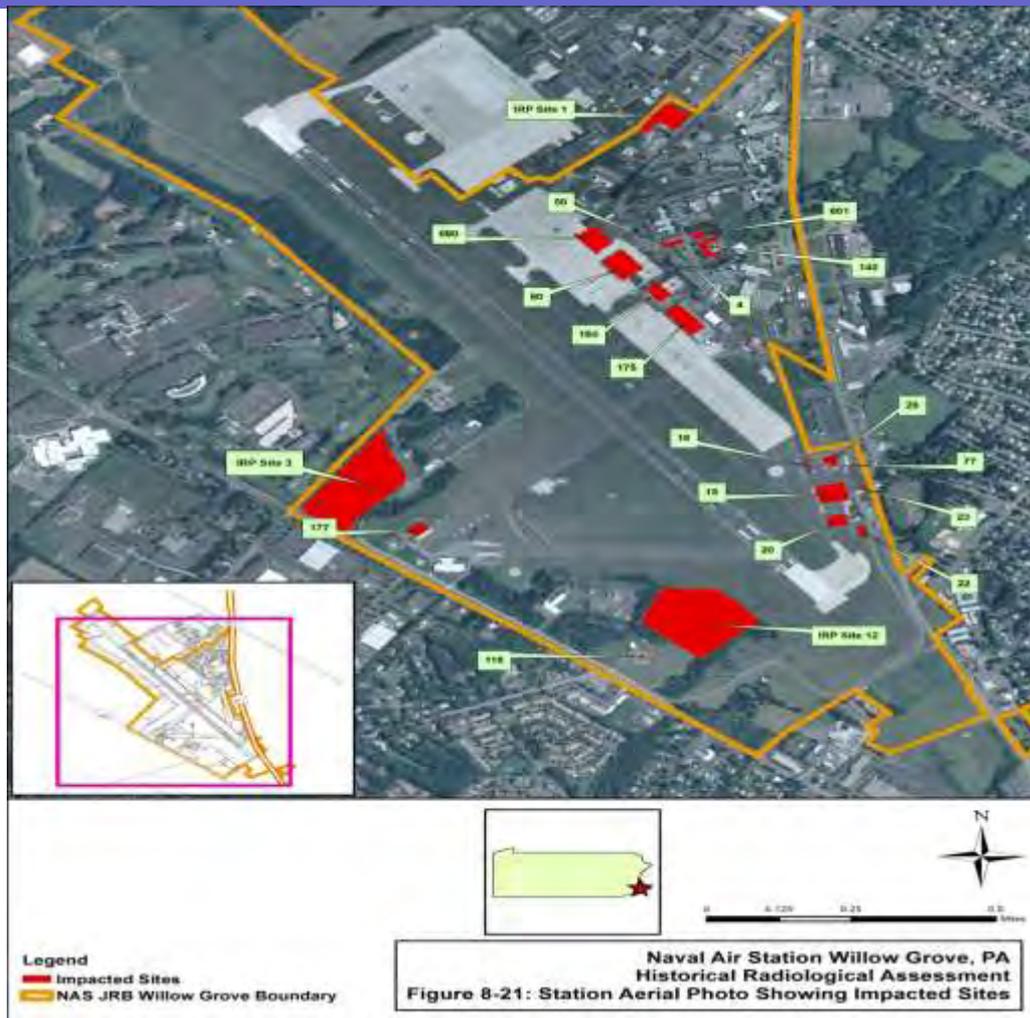
Naval Sea Systems Command Detachment Radiological
Affairs Support Office (RASO) Yorktown, Virginia

HRA Approach, continued

4. Review Base licenses, permits, authorizations, and operating records
5. Review historical regulatory agency inspection reports
6. Interview current and former Base personnel
7. Compile, evaluate information and prepare HRA



Impacted Sites (Approximately 20)



MARSSIM Guidance- HRA & Survey Design

The Environmental Protection Agency (EPA), the Nuclear Regulatory Commission (NRC), the Department of Defense (DOD) and the Department of Energy (DOE) collaborated to prepare site radiological assessment guidelines

- Contained in the Multi-Agency Survey and Site Investigation Manual (MARSSIM)
- MARSSIM was issued in December 1997 and revised in August 2000 and June 2001
- Available to the public at <http://www.epa.gov/radiation/marssim/obtain.html>

HRA Project Management Team

Base Realignment and Closure Office Northeast

Willie Lin– Navy BRAC PMO Northeast

Brian Helland– BRAC PMO N.E. Remedial Project Manager

Naval Sea Systems Command Detachment Radiological Affairs Support Office (RASO)

Patrick Owens– RASO Radiological Site Manager

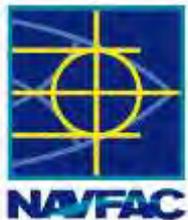
Laurie Lowman– RASO Lead Environmental Program Manager

Tetra Tech NUS

Lawson Bailey – Project Manager

Q & A

Questions?



**NAS JRB
WILLOW GROVE
RESTORATION
ADVISORY BOARD
(RAB)**

**September 5, 2012
Meeting Number 50**



Agenda



- Welcome Community RAB Members
- Historical Radiological Assessment
- Site 1 – Privet Road Compound LUC Inspection
- Site 3 – Ninth Street Landfill Status
- Site 5 – Fire Training Area Groundwater Remediation Status
- Site 12 – South Landfill Phase II Investigation Status
- Building 21 Lead Investigation
- POL Site ST-01
- Closing Remarks



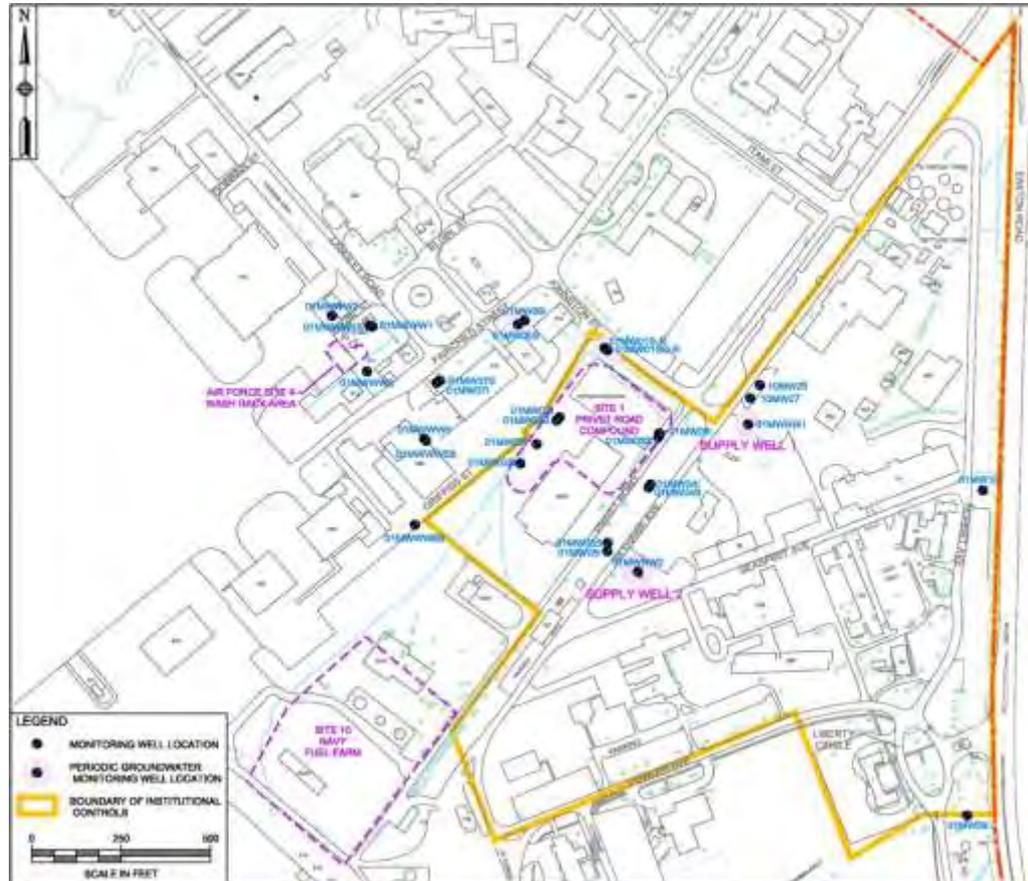
Historical Radiological Assessment



Restoration Advisory Board Meeting September, 2012
Patrick Owens , CHMM, CIH, CSP
Radiological Affairs Support Office (RASO)



Site 1 – Privet Road Compound





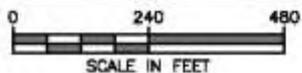
Site 1 – Privet Road LUC Inspection



- Land Use Control Inspection conducted August 2012
- No significant findings or compliance issues identified



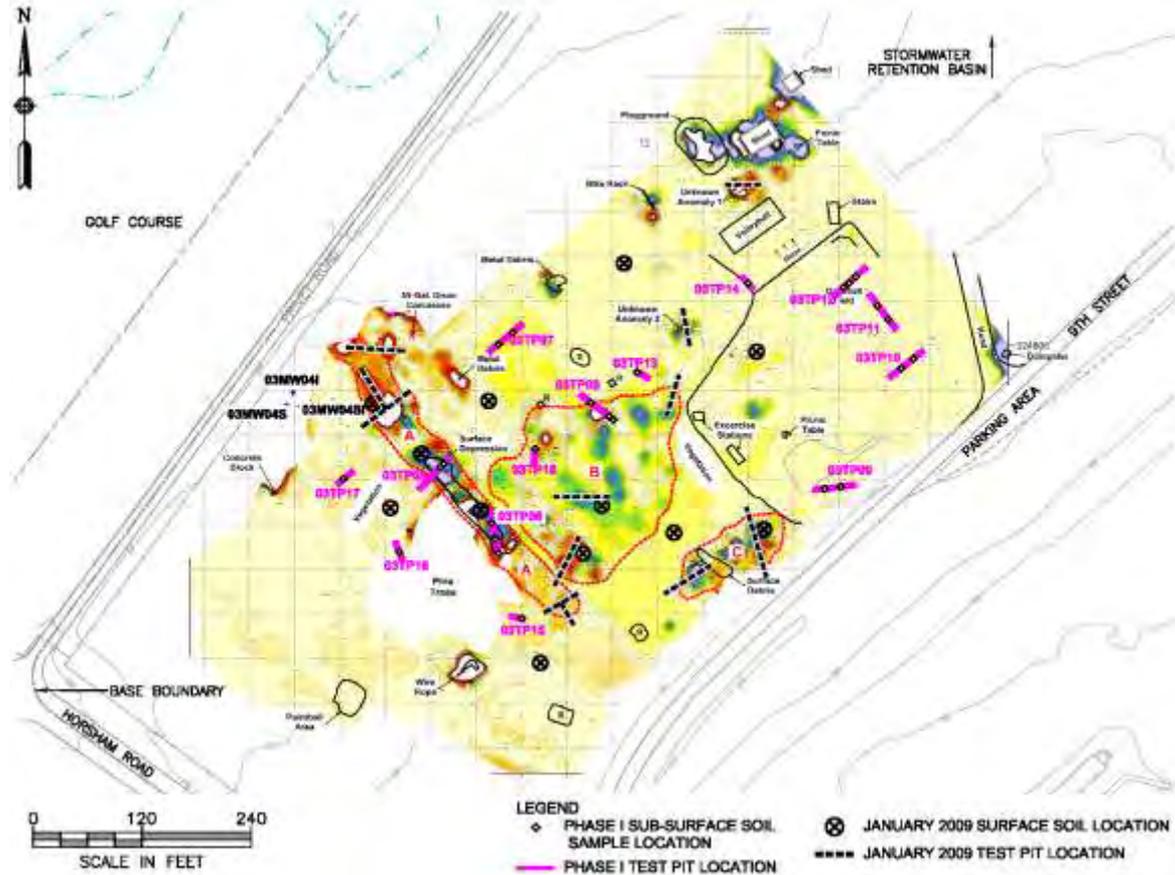
Site 3 – Ninth Street Landfill



SOURCE:
DELAWARE VALLAY REGIONAL PLANNING COMMISSION
2005 DIGITAL ORTHOMAGERY



Site 3 – Ninth Street Landfill





Site 3 – Ninth Street Landfill



- Final RI Report – October 2011
 - Recommendation for chromium speciation at samples with elevated levels of chromium
- Chromium speciation conducted concurrently with Site 12 Phase II field investigation
 - Analysis for total chromium and hexavalent chromium
 - Hexavalent chromium has higher toxicity than total chromium
 - Remediation goal being developed based on results for total chromium and hexavalent chromium
- Feasibility Study in preparation
 - Evaluating removal and capping alternatives
 - Radiological Field Survey



Site 5 – Fire Training Area Groundwater



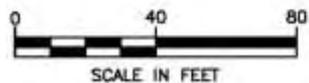


Site 5 – Fire Training Area Groundwater



LEGEND

- MONITORING WELL LOCATION
- INJECTION/EXTRACTION WELL LOCATION
- UNDERGROUND ELECTRIC AND WATER LINE
- UNDERGROUND ELECTRIC LINE





Site 5 – Fire Training Area Groundwater



- Current Status
 - Original solvent compounds sharply reduced to absent
 - Intermediate compounds steady to declining
 - End stage compounds appearing
 - Periodic biostimulation is required
 - August 2012 – sampling for VOCs, dissolved gases and field parameters
 - Lab Data Pending
 - Dissolved oxygen levels and oxidation-reduction potential readings show subsurface environment maintaining an anaerobic and reducing state



Site 5 Groundwater Proposed Remedy



- In-situ treatment of groundwater by anaerobic bioremediation in and around the former drum storage source area
- Monitored Natural Attenuation
- LUCs will be initiated to preclude use of untreated groundwater and require that future buildings are constructed to mitigate the potential for vapor intrusion of VOCs from the subsurface into the buildings



Site 5 Groundwater Remedial Design/Remedial Action



- After Record of Decision
 - Remedial Design for Land Use Controls
 - Remedial Design for Additional Injection Wells
 - Well installation
 - Sampling
 - Evaluation of subsurface **conditions to determine "recipe" for** amendments to continue and enhance bioremediation



Site 12 – South Landfill Phase II Remedial Investigation





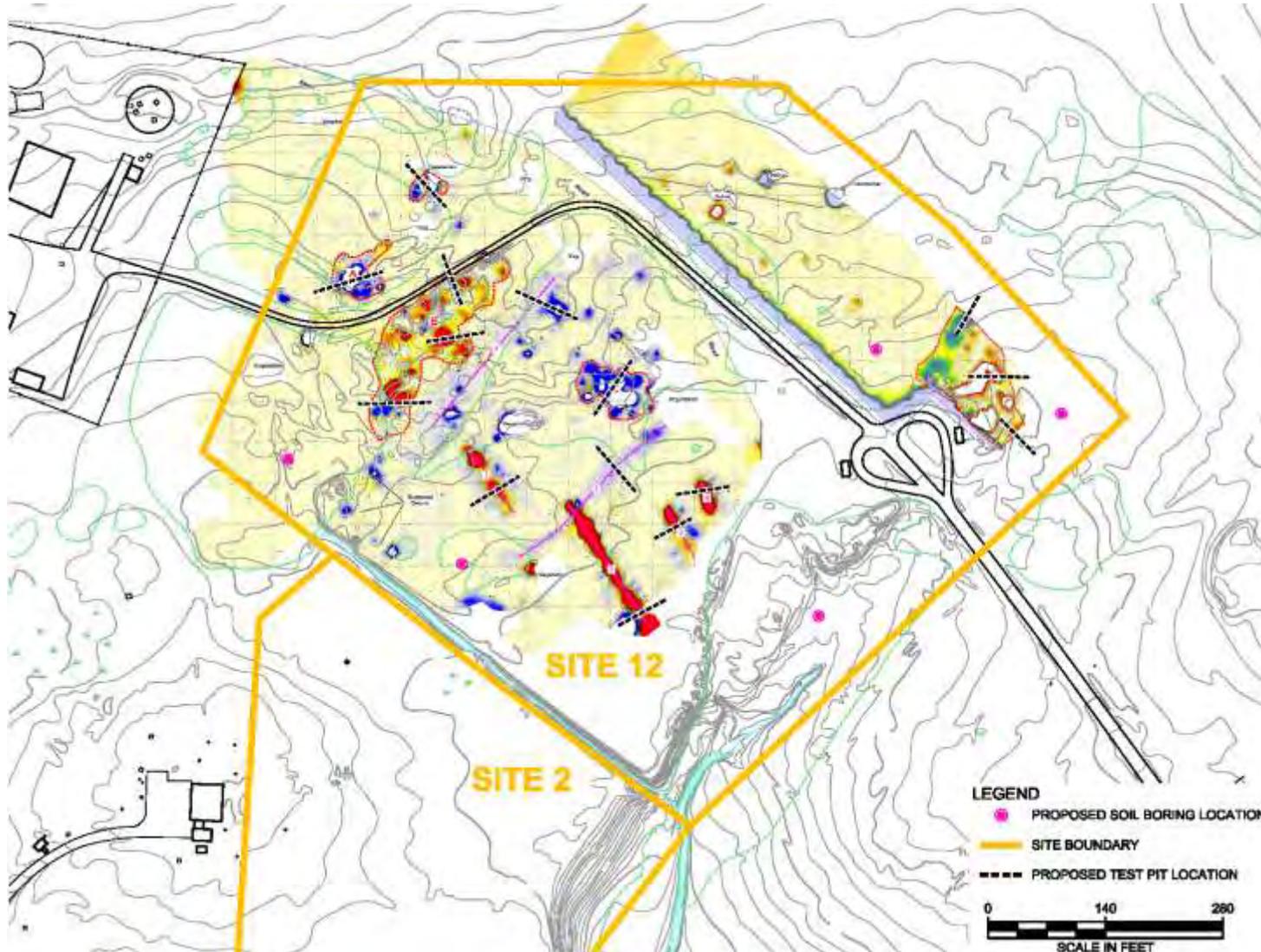
Site 12 – South Landfill Phase I Remedial Investigation



- Field investigation including test pits, soil borings, soil samples, surface water/sediment samples completed January 2010
- Soil sampling biased to areas with buried wastes based on results of electromagnetic (EM) survey
- Test pits at EM anomalies confirmed presence of buried waste
- Contaminants exceeded project screening levels
 - Surface Soils: PAHs, pesticides, metals
 - Subsurface Soils: PAHs, pesticides, dioxins, metals
 - Groundwater results from Site 2 wells showed low levels of TCE (<MCL)
 - Surface Water/Sediment: PAHs, pesticides, metals
- Recommendations for Phase II investigation to delineate nature and extent of surface and subsurface soil contamination and installation and sampling of groundwater monitoring wells



Site 12 Phase I EM Study





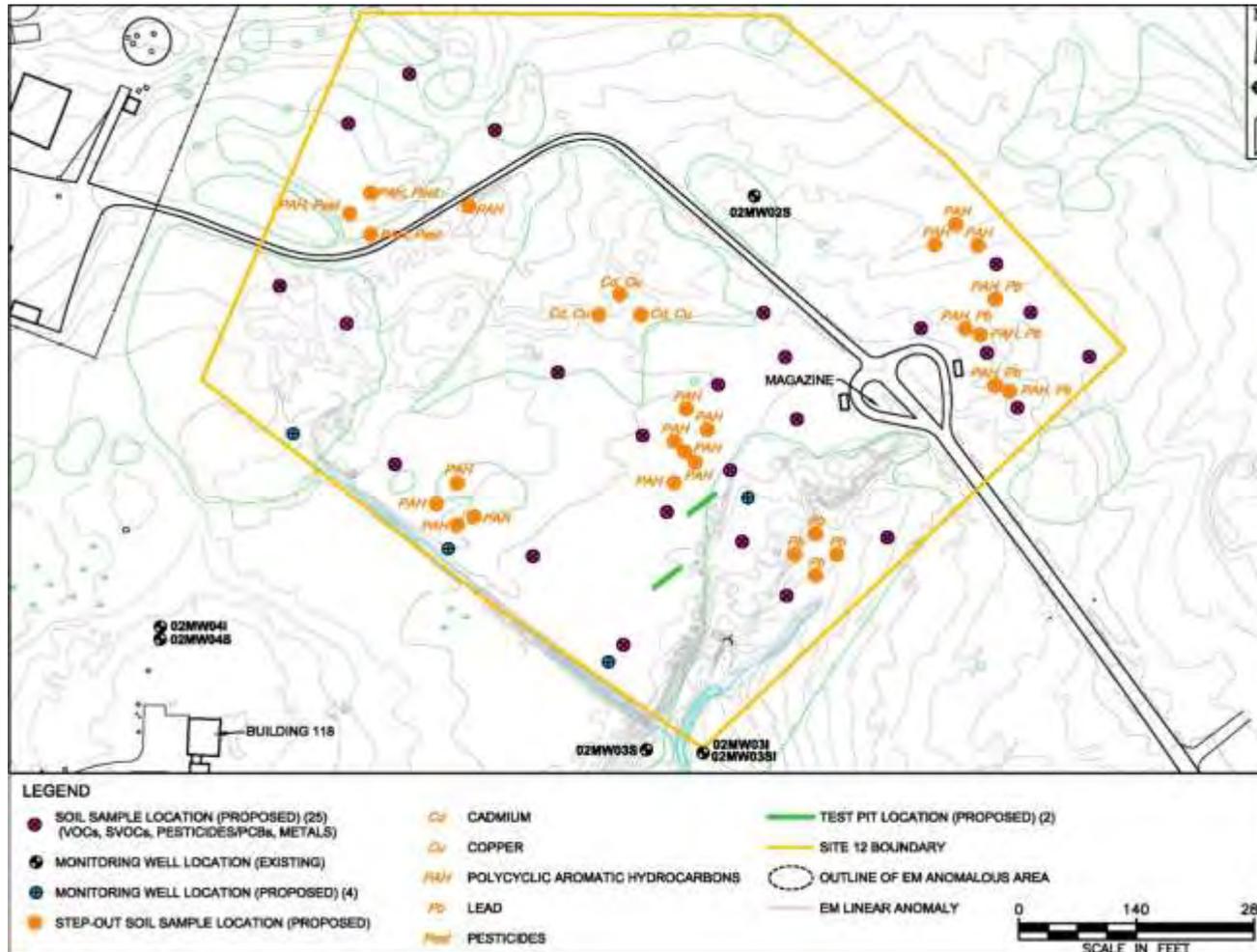
Site 12 – South Landfill Phase II Remedial Investigation



- Phase II investigation field work complete
 - Test pits at 2 linear anomalies in southeastern portion
 - 25 shallow soil borings outside EM anomalies (VOCs, SVOCs, metals/cyanide, pesticides, PCBs; hexavalent chromium at some locations)
 - 29 shallow soil borings at step-out locations based on Phase I results (low level PAHs and/or metals or pesticides)
 - Chromium speciation
 - 4 new monitoring well clusters (overburden, shallow bedrock) within the landfill (VOCs, SVOCs, pesticides, PCBs, metals/cyanide; dioxins and furans at well cluster downgradient of Phase I test pit 12TP02)
 - Site 2 monitoring wells (VOCs)



Site 12 – South Landfill Phase II Remedial Investigation





Site 12 Phase II Status



- Remedial Investigation Report in Progress
 - Data has been received, tabulated, and validated
 - Data evaluation currently being conducted
 - Statistical evaluation
 - Comparison to Project Action Levels/Screening Levels
 - Results confirm Phase I and provide further delineation of contamination
 - Preparation of Human Health Risk Assessment and Ecological Risk Assessment in progress



Building 21 Lead Investigation





Building 21 Lead Investigation



- Former paint blasting and painting facility
- 1995 soil investigation showed lead in five surface soil samples from 186 mg/kg to 2,210 mg/kg
- Lead sampling at 15 locations from 0 -0.5 ft, 0.5 to 1.0 feet, and 1.5 to 2.0 feet conducted October 2011; Final Inspection Report April 2012
- Results show lead-impacted soil on southern side of building and near transformer area (shaded area on next slide)
- Recommendation for removal of lead-impacted (>400 mg/kg) soil
- Work Plan for soil removal this fall with removal planned for late 2012



Air Force POL Site Remediation



Point of Contact

Bill Downs (478) 327-1073



NAS JRB Willow Grove RAB Meeting 50



- Closing Remarks
- Questions or Comments From The Community?
- Next Meeting Date - December 5, 2012



NAS JRB Willow Grove RAB Meeting 50



THE END

Willow Grove Air Reserve Station POL Site (ST-01)

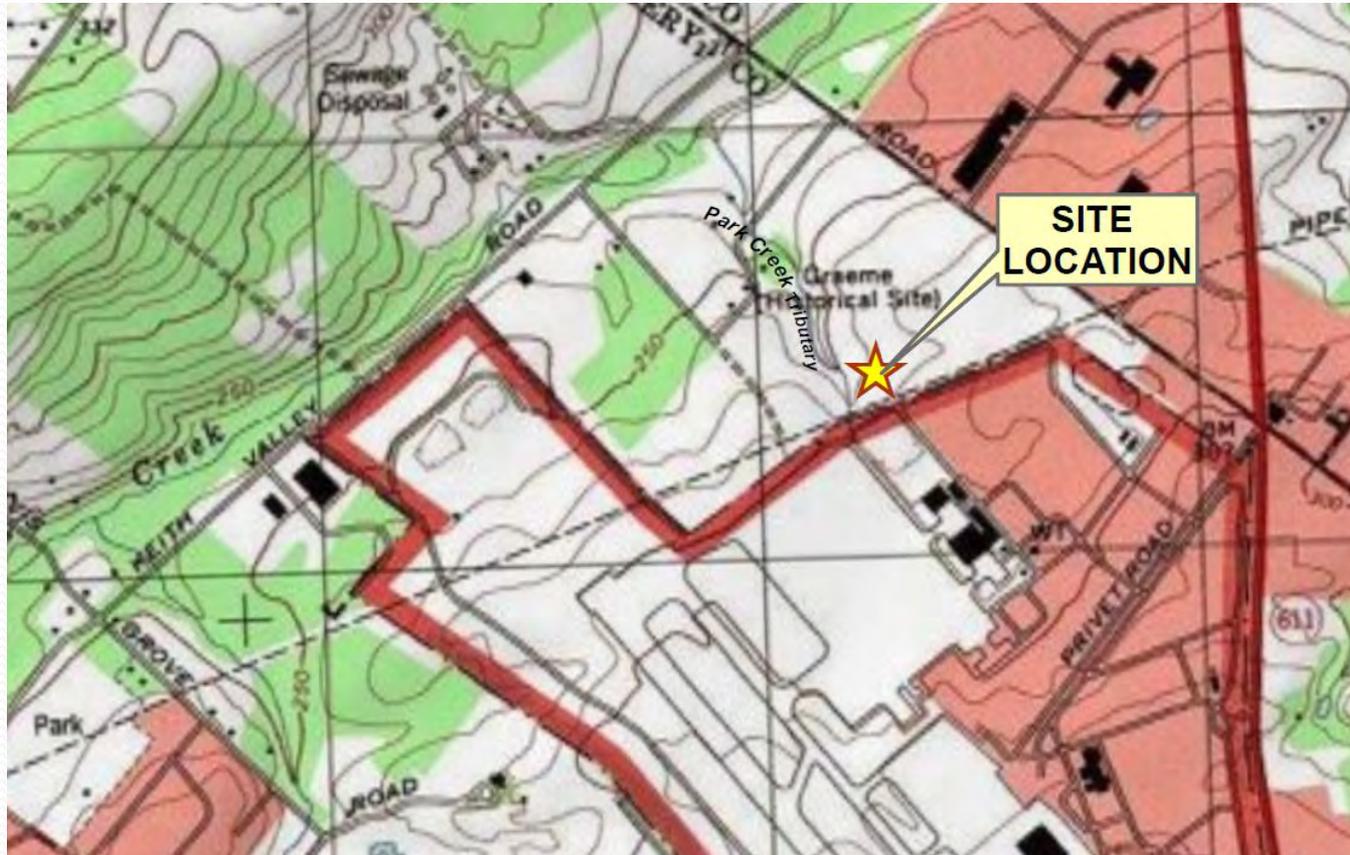
Restoration Advisory Board Meeting
Wednesday September 5, 2012



Outline

- Background, Location, and Status
- Compliance Monitoring Program
- Summary of Current Investigation
 - Delineation Methods
 - Remedial Technology Overview
 - Remedial Technology Testing
- Schedule

POL Site (ST-01)

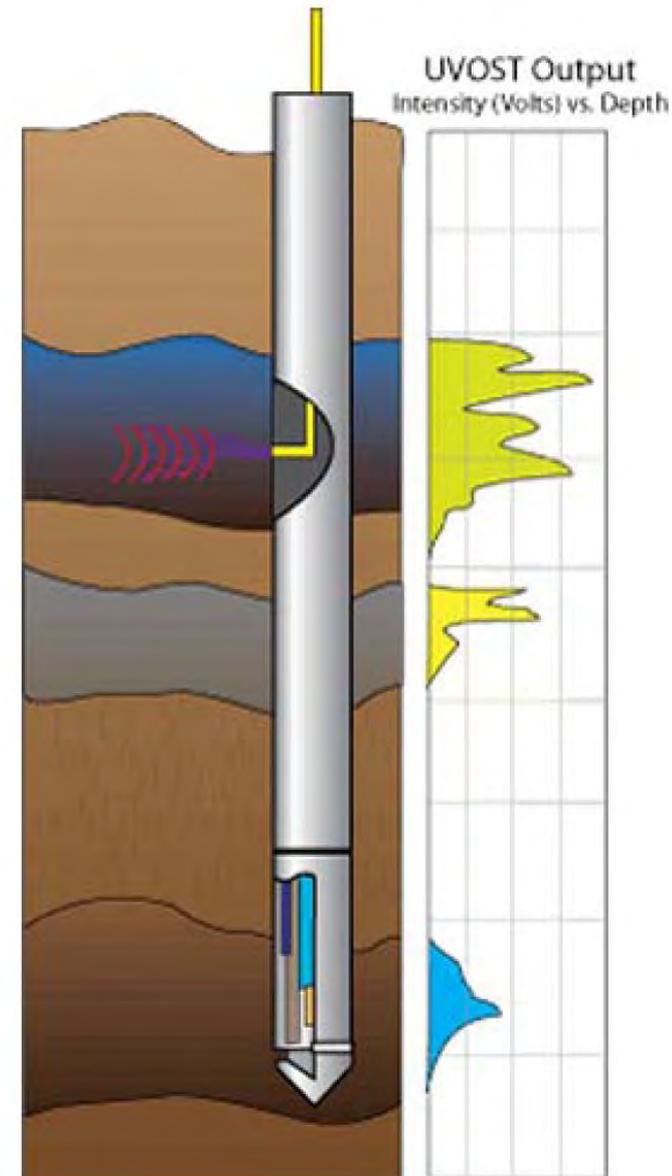


Compliance Monitoring Program

- Routine monitoring conducted over last 3 years
- Recently completed reporting on 12 quarterly groundwater and 4 quarterly surface water events dating back to September 2011
- No results exceeded the applicable Pennsylvania MSC in groundwater during the past 12 events
- No site COCs were detected in surface water
- Quarterly groundwater monitoring will continue
- Surface water monitoring no longer needed

Current Investigation

- Phase I – LNAPL Investigation
 - Laser Induced Fluorescence (3 days)
 - Confirmation Sampling (2 days)
- Phase II – Air Sparge Investigation
 - Locate and Install Test Wells
 - Air Injection Wells
 - Test Monitoring Wells
 - Evaluate Treatment Method
 - Baseline Sampling
 - Air
 - Groundwater
 - Air Sparge Evaluation – (72 hours)
 - Use Existing Equipment
 - Monitor Physical and Chemical Changes
- Reporting and Recommendations



Survey Area

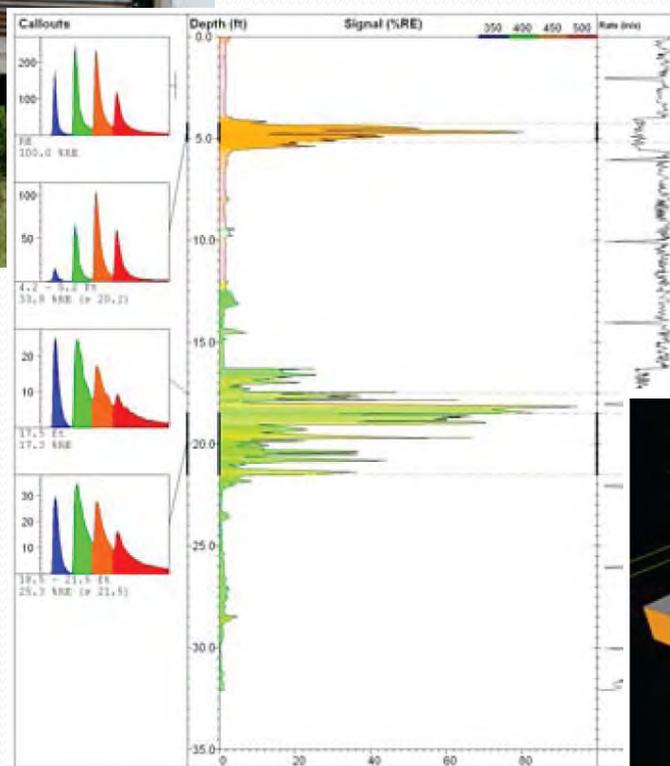


Laser Induced Fluorescence

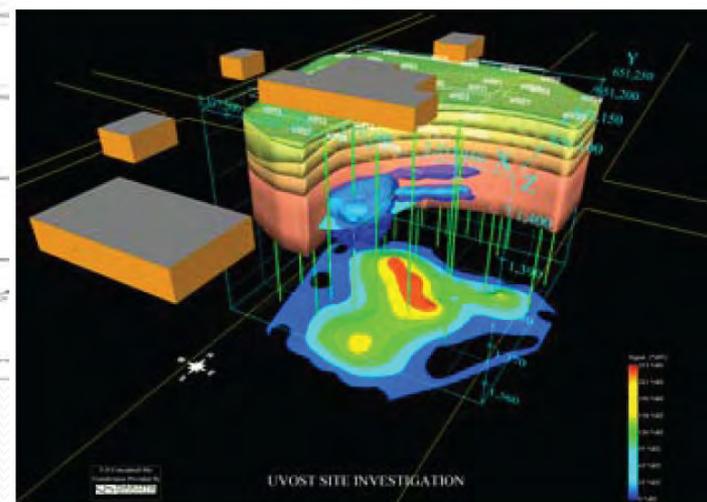


Portable – Small Footprint

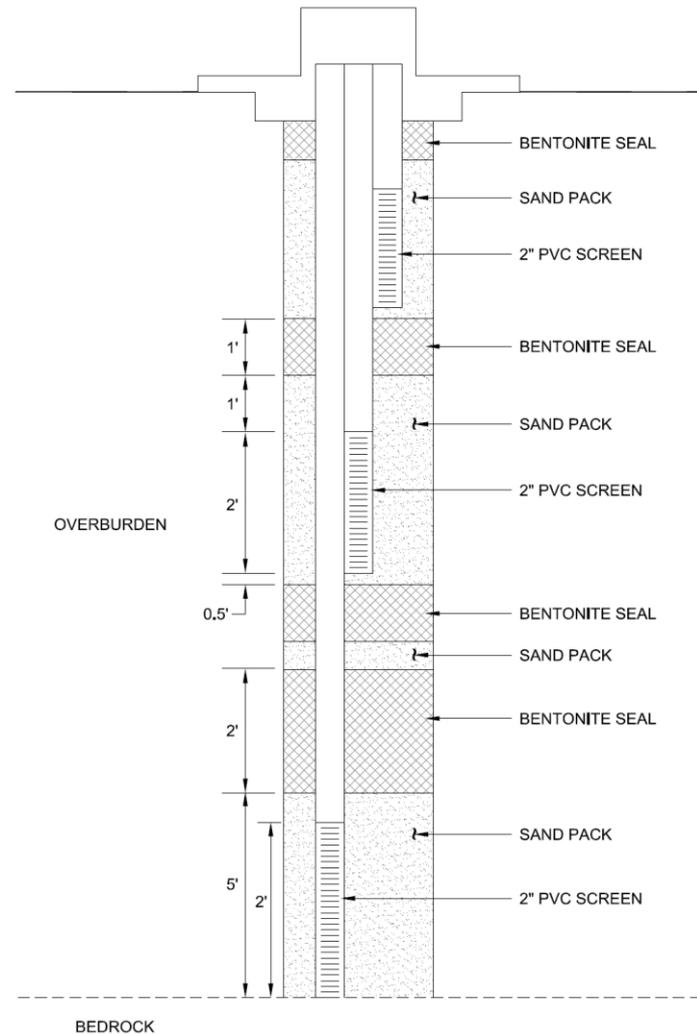
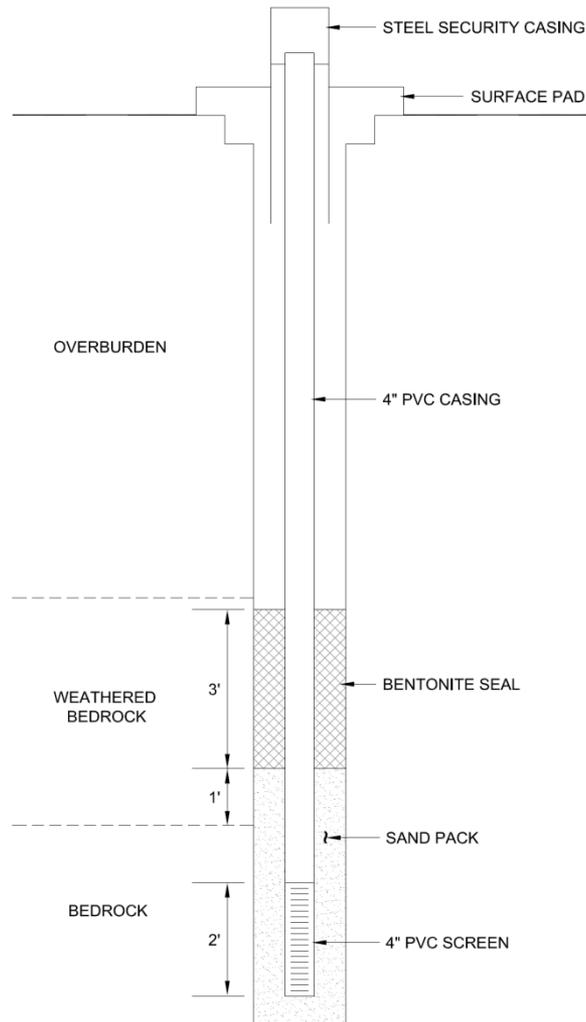
Abundant Data



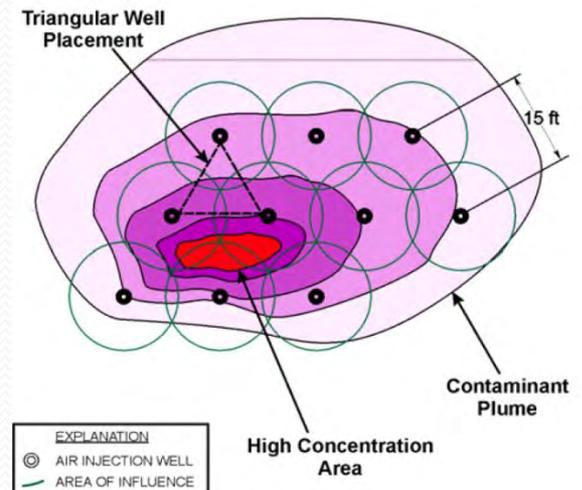
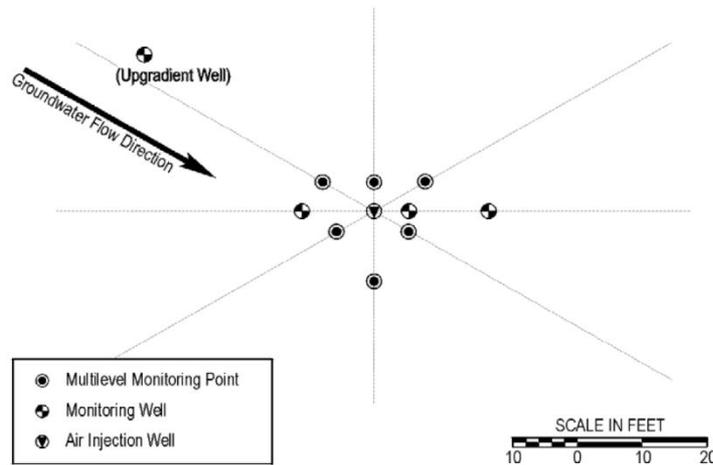
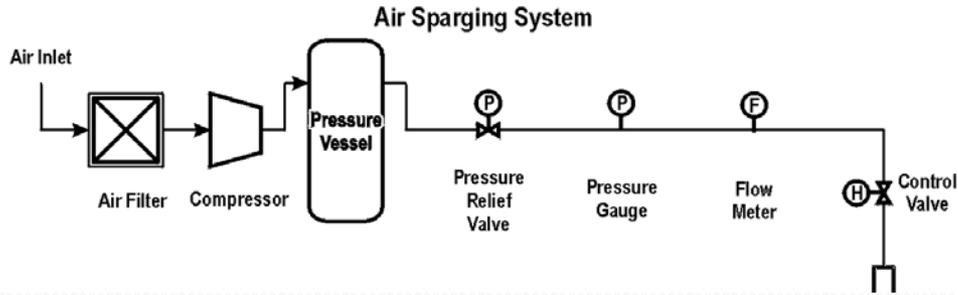
Graphical Interpretation



Well Installation



Air Sparge Testing



Schedule

- LNAPL Investigation – September 2012
- Well Installation and Sampling – October 2012
- Air Sparge Testing - November 2012
- Data Evaluation and Reporting – December (2012) - February (2013)
- Future RAB Meeting Presentations on Site ST-01
 - December 2012
 - June 2013



Questions