



DEPARTMENT OF THE AIR FORCE
20th FIGHTER WING (ACC)
SHAW AIR FORCE BASE, SOUTH CAROLINA

MEMORANDUM FOR 20 FW/CV

FROM: 20 CES/CEIE

SUBJECT: Restoration Advisory Board (RAB) Meeting Minutes

1. Meeting information:

- a. Date: 24 February 2014
- b. Time: 1830
- c. Location: New Beginning Banquet Facility, 1335 Hwy 441, Sumter, SC 29154
- d. Co-Chairman: Col Clark Q. Quinn, USAF Chairperson
- e. RAB Members/Alternates and Others in Attendance:

City/County Officials

Mr. Eddie Newman, County Representative (Not Present)
Mr. Bill Rozier, City Representative (Not Present)

South Carolina Department of Health and Environmental Control (SCDHEC)

Ms. Rachel Poole, SCDHEC, Columbia Office
Mr. Keith Lane, SCDHEC Region 4, Sumter Office (Not Present)

RAB Community Members

Mr. Daniel Burkett (RAB Community Co-Chair)
Ms. Melanie Bennett (Not Present)
Mr. Chip Chase
Mr. Charles Firmbach
Mr. Albert Gagnon (Not Present)
Mr. John Hayes (Not Present)
Mr. Tony Horton (Not Present)
Rev. Willie Lawson
Dr. Wendell Levi, Jr.
Ms. Amanda Skelton (Not Present)
Ms. Elizabeth Williams (Not Present)

Others, Air Force Affiliated

Mr. John McKinley 20 MSG/DI
Lt Col Terrence Walter 20 CES/CC
Capt Difelice 20 FW/JA
Mr. Robert Sexton 20 FW/PA
Maj Greg Garrison 20 AMDS/SGPB
Mr. Nick Muszynski 20 CES/CEIE
Mr. Juvenal Salomon AFCEC/CZOE
Ms. Aliza Tindall AFCEC/CZOE
Mr. Doug Simpleman US Army Corps of Engineers, Omaha District
Ms. Jean Chytil US Army Corps of Engineers, Omaha District
Mr. Denny Jorgenson URS Corporation
Mr. Robert Mallisee URS Corporation
Mr. Dave Overbey URS Corporation
Mr. Kyle Dermatis URS Corporation
Ms. Jeny Mitchell URS Corporation

Others, State of South Carolina

Mr. Michael Danielsen

SCDHEC

Media Representatives

(Not Present)

Community Members

Mr. JW Ainsworth

Ms. Shirley Oquinn

Mr. John Roach

Mr. Steven Schmidt

Mr. F. D. Schmidt

Ms. Marie Wiley

2. Mr. Salomon, Base Restoration Project Manager, served as meeting moderator and opened the meeting. He introduced the 20th Fighter Wing Vice Commander, Col Clark Quinn.
3. Col Quinn opened the meeting by welcoming the community. He emphasized the purpose of this meeting is to provide information about Shaw AFB's environmental cleanup program and to address the community's questions or concerns.
4. Mr. Salomon facilitated the remainder of the meeting. He introduced the RAB members. He explained that this board is advisory in nature and a venue for the Air Force to communicate with the community. Mr. Salomon reiterated Col Quinn's explanation regarding the purpose of the RAB, to keep the community informed of the status of Shaw AFB's Environmental Restoration Program. Shaw AFB's goal is to be transparent to what the base is doing to clean up the contamination. The focus of the meeting was to update the progress the contractor has made in the treatment systems installation, update of the Bilateral Agreement implementation plan, and the upcoming activity to sample for 1,4-Dioxane. The slide presentation is attached (Atch 1).
5. Mr. Salomon briefed the Shaw AFB Environmental Restoration Program goals. The Air Force's goal is to accelerate site closure and to restore the affected sites to unlimited use/unrestricted exposure if it is physically, technically or financially possible. Only 24 out of 121 sites listed in the Resource Conservation Recovery Act Hazardous Waste Permit remain active and are being cleaned up and/or monitored. In 2011, Shaw AFB awarded a Performance-Based Remediation (PBR) contract to URS Corporation. PBR contract focuses on the achievement of the objectives, not how to accomplish the work, thus leveraging the contractor's expertise. The contractor proposed closing 14 sites by the end of their contract performance period. The challenge is that there are ten sites that will not reach site closeout by this period of performance (2020), but the contractor has proposed remedies to reduce the cleanup timeline to most of these sites. These challenging sites include four perchloroethylene and/or trichloroethylene (PCE and/or TCE) sites undergoing long cleanup processes; three landfills where it is more cost effective to monitor every five years than to completely dig up; a dieldrin pesticide site with an on- and off-base footprint that is being monitored (currently no Environmental Protection Agency cleanup standard for dieldrin); a fuel spill site that is located in the middle of the runways that presents an access challenge; and one new site that was discovered in response to a spill in April 2013, with funding programmed in FY2015 to investigate.
6. Mr. Salomon briefed the contractor's progress of the treatment systems installation that began in July 2013. This treatment systems installation was divided into three sections: deep aquifer systems expansion (depth is 150 feet below surface), shallow aquifer systems installation (depth ranges 30 to 70 feet), and dieldrin pilot study. Mr. Salomon began the briefing by reporting the progress of the deep aquifer systems expansion. The contractor is expanding the pump and treat system by increasing the number of extraction wells and adding injection wells. In the current process, contaminated water gets extracted then pumped into a centrally located air stripper for treatment; clean treated water gets discharged into a sewer line that empties to the Wateree River. The additional extraction wells will increase extraction by 140% (from 500 gallons per minute to 1200 gallons per minute). The amount of clean water discharged will remain the same (500 gallons per minute) but the rest of the clean water (about 60% or 700 gallons per minute) will be re-injected back. The re-injected clean water will push the contaminated water more quickly to the next extraction well. The contractor projected that the expanded capability will reduce cleanup time by 75%, from 180 years down to 45 years. All planned new extraction and vertical wells have been installed, except for four wells that are waiting funding and contract action. The contractor is thirty

percent complete with the horizontal piping to connect all the vertical wells together. The upgraded pump, treat, and inject system is projected to be operating at full capacity sometime this summer.

7. Mr. Salomon updated the status pertaining to the installation of the shallow aquifer systems. Nine systems involve injecting ozone, peroxone, and/or potassium permanganate into the shallow aquifers. These are strong oxidizers that breakdown the contaminants into environment-friendly byproducts. Imagine injecting a straw into the ground about 30 to 40 feet and blowing air into the ground; the air will react with the contamination as it percolates up. The size of the contamination determines how many injection wells the contractor will install. Five shallow aquifer systems have begun operations. There are three remnant source areas in the shallow aquifer feeding the plume migrating off base. Since TCE/PCE is heavier than water, it sinks to the lowest point and follows the flow of the water. Due to the complexity of the geology on base (in prehistoric times this area was beachfront property), the TCE/PCE is migrating eastward initially in the shallow aquifer until reaching underneath the runway where it makes a u-turn down into the deeper aquifer and flowing westward off base. One of the objectives of the shallow aquifer systems is to accelerate the cleanup of the remnant source areas on base to prevent it from continuing to migrate off base. The contractor is using potassium permanganate (purple surly) in shallower areas where ozone/peroxone application is not as effective. Potassium permanganate will neutralize the TCE/PCE upon contact.

8. Mr. Salomon briefed the status of the dieldrin pilot study. Dieldrin is persistent, sticks to soil, and does not readily breakdown. The dieldrin plume is 30 to 50 feet below the surface, has low levels, stable, and affects 14 parcels off base. Shaw AFB is monitoring the plume's stability. The contractor is conducting a pilot study using peroxone sparging to evaluate the effectiveness of this treatment. The contractor is conducting post-injection sampling; observed some reduced levels initially but has also observed some rebound in levels. If the pilot study is successful, the contractor may propose to expand the remedy to include other areas.

9. Mr. Salomon briefed about the Bilateral Agreement Implementation plan. When Shaw AFB implemented the remedy for the TCE/PCE groundwater plume in 2009, it included administrative controls to ensure protection of human health and the environment. One of the administrative controls is the bilateral agreement, which is a legal document that states that the landowner is aware of the underlying groundwater contamination and of the obligation, in accordance with South Carolina law, to disclose this contamination when transferring the property. The bilateral agreement is voluntary; the resident does not have to enter into an agreement. The Air Force initiates discussion with the affected resident and requests if it can file a deed notice on parcel owner's behalf. The deed notice is attached to the property deed and filed at Sumter County Register of Deeds. When the groundwater on the property has been cleaned up to safe levels, both parties can then enter into a subsequent agreement to cancel it from the property deed. The reason for this update is the 2013 well sampling results revealed that there was a change in the plume boundary. As a result, additional properties are now located inside the boundary of the TCE/PCE plume. Shaw AFB will implement the bilateral agreement plan and invite these residents to enter into this voluntary agreement. Twenty-one affected properties were identified as being located outside the new plume boundary. This is the first sampling event that the contamination has reached safe levels for these parcels. South Carolina Department of Health and Environmental Control require three consecutive confirmatory sampling before removing the parcel from the list. Shaw AFB is working with the contractor to confirm the extent of the plume boundaries.

10. Mr. Salomon briefed about the upcoming sampling event, which includes sampling for 1,4-Dioxane. This chemical was used in the Air Force as a stabilizer for certain solvents. It is also used commercially, such as in paint strippers, varnishes, and in small amounts in deodorants, shampoos, and cosmetics. The Environmental Protection Agency has 1,4-Dioxane on its watch list as an emerging contaminant but have not developed cleanup standards yet because the science is so new. As a precautionary measure, the Air Force directed bases to begin sampling for 1,4-Dioxane and SCDHEC requested that Shaw AFB also sample. Shaw AFB is one of first bases to sample for 1,4-Dioxane, including it at the next 2014 Spring sampling activity. Determining the potential impact of an emerging contaminant is a multi-step process that could take several months to a few years. The first step is to determine if it is even present at Shaw AFB. If so, the second step commences with more follow-up sampling to determine the extent. Once the extent of impact has been determined, the third step will evaluate if there are unacceptable risks to human health and the environment that will need to be corrected. Shaw AFB will update the public as it goes through these steps.

11. Community members posed a few questions throughout the meeting. Answers to these questions were provided at the meeting and are attached (Atch 2).

12. Prior to closing, Mr. Salomon sought inputs from the RAB panel. There were no inputs from the RAB panel.

13. Col Clark Quinn provided closing remarks. He thanked everyone for their interest and attendance. Shaw AFB cannot change what happened in the past, but is committed to invest many resources to clean up the contamination. Shaw AFB will continue having public meetings to ensure residents are kept informed of the on-going cleanup efforts.

14. The next meeting will be scheduled in six months, around August 2014, starting at 6:30 pm at the New Beginning Banquet Facility. Questions regarding the meeting may be directed to Shaw AFB's Public Affairs Office, (803) 895-2019.

//Signed/jqs/14 Mar 14//

JUVENAL Q. SALOMON, GS-12, DAFC
RAB Administrator

Approved as written.

//Signed/wrj/11 Apr 14//

WILLIAM R. JONES, Colonel, USAF
Vice Commander, 20th Fighter Wing

2 Attachments:

1. RAB Presentation Slides
2. Question and Answer Session

cc:

20 FW/CV

20 FW/JA

20 FW/PA

20 MSG/CC

20 MSG/DI

20 CES/CC

20 CES/CEI

20 CES/CEIE

20 AMDS/SGPB

AFCEC/CZOE

AFCEC/CZRE (Mr. Anthony Williams)

US Army Corps of Engineers (Mr. Doug Simpleman)

SCDHEC (Ms. Rachel Poole, Mr. Keith Lane)

Sumter County Public Works Director (Mr. Eddie Newman)

Sumter City Engineer (Mr. Bill Rozier)

RAB Community Members (Mr. Daniel Burkett, Rev. Willie Lawson, Ms. Melanie Bennett,
Dr. Wendell Levi, Jr., Mr. Chip Chase, Mr. Charles Firmbach,
Mr. Albert Gagnon, Mr. John Hayes, Mr. Tony Horton,
Ms. Amanda Skelton, Ms. Elizabeth Williams)



20th Fighter Wing



RESTORATION ADVISORY BOARD

“Welcome”



**Col Clark J. Quinn
Vice Commander
Shaw Air Force Base**

24 February 2014



Agenda



- **Purpose / mission**
- **Question cards**
- **Shaw Environmental Restoration Program goals**
- **Recent activities**
 - Status update: Treatment systems installation
- **Upcoming activities**
 - Status update: Bilateral agreement implementation
 - Sampling for 1,4-Dioxane
- **Intermission**
- **Q&A**
- **Closing remarks**



RAB Purpose/Mission



PURPOSE:

- **Promote community awareness**
- **Obtain constructive community review and input on current and proposed environmental cleanup actions**

MISSION:

- **Open and interactive dialogue**
 - **Among the Air Force, South Carolina Department of Health and Environmental Control, and our neighbors**
 - **Concerning Shaw's Environmental Restoration Program**



Question Cards



- Health Technical
 Legal Other

Question:

What is ...?

John Doe
123 Question St.
Sumter, SC 29154
(803) 895-XXXX

***Please turn in question cards during intermission.
Questions will be addressed after briefing.***



Shaw AFB Environmental Restoration Program Goals



- **Air Force direction: Site Closeout**
 - This means unlimited use / unrestricted exposure
- **121 total sites listed in RCRA HazWaste Permit**
 - 24 remaining active sites to be cleaned up
- **Solution: Performance-based remediation contract**
 - Awarded in 2011, \$19.8M (funded through 2015)
 - Objective: Close 14 sites by 2020 (end of contract period)
- **For remaining 10 open sites, reduce cleanup timeline**
 - Four TCE/PCE plumes (long cleanup period)
 - Three old landfills (costly removal of buried waste)
 - One Dieldrin pesticide plume (persistent, long half-life)
 - One fuel spill site (in shallow aquifer but underneath runway)
 - One new site (soil contamination due to fuel oil tank removal)



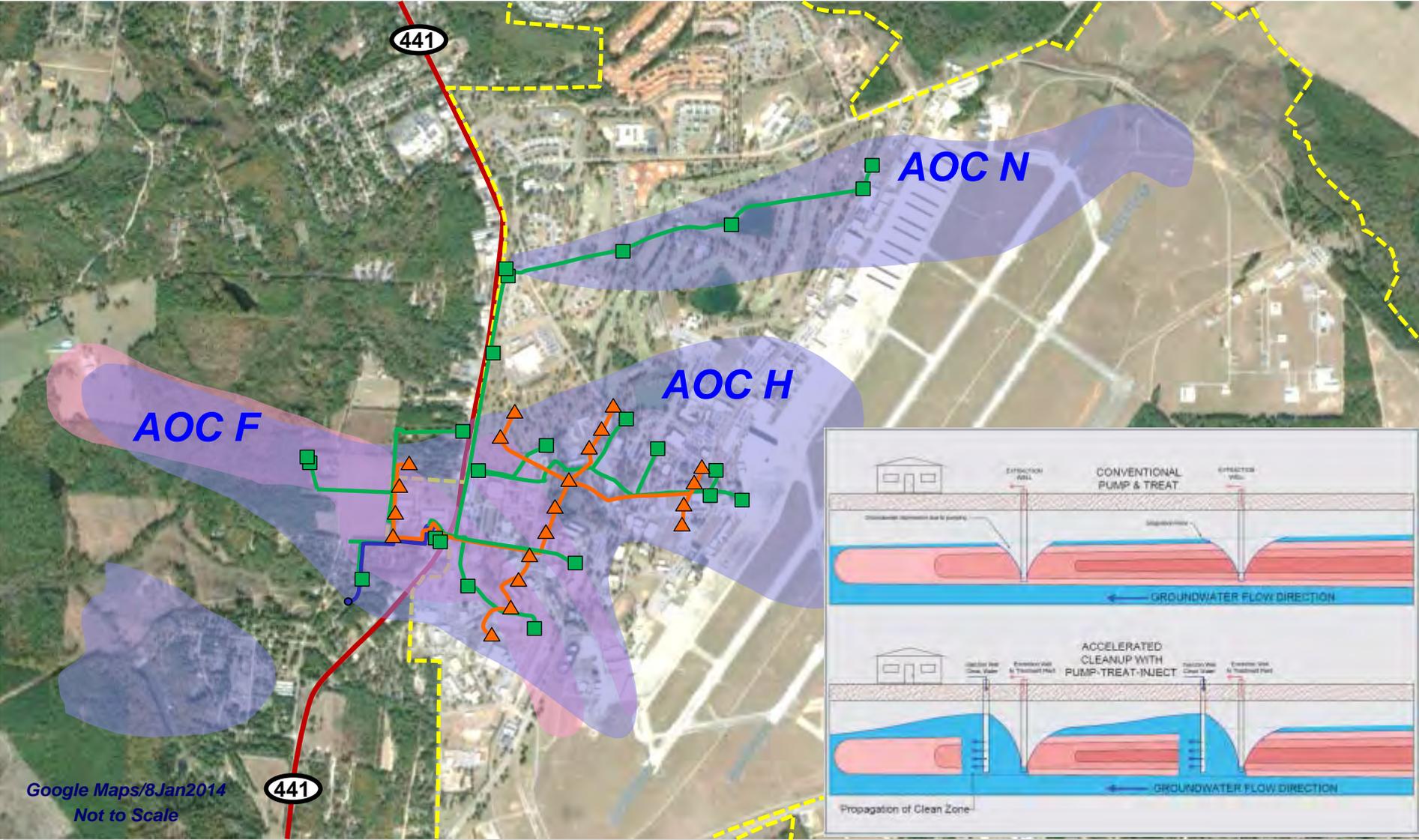
Recent Activities



- **Status update: Treatment systems installation**
 - Deep aquifer
 - Shallow aquifer
 - Dieldrin pilot study



Deep Aquifer Systems Expansion, Concept



Google Maps/8Jan2014
Not to Scale



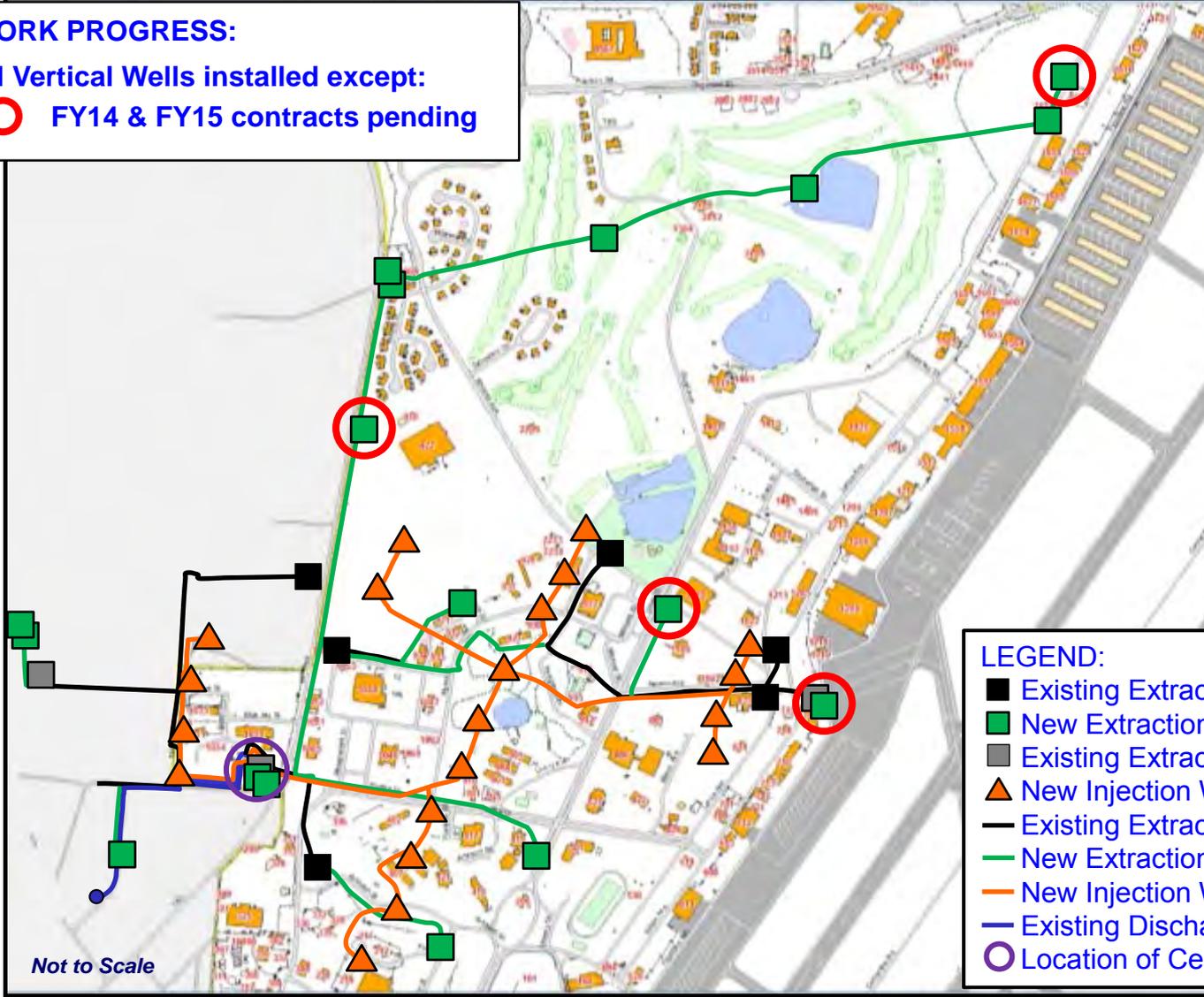
Deep Aquifer Systems Expansion – Work Progress



WORK PROGRESS:

All Vertical Wells installed except:

○ FY14 & FY15 contracts pending



Not to Scale

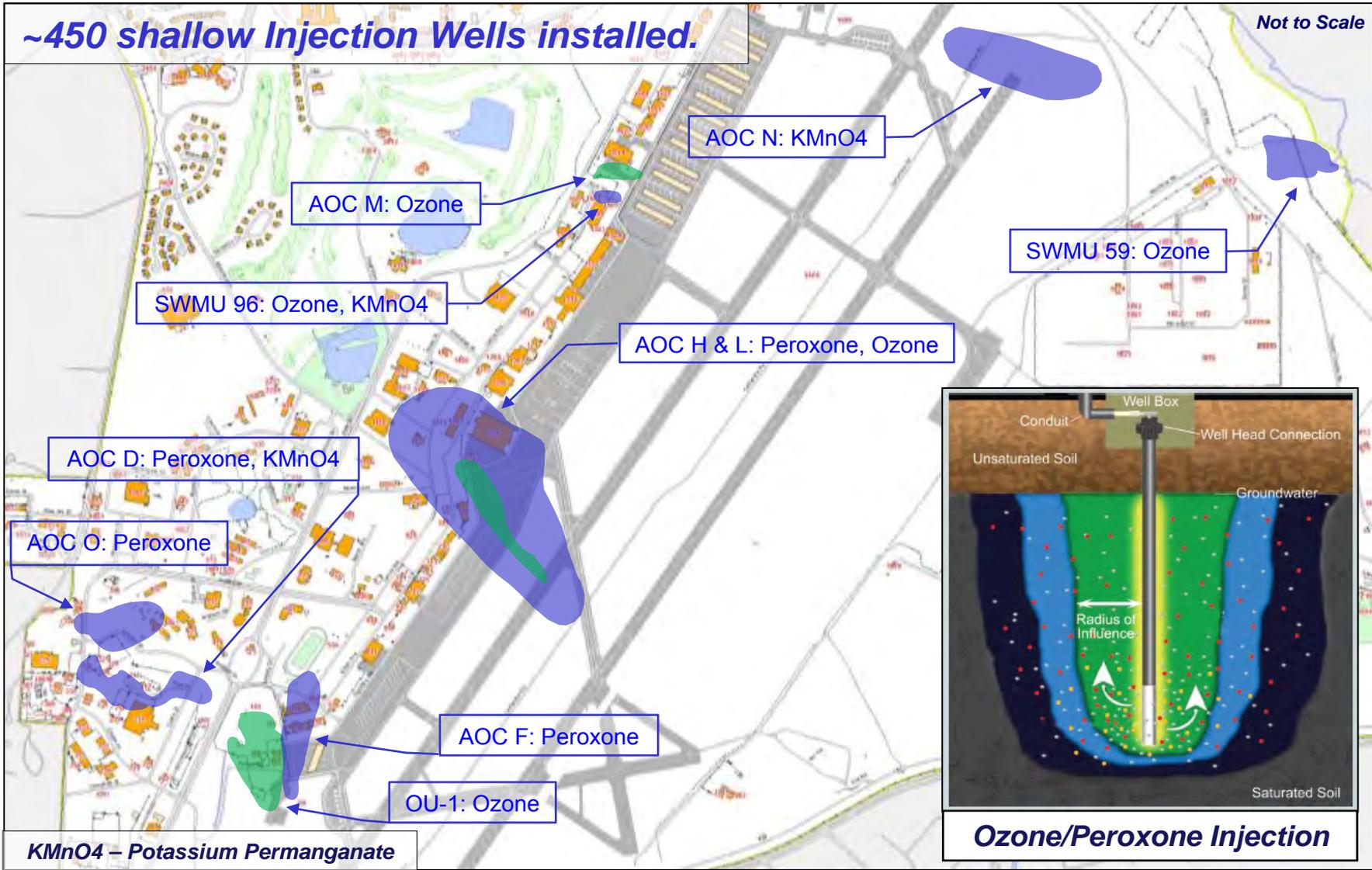


LEGEND:

- Existing Extraction Well (6)
- New Extraction Well (17)
- Existing Extraction Well to be Abandoned (3)
- ▲ New Injection Well (20)
- Existing Extraction Well Piping
- New Extraction Well Piping
- New Injection Well Piping
- Existing Discharge Piping
- Location of Central Air Strippers (2)



Shallow Aquifer Systems Installation



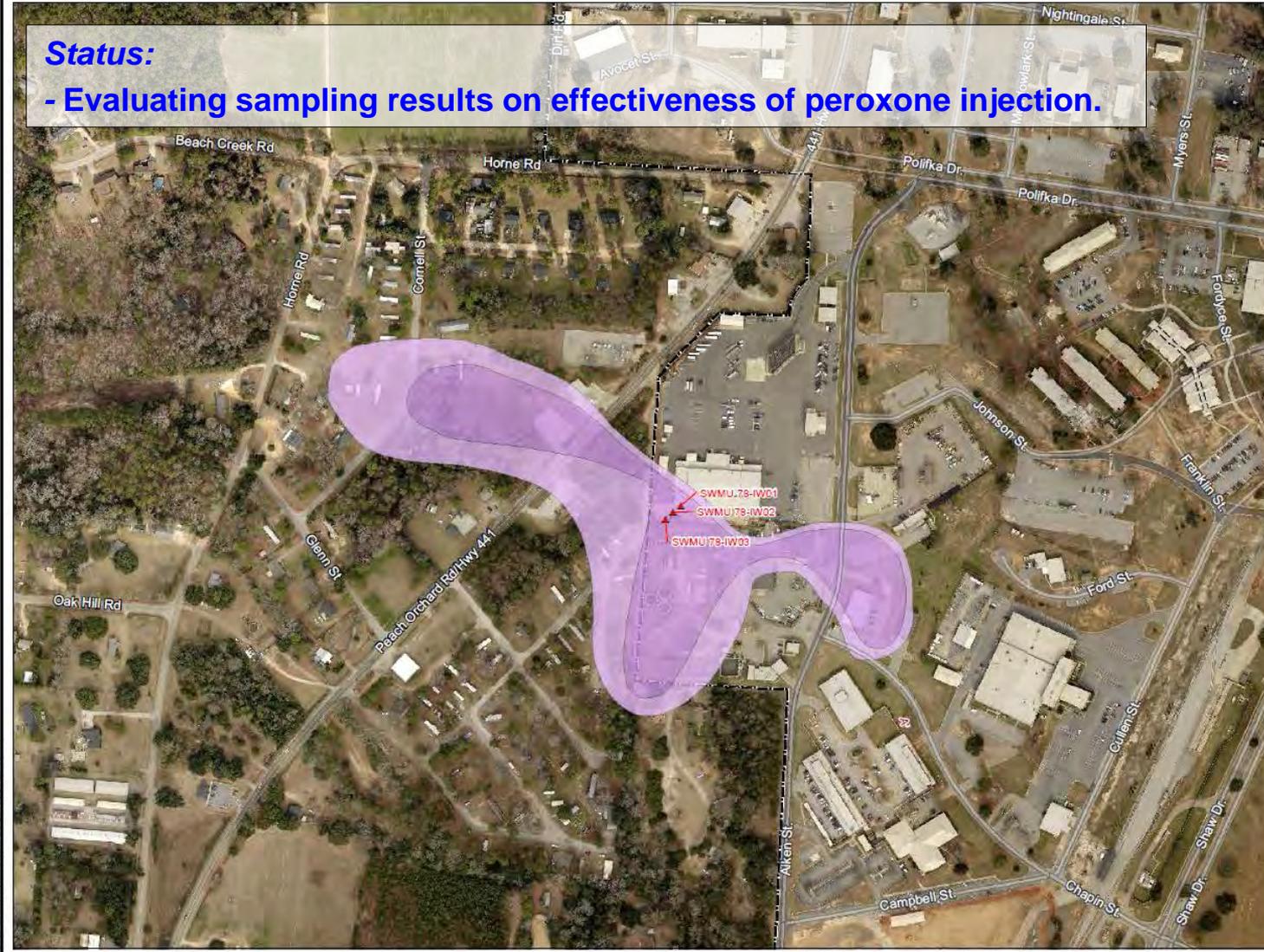


Dieldrin Pilot Study



Status:

- Evaluating sampling results on effectiveness of peroxone injection.



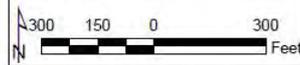
- Legend**
- Well Location
 - Direct Push Location
 - Injection Well Location
 - Installation Boundary

(0,11) 2012
(Most Recent Dieldrin Sampling Result)
with Sampling Year

µg/L = micrograms per liter
ABD = Abandoned
U = Non Detect

Note:

- 1) 2012 results were from Spring LTM event in March or direct push samples collected in December
- 2) 1996 monitoring well samples collected in February.
- 3) 1999 direct push samples collected in April.
- 4) 2013 direct push samples collected in May.



SWMU 78 Site Location Map With Dieldrin Plume
Shaw Air Force Base,
Sumter, South Carolina

Drawn By: DFG	Date: 8/8/2013	Project No: 15110554	Figure 2-1 (R-7/10/13)
Checked By: HO	Revision: 1		



Upcoming Activities



- **Status update: Bilateral agreements**
- **Sampling update: Pending search for 1,4-Dioxane**



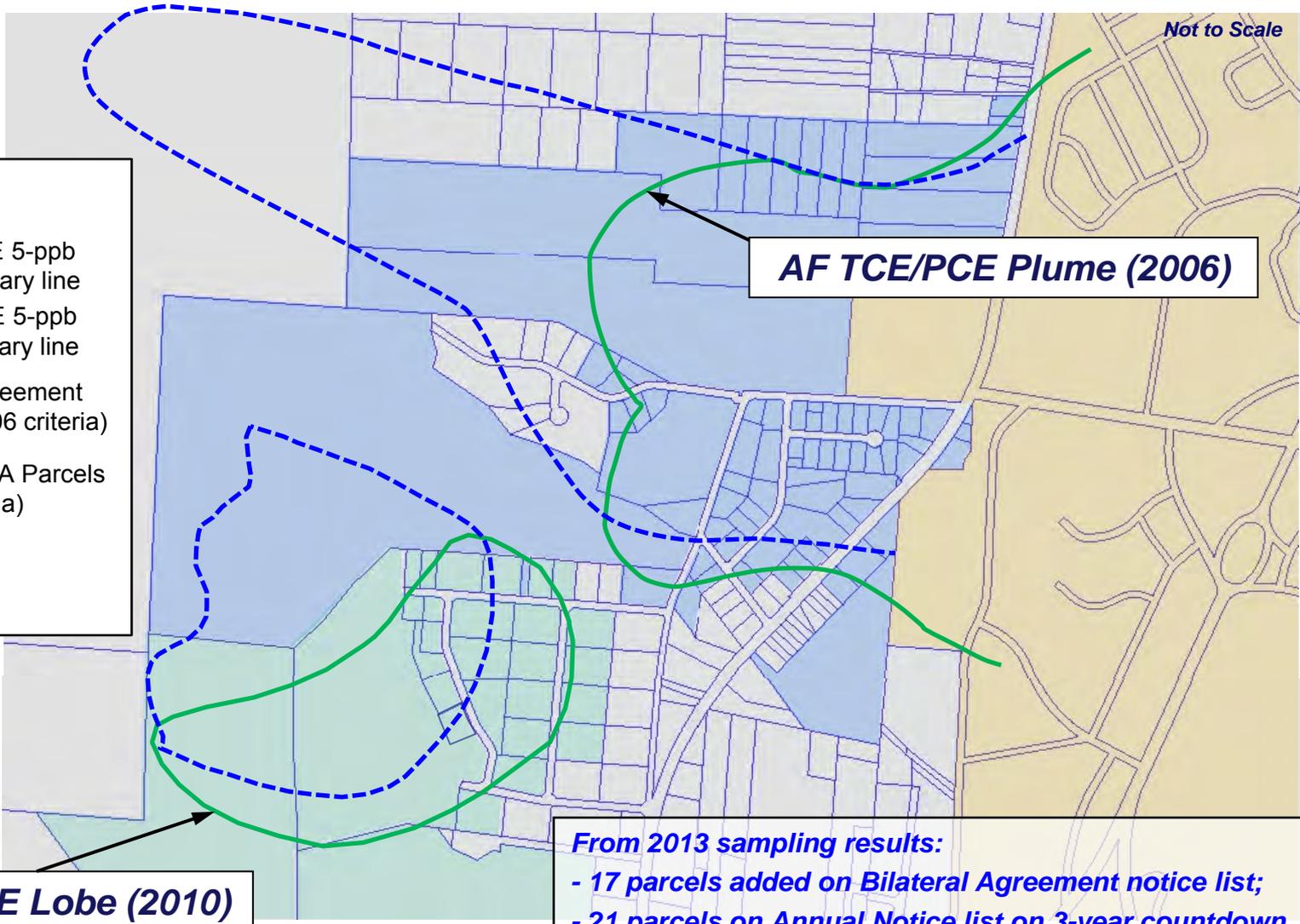
Bilateral Agreements



- **DHEC approved implementation plan, Feb 2009**
- **Between AF and affected landowner**
 - AF seeks **voluntary** agreement to file deed notice
- **States that landowner is aware of groundwater contamination nearly 150 ft below his/her property**
 - Per SC Law, owner provide written disclosure to purchaser
 - Once safe levels reached, agreement will be cancelled
- **Using five parts per billion maximum contaminant level as threshold**
- **Agreement cancellation criteria**
 - Three consecutive annual sampling events below threshold



Bilateral Agreement Implementation – Status Update





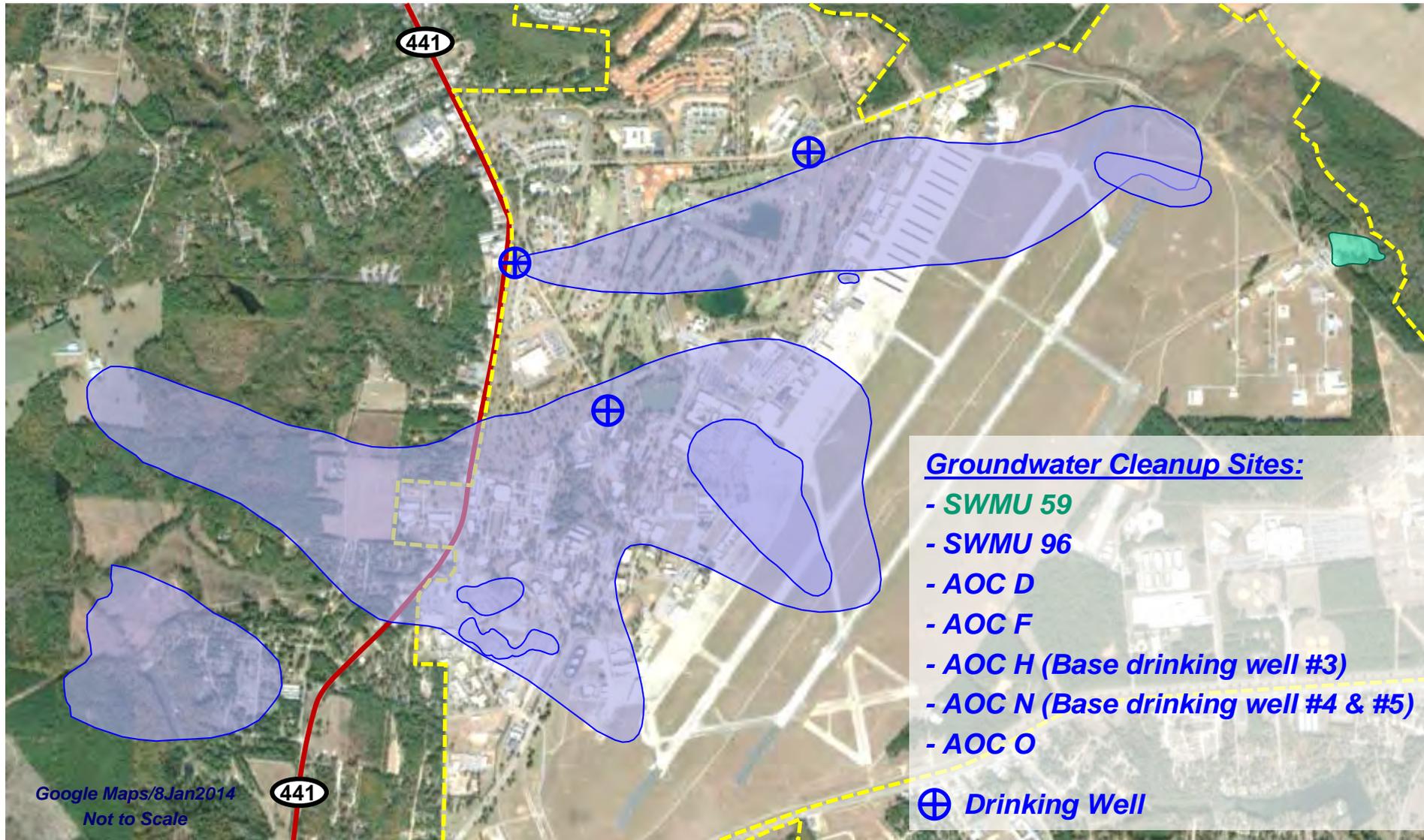
1,4-Dioxane Sampling



- **In Air Force, 1-4 Dioxane used as stabilizer for certain solvents**
 - Also found in certain commercial products (surface finishes, deodorants/shampoos/cosmetics, antifreeze)
- **Air Force requiring at all bases with existing solvent-related contamination**
 - AF published interim policy and guidance, Aug 2013
- **Shaw and SCDHEC working together to agree on sampling locations**
- **No evidence here yet**
- **Will update public as results become known**



Proposed Dioxane Sampling Sites





Intermission



- **10 Minutes**
 - Please turn in question cards



Questions & Answers



Closing Remarks



- **Inputs from Board Members**
- **Action items**
- **Questions? Contact Shaw AFB Public Affairs**
 - (803) 895-2019
 - <http://www.shaw.af.mil/library/restorationadvisoryboard.asp>
- **Administrative Records/Information Repository**
 - Contact Shaw AFB Freedom of Information Act Manager, (803) 895-1630
 - <http://www.shaw.af.mil/library/foia.asp>
- **Next meeting**
 - [Approximately August 2014](#)



Attachment 2
Questions from the Restoration Advisory Board (RAB), 24 February 2014

(Questions and answers were paraphrased for clarity.)*

1. When did the sites become contaminated? Today or years ago?

These sites were contaminated before the 1970s when standards were not as strict and are classified as legacy sites. In the late 1970s and early 1980s, Resource Conservation and Recovery Act, Comprehensive Environmental Response, Compensation, and Liability Act, and various other environmental laws were passed. These laws provide the standards on how to clean up the environment.

2. Is the site located under the runway in the shallow aquifer moving?

There is some movement in the shallow aquifer in that area, as the clay layer that divides the shallow and deep aquifers pinches down allowing communication between the two aquifers. This is main reason why hot spot treatments are being conducted at these remnant sources to prevent them from further feeding the down gradient plumes.

3. Has the off-base TCE/PCE plume improved in the past six months or is it stable?

The figures shown may not give the appearance or visual perspective but the pump and treat system which began operation in late 1997 has since removed a few thousand pounds of the contaminants and it continues to do so. With the expansion of the pump and treat system, and adding injection wells, there should be more improvement within the next few years. If the system is left as is, it will take 180 years to clean up the contamination; however, with the expansion of the system, it is estimated to be reduced down to 45 years.

4. Do you have enough data regarding the shallow aquifer systems once it begins operations?

The contractor previously completed a pilot study of the technology being used and it proved to be effective in reducing contamination. Since the systems just started, it will take time to see results. Sampling data will be collected and compared over the next year or so to verify systems' effectiveness.

5. Does a very heavy rain speed up the clean up process?

It depends, if you have residual soil contamination, which Shaw does not, it can feed the groundwater contamination. It also depends upon how much infiltration that you get; the base has many areas where the rainwater does not permeate and reach the groundwater. A lot of the rainwater does not make it into the aquifer. Because of the many different variables, there is no good answer to this question. That is why the contractor proposed to install injection wells to inject the clean water back into the contaminated groundwater. When the clean water is injected back into the groundwater, this process will accelerate the speed of the contaminated water to reach the next extraction well moving to the treatment system.

6. How clean is the water in the sewer system that flows to the Wateree River?

The contaminated water that is processed through the pump and treat system is potable water. But since it is being discharged into the sewer system, it is included in Shaw's National Pollutant Discharge Elimination System permit, which is required by the State if one discharges to any river or surface water. There are specific standards the water must meet, not just safe from contaminants, but also from biological factors before the water is discharged. For the pump & treat system's clean water byproduct, it is tested at the permitted outfall before it is discharged through the Shaw main sewer lines that eventually empty into the Wateree River.

7. How many gallons of water are being extracted?

Currently, Shaw AFB is extracting about 500 gallons a minute and this water is being discharged into the Wateree River. Once the new treatment system begins operation, it will extract 1,200 gallons per minute.

700 gallons will be injected back into the groundwater as part of the treatment process, while 500 gallons will be discharged to the Wateree River.

8. What year was the first letters mailed out regarding the possibility of contamination?

In 2006, letters were mailed to residents regarding the possibility of contamination. In addition, an extensive private well survey was conducted to determine the residents' drinking water sources. Most residents were on High Hills Rural Water Company, except for two residents who have active wells. The Air Force installed water filter systems for the two residents and are monitoring their water monthly.