

Air Force Installation & Mission Support Center



Wurtsmith Restoration Advisory Board Meeting

Steven Willis

AFCEC/CIBC

15 February 2023

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Classification



The classification of the brief is unclassified



Agenda



- **Welcome, introductions, and ground rules**
- **Stakeholder and Restoration Advisory Board (RAB) member updates**
- **RAB business update**
- **BRAC Environmental Construction and Optimization Services (BECOS) update**
- **Vapor Intrusion (VI)/Remedial Investigation (RI) update**
- **Interim Remedial Action (IRA) update**
- **Schedule**
- **RAB member questions**
- **Public comment**
- **Conclusion – RAB Co-Chairs' closing remarks**

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Restoration Advisory Board Rules



01	Respect one another and maintain an atmosphere of open dialogue and exchange of ideas
02	Use our time together efficiently, wisely and respectfully
03	Speak clearly and succinctly one person at a time; avoid interrupting others
04	Listen and remain open to different points of view
05	Maintain a propensity for progress: prepare, discuss, document and move forward
06	Share information early, openly and honestly
07	Accurately and objectively relay to others the discussions that occur at board meetings

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Checklist for Virtual Participation



- ✓ If you prefer to join audio by phone, please dial the call-in number and enter the access code to enter the meeting
- ✓ RAB Members – mute when not speaking
- ✓ Use “raise hand” to raise your hand
- ✓ RAB Coordinator will unmute your mic when it’s your turn to speak
- ✓ To enable closed captions for language support, click “more” – “language and speech” – “turn on live captions”
- ✓ Use Q&A tab for questions
- ✓ Contact the RAB Coordinator with access questions amy.rauser@wsp.com



Acronyms



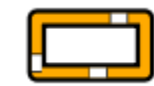
AAA	Alert Aircraft Area	OAQ	outdoor air quality
AFB	Air Force Base	OMM	operation, maintenance and monitoring
AFCEC	Air Force Civil Engineer Center	O&M	operation & maintenance
AFFF	aqueous film forming foam	PA	preliminary assessment
AOI	area of interest	PFAS	per-and polyfluoroalkyl substances
AOPC	area of potential concern	PFOA	perfluorooctanoic acid
BECOS	BRAC Environmental Construction and Optimization Services	PFOS	perfluorooctane sulfonate
BRAC	Base Realignment and Closure	PP	proposed plan
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	PSG	passive soil gas
CSM	conceptual site model	PW	purging well
CTS	Central Treatment System	P&T	pump and treat
DOD	Department of Defense	RA	remedial action
DERP	Defense Environmental Restoration Program	RAB	restoration advisory board
DRMO	Defensive Reutilization Marketing Office	RAO	remedial action objective
EGLE	Michigan Dept of Environment, Great Lakes, and Energy	RA-O	remedial action operation
FS	feasibility study	RD	remedial design
GAC	granular activated carbon	RI	remedial investigation
gpm	gallons per minute	ROD	record of decision
IAQ	indoor air quality	SI	site inspection
IAB	in-situ anaerobic biodegradation	SRD	substantive requirements document
IRA	interim remedial action	UFP-QAPP	Uniform Federal Policy-Quality Assurance Project Plan
IRP	installation restoration program	USACE	U.S. Army Corps of Engineers
LTM	long-term management	VI	vapor intrusion
LUC	land use controls	VOC	volatile organic compounds
MPTS	Mission Street Pump and Treat System	VP	vapor pin
		WWTP	wastewater treatment plant

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Site Map



 Former Installation Boundary

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Stakeholder Updates

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Air Force Update



- **Air Force hosted in-person technical session 14 February 2023**
 - **Free form discussion of the wastewater treatment plant and Clark's Marsh area**

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Stakeholder Updates



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RAB Business

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- **Action item list distributed to RAB prior to meeting**
- **Action item review**
 - **Closed action items since last RAB meeting: 72, 98, and 103**
 - **New action items since last RAB meeting: 105 and 106**
 - **Ongoing action items: 87, 88, 92, 96, 99, 100, 101, 102, and 104**



Presentation:



Base Realignment and Closure
(BRAC) Environmental Construction
and Optimization Services (BECOS) –
Year 2

Jay Mullett
WSP (formerly Wood)
Project Manager

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BECOS Highlights



■ BECOS Highlights

- Wurtsmith performance objectives range from Remedial Action-Operation (RA-O) and Long-Term Management (LTM) in 2022
- Annual sampling completed August through September 2022
 - 148 Monitoring Wells sampled
 - 23 Purge Wells sampled
 - 2 methane gas sampling points
- Land Use Controls (LUC) Inspections/Interviews completed October/November 2022
- Annual groundwater gauging event completed October 2022
 - 453 monitoring wells gauged, Van Etten Lake Dam and Clark's Marsh
- Quarterly IRA sampling and gauging completed October through December 2022
 - 112 Monitoring Wells sampled (Oct-Nov), 18 Purge wells (Dec)
 - 157 Monitoring Wells gauged (Nov)

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BECOS Highlights



■ BECOS Highlights Continued

- Van Etten Lake at Ken Ratliff Memorial Park IRA (CTS2) and associated well field brought online on 17 October 2022 (Operation & Maintenance [O&M] transitioned to BECOS after 90 day prove-out)
 - CTS2 treatment system includes 12 new purge wells, CA-WUREW001 through CA-WUREW012
 - The 12 additional purge wells are treated through a new Granular Activated Carbon (GAC) treatment train located at the Central Treatment System (CTS) system building
- FT002 at Clark's Marsh IRA System Expansion brought online on 16 August 2022 (O&M transitioned to BECOS after 90 day prove out)
 - FT002 system was expanded to include 6 additional purge wells, FT02-PW8 through FT02-PW13
 - Additional sacrificial GAC treatment was added to the FT002 system to treat the increased flow and remove solids to extend changeout frequency of existing GAC vessels
 - Biocide treatment added to treatment train to reduce biofouling within the sacrificial GAC vessels

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BECOS Highlights



■ Operation, Maintenance and Monitoring (OMM) of five (5) Pump and Treat (P&T) systems

■ FT002

- FT002 IRA expanded treatment train and purge wells operational on 08/16/22
- Continuous P&T system operation (**130+ million** [M] gallons treated in 2022)
- **0 Days discharged perfluorooctane sulfonate/perfluorooctanoic acid over the substantive requirements document (SRD) limits**
- Monthly/weekly sampling in accordance with the SRDs
- GAC changeouts conducted in March, June and October
- Biocide monitoring daily – effluent total residual chlorine non-detect
- Air sparge system operated three times per week
- Optimization and additional non-routine maintenance to increase flows/uptime
 - Purge well pump cleaning/replacement
 - Compressed air application to purge well lines to increase individual PWs
 - Installation of influent bypass line to limit downtime during IRA system install



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BECOS Highlights



- **OMM of five (5) P&T systems (cont.)**
 - CTS1
 - Continuous P&T system operation (**121M+** gallons treated in 2022)
 - Monthly/weekly sampling in accordance with the SRDs
 - **0 Days discharged PFOS/PFOA over the SRD limits**
 - GAC Changeout conducted in Nov 2022
 - Optimization and additional non-routine maintenance to increase flows & uptime
 - Purge well pump cleaning/replacement
 - Quarterly line jetting on all BZ-PW's conveyance lines to increase extraction rates on the BZ-PWs
 - Purge well AS-PW5 cleaning to increase extraction rate



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BECOS Highlights



■ OMM of five (5) P&T systems (cont.)

■ CTS2

- CTS2 treatment system and associated purge wells began operation 17 October 2022
 - Continuous P&T system operation (**48M+** gallons treated in 2022)
 - Weekly/biweekly sampling in accordance with the IRA Work Plan
 - **0 Days discharged PFOS/PFOA over CTS1 SRD limits**
- ### ■ Optimization and additional non-routine maintenance to increase flows & uptime
- System startup and extraction well flow rate balancing to meet overall target flow
 - Currently optimizing system components during 90 day prove out period



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BECOS Highlights



- **OMM of five (5) P&T systems (cont.)**
 - Mission Street Pump and Treat System (MPTS)
 - Continuous P&T system operation (**88M+** gallons treated in 2022)
 - Monthly/weekly sampling in accordance with the SRDs
 - **0 Days discharged PFOS/PFOA over the SRD limits**
 - Resin Changeouts conducted in Feb and Nov 2022
 - Optimization and additional non-routine maintenance to increase flows & uptime
 - Purge well pump cleaning/replacement
 - UV light and lamp replacements



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BECOS Highlights



■ OMM of five (5) P&T systems (cont.)

■ LF030/31

- Continuous P&T system operation (**116M+** gallons treated in 2022)
- Monthly sampling in accordance with the O&M Manual

■ Optimization and additional non-routine maintenance to increase flows & uptime

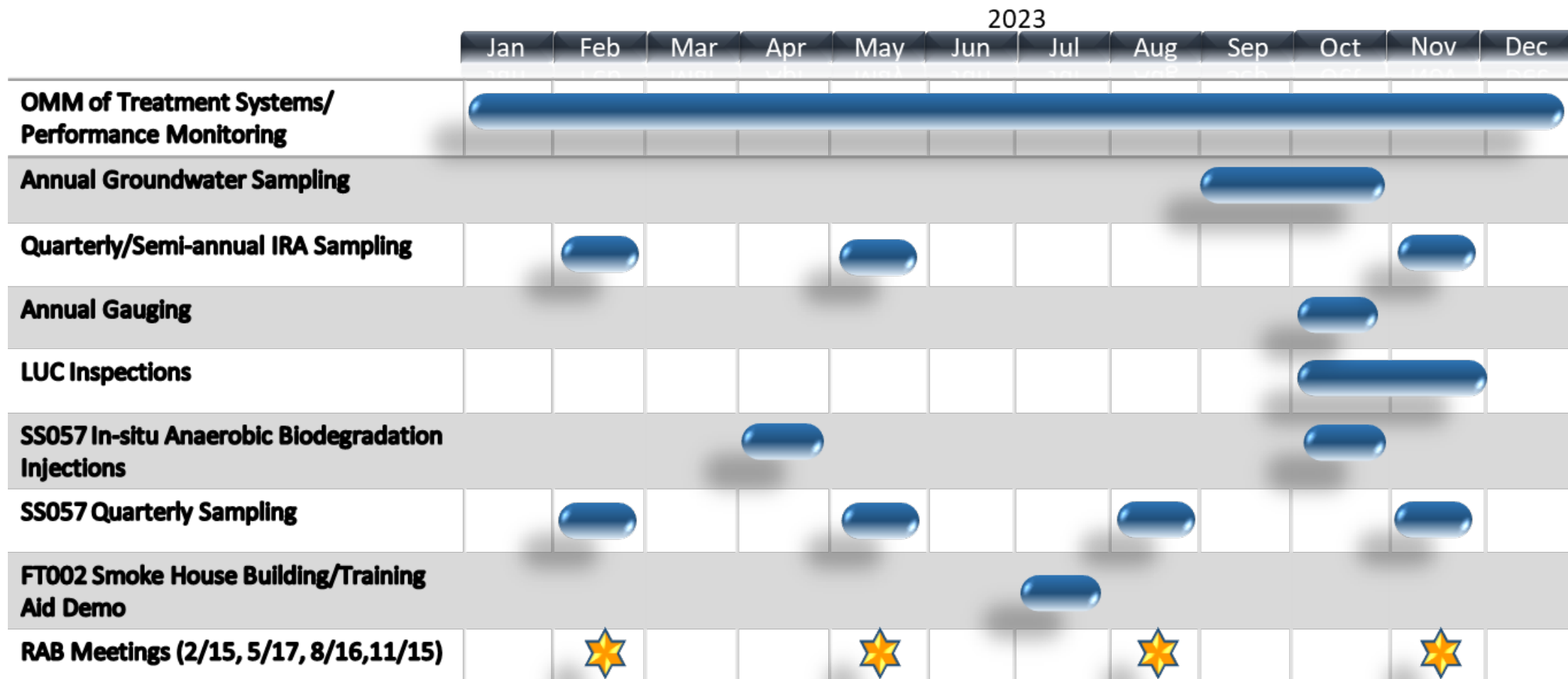
- Purge well pump cleaning/replacement
- Vegetation (phragmites) and animal control (muskrat) actions performed to maintain ponds
- Excavate sediments and pea stone covering influent and effluent piping of Pond #4 and effluent piping of Pond #3 to clear blockages
- Compressed air application to extraction wells to increase flow rates
- Air scoured purging well (PW) lines for increased flow



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RA-O/LTM Fieldwork Timeline



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Presentation:



Vapor Intrusion Remedial
Investigation Addendum,
Feasibility Study, Proposed Plan
and Record of Decision

Celeste Holtz
BB&E
Project Manager



Presentation Outline



- **Federal response to hazardous waste sites**
- **The Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) Process**
- **Former Wurtsmith AFB – Vapor Intrusion (VI) Investigative Process**
- **What is Vapor Intrusion?**
- **Resources for Additional Information on VI**
- **Sites included in the contract**
- **Remedial Investigation (RI) Addendum for VI at the Former Wurtsmith AFB**
 - *Sampling and analysis methods*
 - *Next Steps after RI Addendum*
 - *Overview of Project Timeline*
- **Questions and Contact Information**

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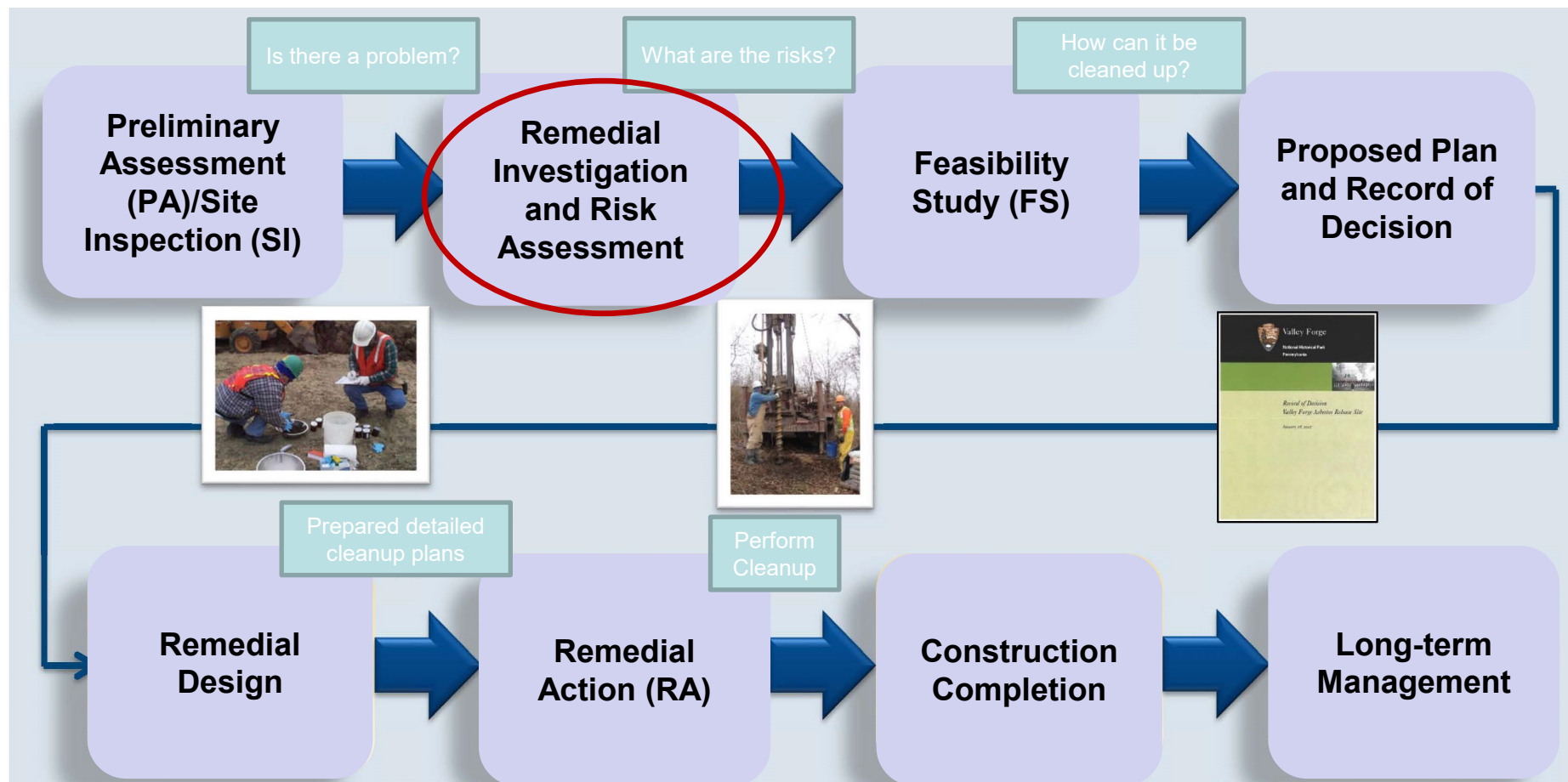
Federal Response to Hazardous Waste Sites



- **Comprehensive Environmental Response, Compensation and Liability Act of 1980**
 - Provides broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.
 - The DOD conducts environmental restoration activities in accordance with CERCLA.
 - Activities are conducted under the Defense Environmental Restoration Program (DERP).



The CERCLA Process



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Former WAFB – VI Investigative Process



1. Preliminary Assessment

- Review historical site information

2. Site Inspection

- Does the site pose a threat?
- Sample environmental media

3. Remedial Investigation

- Evaluate nature and extent of contamination
- Assess risks to human health and the environment

4. Feasibility Study

- Evaluate potential remedies

5. Proposed Plan and Record of Decision

- PP with Public Comment Period
- Decision Document for remedy

6. Remedial Design

- Cleanup plan development
- Engineering and design

7. Remedial Action

- Construction/Construction Completion
- Removal
- Operation

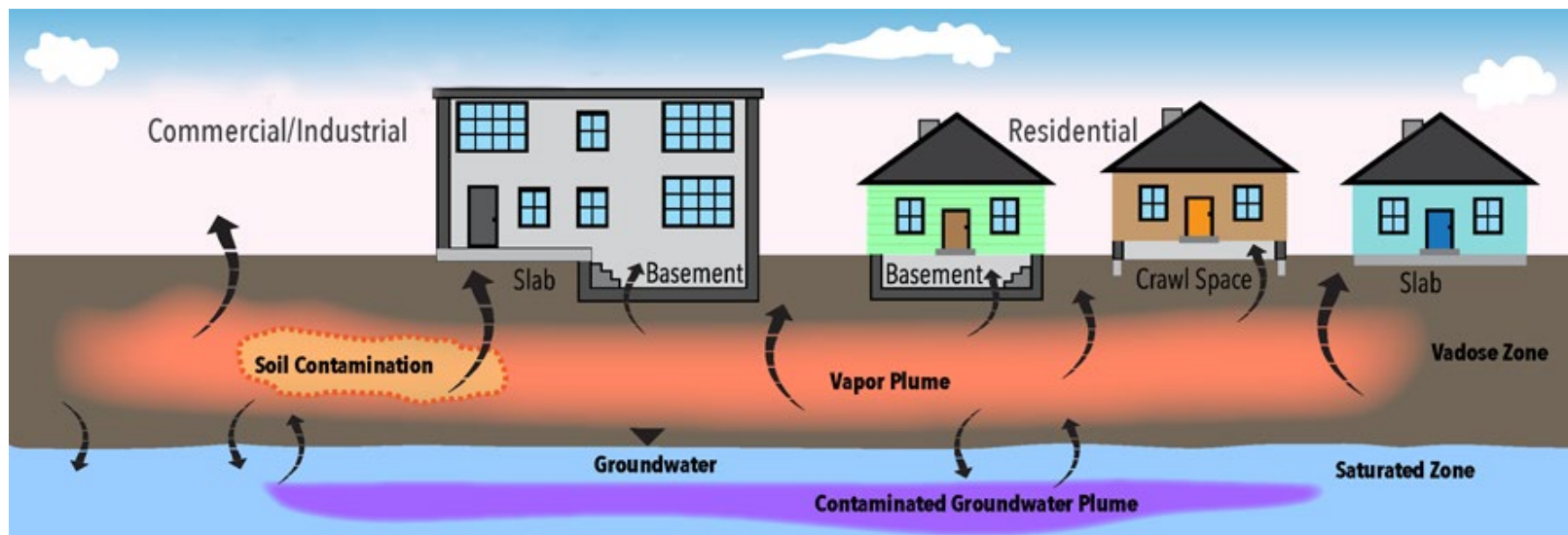
8. Long-term Management

- Confirmation sampling
- Natural attenuation
- Five-Year Reviews
- Site redevelopment

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What is Vapor Intrusion?

- VI is the process of vapors migrating from volatile organic compounds (VOCs) in soil and/or groundwater through subsurface soils and/or preferential pathways (such as underground utilities) and impacting the indoor air quality of any overlying buildings.
- VI is considered an emerging pathway – i.e., what we know about VI has been increasing in recent years, and potential risks are better understood today.



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What is Vapor Intrusion? (cont.)

- Many factors affect vapor intrusion (Building construction, foundations, soil types, depth to groundwater, presence of pipes/underground utilities, etc.).
- VI Investigation Process:
 1. A contaminant known to volatilize is released to the environment and there are buildings/structures nearby which have the potential to accumulate vapors.
 2. Samples are collected to characterize soil, groundwater, and soil gas/vapor—typically from the exterior of buildings first.
 3. Buildings/structures within the area of concern may then be tested by sampling the sub-slab vapor, followed by indoor air/outdoor air.
 4. If testing finds vapor intrusion is a problem, a mitigation system may be installed.



Example sub-slab Vapor Pin (VP)



Resources for Additional Information on VI



- [Department of Defense January 2009 Vapor Intrusion \(VI\) Handbook](#)
- [EGLE YouTube Video - What is Vapor Intrusion?](#)
- [EGLE Flyer - What is Vapor Intrusion and How is it Investigated?](#)
- [EGLE Vapor Intrusion Guidance Document](#)
- [United States Environmental Protection Agency \(USEPA\) - What is VI?](#)
- [Interstate Technology Regulatory Council \(ITRC\) Vapor Intrusion](#)

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Sites Included in Contract



(25) Areas of Potential Concern (AOPCs) were investigated during previous VI RI; (6) new Areas of Interest (AOIs) were not investigated previously but have been included in the contract at the request of EGLE.




Site ID	Site Name	Site ID	Site Name
LF023	Landfill, Southeast of POL Bulk Storage Area	OT016	Jet Engine Test Cell Building 5098
LF026	Landfill, south of center of SAC Instrument Runway	OT024	Three Pipes Drainage Ditch
LF027	Landfill, east of Alert Apron	SS005	TCE Spill SW of SAC Alert Apron
SS017	Fuel Spill Near Building 25	SS006	Fuel Spill, POL Bulk Storage Area
OT049	EOD Range	SS008	TCE/Fuel Spill, SAC Nose Doc/Apron
SR408	Bombing and Strafing Area	SS021	TCE Spill Northeast of Building 43
SS051	KC-135 Crash Site	SS047	Base Gas Station
SS057	Old Apron Hydrant Fuel System	SS072	PCE Plume Discharging to Clark's Marsh
SS071	Building 5098 Drain Field	WP004	Inactive WWTP Sludge Drying Beds
ST068	OWS, Facility 5067	ST067	AOI Vehicle Refueling Shop, B. 393
ST069	TCE Plume at DRMO	N/A	AOI Vehicle Maintenance Shop, B. 394
WP070	Sand-Fill Storage and Borrow	N/A	AOI Vehicle Parking, B. 396
XE404	Weapons Storage Area	N/A	AOI Benzene Plant, B. 397
XU402	Former Grenade Range	N/A	AOI Fueling Station, B. 7297
FT002	Fire Training Area	N/A	AOI Auto Hobby Shop, B. 388
LF030/031	Landfill, Northern Area		

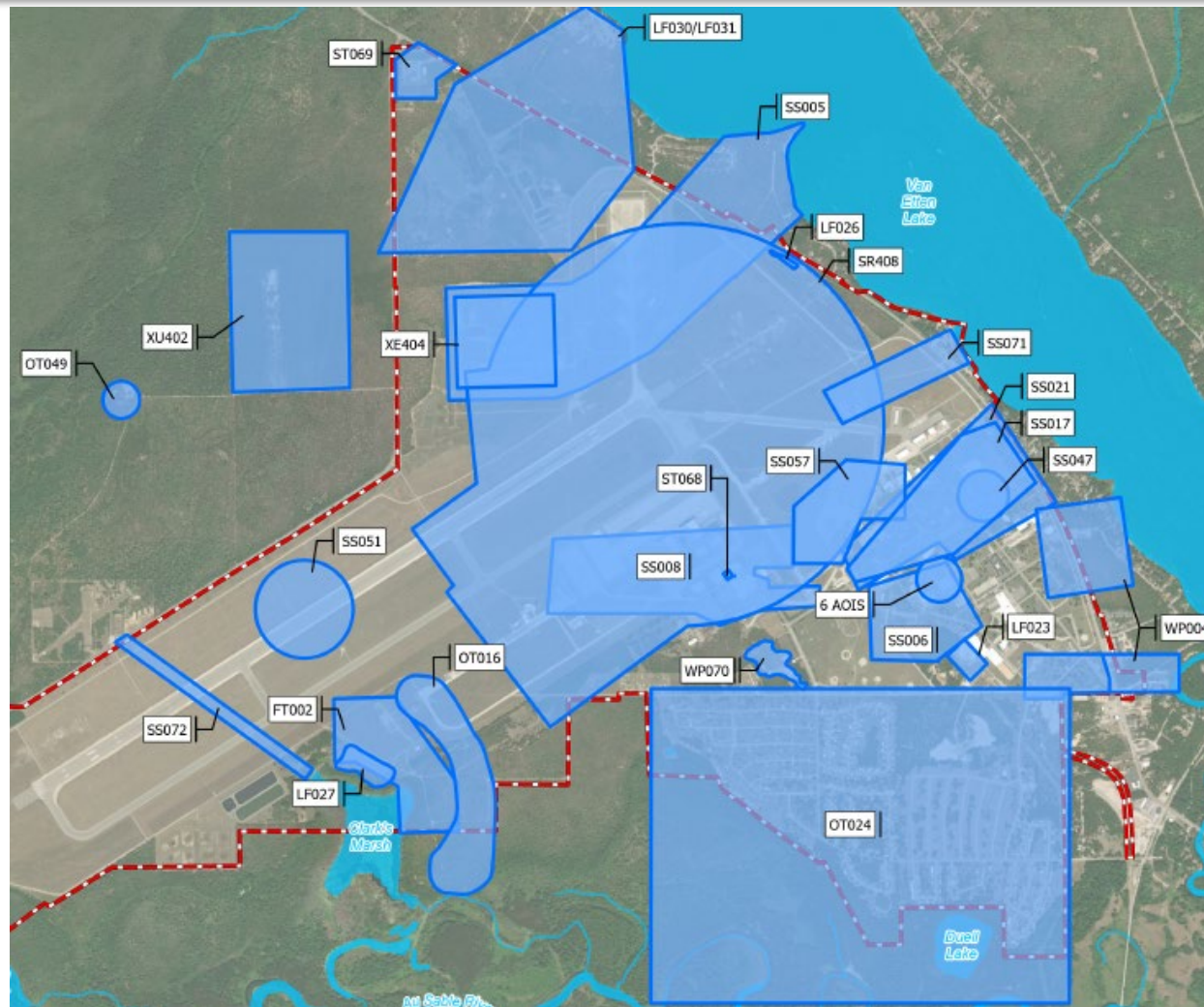
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Areas of Potential Concern

Legend

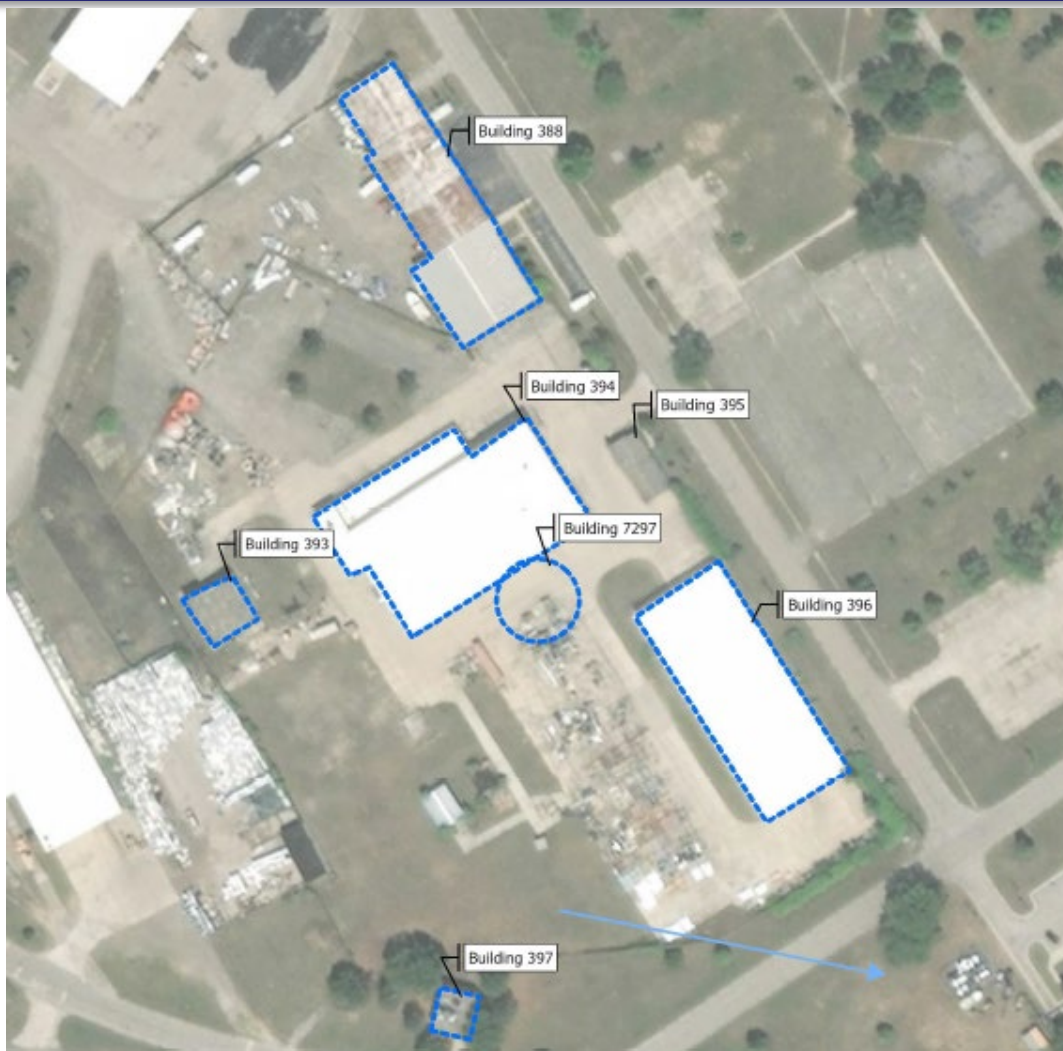
-  Former Wurtsmith Air Force Base Installation Boundary
-  Surface Water
-  Approximate IRP Site Boundaries



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Areas of Interest



Legend

→ Estimated 2021 Groundwater Flow Direction (Aerostar, 2022)

Area of Interest

Notes:

Building 7297 was included in the contract but the building is no longer present.

Groundwater Flow Direction source: Aerostar, 2022. Uniform Federal Policy-Quality Assurance Project Plan, Remedial Investigation. Final. February.

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VI RI Addendum at the Former Wurtsmith AFB



■ **Conceptual Site Models (CSMs)**

- Information includes:
 - Ownership, occupancy, and land use history
 - Site features
 - Environmental setting (climate, topography, geology, etc.).
- First developed during PA/SI and refined during the RI process.
- Identify sources (spills, underground storage tanks, etc.) of VOCs (trichloroethylene, vinyl chloride, etc.)
- Identify migration pathways (groundwater, utilities)
- Identify receptors (humans – residential and non-residential)

■ **Investigative Procedures for RI Addendum**

- Collect data at AOPCs/AOIs
- Environmental sampling in a phased approach:
 - **Phase 1** - Passive Soil Gas (PSG) Samples
 - **Phase 2** - Soil and Groundwater
 - **Phase 3A** - Soil Gas Wells (exterior), Sub-slab Vapor Pins (Interior), and Indoor Air Quality (IAQ)/Outdoor Air Quality (OAQ) Samples, if warranted
 - **Phase 3B** – Additional soil Gas Wells (exterior), Sub-slab Vapor Pins (Interior), and IAQ/OAQ Samples, if warranted as step-out locations.

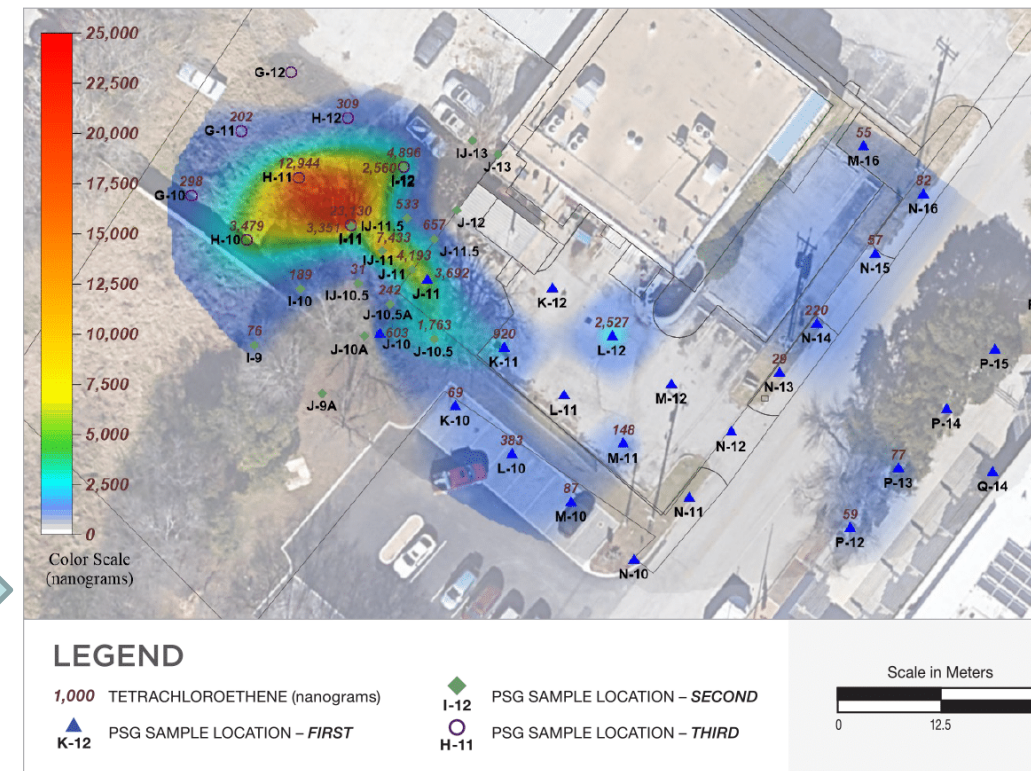


VI RI Addendum Sampling and Analysis Methods



Phase 1 – Passive Soil Gas Samples

1. Collection of PSG samples from the shallow subsurface with samples analyzed for VOCs (one-time sampling event).



Example Color Isopleth Map (not Wurtsmith AFB)



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VI RI Addendum Sampling and Analysis Methods (cont.)



Phase 2 - Soil and Groundwater

1. Surface and subsurface soil sampling for VOC analysis using Direct Push Technology.
2. Installation of temporary wells for collection of groundwater samples for VOC analysis.
3. Soil borings/temporary wells will be co-located (one-time sampling event).



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Phase 3A and 3B – Soil Gas Well, Sub-Slab Vapor Pin, and IAQ/OAQ Sampling, if warranted

1. Phase 3A: One year (four quarterly events) of soil gas well/sub-slab vapor pin (VP) sampling, and IAQ/OAQ sampling, if warranted.
2. Phase 3B: One year (four quarterly events) of soil gas well/sub-slab VP sampling, and IAQ/OAQ sampling, if warranted, at “step-out” locations as needed.

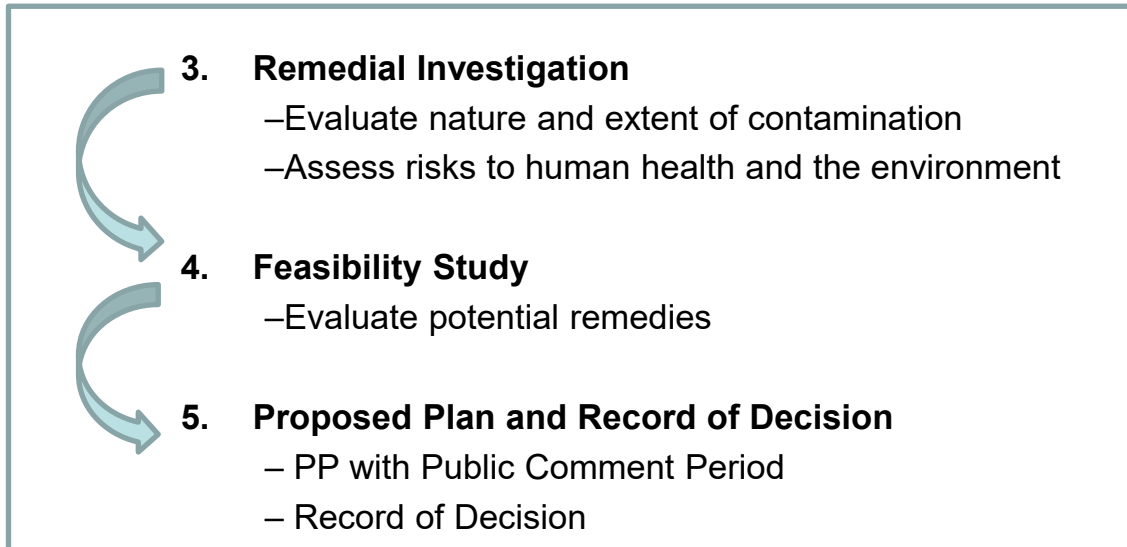




Next Steps after VI/RI Addendum



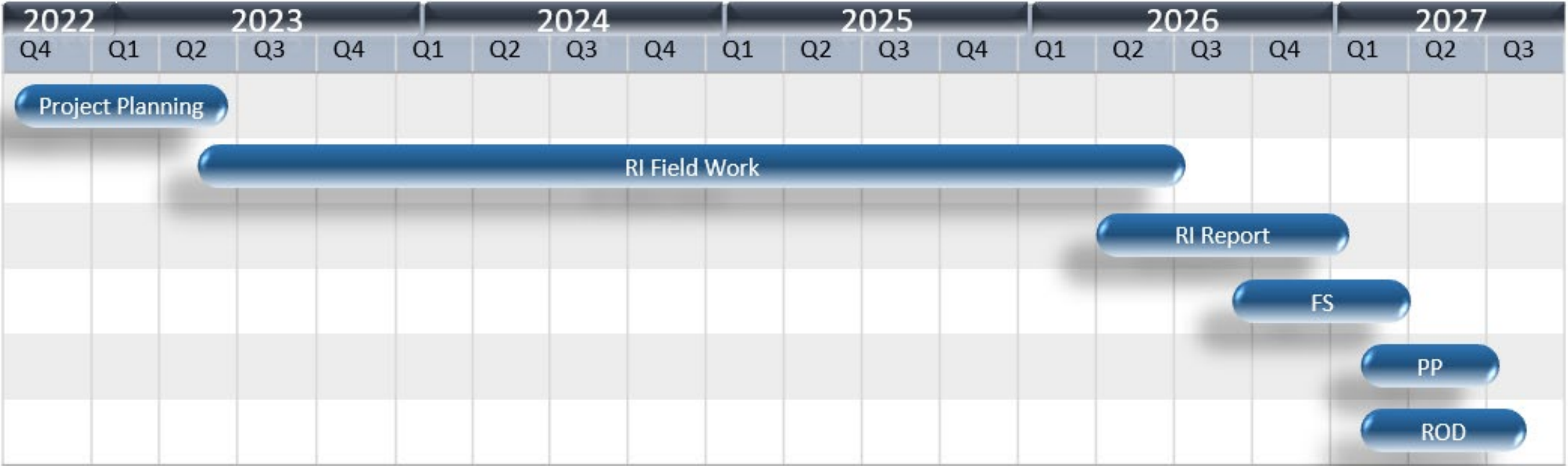
- 1. Following field activities, results will be documented in a VI RI Addendum Report.**
- 2. After achieving concurrence on the VI RI Addendum Report, a Feasibility Study will be completed for those sites found to have unacceptable risk during the RA.**
- 3. Final PPs and RODs will be prepared for all sites – (1) PP and (1) ROD for all No Further Action sites and (1) PP and (1) ROD for remaining sites.**



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Overview of VI/RI/FS/PP/ROD Project Timeline



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Questions and Contact Information



AFCEC

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Presentation:

Remedial Investigation and Interim Remedial Action Update

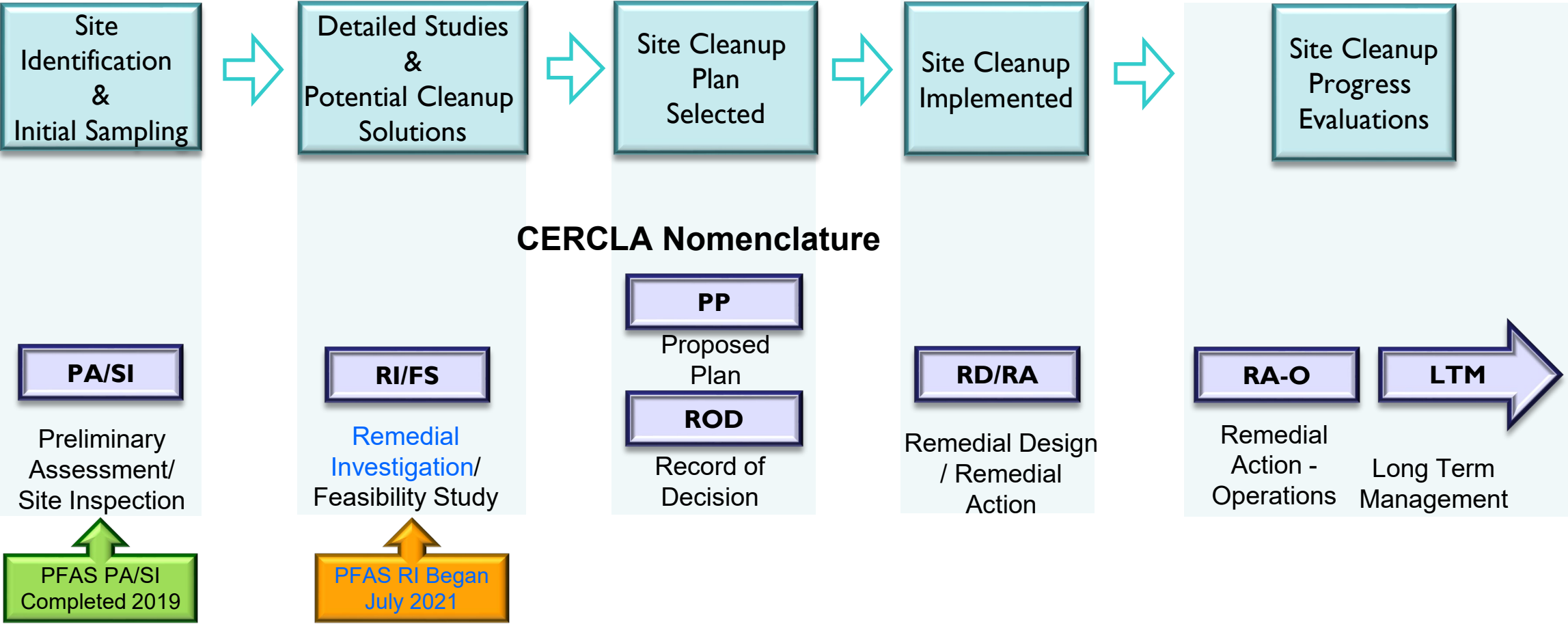


Paula Bond
Aerostar SES LLC
Project Manager

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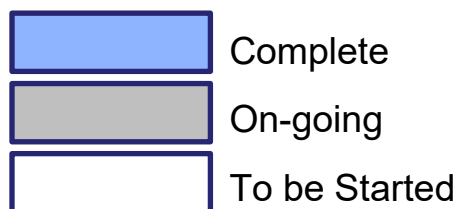
CERCLA Overview



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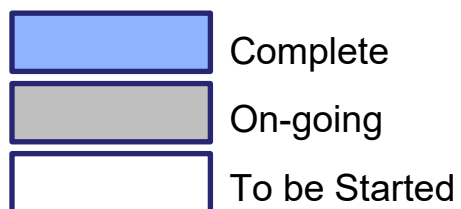
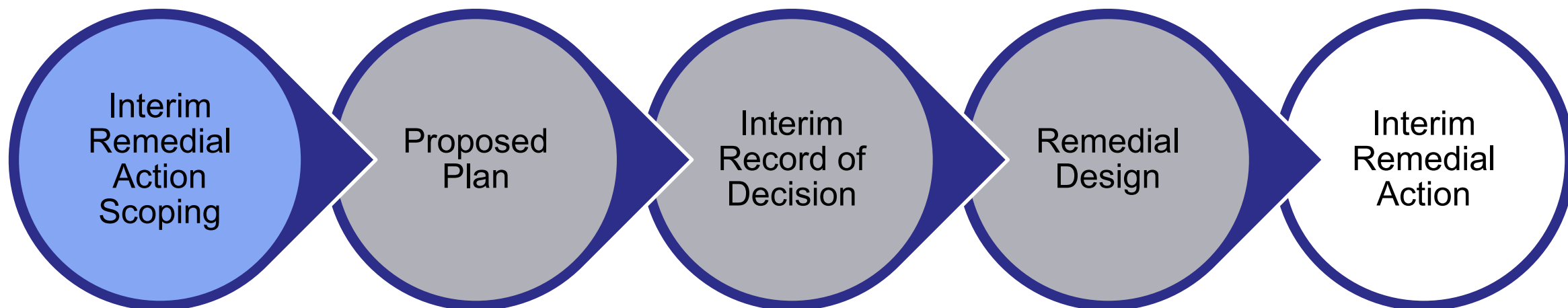
Per-and polyfluoroalkyl substances (PFAS) RI Progress



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PFAS Aircraft Alert Area IRA Progress



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PFAS RI Update



- **No new RI data has been collected since the last RAB.**
- **A Strategic Project Planning meeting was held between Air Force and EGLE on 6 and 7 December to review the RI data collected and develop the field investigation for 2023.**
- **Under new Air Force guidance, we will be using the lower of the EPA Regional Screening Levels and the EGLE Rule 299.44 generic groundwater cleanup criteria for plume delineation.**
- **Groundwater plume maps have been revised based on the guidance**



PFAS RI Update



Analyte	Abbreviation	EGLE Rule 299.44 generic groundwater cleanup criteria	EPA RSL (ng/L)	New RI Delineation Criteria
Perfluorooctanoic acid	PFOA	8	6	6
Perfluorononanoic acid	PFNA	6	6	6
Perfluorobutane sulfonic acid	PFBS	420	601	420
Perfluorohexane sulfonic acid	PFHxS	51	39	39
Perfluorooctane sulfonate	PFOS	16	4	4

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IRA Alert Aircraft Area



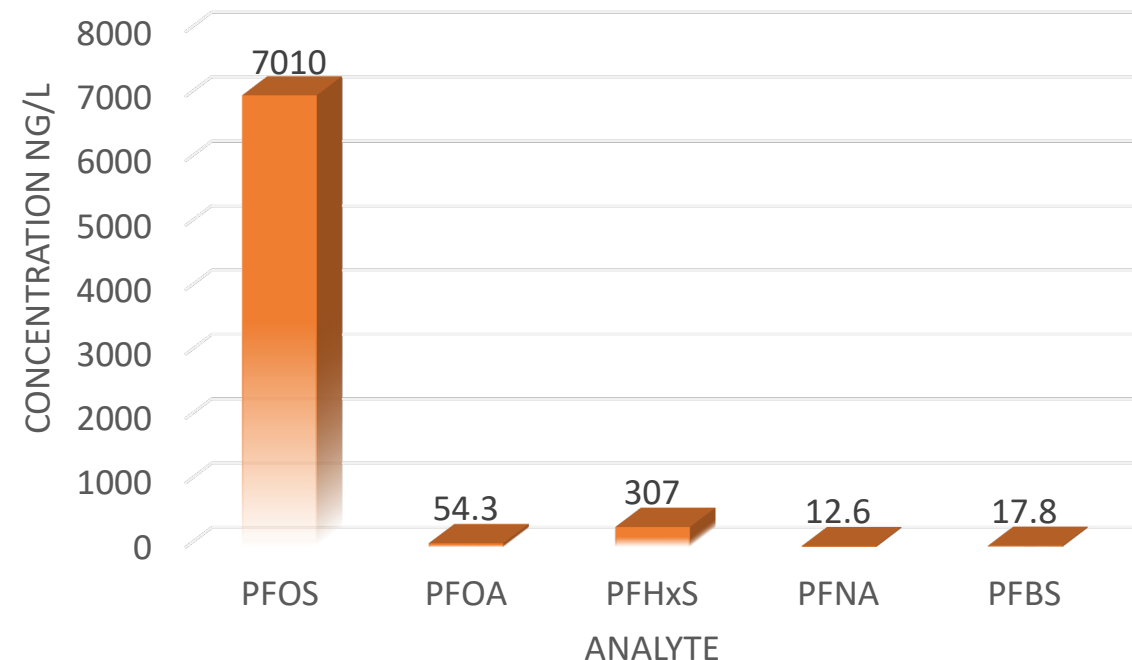
■ Background

- Contaminated groundwater is migrating toward Van Etten Lake
- RI data collection is ongoing for the Alert Aircraft Area

■ Purpose

- To hydraulically control the highest concentrations of PFOS, PFOA, PFHxS, PFNA, and PFBS migrating towards Van Etten Lake using pump and treat with GAC

HIGHEST GROUNDWATER CONCENTRATIONS AT THE ALERT AIRCRAFT AREA





IRA Alert Aircraft Area



- Initial treatment train capacity of up to 500 gpm
- Building design will allow for the expansion of treatment capacity required
- Proposed plant effluent discharge via groundwater infiltration

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IRA Alert Aircraft Area

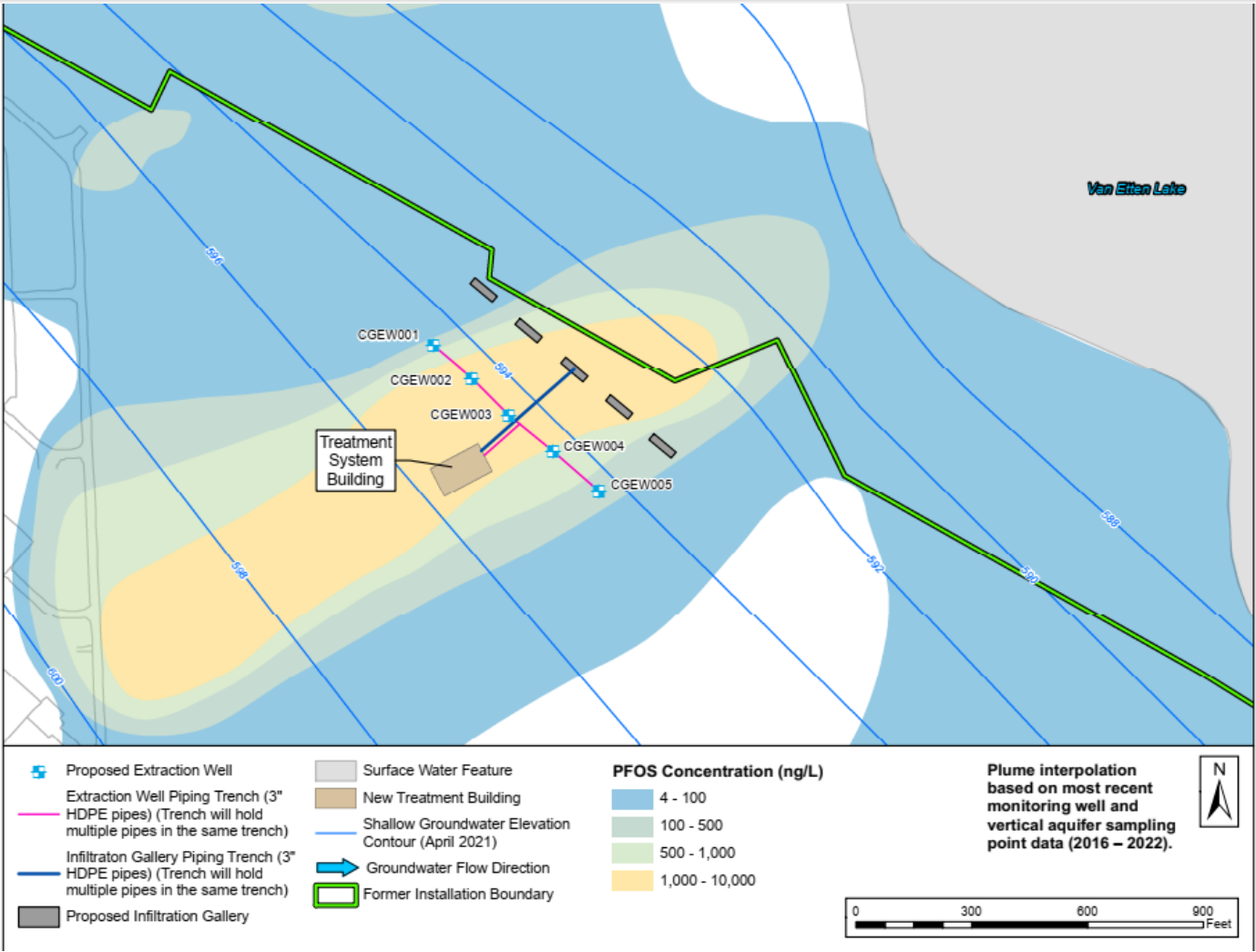


- **New building with a single treatment train capacity of up to 500 gpm with the space to expand future treatment capacity if required (similar to the CTS)**
- **Three-vessel GAC treatment train**
- **Five extraction wells**
- **Extraction well spacing – 150 ft apart**
- **Five infiltration galleries similar to FT002**

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IRA Alert Aircraft Area



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Three Pipes Ditch Pilot Study



■ Purpose

- To evaluate effectiveness of organoclay to sorb PFAS in surface water and groundwater

■ Conceptually the organoclay sorbent technology effectiveness will be evaluated in two approaches

- Sorbent mats to evaluate PFAS removal in groundwater discharging to Three Pipes Ditch
- A flow-through barrier to evaluate PFAS removal in flowing surface water within the ditch



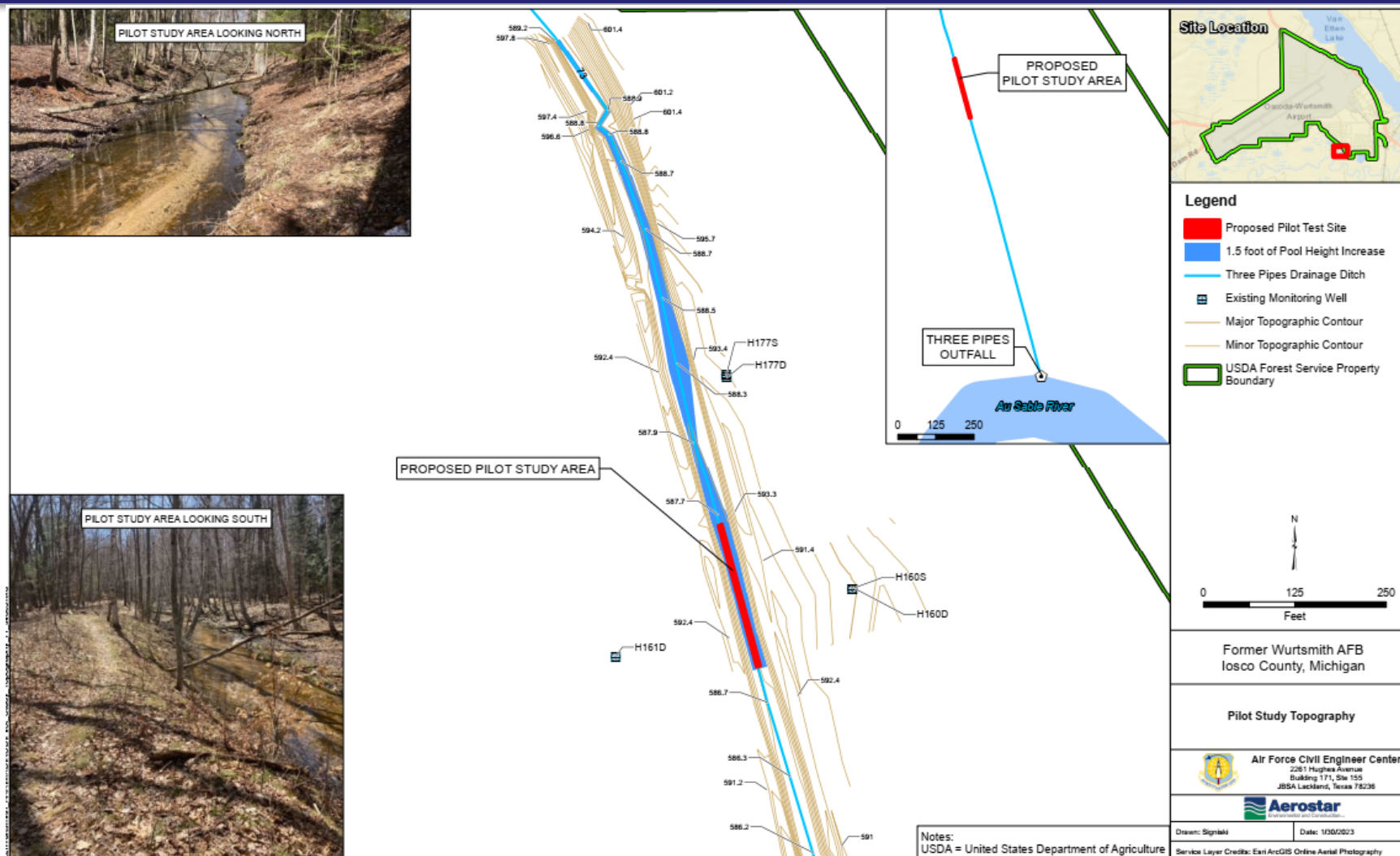
Three Pipes Ditch Pilot Study



- **Flow at Three Pipes Outfall is ~600 gpm under typical dry weather conditions**
- **Geotextile mat with 1/4-inch layer of Fluoro-Sorb® 400 (organoclay) will be placed to address PFAS at the groundwater/surface water interface in the streambed via sorption**
- **Flow-through filtration tubes consisting of a mixture of Fluoro-Sorb® 400 and pea gravel will be placed to on top of the mat to address PFAS in surface water via sorption**



Three Pipes Ditch Pilot Study



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RAB

Member

Questions

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Public Comments

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Public Comment Period



Guidelines

- 01** | **Indicate you want to make a comment (follow guidance)**
- 02** | **Wait until the facilitator states you can start your comment**
- 03** | **Three minute time limit**
- 04** | **RAB members will confer after your comment to see if a follow-up action is needed**

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Conclusion and Adjournment

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