

Fairchild AFB Restoration Advisory Board Meeting

**2 p.m., June 5, 2019
SFCC Falls Gateway; Building 30, Room 107
3410 W. Fort George Wright Dr.
Spokane, WA**

RAB Meeting Agenda

2:00 – 2:05	Welcome Col. Heathman, RAB Installation Co-Chair
2:05 – 2:15	RAB BusinessLiz Drake, RAB Facilitator <ul style="list-style-type: none">▪ Ground Rules for Meeting▪ Approving Previous RAB Meeting Minutes▪ Process for Soliciting for New RAB Members▪ Showing Appreciation to Departing Community Co-chair▪ Selecting a new Community Co-chair
2:15 – 2:30	Five Year Review Update Mark Loucks, Hill AFB
2:30 – 2:45	Update on Sites Managed Under the Performance Based Contract John Olson, Bay West and Sean Bayer, URS
2:45 – 2:55	Break
2:55 – 3:10	Progress report on Residential Water Treatment Systems and Airway Heights Municipal Water Treatment System Beth Flynn, AMEC
3:10 – 3:25	PFOS/PFOA Investigation Update Marc Connally, Fairchild AFB
3:25 – 3:35	Public Comment OpportunityLiz Drake, RAB Facilitator <ul style="list-style-type: none">▪ Process for Addressing Detailed Questions and Comments
3:35 – 3:40	Discuss Date and Agenda Items for Next Meeting Adjournment

**Fairchild Air Force Base
Restoration Advisory Board (RAB) Meeting Minutes
Spokane Falls Community College
Falls Gateway Building 30, Room 107
5 June 2019 2:00 PM**

LIST OF ATTENDEES

RAB Members Present

- Craig Schwyn (Retiring Community Co-Chair)
- Mike Johnson (Acting USAF Co-Chair)
- Chuck Gruenenfelder (Community Representative, WDOE)
- Doug Greenlund (City of Spokane)
- Jon Welge (Tetra Tech)
- Michael LaScuola (Community Representative, Spokane County Health District)
- Kim Prestbo (USEPA)
- Jason Cook (WDOE)
- Dr. Hugh Lefcort (Community Representative, Gonzaga University)

By Invitation

- Josh Miller (Bay West LLC)
- John Olson (Bay West LLC)
- Jacob Bradley (Bay West LLC)
- Sean Bayer (AECOM)
- Liz Drake (AECOM)
- Beth Flynn (Wood PLC)

Fairchild AFB and Support Staff

- Col Michael Johnson (92 MSG)
- Kristin Nester (92 CES/CEI)
- Ron Daniels (92 CES/CP)
- James Wilkinson (AFCEC/CZOM)
- John Ayre (AFCEC/CZOM)
- Savannah San Nicolas (AFCEC/CZOM)
- Marc Connally (AFCEC/CZOM)
- Mark Loucks (AFCEC/CZOM)
- Matthew Metcalf (AFCEC/CZOM)
- Chase Stephenson (AFCEC/CZOM)
- Megan Riccobono (AGEISS)
- Abigail Power (AGEISS)
- Jonathan Burgoon (AGEISS)

Community Members

- Mark Henry (Community)
- Debra Connally (Community)
- Bryan Connally (Community)
- Nate Ellison (Hurricane Industries LLC)

CALL TO ORDER

Col Michael Johnson welcomed the attendees and reached out for feedback from community partners.

Ms. Liz Drake (AECOM) thanked everyone for coming to the RAB for Fairchild Air Force Base (AFB), provided an introduction, and began the meeting by providing meeting ground rules.

All RAB members present introduced themselves.

Departing community co-chair, Mr. Craig Schwyn, acknowledged and thanked Mr. Marc Connally for his service. John Welge volunteered to become community co-chair. Motion seconded and approved.

MINUTES OF PREVIOUS MEETING

The November 2018 RAB Meeting Minutes were approved.

FINDINGS OF THE FAIRCHILD FIVE-YEAR REVIEW (4TH, 2018)

By Mr. Mark Loucks (AFCEC/CZOM)

Mr. Loucks discussed the purpose and findings of the Five-Year Review (see attached presentation). Based on the presentation, the following questions were asked:

- **QUESTION FOR RAB** (Mr. Loucks): Would the RAB like future updates on the Five-Year Review during RAB meetings?
 - Mr. LaScuola replied: RAB members would like to have annual updates on the issues.

2018/2019 PERFORMANCE-BASED REMEDIATION OVERVIEW

By Mr. Sean Bayer (AECOM)

Mr. Bayer is a site lead for the performance-based remediation (PBR) contract at Fairchild AFB. Mr. Bayer provided a summary of the PBR contract (see attached presentation).

ORPHAN TCE PLUMES (SS039) OVERVIEW

By Mr. Sean Bayer (AECOM)

Mr. Bayer is the site lead for AECOM. Mr. Bayer provided an overview of site SS039. Based on the presentation, the following questions were asked:

- **QUESTION** (Mr. Lefcort): Do you expect to get the same type of results from follow-on injections?
 - Mr. Bayer replied: We expect to get the same results, but each round of injection will be treating less mass so will have a “reduced” effect.
- **QUESTION** (Mr. Welge): What are time expectations and mass expectations for reducing the plume?
 - Mr. Bayer replied: We have three injection events planned during our contract and expect the high concentration treatment areas to be reduced by over 90% with monitored natural attenuation (MNA) on the rest of the plume. The treatment was designed to meet the timeframe outlined in the Interim ROD.
- **QUESTION** (Mr. Welge): Is lack of oxygen and contact an issue?

- Mr. Bayer replied: We don't believe lack of oxygen is an issue. Contact is important and based on our first quarter performance monitoring we believe we achieved good contact.
- **QUESTION** (Mr. Gruenenfelder): Is there any tracking of degradation or byproducts of removing TCE?
 - Mr. Bayer replied: Yes, we are monitoring the treatment area as well as down gradient for degradation products at the EISB treatment area. The in situ chemical oxidation (ISCO) treatment areas will not have degradation products.

SD037 BUILDINGS 2447/2451 OVERVIEW

By Mr. Sean Bayer (AECOM)

Mr. Bayer provided an overview of vapor intrusion work at site SD037 (see attached presentation). There were no questions asked.

CRAIG ROAD LANDFILL (LF002) REMEDIAL ACTION-OPERATIONS OVERVIEW

By Mr. John Olson (Bay West LLC [Bay West])

Mr. Olson is the Bay West technical lead for several of the sites at Fairchild AFB. He provided an overview of site LF002 (see attached presentation). Based on the presentation, the following questions were asked:

- **QUESTION** (Mr. Gruenenfelder): What is the basis for the estimate of remaining in situ trichloroethene (TCE) mass?
 - Mr. Olson replied: It is based on using yield/response curves. They are in line over the past five years of monitoring.
- **QUESTION** (Mr. Welge): How accurate is the mass estimate, could there be a buried vessel?
 - Mr. Olson replied: The concentrations seem to be following the curve. Mass estimates are never 100% but Bay West believes that the trending observed provides confidence in the calculations.

INDUSTRIAL WASTEWATER LAGOON SYSTEM (WP003) REMEDIAL ACTION-OPERATIONS OVERVIEW

By Mr. John Olson (Bay West)

Mr. Olson provided an overview of site WP003 (see attached presentation). There were no questions asked.

PUBLIC COMMENT OPPORTUNITIES IN 2019

By Mr. John Olson (Bay West)

Mr. Olson provided an overview of the documents that will be available for public comment opportunities in 2019 (see attached presentation). There were no questions asked.

PROGRESS REPORT ON RESIDENTIAL WATER TREATMENT SYSTEMS AND AIRWAY HEIGHTS MUNICIPAL WATER TREATMENT SYSTEM

By Ms. Beth Flynn (Wood PLC)

Ms. Flynn provided an overview of the residential water and Airway Heights municipal water treatment systems (see attached presentation). Based on the presentation, the following questions were asked:

- **QUESTION** (Mr. Greenlund): What are the laboratory detection limits?
 - Ms. Flynn replied: 6 to 10 nanograms per liter.
- **QUESTION** (Mr. Lefcort): Have there been issues with cloudiness or comments on taste?
 - Ms. Flynn replied: There have not been any comments regarding cloudiness and or taste.
- **QUESTION** (Mr. LaScuola): Have there been any chloroform bacteria tests done?
 - Ms. Flynn replied: No.
- **QUESTION** (Mr. Welge): What is being done with the granular activated carbon (GAC) after it is spent?
 - Ms. Flynn replied: The spent GAC has been tested and results indicate it is non-hazardous, currently negotiating with Calgon about regeneration or disposal as non-hazardous waste.
- **QUESTION** (Mr. Welge): What about homes to be hooked up to the municipal system, can they still use their well?
 - Mr. Connally replied: They can't use their well for drinking water, but still have access to it.
- **QUESTION** (): Are wells with Per- and Polyfluoroalkyl Substance (PFAS) detections being monitored quarterly?
 - Ms. Flynn replied: Yes, we are looking at trends. There are about 70 being looked at.

PFOA/PFOS SITE INSPECTION UPDATE

By Mr. Marc Connally (AFCEC/CZOM)

Mr. Connally provided an overview of perfluorooctanoic acid (PFOA)/perfluorooctanesulfonic acid (PFOS) investigation and response (see attached presentation). Based on the presentation, the following questions were asked:

- **QUESTION** (Mr. Lefcort): If the U.S. Environmental Protection Agency (EPA) becomes less stringent above the Health Advisory (HA) of 70 parts per million (ppm), would the Air Force still use 70 ppm or go with what the EPA recommends?
 - Mr. Connally replied: The Air Force would follow the EPA's recommendation. Promulgated values will be followed. Currently the work is in alignment with the HA.
 - Mr. Loucks replied: The AF would also follow any State of Washington promulgated levels.
- **QUESTION** (Mr. Schwyn): Are there any source controls?

- Mr. Connally replied: Not at this time as the Remedial Investigation/Feasibility Study (RI/FS) has not been completed.
- Mr. Loucks replied: The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) allows for interim action but sources need to be investigated further.
- Ms. Nester replied: The Air Force has removed PFOS/PFOA-containing aqueous film-forming foam (AFFF) from the base inventory and it is no longer being used or stored.
- **QUESTION** (Mr. Greenlund): Have there been any site investigations or remediation where AFFF was used (five source areas identified in the Preliminary Assessment/Site Inspection [PA/SI])?
 - Mr. Connally replied: Not at this time because CERCLA doesn't identify PFOS/PFOA as a hazardous substance and therefore no regulatory clean-up limits have been set.
 - Mr. Loucks replied: The Air Force is waiting on regulatory limits before remediation can begin. Congress and the Department of Defense (DoD)/EPA are pressing for regulatory levels.
- **QUESTION** (Mr. Lefcort): When is the next RAB meeting?
 - Mr. Connally replied: The next RAB meeting is proposed in the October 2019 timeframe.

PUBLIC COMMENT OPPORTUNITY

Ms. Liz Drake (AECOM) opened the floor to the public for comment and discussion. There were no questions asked.

ADJOURNMENT

Mr. Loucks announced the retirement of Mr. Connally. The next RAB is proposed for October 2019.

**Fairchild Air Force Base
Restoration Advisory Board Meeting Attendees**

**Spokane Falls Community College
Falls Gateway (Building 30), Room 107
June 5th, 2019
2:00 p.m.**

<u>NAME:</u>	<u>ORGANIZATION:</u>	<u>PHONE NUMBER</u>	<u>EMAIL ADDRESS:</u>
<u>James Wilkinson</u>	<u>USAF</u>	<u>801-586-5765</u>	<u>james.wilkinson.13@us.af.mil</u>
<u>LIZ DRAKE</u>	<u>AECOM</u>	<u>619-610-7706</u>	<u>LIZ.DRAKE@AECOM.COM</u>
<u>J. G. Cook</u>	<u>Ecology.</u>	<u>360-407-6235</u>	<u>Asco@ecy.wa.gov.</u>
<u>Kim Prestbo</u>	<u>EPA</u>	<u>206-553-0239</u>	<u>presto.kim@epa.gov</u>
<u>Mark Henry</u>	<u>—</u>	<u>509 655-1912</u>	<u>markhenryhydro@gmail.com</u>

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<u>NAME:</u>	<u>ORGANIZATION:</u>	<u>PHONE NUMBER</u>	<u>EMAIL ADDRESS:</u>
<u>Megan Riccobono Ageiss</u>		<u>N/A</u>	<u>meganr@ageiss-inc.com</u>
<u>Abigail Power</u>	<u>"</u>	<u>210-859-1353</u>	<u>Abigailp@ageiss-inc.com</u>
<u>Sean Bayer</u>	<u>URS</u>	<u>402-250-6318</u>	<u>sean.bayer@urscorp.com</u>
<u>Mark Louck</u>	<u>USAF</u>	<u>801-777-6299</u>	<u>mark.louck@us.af.mil</u>
<u>John Olson</u>	<u>Bay West</u>	<u>651-291-3445</u>	<u>john@baywest.com</u>

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<u>NAME:</u>	<u>ORGANIZATION:</u>	<u>PHONE NUMBER</u>	<u>EMAIL ADDRESS:</u>
<u>HUGH LEFCORT</u>	<u>GONZAGA UNIV</u>	<u>509 313 6706</u>	<u>LEFCORT@GONZAGA.EDU</u>
<u>John Ayre</u>	<u>USAF</u>	<u>509-247-4314</u>	<u>John.Ayre@US.AF.MIL</u>
<u>Savannah San Nicolas</u>	<u>USAF</u>	<u>509-247-5705</u>	<u>savannah.san-nicolas.1@us.af.mil</u>
<u>Jon Welge</u>	<u>TETRA TECH</u>	<u>509-344-0202</u>	<u>jon.welge@tetratech.com</u>
<u>Nate Ellison</u>	<u>Hurricane Industries</u>	<u>910 603 0120</u>	<u>you have it</u>

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Restoration Advisory Board Meeting Attendees**

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<u>NAME:</u>	<u>ORGANIZATION:</u>	<u>PHONE NUMBER</u>	<u>EMAIL ADDRESS:</u>
<u>Mike LaScola</u>	<u>Health</u>	<u>324-1574</u>	<u>MLASCOLA@SRHD.ORG</u>
<u>Matthew Metcalf</u>	<u>USAF</u>	<u>247-2391</u>	<u>matthew.j.metcalf@mail.mil</u>
<u>Chase Stephenson</u>	<u>USAF</u>	<u>247-2391</u>	<u>chase.a.stephenson.mil@mail.mil</u>
<u>Jacob Bradley</u>	<u>Bay West</u>	<u>859-4367</u>	<u>jbradley@baywest.com</u>
<u>Doug Greenland</u>	<u>City of Spokane</u>	<u>509-625-6533</u>	<u>dgreenland@spokanecity.org</u>

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Restoration Advisory Board Meeting Attendees**

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June 5th, 2019
2:00 p.m.**

<u>NAME:</u>	<u>ORGANIZATION:</u>	<u>PHONE NUMBER</u>	<u>EMAIL ADDRESS:</u>
<u>Kristin Nester</u>	<u>92CES/CEI</u>	<u>509 247-4157</u>	<u>kristin.nester@us.af.mil</u>
<u>Chuck Gruenenfelder</u>	<u>Community rep.</u>	<u>509-329-3439</u>	<u>chgr461@ccy.wa.gov</u>
<u>Ron Daniels</u>	<u>92CES/CD</u>	<u>247-2291</u>	<u>ronald.daniels.1@us.af.mil</u>
<u>Sam Burgeon</u>	<u>AFC3C/OZON</u>	<u>247-2351</u>	<u>douglas.w.burgeon.1@us.af.mil</u>
<u>Beth Flynn</u>	<u>WOOD</u>	<u>415-320-2170</u>	<u>bethany.flynn@woodplc.com</u>

Marc Connally

Debra Connally

Bryan Connally

Seating chart

Dr. Hugh Leftcort
(con. rep. Gonzaga Univ.)

Jason Cook
(UDOE)

Kim Prestao
(USEPA)

Nike LaSuda
(Spokane city
Health Dept.)

John Wajge
(Incoming con.
co-chair)

Doug Greenlung
(City of Spokane)

Chuck Gruenfelder
(con. rep.)

Craig Schuyin
(retiring con.
co-chair)

Mike Johnson
(Atty. AF
co-chair)

AFFIDAVIT OF PUBLICATION

STATE OF WASHINGTON

County of Spokane} ss

PUBLIC MEETING

Fairchild Air Force Base Restoration Advisory Board

Will meet Wednesday,
June 5, 2019, at 2:00 p.m.
Spokane Falls
Community College
Building 30, Room 107

The Restoration Advisory Board (RAB) ensures that all community members, on and off base, have a voice and can actively participate in a timely and thorough manner in the review of Environmental Restoration Program documents. The Fairchild AFB Restoration Program seeks out, investigates, and cleans up past waste disposal and spill sites. Board members include private citizens, members of community groups, educational institutions, and representatives from Spokane City/County, Washington State Department of Ecology, and the Environmental Protection Agency.

Topics for this Fairchild AFB RAB meeting include:

- PFOS/PFOA Investigation Update
- Status of Residential and Airway Heights Water Treatment Systems
- Five Year Review Findings
- Performance Based Contract Overview & Site Updates
- Public Comment Opportunity

Additional information on the Fairchild AFB Restoration Program is available at the Information Repository located at Spokane Falls Community College Library. Information is also available by calling or writing:

Capt Tanya Downsworth
Public Affairs (USAF)
92nd ARW/PA
Fairchild AFB WA 99011-9404
(509) 247-5705

SR35447

Name:	<u>AECOM</u>	Client ID:	<u>9024523</u>
PO No.:	<u>SR35447</u>	No. Lines:	<u>60</u>
Total Cost:	<u>\$285.10</u>	Order No.	<u>2021088</u>

I, Ruth Sullivan

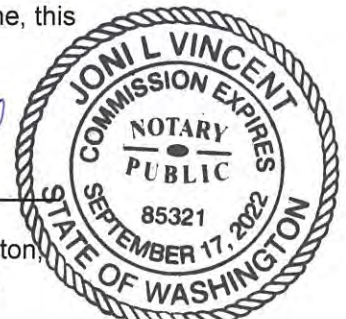
do solemnly swear that I am the Principal Clerk of ***The Spokesman-Review***, a newspaper established and regularly published, once each day in the English language, in and of general circulation in the City of Spokane County, Washington; and in the City of Coeur d'Alene, Kootenai County, Idaho; that said newspaper has been so established and regularly published and has had said general circulation continuously for more than six (6) months prior to the 23rd day of July, 1941; that said newspaper is printed in an office maintained at its place of publication in the City of Spokane, Washington; that said newspaper was approved and designated as a legal newspaper by order of the Superior Court of the State of Washington for Spokane County on the 23rd day of July, 1941, and that said order has not been revoked and is in full force and effect; that the notice attached hereto and which is a part of the proof of publication, was published in said newspaper one time(s), the publication having been made once each time on the following dates:

June 2, 2019

That said notice was published in the regular and entire issue of every number of the paper during the period of time of publication, and that the notice was published in the newspaper proper and not in a supplement.

Ruth Sullivan
Subscribed and sworn to before me at the City of Spokane, this
3rd day of June, 2019.

Joni L. Vincent
Notary Public in and for the State of Washington,
residing at Spokane County, Washington



Notary Stamp

Paper Affidavits.xls

Air Force Civil Engineer Center

Integrity - Service - Excellence

Overview, Findings Of The Fairchild 5 Yr Review 2018



**Fairchild AFB RAB
5 June 2019**

**Mark D. Loucks
Section Chief
AFCEC/CZOM Hill ISS
801-777-6299**



Overview



- **Purpose of a 5 Year Review**
- **Sites reviewed in this study**
- **Issues and recommendations Identified**
- **Protectiveness statements**



Purpose of the FYR



- Required for all remedial actions selected under CERCLA §121(c).
- The purpose is to “*Evaluate the implementation and performance of a remedy to determine if the remedy is or will be protective of human health and the environment.*”
- Evaluation based on data and observations.



Questions to Answer



- Question A: Is the remedy functioning as intended by the decision documents?
- Question B: Are the assumptions used to design the remedy still valid?
- Question C: Has any other information come to light that could call into question the protectiveness of the remedy?



Fairchild AFB 2018 FYR Information



- 2018 FYR was conducted by independent contractor TETRA TECH
- 4th - 5 Year Review for Fairchild cleanup program
- Current PBR Contractor is responsible for addressing FYR recommendations



Summary of Sites Included in the 2018 Five-Year Review



Site	Site	OU	Record of Decision
LF 002 (SW-8)	Craig Road Landfill	1	USAF 1993a
LF 001 (SW-1)	Old Base Landfill	2	
SS 018 (PS-2)*	Refueling Pit Area	2	On-Base Priority One Sites (USAF 1993b)
SS 026 (PS-8)*	Spill Site - Flightline	2	
FT004 (FT-1)	FT-1 Fire Training Area	2	
WP003 (WW-1)	Industrial Wastewater Lagoon System	2	
OT 016 (IS-3)	Reciprocating Engine Test Cell - Bldg 2150	3	
OT 017 (IS-4)*	Former Jet Engine Test Stand	3	
ST 006 (PS-I)*	POL Bulk Storage	3	
SS 009 (PS-5)*	Former Fuel Oil Tank, Wherry Housing	3	
ST 010 (PS-7)*	Fuel Oil Storage Tanks	3	Priority Two Sites (USAF 1955a)
SD 031 (PS-10)	Fuel Truck Maintenance Facility	3	
FT032 (FT-02)*	Fire Training Area	3	
DP 022 (SW-4)	Waste Disposal N of Bldg 2451	3	
DP 024 (SW-7)	Waste Disposal S of Taxiway #10	3	
DP 012 (SW-10)	Disposal Area near WANG Test Cell	3	
DP 013 (SW-I I)	Disposal Area at Warrior Park	3	
SS 039 (SS-39)	Orphan TCE Plumes	5	Interim ROD (USAF 2011)



FYR Issues and Recommendations



OU	Category: Institutional Controls	Status
1, 2, 3, 5	Issue: Review of Installation Development Plan (IDP) indicates it is outdated and incomplete, but no unacceptable exposures identified because of this.	In Progress To be complete later in 2019
	Recommendation: Update the IDP to describe the specific on-base LUCs for each site. Ensure Base personnel have access to it and its requirements.	
1, 2 and Site WP003	Issue: Current off-base LUCs to prevent the use of contaminated groundwater and to address potential vapor intrusion (VI) will need to be supplemented; however, no known off-base drinking water exposures are currently occurring.	In Progress Scheduled to be completed by 2023 with ROD Amendment
	Recommendation: Prepare ROD Amendments to memorialize off-base LUCs. Ensure that specific off-base LUCs described in these documents outline what combination of Institutional Controls (ICs) and engineering controls will be used to meet off-base performance objectives.	



OU	Category: Institutional Controls	Status
OU-3: Site DP012 (SOU-2W-10)	Issue: A limited field investigation at site DP012 revealed the presence of buried aircraft reciprocating valves that contain elemental sodium. Because the presence of these valves presents a potential safety and health hazard, the site is inspected on an annual basis and the results of the inspection are presented in annual LUC reports. Facility-wide institutional controls are in place, but there are no site-specific LUCs memorialized. No unacceptable exposures have currently occurred.	Almost Complete ESD is awaiting signature
	Recommendation: Prepare an ESD to clarify and formalize site-specific LUCs at site DP012.	
OU-5: Site SS 039	Issue: Current off-base LUCs to prevent the use of contaminated groundwater may need to be supplemented.	In Progress Off-base investigation is planned in 2019 pending review of the Investigation Work Plan
	Recommendation: Investigate off-base contamination and complete appropriate ROD modification if off-base LUCs are necessary. Ensure that data collection will be adequate to described what off-base LUCs are needed.	



FYR Issues and Recommendations (continued)



OU	Category: Monitoring	Status
OU-1: Craig Road Landfill	Issue: The off-base down-gradient trichloroethene (TCE) plume has not been adequately characterized where TCE concentrations continue to exceed Maximum Contaminant Limits (MCLs).	In Progress Off-Base Investigation summer of 2019
	Recommendation: Perform additional off-base investigations defining TCE extent.	
OU-1: Craig Road Landfill	Issue: Off-base vapor intrusion (VI) pathways have not been assessed. No inventory of buildings located within the proposed boundary has been completed.	In Progress Off-Base Investigation summer of 2019
	Recommendation: Will need to occur after recommendation above to characterize boundary. Step 1, perform inventory of buildings located within the TCE boundary for assessing VI. Step 2 complete the evaluation of the VI pathway in this area.	
OU-2: Site WP003 (WW-1)	Issue: TCE continues to exceed MCLs in off-Base well, and a slow moving detached TCE plume was identified. TCE has not been detected in down-gradient residential monitoring wells and no drinking water exposures are currently occurring.	In Progress On-base investigation planned in 2019 ROD amendment completed by 2023
	Recommendation: Complete a Feasibility Study Addendum using data collected during the pre-design investigation to screen and analyze remedy alternatives to address the offsite TCE plume. Prepare Proposed Plan and ROD Amendments.	



FYR Issues and Recommendations (continued)



OU	Category: Monitoring and Mitigation	Status
OU-2: Site FT004 (FT-1)	Issue: The preliminary assessment/site inspection (PA/SI) process confirmed significant quantities of perfluorooctane sulfonate and perfluorooctanoic acid (PFOS/PFOA) containing aqueous film forming foams (AFFF) were historically used at FT004 and released to the environment. Where PFOS/PFOA originating from Base sources has been identified in drinking water sources above the EPA Health Advisory, the USAF has implemented time critical actions providing alternate drinking water sources as well as mitigation of Residential and Municipal drinking water supply wells.	In Progress Will continue many year into the future
	Recommendation: Continue to identify and institute mitigation actions everywhere exposures from Base contamination is identified. Perform Remedial Investigation and Feasibility Study to define nature and extent of the PFOS/PFOA. Once sufficient characterization has been accomplished, institute LUCs/ICs as needed to prevent exposure, pending completion of a Risk Assessment/Proposed Plan and ROD.	



FYR Issues and Recommendations (continued)



OU	Category: Changed Site Conditions	Status
OU-1: Craig Road Landfill	Issue: Vinyl chloride, cis-dichloroethene, and chromium exceed MCLs in several monitoring wells at Craig Road Landfill and are not identified as Contaminants of Concern (COCs) by the ROD.	In Progress Proposed Plan Amendment is in review. ROD Amendment to be completed before end of 2019.
	Recommendation: Prepare a ROD Amendment to include these site chemicals present above MCLs as COCs.	
OU-3: Sites DP022 (SW-4) and DP024 (SW-7)	Issue: New Contaminants of Potential Concern (COPCs) were identified at these sites since the Third Five-Year Review that were not considered during the original Remedial Investigation/Feasibility Study (RI/FS) and subsequent ROD.	In Progress Additional investigations are complete. RI report are in review. Complete in 2019
	Recommendation: Perform additional investigation to address data gaps for sites DP022 and DP024. If additional COCs are discovered at the sites complete a risk assessment, Feasibility Study and a ROD modification to address these additional contaminants.	
OU-2: Site WP003	Issue: Vinyl chloride and arsenic exceed their respective MCLs in shallow groundwater on- and off-base, these constituents were not identified in the ROD as site COCs.	Almost Complete ESD is awaiting signature
	Recommendation: Prepare an ESD to address vinyl chloride and arsenic as site COCs.	

11



Protectiveness Statements



Operable Unit	Protectiveness Determination	Protectiveness Statement
OU-1	Protectiveness Deferred	Protectiveness determination of the remedy at OU-1 cannot be made until further information is obtained. Once recommendations for OU1 are completed a protectiveness determination can be made.
OU-2	Short-term Protective	The remedy at OU-2 currently protects human health and the environment in the short term because LUCs preventing exposures to contaminated groundwater are in place, and where necessary Air Force is providing bottled water or have installed treatment systems to meet drinking water standards where needed. However, in order for the remedy to remain protective in the long term, the recommended actions need to be taken to ensure protectiveness.
OU-3	Short-term Protective	The remedy at OU-3 currently protects human health and the environment because LUCs preventing exposures to contaminated media are in place. For the remedy to be protective in the long-term, facility wide ICs should be clarified through an update of the IDP.
OU-5	Will be Protective	The remedy at OU-5 will be protective of human health and the environment upon completion. In the interim, remedial activities completed to date have adequately addressed all exposure pathways that could result in unacceptable risk. To be protective in the long-term, facility-wide ICs should be clarified through an update of the IDP, and off-base LUCs should be implemented.

12



Questions

How would the RAB like to see follow up on the progress made on the recommendations in this 5 Yr Review?

Questions?



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2018/2019 Performance- Based Remediation Overview

Bay West and URS

5 June 2019



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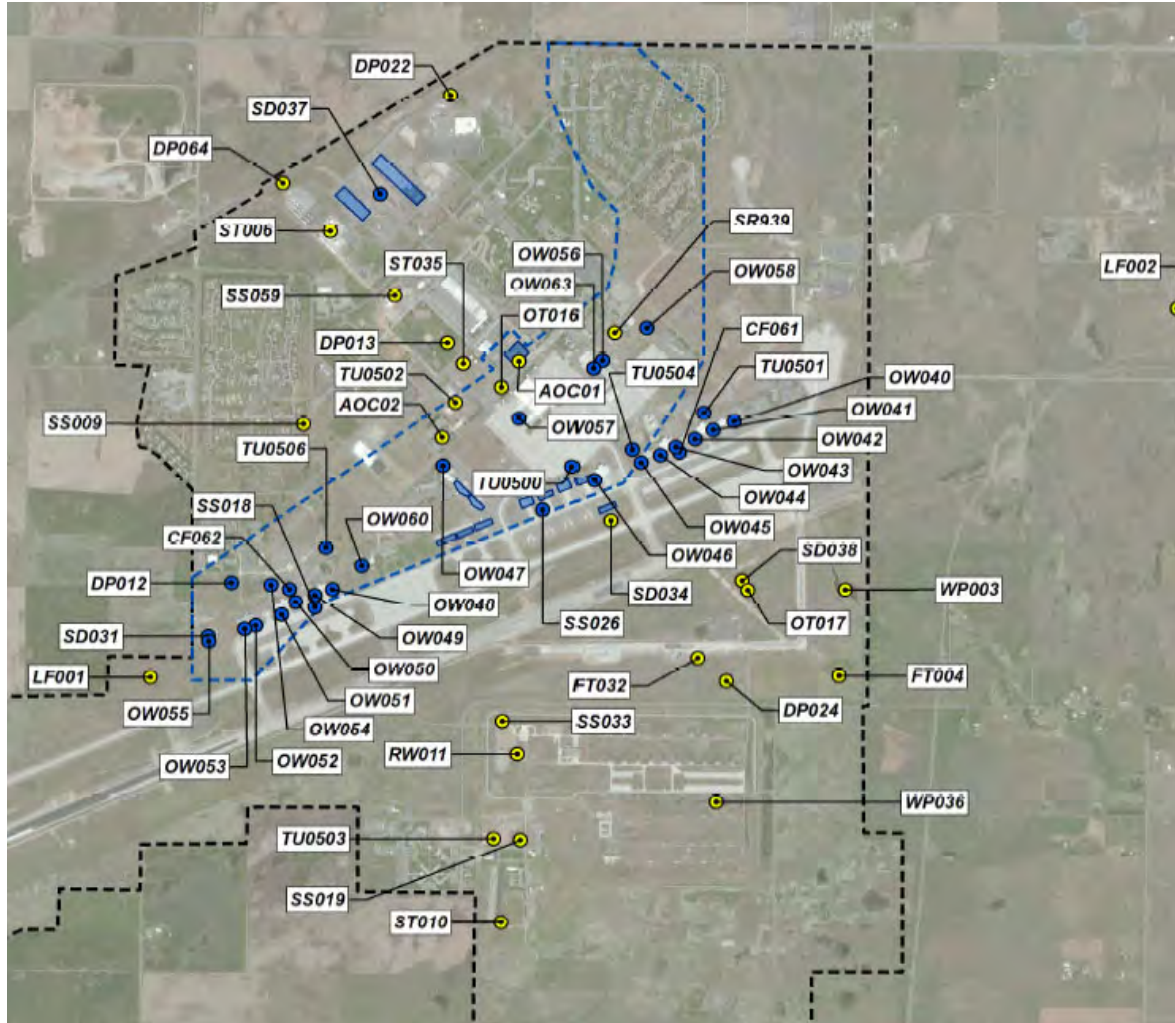
Overview

- **Site Overview**
- **2018/2019 Major Sites**
 - SS039, SD037, LF002, WP003, Voluntary Cleanup Program (VCP) Sites
- **Public Comment Opportunities in 2019**



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Site Overview



59 historical environmental sites. One historical Military Munitions Response Site at Fairchild Air Force Base. Environmental actions include:

- Work Plans
- Remedial Action-Operations (RA-O)
- Treatment Operations
- Remedial Design
- Investigation Reports
- Monitoring/Remedial Performance Reports
- Treatment Reports



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Orphan TCE Plumes (SS039) 2018/2019 Overview

**Mr. Sean Bayer
URS Site Lead
5 June 2019**

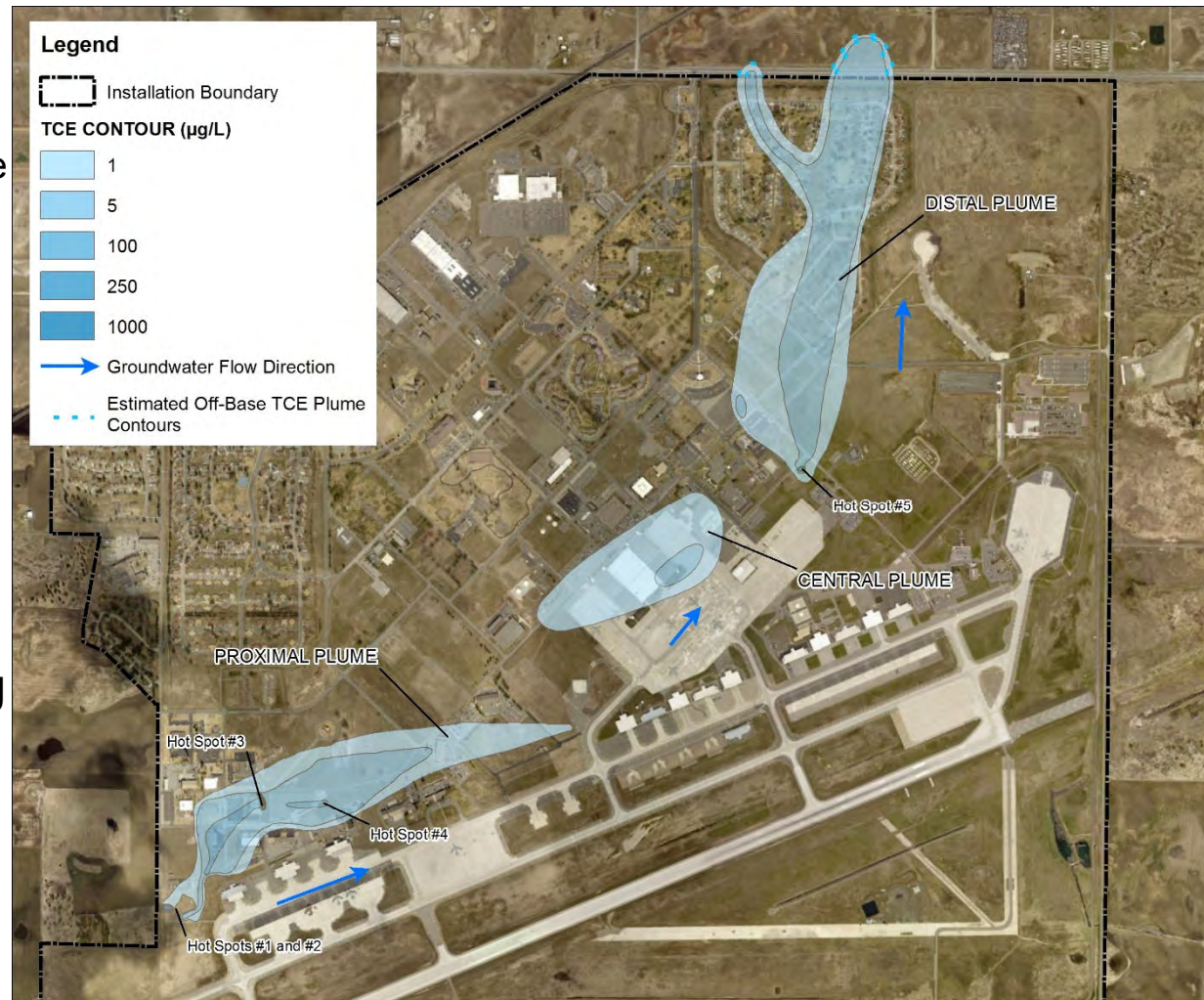
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SS039 2018/2019 Overview

- Hot Spot Injection Event - 2018
- Quarterly Performance Monitoring - 2019
- 2018 Annual Groundwater Monitoring Report
- TCE plume interpretation reduced based on performance monitoring following injections



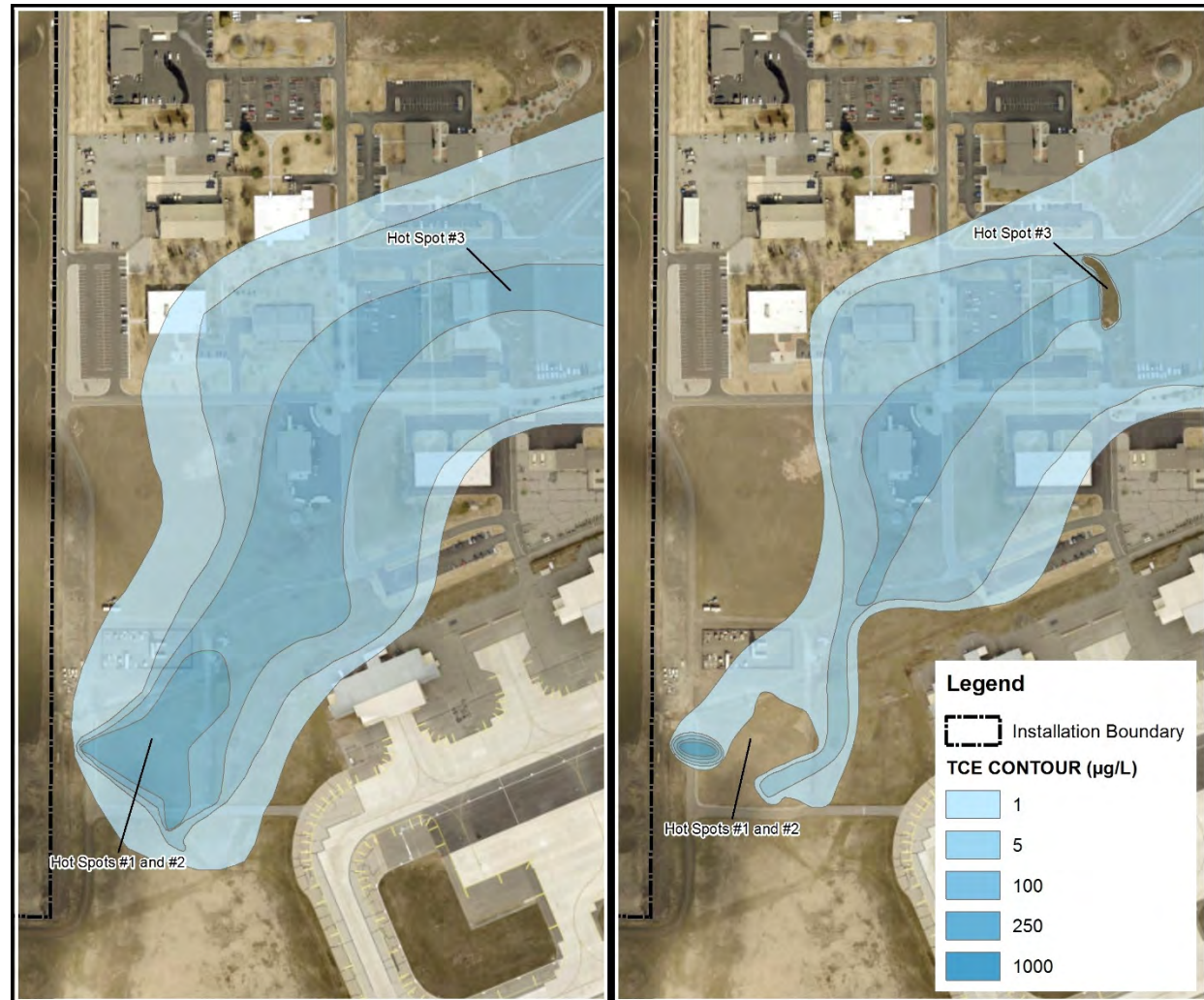


SS039 2018/2019 Overview

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■ Before and After 2018 Sodium Permanganate Injection Event

- Installed 14 IWs and injected approx. 455,000 gallons (1-2% solution) into 16 IWs at Hot Spots #1 and #2
- Injected approx. 110,000 gallons (1% solution) into 7 IWs at Hot Spot #3
- Plume interpretation after one quarter of performance monitoring





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SS039 2018/2019 Overview

- **November 2018 Direct Push Injection Event**
 - Approximately 30,000 gallons of sodium permanganate (1% solution) were injected into six direct push injection points at Hot Spot #4
 - Approximately 5,000 gallons of EHC Liquid (5% solution) were injected into eight direct push injection points at Hot Spot #5 along with 4 liters of SDC-9
 - Updated plume interpretations for these areas will be completed following the four quarters of performance monitoring



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SS039 2018/2019 Overview

■ Off-base ground-water monitoring

- All 5 off-base wells were non-detect for TCE in November 2018 and have been non-detect since 2016

■ Off-Base Data Gaps UFP-QAPP - 2019

- Off-Base Investigation – 2019 (pending access agreements)





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SD037 Buildings 2447/2451 2018/2019 Overview

**Mr. Sean Bayer
URS Site Lead
5 June 2019**

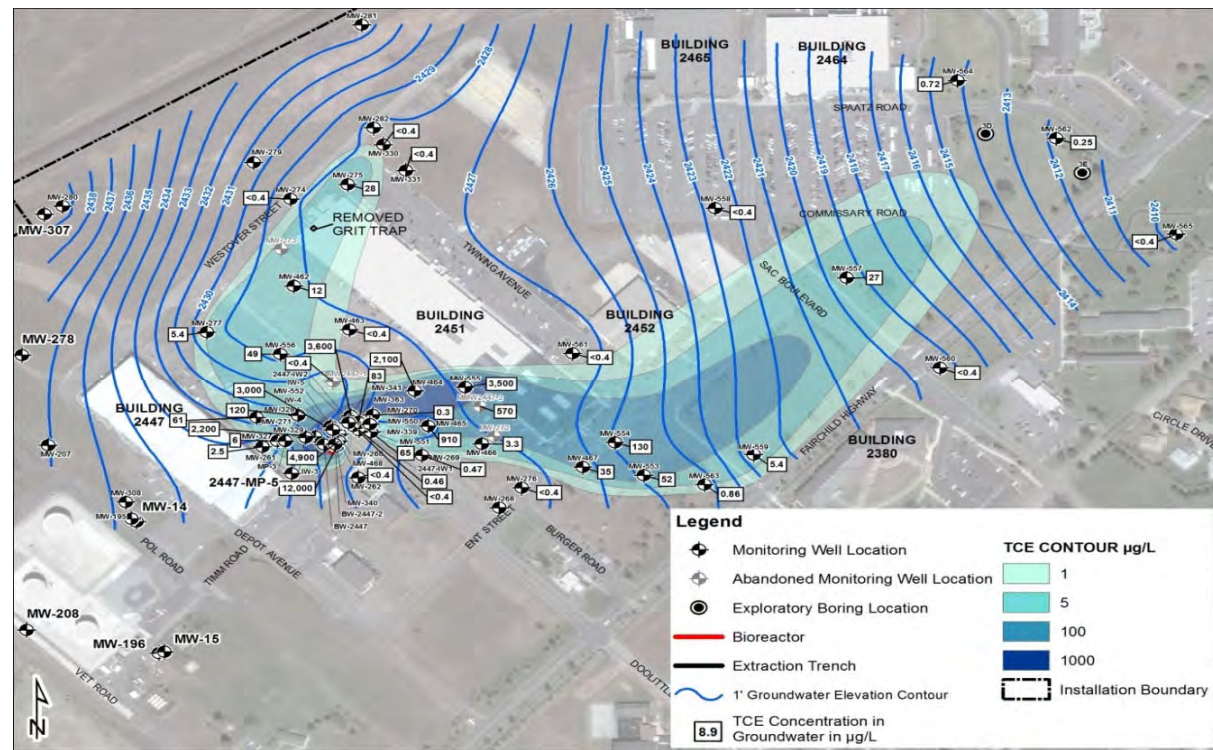
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SD037 – Buildings 2447 and 2451 TCE Plume

- **Data Gap Investigation, Injection Completion Report, and Pilot Study Monitoring Report – 2018**
- **Buildings 2447 and 2451 Vapor Intrusion (VI) UFP-QAPP – 2018**
- **VI Fieldwork**
 - Winter Heating Season 2018/2019
- **VI Report - 2019**





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SD037 2018/2019 Overview

SD037 – VI Fieldwork

■ Vapor Intrusion Evaluation Fieldwork

- Determine concentrations of COPCs in soil gas immediately upgradient of Buildings 2452 and 2380 at depths of 5 and 10 feet below ground surface
- Determine concentrations of COPCs in indoor air and sub-slab soil gas in Buildings 2447 (4 sample locations) and 2451 (5 sample locations). Locations were biased toward the side of the buildings closest to the TCE plume. In each building the following was done:
 - Building Survey
 - Collect sub-slab soil gas and high volume soil gas grab samples
 - Collect 8-hour, time-integrated indoor air samples at breathing zone height, co-located with the sub-slab sample locations
 - Collect an outdoor (ambient) air sample immediately upwind or at the building make-up air intake
 - Collect indoor air samples at two locations under positive and negative pressure conditions
 - If indoor air concentrations exceed screening levels, follow-up work will involve identifying and removing/isolating indoor emission sources and resampling the indoor air



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Craig Road Landfill (LF002) 2018/2019 Remedial Action- Operations Overview

**Mr. John Olson, PG
Bay West Site Lead
5 June 2019**

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LF002 2018/2019 Overview

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2019 Actions to Date

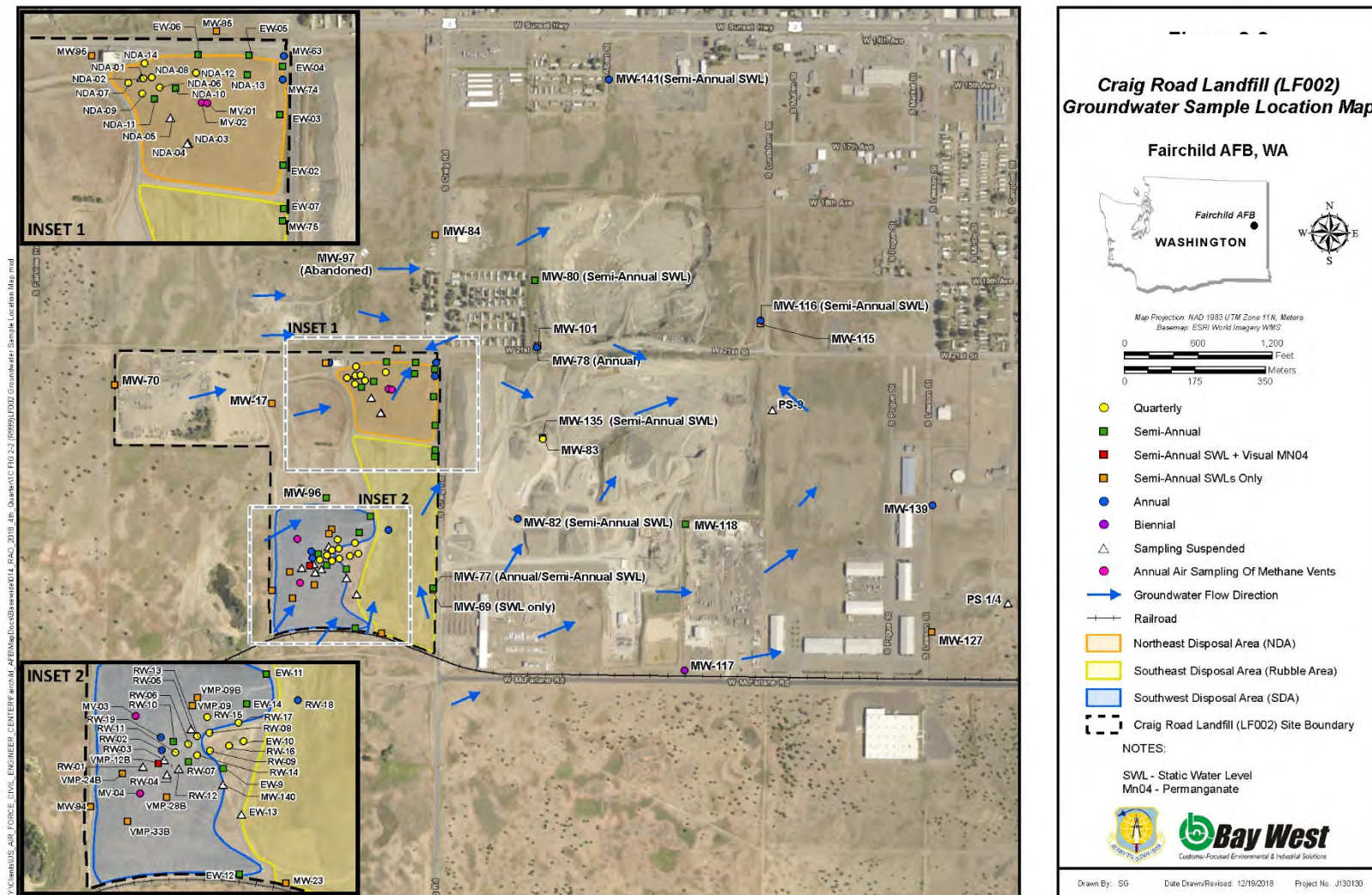
- Performed First Quarter 2019 RA-O sampling event at LF002 and WP003 in March 2019
- Submitted Draft 2018 Fourth Quarter and Annual RA-O Report
- Operation and Maintenance of the Groundwater Extraction and Treatment System/Soil Vapor Extraction Systems (GETS/SVE)
 - 55 lbs of TCE removed in 2018 (78% via SVE)
 - Estimated 38 lbs remaining
- Proposed Plan Amendment (in review)
- UFP-QAPP Addendum II: Off-Site Investigation (in review)

Remaining 2019 Actions

- Finalize above documents
- Continue GETS/SVE operations
- Prepare Record of Decision Amendment
- Obtain Off-Base Access and Perform Off-Base Investigation

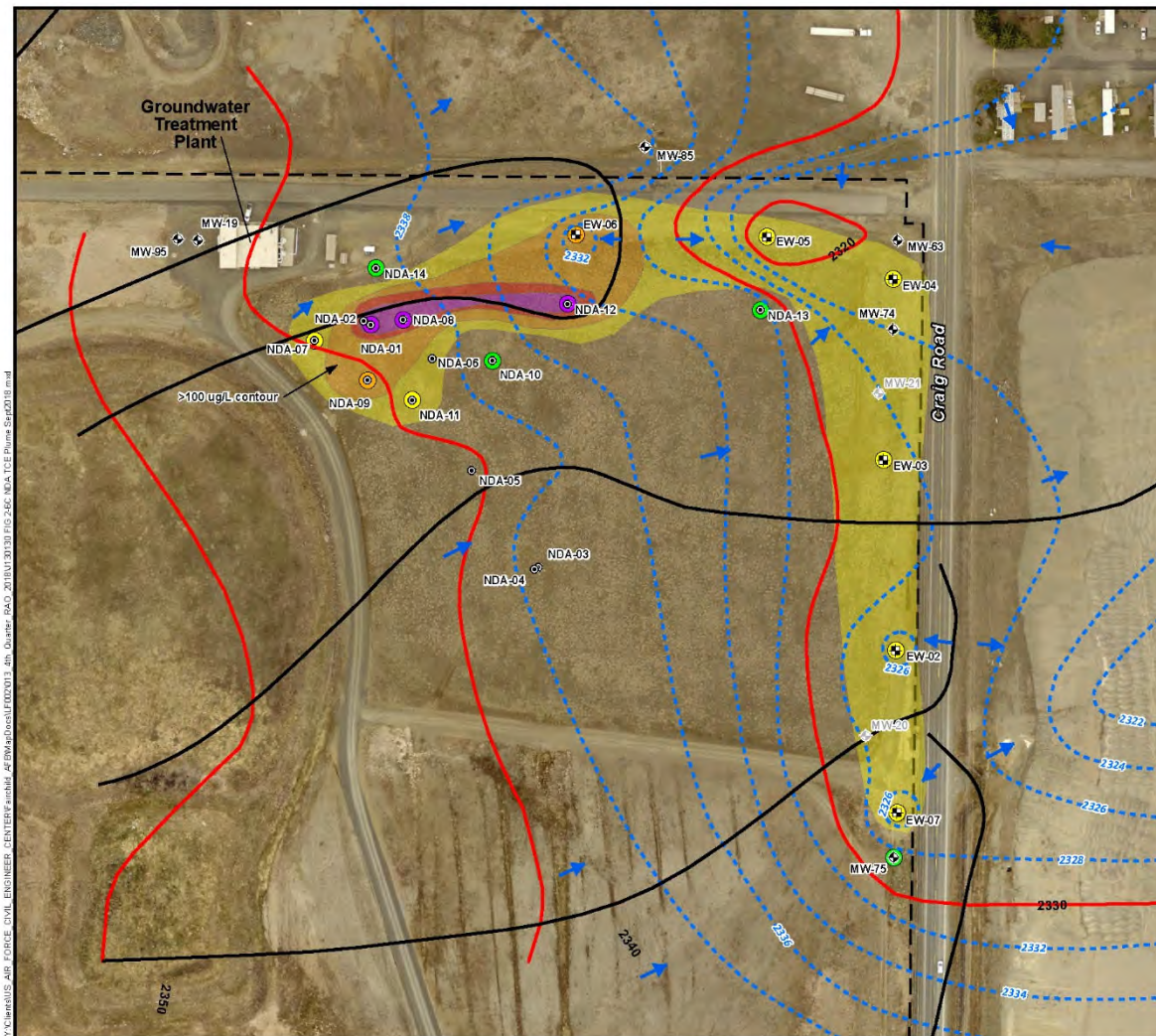


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NDA TCE Plume (September 2018)

Fairchild AFB, WA



Map Projection: NAD 1983 UTM Zone 11N, Meters

Basemap: ESRI World Imagery WGS, March 2018



- ✦ Extraction Well
- ✦ Decommissioned Wells
- ✦ Monitoring Well
- ✦ Remediation Well
- ➔ Groundwater Flow Direction
- 10-ft Groundwater Elevation Contour
- - 2-ft Groundwater Elevation Contour
- Groundwater Capture Zone
- TCE Results**
- <5 µg/L
- 5 - 50 µg/L
- 50 - 100 µg/L
- 100 - 500 µg/L
- >500 µg/L
- TCE Concentrations**
- 5 - 50 µg/L
- 50 - 100 µg/L
- 100 - 500 µg/L
- >500 µg/L
- ▭ Craig Road Landfill (LF002) Site Boundary

- Notes:**
- 1) < = Less than; > = Greater than
 - 2) NS - Not sampled
 - 3) TCE = Trichloroethene
 - 4) µg/L = micrograms per liter



Drawn By: SC Date Drawn/Revised: 5/6/2019 Project No.: J130130

5 June 2019

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15



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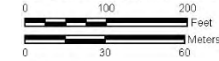


SDA TCE Plume (September 2018)

Fairchild AFB, WA



Map Projection: NAD 1983 UTM Zone 11N, Meters
Base Map: ESRI World Imagery WMS, March 2019



- Extraction Well
- Decommissioned Wells
- Monitoring Well
- Remediation Well
- Groundwater Flow Direction
- 10-ft Groundwater Elevation Contour
- 2-ft Groundwater Elevation Contour
- Groundwater Capture Zone
- TCE Results
 - <5 µg/L
 - 5 - 50 µg/L
 - 50 - 100 µg/L
 - 100 - 500 µg/L
 - >500 µg/L
- TCE Concentrations
 - 5 - 50 µg/L
 - 50 - 100 µg/L
 - 100 - 500 µg/L
 - >500 µg/L
- Craig Road Landfill (LF002) Site Boundary

Notes:

- 1) < = Less than; > = Greater than
- 2) NS - Not sampled
- 3) TCE = Trichloroethene
- 4) µg/L = micrograms per liter



Drawn By: SG Date Drawn/Revised: 5/6/2019 Project No.: J130130

5 June 2019

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Industrial Wastewater Lagoon System (WP003) 2018/2019 RA-O Overview

**Mr. John Olson, PG
Bay West Site Lead
5 June 2019**

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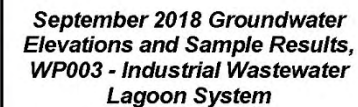
WP003 Overview

2019 Actions to Date

- Performed First Quarter 2019 RA-O sampling event at LF002 and WP003 in March 2019
- Submitted Draft 2018 Fourth Quarter and Annual RA-O Report
- Operable Unit 2 (OU2) Explanation Of Significant Differences (signature process)
- UFP-QAPP Addendum - Data collection in support of a Feasibility Study (in review)

Remaining 2019 Actions

- Finalize documents
- Continue RA-O Monitoring/Reporting
- Complete additional on-site data collection
- Prepare a Feasibility Study Addendum



Fairchild AFB, WA



Fairchild AFB

WASHINGTON



Map Projection: NAD 1983 UTM Zone 11N, Metres
Basemap: ESRI World Imagery WMS, 6/26/2016



-  Alluvial Aquifer Monitoring Well
-  Basalt A Monitoring Well
-  Extraction Well
-  Monitoring Well (Decommissioned)
-  Residential Well
-  Groundwater Elevation Contour Line - (ft amsl)
(March 2017)
-  Groundwater Flow Direction
-  Installation Boundary

No data		
<PAL		
>PAL		
>Background		

Analyte	PAL (ug/L)	Background (ug/L)
As	5	10
TCE	5	--
VC	0.2	--

Notes:
As = Dissolved arsenic
TCE = trichloroethylene
VC = vinyl chloride
Groundwater elevations are shown in blue
*Groundwater elevations not used to generate contours
**MW-245A and MW-245B installed in September 2018



Drawn By: SG Date Drawn/Revised: 5/6/2019 Project No. J130130



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Voluntary Cleanup Program (VCP) Sites

Bay West Team

5 June 2019

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VCP Sites

Eight former oil/water separator sites along the flight line have achieved AF and Washington Department of Ecology (WDOE) approval of site closure through the WDOE Voluntary Cleanup Program

- OW044, OW047, OW053, OW054, OW055, OW056, OW057, and OW063 are in various stages of the AF signature process or are signed

Other Petroleum Sites in the NFA Approval Process

- ST006 GW-NFA Approved), OT017, FT032, ST035 (signatures pending), SS033 (NFA Tech Memo in review)

Petroleum Sites in the Interim Measures/Remediation Planning Stage

- ST010, TU500, TU502, TU503, TU506

Petroleum Sites in the Remedial Investigation Stage

- TU500, SS059



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Public Comment Opportunities in 2019

**Mr. Josh Miller, PG
Bay West Project Manager
5 June 2019**

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Public Comment Opportunities 2019

OU1 Proposed Plan Amendment: *Public Notice Estimated Timing: July 2019*

- Clarify and add land use controls for LF002 – Craig Road Landfill
- Amend CULs to include Chromium and Vinyl Chloride



Acronyms and Abbreviations

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µg/L	micrograms per liter
COPC	contaminant of potential concern
CUL	cleanup level
GETS	Groundwater Extraction and Treatment System
IW	injection well
OU	operable unit
PG	Professional Geologist
RA-O	remedial action-operations
SVE	soil vapor extraction
TCE	trichloroethylene
UFP-QAPP	Uniform Federal Policy for Quality Assurance Project Plan
USAF	United States Air Force
VCP	Voluntary Cleanup Program
VI	vapor intrusion
WDOE	Washington Department of Ecology

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Progress report on Residential Water Treatment Systems and Airway Heights Municipal Water Treatment System

**Fairchild AFB RAB
June 2019**



5 June 2019



Agenda

- Overview
- Residential Treatment System Status
- Residential Connections to Municipal System
- Airway Heights Treatment System Status
- Questions



Overview

- AF sampling between April 2017 and April 2019 identified:
 - 90 private residential wells above the EPA Health Advisory (HA)
 - 2 Airway Heights municipal system wells above the HA
- Granulated Activated Carbon (GAC) treatment systems for impacted wells:
 - October 2017 Action Memorandum: Residential Wells
 - Purpose: provide a longer term supply of clean drinking water to affected residents
 - Installation 2018/2019
 - March 2018 Action Memorandum: Airway Heights Well #9
 - Purpose: to allow Airway Heights to meet peak summer-time demand
 - Installation 2018

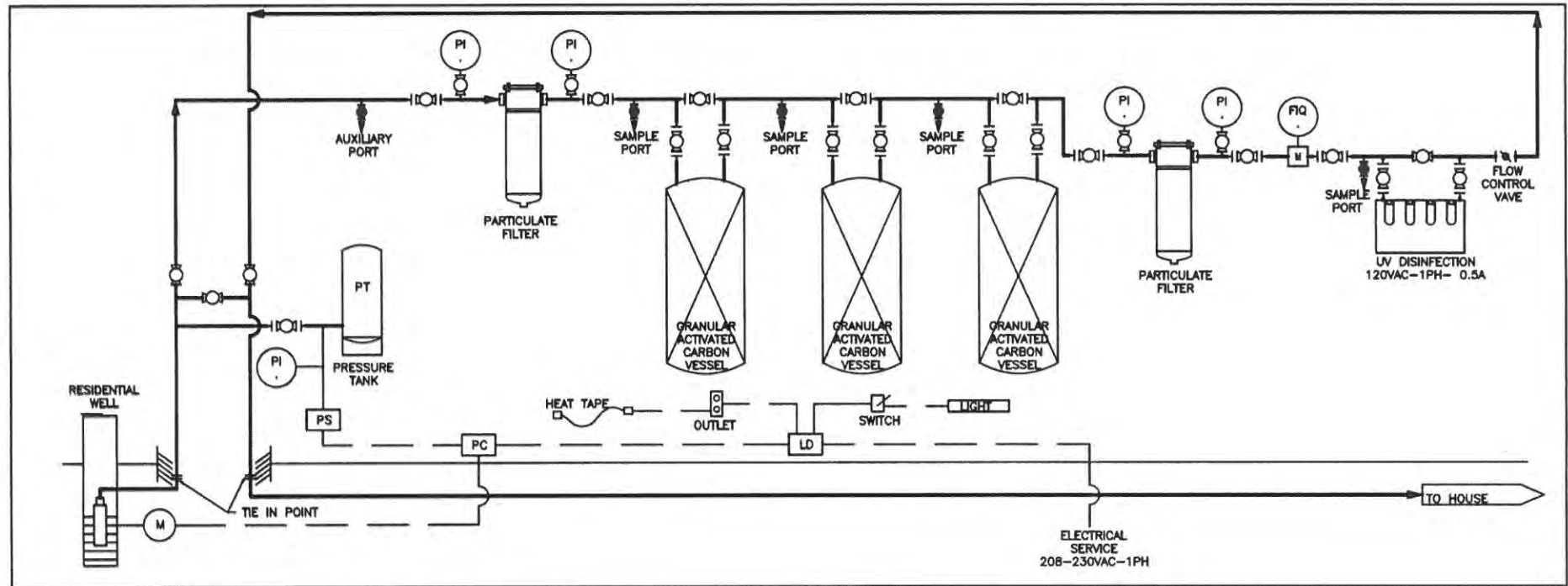


Overview (Cont.)

- Connection to Municipal Water Supply
 - Action Memorandum Amendment is in coordination
 - Provides alternate water supply where GAC filtration system not feasible
 - Installation planned for 2019



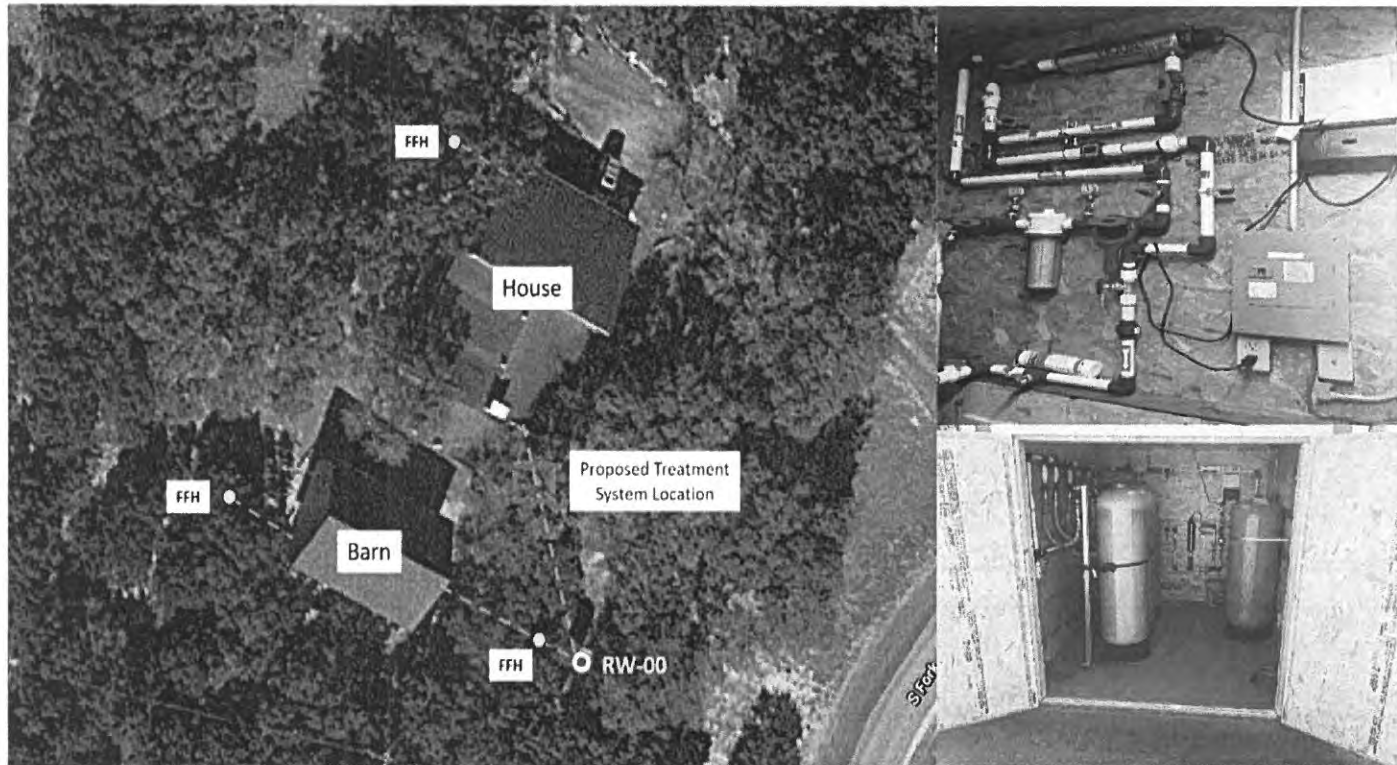
Residential Treatment Conceptual Design



- **3 GAC tanks with particulate filters and ultraviolet disinfection**
 - Up to 10 gallons per minute
 - Design supports typical shower, two sinks, toilet flush/fill at same time



Typical Property – Specific Design



- Locate to provide treated water for drinking/household use
- Locate in basement, garage, existing or new shed, etc
- Property-specific plumbing, electrical, support equipment needed for system to work



Residential System Installation Status (29 May 2019)

Homes in need of treatment system	84
Owner agreements/access in place	77
Homes in design phase	7
Homes with installation in progress	0
Homes with installation complete	77
Homes with commissioning/testing underway	7
Homes with commissioning issues	0
Homes with systems in place and operating	70



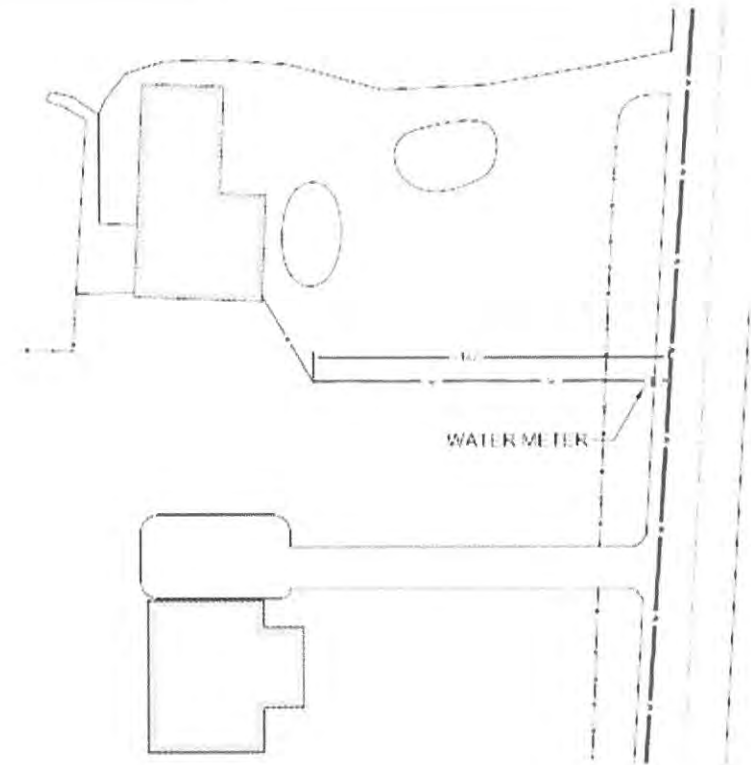
Residential System Operations and Maintenance

- When sample analysis results confirm system working as designed:
 - Quarterly operation and maintenance checks
 - Confirmation sampling after first and third GAC tanks
- O&M activities:
 - Pressure/flow not meeting design target; planned replacement of pressure switches at select locations
 - Routine replacement of filters and UV lamps
 - Replacement of GAC Tanks; 4 replaced to date



Municipal Connections

- Three locations planned for municipal connections
- Proximity to existing municipal water line
- Multiple residents on property/poor well condition
- Designs complete
- Permitting in progress
- Expect 2019 completion



LEGEND

- v — EXISTING DISTRIBUTION LINE
- v — NEW WATER LATERAL TO HOUSE
- v — EXISTING WATER LINE TO WELL



Municipal System

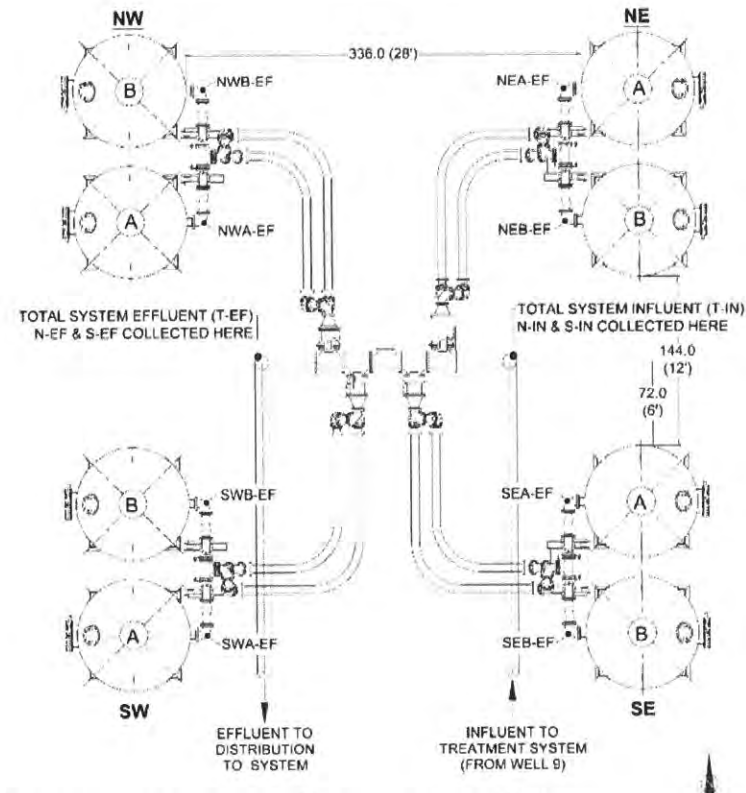
Airway Heights Well #9

- Airway Heights officials identified summer peak water demand above capacity of interties with Spokane water system
- AF time critical action to design and install a temporary, seasonal treatment system at Well #9 to cover summer peak demand
- Aggressive schedule required team of AF, City, EPA, Washington Department of Health (WDOH), and supporting contractors to expedite/accelerate standard timelines



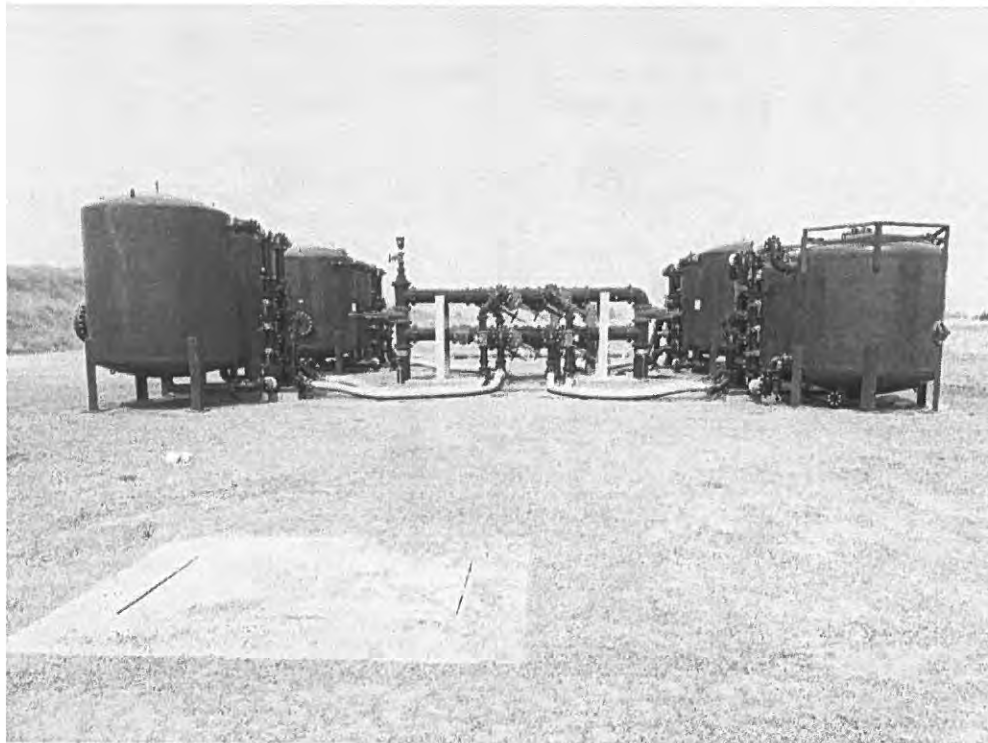
Municipal System Design

- Large scale Granular Activated Carbon (GAC) filtration system selected as treatment technology
- System segregated into four subsystems to allow for partial operation and redundancy
- System designed for 1,200 gallons per minute with pressure telemetry added to City's control system
- Design approved by-WDOH and City of Airway Heights





Municipal System Installation



- Underground portion and aboveground main line installed in June 2018
- Aboveground sub-systems and GAC vessels installed in July to August 2018
- System commissioned in accordance with WDOH requirements in early September 2018
- System passed analytical testing for PFOS/PFOA removal to non-detect levels by mid-September 2018



Municipal System Status

- System operation started in September 2018
- Operation halted to trouble-shoot high micro-bubble aeration making water appear cloudy
- System drained and sealed for Winter weather in October 2018
- Installation of permanent supports and Spring restart in progress



Questions

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***PFOA/PFOS Site
Inspection Update***

Fairchild Air Force Base

June 5, 2019



Overview

- **Timeline of Events**
- **Preliminary Assessment and Site Inspection**
- **Time Critical Removal Actions**
- **On-Going Study/Evaluation Efforts**

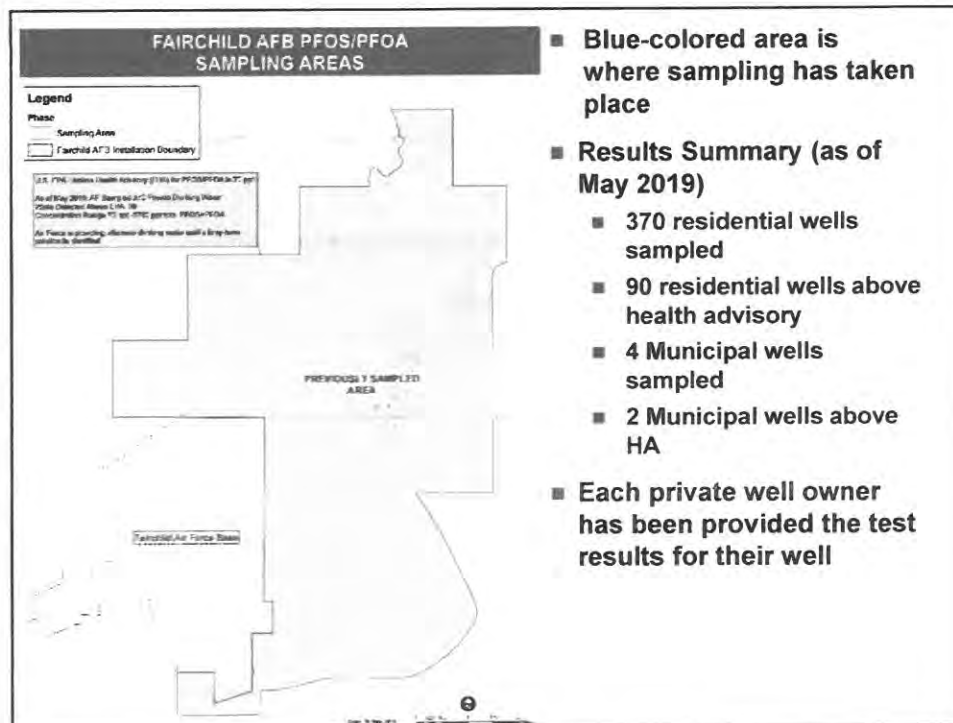
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Timeline of Events

- **2015 – Preliminary Assessment identified AFFF release areas on Fairchild AFB**
- **Feb/Mar 2017 - Site Inspection of 5 on-base suspect AFFF release locations**
- **April 2017 – Initiated off-base sampling - residences and municipal wells (Airway Heights, Medical Lake)**
- **May 2017 thru April 2018 - Off-base sampling area stepped out in phases based upon analytical results and 3 Ps (probability, proximity, pathway)**
- **Aug 2018 – Current sampling area boundary established; no plans to expand until/unless additional info and 3 Ps support it**
- **Outreach**
 - **Town Hall – 23 May 2017 at Medical Lake High School**
 - **Open House - 19 April 2018 at Spokane Falls Comm College**

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Preliminary Assessment Site Inspection (PA/SI)

- Preliminary Assessment (PA) consisted of records search and interviews
- Five areas were investigated based on results of PA; Site Inspection (SI) looked at each of these five locations in detail
 - Soil and groundwater were sampled
- SI in the former fire training area identified significant Lifetime Health Advisory exceedance
- PA and SI reports available at Administrative Record
- SI Addendum to undergo regulatory review June 2019

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Residential Wells TCRA

- Time-Critical Removal Action (TCRA) initiated to mitigate exposures to water containing PFOS/PFOA above EPA lifetime health advisory of 70 parts per trillion in private residential wells
- Bottle water provided by Air Force until a treatment system could be installed
- System applied to well to treat water using granular activated carbon (GAC)
- Wells below the health advisory will be monitored regularly. If levels rise above HA, bottled water provided immediately with a treatment system to follow
- TCRA is available in Administrative Record
- TCRA Amendment will connect limited sites to municipal water

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Airway Heights Municipal Well TCRA

- Time-Critical Removal Action (TCRA) initiated to treat PFOS/PFOA in Airway Heights municipal well 9
- When contamination was discovered, Air Force and City of Airway Heights worked to provide city residents with bottled water
- Air Force, Airway Heights worked with the City of Spokane to provide Airway Heights with water from their distribution system
- Air Force has designed and installed a temporary treatment system on well 9 that supplement water supplied by the City of Spokane during high-demand summer and fall months
- System is designed to operate for three summer/fall seasons, during which time a longer-term solution will be identified and implemented
- TCRA is available in in Administrative Record

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Drinking Water Protection Study

- Objective is to improve AF ability to understand and address current and future potential impacts from PFOS/PFOA
- Includes comprehensive data analysis of existing information leading to identification of data gaps
- Detailed stratigraphy will be used to develop regional geologic setting
- Geologic cross sections to be developed as well as a groundwater surface map
- Conceptual site model to be completed in late 2019

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Action Memorandum for a Non-Time Critical Removal Action

- **New alternate drinking water source(s) will be evaluated for the City of Airway Heights**
- **A hydrogeological study is underway to demonstrate appropriateness of alternate source(s) considered for current use and future growth**
- **An Engineering Evaluation/Cost Analysis will evaluate treatment alternatives as well as potential new source(s) that can be considered for implementation**
- **Public meeting will be held to present findings of the EE/CA and to obtain stakeholder input**
- **Action Memo will document the final decision**

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More Information

For more information on PFOS, PFAS and PFBS, visit:

Air Force Civil Engineer Center
www.afcec.af.mil/

Environmental Protection Agency
www.epa.gov/

Agency for Toxic Substances and Disease Registry
www.atsdr.cdc.gov/

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Questions?

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