

Air Force Installation & Mission Support Center



Status of Operable Units at Ellsworth AFB

Jens Christensen, AFCEC/CZOM
Environmental Restoration Program
March 28, 2024



Purpose



To present an update on the status of Operable Units (traditional contaminant sites) at Ellsworth AFB

Overview

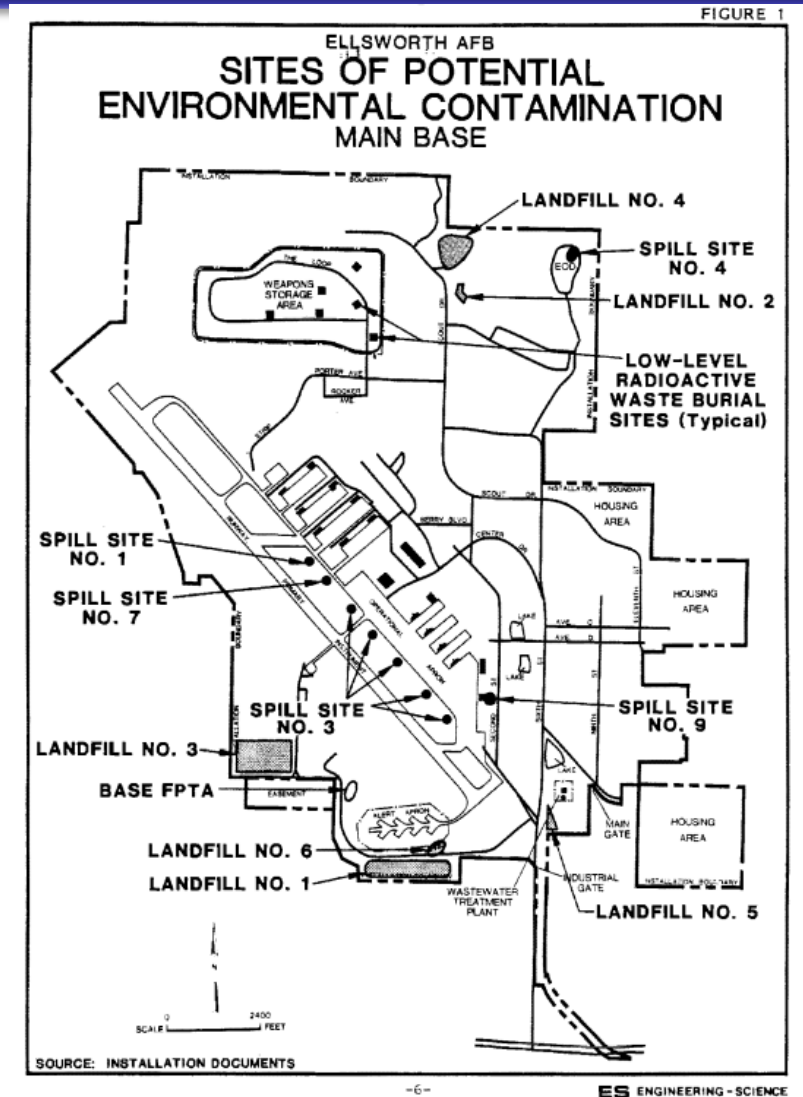
- Where we started
- Where we are
- Where we are going



Where we started



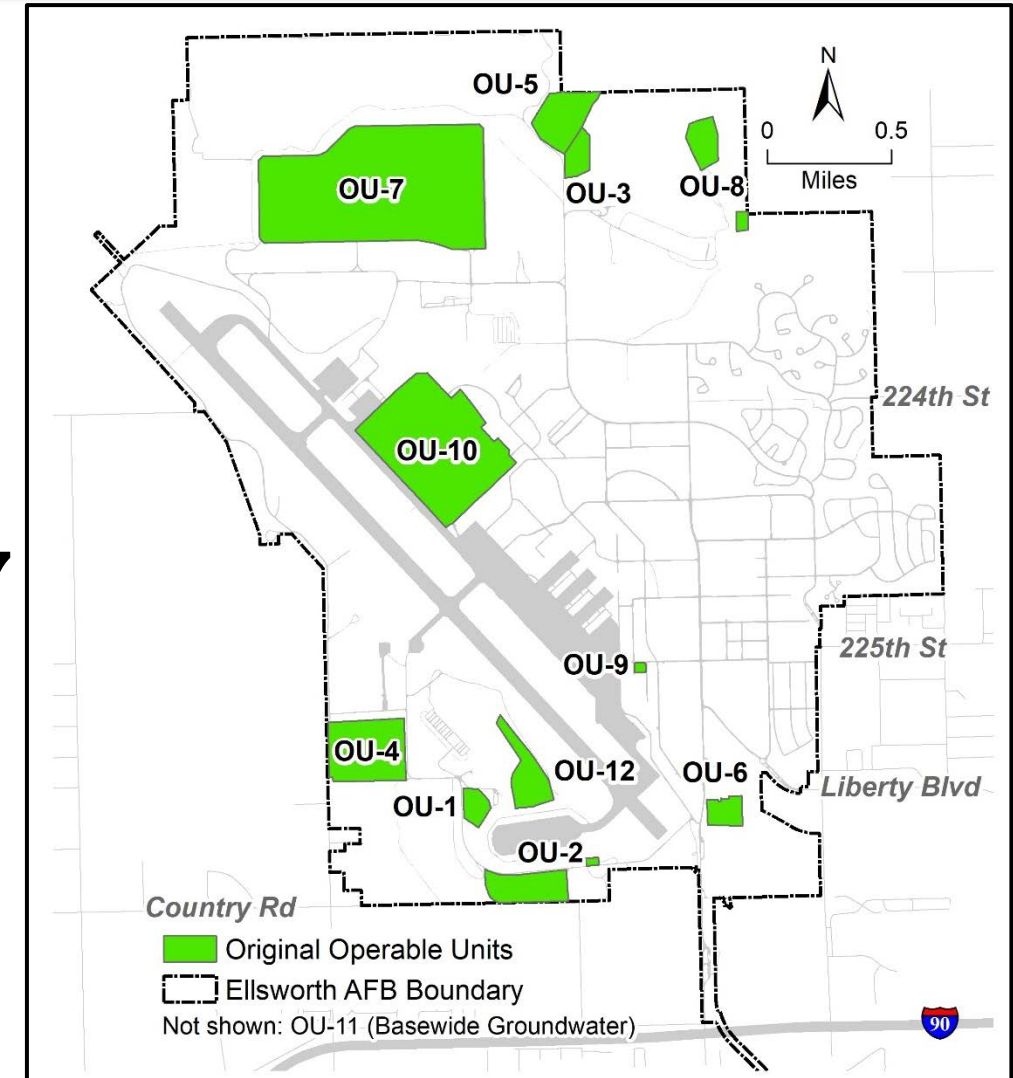
- 1984 – Phase I records search completed
- 1985 – 1989 - Phase II investigation
Concluded that solvents and jet fuel were present in soil and groundwater
- 1989 – I started my career with the Air Force in the IRP
- 1990 – Ellsworth designated as superfund site





Where we started

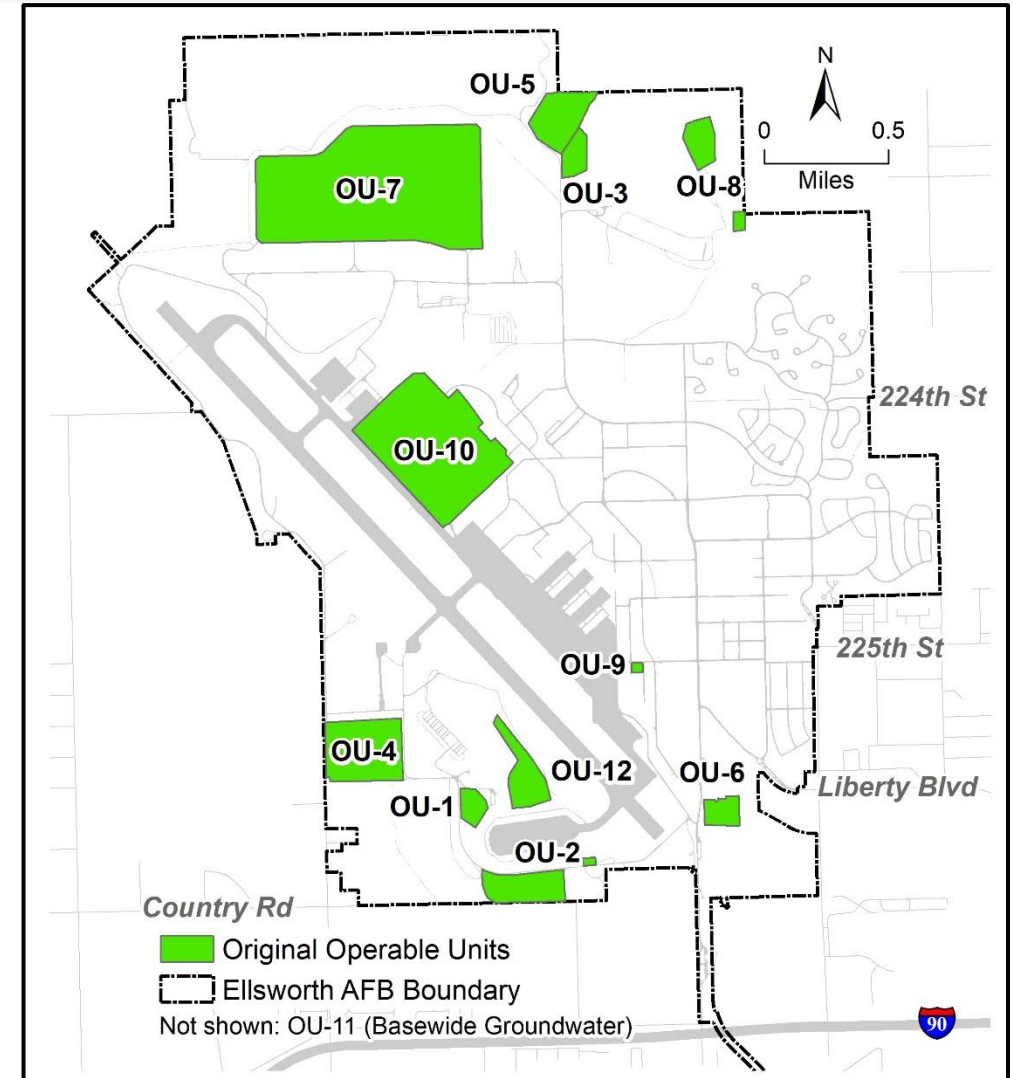
- **1992 Federal Facilities Agreement Signed (12 OUs identified)**
 - 6 Landfills – OU-2, OU-3, OU-4, OU-5, OU-6, & OU-12
 - Former Fire Training Area – OU-1
 - Low-Level Radioactive Waste Site – OU-7
 - 3 Spill Sites – OU-8, OU-9, OU-10
 - Basewide Groundwater – OU-11





Where we started

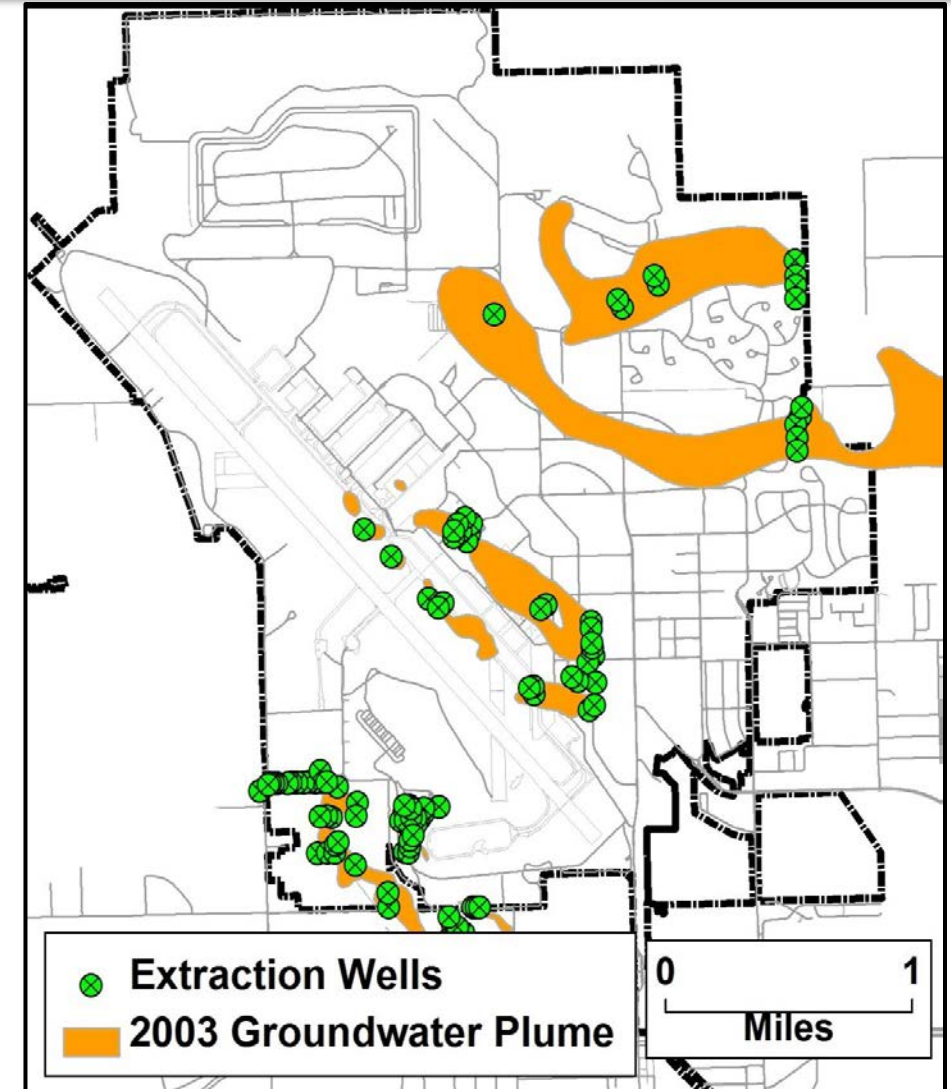
- **1994 – 1996** *PFAS at Ellsworth is here
 - Completed Remedial Investigations (RIs)
- **1995 – 1997**
 - Completed Feasibility Studies (FSs)
- **1995 – 1997**
 - Completed Records of Decision (RODs)
- **1995 – 1997**
 - Landfill Remedial Actions in Place





Where we started

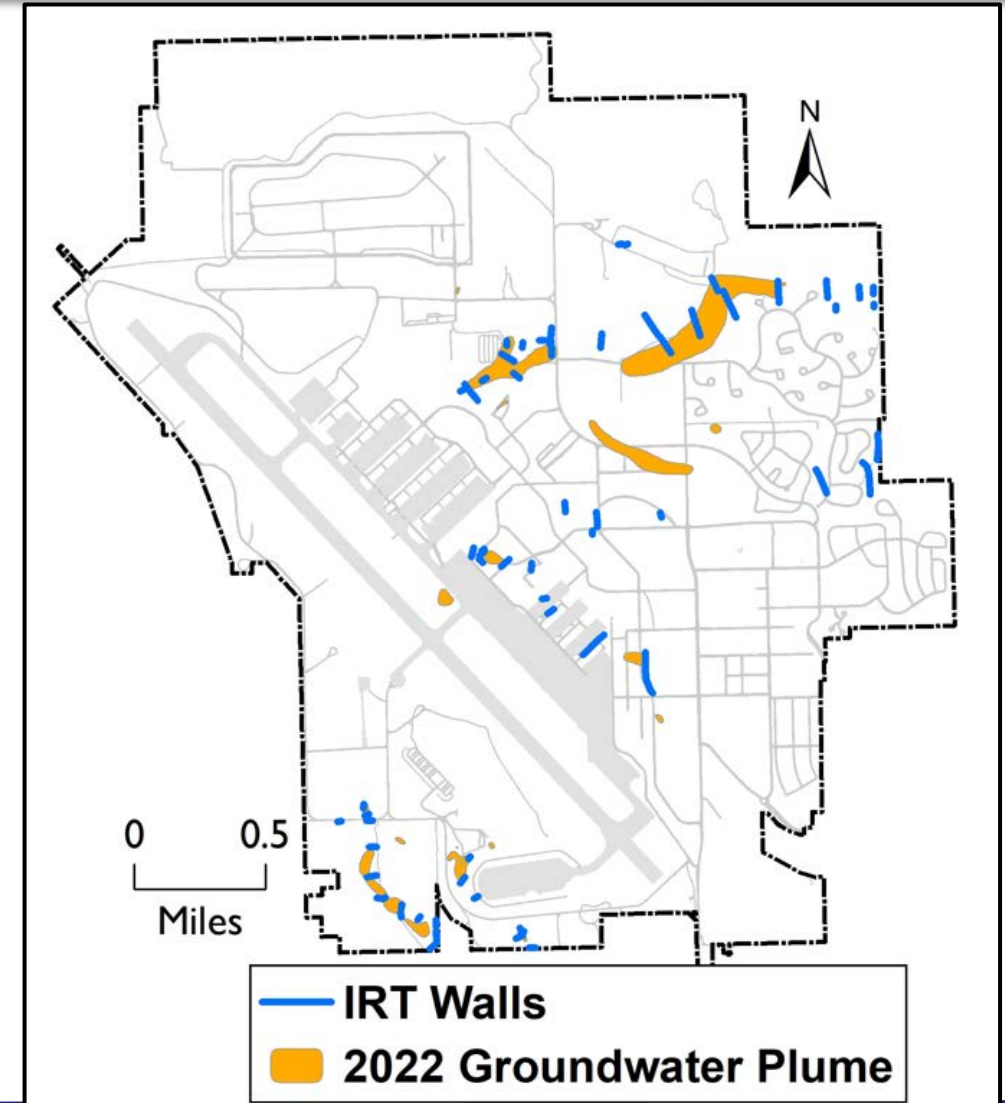
- 1996 – Pump and Treat begins





Where We Are

- **2012 – Switched treatment to in-situ reductive treatment (IRT; aka bioremediation)**
 - Contamination is treated in place
 - The natural biodegradation process is optimized and monitored

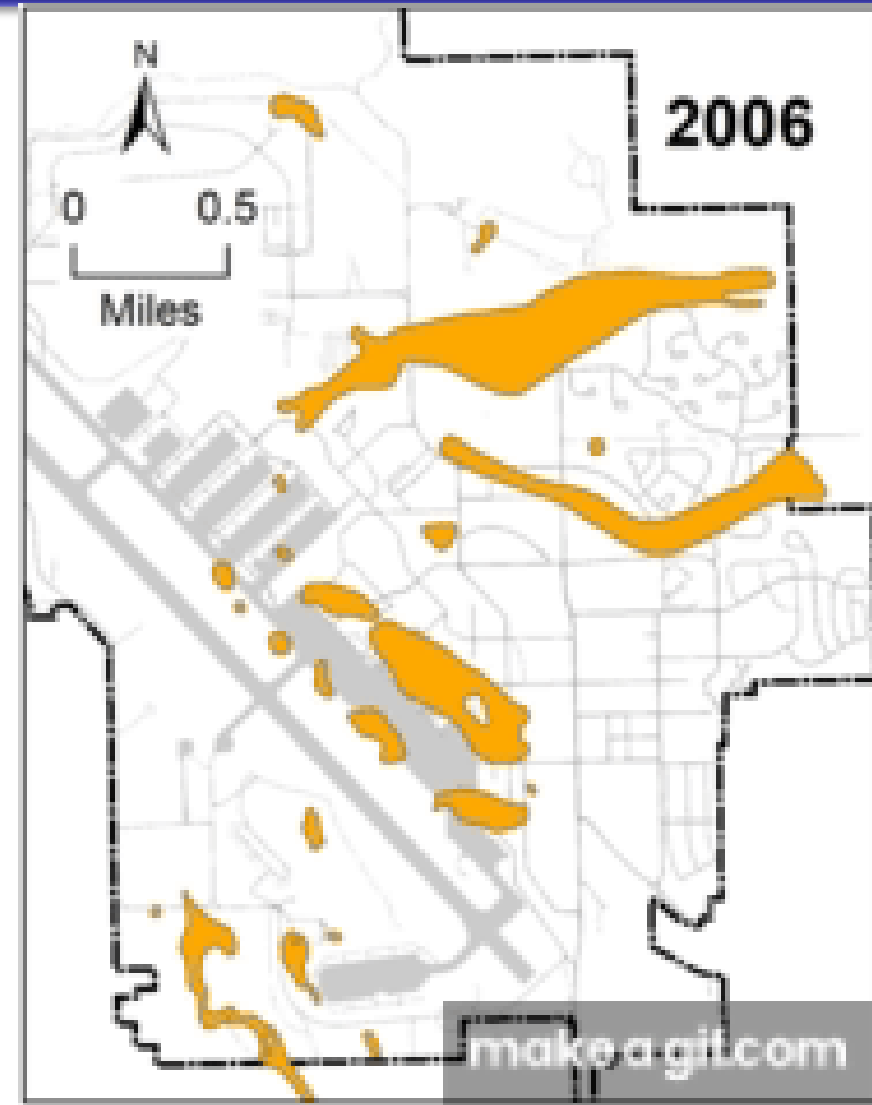




Where We Are

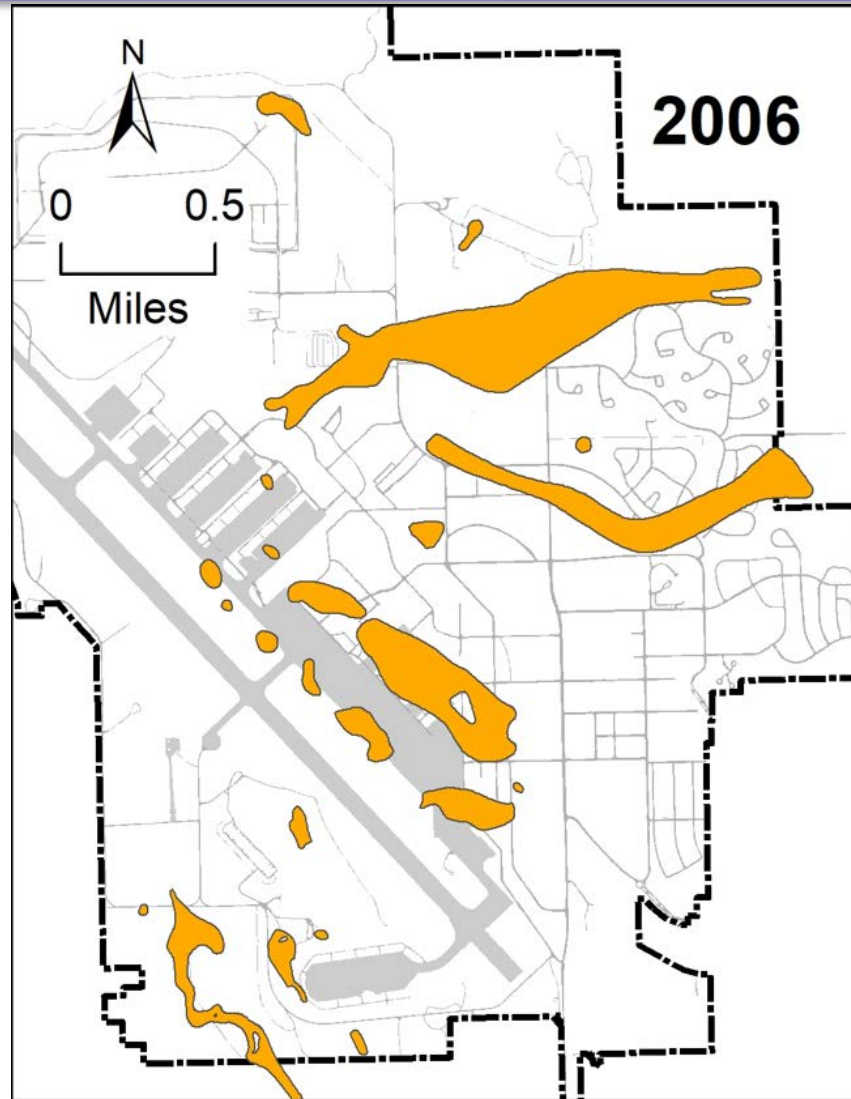
OU-11 Plume Progress 2006-2023

- 1996 – Pump and Treat Systems begin operation
- 2012 – Switch treatment to IRT





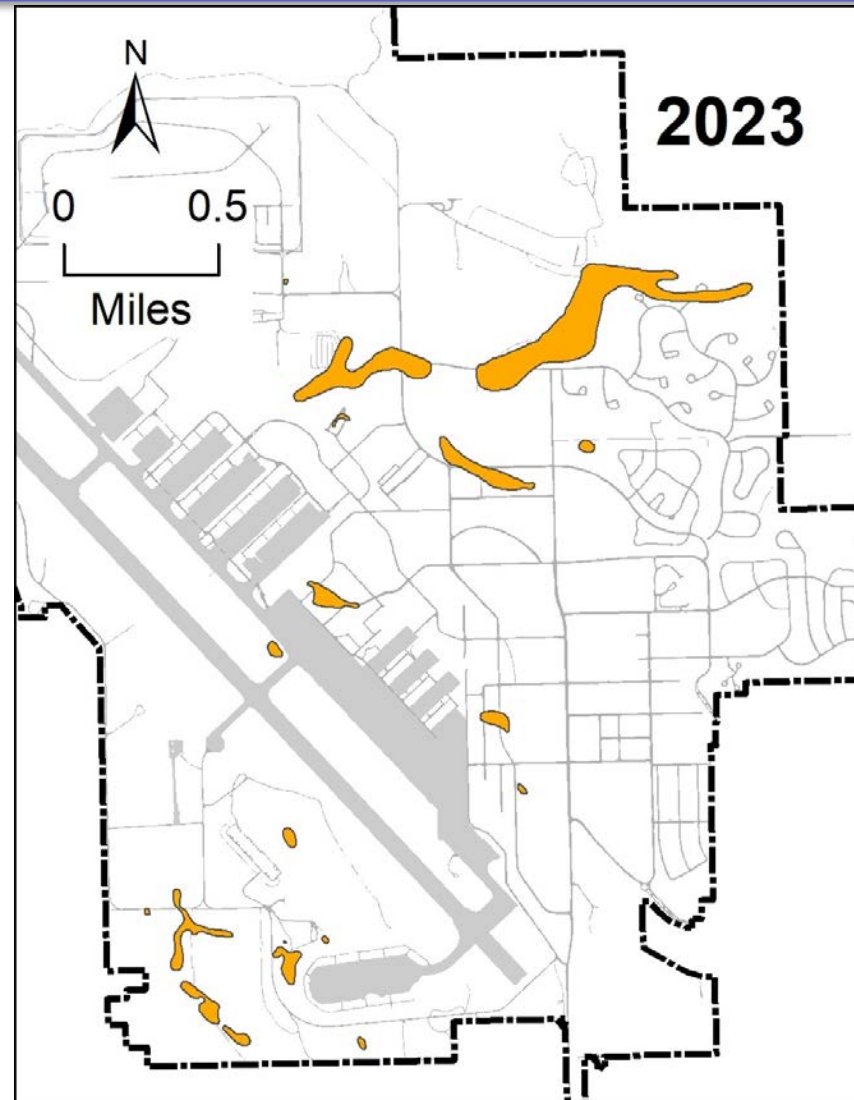
Where We Started



Your Success is Our Mission!



Where We Are

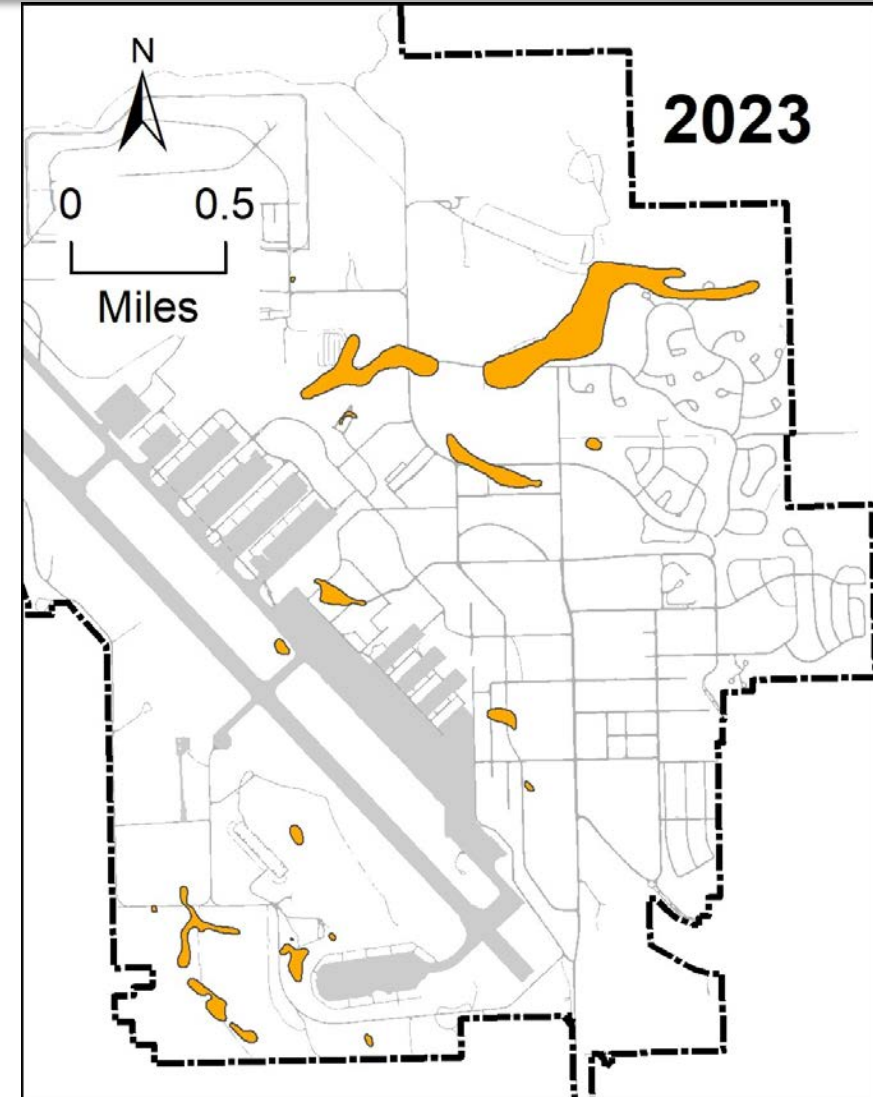




Where We Are Going

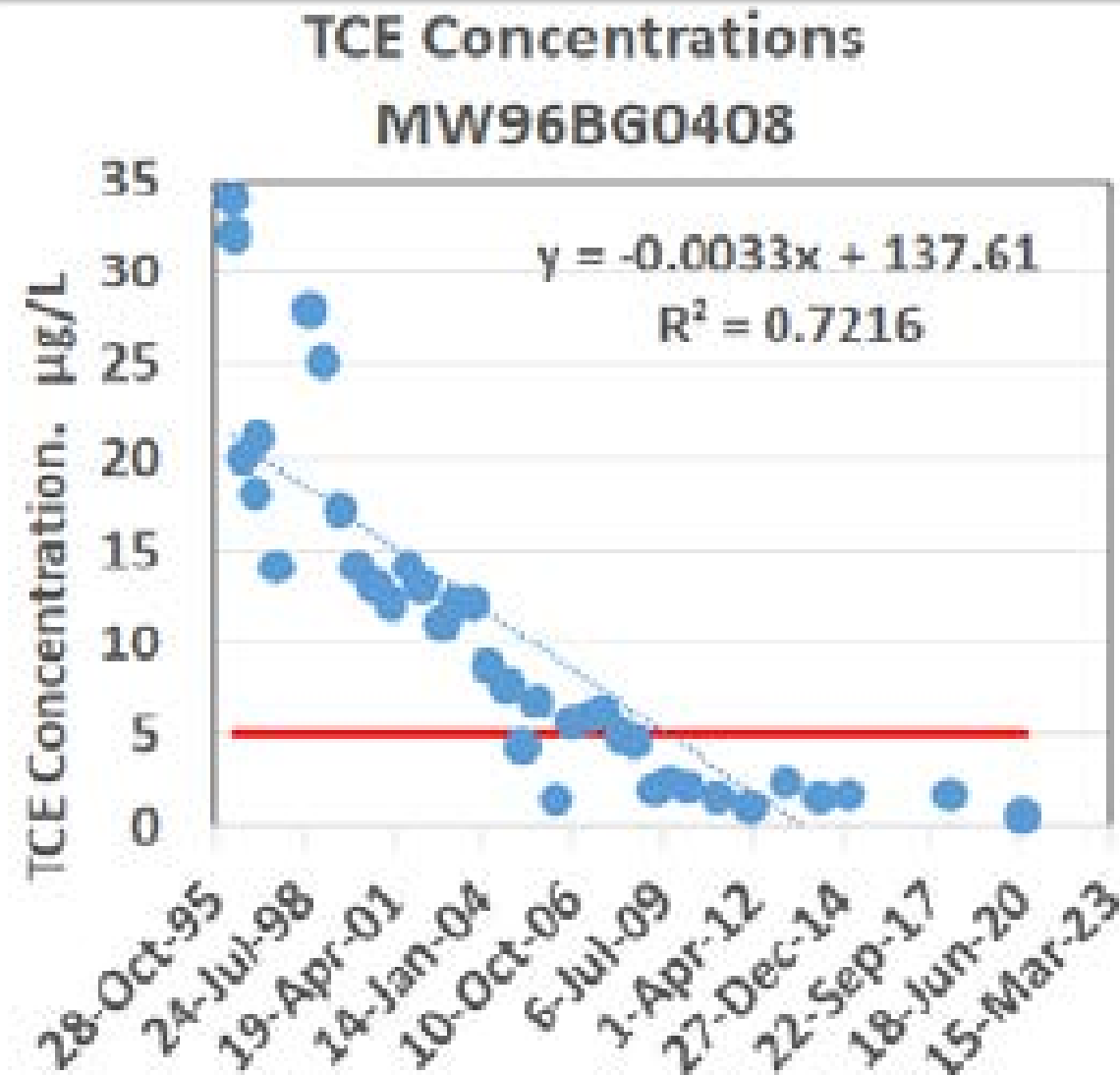
Exit Strategy Criteria

1. Minimum 4 samples
2. Stable to decreasing trend
3. Concentration below MCL/PAL for 3 consecutive years
4. Simultaneous verification sampling of all plume monitor wells





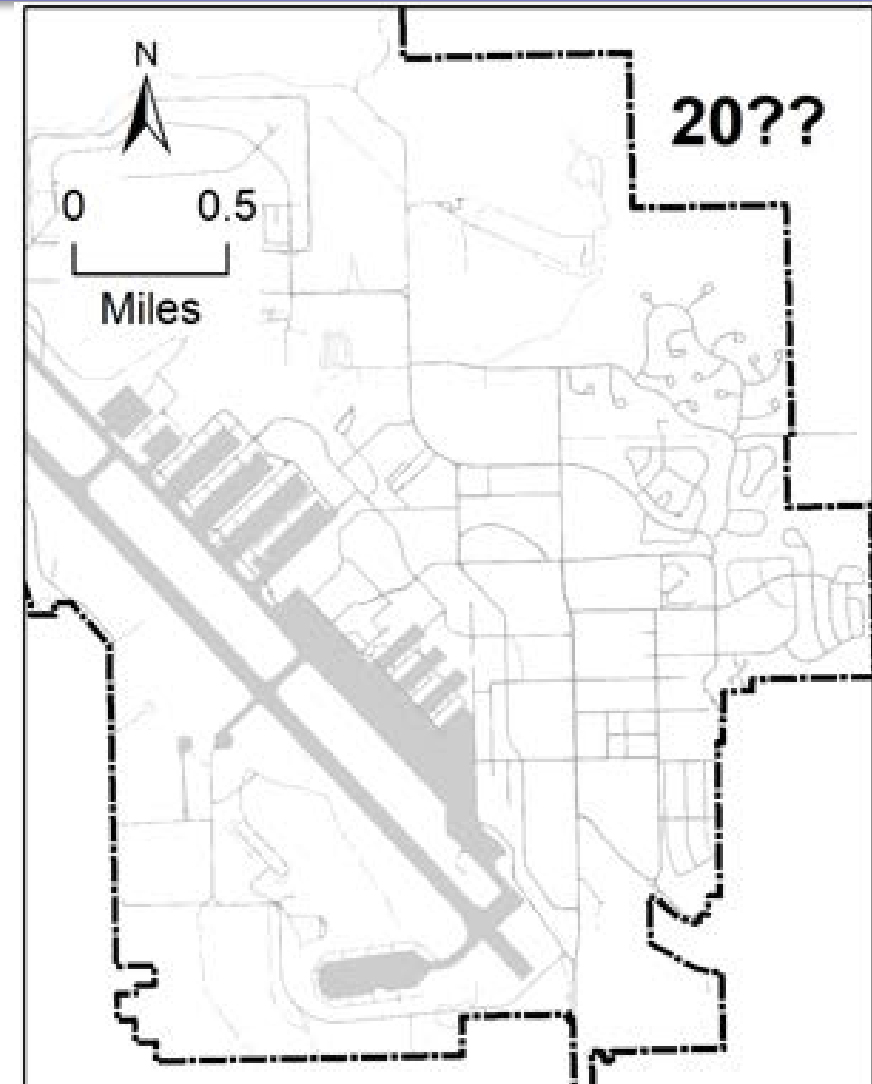
Where We Are Going



Where We Are Going

The Future:

- Long-Term Monitoring and Inspection of Landfills
- Land Use Controls
- Plume Treatment, Monitoring and Closeout



Air Force Installation & Mission Support Center



PFAS Remedial Investigation Status Ellsworth AFB

Rita Krebs, PG
Environmental Restoration Program
March 28, 2024



Purpose



To present the status of the Remedial Investigation for per- and polyfluoroalkyl substances (PFAS) at Ellsworth AFB



- **Background**
- **Status of Remedial Investigation for PFAS**
- **Remediation plans at Ellsworth AFB**
- **Update on transition away from legacy firefighting foam**
- **Resources for additional information**

Background on PFAS

- **PFAS = Per- and polyfluoroalkyl substances**
 - Very stable and persistent in the environment
 - Water-soluble and highly mobile in groundwater
 - Bioaccumulate
- **PFAS are man-made chemicals found in:**
 - Nonstick cookware (Teflon)
 - Stain-resistant fabric/carpet (Scotchgard)
 - Water resistant clothing/shoes (Gore-Tex)
 - Some food packaging
 - Firefighting foam





Background on AFFF



- **1960s – Navy collaborated with 3M to develop aqueous film-forming foam (AFFF)**
 - **1967 – 134 sailors died in fire on aircraft carrier USS Forrestal**
 - **Late 1960s – Navy mandated use of AFFF**
- **AFFF**
 - **Efficient at extinguishing petroleum fires**
 - **On ships and aircraft, proximity of people, fuel, and munitions is dangerous**
 - **Widely used across firefighting industry, to include commercial airports**
- **1970 – Air Force began using AFFF**
 - **Air Force did not use AFFF negligently or in violation of environmental laws**
 - **Used according to manufacturer's guidelines**



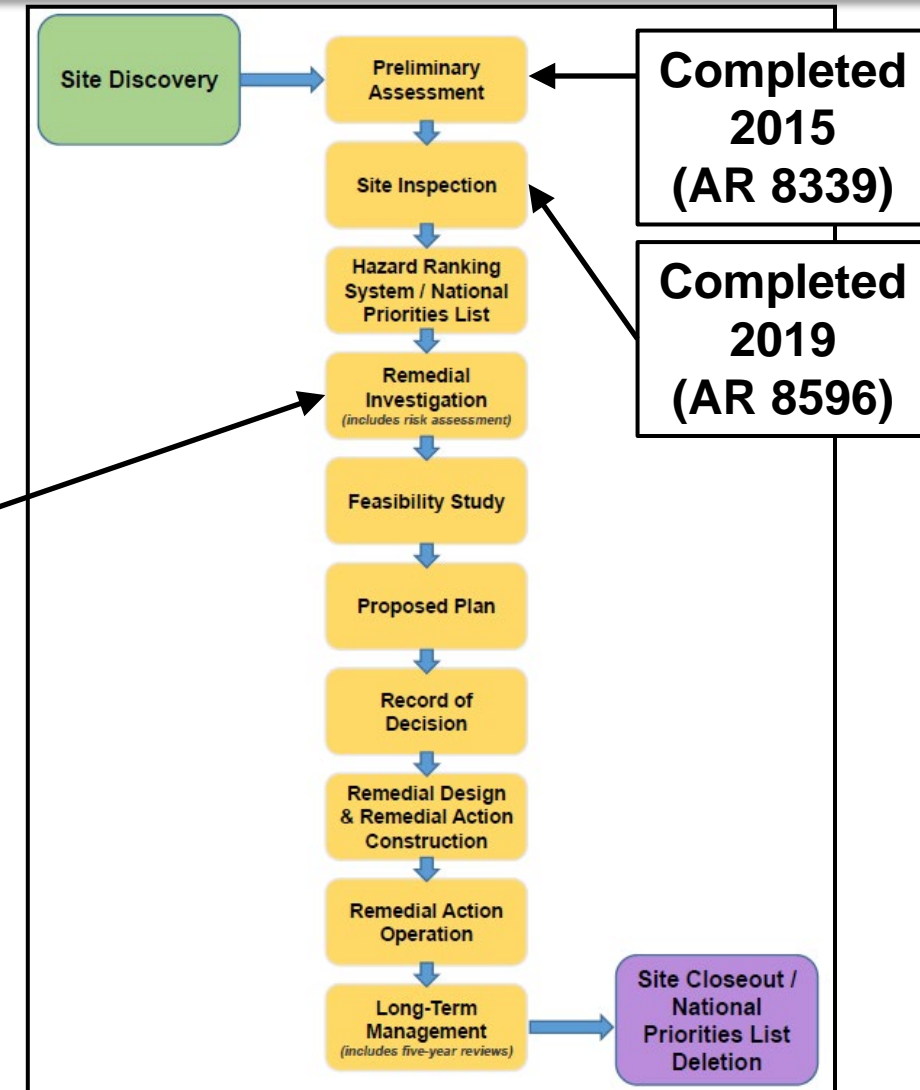
U.S. Navy Photograph USN1124775



Background on CERCLA (AKA Superfund)

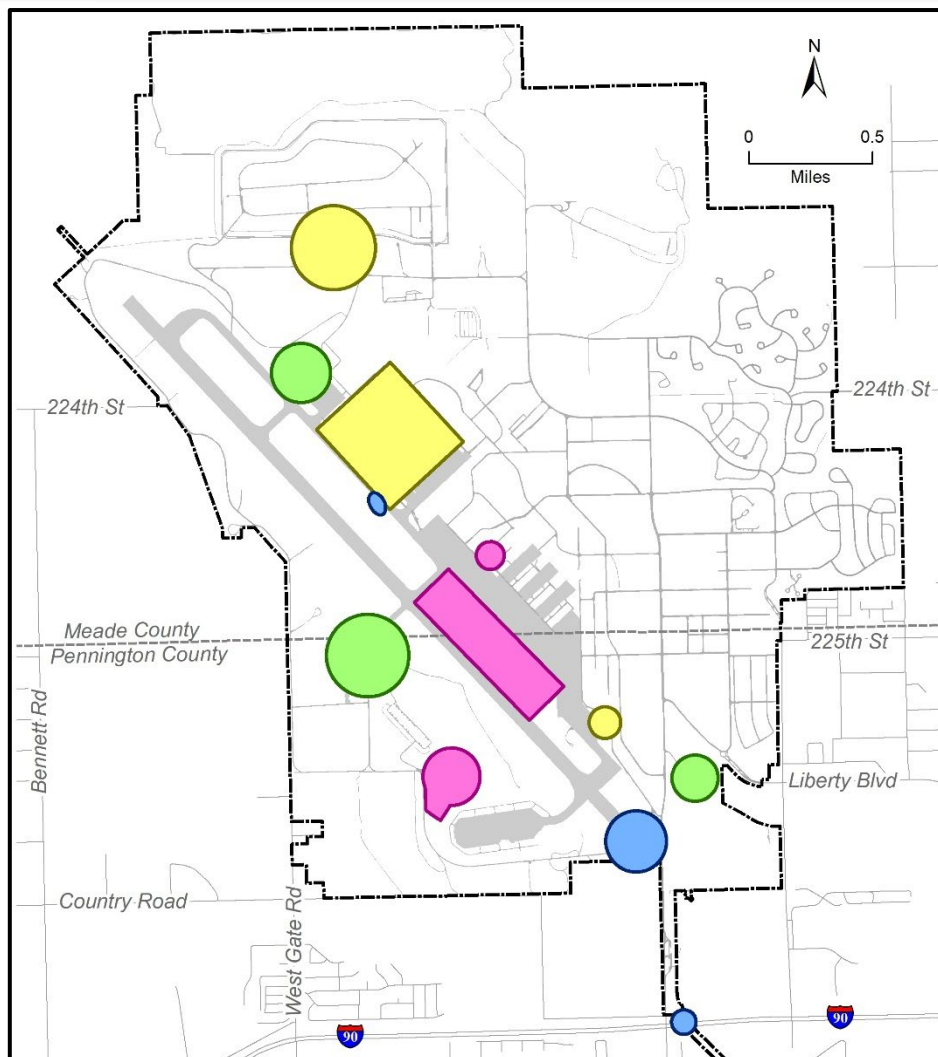


- Air Force is responding to PFAS in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA or “Superfund”)
- Currently in Remedial Investigation stage for PFAS





Background on AFFF Sites at Ellsworth AFB



- Training/Nozzle Testing/Former Fire Station
- Emergency Response
- Fire Suppression System
- Spill/Other
- Ellsworth AFB Boundary



2020-2023: Basewide Remedial Investigation



- Phase I RI sampling completed from 2020-2023
- 1,200 samples collected
- 87 new monitor wells installed
- Reporting underway (Final coming in 2025)



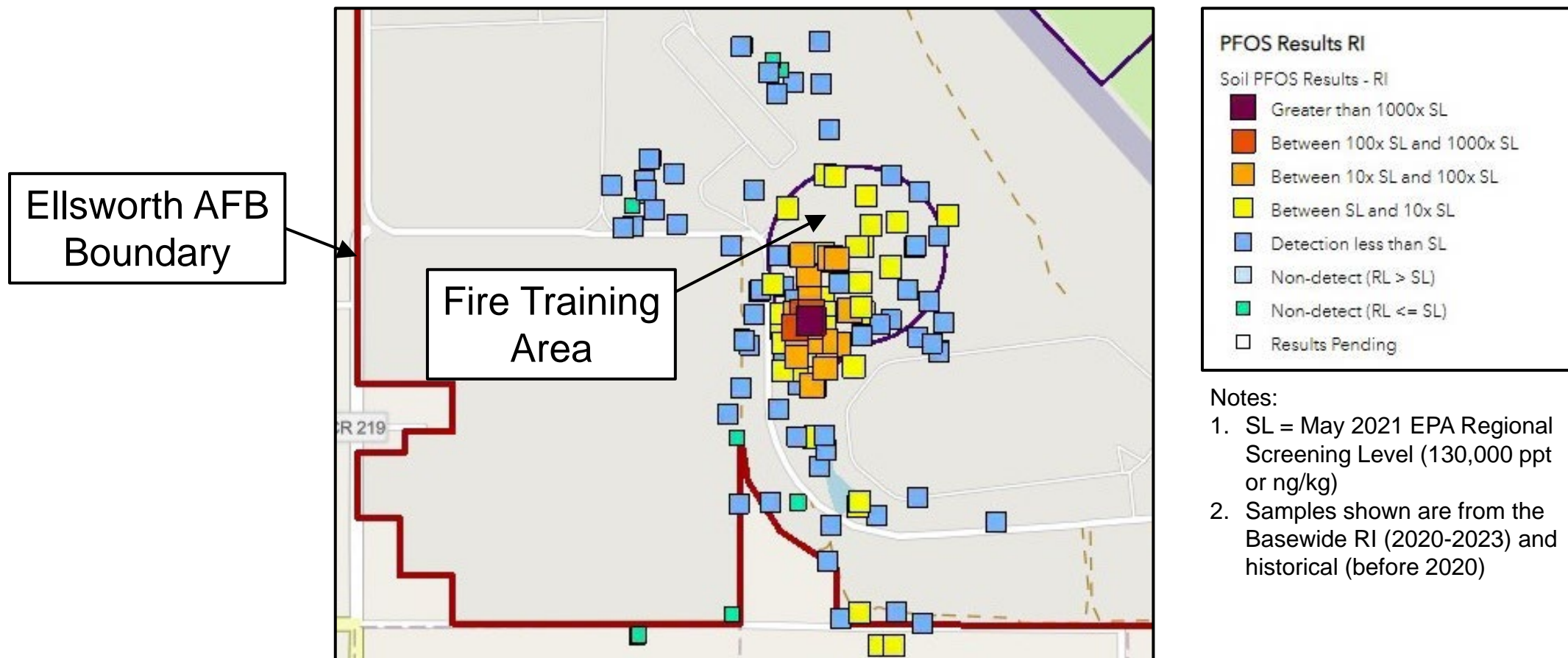
Drilling a new monitor well in 2023



New Monitor Well

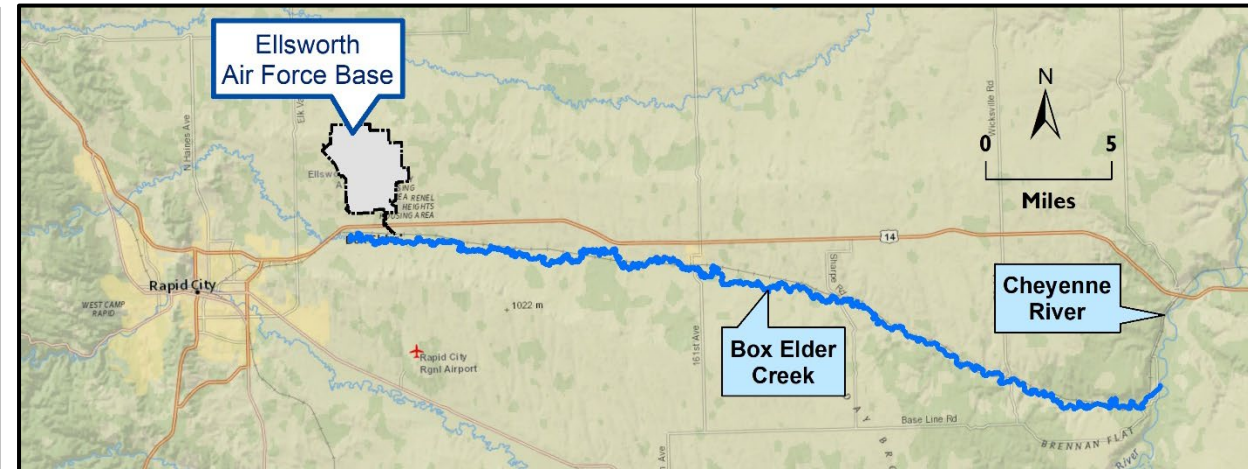
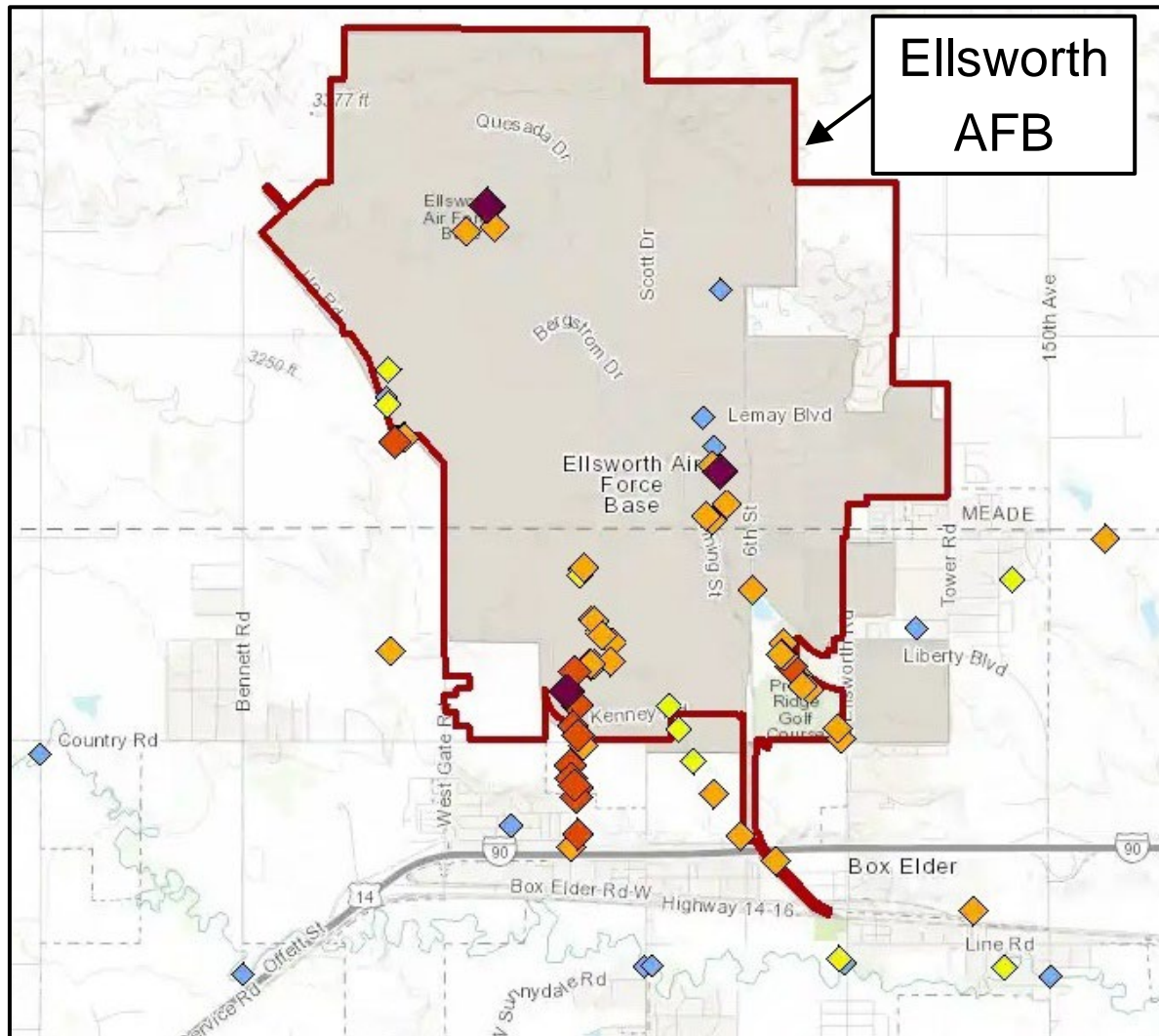


2020-2023: Basewide Remedial Investigation – PFOS in Soil





2020-2023: Basewide Remedial Investigation – PFOS in Surface Water



Legend

PFOS Results RI

Surface Water PFOS Results - RI

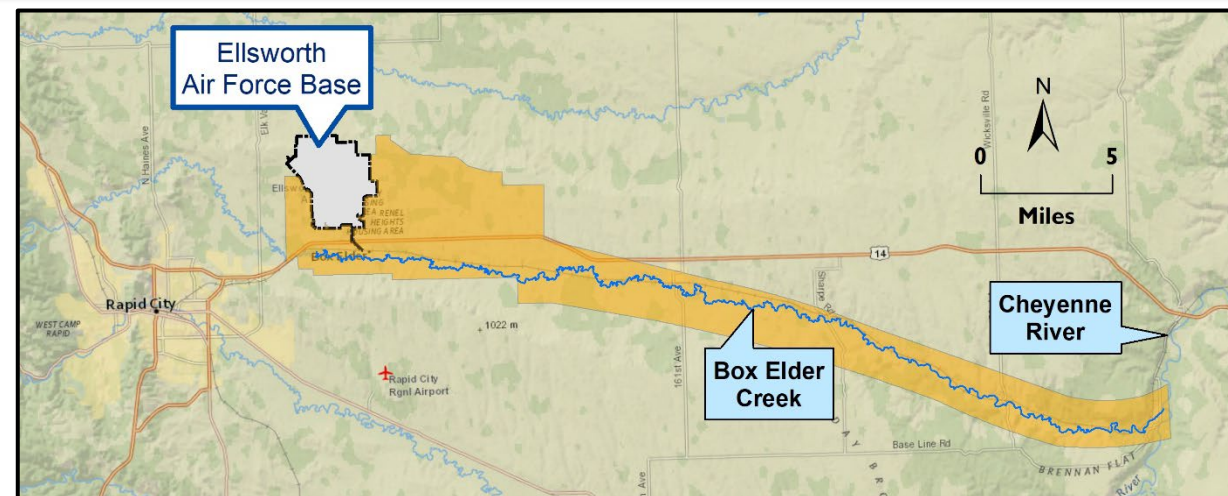
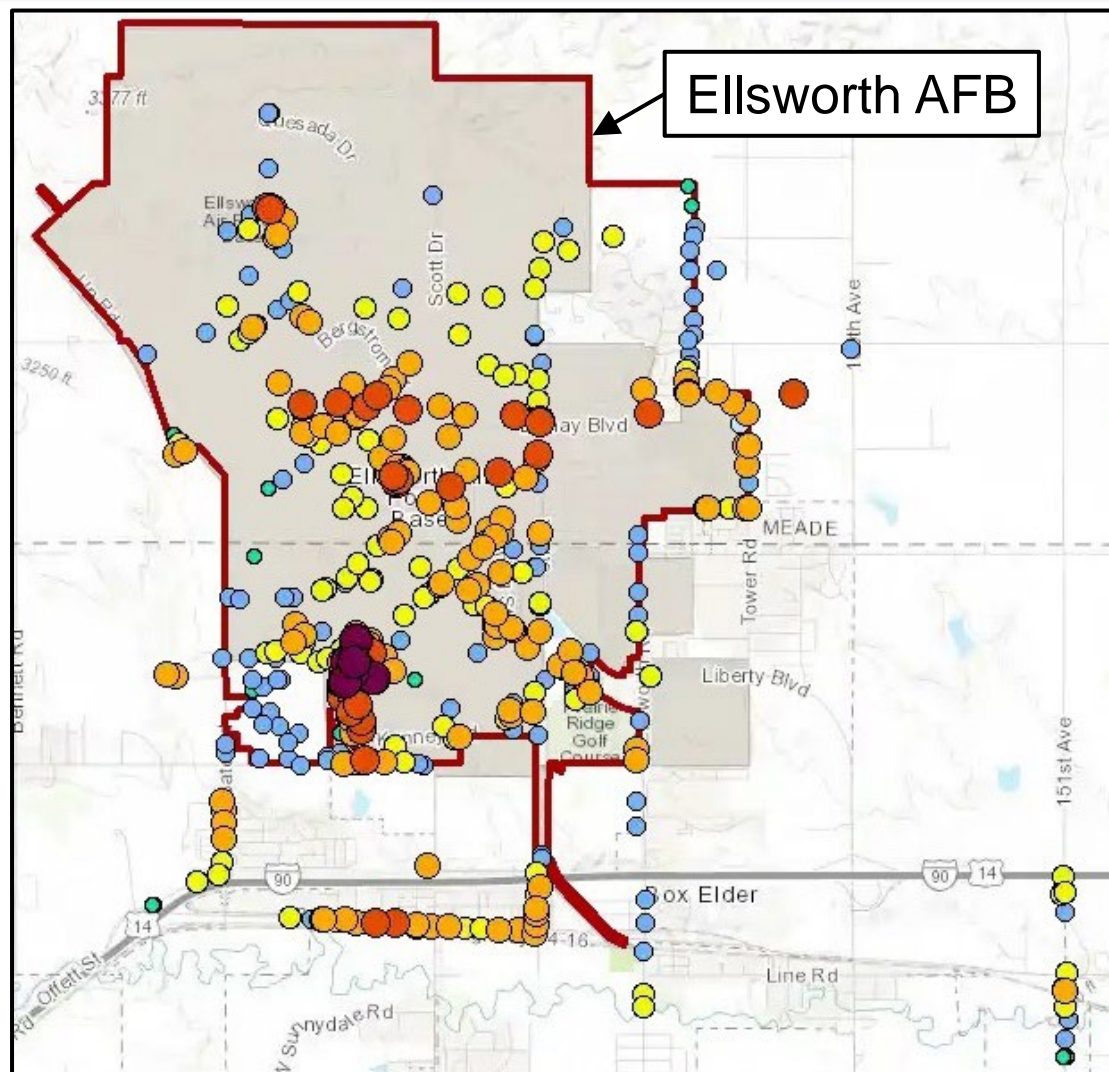
- Greater than 1000x SL
- Between 100x SL and 1000x SL
- Between 10x SL and 100x SL
- Between SL and 10x SL
- Detection less than SL
- Non-detect (RL > SL)
- Non-detect (RL ≤ SL)
- Results Pending

Notes:

- SL = May 2021 EPA Regional Screening Level (40 ppt or ng/L)
- Samples shown are from the Basewide RI (2020-2023) and historical (before 2020)



2020-2023: Basewide Remedial Investigation – PFOS in Groundwater



Legend

PFOS Results RI

On-Base Groundwater PFOS Results - RI

- Greater than 1000x SL
- Between 100x SL and 1000x SL
- Between 10x SL and 100x SL
- Between SL and 10x SL
- Detection less than SL
- Non-detect (RL > SL)
- Non-detect (RL <= SL)
- Results Pending

Notes:

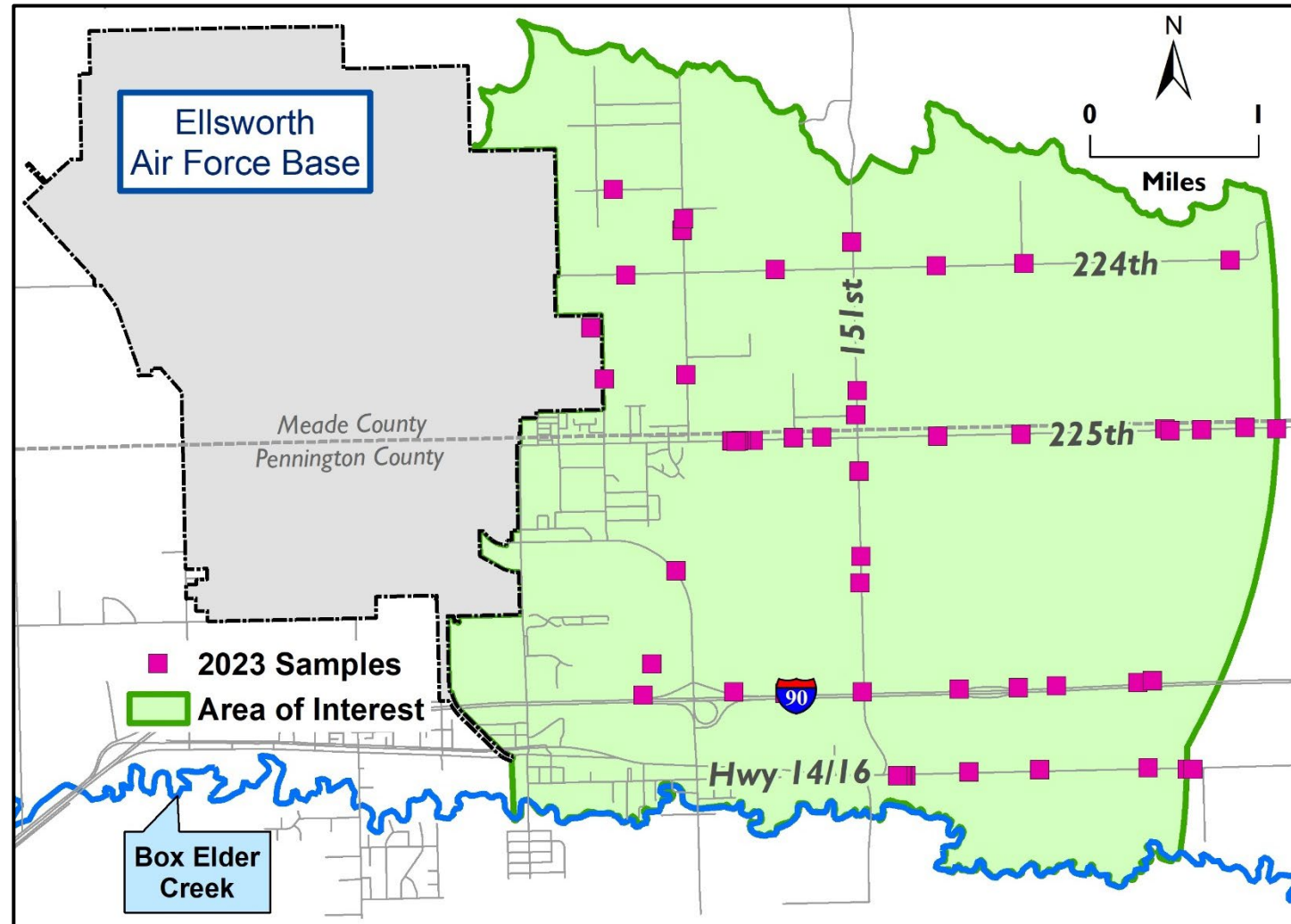
1. SL = May 2021 EPA Regional Screening Level (40 ppt or ng/L)
2. Samples shown are from the Basewide RI (2020-2023) and do not include private wells nor historical results



2023-2026: East Off-Base Remedial Investigation



- Fall 2023: Samples collected in public rights-of-way
- 2024: Sampling planned on private properties
- 2027: Reporting complete

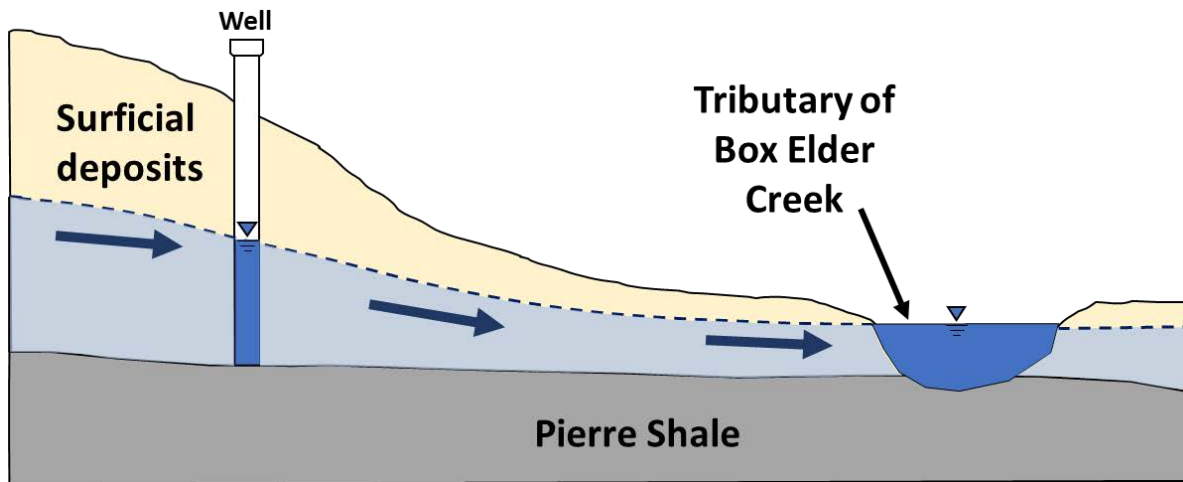




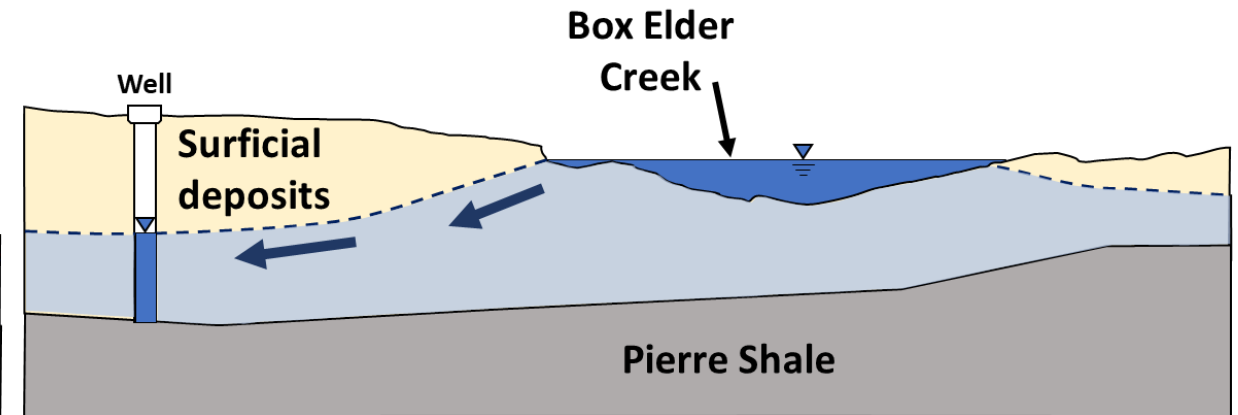
Surface Water / Groundwater Interactions



Direction of Groundwater Flow →
Water Table ▼



Gaining Stream
(groundwater recharges surface water)



Losing Stream
(surface water recharges groundwater)

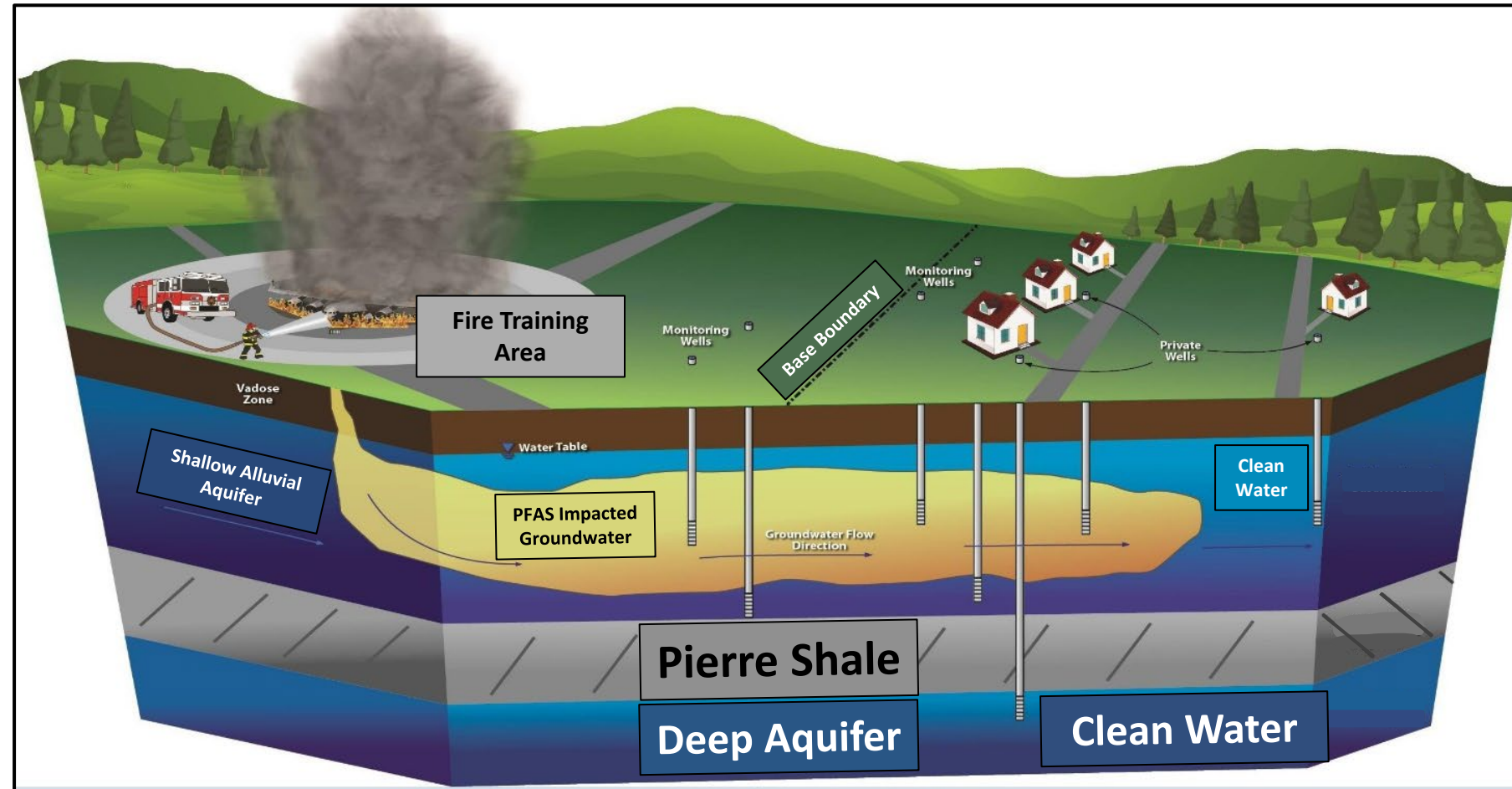
Modified from Bill Eldridge (U.S. Geological Survey Dakota Water Science Center)



City of Box Elder and Ellsworth AFB Drinking Water Supplies Not Impacted



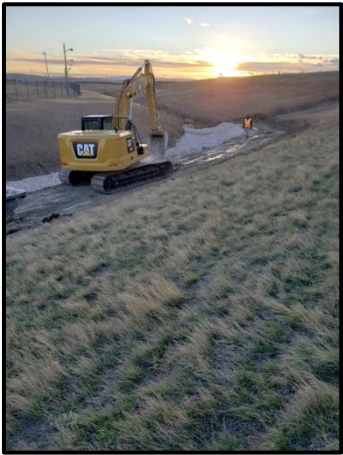
- Ellsworth AFB drinking water comes from Rapid City municipal system:
 - Supplied from west Rapid Creek (Pactola) and deep Madison Aquifer wells
 - Not impacted
- City of Box Elder drinking water:
 - Supplied from deep (>4,000 feet) Madison Aquifer wells
 - Not impacted





PFAS Remediation Current and Future Projects (2024)

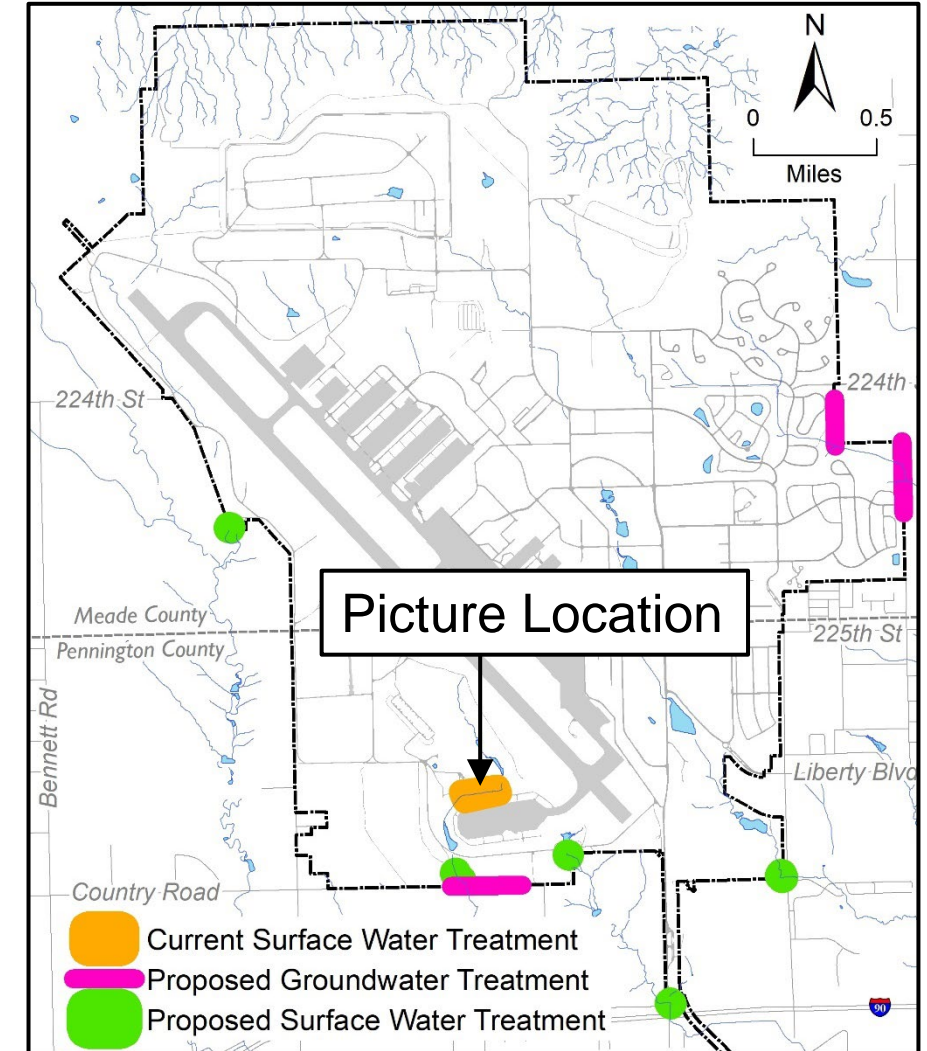
- **Current Action (Demonstration Project)**
 - Surface water treatment – Clay Mats
- **Proposed Base Boundary Actions**
 - Groundwater treatment – Pump and Treat
 - Surface water treatment – Clay Mats



Installing clay mats in the drainage south of the fire training area in 2021



The surface water drainage after installation of the clay mats





Transition Away From Legacy AFFF at Ellsworth AFB



2012

Hangars switched to alternate foam

2017

Training switched to water-only

2018

Emergency response vehicles switched to alternate foam

2023

Hangars switched to water-only fire suppression

2024

Emergency response vehicles will transition to Fluorine Free Foam (F3)



Resources for Additional Information



■ Quarterly Newsletters

- Mailed to 300+ off-Base residents and local/state officials
- Most recent issue – Mar 24
- Next Issue – Jun 24

■ Administrative Record Website

- <https://ar.afcec-cloud.af.mil/>
- Search for “Air Force Administrative Record”

■ Environmental Matters Website

- <https://www.ellsworth.af.mil/About-Us/Environmental/>

Restoration NEWS
March 2024 | Issue 28
NEXT NEWSLETTER
The next newsletter will be released in June 2024.
VISIT OUR WEBSITE
<https://www.ellsworth.af.mil/About-Us/Environmental/>
View the following:

- Past newsletters
- PFAS Updates
- Presentations
- Public announcements

CONTACT PUBLIC AFFAIRS
28 BW/PA
1958 Scott Drive
Ellsworth AFB, SD 57706
(605) 385-5056
FOR MORE INFORMATION
Visit the Administrative Record (AR) Website
<https://ar.afcec-cloud.af.mil/>

- From the “Installation List” on the left, scroll down and select “Ellsworth AFB, SD”
- If you know the AR number enter it next to “AR #” and click “Search”
- Click on the magnifying glass to open
- Numerous other search blocks can be used

ELLSWORTH AIR FORCE BASE
Keeping residents informed of cleanup activities
Community Town Hall Meeting
Thursday, March 28th from 4:00 to 6:00 p.m.
130 Kansas City Street, Suite 100
Host: Pennington County Board of Commissioners
Purpose: Updates on Air Force response actions regarding per- and polyfluoroalkyl substances (PFAS)
Location: The Commission Chambers at the Pennington County Administration Building in Rapid City
The meeting will also be available remotely via the Zoom link below.

Speaker	Organization	Topics
Travis Lasseter	Pennington County Board of Commissioners	Opening remarks / introductions Closing remarks / questions
Jens Christensen	Air Force Civil Engineer Center	Status of Operable Units
Rita Krebs	Air Force Civil Engineer Center	PFAS Remedial Investigation Upcoming PFAS Cleanup Plans
Howie Aubertin	S.D. Ellsworth Development Authority	Ellsworth Community Clean Water Project Update
Rachel Puttmann	U.S. Environmental Protection Agency (EPA) Region 8	Introducing the EPA Technical Team
Will Folland	U.S. EPA Region 8	Understanding PFAS Regulatory and Non-regulatory Values
Karen Scruton and Elizabeth Irvin	Agency for Toxic Substances and Disease Registry	PFAS Exposure Assessment Results and Petition Process

****To watch the Community Town Hall via Zoom:**
<https://us02web.zoom.us/j/7755207200?omn=81356022576> or
<http://tinyurl.com/pennco-town-hall>
Zoom Meeting ID: 775 520 7200

Air Force Determines No Further Action is Necessary at Off-Base Sludge Disposal Site
The Air Force recently completed PFAS sampling at an off-Base private property where sludge from the former Base wastewater treatment plant was land applied. The sludge was land applied in 2004 and 2005 with approval from the State. Based on laboratory analysis of soil samples collected in February 2023, seven PFAS constituents were detected below applicable screening levels. Shallow groundwater was not encountered. Therefore, the Air Force determined no further action is required at the site.
The Final Site Inspection Report for the Wastewater Treatment Plant Sludge Land Application Site is AR# 8820 on the Administrative Record (see instructions on the left).



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