

Air Force Civil Engineer Center



Ellsworth AFB Environmental Restoration Program

AFCEC/CZOM
22 March 2022



Purpose



To provide an update on the environmental restoration program at Ellsworth AFB



Overview



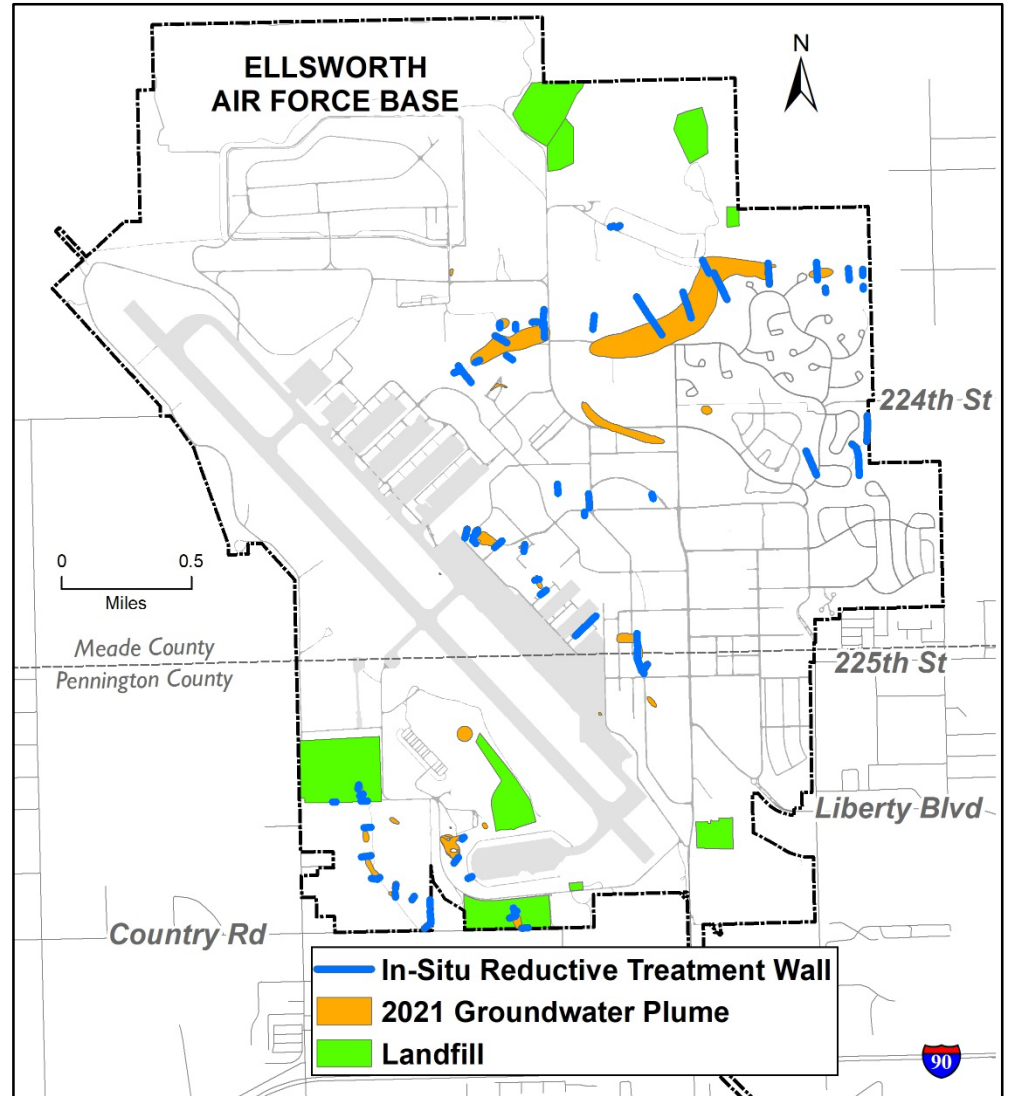
- **Legacy Restoration Issues (Mr. Jens Christensen)**
 - **Solvents (mostly trichloroethene [TCE])**
 - **Petroleum**
 - **Landfills**
- **PFAS (Ms. Rita Krebs)**



Optimized Remediation Contract



- Long term management of 9 landfills
- Long term monitoring and cleanup of 12 TCE and 3 petroleum plumes in groundwater
- Treatment has shifted from “pump-and-treat” to in-situ remediation

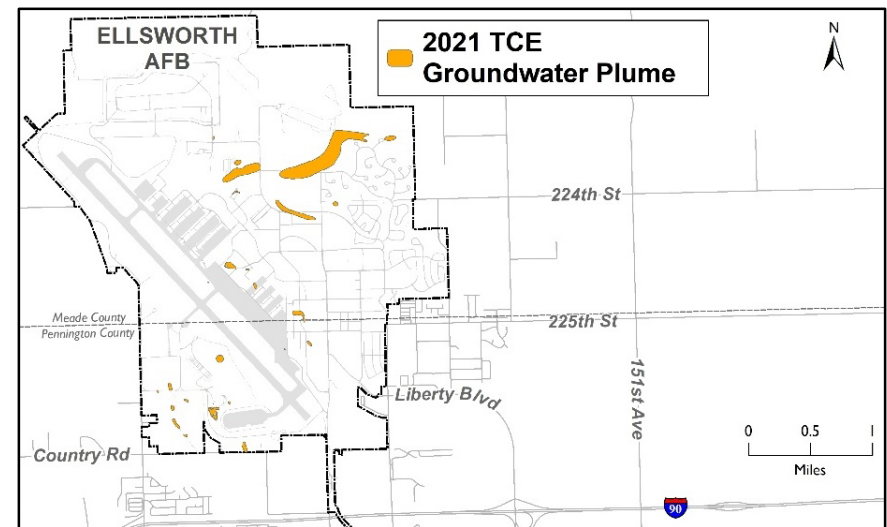
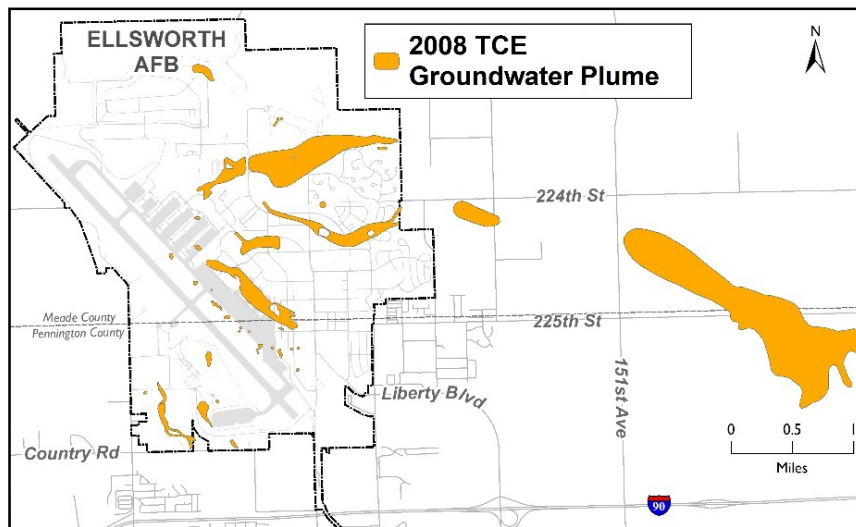




East Waterline Exit Evaluation



- **Constructed by USAF in 1997 for TCE contamination**
 - Turned over to City of Box Elder in 2006 to own and operate
 - AF paid water bills for 51 residences for 20+ years
- **State/EPA agreed Record of Decision terms are met**
- **Memoranda of Agreement Terminated August 2021**
 - Residents paying their water bills as of October 2021
- **Took 13 years to delineate and then 20 years to clean up TCE off-Base**

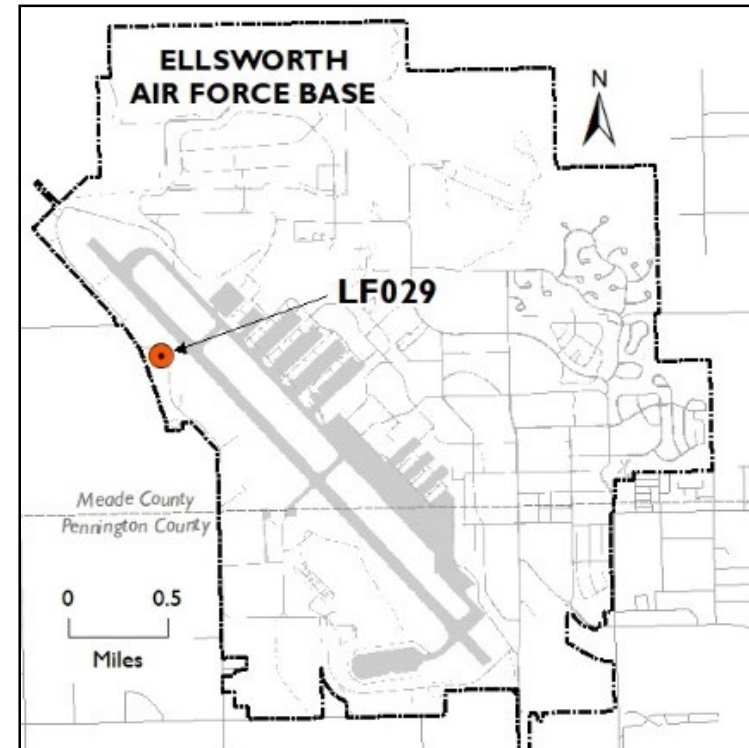
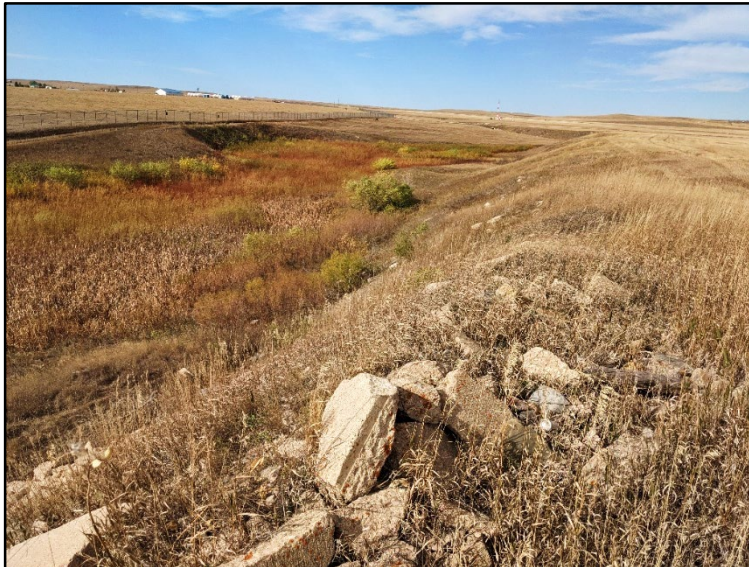




LF029 (Hardfill No. 2) Site Inspection



- Evidence of historical material disposal observed during 2020 Base cleanup day
- Work Plan preparation underway
- Field work summer 2022
- Goal is to determine presence or absence of contamination





PFAS – Overview

- Well survey & sampling conducted 2018-2019
- 23 off-Base drinking water wells (94 residences) identified with PFOS/PFOA > Lifetime Health Advisories (HAs)





Drinking Water Well Mitigation at Individual Residences



- **Bottled water provided within 48 hours to 94 residences**
 - Still providing bottled water at 3 residences
- **Connected 6 properties to existing municipal systems**
- **Installed, operate, and maintain 20 household treatment systems**
- **Quarterly sampling where PFOS/PFOA results were less than Lifetime HAs but above $\frac{1}{2}$ Lifetime HAs**
 - 2 wells still in quarterly program



Typical household treatment system

Drinking Water Well Mitigation at a Mobile Home Park

- Installed, operate, and maintain well-head treatment system



Bag filter assembly and equilibration tank



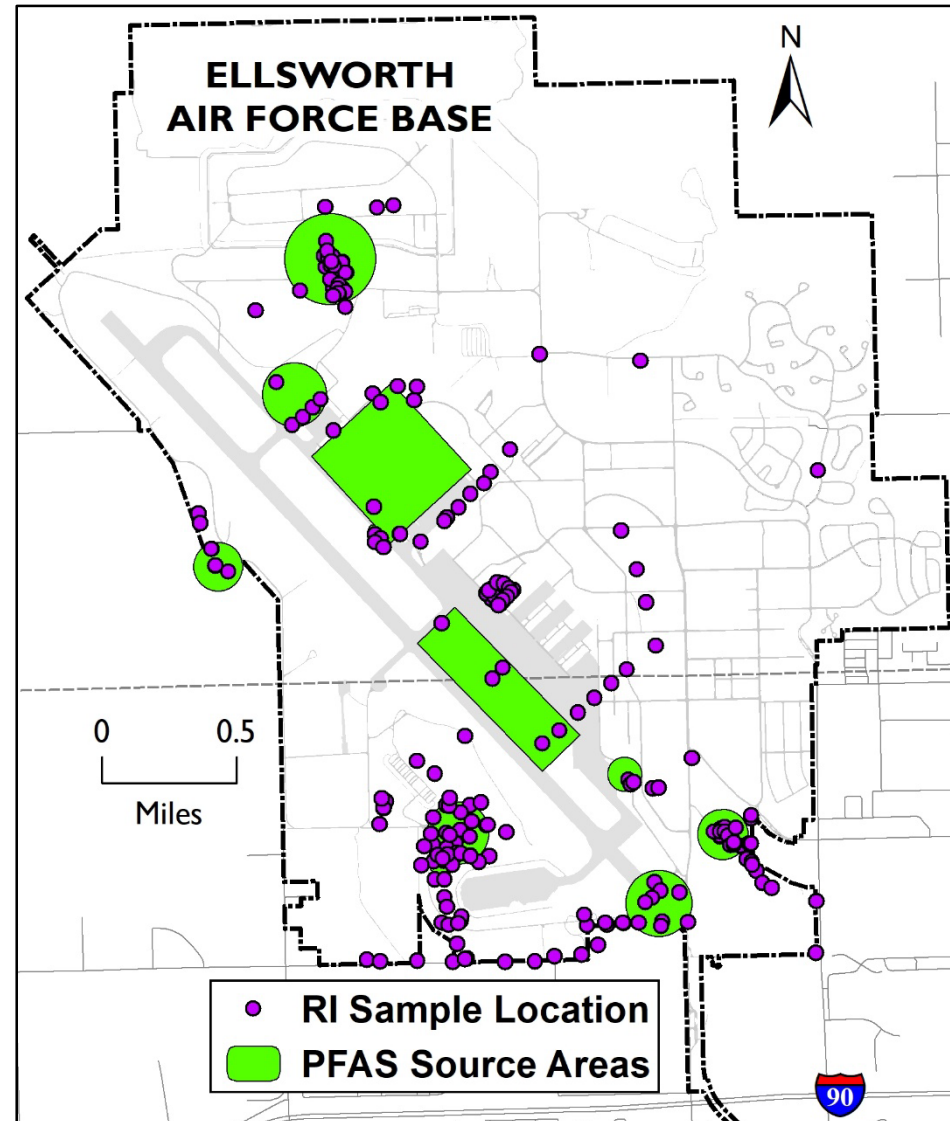
Ion exchange resin treatment vessel



Basewide PFAS Remedial Investigation



- **Purpose is to determine nature and extent of PFAS impacts from aqueous film-forming foam (AFFF)**
 - Over 600 samples collected so far
- **1 of only 3 active AF installations with human health risk assessments underway**
 - Work plan currently under AF review
 - To be submitted to EPA and State for review 5/2/2022



Lysimeter Demonstration Study

- Twelve pairs of lysimeters were installed in 2021
- Goal is to measure the amount of PFAS leaching from soil to groundwater within the former fire training area



Lysimeter



Drilling activities at the former fire training area prior to lysimeter installation



Getting ready to install a lysimeter at the former fire training area



Pond 1 Demonstration Study



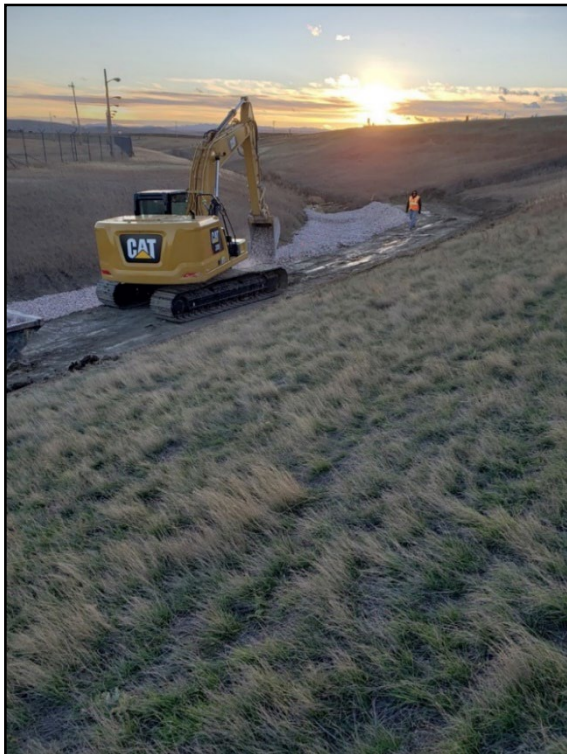
- **Bench-scale study in progress**
- **Purpose is to evaluate viability of chemically stabilizing (or solidifying) PFAS-impacted sediment in Pond 1**



Pond 1, located directly south of the current and former fire training areas

Clay Mats Demonstration Study

- Sorbent flow-through barriers installed November 2021 in surface water drainage south of the fire training area
- Purpose is to determine capability of clay mats to reduce PFAS discharges from groundwater into surface water
- Quarterly monitoring will be conducted for two years



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



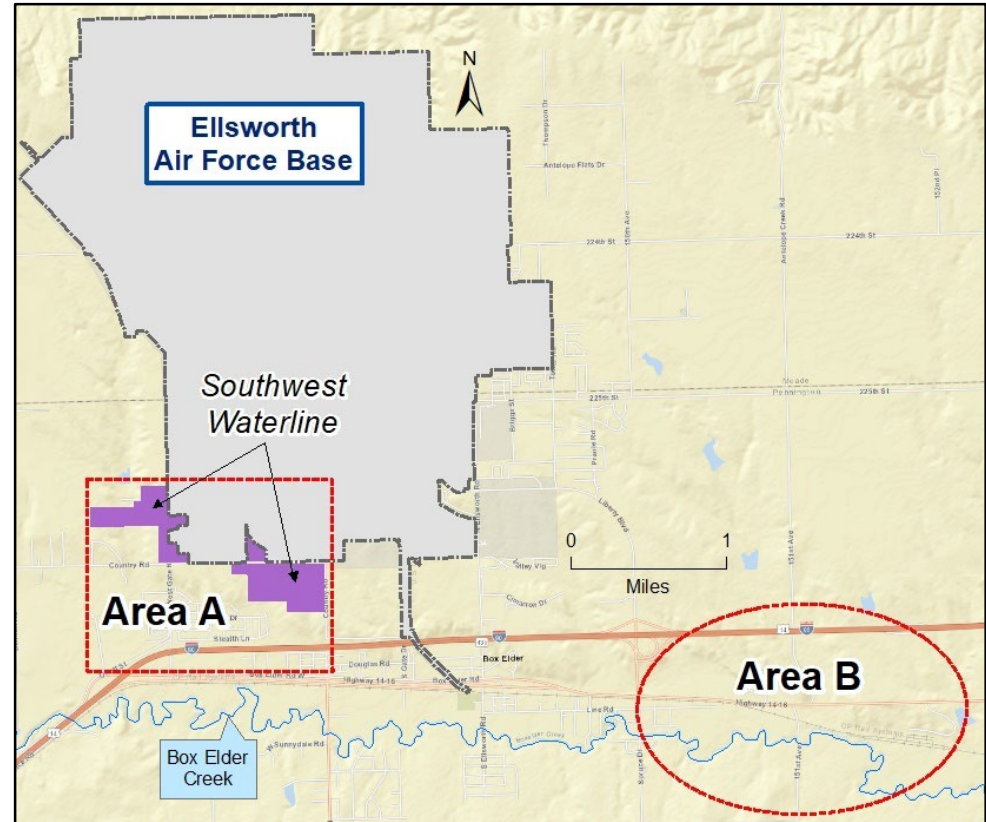
The surface water drainage after installation of the clay mats



PFAS Remedy Implementation (Areas A and B)



- **AF and South Dakota Ellsworth Development Authority (SDEDA) entered into a one-year, \$1 Million *Environmental Services Agreement* for SDEDA to design a community water system**
- **AF will provide partial funding to build the system in a follow-on agreement**
- **SDEDA will own/operate the community water system**

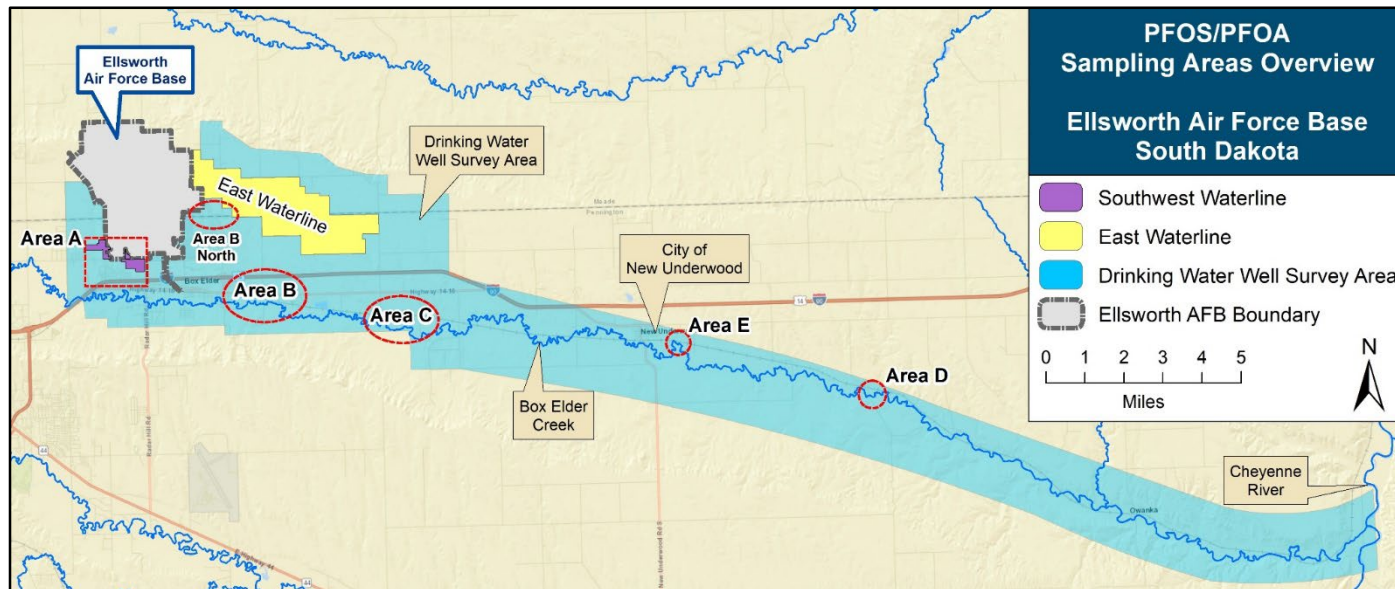




PFAS Remedy Implementation (Areas C, D, and E)



- **Area C – Connect to existing community water system (Sunset Ranch) – Design underway**
- **Area D – Drill replacement shallow well – Samples collected March 2022**
- **Area E – Non-Environmental Restoration Program funds were used to purchase the property for wetlands banking for the new B-21 mission**

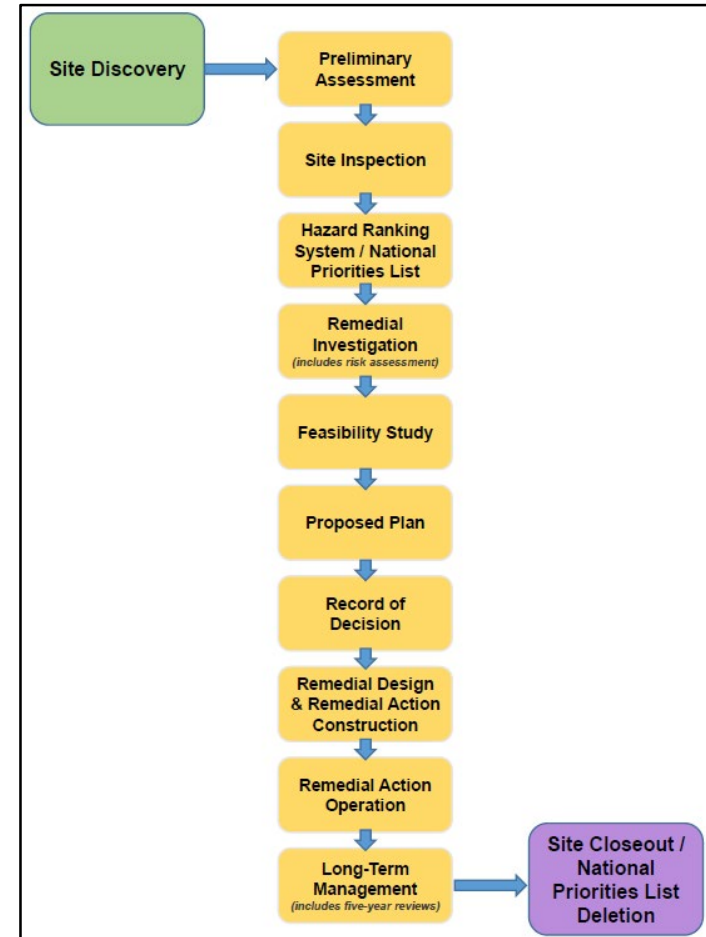




Future Plans for PFAS (Estimated Completion Dates)



- **2023 – Complete Remedial Investigation**
- **2026 – Complete supplemental Remedial Investigation in the East Off-Base area**
- **2027 – Feasibility Study**
- **2028 – Proposed Plan**
- **2028 – Record of Decision**
- **2029 – Remedial Design**
- **2030 – Remedial Actions begin**



The CERCLA Process



Communication Strategy



- Environmental Restoration Newsletters
- Administrative Record <https://ar.afcec-cloud.af.mil/>
- Environmental Matters Website www.ellsworth.af.mil/About-Us/Environmental/
- One-on-one meetings with impacted residents as needed



U.S. AIR FORCE
ELLSWORTH AFB, S.D.

Next Newsletter

The next newsletter will be released in December 2021.

VISIT OUR WEBSITE
www.ellsworth.af.mil/
[About-Us/environmental/](http://www.ellsworth.af.mil/About-Us/environmental/)

View the following:

- Past newsletters
- PFOS/PFOA Updates
- Presentations
- Public announcements

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FOR MORE INFORMATION, VISIT THE ADMINISTRATIVE RECORD 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 Restoration News

SEPTEMBER 2021 Keeping local residents informed of cleanup activities
ISSUE 18

Air Force and South Dakota Ellsworth Development Authority Enter Partnership to Design a Community Water System

The U.S. Air Force (USAF) and the South Dakota Ellsworth Development Authority (SDEDA) entered into a one-year Environmental Services Agreement on September 1, 2021.

Under the agreement, SDEDA will design a community water system that will provide an alternate source of drinking water to:

- Residents in Areas A and B whose private drinking water wells are impacted by Perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) above the Lifetime Health Advisories (HLAs) of 70 parts per trillion (ppt); and
- Residents currently connected to the Base-operated Southwest Waterline.

Once the system is designed, the USAF and SDEDA will enter into a follow-on agreement in 2022 to build the system and connect households to the system. SDEDA will ultimately own and operate the new community water system.

Tentative plans include obtaining water from a new well installed into the Madison Aquifer. Connection to the system will not require annexation into a municipality. The USAF and SDEDA will be reaching out to each property owner to discuss additional details. The goal is to meet with 100% of the impacted property owners.



Figure 1. Locations of Areas A/B and the Southwest Waterline

Progress Made Over Last Decade Cleaning up Trichloroethylene in Groundwater at Ellsworth AFB

The Ellsworth AFB Environmental Restoration Program continues making progress in reducing the trichloroethylene (TCE) groundwater contaminant plume. The figures on the reverse show the plumes shrinking by 80% between 2010 and 2020. Significant progress was made at the PRIDE Hangar/South Docks Main, BG04, and Twining/Risner-BG05 plumes.

Since 2012, the primary cleanup on-Base is in-situ reductive treatment, which supports natural processes to clean up harmful chemicals in the environment. Natural bacteria that live in the soil and groundwater "eat" the harmful chemicals and change them into water and harmless gases.

In May 2020, the USAF awarded an 8-year contract to OTIE/AECOM with the goal of speeding up treatment processes. The USAF team is working closely with the U.S. EPA and South Dakota Department of Agriculture and Natural Resources to close areas of the plume where TCE concentrations are below the Maximum Contaminant Level (MCL). The MCL for TCE is 5 parts per billion. One complicating factor is the presence of PFOS/PFOA mixed in with the same groundwater as the shrinking TCE plumes. Reduction of TCE on-Base will continue even though PFOS/PFOA are present.





**South Dakota
Ellsworth
Development
Authority**

**Community
Water System
Update**

**Mr. Glen Kane
22 March 2022**

