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Ellsworth Air Force Base Restoration News

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Next RAB Meeting

Mark your calendars! The next Restoration Advisory Board meeting is scheduled for:

September 13, 2017, 6 p.m., at the Air and Space Museum

For more information, please call (605) 385-2677 or (605) 385-5056.

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- **RAB presentations**
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- **Meeting information**
- **Past newsletters**
- **Off-base groundwater cleanup progress**
- **Updates on PFCs**

Success Story: South Flightline Drain

The south flightline drain (*SFLD*) was discovered in 2003, when a steady stream of water was observed discharging from a clay drain pipe into surface water (see Figure 1).

Based on historical photographs, the drain line was probably installed before 1952. Groundwater likely infiltrates along the length of the deteriorated line.

In 2005, water samples collected from the SFLD had concentrations of trichloroethylene (*TCE*) above the maximum contaminant level (*MCL*) of five parts per billion. Treatment of the SFLD discharge started in 2006 to remove the TCE. After treatment, the water was discharged to surface water.

In 2010, the SFLD discharge was diverted to the Base wastewater treatment plant (*WWTP*) for treatment. In July 2014, the Base WWTP ceased operation and the SFLD discharge was routed to the new regional WWTP in Box Elder for treatment.

The TCE concentration has been below the MCL since April 2011 due to groundwater cleanup activities above the SFLD. The most recent sample collected in May 2017 had a TCE concentration of 0.54 parts per billion.

In June 2017, the South Dakota Department of Environment and Natural Resources (SDDENR) and U.S. Environmental Protection Agency approved a proposal to divert the discharge back to surface water. The diversion occurred in July 2017.

There are two advantages to restoring the SFLD discharge back into surface water:

- The Air Force will no longer need to pay for treatment costs. In fiscal year 2016, 2.7 million gallons were diverted to the regional WWTP at a cost of $27,476.
- The restored water flow benefits downstream users, particularly the Base golf course.

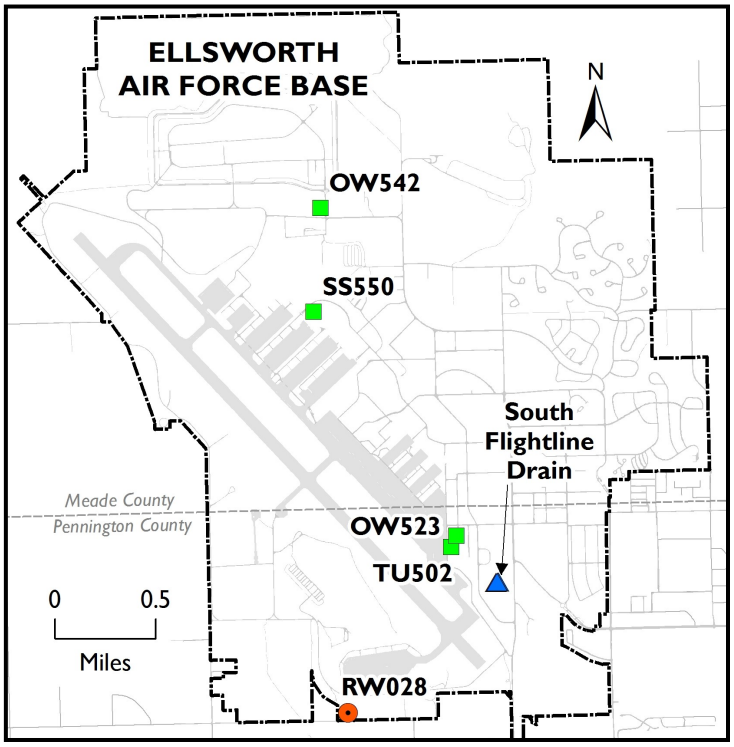


FIGURE 1. Location of the RW028 Site, South Flightline Drain, and the Four Sites Closed Since 2015

Four Closed Sites since 2015

Since 2015, the Ellsworth Air Force Base environmental restoration program received closure letters from *SDDENR* for four sites (see Figure 1). No further restoration work is required at these sites.

The sites include a former underground storage tank (*UST*) where a release of fuel oil occurred, two oil/water separators (*OWS*) where releases occurred, and a jet fuel spill site. The recently closed sites are:

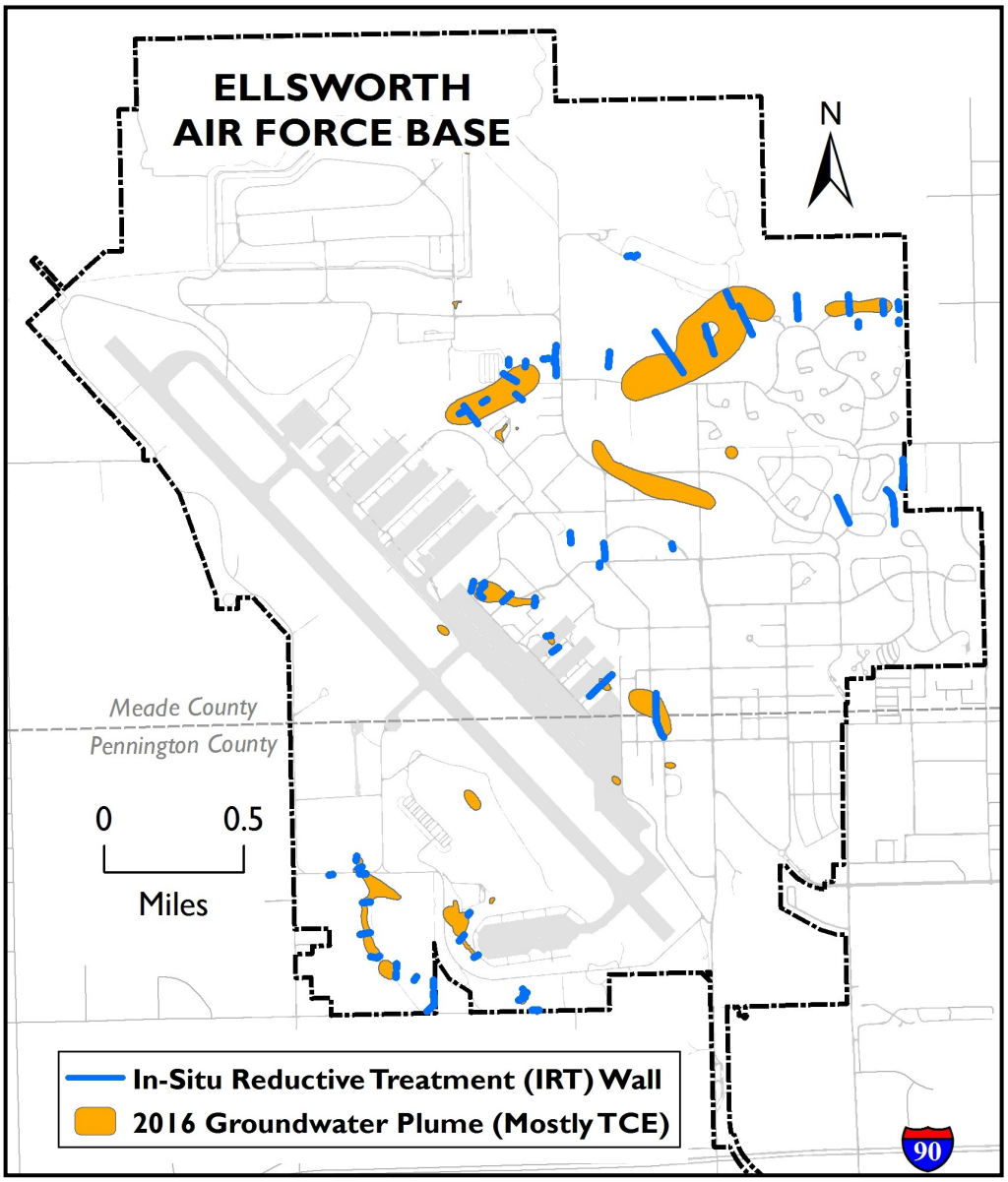
- TU502 (UST Site 605)
- OW523 (OWS 601)
- OW542 (OWS 88409)
- SS550 (Building 7253 JP-8 Spill)

RW028 Low-Level Radioactive Waste Burial Site

In 1997, two concrete burial monoliths presumed to contain low-level radioactive waste were removed from the burial site located at the southern boundary of the Base (see Figure 1). Based on historical records, the monoliths possibly contain luminous instrument dials and markers, electronic tubes, valve knobs and handles, and various experimental items. Chemical Agent Identification Sets (training aids) were unexpectedly discovered during the 1997 removal action.

In 2011, one, and possibly two additional presumed monoliths were discovered and are planned for removal in the **fall of 2017**. Additional Chemical Agent Identification Sets are not anticipated but a contingency plan is being developed in the event they are found.

FIGURE 2. In-Situ Reductive Treatment Walls and 2016 Groundwater Contamination Plumes



What is In-Situ Reductive Treatment (IRT)?

The primary remedy for groundwater cleanup at Ellsworth Air Force Base is in-situ reductive treatment (*IRT*). The IRT walls are shown on Figure 2, above. IRT is a type of bioremediation.

Bioremediation is used because it allows natural processes to clean up harmful chemicals in the environment. Microbes that live in the soil and groundwater "eat" the harmful chemicals and change them into water and harmless gases such as methane and ethane.

Groundwater can be cleaned at the site without having to pump it out. Once harmful chemicals are cleaned up and microbes have eaten their available "food," the microbes die.

In order for microbes to clean up trichloroethylene (*TCE*), the main contaminant at Ellsworth Air Force Base, the right temperature, nutrients, and amount of oxygen must be present in the soil and groundwater. If conditions are not right, they can be improved. One way to improve conditions is to pump nutrients or other substances (such as vegetable oil or molasses) into groundwater.

The Air Force conducts routine performance monitoring to determine if each IRT wall is still effective. If conditions are determined to be less than optimal, vegetable oil, nutrients, or microbes may be added.

The Air Force is currently finalizing a work plan to complete the ninth round of injections at the Base in late 2017. During this round of injections, food grade soybean oil with nutrients (including Vitamin B_{12}) will be injected into groundwater to help the microbes thrive at underperforming IRT walls.