

## Updated Revised Proposed Plan for Operable Unit 4

The Air Force is proposing an amendment to the existing remedy at Operable Unit 4 (OU-4), an area on the north side of Hill Air Force Base (AFB), which includes former landfills and associated groundwater contamination that has moved off base into the communities of South Weber and Riverdale. This groundwater is not used for drinking or other household uses. Hill AFB made the *Updated Revised Proposed Plan for Operable Unit 4* available for public review and comment on June 17. In the document, the Air Force outlines its proposal to change the existing remedy outlined in the original *Record of Decision for Operable Unit 4* (ROD), signed June 1994. The revised Proposed Plan also highlights the key factors that led to the Air Force's proposal to change the remedy.

This is an update to a previous Revised Proposed Plan. An earlier proposal was made in August 2015, but an amendment to the ROD was never completed. Based on unexpected results from soil and groundwater samples taken at the site, engineers determined the remedies in the first Revised Proposed Plan would not be effective. Therefore, new remedies that would be effective were proposed in this *Updated Revised Proposed Plan for Operable Unit 4*.

**The public is invited to review and comment on the proposal during the 30-day public comment period, which begins June 17, 2016, and ends July 16, 2016. A public meeting will also be held on June 22, 2016, and will provide additional information about the proposal and provide an opportunity for the public to ask questions and make comments.** Details on how to make a comment are included in this fact sheet and in the *Updated Revised Proposed Plan for Operable Unit 4*.

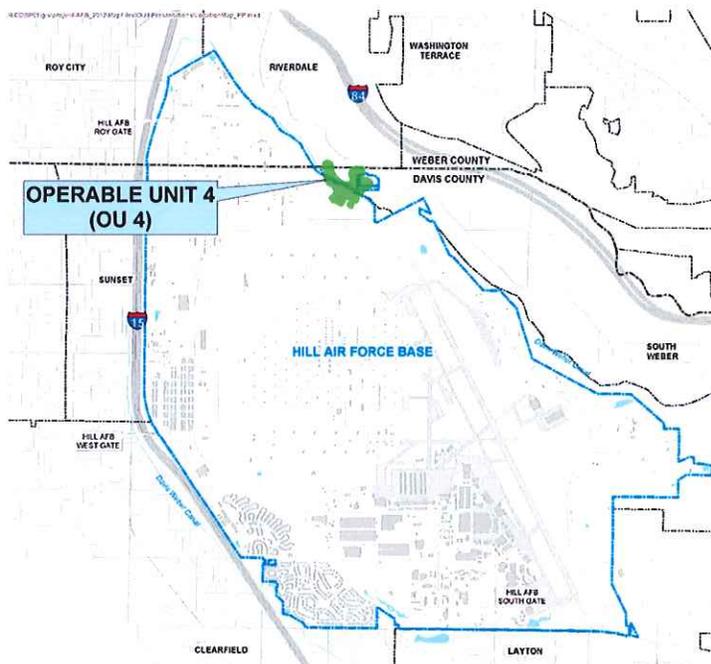
### Site Background

The primary contaminant of concern at OU-4 is trichloroethene (TCE), a common degreasing solvent used at Hill AFB in the 1960s and 1970s. The common practice for disposing of waste TCE was to dump it in landfills or chemical disposal pits. Environmental investigations determined that two landfills, which primarily received municipal waste, are the likely source areas for the TCE contamination.

TCE from the source areas has moved down and dissolved into the groundwater, which has carried the contaminants off base and into the communities of South Weber and Riverdale. While the contaminated groundwater is not used for drinking water, it poses a potential health risk to residents from contaminant vapors that may come into homes from the groundwater.

In 1994, the Air Force, Environmental Protection Agency and the Utah Department of Environmental Quality signed a *Record of Decision for Operable Unit 4*, which formalized the remedies to put into place at the site. These remedies included the following actions:

- A cap over the area known as Landfill 1 to prevent the infiltration of surface water into the landfill.
- A series of horizontal drains to collect contaminated groundwater. These drains (three sets of three drains) were installed by drilling horizontally into the steeply sloped hillsides beneath the OU-4 source areas. Perforated pipes collected contaminated groundwater and carried it to an air stripper for treatment. Later, the air stripper was removed and the water



was discharged to the Central Weber Sewer Improvement District system via a permit.

- Various institutional controls were implemented to prevent the use of groundwater at OU-4 and to prevent access to the landfills.

In 2013, the Air Force conducted a Five Year Review (FYR) of all its existing remedies, as required by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the law that governs the cleanup of most hazardous waste sites at Hill AFB. In the FYR, the remedy at OU-4 was identified as not being protective in the long-term for the following three reasons:

- Increasing contaminant concentrations in the groundwater east of Landfill 1 indicate that there may be an additional unidentified source of TCE.
- Increasing contaminant concentrations within Landfill 1 indicate a potential problem with the landfill cap.
- Increasing contaminant concentrations downgradient of Landfill 2 indicate that it may be a potential source area.

### Original Revised Proposed Plan

Based on the findings, the Air Force determined that additional actions would be required at the site. A Revised Proposed Plan was developed with new remedies to supplement the existing remedies at the site. The proposal included the following:

- Install a bioreactor within the Landfill 1 cap. This would involve excavating the source material and backfilling with mulch, gravel and emulsified vegetable oil to treat the contaminants.
- Excavate shallow TCE-contaminated soil in areas of highest concentrations.

- Install soil vapor extraction systems (SVE) to remove contaminant vapors from the soil.
- Install bio-barriers within the eastern portion of the plume. This would consist of multiple points at which emulsified vegetable oil would be injected into the groundwater to promote biological treatment of the TCE.
- Maintain all the components of the original remedy.

A Revised Proposed Plan was issued for public comment and review in August 2015 and a public meeting was held Aug. 12, 2015.

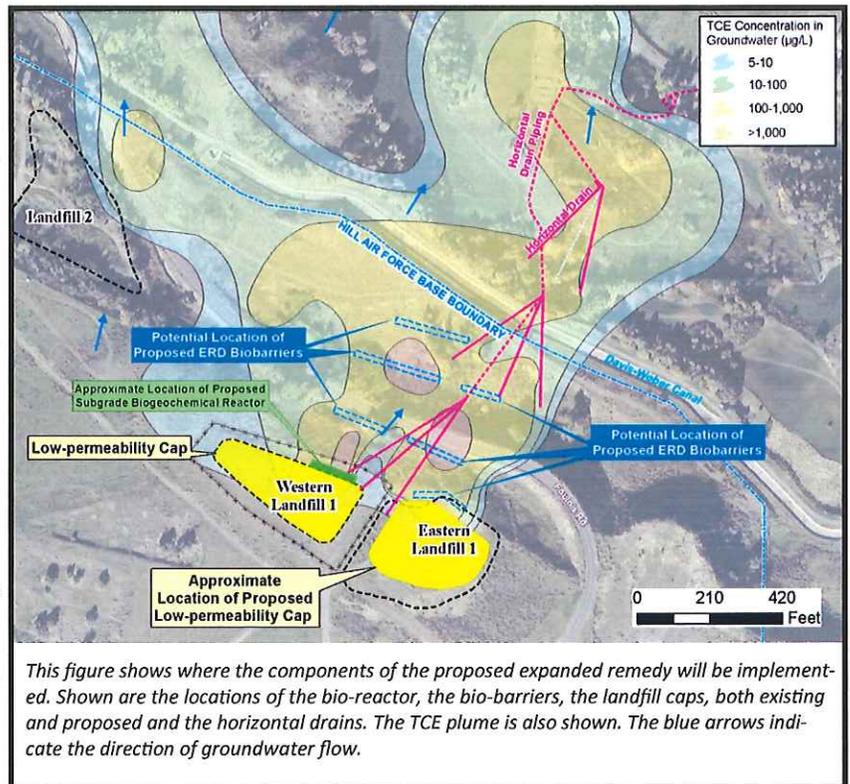
## Updated Proposal

After the proposed plan received regulatory acceptance, the Air Force began working on the remedy's design as the ROD Amendment was being finalized. As part of the design, soil and groundwater samples were taken to determine the excavations' locations and where to best place the bio-barriers and bio-reactor. The results, however, were not what the engineers and geologists had expected for the site. In fact, they showed that the proposed remedies would likely not be effective if implemented as outlined in the proposal.

The Air Force decided to modify the original Revised Proposed Plan to better suit the conditions they found at the site. The new proposal includes the following remedies, all of which will be installed inside the base boundary:

- Instead of excavating into the landfill, a bio-reactor will be installed downgradient of the Landfill 1 cap. This will employ a series of column bioreactors. Columns will be dug into the soil within the area of groundwater contamination downgradient of Landfill 1. The column will be filled with a mixture of mulch, gravel and emulsified vegetable oil. These components will treat the groundwater as it passes through the reactor. Downgradient of the reactor will be a series of groundwater extraction wells, which will remove contaminated groundwater and run it back through the bio-reactor for further treatment.
- Install a low-permeability cap over the uncapped portion of Landfill 1. This will prevent surface water from moving down through the landfill over the entire Landfill 1 area.
- Install bio-barriers within the core of the eastern portion of the plume downgradient of the new landfill cap. The bio-barriers consist of a series of injection points, into which emulsified vegetable oil is injected into the contaminated groundwater. The vegetable oil mixes with the water and provides optimal conditions for naturally occurring bacteria to break down the TCE in the water. The proposal calls for three sets of three bio-barriers to be installed between the landfill and the base boundary.
- Engineers decided that SVE needs more testing before it could be used as a remedy at the site. So instead of making it part of the revised remedy, SVE will be pursued as a treatability study to determine if the technology would be effective at the site.
- As with the original proposal, all components of the existing remedy are retained and will continue to operate.

The revised remedy will cost about \$5.6 million (present-value cost) to implement and operate for the next 30 years. The changes to the remedy, however, have reduced the estimated cleanup timeframe for the off-base portion of the plume to approximately



70 years. Under the original remedy, the cleanup timeframe was indefinite.

## How to comment on the proposal

**Attend the public meeting**  
 June 22, 2016 7 to 8 p.m.  
 Riverdale Community Center  
 4360 S. Parker Drive  
 Riverdale, Utah

**Write to**  
 Mr. Mark Loucks  
 AFCEC/CZOM  
 7290 Weiner Street  
 Building 383  
 Hill AFB, UT 84056-5003

**E-mail**  
 mark.loucks@us.af.mil

**All comments must be postmarked or received by midnight, July 16, 2016.**

Please direct questions to Barbara Fisher at 801-775-3652.

The Updated Revised Proposed Plan for Operable Unit 4 can be found online at <http://afcec.publicadmin-record.us.af.mil>

Search under Hill AFB for "Operable Unit 4 Updated Revised Proposed Plan".

**Regulatory Agency Contacts**  
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 Sandra Burgeois 800-227-8917 ext. 6666  
**Utah Department of Environmental Quality:**  
 Muhammed Slam 801-536-4178