

EXECUTIVE SUMMARY

Operable Unit 4 (OU 4) is one of twelve operable units at Hill AFB and is located on the northeastern perimeter of the base adjacent the former north gate. The site is situated on the northern edge of a terraced escarpment that separates the Weber Delta from the present Weber River Valley. Sediments found at OU 4 include heterogeneous deltaic clays and silty clays interbedded with sandy stringers and thicker sandy units and coarser grained alluvial deposits. The geology of the site is further complicated by occasional surficial landslides and larger rotational slump blocks found on the escarpment. Ground water in the shallow water-table aquifer generally flows perpendicular to the steep topographic contours and numerous springs are found along the lower terraces where the sandy units crop out on the hill slope.

Several disposal sites are found at OU 4, including some of the base's oldest landfills, a munitions dump, spoils pit, and suspected roadside dumping areas. Landfills 1 and 2 were used primarily for solid waste disposal from the early 1940s to the late 1960s, but a plume of TCE contaminated groundwater that originates at the upper terraced elevations of OU 4 where Landfill 1 and Landfill 2 are situated Provides evidence of some liquid waste disposal at the site.

Beginning in 1988, the United States Geological Service (USGS) compiled an initial Site Conceptual Model (SCM) based on data obtained through the Remedial Investigation (RI) conducted at OU 4. The original OU 4 SCM has been revised through time to reflect new information obtained through subsequent investigations by other USAF contractors. In addition to site characterization studies, several remedial measures have been implemented in response to the Record of Decision (ROD) (USAF, 1994) to contain and recover ground water contamination at OU 4 over the past decade. Current remedial systems include a landfill cap system at Landfill 1, an inactive SVE system altered to serve as perched water extraction system for Landfill 1, and a horizontal drain system in the plume. A groundwater extraction trench system (GWETS) has been designed for the site as well, and it's implementation is currently under review, primarily due to slope stability concerns.

In 2001, SVERDRUP and INTERA were tasked to review the SCM for OU 4 and to ascertain whether a more quantitative geosystem model of the site was warranted for future site management purposes. The site conceptual model review tasks included reviewing all of the pertinent site data, analyses, and interpretations conducted to date for OU 4, updating the SCM as necessary, and evaluating current and proposed remedies.

More than 160 documents were reviewed, in addition to the comprehensive database compiled by ERPIMS for the site. The SCM was evaluated in terms of its technical competence for use in the decision- making framework of future actions at OU 4. Specifically, this task addressed plume status and dynamics, and the identification of any data deficiencies that pose a significant risk to the decision-making processes. Significant findings and/or updates to the SCM include:

- Review and conversion of all the available geologic data to an electronic format (GMS) for visualization and future modeling efforts if warranted,
- determination that little if any changes have occurred in the ground water table for the period of record at OU 4,
- visualization of the plume in three dimensions resulting in a better understanding of the hydrogeology and contaminant transport at the site, including the differentiation of individual plumes within the composite plume depicted in the current SCM

- enhanced resolution of potential trichloroethylene (TCE) source locations
- contaminant trend analysis confirms that TCE and sulfate were co-disposed in at least one source location and show hydraulic connection between Landfill 1 and well U4-006 on Foulois Drive
- overall plume dimensions are relatively static through time and the composite plume does not seem to be growing significantly. Spring U4-308 and well U4-069 in the distal portion of the plumes (far-field) do show increasing contaminant trends.
- geochemical analysis of available data indicates arsenic is not related to TCE disposal at the site, and provides direct evidence of TCE biodegradation.

Once the site conceptual model was evaluated and updated, the model was used to assess the current and proposed remedies for technical merit, including the potential to meet ROD-specified clean-up goals. The landfill cap is judged to be effective in preventing any contaminant remaining in the unsaturated portion of the landfill from reaching the water table. Although the horizontal drains are not effectively containing the plume nor removing significant amounts of contaminant mass, they are recovering some contaminant and not hampering other remediation processes at the site. A qualitative evaluation of the GWETs remedy questions the need for containment devices in the middle of the composite plume. Recommendations were also made for the potential to enhance natural attenuation through biodegradation, and for optimization of site monitoring and data collection efforts at OU 4.