

## EXECUTIVE SUMMARY

### Purpose

This document is an *Addendum to the Remedial Investigation Report for Operable Unit 2 (RI Addendum)*. Its main purpose is to document the results of a field sampling and analytical program conducted at Operable Unit 2 (OU 2) during the fall of 1992 and to incorporate this new information into the existing understanding of site conditions and baseline risks to human health. Specifically, this document addresses: 1) the nature and extent of contamination; 2) subsurface geologic conditions across the eastern portions of the site; 3) contaminant fate and transport; and 4) baseline assessments of human-health risk.

### Background

Hill AFB, Region VIII U.S. EPA, and the Utah Department of Health signed a Federal Facilities Agreement (FFA) on 10 April 1991. Among other items, this agreement defines the work to be performed by the USAF to investigate and remediate sites known contaminated by past disposal of hazardous waste. One of the sites addressed in the FFA is called Operable Unit 2 and this document pertains to that site only.

Several documents have been prepared pertaining to characterizing the nature and extent of contamination (*Final Remedial Investigation Report for Operable Unit 2*; Radian, 1992a) and estimating the risks to human health for this site (*Final Baseline Risk Assessment for Operable Unit 2*; Radian, 1992c). During regulatory review of these documents, it became apparent that insufficient site monitoring data were available to confirm the absence or presence of each constituent on the "RCRA Target Analyte List/Target Compound List" (TAL/TCL) for all environmental media at OU 2 (ground-water, surface soils, subsurface soils, seeps & springs, and irrigation canals). Other data gaps identified pertained to the extent of contamination in the off-base area, possible inorganic compound contamination, statistical characterization of background conditions, and determining the presence or absence of contamination in the Bambrough Canal.

Therefore, a plan was developed (*Addendum to the Work Plan for Operable Unit 2*, Radian 1992b) to conduct a field program aimed at collecting the data required to produce a comprehensive data set containing analytical measurement data for all TAL/TCL constituents in all media. The sampling described in the *Addendum to the Work Plan* was generally performed during August through October 1992. Because it was intended that the additional investigations be conducted with a phased approach, the sampling and analyses were planned strictly to fill in the data gaps. It was recognized in the *Addendum to the Work Plan* that the results of this investigation could identify issues which might lead to further studies.

## Report Contents

This document has been divided into seven sections as follows:

### **Section 1.0--Introduction.**

**Section 2.0--Investigative Techniques.** This section describes the investigative techniques used during the 1992 field program when they were different from work previously described in other OU 2 reports.

**Section 3.0--Physical Characteristics of Study Area.** This section contains new information pertaining to hydrogeologic conditions in parts of the site previously not investigated.

**Section 4.0--Nature and Extent of Contamination.** This section presents the analytical results from the 1992 field program and contains interpretations of this information.

**Section 5.0--Contaminant Fate and Transport.** This section presents a discussion of the contaminant fate and transport. The discussion considers the physical and chemical characteristics of the contaminants, potential routes of migration, and other factors which could influence the migration and persistence of contaminants at OU 2.

**Section 6.0--Risk Assessment Addendum.** This section contains a quantitative assessment of risks to human health (carcinogenic and noncarcinogenic) due to the presence of hazardous constituents at OU 2. This section contains similar information as presented in the *Final Baseline Risk Assessment for Operable Unit 2* (Radian, 1992c), but has been modified to incorporate the analytical results from the site investigation work performed in the fall of 1992.

**Section 7.0--Summary, Conclusions, and Recommendations.** This section summarizes the previous six sections, provides fundamental conclusions, and contains recommendations for further work.

### **Summary of Findings**

The site investigation work described in this document focused on delineating the land area located east of Hill AFB which has been affected by past waste disposal activities at OU 2.

The subsurface investigation in the off-base area identified three groundwater flow systems: a shallow system; a hillside system; and the Weber River alluvium system. The presence of volatile organic contaminants is generally limited to the shallow system, although low levels of VOC contamination have been found in the hillside system, thereby suggesting possible hydraulic communication between the two.

The aerial extent of the chlorinated volatile organic compound plume was defined on all sides and has been found to cover approximately 31 acres. As with the *Final Remedial*

*Investigation Report for Operable Unit 2* (Radian, 1992a), trichloroethene (TCE) was found to be the most aerially extensive contaminant. The extent of all other organic compounds fell within the boundaries of the TCE plume.

A number of groundwater samples were found to contain certain metals (i.e., chromium and nickel) above state or federal Maximum Contaminant Levels (MCLs). These metals are considered artifacts of the sampling methods since they are found only in wells located far away from the known source of contamination and several monitoring points between the source and these wells do not contain these same contaminants. Nonetheless, these metals were retained as chemicals of potential concern where appropriate and human-health risks associated with them were quantified.

Because the site investigation activities documented in this report substantially increased the size of the site characterization data set and because new media were identified as contaminated, the baseline risk assessment was thoroughly revised and a risk assessment addendum (RA Addendum) was prepared (see Section 6). Human-health risks for the same basic exposure scenario and subpopulation combinations were quantified with the results of the risk characterization being similar to the results of the *Final Baseline Risk Assessment for Operable Unit 2* (Radian, 1992c; referred to as "1992 RA"). The two exceptions are noted below.

- The estimated carcinogenic risks for current off-site residents were higher in the RA Addendum (and slightly above the CERCLA specified threshold of  $10^{-6}$  for children) than in the 1992 RA.
- The estimated noncarcinogenic risks to future on-site construction workers was significantly lower in the RA Addendum (hazard index less than one) than in the 1992 RA (hazard index greater than one).

Similarly, pesticides may be present at OU 2 due to waste disposal practices or they may be present for other reasons such as routine insect or weed control. This document includes certain pesticides in the discussions of the nature and extent of contamination and in the quantitative assessment of baseline risk. However, because low levels of these and other pesticides have been found in background areas, their presence may not truly be associated with past waste disposal practices at OU 2.

### **Fundamental Conclusions**

The extent of VOC contamination in groundwater has been determined. While several new contaminants were detected as a result of the TAL/TCL analyses in environmental media at OU 2, this additional investigation confirmed the earlier belief that chlorinated volatile organic compounds in groundwater represent the most wide-spread contamination and greatest health risks.