

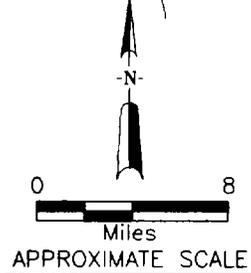
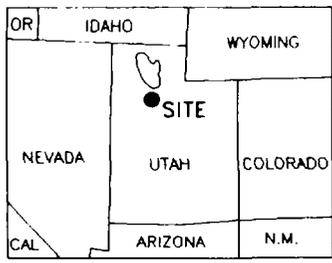
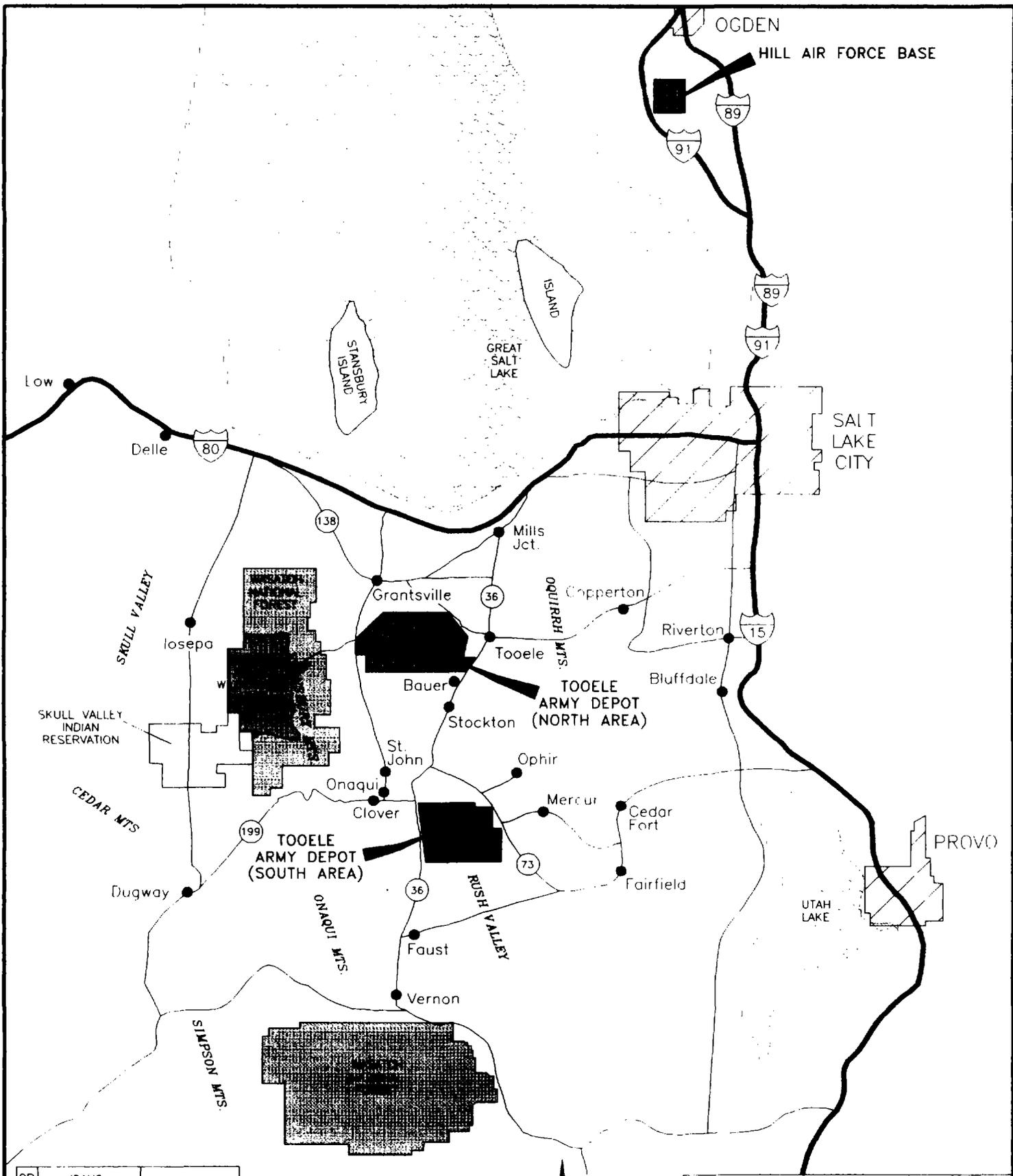
## 1.0 INTRODUCTION

This report presents the results of a Phase II Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI-Phase II) conducted at Tooele Army Depot-South Area (TEAD-S) by the U.S. Army Environmental Center (USAEC) and its contractor, Ebasco Services Incorporated (EBASCO). This environmental study is one of the requirements of Module VII - Corrective Action for Solid Waste Management Units (SWMUs) in the Chemical Stockpile Disposal Plant (CSDP) permit (Permit No. UT5210090002) issued by the State of Utah to the U.S. Army (Army) for TEAD-S. EBASCO's work at TEAD-S was performed under Task Order 0003 of USAEC Contract No. DAAA15-91-D-010.

TEAD-S, originally constructed by the Army as a chemical munitions facility called Deseret Chemical Depot, is located in north-central Utah (Figure 1.0-1). It has been used by the Army since the 1940s, primarily to store chemical weapons. The objective of the RFI-Phase II work was to compile historical, field, and analytical data from 10 previous environmental investigations of the installation, the RFI-Phase I (EBASCO 1993a), and the RFI-Phase II field program so that a comprehensive evaluation of the environmental sampling results and a human health and ecological risk assessment of six suspected releases SWMUs at TEAD-S could be presented.

At TEAD-S, RFI-Phase II work is being conducted separately for three groups of SWMUs (Groups 1, 2, and 3) because Phase II recommendations and funding were available for some units earlier than others. The Group 2 SWMUs that are the subject of this report include SWMUs 3, 5, 8, 9, 30, and 31 (Figure 1.0-2). At this time, the RFI-Phase II investigation of Group 1 SWMUs (SWMUs 1, 25, and 37) has been completed (EBASCO 1993a), and the investigation of the Group 3 SWMUs (SWMUs 11, 19, 20, and 33) is under way.

Suspected releases SWMUs 3, 5, 8, 9, 30, and 31 are all listed in Table 16 of the permit's corrective action module. The areal extent of these SWMUs is not as well-defined as the Group 1 SWMUs. Therefore, the SWMU boundaries shown in this report are approximate and indicate the general limits of operations associated with each SWMU. SWMU 3 [Disposal Pit] located southeast of Old Area 2, has been renamed Impounding Bay/Disposal Pit to reflect the activities that historically occurred in the unit. This small SWMU was used for renovation of leaking chemical agent containers and includes a partially open disposal trench. SWMU 5 [Building 600 Foundation, Drainage Pond, and Ditch] is a small unit formerly used for renovation of munitions and for retort operations. SWMU 8 [Surveillance Test Site] is an open area where munitions stored at TEAD-S were drop tested from a 30-ft- high wooden tower; some of the resulting

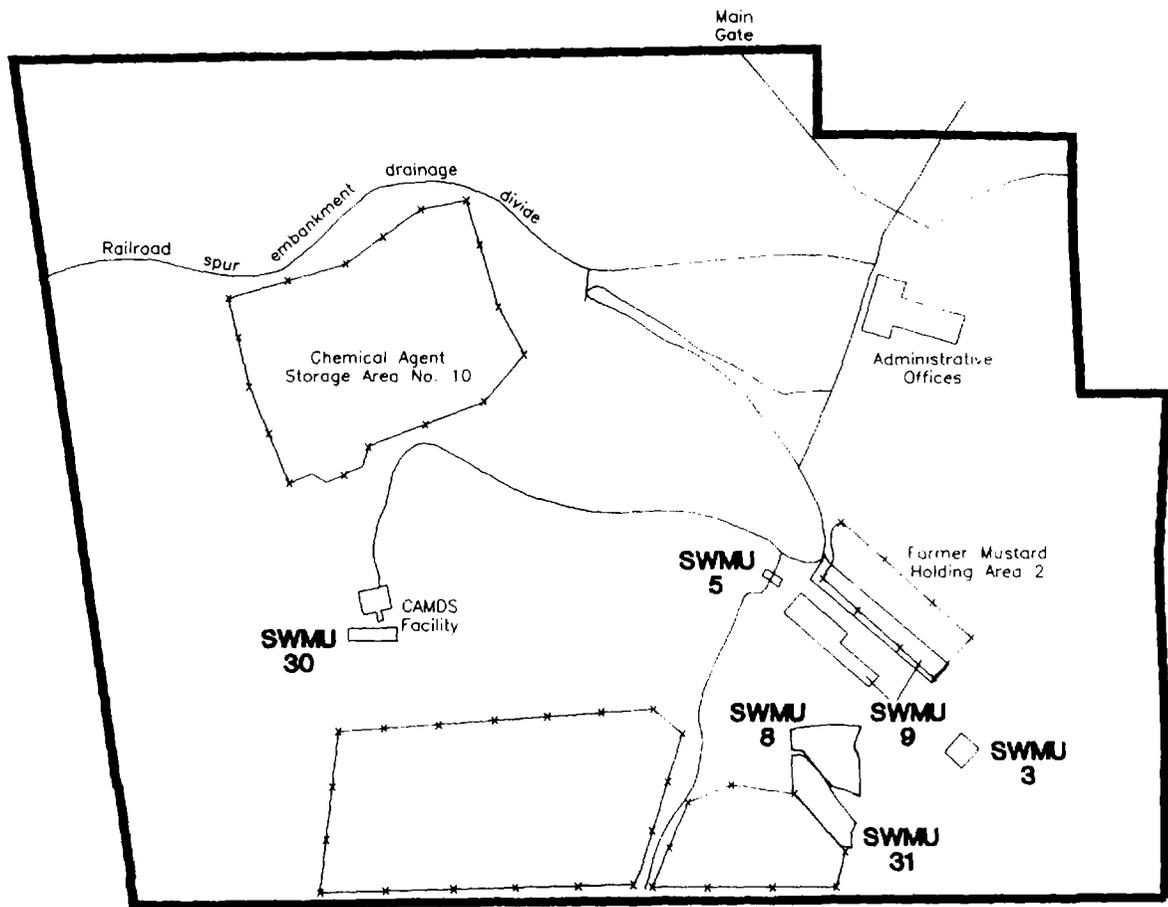


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Aberdeen, Maryland

**Figure 10-1**

**Location Map of Tooele Army Depot**

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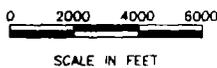


LEGEND

-  Tooele Army Depot - South Area Boundary
-  Roads
-  Fence
-  Location of Group 2 SWMUs

GROUP 2 SOLID WASTE MANAGEMENT UNITS

- 3 Impounding Bay/Disposal Pit (Southeast of Area 2)
- 5 Building 600 Foundation, Drainage Pond, and Ditch
- 8 Surveillance Test Site
- 9 Old Area 2 (including Mustard Holding and Pit Areas)
- 30 CAMDS Landfill
- 31 Demilitarization Area (Northeast of SWMU 1)



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Figure 1.0-2

Location of RFI-Phase II  
Group 2 SWMUs

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debris was placed in two disposal trenches. SWMU 9 [Old Area 2 (including Mustard Holding and Pit Areas)] is a large open area where 1-ton containers of chemical agents were stored in buildings and on rails. Known releases SWMU 13, adjacent to the Chemical Agent Munitions Disposal System or CAMDS. SWMU 30 [CAMDS Landfill] is a small area of mounded construction debris and a separate area of three burn trenches. SWMU 31 [Demilitarization Area (Northeast of SWMU 1)] is an active open burning/open detonation area for high-explosive munitions that is operating under a RCRA Subpart X permit. Table 1.0-1 summarizes the histories of these six SWMUs.

EBASCO investigated the Group 2 SWMUs using a combination of aerial photography interpretation, employee interviews, document reviews, site visits, and environmental sampling of air, soil, groundwater, and surface water. The investigation of these SWMUs generally followed the revised final RFI-Phase II work plan (EBASCO 1993b), which includes a Data Collection Quality Assurance Plan (DCQAP), Health and Safety Plan (HASP), Project Management Plan (PMP), and Data Management Plan (DMP). Variances from the work plan are documented in Section 3 of this report. In addition to environmental sampling activities, EBASCO conducted ecological surveys and unexploded ordnance (UXO) surveys to characterize the Group 2 SWMUs. A soil gas survey was conducted at SWMU 5 to determine the areal extent of VOC contamination (including trichloroethylene) in the soil. Nonintrusive geophysical surveys were used to locate burn trenches at SWMU 9 and 30.

## 1.1 PURPOSE AND SCOPE OF REPORT

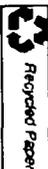
As stated in Section VII.C.1.a and Appendix A of the CSDP permit corrective action module, the objective of the RFI-Phase II report is to characterize the environmental setting of the installation, define sources of contamination, characterize the degree and extent of contamination, identify actual and potential receptors, and evaluate potential threats to human health and the environment. The resulting data are to be of adequate technical quality to support development and evaluation of corrective measures alternatives that would be needed to ensure the safety of on-post workers and off-post residents or users of adjacent property under current conditions.

To address these requirements, environmental investigations were conducted to define the nature and extent of contamination of each of the six SWMUs. In addition, current land use outside TEAD-S, facility-wide ecological habitats, and key species were investigated to identify actual and potential receptors. These data were used in this report to support a human health and ecological risk assessment of each of the six SWMUs.

**Table 1.0-1 • SWMU Summary**

SWMU No.	SWMU Description
3. Impounding Bay/ Disposal Pit (Southeast of Area 2)	This SWMU consists of a gravel decon pad where leaking chemical agent containers were decontaminated and a nearby disposal trench. Leaking 1-ton containers were decontaminated on the pad with DANC, sodium hydroxide, and sodium hypochlorite, and valves were repaired pending disposal. The disposal trench has been partially backfilled but remains open at the southern end. The open trench contains 15 to 20 corroded and empty 55-gallon drums. The area near the trench also reportedly served as a holding area for leaking chemical munitions pending disposal and was the site of a possible VX spill in the 1960s.
5. Building 600 Foundation, Drainage Pond, and Ditch	This SWMU consists of several concrete building foundations, an earthen drainage pond, and a ditch. This SWMU was used for munitions washout, spray painting and sand blasting, and later for retort operations. Also in this SWMU trucks that moved leaking mustard bombs from SWMU 9 to SWMU 1 were decontaminated with DANC and washed down with the effluent directed into the pond and ditch.
8. Surveillance Test Site	This SWMU is adjacent to SWMU 31. It is the site of a former drop tower where grenade and munitions functional testing took place. Two formerly open pits near the former drop tower area contain smoke pots, grenades, and napalm cans, as does the drainage ditch through the unit.
9. Area 2 (Including Mustard Holding and Pit Areas)	Munitions containing mustard and various other agents were stored in part of Area 2 pending disposal. Old Area 2 reportedly contained leaking mustard munitions. The area southeast of Old Area 2 reportedly contains covered burn trenches.
30. CAMDS Landfill	This SWMU was used for wood and dunnage disposal by burning in trenches until the early 1970s. Currently a landfill in the unit receives construction debris such as soil, asphalt, and PVC pipe.
31. Demilitarization Area (Northeast of SWMU 1)	This SWMU is an active open burning and open detonation area operating under a RCRA Subpart X permit. Waste munitions are currently disposed at this SWMU, including high explosives and munitions.

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It should be noted that the risk assessment results for SWMU 3 are preliminary because the scope of the 1993 soil sampling program in this area was limited. Although contamination may occur in subsurface soil, only surficial soil samples were collected at the southern end of the closed portion of the disposal trench. The Army and the State of Utah Department of Environmental Quality Division of Solid and Hazardous Waste agreed to this temporary limitation on the field program to avoid the excavation of agent-contaminated soil or the release of chemical agents until policies and procedures are established to ensure that this type of contamination can be handled, stored, and disposed safely. The Army is currently developing these policies and procedures, and the investigation of SWMU 3 will be expanded in the future to characterize subsurface soil below and adjacent to the covered trench and any buried trench debris. When this additional field sampling and chemical analysis is completed, the risk assessment of the trench can be finalized and used to evaluate the need for a corrective measures study at this part of SWMU 3.

## 1.2 REPORT ORGANIZATION

This report presents the contamination assessment and the baseline risk assessments of SWMUs 3, 5, 8, 9, 30, and 31. Section 1 describes the purpose and scope of this investigation.

Section 2 discusses the overall site background. This section outlines the history, geology and soils, surface water, groundwater, climate, and demography of TEAD-S and surrounding areas in Rush Valley. A summary of previous investigations is also included in Section 2, along with a discussion of background chemical concentrations in soil and groundwater and a general discussion of chemical fate and transport in the environment.

Section 3 discusses the RFI-Phase II field investigation. This section describes the rationale of each portion of the field program and summarizes the field procedures and number of samples collected. It also discusses changes from the proposed RFI-Phase II work plan that occurred in response to field conditions during sampling, the chemical analyses applied to the environmental samples, and the data validation, data management, and quality control results.

Section 4 presents the contamination assessment of SWMUs 3, 5, 8, 9, 30, and 31. This assessment includes detailed information on site history and physical setting, soil, water, and air contamination, and potential fate and transport of contaminants at each unit.

Sections 5 and 6 contain the preliminary baseline risk assessments of all six SWMUs. Section 5 presents the quantitative human health risk assessment, and Section 6 presents the qualitative ecological risk assessment. Section 7 summarizes the findings of the RFI-Phase II investigation, including the remedial goals.

Section 8 lists the references cited in this report.