

Base Road and the skeet range. Sites S-1 and S-3 are small abandoned waste oil and fuel leach pits behind vehicle maintenance buildings and the fuels lab. Site S-5 is the current fire training area north of Crosswind Runway 21, while Site S-7 is the old wing tip tank fuel drainage area near the operations apron. Removal of fuel-enriched soils in affected areas, particularly at Site S-7, has been undertaken in the past. All five of these sites have been incorporated into these Phase II (Stage 2) investigations.

The sixth site, Site S-12, is the base golf course which for several years was irrigated with effluent from the now closed wastewater treatment plant. Golf course irrigation is accomplished solely with groundwater now that all sanitary and industrial wastewaters are transported off-base to treatment facilities operated by the Victor Valley Wastewater Reclamation Authority. Although scored by HARM, this area of treated wastewater disposal was not included in these IRP Phase II (Stage 2) investigations because there have been no observed detrimental effects to the golf course or downslope vegetation, or any reported impact to base water supply groundwater quality.

The HARM ratings of the remaining 17 sites indicated many have a moderate to high potential for contaminant release or migration. In addition, possible additive effects may result from combined contaminant migration because in some areas the sites are close together. Finally, due in part to the types or quantities of potential hazardous wastes, two sites not rated by HARM were added to the sites of interest in this investigation. These sites included the current hazardous waste storage area (S-18) and the former temporary storage area for transformers which contained PCB oils (S-19). Following evaluation of these 19 sites and their proximity to one another, five general areas were identified as having the highest potential for pollutant migration (see Figure 1.2). Presented in order of priority, these five areas are:

1. Industrial/Storm drain line and its northeast trending drainage arroyo (Site No. S-20).
2. Northeast Disposal Area - Wastewater treatment plant percolation ponds (S-21), the most recent base landfill (L-13), the current and abandoned fire training areas (S-5 and S-6, respectively), the sludge drying beds (S-25), the original base landfill (L-12), the street sweeping disposal area (L-11), and the three reported but unverified acid, oil, paint, and pesticide burial sites (B-8, B-9, B-10).

Two wells owned by the Victor Valley Wastewater Reclamation Authority are located northeast of the base. The wells are reported to be screened at 65 to 75 feet below the ground surface and have pumping capacities of 500 gallons per minute (gpm) (Israel, 1986). Based on the approximate elevation of the well heads, these wells are believed to be screened in the same aquifer as the majority of wells installed during the IRP Phase II field investigations. Logs from a soil boring constructed near the water supply wells show the top 65 feet of alluvium to consist of silty sands with streaks of sand, silt and gravel. The groundwater table was measured at 36 feet below the ground surface. Groundwater is used only for non-potable industrial applications (Israel, 1986).

According to the records of the California Department of Water Resources (CDWR), four production wells exist southeast of the base. Production capacities of these wells range from 100 to 1,200 gpm. Wells are screened to depths ranging from 500 to 610 feet below land surface indicating that these wells are screened in a deeper and probably different aquifer system than the monitoring wells installed at George AFB under the IRP Phase II program.

Currently, seven production wells supply water to both George AFB and the adjacent town of Adelanto. An eighth well was closed when production rates declined. All of the wells are located near the Mojave River below the base golf course and beyond the eastern base boundary. These wells are located on the west side of the Mojave River in Section 30 T6N, R4W, just north of the Lower Narrows. Three additional wells located northeast of the George AFB production wells but across the Mojave River serve to supply water to the town of Oro Grande. All ten wells are believed to be screened in a deeper aquifer system than that penetrated by the monitoring wells installed at George AFB during the IRP Phase II (Stage 1) field investigation.

Five of the seven water supply wells near George AFB are currently in operation. George AFB and Adelanto have received licenses from the California Department of Water Resources to extract a sum of 8.34 cubic feet per second (cfs) of water from the upper regional aquifer. Total productive capacity of the seven functional wells reaches 15.33 cfs, exceeding the sum of appropriated water rights by 6.99 cfs. On a more representative basis, the 1983/84

Finally, two surface water stations and various wells within or adjacent to the Victor Valley County Water District have been analyzed for specific mineral constituents. Figure 2.7 identifies the location of major production wells in the Victorville and George AFB areas. Summaries of the surface and groundwater monitoring results are presented in Tables 2.9 and 2.10. These data indicate uniform water quality for measured anions and cations plus specific conductance, nitrates and total dissolved solids. Well No. 12, located at the south end of Victorville and tested on August 21, 1972, reported high specific conductance and a nitrate concentration equal to the regulated drinking water standard of 10 mg/L.

Figure 2.8 shows the location of the seven George AFB and town of Adelanto wells east of the base golf course, VVWRA Well No. 2 at the regional wastewater treatment plant, and private water supply wells located adjacent to the east boundary line of George AFB. Concentrations of inorganic chemical constituents in groundwater as measured prior to 1982 in the seven water supply wells serving George AFB and the town of Adelanto are summarized on Table 2.11. These wells are screened in the deep aquifer at depths ranging from 300 to 600 feet below the land surface. The water is only moderately hard with a favorable TDS concentration. In terms of conventional water quality and heavy metals, these seven wells appear to be of good quality for the samples tested. Based on an evaluation of data from these wells not summarized herein, Lee & Ro Consulting Engineers (1984) reported elevated concentrations of iron close to and greater than 0.3 mg/L in many of the river wells which serve the base. Lee & Ro also report that resultant iron bacteria and iron salt encrustation in well screens and gravel packs have caused losses in productive capacity in some George AFB wells, requiring their premature replacement.

All George AFB production wells are tested at least four times yearly for volatile organics, selected minerals and salts, and bacteriological constituents. The wells are also tested at least once every three years for a rigorous suite of analyses including the full range of priority pollutants as designated by the U.S. EPA. A review of monitoring data collected after 1982 indicates some of the base water supply wells may have measurable but low concentrations of some of the EPA organic priority pollutants and radioactive

#### 4.6 SUMMARY OF FIELD ACTIVITIES AND FINDINGS

A comprehensive field and chemical analytical investigation was undertaken at George AFB in Victorville, California. This investigation represents Phase II (Stage 2) of the George AFB Installation Restoration Program. The purpose of the U.S. Department of Defense's Installation Restoration Program (IRP) is to identify, define, and eliminate toxic and hazardous waste contamination at U.S. Air Force bases and other defense installations throughout the United States. Major activities, findings and conclusions are presented below.

##### 4.6.1 Summary of Field Activities

Twenty-one sites on George AFB previously rated by the USAF Hazard Assessment Rating Methodology (HARM) were investigated in these IRP Phase II (Stage 2) studies. One HARM site (S-23) could not be found and the 23rd and last site rated by HARM (S-12, the base golf course formerly irrigated with treatment plant effluent) was not a part of the studies due to no signs of stressed vegetation and no impact on groundwater quality as measured in base water supply wells near the golf course. Four point source sites (S-18, S-19, L-4, and L-5) and two non-point sources (base housing and liquid fuels distribution) contiguous to the HARM sites or suspected of containing potentially hazardous chemicals were also made a part of the investigations. Finally, public and institutional areas off-site but adjacent to the base were investigated as needed to insure the protection of public health and confirm the extent of contaminant migration. The 27 on-base sites were organized into 15 major areas:

- Fire Training Area (Site S-5)
- Industrial/Storm Drain and Outfall Ditch (Site S-20)
- Sludge Drying Beds (Site S-25)
- Percolation Ponds (Site S-21)
- Non-Point Residential Housing
- Northeast Disposal Area (Sites L-11, L-12, L-13, B-8, B-9, B-10, and S-6)
- Southeast Disposal Area (Sites L-1 through L-5, and M-2)
- West Perimeter Road (Site S-4)
- Waste Fuel Dry Well (Site S-22)
- Tip Tank Drainage Area (Site S-7)

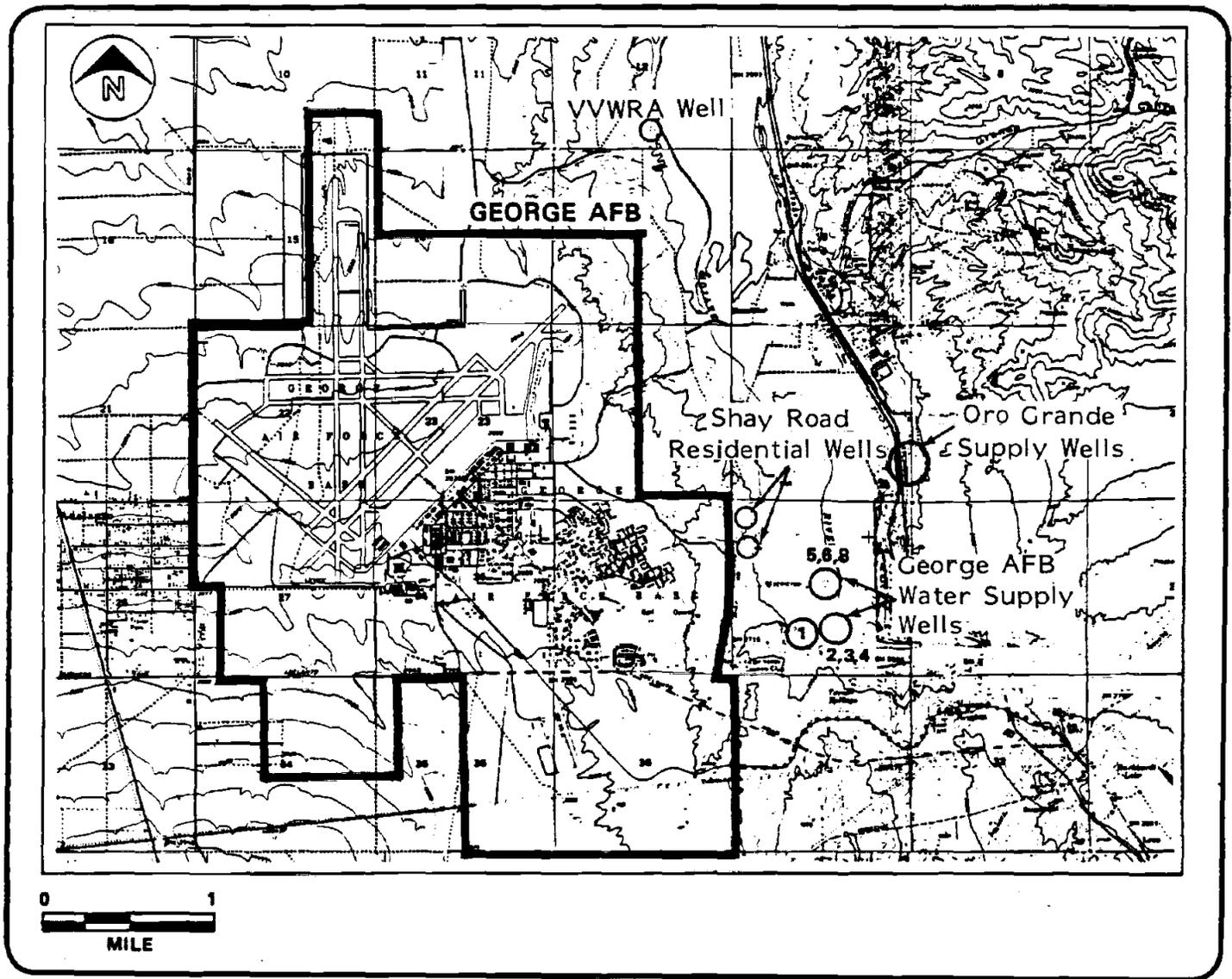


Figure 2.8

LOCATION OF KNOWN WATER SUPPLY WELLS  
NEAR GEORGE AFB

Source: CH2M HILL, 1982.



GEORGE AFB  
CALIFORNIA

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**ADMINISTRATIVE RECORD  
COVER SHEET**

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**Installation Restoration Program**  
**Phase II — Confirmation/Quantification**  
**Stage 2**

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