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FINAL CLOSURE REPORT FOR SOLID WASTE MANAGEMENT UNITS 7 AND 8 NAS FORT
WORTH TX
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HYDROGEOLOGIC



**NAVAL AIR STATION
FORT WORTH JRB
CARSWELL FIELD
TEXAS**

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FINAL CLOSURE REPORT

SWMU 7 AND SWMU 8 NAS FORT WORTH JRB, TEXAS

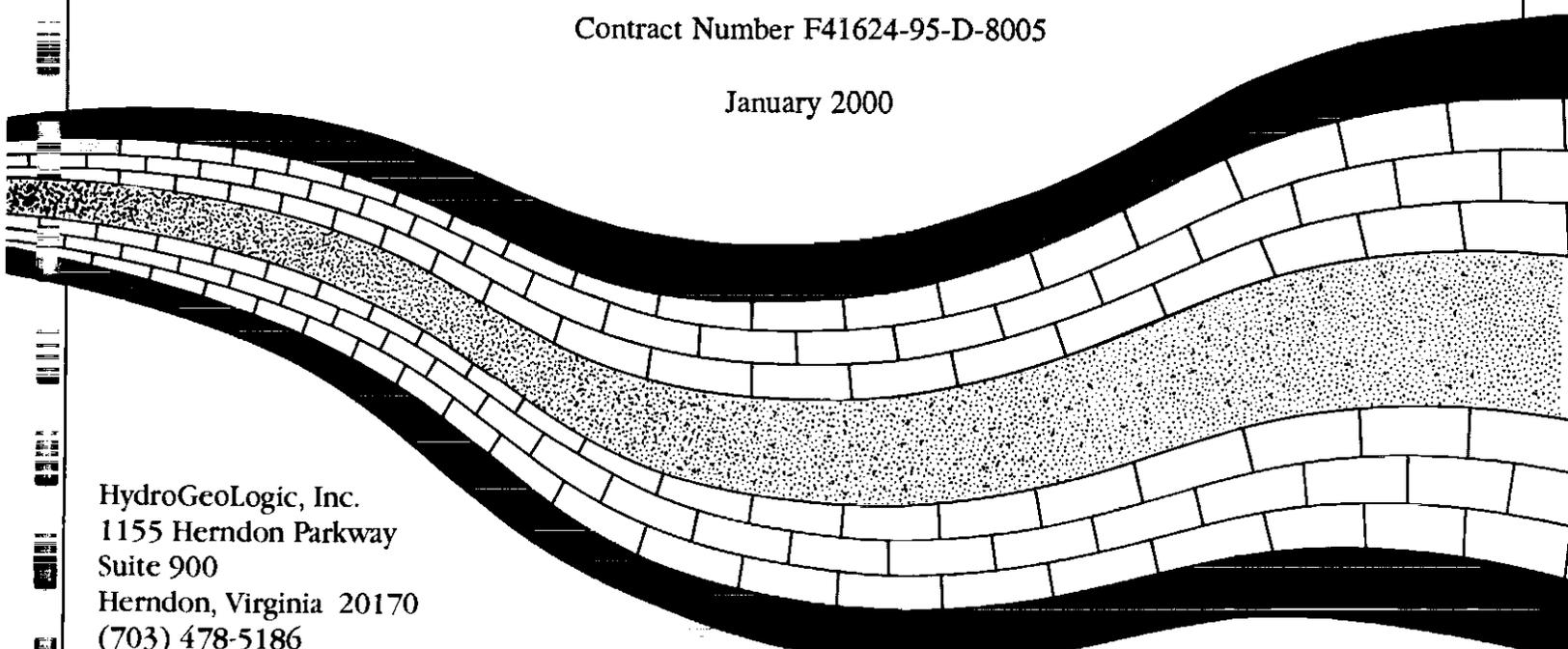


Prepared for

U.S. Air Force Center for Environmental Excellence
Brooks AFB, Texas

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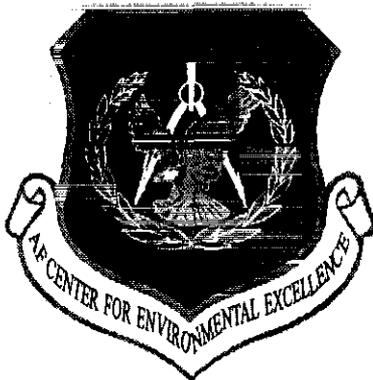
January 2000

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FINAL CLOSURE REPORT

SWMU 7 AND SWMU 8
NAS FORT WORTH JRB, TEXAS



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Prepared for
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PREFACE

This document contains the Final Closure Report for solid waste management units (SWMUs) 7 and 8 at the Naval Air Station (NAS) Fort Worth Joint Reserve Base (JRB), Texas.

HydroGeoLogic, Inc. (HydroGeoLogic) prepared this report under contract to the U.S. Air Force Center for Environmental Excellence (AFCEE), Contract No. F41624-95-D-8005, Delivery Order No. 0016, in support of the Air Force Installation Restoration Program.

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This contract is administered by the Defense Contract Management Command (DCMC), 10500 Battleview Parkway, Suite 200, Manassas, Virginia, 22110. The Contracting Officer is Ms. Diane C. Sharpe. The Contracting Officer's Representative is Mr. Don Ficklen (210/536-5214), located at the AFCEE/Environmental Restoration Division (ERD), 3207 North Road, Brooks Air Force Base (AFB), Texas 78235-5363.

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LIST OF ACRONYMS AND ABBREVIATIONS

AFB	Air Force Base
AFCEE	U.S. Air Force Center for Environmental Excellence
AGE	aerospace ground equipment
AOC	area of concern
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylenes
CoC	Contaminant of concern
DCMC	Defense Contract Management Command
ENSR	ENSR Corporation
ERD	Environmental Restoration Division
HW	hazardous waste
HydroGeoLogic	HydroGeoLogic, Inc.
IT	International Technology Corporation
JP-4	jet propulsion fuel, grade 4
JRB	Joint Reserve Base
LPST	leaking petroleum storage tank
LSA	limited site assessment
MEK	methyl ethyl ketone
mg/kg	milligrams per kilogram
mg/L	milligrams per liter
MSCs	medium-specific concentrations
NAS	Naval Air Station
NFA	no further action
OWS	oil/water separator
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PCE	tetrachloroethene
PQL	practical quantitation limit
PST	petroleum storage tank

LIST OF ACRONYMS AND ABBREVIATIONS

RCRA	Resource Conservation and Recovery Act
RFA	RCRA facility assessment
RFI	RCRA facility investigation
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TCE	trichloroethene
TNRCC	Texas Natural Resource Conservation Commission
TPH	total petroleum hydrocarbons
USACE	U. S. Army Corps of Engineers
UST	underground storage tank
VOC	volatile organic compound
VSI	visual site inspection
WAA	waste accumulation area
WP	work plan

FINAL CLOSURE REPORT SWMU 7 AND SWMU 8 NAS FORT WORTH JRB, TEXAS

1.0 INTRODUCTION

This Closure Report is intended to provide justification for removal of Air Force obligations for solid waste management units (SWMUs) 7 and 8 under the Resource Conservation and Recovery Act (RCRA) hazardous waste (HW) permit (HW-50289) issued by the Texas Natural Resource Conservation Commission (TNRCC). The issuance of this permit is discussed in more detail in Section 1.1. Following closure of these sites, SWMU 7 and 8 will continue to operate under the Navy Compliance Program.

The information provided in this closure report includes site descriptions, operational histories, description of wastes managed, and summaries of previous investigations conducted at the sites. These previous investigations focused on recognizing the potential sources of contamination at SWMUs 7 and 8, along with the nature and extent of any possible contamination.

The results of the previous investigations have led to the conclusion that SWMUs 7 and 8 pose no significant risk to human health or the environment since there is no evidence or history of release from SWMU 7 or SWMU 8 while they operated under Air Force management prior to the base realignment on October 1, 1994.

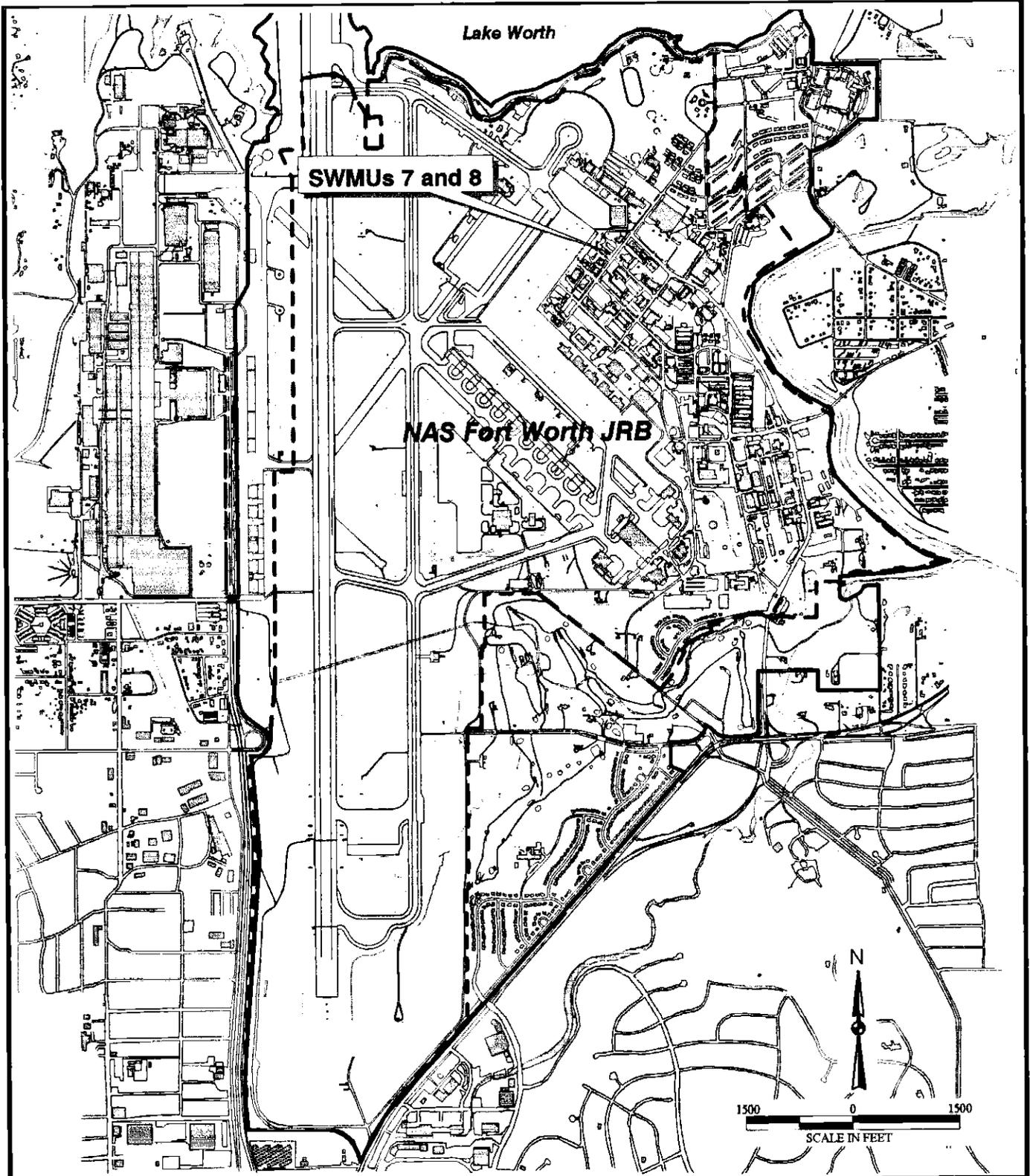
1.1 BACKGROUND

On February 7, 1991, the former Carswell Air Force Base (AFB), currently realigned as Naval Air Station (NAS) Fort Worth Joint Reserve Base (JRB), was issued RCRA permit HW-50289 by the TNRCC. This permit requires a RCRA facility investigation (RFI) of all SWMUs and areas of concern (AOCs) listed in Permit Provision VIII in order to determine whether any hazardous constituents listed in 40 Code of Federal Regulations Part 264, Appendix IX have been released into the environment. SWMUs 7 and 8, although not included in the original permit, were added to the list of SWMUs and AOCs requiring investigation by the TNRCC in a letter dated April 22, 1994.

1.2 SITE IDENTIFICATION AND DESCRIPTION

Descriptions of the location, physical setting, operational history, and previous environmental investigations at NAS Fort Worth JRB are included in Section 1.0 of the Revised Final Work Plans (WPs) for the RFI of Waste Accumulation Areas (WAAs) (HydroGeoLogic, 1999b).

The areas of interest for this Closure Report are two SWMUs located south of Building 1628, at the northern end of NAS Fort Worth JRB. The location of these two SWMUs in relation to the installation are depicted in Figure 1.1. These SWMUs are identified as follows:



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Legend

- NAS Fort Worth JRB Boundary
- Former Carswell AFB Boundary

Figure 1.1

**Location of
SWMUs 7 and 8**

- SWMU 7, Building 1628 Oil/Water Separator (OWS)
- SWMU 8, Building 1628 Sludge Collection Tank¹

The following sections provide a description and the current status of each site.

1.2.1 Description of SWMU 7

SWMU 7, the Building 1628 OWS, is an outdoor, L-shaped, concrete structure, exposed approximately 2 feet above the ground surface and the remaining 4.5 feet below the ground surface (Dodyk, M., 1999b). SWMU 7 is located west of the intersection of Carswell and Eisenhower Avenues in the grassy area south of Building 1628. SWMU 7 measures approximately 7.5 feet wide by 32 feet long on the main section with an adjacent stormwater overflow section that measures 7 feet 8 inches by 6 feet 3 inches, and has a capacity of approximately 20,000 gallons² (Dodyk, M., 1999b). Photographs of SWMU 7 are depicted in Figure 1.2.

The SWMU 7 OWS was originally installed in 1979 to receive wastewater from the Building 1628 washrack and drain (SWMU 6), which was removed shortly after 1990. Building 1628 housed operations for the corrosion control shop and the aerospace ground equipment (AGE) maintenance shop. Wastewater flowed from SWMU 6 to SWMU 7 where the oily fraction flowed to SWMU 8, described in Section 1.2.2, and the wastewater fraction flowed to the sanitary sewer (International Technology Corporation (IT), 1997). Wastewater from SWMU 6 may have contained fractions of aircraft cleaning agents³, aircraft engine hydraulic fluid, and aircraft engine oil. Wastewater from SWMU 6 may also have contained small amounts of surface water runoff from SWMU 5, the Building 1628 WAA. Waste stored at SWMU 5 included waste antifreeze, methyl ethyl ketone (MEK), epoxy paint stripper and thinner, and recyclable oils (U.S. Air Force, 1989). SWMU 5 and SWMU 6 are currently being investigated in accordance with the Revised Final WPs for the RFI of WAAs (HydroGeoLogic, 1999b).

The SWMU 7 OWS was also originally installed to serve as a release control for the Building 1628 refueling facility. This refueling facility was located to the immediate west of SWMU 7 (Figure 1.2), and contained three underground storage tanks (USTs) identified as 1628-1, 1628-2, and 1628-3. These tanks were removed in October 1994 after they were discovered to be leaking. The site was assigned leaking petroleum storage tank (LPST) number 106684. Summaries of the resulting site assessment and remedial activities are presented in Section 2.2.

¹ SWMU 8 is identified on Air Force records as UST 1628-4, and Navy records as UST 1628-5. Both Air Force and Navy records describe the contents of the tank as waste oil. This Closure Report will refer to SWMU 8 as the Building 1628 sludge collection tank, as it is identified in the TNRCC letter dated April 22, 1994.

² SWMU 7 is identified on Navy inventory records as UST 1628-4 with a capacity of 4,380 gallons. This Closure Report will refer to SWMU 7 as the 20,000 gallon, Building 1628 OWS, as it is identified by A.T. Kearney in 1989 and IT in 1998.

³ The primary cleaning agent used to wash aircraft parts at SWMU 6 was the petroleum naphtha solvent, PD-680 (Type II).

SWMU 7 currently serves as a release control for any potential fuel leaks from the AGE fueling facility, and its associated above ground storage tanks located to the north of Building 1628. There have been no reported releases from this area. In addition, SWMU 7 receives small amounts of waste, in the form of fuels, lubricants, detergents, and cleaning solvents from the aqueous parts washer discharged through the floor drain inside Building 1628 which is currently utilized by the U.S. Air Force Reserve 457th Fighter Squadron for cleaning and storage of aerospace bomb racks (Dodyk, M., 1999b).

1.2.2 Description of SWMU 8

SWMU 8, the Building 1628 sludge collection tank, is described as an underground, carbon steel tank encased in concrete, which has a capacity to hold approximately 1,000 gallons of waste liquids and sludges (A.T. Kearney, 1989). SWMU 8 is not included on the list of regulated USTs on the TNRCC Petroleum Storage Tanks (PSTs) Summary Listing. SWMU 8 began operating in 1979, and is currently used by the 301st Air Reserve. A tank gauge, located at ground level, shows the current volume of the tank from the surface. A photograph of the surface area of SWMU 8 is presented in Figure 1.2.

SWMU 8 manages the oily fraction of waste that has separated from the SWMU 7 OWS (A.T. Kearney, 1989). SWMU 8 contains waste oils which may also include traces of aircraft engine hydraulic fluids, and PD-680 (Type II). The volume of waste oil in SWMU 8 is monitored and the UST is emptied and cleaned out on an as-needed basis. At the time the RCRA Facility Assessment (RFA) was conducted in 1989, SWMU 8 was reported to have been emptied by a removal contractor arranged by the base Civil Engineering Department every two to three years (A.T. Kearney, 1989). According to interviews with Air Force and Navy personnel, SWMU 8 was emptied by the Air Force in 1992, and was emptied again by the Navy in 1999 (Dodyk, M., 1999a).

1.2.3 Contaminants of Concern

Based on the types of wastes managed at SWMUs 7 and 8, several potential contaminants of concern (CoCs) have been identified at this site. As previously stated in Sections 1.2.1 and 1.2.2, SWMUs 7 and 8 serve as release controls for wastes produced within Building 1628, the AGE facility, and for the former refueling facility located immediately east of the site. The primary wastes identified with these facilities include cleaning solvents and strippers, lubricants, fuels, and oils. The majority of these wastes may have been managed at SWMU 7. The oily fraction was skimmed off the surface of SWMU 7 and was stored within SWMU 8. These wastes are limited to waste oils and fuels. Based on these types of wastes, primary CoCs have been identified at SWMU 7 and SWMU 8. These CoCs are identified in Table 1.1.

Table 1.1
Contaminants of Concern
SWMU 7 and SWMU 8
NAS Fort Worth JRB, Texas

Wastes Managed	Contaminants of Concern	Analytical Method
SWMU 7		
Fuels (diesel, gasoline, JP-4)	Lead BTEX PAHs	Metals (SW6010) VOCs (SW8260) SVOCs (SW8270)
Lubricants (hydraulic fluids, waste oils)	Barium BTEX PAHs	Metals (SW6010) VOCs (SW8260) SVOCs (SW8270)
Solvents, strippers, cleaners	TCE PCE MEK Benzene Propylbenzene PAHs	VOCs (SW8260) VOCs (SW8260) VOCs (SW8260) VOCs (SW8260) VOCs (SW8260) SVOCs (SW8270)
SWMU 8		
Fuels (diesel, gasoline, JP-4)	Lead BTEX PAHs	Metals (SW6010) VOCs (SW8260) SVOCs (SW8270)
Lubricants (hydraulic fluids, waste oils)	Barium BTEX PAHs	Metals (SW6010) VOCs (SW8260) SVOCs (SW8270)

Notes:

- JP-4 = Jet propulsion fuel, grade 4
 BTEX = Benzene, toluene, ethylbenzene, xylenes
 PAHs = Polynuclear aromatic hydrocarbons
 TCE = Trichloroethene
 PCE = Tetrachloroethene
 SVOC = Semivolatile organic compound
 VOC = Volatile organic compound



Photo taken at Point B: 01/99

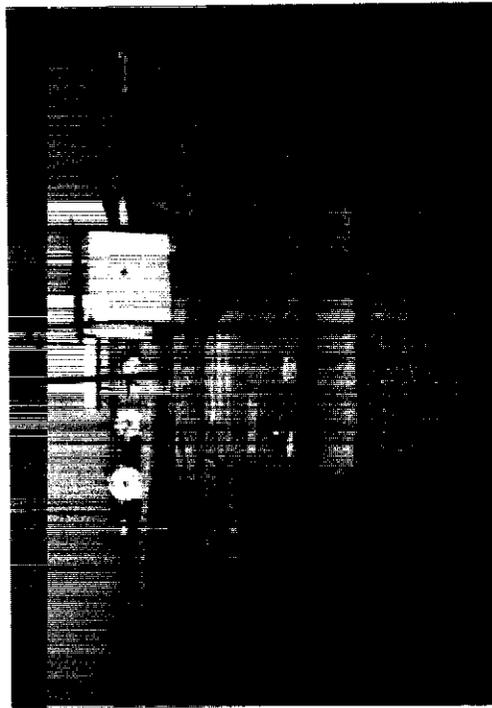


Photo taken at Point A: 01/99

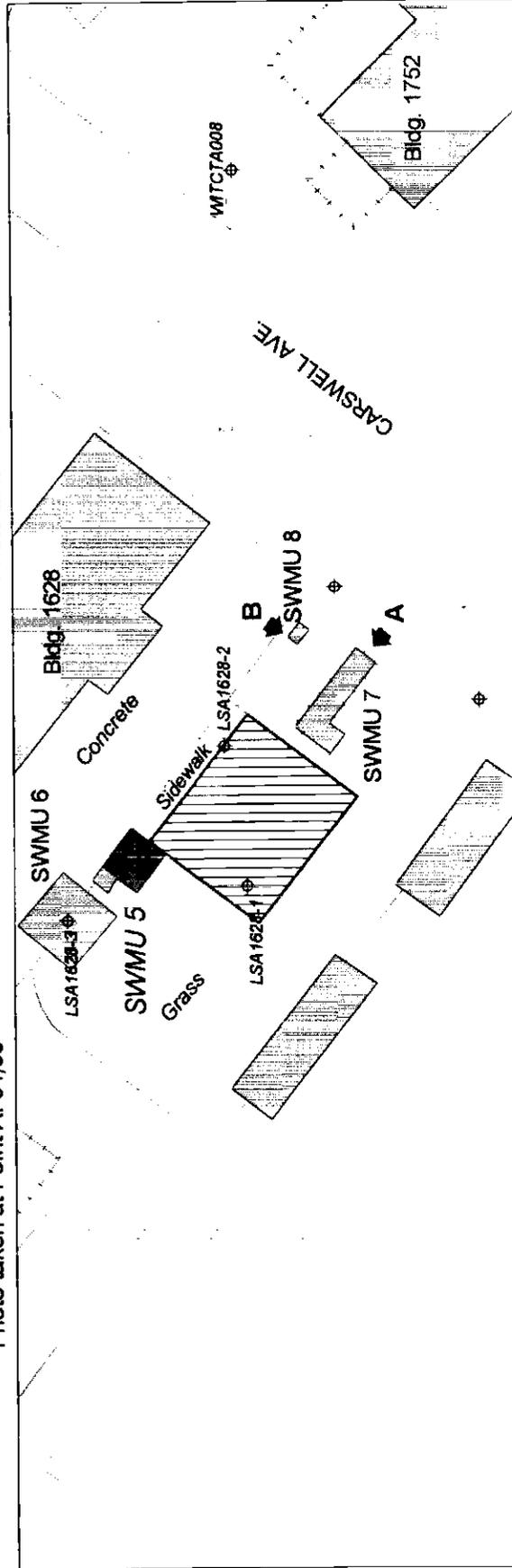


Figure 1.2
Locations of
SWMUs 7 and 8

SCALE IN FEET

Legend

- Solid Waste Management Unit (SWMU)
- Waste Accumulation Area (WAA)
- Existing Monitoring Well
- Former UST Site



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2.0 SITE INVESTIGATION SUMMARY

The following sections summarize previous soil and groundwater investigations and remedial actions both directly and indirectly associated with SWMUs 7 and 8.

2.1 1989 RCRA FACILITY ASSESSMENT, PRELIMINARY REVIEW/VISUAL SITE INSPECTION

A.T. Kearney conducted a Visual Site Inspection (VSI) which included SWMUs 7 and 8 in 1989. According to the VSI report, both SWMU 7 and SWMU 8 were recommended for no further action (NFA) based on the conclusion that there was no documented history or evidence of release from either SWMU. The release potential for SWMU 7 was considered to be low due to its connection to SWMU 8, and the release potential for SWMU 8 was considered to be low due to its enclosure within a concrete vault (A.T. Kearney, 1989).

2.2 UNDERGROUND STORAGE TANK INVESTIGATION AT BUILDING 1628

In 1993, the Fort Worth District Corps of Engineers conducted a limited site assessment (LSA) for LPST site 106684 located adjacent to SWMUs 7 and 8 (Figure 2.1). The site contained three leaking USTs that were removed from the Building 1628 vehicle refueling area in October 1993 (U.S. Army Corps of Engineers (USACE), 1994). These three USTs, 1628-1 (1,000 gallons gasoline), 1628-2 (1,000 gallons diesel), and 1628-3 (2,000 gallons jet propulsion fuel, grade 4 [JP-4]), were located immediately to the west (upgradient) of SWMUs 7 and 8. After the tanks were exhumed, contaminated backfill was returned to the excavation and covered with a plastic liner. Clean soil was brought in to level the site. Three monitoring wells, LSA1628-1, LSA1628-2, and LSA1628-3, were subsequently installed in and around the former UST site (USACE, 1994). The locations of the former UST site and the associated monitoring wells are depicted in Figure 2.1.

Soil samples collected during the installation of LSA1628-3 indicated the area upgradient of the LPST site was not impacted by the leaking USTs. The soil samples during the installation of LSA1628-1 contained the highest levels of contamination, while the samples from LSA1628-2 contained moderate levels of petroleum contamination. Groundwater samples collected during 1993, indicate the same distribution of petroleum contamination. This distribution suggests the soil and groundwater surrounding the UST excavation, and upgradient of SWMUs 7 and 8 was impacted by the leaking tanks.

In April 1998, the USACE began remediation activities of the groundwater beneath the former UST site. ENSR Corporation (ENSR) installed two additional monitoring wells, LSA1628-14 and LSA1628-15 downgradient of the site (Figure 2.1) and injected a slurry of an Oxygen Releasing Compound® to a depth of 17 feet below ground surface (bgs), to the north and east of LSA1628-3 (ENSR, 1998b). Groundwater samples were collected in June and September of 1998 from each of the five wells at the site, and analyzed for volatile organic compounds (VOCs) (8260), polynuclear aromatic hydrocarbon (PAHs) (8310), and total petroleum hydrocarbons (TPH) (1005). The 1998 groundwater sampling results are presented in Table 2.1. The distribution of contaminants in the groundwater samples collected from LSA1628-1, LSA1628-2, and LSA1628-3

was similar to the analytical results of the 1993 soil and groundwater investigation. Benzene was detected in the groundwater from LSA1628-14 slightly above the current TNRCC medium-specific concentrations (MSCs) in June of 1998 and in September of 1998 (ENSR, 1998a). However, higher concentrations of benzene were detected in upgradient wells LSA1628-1 and LSA1628-2. As no additional petroleum-related VOCs were detected in the groundwater samples from LSA1628-14 and LSA1628-15, these results are most likely to be indicative of plume migration from the tank excavation, and are not considered to be indicative of a release from SWMU 7 or 8. Trichloroethene (TCE) and associated VOCs were detected in all five wells and are attributed to the regional TCE plume.

2.3 1997 RCRA FACILITY INVESTIGATION, SANITARY SEWER SYSTEM; AND 1998 OWS RCRA FACILITIES INVESTIGATION ADDENDUM REPORT

IT advanced two soil borings, SB162801 and SB162802, downgradient and upgradient, respectively, of SWMU 7 during an investigation of the sanitary sewer system at NAS Fort Worth JRB in 1997 (IT, 1997). The locations of these borings are shown on Figure 2.1. Soil samples collected from each boring were analyzed for metals (SW6010/7471), VOCs (SW8260), semivolatile organic compounds (SVOCs) (SW8270), and pesticides/polychlorinated biphenyls (PCBs)(SW8080). Surface and subsurface soil sample results above detection limits are shown in comparison to the Jacobs background levels for NAS Fort Worth JRB (Jacobs, 1998) and the TNRCC MSCs (April, 1999) in Tables 2.2 and 2.3.

2.3.1 Analytical Results from Surface Soils

No pesticides or PCBs were detected in the surface soil samples from soil borings SB162801 and SB162802. SVOCs were not detected above the practical quantitation limit (PQL) in any of the surface soil samples. The detections of metals above background and VOCs above the PQL are presented in the following paragraph.

The surface soil sample from boring SB162801 contained concentrations of silver (0.76 F⁴ milligrams per kilogram [mg/kg]) slightly above the background concentration of 0.213 mg/kg. Methylene chloride was detected above the PQL at 0.0081 mg/kg in the surface soil sample from SB162801. Toluene was also detected in the same sample at 0.011 mg/kg.

2.3.2 Analytical Results from Subsurface Soils

SVOCs, pesticides, and PCBs were not detected in the subsurface soil samples collected from borings SB162801 or SB162802. Two VOCs, methylene chloride and toluene, were detected below the PQL in the subsurface soil samples from both soil borings. Detections of metals in the samples are presented in the following paragraph.

The subsurface soil sample from SB162802 at 6-8 feet bgs had a concentration of 377 mg/kg of manganese which slightly exceeds the background concentration of 351.7 mg/kg. Silver was

⁴ F = Analyte detected below reporting limit.

detected in the same sample at a concentration of 0.47 F mg/kg, which is above the background concentration of 0.128 mg/kg.

2.3.3 Analytical Results from Groundwater

In addition to the soil samples collected in 1997, IT installed and sampled monitoring well WITCTA008 (IT, 1998). IT also sampled groundwater from an existing upgradient monitoring well, LSA1628-3. The locations of these monitoring wells are shown in Figure 2.1. Groundwater was encountered at the site at approximately 10 feet bgs. Groundwater samples were analyzed for VOCs (SW8260), SVOCs (SW8270), and metals (SW6010/7470). The 1997 groundwater results are presented in Table 2.4.

No SVOCs were detected above the PQL in any of the groundwater samples. The levels of metals and VOCs detected from the samples are presented in the following paragraphs.

Groundwater sample results from the upgradient well, LSA1628-3, contained an antimony concentration of 0.0195 F milligrams per liter (mg/L), which is above the background value of 0.002 mg/L. Manganese was also detected in the sample above the background value of 0.175 mg/L. There were no detections of metals above background in the groundwater sample collected from the downgradient well WITCTA008.

Concentrations of *cis*-1,2-dichloroethene, and TCE, were detected above PQLs in groundwater samples from WITCTA008 and LSA1628-3. TCE concentrations were detected above the PQL from the groundwater samples at WITCTA008 (0.62 mg/L) and LSA1628-3 (0.410 mg/L). Concentrations of *cis*-1,2-dichloroethene (0.074 mg/L) and methylene chloride (0.110 mg/L) were detected in the sample collected from LSA1628-3 above the PQL. *Cis*-1, 2,-dichloroethene was detected in the sample from WITCTA008 at 0.022 J mg/L. Chloroform (0.012 J mg/L) was also detected above the PQL in the sample from WITCTA008.

2.3.4 Summary of Analytical Results

The results of the sampling events summarized above suggest there has not been a release to the soil and groundwater from either SWMU 7 or SWMU 8. Results of the soil analysis did not detect concentrations of metals substantially above background concentrations in the surface or subsurface soil borings adjacent to SWMU 7 or 8 with the exception of silver. However, silver is not a waste associated with SWMU 7 or SWMU 8. Benzene, ethylbenzene, toluene, and xylene (BTEX) concentrations detected in soil can be attributed to the former USTs which are being remediated under the TNRCC PST program. No SVOCs were detected above the PQLs in the soil. The results of the groundwater investigation, which show minor detections of metals upgradient and comparable levels of TCE-related VOCs in each well, substantiates that a release has not occurred from SWMU 7 or 8. The TCE-related contamination detected in groundwater samples collected from both wells will be addressed as part of the regional TCE plume investigation (CH2M Hill, 1997).

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Figure 2.1

Field Investigation Summary
SWMUs 7 and 8



U.S. Air Force Center For
Environmental Excellence
Brooks AFB, Texas

Legend

- Waste Accumulation Area (WAA)
- Solid Waste Management Units (SWMU)
- Former UST Site
- Existing Monitoring Wells
- Soil Borings (IT, 1997)
- Storm Sewer Line
- Sanitary Sewer Line
- Former Sanitary Sewer Line

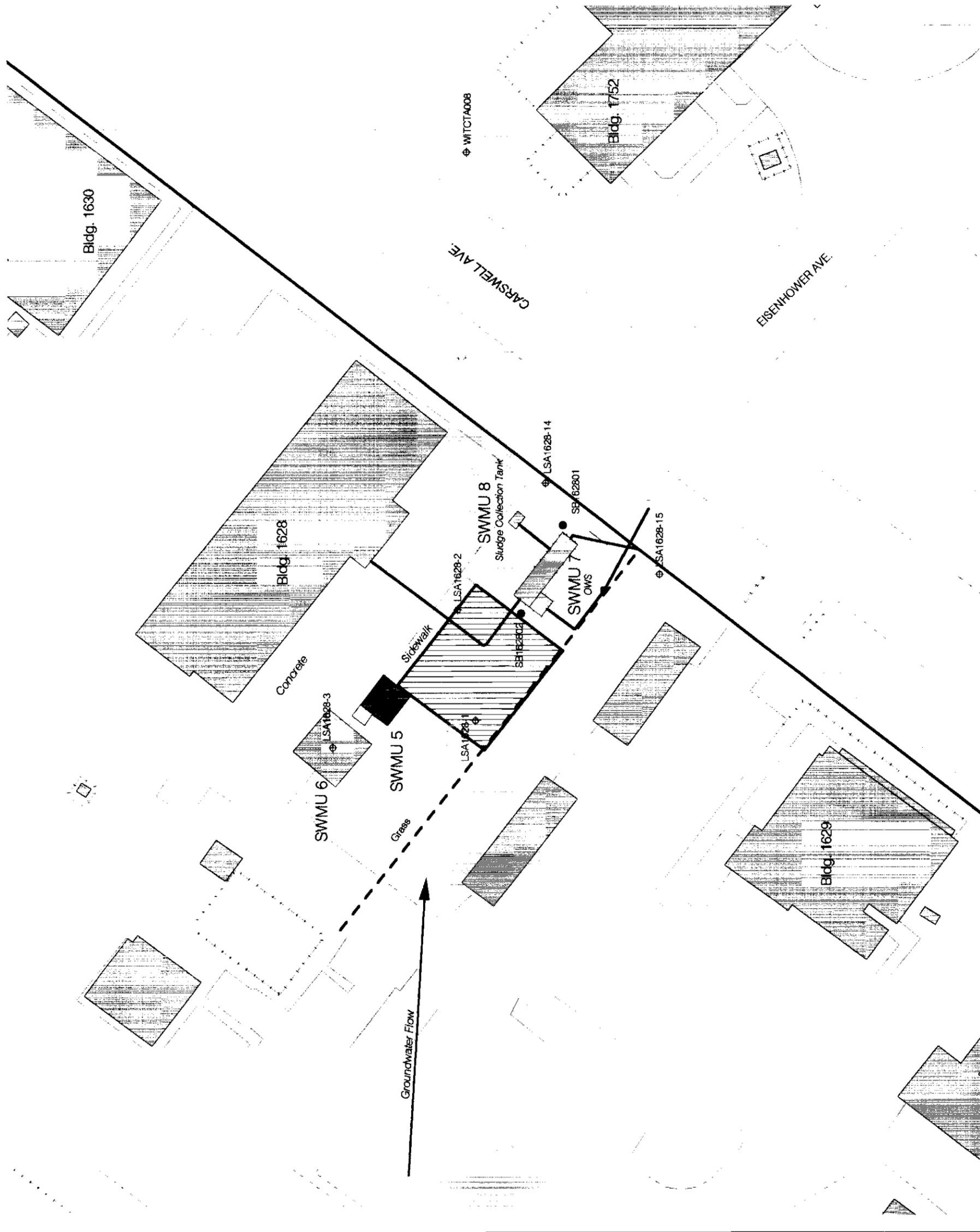


Table 2.1
1998 Groundwater Remedial Action Sampling Results for Building 1628
NAS Fort Worth JRB, Texas

Compounds	Parameters		Well Numbers								
	BG (mg/L)	RRS2 (mg/L)	LSA1628-1			LSA1628-2			LSA1628-3		
			June 1998 (mg/L)	Sept. 1998 (mg/L)							
VOCs (8260)											
Benzene	PQL	0.005	0.701	1.690	0.116	0.0303	ND	ND	ND	ND	ND
Toluene	PQL	1.0	1.830	3.700	ND	0.00501	ND	ND	ND	ND	ND
Ethylbenzene	PQL	0.7	0.748	1.220	ND	0.00607	ND	ND	ND	ND	ND
Xylene (total)	PQL	10	3.839	8.920	ND	0.0107	ND	ND	ND	ND	ND
Acetone	PQL	NV	ND	0.0865	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	PQL	NV	0.00934	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	PQL	0.73	ND	ND	0.00261	ND	ND	ND	ND	ND	ND
cis-1,2-Dichloroethene	PQL	0.07	0.028	0.0219	0.0216	0.00932	0.0713	0.0933	0.0554	ND	ND
trans-1,2-Dichloroethene	PQL	0.1	0.0248	0.0196	0.0251	0.00633	0.0554	0.0554	0.0554	ND	ND
2-Hexane	PQL	NV	0.0838	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	PQL	0.005	0.0941	0.0765	0.0606	0.0229	0.386	0.360	0.386	0.360	0.360
Vinyl chloride	PQL	0.002	ND	ND	0.0115	0.00604	ND	ND	ND	ND	ND
PAHs (8310)											
Benzo[a]anthracene	PQL	0.0004	ND	0.00312	ND	ND	ND	ND	ND	0.000164	0.000164
Benzo[b]fluoranthene	PQL	0.0004	ND	0.00254	ND	0.00052	ND	ND	ND	ND	ND
Benzo[k]fluoranthene	PQL	NV	ND	0.00895	ND	0.000512	ND	ND	ND	ND	ND

Table 2.1 (continued)
 1998 Groundwater Remedial Action Sampling Results for Building 1628
 NAS Fort Worth JRB, Texas

Compounds	Parameters		Well Numbers								
	BG (mg/L)	RRS2 (mg/L)	LSA1628-1			LSA1628-2			LSA1628-3		
			June 1998 (mg/L)	Sept. 1998 (mg/L)							
Benzo[<i>a</i>]pyrene	PQL	0.0002	ND	0.002	ND	0.0004	ND	0.0004	ND	ND	ND
Chrysene	PQL	0.039	ND	ND	0.0096	ND	ND	ND	ND	ND	ND
Fluoranthene	PQL	1.46	ND	0.00552	ND	ND	ND	ND	ND	ND	ND
Naphthalene	PQL	1.46	0.024	0.0296	0.023	ND	ND	ND	ND	ND	ND
Pyrene	PQL	1.1	ND	0.00372	ND	ND	ND	ND	ND	ND	ND
TPH (1005)											
TPH (C6-C10)	PQL	5'	15.2	19.0	ND	ND	ND	ND	ND	ND	ND
TPH (> C10-C28)	PQL	5'	ND	11.3	8.5	ND	ND	ND	ND	ND	ND
TPH (C6-C28)	PQL	5'	15.2	30.3	8.5	ND	ND	ND	ND	ND	ND

Table 2.1 (continued)
 1998 Groundwater Remedial Action Sampling Results for Building 1628
 NAS Fort Worth JRB, Texas

Compounds	Parameters		Well Numbers			
	BG (mg/L)	RRS2 (mg/L)	LSA1628-14		LSA1628-15	
			June 1998 (mg/L)	Sept. 1998 (mg/L)	June 1998 (mg/L)	Sept. 1998 (mg/L)
VOCs (8260)						
Benzene	PQL	0.005	0.0154	0.0271	ND	ND
<i>cis</i> -1,2-Dichloroethene	PQL	0.07	0.0171	0.0186	0.0474	0.0715
<i>trans</i> -1,2-Dichloroethene	PQL	0.1	0.0124	0.0110	0.0570	0.0522
Trichloroethene	PQL	0.005	0.0699	0.0696	0.144	0.325

Notes:

1 Groundwater action level for coarse-grained soils (TNRCC RG-17)

Shaded boxes show results above background and detection limits

Shaded boxes with double borders show results above both background and RRS2

NA = Not analyzed

ND = Not detected

NV = No value

Source: September 1998 Quarterly Groundwater Monitoring Data, Bldg 1628 (ENSR, 1998d)

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Table 2.2
1997 Surface Soil Sampling Results for SWMUs 7 and 8
NAS Fort Worth JRB, Texas

Analytes	Background (mg/kg)	MSC (mg/kg)	SB162801	SB162802
			0-2' (mg/kg)	0-2' (mg/kg)
Metals (SW6010/7471)				
Aluminum	22035	10000	11600	9410
Arsenic	5.85	5	ND	ND
Barium	233	200	67.2	68.2
Beryllium	1.02	0.4	0.77	0.67
Cadmium	0.556	0.5	0.54F	0.31F
Calcium	167788	NA	13000	25600
Chromium	25.86	10	14	11.1
Cobalt	11.05	610	4.7F	4.2F
Copper	17.37	130	7.7	6.3F
Iron	17717	NA	15200	11000
Lead	30.97	1.5	11.9F	11.3F
Magnesium	3003	NA	1210	1260
Manganese	849	1400	206	169
Molybdenum	1.46	51	ND	0.83F
Nickel	14.6	200	10.9F	8.3F
Potassium	2895	NA	1540	1110
Silver	0.213	51	0.76F	ND
Sodium	37300	NA	46.2	66.3
Vanadium	46.30	72	24	22.2
Zinc	38.8	3100	20	22.6
Mercury	0.14	0.2	0.01F	0.01F
VOCs (SW8260)				
1,1,2,2,- Tetrachloroethane	PQL	1.4	ND	ND
<i>m+p</i> -Xylene	PQL	1000	0.0018F	ND

Table 2.2 (continued)
1997 Surface Soil Sampling Results for SWMUs 7 and 8
NAS Fort Worth JRB, Texas

Analytes	Background (mg/kg)	MSC (mg/kg)	SB162801	SB162802
			0-2' (mg/kg)	0-2' (mg/kg)
Methylene chloride	PQL	0.5	0.0081	0.0019F
Toluene	PQL	100	0.011	0.0042F

Notes:

Shaded boxes show results above background or detection limits

Shaded boxes with double borders show results above both background and MSC levels

F = Analyte detected below reporting limit

MSC = TNRCC Medium-Specific Concentrations

NA = No comparison value

ND = Not detected

PQL = Practical quantitation limit

Source: Draft Naval Air Station Fort Worth OWS RCRA Facilities Investigation Addendum Report (IT, 1998)

Table 2.3
1997 Subsurface Soil Sampling Results for SWMUs 7 and 8
NAS Fort Worth JRB, Texas

Analytes	Background (mg/kg)	MSC (mg/kg)	SB162801	SB162802
			6-8' (mg/kg)	6-8' (mg/kg)
Metals (SW6010/7471)				
Aluminum	20260	10000	9580	9670
Arsenic	6.58	5.0	ND	3.7F
Barium	128.1	200	31.8	105
Beryllium	1.13	0.4	0.72	0.66
Cadmium	0.59	0.5	0.35F	0.39F
Calcium	272000	NA	5100	20400
Chromium	16.31	10	11.8	12.7
Cobalt	6.19	610	3.3F	5.6F
Copper	13.72	130	6.9F	5.7F
Iron	17469	NA	15200	14700
Lead	12.66	1.5	7F	8.5F
Magnesium	2420	NA	1370	1460
Manganese	351.7	1400	63.1	377
Molybdenum	1.93	51	1.0F	0.73F
Nickel	19.76	200	9.5F	11F
Potassium	1717	NA	1130	1430
Silver	0.128	51	ND	0.47F
Sodium	53200	NA	1320	804
Vanadium	37.4	72	21.9	20.7
Zinc	31.3	3100	19.1	22
Mercury	0.035	0.2	0.01F	0.01F

Table 2.3 (continued)
1997 Subsurface Soil Sampling Results for SWMU 7 and 8
NAS Fort Worth JRB, Texas

Analytes	Background (mg/kg)	MSC (mg/kg)	SB162801	SB162802
			6-8' (mg/kg)	6-8' (mg/kg)
VOCs (SW8260)				
Methylene chloride	PQL	0.5	0.0017F	0.0024F
Toluene	PQL	100	0.0022F	0.004F
1,1,2,2,- Tetrachloroethane	PQL	1.4	ND	ND
1,2,4-Trimethylbenzene	PQL	NA	ND	ND

Notes:

Shaded boxes show results above background or detection limits

Shaded boxes with double borders show results above both background and MSC values

F = Analyte detected below reporting limit

MSC = TNRCC Medium-Specific Concentrations

NA = No comparison value

ND = Not detected

PQL = Practical quantitation limit

Source: Draft Naval Air Station Fort Worth OWS RCRA Facilities Investigation Addendum Report (IT, 1998)

Table 2.4
1997 Groundwater Sampling Results for SWMUs 7 and 8
NAS Fort Worth JRB, Texas

Compounds	Background (mg/L)	MSC (mg/L)	WITCTA008	LSA1628-3
			May 1997 (mg/L)	April 1997 (mg/L)
Metals (SW6010/7470)				
Aluminum	1.332	100	0.046F	0.0322F
Antimony	0.002	0.006	ND	0.0195F
Barium	0.587	2	0.07	0.156
Beryllium	0.0003	0.004	ND	0.00056F
Calcium	266.3	NA	126	115
Iron	0.224	NA	0.204	0.146
Magnesium	37.80	NA	18.2	13.1
Manganese	0.175	14	0.144	0.825
Potassium	15.03	NA	2.86F	1.71F
Sodium	167	NA	134	126
Zinc	0.118	31	0.0192F	0.0755
Mercury	0.0001	0.002	ND	0.00007F
VOCs (SW8260)				
Chloroform	PQL	0.1	0.012J	ND
cis-1,2-Dichloroethene	PQL	0.07	0.022J	0.074
Methylene chloride	PQL	0.005	0.018R	0.110
Trichloroethene	PQL	0.005	0.62	0.410

Notes:

Shaded boxes show results above background or detection limits

Shaded boxes with double borders show results above both background and RRS2

F = Analyte detected below reporting limit

J = The associate value is an estimated quantity

MSCs = TNRCC Medium-Specific Concentrations

NA = No comparison value

ND = Not detected

PQL = Practical quantitation limit

R = The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Source: Draft Naval Air Station Fort Worth OWS RCRA Facilities Investigation Addendum Report (IT, 1998)

2.4 UNDERGROUND STORAGE TANK MONTHLY MONITORING PROGRAM

SWMU 8 has been involved in a monthly monitoring program since 1994, to ensure that a release does not occur (HydroGeoLogic, 1999a). SWMU 8 was monitored by Unified Services of Texas, Inc., using a Tracer Tight[®] test that involved the installation of soil gas probes adjacent to the UST and the injection of an aerosol into the tank on a monthly basis. Soil gas samples were collected from the probes 7 to 35 days after the aerosol was injected and analyzed for the aerosol. If no aerosol was detected, the UST had passed the test. If the aerosol was detected, an "Alarm I" would be reported and a site investigation conducted. If the site investigation revealed a potential problem, an "Alarm II" would be reported and a tightness test would be conducted. If the UST subsequently failed the test, repairs to the UST or its associated lines would be required. Tracer Tight[®] test records reviewed for this SWMU confirmed that the tank successfully passed all tightness tests from August 1994 through December of 1996 (HydroGeoLogic, 1999a)⁵. The Navy continued monitoring SWMU 8 after 1996 through Groundwater Management Southwest, Co. According to the recent certification records, SWMU 8 has continued to pass tightness testing requirements through January 1999 (Groundwater Management Southwest, Co., 1999). All monitoring was performed in accordance with the manufacturer's protocol as required by federal, state, and county regulations for UST compliance (Groundwater Management Southwest, Co., 1999).

These monthly monitoring results combined with the secondary containment features further confirm there has not been a release from SWMU 8. SWMU 8 will continue to be monitored monthly under the Navy's compliance program.

⁵ Air Force tightness testing records identified SWMU 8 as UST 1628-4. Navy tightness test records identified SWMU 8 as UST 1628-5.

3.0 CONCLUSIONS

This Closure Report is intended to provide justification for removal of Air Force obligations for SWMUs 7 and 8 under the RCRA permit HW-50289. This Closure Report is presented to verify that there is no evidence or history of release from SWMU 7 or SWMU 8 while they operated under Air Force management prior to the base realignment on October 1, 1994.

Field observations and analytical results indicate a release has not occurred from SWMU 7 or SWMU 8. Both sites were recommended for closure in 1989 based on the observation that proper release controls were in place, and there was no evidence or history of release from either site (A.T. Kearney, 1989). A review of the analytical results presented in Section 2.0 indicate that any petroleum contamination in the area of SWMUs 7 and 8 is a result of the leaking USTs and is being addressed under the ongoing remediation program conducted by the USACE under the TNRCC PST program. Further indication of no release from SWMU 8 is demonstrated by the documented passing of Tracer Tight® tests (HydroGeoLogic, 1999a; Groundwater Management Southwest, Co., 1999). The presence of TCE and related products in the groundwater upgradient and downgradient of the SWMUs is being addressed under the regional groundwater TCE plume investigation. With no direct evidence of contamination of the soil or groundwater from either SWMU 7 or 8, NFA is warranted and these units are recommended for closure. Following closure of these sites, SWMU 7 and 8 will continue to operate under the Navy Compliance Program.

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4.0 REFERENCES

- A. T. Kearney, 1989, RCRA Facility Assessment, Preliminary Review/Visual Site Inspection.
- CH2M HILL, 1997, Draft RCRA Facility Investigation Work Plan for Area of Concern 2, (TCE Groundwater Plume).
- Dodyk, M., 1999a, Electronic Mail Communication with James P. Costello of HydroGeoLogic, Inc., Regarding Status of SWMU 7 and SWMU 8, February 18, 1999.
- Dodyk, M., 1999b, Comments to the Internal Draft Technical Memorandum Recommendation for No Further Action at SWMU 7 and SWMU 8, NAS Fort Worth JRB, Texas (August, 1999).
- ENSR, 1998a, September 1998 Summary of Quarterly Groundwater Monitoring Data, Bldg 1628, Naval Air Station (NAS) Located in Ft. Worth, Texas (LPST ID No. 106684).
- ENSR, 1998b, Summary of Oxygen Releasing Compound (ORC®) Installation, Bldg 1628, Naval Air Station (NAS) Located in Ft. Worth, Texas (LPST ID No. 106684).
- Groundwater Management Southwest, Co., 1999, January Monthly Tank Testing Certification Results, Naval Air Station, Joint Reserve Base, Fort Worth
- HydroGeoLogic, Inc., 1999a, Final Technical Memorandum, Recommended Actions, Underground Storage Tanks, NAS Fort Worth JRB, Texas.
- HydroGeoLogic, Inc., 1999b, Revised Final Work Plans RCRA Facility Investigation of Waste Accumulation Areas, NAS Fort Worth JRB, Texas.
- International Technology Corporation, 1997, Draft RCRA Facility Investigation, Sanitary Sewer System.
- International Technology Corporation, 1998, Draft Naval Air Station Fort Worth, OWS RCRA Facilities Investigation Addendum Report.
- Jacobs Engineering Group, 1998, Final Basewide Background Study, Volume 1, NAS Fort Worth JRB, Texas.
- Texas Natural Resource Conservation Commission, Petroleum Storage Tank Division, 1996, Action Levels for LPST Sites, RG-17.
- Texas Natural Resource Conservation Commission, 1996b, Texas Administrative Code, Environmental Quality, Chapter 335 Industrial Solid Waste and Municipal Hazardous Waste, Risk Reduction Standards.

U.S. Air Force Occupational and Environmental Health Laboratory Human Systems Division,
1989, Hazardous Waste Technical Assistance Survey, Carswell AFB, Texas.

U.S. Army Corps of Engineers, Fort Worth District, 1994, Limited Site Assessment Report for
UST Facility ID No. 16288, LPST ID No. 106684.

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