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HydroGeoLogic INC.

DRAFT FINAL
BASEWIDE GROUNDWATER SAMPLING AND ANALYSIS PROGRAM 2000 ANNUAL REPORT NAS FORT WORTH JRB, TEXAS

Prepared for

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

Contract Number F41624-95-D-8005-0033

February 2001

HydroGeoLogic, Inc.
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Herndon, Virginia 20170
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HYDRO GeoLogic INC

FEDERAL EXPRESS

February 2, 2001

Mr. Don Ficklen
HQ AFCEE/ERD
3207 North Road
Brooks AFB, Texas 78235-5363

Re: Draft Final Basewide Groundwater Sampling and Analysis Program
2000 Annual Report
NAS Fort Worth JRB, Texas
F41624-95-D-8005-0033

Dear Mr. Ficklen

HydroGeoLogic, Inc. is pleased to submit the Draft Final of the Basewide Groundwater Sampling and Analysis Program, 2000 Annual Report for NAS Fort Worth JRB, Texas. This report presents the field screening and analytical data generated as part of the October 2000 Quarterly sampling event, as well as summarizing analytical results for this program during the calendar year 2000.

Please call me at (512) 336-1170 x29 should you have any questions or comments concerning this document.

Sincerely,

Todd Harrah
Project Manager

Enclosure
cc: Mr. Michael Dodyk, P.E.
AFCEE/ERD
Building 1619, Intersection of Doolittle and Carswell Ave.
NAS Fort Worth JRB, Texas 76127

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DRAFT FINAL
BASEWIDE GROUNDWATER
SAMPLING AND ANALYSIS PROGRAM
2000 ANNUAL REPORT
NAS FORT WORTH JRB, TEXAS

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February 2001

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13 ABSTRACT (Maximum 200 words)

This document presents the Draft Final Basewide Groundwater Sampling and Analysis Program 2000 Annual Report for quarterly monitoring events conducted at Naval Air Station Fort Worth JRB (NAS Fort Worth JRB), Texas This report presents, the field screening and analytical data generated as part of the October 2000 quarterly sampling event, as well as summarizing analytical results for this program during the calendar year 2000 In addition to the October sampling event, the year 2000 program included quarterly sampling events performed in April and July 2000 A January sampling event was not conducted in 2000 This report presents observations of groundwater plume concentrations and stability, and provides recommendations for modifications to the basewide groundwater sampling and analysis program The basewide groundwater monitoring program was initiated for NAS Fort Worth JRB in April 1995 to address groundwater contamination associated with various SWMUs and AOCs identified on the base Nineteen rounds of sampling have been implemented to date, from April 1995 until October 2000

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PREFACE

This Basewide Groundwater Sampling and Analysis Program Annual Report (Annual Report) was prepared for the Air Force Center for Environmental Excellence (AFCEE) to describe the basewide quarterly groundwater monitoring events conducted at Naval Air Station Fort Worth Joint Reserve Base (NAS Fort Worth JRB), Carswell Field, Texas during 2000. The work has been conducted under Contract Number F41624-95-D-8005, Delivery Order 33, issued to HydroGeoLogic, Inc. (HydroGeoLogic). The AFCEE Contracting Officer's Representative is Mr. Don Ficklen. HydroGeoLogic's Project Manager is Mr. Todd Harrah.

Activities described in the Annual Report were performed in accordance with HydroGeoLogic's Final 2000 Basewide Groundwater Sampling and Analysis Plan (GSAP) (HydroGeoLogic, 2000b), the Final 2000 Basewide Quality Assurance Project Plan (HydroGeoLogic, 2000c), and AFCEE-approved modifications.

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LIST OF ACRONYMS AND ABBREVIATIONS

AFB	Air Force Base
AFCEE	Air Force Center for Environmental Excellence
AFP 4	Air Force Plant 4
AOC	Area of Concern
ASTM	American Society for Testing and Materials
BRAC	Base Realignment and Closure
BTEX	benzene, toluene, ethylbenzene, and xylenes
cm/s	centimeters per second
DCE	dichloroethene (e.g., 1,1-DCE, 1,2-DCE)
DNAPL	dense non-aqueous phase liquid
DO	dissolved oxygen
DQE	data quality evaluation
EC	electrical conductance
EDD	electronic data deliverable
Eh	oxidation-reduction potential
EPA	U.S. Environmental Protection Agency
ERA	environmental restoration account
ERPIMS	Environmental Resources Program Information Management System
ESE	Environmental Science and Engineering, Inc.
F	data qualifier indicating analyte was detected at concentration less than PQL but greater than the MDL. Value may not be accurate or precise (estimated).
°F	degrees Fahrenheit
Fe^{2+}	ferrous iron
Fe^{3+}	ferric iron
ft/d	feet per day
ft above msl	feet above mean sea level
gpd/ft	gallons per day per foot
gpd/ft^2	gallons per day per square foot
GSAP	Groundwater Sampling and Analysis Plan
HydroGeoLogic	HydroGeoLogic, Inc.
IDW	investigative-derived waste
IHW	Industrial Hazardous Waste

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

J	data qualifier indicating analyte was detected but the quantitation is an estimate
Jacobs	Jacobs Engineering
LCS	laboratory control sample
LNAPL	light non-aqueous phase liquid
LTM	long-term monitoring
µg/L	micrograms per liter
mg/L	milligrams per liter
MDL	method detection limit
MQL	method quantitation limit
MS/MSD	matrix spike/matrix spike duplicate
MSC	medium specific concentration
MTBE	methyl *tert*-butyl ether
mya	million years ago
NAS Fort Worth JRB	Naval Air Station Fort Worth Joint Reserve Base
NFA	no further action
NGVD	National Geodetic Vertical Datum
NPDES	National Pollutant Discharge Elimination System
OWS	Oil/Water Separator
OPR	Office of Primary Responsibility
%R	percent recovery
PCE	tetrachloroethene
PE	performance evaluation
PID	photoionization detector
POL	petroleum, oil, and lubricant
PQL	practical quantitation limit
PST	petroleum storage tank
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RAP	remedial action plan
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RPD	relative percent difference
RRS	Risk Reduction Standard

LIST OF ACRONYMS AND ABBREVIATIONS (continued)

SQL	sample quantitation limit
STL	Severn Trent Laboratory
SVOC	semivolatile organic compound
SWMU	solid waste management unit
TAC	Texas Administrative Code
TCE	trichloroethene
TI	tolerance interval
TNRCC	Texas Natural Resource Conservation Commission
TOC	total organic carbon
TPH	total petroleum hydrocarbon
TWC	Texas Water Commission
U	data qualifier indicating analyte was analyzed for but not detected and the associated numerical value is at or below the MDL
UJ	data qualifier indicating analyte was analyzed for but not detected and the associated numerical value is an MDL which is estimated due to deficiencies in the QC criteria
USGS	U.S. Geological Survey
UST	underground storage tank
UTL	upper tolerance limit
VC	vinyl chloride
VOC	volatile organic compound
WAA	waste accumulation area

TAB

SECTION 1.0

DRAFT FINAL
BASEWIDE GROUNDWATER SAMPLING AND ANALYSIS PROGRAM
2000 ANNUAL REPORT
NAS FORT WORTH JRB, TEXAS

1.0 INTRODUCTION

Groundwater monitoring at Naval Air Station Fort Worth Joint Reserve Base (NAS Fort Worth JRB), Texas (Figure 1.1) has been performed to provide a basis for development and implementation of remedial actions under the Air Force Installation Restoration Program. This report summarizes the three scheduled quarterly sampling events for 2000, performed in accordance with the Final 2000 Basewide Groundwater Sampling and Analysis Plan (GSAP) (HydroGeoLogic, Inc. [HydroGeoLogic], 2000b) and the Final Basewide Quality Assurance Project Plan (QAPP) (HydroGeoLogic, 2000c). Sampling was not conducted during January 2000. Quarterly groundwater sampling events are conducted to monitor the presence and extent of groundwater contamination and potential surface water contamination at NAS Fort Worth JRB.

1.1 PURPOSE OF THE ANNUAL REPORT

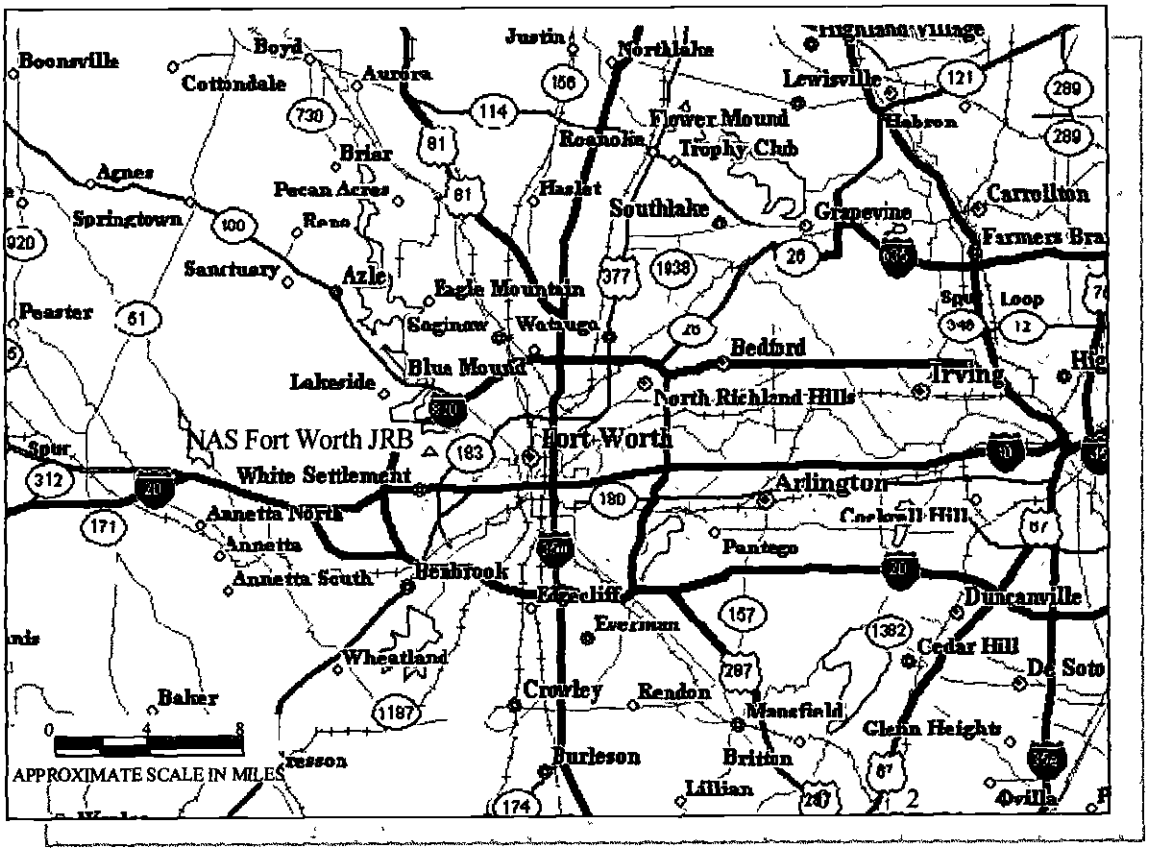
The purpose of this Annual Report is to summarize and interpret the results of the 2000 quarterly groundwater sampling program at NAS Fort Worth JRB. The interpretation includes evaluating the data for any trends and determining whether or not the objectives of the 2000 GSAP were met (HydroGeoLogic, 2000b). Although the Annual Report summarizes the data for all three quarters of groundwater sampling performed in 2000, the report provides a detailed description of the October 2000 sampling event in lieu of a separate quarterly monitoring report. The results of the April and July sampling events were presented individually in the quarterly reports published previously (HydroGeoLogic, 2000h; and HydroGeoLogic, 2000l).

1.2 GROUNDWATER MONITORING OBJECTIVES FOR 2000

The objectives for the 2000 GSAP were established to ensure that adequate data were collected for the evaluation of the critical exposure pathways involving groundwater. The objectives also address the mandatory monitoring requirements for three units, which have proposed or approved remedial action plans (RAPs).

1.2.1 GSAP Objectives

A basewide groundwater sampling and analysis program was initiated for NAS Fort Worth JRB in April 1995 to address groundwater contamination associated with various solid waste management units (SWMUs) and areas of concern (AOCs) identified on the base. Nineteen rounds of quarterly sampling have been implemented to date: April 1995, July 1995, October



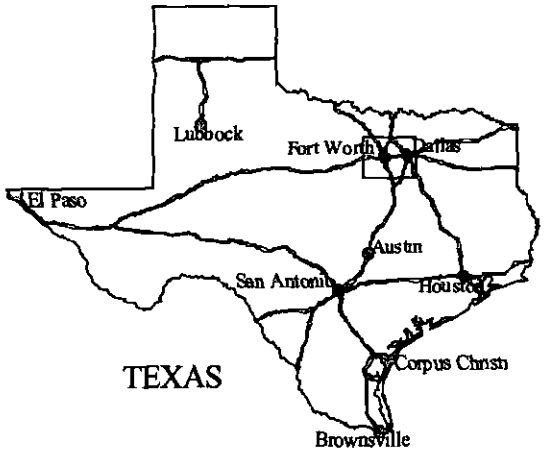


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Figure 1.1

Site Location Map
NAS Fort Worth JRB, Texas

1995, January 1996, January 1997, April 1997, July 1997, October 1997, January 1998, April 1998, July 1998, October 1998, January 1999, April 1999, July 1999, October 1999, April 2000, July 2000, and October 2000.

The 2000 GSAP monitoring objectives, listed below, were based on the findings of previous investigations, and the current understanding of the remediation/assessment plans required for the year. These monitoring objectives were developed specifically for the 2000 quarterly GSAP and are listed below:

- Critical Groundwater Exposure Pathways Evaluation - collect data to investigate: (1) potential exposure to groundwater sources used for drinking water; and (2) on-site and off-site exposure to surface water bodies;

- Additional Source and Plume Delineation - define horizontal or vertical migration of contamination associated with miscellaneous hot spots and potential source areas where data are not currently available; and

- Natural Attenuation Monitoring - collect data to determine the extent that natural attenuation of trichloroethene (TCE) is occurring.

1.3 SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN

Since 1942, most hazardous waste generated through operations and activities at the base has been disposed of in landfills, reused on base, or processed through the Defense Property Disposal Office for off-base recycling or disposal. Since 1984, many of these sites (which include landfills, fire training areas, oil/water separators (OWS), and evidence of spills at waste accumulation areas) have been investigated. A total of 68 SWMUs have been identified at the base. Many were addressed as part of a Resource Conservation and Recovery Act (RCRA) Facility Assessment conducted for what was then Carswell Air Force Base (AFB) (A.T. Kearney, 1989), with additional SWMUs added later via letters from the Texas Natural Resource Conservation Commission (TNRCC). Additionally, 19 AOCs were identified in either Hazardous Waste Permit HW50289 for Carswell AFB issued by the TNRCC (formerly Texas Water Commission [TWC]) on February 13, 1991 (TWC, 1991) or by individual letters from the TNRCC. A number of the SWMUs and AOCs identified have been determined to require no further action (NFA) and are currently considered closed by the TNRCC (TNRCC, 1995). All SWMUs and AOCs are listed on Table 1.1 and Table 1.2, respectively, and the locations of the active SWMUs and AOCs are shown on Figure 1.2.

Portions of the facility are subject to Air Force Base Realignment and Closure (BRAC) management, while other portions are managed by the Air Force Center for Environmental Excellence (AFCEE) under the Environmental Restoration Account (ERA). These management responsibilities are also included on Table 1.1 and Table 1.2.

Table 1.1
Solid Waste Management Units at NAS Fort Worth JRB, Texas

SWMU	Description	OPR
1	Pathological Waste Incinerator (NFA)	BRAC
2	Pathological Waste Storage Shed (NFA)	BRAC
3	Metal Cans (NFA)	BRAC
4	Facility Dumpsters (NFA)	BRAC
5	Building 1627 Waste Accumulation Area for Building 1628	ERA
6	Building 1628 Wash Rack and Drain	ERA
7	Building 1628 Oil/Water Separator (NFA)	ERA
8	Building 1628 Sludge Collection Tank (NFA)	ERA
9	Building 1628 Work Station Waste Accumulation Area (NFA)	ERA
10	Building 1617 Work Station Waste Accumulation Area (NFA)	ERA
11	Building 1618 Waste Accumulation Area for Buildings 1617 and 1619	ERA
12	Building 1602 Former Waste Accumulation Area	ERA
13	Building 1710 Visual Information Center Work Station Former Waste Accumulation	ERA
14	Building 1060 Bead Blaster Collection Tray (NFA)	BRAC
15	Building 1060 Paint Booth Vault (NFA)	BRAC
16	Building 1059 Waste Accumulation Area (NFA)	ERA
17	Landfill No 7	ERA
18	Fire Training Area No 1 (NFA)	BRAC
19	Fire Training Area No 2	ERA
20	Waste Fuel Storage Tank	ERA
21	Waste Oil Tank	ERA
22	Landfill No 4	BRAC
23	Landfill No.5	BRAC
24	Waste Burial Area	BRAC
25	Landfill No 8	ERA
26	Landfill No 3	ERA
27	Landfill No 10 (NFA)	ERA
28	Landfill No.1	ERA
29	Landfill No 2	ERA
30	Landfill No.9	ERA
31	Building 1050 Former Waste Accumulation Area	ERA
32	Building 1415 Waste Accumulation Area for Building 1410	ERA
33	Building 1436 Waste Accumulation Area for Building 1420 (NFA)	ERA
34	Building 1194 Former Waste Accumulation Area (NFA)	ERA
35	Vehicle Refueling Shop (Building 1194) Oil/Water Separation System	ERA
36	Building 1191 Former Waste Accumulation Area	ERA

Table 1.1 (continued)
Solid Waste Management Units at NAS Fort Worth JRB, Texas

SWMU	Description	OPR
37	Vehicle Maintenance Shop (Building 1191) Oil/Water Separation System	ERA
38	Building 1269 Polychlorinated Biphenyl Transformers Building (NFA)	BRAC
39	Building 1643 Former Waste Accumulation Area (NFA)	ERA
40	Building 1643 Oil/Water Separation System	ERA
41	Building 1414 Oil/Water Separation System, Field Maintenance Squadron Aerospace	ERA
42	Building 1414 Former Waste Accumulation Area (NFA)	ERA
43	Building 1414 Non Destructive Inspection Waste Accumulation Point (NFA)	ERA
44	Building 1027 Oil/Water Separation System at the Aircraft Washing Hangar	ERA
45	Building 1027 Waste Oil Tank Vault	ERA
46	Building 1027 Waste Accumulation Area (NFA)	ERA
47	Building 1015 Jet Engine Test Cell Oil/Water Separator	ERA
48	Building 1048 Fuel Systems Shop Floor Drains (NFA)	ERA
49	Aircraft Washing Area No 1	ERA
50	Aircraft Washing Area No.2	ERA
51	Central Waste Holding Area/Waste Accumulation Areas 1187 and 1189	ERA
52	Building 1190 Oil/Water Separation System	ERA
53	Storm Water Drainage System	ERA
54	Storm Water Interceptors	ERA
55	East Gate Oil/Water Separator	ERA
56	Building 1405 Waste Accumulation Area (NFA)	ERA
57	Buildings 1432/1434 Waste Accumulation Area (NFA)	ERA
58	Pesticide Rinse Area (NFA)	BRAC
59	Building 8503 Weapons Storage Area Waste Accumulation Area	BRAC
60	Building 8503 Radioactive Waste Burial Site	BRAC
61	Building 1319 Waste Accumulation Area for Building 1320	ERA
62	Landfill No 6	ERA
63	Entomology Dry Well (NFA)	ERA
64	French Underdrain System	ERA
65	Weapons Storage Area Disposal Site (NFA)	BRAC
66	Sanitary Sewer System	BRAC
67	Building 1340 Oil/Water Separator	ERA
68	POL Tank Farm	ERA

Notes.
OPR - Office of Primary Responsibility
BRAC - Base Realignment and Closure
ERA - Environmental Restoration Account
NFA - No further action
POL - Petroleum, oil, and lubricant

Table 1.2
Areas of Concern at NAS Fort Worth JRB, Texas

AOC	Description	OPR
1	Former Base Service Station/ Former Base Gas Station	ERA
2	Airfield Groundwater Plume	ERA
3	Waste Oil Dump (NFA)	ERA
4	Fuel Hydrant System	ERA
5	Grounds Maintenance Yard	BRAC
6	RV Storage Area (NFA)	ERA
7	Former Base Refueling Area	ERA
8	Aerospace Museum	BRAC
9	Golf Course Maintenance Yard (NFA)	BRAC
10	Building 1064 Oil/Water Separator	ERA
11	Building 1060 Oil/Water Separator	ERA
12	Building 4210 Oil/Water Separator	ERA
13	Building 1145 Oil/Water Separator	ERA
14	Unnamed Stream	BRAC
15	Storage Shed Building 1190 (NFA)	ERA
16	Family Camp (NFA)	BRAC
17	Suspected Former Landfill	ERA
18	Suspected Former Fire Training Area A	ERA
19	Suspected Former Fire Training Area B	ERA

Notes
OPR - Office of Primary Responsibility
BRAC - Base Realignment and Closure
ERA - Environmental Restoration Account
NFA - No further action

Areas of Concern (AOC)

1 Former Base Service Station/ Former Base Gas Station
2 Airfield Groundwater (Basewide Coverage)
4 Fuel Hydrant System
5 Grounds Maintenance Yard
6 R.V Storage Area
7 Former Base Refueling Area
8 Aerospace Museum
9 Golf Course Maintenance Yard
10 Building 1064 Oil/Water Separator
11 Building 1060 Oil/Water Separator
12 Building 4210 Oil/Water Separator
13 Building 1145 Oil/Water Separator
14 Unnamed Stream
15 Storage Shed
16 Family Camp
17 Suspected Former Landfill
18 Suspected Former Fire Training Area A
19 Suspected Former Fire Training Area B

Solid Waste Management Units (SWMU)

5 Building 1626 Waste Accumulation Area
6 Building 1628 Wash Rack and Drain
7 Building 1628 Oil/Water Separator
8 Building 1628 Sludge Collection Tank
11 Building 1617 Waste Accumulation Area
12 Building 1619 Waste Accumulation Area
13 Building 1710 Visual Information Center Work Station Waste Accumulation Areas
16 Building 1060 Waste Accumulation Area
17 Landfill No.7
19 Fire Training Area No.2
20 Waste Fuel Storage Tank
21 Waste Oil Tank
22 Landfill No 4
23 Landfill No 5
24 Waste Burial Area
25 Landfill No 8
26 Landfill No.3
27 Landfill No 10
28 Landfill No 1
29 Landfill No.2
30 Landfill No 9
31 Building 1050 Waste Accumulation Area
32 Building 1410 Waste Accumulation Area
33 Building 1420 Waste Accumulation Area
34 Building 1194 Waste Accumulation Area
35 Vehicle Refueling Shop (Building 1194) Oil/Water Separation System
36 Building 1191 Waste Accumulation Area
37 Vehicle Maintenance Shop (Building 1191) Oil/Water Separation System
39 Building 1643 Waste Accumulation Area
40 Building 1643 Oil/Water Separation System
41 Building 1414 Oil/Water Separation System, Field Maintenance Squadron Aerospace Ground Equipment
42 Building 1414 Waste Accumulation Area
44 Building 1027 Oil/Water Separation System at the Aircraft Washing Hangar
45 Building 1027 Waste Oil Tank Vault at the Aircraft Washing Hangar
47 Building 1015 Jet Engine Test Cell Oil/Water Separator
49 Aircraft Washing Area No.1
50 Aircraft Washing Area No.2
51 Building 1190 Central Waste Holding Area
52 Building 1190 Oil/Water Separation System
53 Storm Water Drainage System
54 Storm Water Interceptors
55 East Gate Oil/Water Separator
61 Building 1320 Power Production Maintenance Facility Waste Accumulation Area
62 Landfill No 6
64 French Underdrain System
66 Sanitary Sewer System (Basewide Coverage)
67 Building 1340 Oil/Water Separator
68 POL Tank Farm

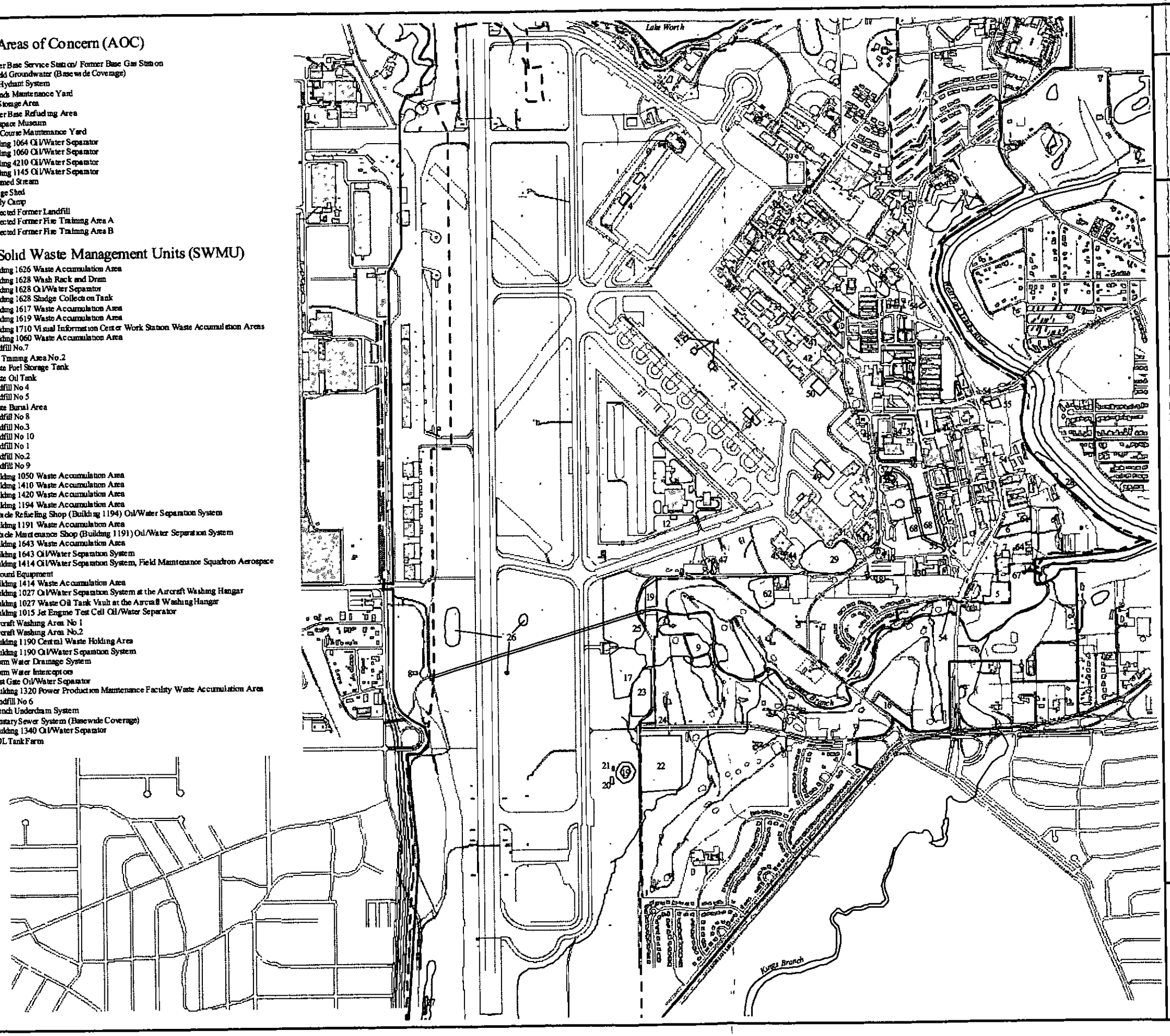

Figure 1.2

SWMU/AOC Location Map

U.S. Air Force Center for Environmental Excellence

Legend

- NAS Fort Worth JRB (Carswell Field)
- Property Boundary of Air Force Plant 4
- Former Carswell Air Force Base
- Solid Waste Management Unit (SWMU)
- Area of Concern (AOC)

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Map Source Jacobs, 1996
HydroGeoLogic GIS Database, 2000

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1.4 GROUNDWATER MONITORING ACTIVITIES CONDUCTED IN 2000

Since the publication of the 2000 GSAP, a number of activities have taken place at NAS Fort Worth JRB related to groundwater monitoring; these activities are summarized in Table 1.3. Table 1.3 also provides a brief description of the anticipated monitoring activities to be conducted in 2001 as part of the ongoing and/or proposed remediation/assessment efforts. The reader should refer to the documents listed under each activity in Table 1.3 for additional information on the specific monitoring objectives and activities. The following is a summary of the groundwater monitoring conducted in 2000:

- HydroGeoLogic performed three rounds of quarterly groundwater sampling as part of the basewide groundwater sampling program. Between seventeen to nineteen monitoring wells were selected in and around the north and south lobes of the regional TCE plume, as well as locations required for regulatory compliance issues;

- Jacobs Engineering (Jacobs) conducted semi-annual sampling (April and October events) of twenty-four monitoring wells, 16 are located at Air Force Plant 4 (AFP 4) and 8 are located on NAS Fort Worth JRB surrounding the TCE plume to ensure no off-site migration of contaminants;

- HydroGeoLogic conducted semi-annual sampling (April and October events) at AOC 4 simultaneously with the GSAP. Seven monitoring wells were selected to monitor volatile organic compounds (VOCs) under the long-term monitoring (LTM) program; and

- HydroGeoLogic conducted semi-annual sampling (April and October events) at SWMUs 68 and AOC 7, in accordance with the RAP. Nine monitoring wells were sampled simultaneously for VOCs with the GSAP;

- HydroGeoLogic conducted semi-annual sampling (April and October events) at AOC 1 simultaneously with the GSAP. Nine to ten monitoring wells were sampled for VOCs.

Table 1.3
Summary of Recent and Anticipated Groundwater Monitoring Activities at NAS Fort Worth JRB, Texas

Documentation of Project/Activities	Description of Project/Activity	Contractor	2000 Groundwater-Related Activities	Anticipated 2001 Groundwater-Related Activities
Final Remedial Action Plan for the Risk-Based Remediation of SWMU 68 and AOC 7 (POL Tank Farm) [Parsons, 1997]	Semi-annual long-term monitoring.	HydroGeoLogic	Final Site Assessment Report was submitted to the TNRCC in August 2000 Semi-annual groundwater sampling of 9 wells for VOCs performed in 2000	Submit a 2000 Annual Report to AFCEE including a Closure Report No additional sampling planned.
Corrective Action Plans for AOC 1 (Base Service Station and Base Gas Station) [IT Corporation, 1997b, 1997c]	Semi-annual long-term monitoring.	HydroGeoLogic	Semi-annual groundwater sampling of 9 wells for VOCs performed in 2000	Quarterly sampling of the 9 selected wells for VOCs.
NAS Fort Worth JRB Basewide Sampling and Analysis Plan [HydroGeoLogic, 2000b]	Continued monitoring of wells basewide.	HydroGeoLogic	Quarterly sampling events conducted in April, July, and October for approximately 17 wells	Submit an 2000 Annual Report to AFCEE. Semi-annual sampling events will be conducted in April and October 2001 for approximately 17 to 21 wells.
AFP 4 Basewide Sampling [Jacobs, 2000]	Continued monitoring of groundwater contamination at AFP 4	Jacobs	Semi-Annual Monitoring of 8 monitoring wells at NAS Fort Worth JRB and 16 monitoring wells at AFP 4 in April and October 2000	Continue semi-annual monitoring of approximately 8 monitoring wells at NAS Fort Worth JRB and 16 monitoring wells at AFP 4 in April and October 2001

Table 1.3 (continued)
Summary of Recent and Anticipated Groundwater Monitoring Activities at NAS Fort Worth JRB, Texas

Documentation of Project/Activities	Description of Project/Activity	Contractor	2000 Groundwater-Related Activities	Anticipated 2001 Groundwater-Related Activities
RCRA Facility Investigation of Landfills 1, 2, 3, 6, 7, and 9 (SWMUs 28, 29, 26, 62, 17, and 30, respectively) [HydroGeoLogic, 2001]	Determine nature and extent of landfill related contaminants in groundwater for six landfills.	HydroGeoLogic	Phase III investigation of each Landfill was completed in June 2000	Landfill RFI reports will be submitted to AFCEE next year, pending additional delineation activities Additional groundwater sampling activities may be performed
Final Monitoring Well Abandonment and Repair Letter Report [HydroGeoLogic, 2000m]	Abandonment of damaged and/or unnecessary wells and repair of damaged wells at AFP 4 and NAS Fort Worth JRB.	HydroGeoLogic	Determined the number of wells requiring abandonment and repair. Abandonment of 15 wells at NAS Fort Worth JRB and 41 wells at AFP 4 Repair of 4 wells located at NAS Fort Worth JRB	Review well reconnaissance data in Spring 2001 to develop a new list of wells to be abandoned or repaired at NAS Fort Worth JRB and AFP 4.
AOC 4 Site Investigation [HydroGeoLogic, 2000g]	Monitor contamination associated with the abandoned fuel hydrant system located at the Navy Ramp and Alert Apron.	HydroGeoLogic	Semi-annual groundwater sampling of 7 wells for VOCs performed in 2000.	Submit a 2000 Annual Report to AFCEE including a Closure Report. No additional sampling planned.
Phase II RFI of AOC 13 (Building 1145 - Automotive Hobby Shop) [HydroGeoLogic, 2000f]	Removal, disposal, and investigation of Hobby Shop OWS and waste oil tank.	HydroGeoLogic	May and June 2000, the OWS and UST was removed and replaced with a new OWS. Delineation/confirmation groundwater sampling occurred with October Quarterly sampling.	RFI Report planned for submission in April 2001. No additional sampling planned.

Table 1.3 (continued)
Summary of Recent and Anticipated Groundwater Monitoring Activities at NAS Fort Worth JRB, Texas

Documentation of Project/Activities	Description of Project/Activity	Contractor	2000 Groundwater-Related Activities	Anticipated 2001 Groundwater-Related Activities
Site Investigation of 12 Underground Storage Tanks [HydroGeoLogic, 1999]	Review data gaps for 12 USTs and recommend additional sampling activities necessary for closure	HydroGeoLogic	Sampled two monitoring wells at Building 1411 and one well at Building 1191	No additional groundwater sampling planned
RCRA Facility Investigation of Waste Accumulation Areas [HydroGeoLogic, 2000d]	Review of existing data on 16 waste accumulation areas (WAAs). Recommend additional investigation.	HydroGeoLogic	7 of 16 WAAs approved for closure in November 2000 Phase II of RFI completed in October 2000.	Additional groundwater delineation to be performed in 2001.
RCRA Facility Investigation of SWMUs 19, 20, 21, and 53; and Site Investigation of AOCs 17, 18, and 19 [HydroGeoLogic, 2000e]	Conduct SI at one former landfill and two former fire training areas to determine if a release occurred Conduct RFI to determine nature and extent of contamination related to the former Fire Training Area No. 2 and the Stormwater Drainage System	HydroGeoLogic	None	Installation of monitoring wells with three rounds of sampling approximately two months apart. The first round analyzing for full suite of Appendix IX compounds, with two subsequent rounds of Appendix IX VOCs, SVOCs, and metals
RCRA Facility Investigation at SWMU 50, (Former Aircraft Washrack) [HydroGeoLogic, 2000k]	Conduct investigation of washrack to determine extent of contamination.	HydroGeoLogic	None	Groundwater investigations may occur depending on results of soil investigations performed in late 2000.

Table 1.3 (continued)
Summary of Recent and Anticipated Groundwater Monitoring Activities at NAS Fort Worth JRB, Texas

Documentation of Project/Activities	Description of Project/Activity	Contractor	2000 Groundwater-Related Activities	Anticipated 2001 Groundwater-Related Activities
RCRA Facility Investigation at SWMU 54 and 55 (Storm Water Interceptors and East Gate OWS) [HydroGeoLogic, 2000j]	Investigation of potential contamination associated with stormwater interceptors and East Gate OWS.	HydroGeoLogic	None	Groundwater investigations may occur depending on results of soil investigations performed in late 2000.
Focus Feasibility Study of the Southern Plume Lobe (additional Terrace and Paluxy Wells) [HydroGeoLogic, 2000i]	Performed Feasibility Study for remediation of Southern Lobe of TCE in the area of the golf course	HydroGeoLogic	Installation and two rounds of groundwater sampling at five Terrace Alluvium wells and four Paluxy wells.	No additional sampling planned under this project.

Notes
AFCEE - Air Force Center for Environmental Excellence
AOC - Area of Concern
AFP - Air Force Plant
NAS Fort Worth JRB - Naval Air Station Fort Worth Joint Reserve Base
OWS - oil/water separator
RCRA - Resource Conservation and Recovery Act
RFI - RCRA Facility Investigation
SI - site investigation
SVOC - semivolatile organic compound
SWMU - solid waste management unit
TCE - trichloroethene
UST - underground storage tank
VOC - volatile organic compound
WAA - Waste Accumulation Area

1.5 REPORT ORGANIZATION

Section 2.0 of this report provides a description of the environmental setting, while Section 3.0 includes a description of the monitoring activities performed during 2000 as part of the basewide groundwater monitoring program. Section 4.0 of this report presents the quality assurance/quality control (QA/QC) program implemented for the project. Section 5.0 presents the analytical results and results of the activities described in Section 3.0. Section 6.0 provides a summary and interpretation of the basewide groundwater sampling program for 2000. Section 7.0 lists references used in preparing this report. Appendix A presents field sampling data sheets, field notes, field sampling reports, and chains of custody, for the October 2000 sampling event. Appendix B provides the analytical data for the October 2000 sampling event, a summary of detections from April, July, and October 2000 sampling events, and results from additional groundwater sampling conducted during October and November 2000. Specific field and analytical data for the April and July 2000 sampling events are presented in the appendices of the individual quarterly reports (HydroGeoLogic, 2000h and HydroGeoLogic, 2000l).

TAB

SECTION 2.0

2.0 SITE DESCRIPTION

On October 1, 1994, the Air Force transferred the majority of the property that constituted Carswell AFB to the U.S. Navy to become NAS Fort Worth JRB. NAS Fort Worth JRB is located on 2,264 acres of land in Tarrant County, Texas, 8 miles west of downtown Fort Worth. The base is bordered by Lake Worth to the north; the West Fork Trinity River, River Oaks, and Westworth Village to the east; other urban areas of Fort Worth to the northeast and southeast; White Settlement to the west and southwest, and AFP 4 to the west (Figure 2.1). The area surrounding NAS Fort Worth JRB is mostly suburban. Land use in the immediate vicinity of the base is industrial, commercial, residential, and recreational (A.T. Kearney, 1989)

2.1 PHYSIOGRAPHY

The NAS Fort Worth JRB area is located along the border zone between two physiographic provinces. The southeastern part of the base is situated within the Grand Prairie section of the Central Lowlands Physiographic Province. The Central Lowlands Physiographic Province is characterized by broad, eastward-sloping terrace surfaces that are interrupted by westward-facing escarpments. The land surface is typically grass-covered and treeless except for isolated stands of upland timber. The northwestern part of the NAS Fort Worth JRB area is situated within the Western Cross Timbers Physiographic Province, which is characterized by rolling topography and a heavy growth of post and blackjack oaks (Radian, 1989). Surface elevations for this region range from about 850 feet above national geodetic vertical datum (NGVD) west of the base, to approximately 550 feet above NGVD, along the eastern side of the base. Figure 2.1 is a portion of the Lake Worth and Benbrook Texas, U.S. Geological Survey (USGS) topographic maps showing the relief of the NAS Fort Worth JRB Area.

2.2 REGIONAL GEOLOGY

The major geologic units of interest for the region, from youngest to oldest, are as follows: (1) the Quaternary Alluvium (including fill material and terrace deposits), (2) the Cretaceous Goodland Limestone, (3) the Cretaceous Walnut Formation, (4) the Cretaceous Paluxy Formation, (5) the Cretaceous Glen Rose Formation, and (6) the Cretaceous Twin Mountains Formation. A generalized cross section of the geology beneath NAS Fort Worth JRB is presented in Figures 2.2 and 2.3 (Radian, 1989). The areal limits of surface exposure of these geologic units at NAS Fort Worth JRB are shown in Figure 2.4. The regional dip of these stratigraphic units beneath NAS Fort Worth JRB is between 35 to 40 feet per mile in an easterly to southeasterly direction. NAS Fort Worth JRB is located on the relatively stable Texas Craton, west of the faults that lie along the Ouachita Structural Belt. No major faults or fracture zones have been mapped near the base.

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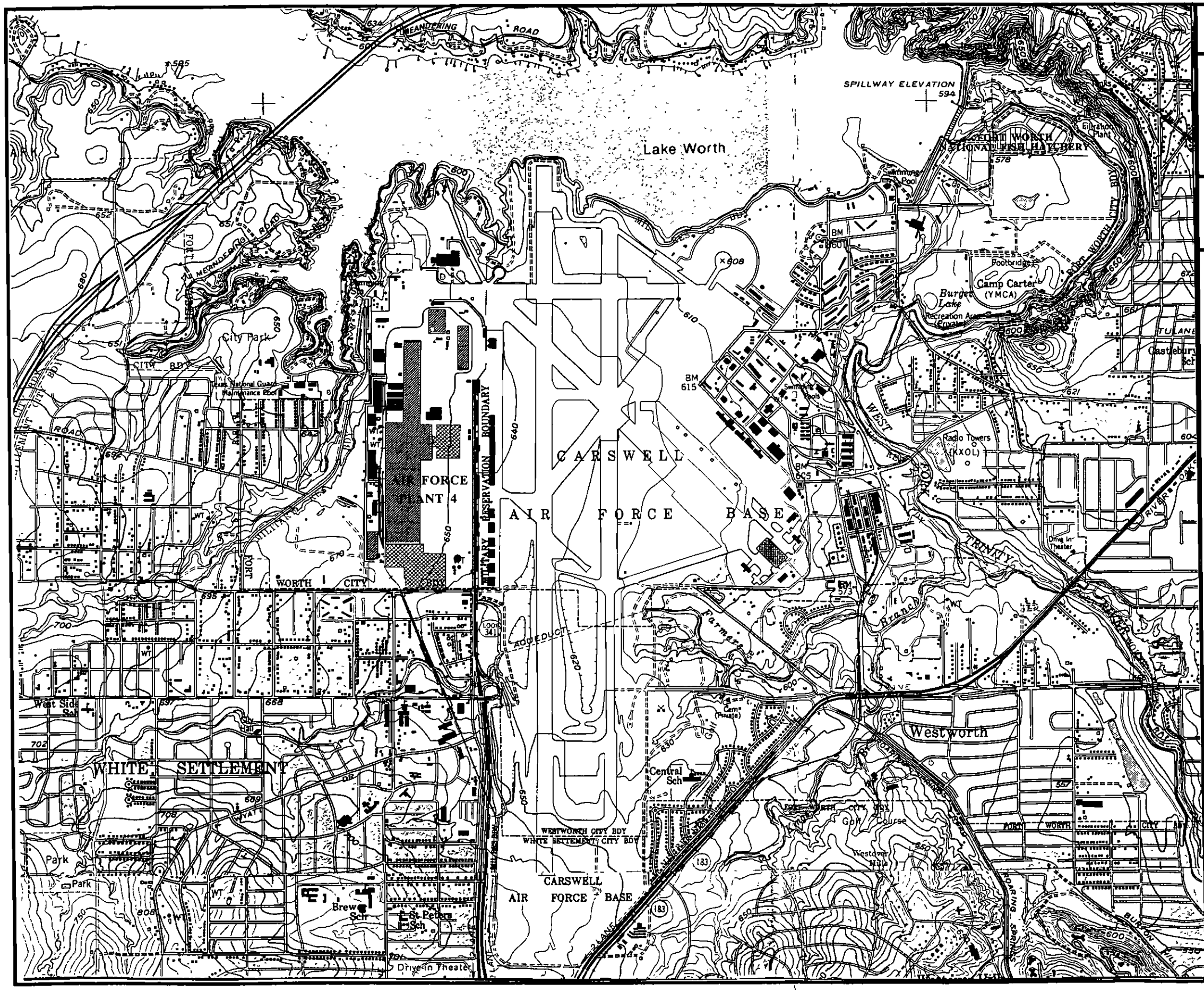


HydroGeoLogic, Inc.—2000 Annual Report
NAS Fort Worth JRB, Texas

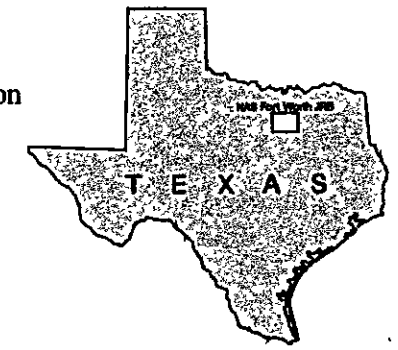
Figure 2.1

NAS Fort Worth JRB
Regional Topographic Map

Air Force Center for
Environmental Excellence
Brooks AFB, Texas

Legend

Site Location



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Scale 1:24,000

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Project AFC001-33DDBA
Created by cfarmer 05/27/99
Revised 12/19/00 cf
Map Source. USGS
Maps. Lake Worth and Benbrook, TX
Dates. Photorevised 1981, 1982

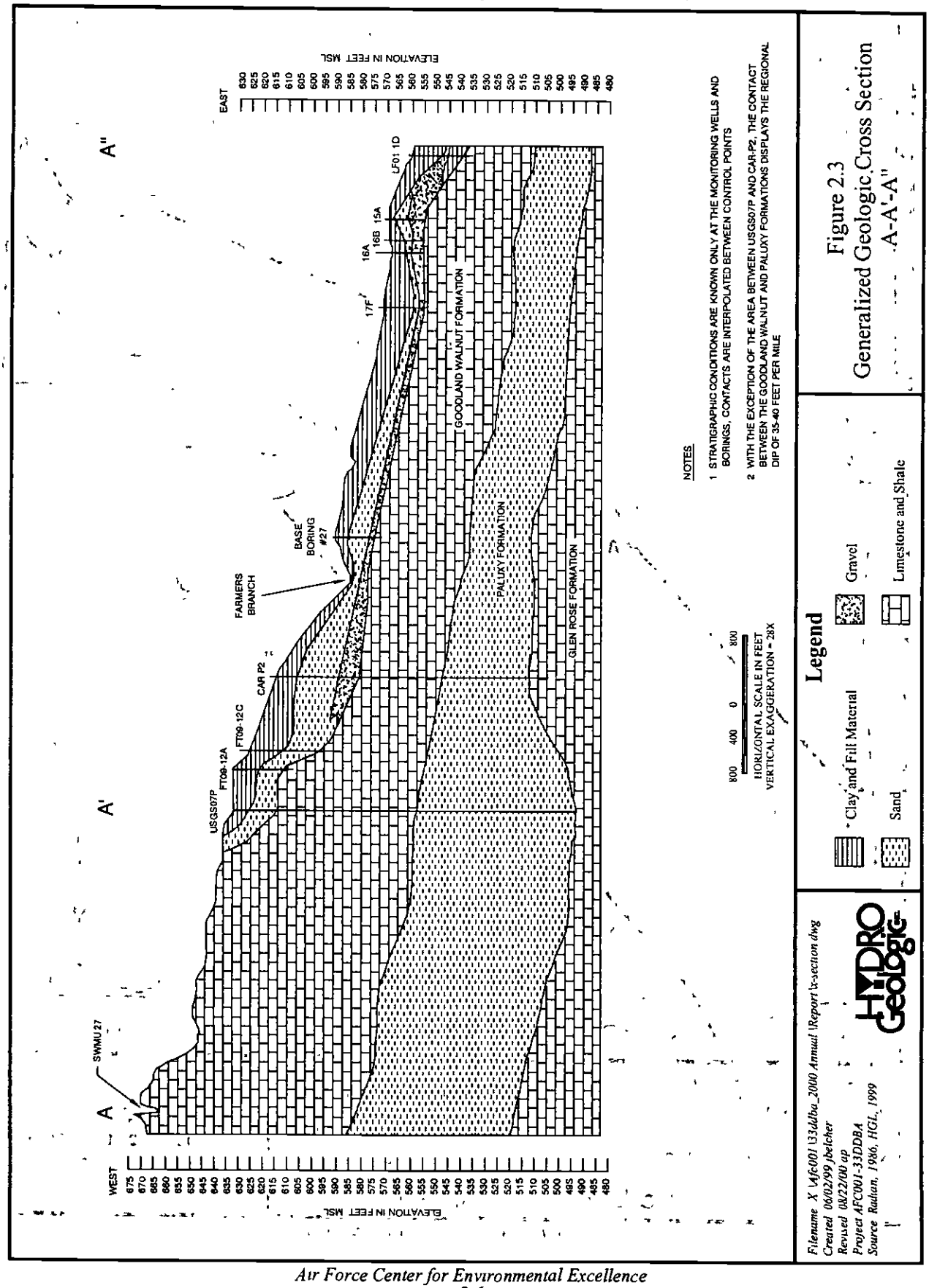
HYDRO GeoLogic

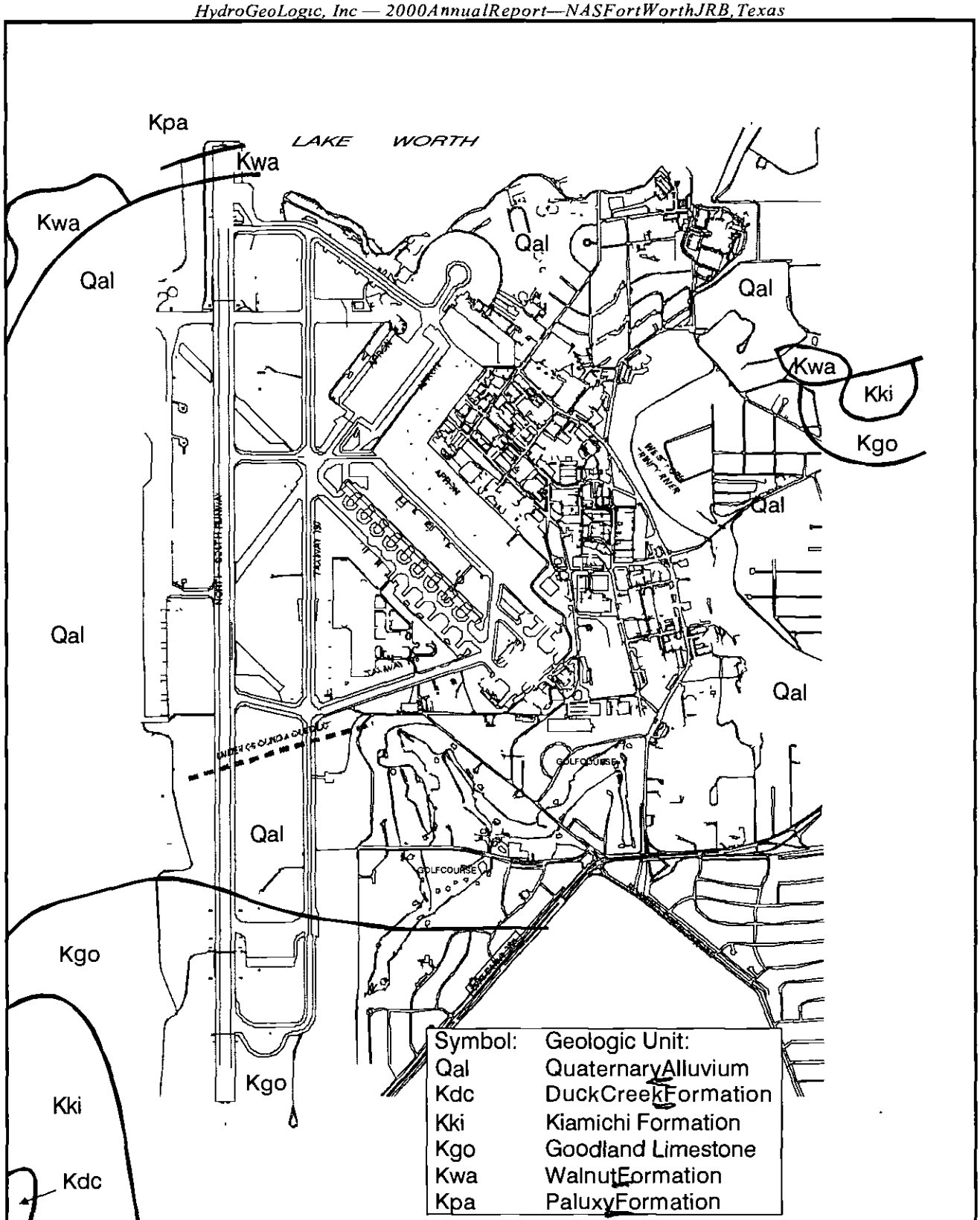
Filename X:\AFC001\33ddba_2000 Annual\Report\ x-section_a_a.apr
Project AFC001- 33DDBA
Created 03/11/99 jbelcher
Revised 12/19/00 cf
Source HydroGeoLogic, Inc—GIS Database

Legend

- NAS Fort Worth JRB Boundary
- Former Carswell AFB Boundary
- SWMU 27 Location
- 660 Topographic Contour

Figure 2.2
Cross Section Location
A-A'-A"


A
A'
A"
WEST
EAST
ELEVATION IN FEET MSL
SWMU 27
USGS07P
FT08-12A
FT09-12C
CAR P2
FARMERS BRANCH
BASE BORING #27
LF01 1D
15A
16B
16A
17F
GOODLAND WALNUT FORMATION
PALUXY FORMATION
GLEN ROSE FORMATION
NOTES
1 STRATIGRAPHIC CONDITIONS ARE KNOWN ONLY AT THE MONITORING WELLS AND BORINGS, CONTACTS ARE INTERPOLATED BETWEEN CONTROL POINTS
2 WITH THE EXCEPTION OF THE AREA BETWEEN USGS07P AND CAR-P2, THE CONTACT BETWEEN THE GOODLAND WALNUT AND PALUXY FORMATIONS DISPLAYS THE REGIONAL DIP OF 35-40 FEET PER MILE
800 400 0 800
HORIZONTAL SCALE IN FEET
VERTICAL EXAGGERATION = 28X
Legend
Clay and Fill Material
Gravel
Sand
Limestone and Shale
Figure 2.3
Generalized Geologic Cross Section
A-A'-A"
Filename X:\Afc001\33ddba_2000 Annual\Report\x-section.dwg
Created 06/02/99 jbelcher
Revised 08/22/00 ap
Project AFC001-33DDBA
Source Radian, 1986, HGL, 1999
HYDRO GeoLogic



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MapSource Radian, 1989

HYDRO GeoLogic

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Figure 2.4
Areal Distribution of Geologic Units

2.3 GROUNDWATER

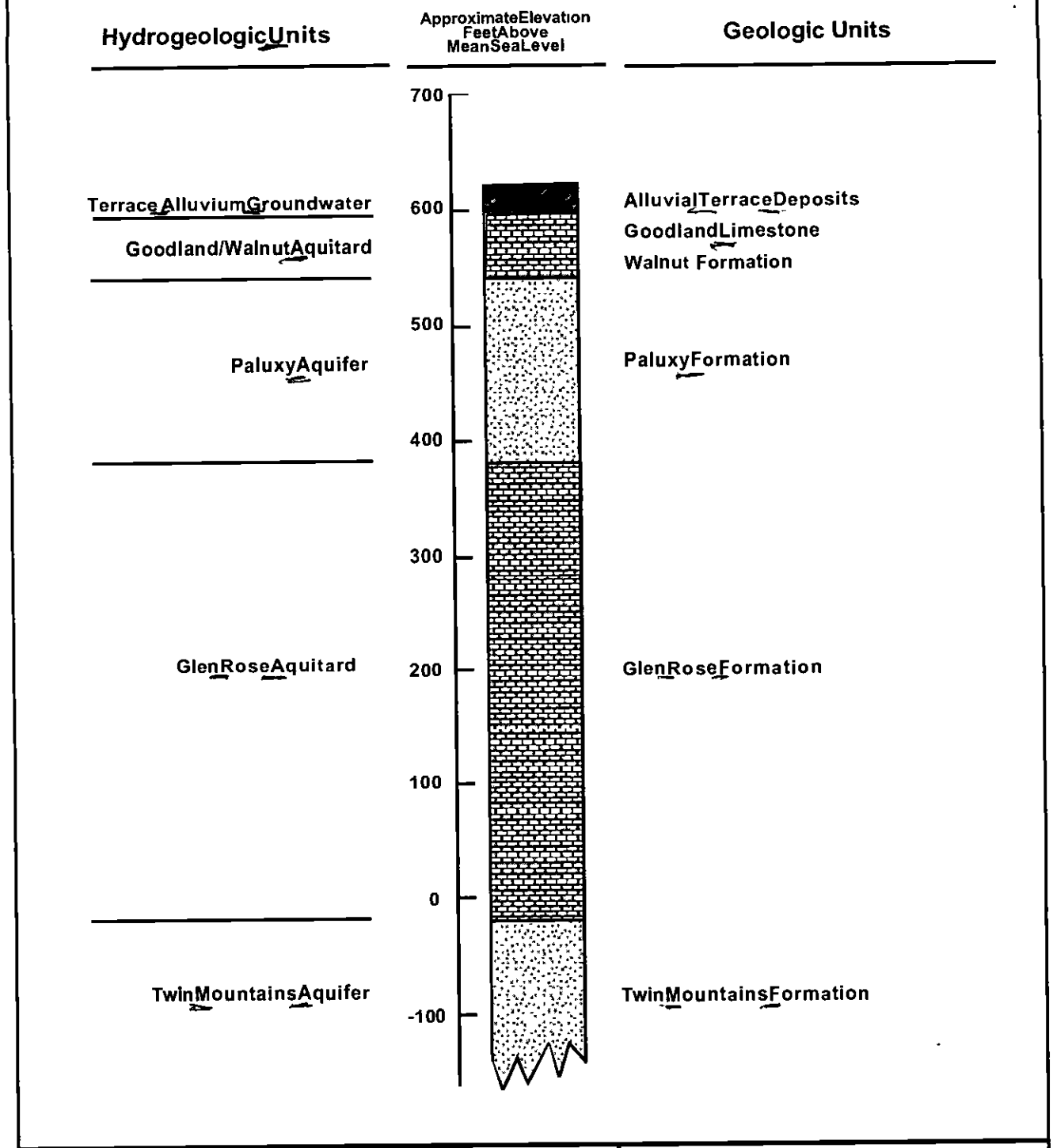
The following five hydrogeologic units, listed from the shallowest to the deepest, located in the NAS Fort Worth JRB area include (Figure 2 5): (1) an upper perched-water zone occurring in the alluvial terrace deposits associated with the Trinity River (Terrace Alluvium), (2) an aquitard of predominantly dry limestone with interbedded fine-grained clay and shale layers of the Goodland and Walnut Formations, (3) an aquifer in the sandstone of the Paluxy Formation, (4) an aquitard of relatively impermeable limestone in the Glen Rose Formation, and (5) a major aquifer in the sandstone of the Twin Mountains Formation. Table 2.1 presents additional information on the stratigraphic units found beneath NAS Fort Worth JRB. Each of the major lithologic units beneath NAS Fort Worth JRB is examined in more detail in the following paragraphs.

2.3.1 Terrace Alluvium Deposits

The uppermost groundwater in the area occurs within the pore space of the grains of silt, clay, sand, and gravels deposited by the Trinity River. In some parts of Tarrant County, primarily in those areas adjacent to the Trinity River, groundwater from the terrace deposits is used for irrigation and residential use. However, groundwater from the terrace deposits is not often used as a source of potable water due to its limited distribution, poor yield, and susceptibility to surface/storm-water pollution (USGS, 1996). No potable water supply monitoring wells are completed in the Terrace Alluvium within 0.5 miles of NAS Fort Worth JRB.

Recharge to the water-bearing deposits occurs through infiltration from precipitation and from surface water bodies. Extensive on-site pavement and construction restricts this recharge. Additional recharge, however, comes from leakage in water lines, sewer systems, storm drains, and cooling water systems. This inflow of water to the shallow aquifer locally affects groundwater flow patterns and contamination transport. The estimated hydraulic of the Terrace Alluvium groundwater is 4 57 gallons per day per square foot (gpd/ft^2) (Radian, 1989).

Flow between aquifers is restricted by the Goodland/Walnut Formations; therefore, the Terrace Alluvium groundwater has no significant hydraulic connection to the underlying aquifers at NAS Fort Worth JRB. During a Risk Assessment/Focus Feasibility Study conducted on Former Carswell AFB, several data gap investigations were conducted (HydroGeoLogic, 2000i). As part of the investigations, three monitoring wells were installed and screened in the paluxy upper sands (WHGLPA001, WHGLPA002, and WHGLPA004). When drilling the wells, the Goodland/Walnut formation located between the Terrace Alluvium and the Paluxy at all three well locations, was fractured and appeared to have higher hydraulic conductivities than the Paluxy. An additional monitoring well (WHGLPA003) was installed on-base in the Walnut Limestone formation in order to characterize the unit. The locations of these wells can be seen on Figure 2.6.



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MapSource Radian,1989

HYDRO GeoLogic

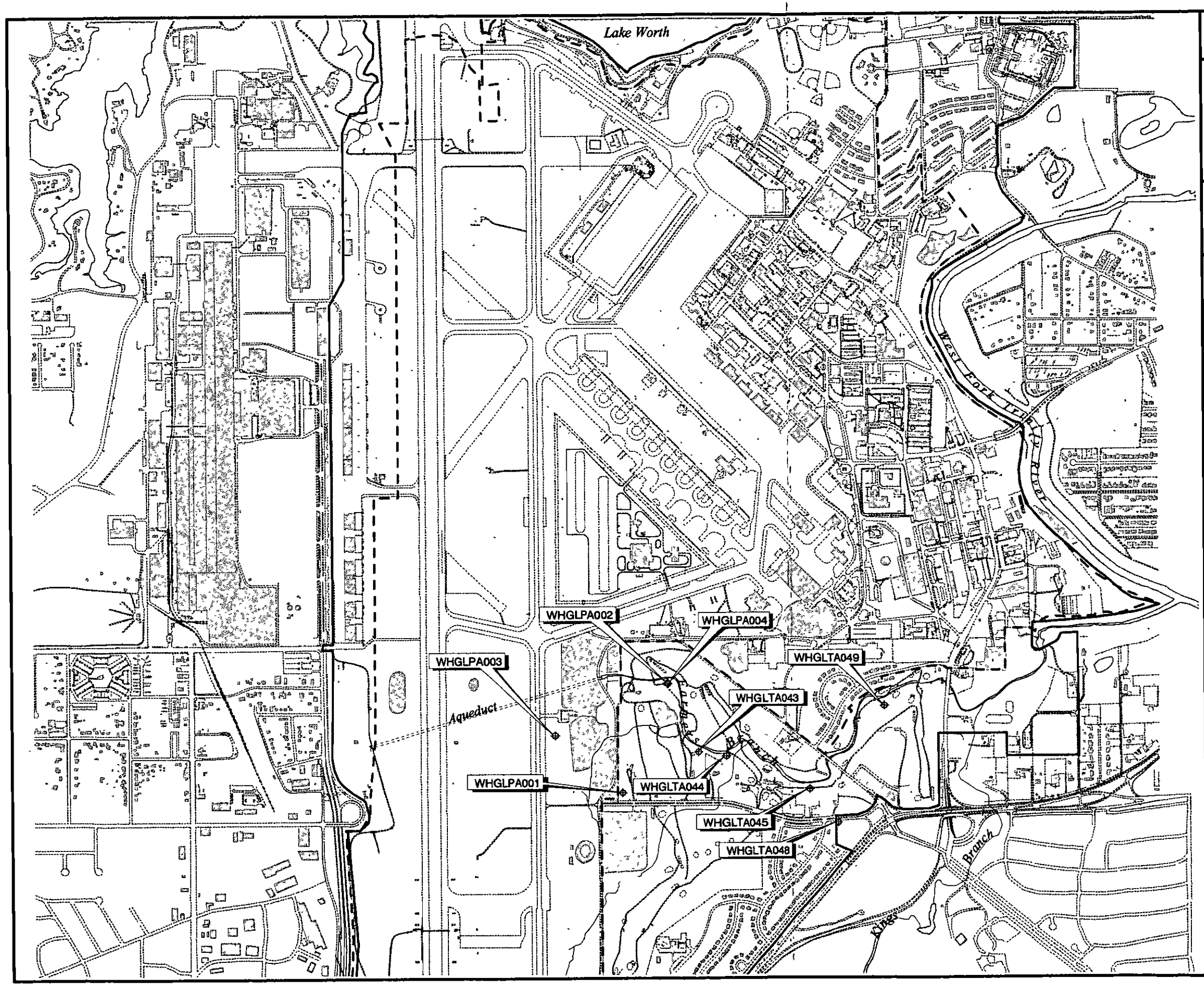
Figure 2.5
Stratigraphic Column Correlating Hydrogeologic Units and Geologic Units

Table 2.1
Stratigraphic Units at NAS Fort Worth JRB, Texas [1]

Era	System	Series/Group	Stratigraphic Unit	Thickness (Feet)[2]	Lithologic Characteristics[3]	Water Yielding Characteristics
Cenozoic	Quaternary (1 8 mya to present)	Holocene	Fill material	0	Construction debris	Permeability varies; gravels and sands permeable
			Recent alluvial deposits	0-50	Gravel, sand, silt, clay	Permeability varies, gravels and sands permeable
		Pleistocene	Terrace alluvial deposits	0-60	Gravel, sand, silt, clay	Permeability varies, gravels and sands permeable
Mesozoic	Cretaceous (65 to 140 mya)	Comanchean/ Fredericksburg	Goodland limestone	0-40	White fossiliferous limestone, coarsely nodular, resistant, and dense, contains some marl	Impermeable where not weathered, considered confining unit
			Walnut Formation	0 5-30	Medium to dark grey clay and limestone with shell conglomerates, fossiliferous, Gryphaea beds	Very low permeability, considered confining unit
		Comanchean/ Trinity	Paluxy Formation	130-175	Light grey to greenish-grey sandstone and mudstone, fine-grained to coarse-grained sandstone	Considered an aquifer, yields small to moderate quantities of water
			Glen Rose Formation	150, range unknown at AFP 4	Brownish-yellow and gray alternating limestone, marl, shale, and sand	Low permeability, considered confining unit in area of AFP 4
			Twin Mountains Formation[4]	200, range unknown at AFP 4	Fine- to coarse-grained sandstone shale and claystone, basal gravel conglomerate	Coarse sandstones and parts of formation considered aquifer, yields moderate to large quantities of water

Notes
1 Table adapted from USGS, 1996
2 Thickness determined from site logs, except for Glen Rose Limestone and Twin Mountains Formation (Baker et al , 1990, Figure 4, as cited in USGS 1996)
3 Lithologic characteristics determined from field observations and from Winton and Adkins, 1919, University of Texas, Bureau of Economic Geology, 1972, U S Army Corps of Engineers, 1986, Baker et al , 1990, Environmental Science and Engineering, Inc , 1994, all as cited in USGS 1996
4 This stratigraphic name does not conform to the usage of the USGS

mya - million years ago



HydroGeoLogic, Inc.—2000 Annual Report
NAS Fort Worth JRB, Texas

Figure 2.6

Paluxy and Terrace Alluvium Southern Plume Delineation Wells Installed October 2000

U.S. Air Force Center For Environmental Excellence

Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- Paluxy Well
- Southern Plume Delineation Well

N

600 0 600 1200

SCALE IN FEET

Filename X:\Afc001\33ddba_2000 Annual\Report\paluxy & southern delineation wells apr
Created 01/26/01 jbelcher
Revised 02/01/01 jb
Project AFC001-33DDBA
Map Source HydroGeoLogic, Inc GIS Database, Jacobs Engineering

HYDRO GeoLogic INC.

The initial sample collected from WHGLPA001 in October 2000 displayed TCE concentrations of 4 micrograms per liter (μg/L), which is below the RRS 2 value of 5 μg/L. Also detected was *cis*-1,2-dichloroethene (DCE), methylene chloride, bromochloromethane, and chloroform. Samples collected from the three other Paluxy wells contained no VOCs above the laboratory detection limits. A second round of sampling was conducted in December 2000 and preliminary laboratory results indicated that WHGLPA001 had a TCE concentration of 5 μg/L and no other VOCs were detected. The remaining three Paluxy wells contained no VOCs. These early results suggest a degree of hydraulic connection between the Terrace alluvium groundwater and the underlying aquifer greater than that indicated by previous data and literature, at least in the area of the Paluxy monitoring well WHGLPA001.

The primary flow direction of water in the Terrace Alluvium is generally eastward toward the West Fork Trinity River, although localized variations exist across the base. The hydraulic gradient across the base is variable, reflecting variations in the flow direction and localized recharge. Groundwater discharge occurs into surface water on-site, specifically Farmers Branch Creek

Potentiometric maps of NAS Fort Worth JRB Terrace Alluvium groundwater developed from data obtained in July 2000 are presented in Section 5.0. Groundwater elevation data show an easterly trend in groundwater flow across the base toward the West Fork Trinity River.

2.3.2 Goodland/Walnut Aquitard

The groundwater within the terrace deposits is isolated from groundwater within the lower aquifers by the low permeability rocks of the Goodland Limestone and Walnut Formations. The primary inhibitors to vertical groundwater movement within these units are the fine-grained clay and shale layers that are interbedded with layers of limestone. Some groundwater movement does occur between the individual bedding planes of both of these units, but the vertical hydraulic has been calculated to range between 7.3×10^{-11} centimeters per second (cm/s) to 1.2×10^{-09} cm/s for the NAS Fort Worth JRB and AFP 4 area. This corresponds to a vertical advective velocity rate that ranges between 1.16×10^{-03} feet per day (ft/d) to 5.22×10^{-03} ft/d (Environmental Science and Engineering, Inc. [ESE], 1994).

At the AFP 4 "window area", the Goodland/Walnut Aquitard is breached, and the Alluvial Terrace groundwater is in direct communication with the groundwater in the Paluxy aquifer. A significant number of monitoring wells and borings have been advanced on NAS Fort Worth JRB, and no evidence has been found indicating that a similar window exists on the base property.

2.3.3 Paluxy Aquifer

The Paluxy aquifer is an important source of potable groundwater for the Fort Worth area. Many of the surrounding communities, particularly White Settlement, obtain their municipal water supplies from the Paluxy aquifer. Groundwater from the Paluxy aquifer is also used in some of the surrounding farms and ranches for agricultural purposes. Due to the extensive use of the Paluxy aquifer, water levels have declined significantly over the years. Water levels in the NAS Fort Worth JRB vicinity have not decreased as much as in the Fort Worth area due to its proximity to the Lake Worth recharge area and the fact that the base does not use water from the

Paluxy aquifer. Drinking water at the base is supplied by the city of Fort Worth, which uses Lake Worth as its water source. The groundwater of the Paluxy aquifer is contained within the openings created by gaps between bedding planes and cracks and fissures in the sandstones of the Paluxy Formation. Just as the Paluxy Formation is divided into upper and lower sand members, the aquifer is likewise divided into upper and lower aquifers. The upper sand is finer grained and contains a higher percentage of shale than the lower sand. Radian (1989) estimated the hydraulic and transmissivity to be 130 to 140 gpd/ft^2 and 1,263 to 13,808 gallons per day per foot (gpd/ft), respectively.

2.3.4 Glen Rose Aquitard

Below the Paluxy aquifer are the fine-grained limestone, shale, marl, and sandstone beds of the Glen Rose Formation. The thickness of the formation ranges from 250 to 450 feet. Although the sands in the Glen Rose Formation yield small quantities of groundwater in the area, the relatively impermeable limestone acts as an aquitard restricting water movement between the Paluxy aquifer above and the Twin Mountains aquifer below.

2.3.5 Twin Mountains Aquifer

The Twin Mountains Formation is the oldest and deepest water supply source used in the NAS Fort Worth JRB area The Twin Mountains Formation occurs approximately 600 feet below NAS Fort Worth JRB with a thickness of between 250 to 430 feet. Recharge to the Twin Mountains aquifer occurs west of NAS Fort Worth JRB where the formation crops out. Groundwater movement follows the regional eastward slope of the bedrock. Like the groundwater in the Paluxy aquifer, the Twin Mountains groundwater occurs under unconfined conditions in the recharge area and becomes confined as it moves downdip. Transmissivities in the Twin Mountain aquifer range from 1,950 to 29,700 gpd/ft and average 8,450 gpd/ft in Tarrant County. Permeabilities range from 8 to 165 gpd/ft^2 and average 68 gpd/ft^2 in Tarrant County (CH2MHILL, 1984).

2.4 SURFACE WATER

NAS Fort Worth JRB is located within the Trinity River Basin adjacent to Lake Worth. The main surface water features of interest are Lake Worth, the West Fork Trinity River, and Farmers Branch Creek. Lake Worth, which was constructed in 1941 as a source of municipal water for the city of Fort Worth, borders the base to the north of NAS Fort Worth JRB. The surface area of the lake is approximately 2,500 acres. The Paluxy aquifer discharges to Lake Worth near its western extent. However, in the portion of the lake near Bomber Road, the top of the Paluxy aquifer is recharged by Lake Worth. There does not appear to be a hydraulic connection between the Paluxy aquifer and the lake in the eastern portion where the Walnut Formation separates the Paluxy aquifer and Lake Worth. The elevation of the lake is fairly constant at approximately 594 feet above NGVD, the fixed elevation of the dam spillway (USGS, 1996).

The West Fork Trinity River, a major river in north central Texas, defines the eastern boundary of the base. The Trinity River flows southeast towards the Gulf of Mexico. Because the river has been dammed, the 100- and 500-year flood plains downstream of the dam do not extend more than 400 feet from the center of the river or any of its tributaries.

Storm water, which enters the NAS Fort Worth storm water drainage system, is discharged directly into Lake Worth. The outfall is permitted under the National Pollutant Discharge Elimination System (NPDES), and monitoring results document compliance with permit discharge limitations (IT Corporation, 1997a).

Storm water, which does not enter the drainage system, drains east towards the West Fork Trinity River. A portion of the base is drained by Farmers Branch Creek, a tributary to the West Fork Trinity River. Farmers Branch Creek begins within the community of White Settlement and flows eastward. Most of the flow in the creek is due to surface runoff, with some groundwater recharge from the Terrace Alluvium groundwater. Just south of AFP 4, Farmers Branch flows under the runway within two large culverts identified as an aqueduct. Two unnamed tributaries flow across the Flightline Area and discharge into Farmers Branch Creek. Another unnamed stream (approximately 200 feet long) is located in the SD13 area and discharges to Farmers Branch Creek as well. Most of the base drainage is intercepted by a series of storm drains and culverts, directed to OWSs, and discharged to the West Fork Trinity River downstream of Lake Worth. A small portion of the north end of the base drains directly into Lake Worth.

2.5 CLIMATE

The climate in the Fort Worth area is classified as sub-humid with long, hot summers and short, dry winters. Tropical maritime air masses control the weather during much of the year, but the passage of polar cold fronts and continental air masses can create large variations in winter temperatures. The average annual temperature in the area is 76.3 degrees Fahrenheit (°F), and monthly mean temperatures vary from 48.6 °F in January to 86.1 °F in July. The average daily minimum temperature in January is 33.7 °F, and the lowest recorded temperature is 4 °F. The average daily maximum temperature in July is 96.0 °F, and the highest temperature ever recorded at the base was 113 °F in the month of June (National Weather Service, 2001).

Mean annual precipitation recorded at the base is approximately 36.26 inches. The wettest months are May and October, with a secondary maximum in April. The period from November to March is generally dry, with a secondary minimum in August. Snowfall accounts for a small percentage of the total precipitation between December and March. Thunderstorm activity occurs at the base an average of 45.6 days per year, with the majority of the activity between April and June. Hail may fall 2 to 3 days per year. The maximum precipitation recorded in a 24-hour period during 2000 was 5.91 inches in October. On the average, measurable snowfall occurs 2 days per year.

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TAB

SECTION 3.0

3.0 MONITORING ACTIVITIES

This section describes the procedures performed during the three 2000 quarterly groundwater sampling events at NAS Fort Worth JRB. Monitoring wells selected for inspection and water level measurements are depicted on Figure 3.1. Where appropriate, October 2000 quarterly sampling procedures are described in depth throughout this section. Detailed descriptions of procedures followed for the April and July 2000 quarterly sampling events are provided in their respective quarterly reports (HydroGeoLogic, 2000h; HydroGeoLogic, 2000l). All work was performed in accordance with the Final 2000 Basewide GSAP (HydroGeoLogic, 2000b) and the Final 2000 Basewide QAPP (HydroGeoLogic, 2000c).

Monitoring activities included:

- Monitoring well inspection/maintenance
- Water level measurements
- Monitoring well purging and analytical sampling
- Investigation-derived waste (IDW) management
- Laboratory and field analysis

3.1 MONITORING WELL INSPECTION/MAINTENANCE

A full well inspection and maintenance was performed at 272 monitoring wells following the July 2000 sampling event. A visual inspection of each monitoring well proposed for sampling was conducted to determine the monitoring well's condition and integrity. As part of the monitoring well inspection procedure, the integrity of the surface features, such as, the concrete pad, security posts, and the manhole cover, were thoroughly examined and the maintenance needs were recorded. The monitoring well casing, cap, and any security features such as locks, monitoring well identification and bolts, were repaired or replaced as appropriate, or noted for future maintenance Following the visual inspection of each monitoring well, a photoionization detector (PID) was used to measure the levels of organic vapors in the background area, breathing zone, and at the top of each well casing immediately after the well cap had been removed. All well inspection and measurement data were recorded on the monitoring well maintenance forms presented in the July 2000 Quarterly Report and in the Final Monitoring Well Abandonment and Repair Letter Report Air Force Plant 4 and NAS Fort Worth JRB, Texas (HydroGeoLogic, 2000m).

3.2 WATER LEVEL MEASUREMENTS

In order to evaluate existing groundwater flow patterns, water level measurements were taken at 272 monitoring wells during the July 2000 sampling event. The monitoring wells were inspected, and both depth to water and total depth of the monitoring well were measured. For wells containing dedicated sampling equipment, the pumps were temporarily removed. The water level measurements and total depths were taken several days after purging and sampling the monitoring wells, or after the dedicated sampling equipment was removed, to ensure equilibrium conditions. After water level measurements were recorded, dedicated sampling equipment was replaced.

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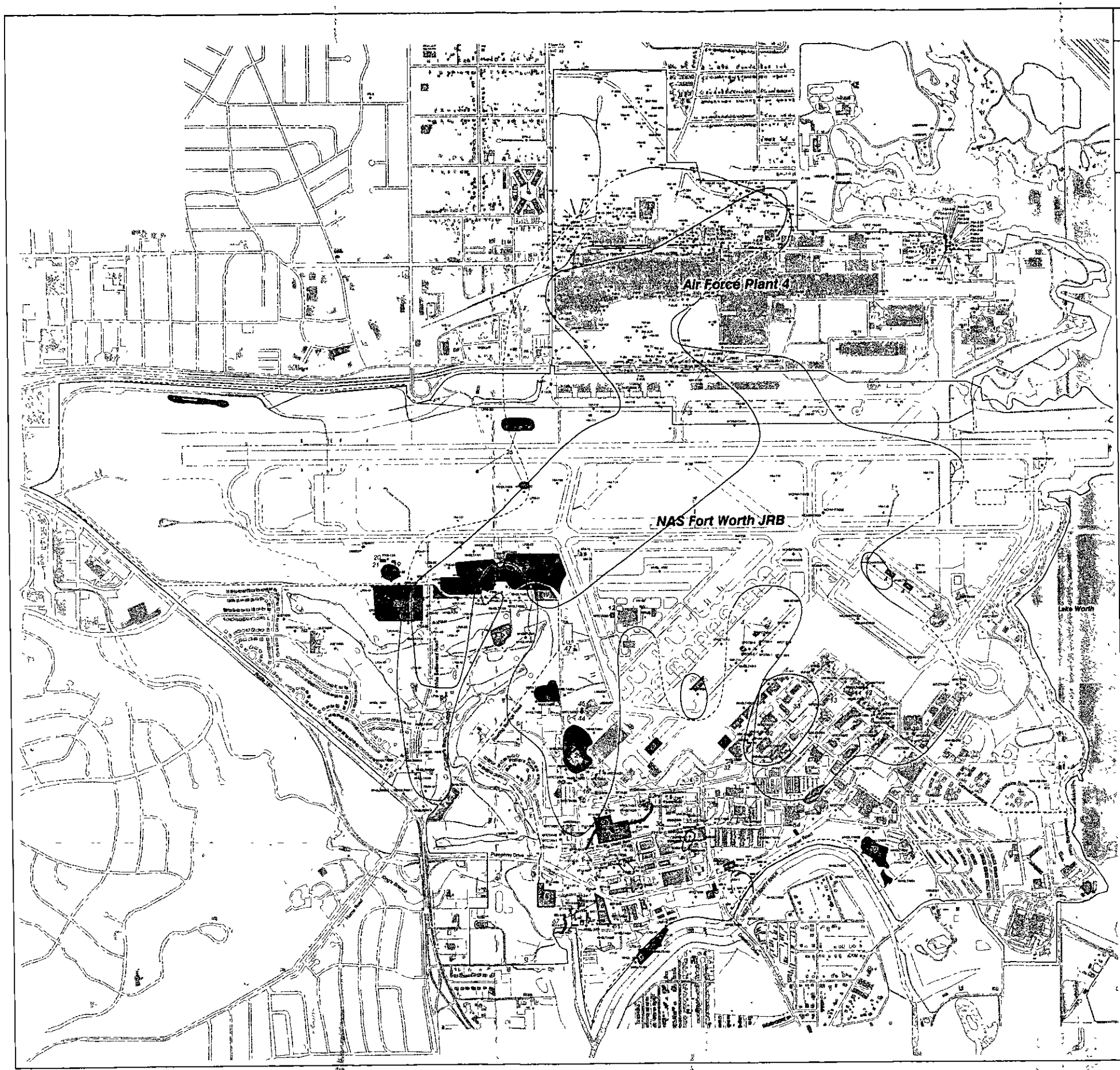

Figure 3.1

Wells Selected for Inspection and Water Level Measurement October 2000

US Air Force Center For Environmental Excellence
Brooks AFB, Texas

Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- Trichloroethene Plume Boundary set at MCL (5 µg/L)
- cis-1,2-Dichloroethene Plume Boundary set at MCL (70 µg/L)
- Benzene Plume Boundary set at MCL (5 µg/L)
- Plume Monitoring Wells
- AOC 1 Monitoring Wells
- AOC 4 Monitoring Wells
- SWMU 68 and AOC 7 Monitoring Wells
- Monitoring Wells Sampled as part of other Groundwater Investigations
- AFP 4 Semi Annual Monitoring Wells
- Other Monitoring Wells

Note: Dashed contour indicates interpreted plume boundary

Area of Concern (AOC)

1 Former Base Service Station/Former Base Gas Station
2 Airfield Groundwater (Basewide Coverage)
4 Fuel Hydrant System
5 Grounds Maintenance Yard
6 RV Storage Area
7 Former Base Housing Area
9 Aerospace Museum
9 Golf Course Maintenance Yard
10 O/W Separator
11 O/W Separator
12 O/W Separator
13 O/W Separator
14 Unnamed Stream
15 Storage Shed
16 Family Camp
17 Former Landfill
18 Suspected Former Fire Training Area A
19 Suspected Former Fire Training Area B

Solid Waste Management Unit (SWMU)

6 Building 1626 Waste Accumulation Area
7 Building 1626 Wash Rack and Drain
7 Building 1626 Oil/Water Separator
8 Building 1626 Sludge Collection Tank
11 Building 1617 Waste Accumulation Area
12 Building 1618 Waste Accumulation Area
13 Building 1710 Visual Information Center/ Won Station Waste Accumulation Areas
16 Building 1060 Waste Accumulation Area
17 Landfill No.7
19 Fire Training Area No.2
20 Waste Fuel Storage Tank
21 Waste Oil Tank
22 Landfill No.4
23 Landfill No.5
24 Waste Dumps Area
25 Landfill No.6
26 Landfill No.3
27 Landfill No.10
28 Landfill No.1
29 Landfill No.2
30 Landfill No.9
31 Building 1050 Waste Accumulation Area
33 Building 1410 Waste Accumulation Area
33 Building 1420 Waste Accumulation Area
34 Building 1184 Waste Accumulation Area
35 Vehicle Refueling Shop (Building 1184) Oil/Water Separation System
36 Building 1181 Waste Accumulation Area
37 Vehicle Maintenance Shop (Building 1181) Oil/Water Separation System
39 Building 1642 Waste Accumulation Area
40 Building 1643 Oil/Water Separation System
41 Building 1414 Oil/Water Separation System, Field Maintenance Squadron Aerospace Ground Equipment
42 Building 1414 Waste Accumulation Area
44 Building 1027 Oil/Water Separation System at the Aircraft Washing Hangar
45 Building 1027 Waste Oil Tank Vault at the Aircraft Washing Hangar
47 Building 1015 Jet Engine Test Cell Oil/Water Separator
48 Aircraft Washing Area No.1
50 Aircraft Washing Area No.2
51 Building 1180 Central Waste Holding Area
52 Building 1180 Oil/Water Separation System
53 Storm Water Drainage System
54 Storm Water Interceptors
62 East Gate Oil/Water Separator
61 Building 1520 Power Production Maintenance Facility Waste Accumulation Area
62 Landfill No.8
64 French Underdrain System
66 Sanitary Sewer System (Basewide Coverage)
67 Building 1340 Oil/Water Separator
68 POL Tank Farm

N

500 0 500 1000
SCALE IN FEET

HYDRO GeoLogic INC.

Filename: X:\AG001.33\dba_2000 Annual Report\ex.dir\ benzene_plate.apr
Created by: jbelcher 06/26/99
Revised: 02/02/01 jb
Project: APC'001.33'DBA
Map Source: HydroGeoLogic GIS Database 2001
Jacobs Engineering, 1996

Each monitoring well was checked for total depth to determine whether fine materials have accumulated inside the monitoring well casing. For monitoring wells that contain an accumulation of fine material greater than 20 percent of the screened interval, the monitoring well will be considered for redevelopment. During the July 2000 sampling event, no monitoring wells contained an accumulation of fine material greater than 20 percent. Typically, the total depth of monitoring wells with dedicated sampling equipment is also measured during the January sampling event. However, since a sampling event was not conducted in January 2000, the total depth of monitoring wells with dedicated sampling equipment was measured only during the July 2000 sampling event for calendar year 2000.

For monitoring wells which recorded photoionization detector readings over 100 parts per million or contained free product in the past, an interface probe was used, in accordance with Appendix C of the GSAP (HydroGeoLogic, 2000b), in order to check for free-product (i.e., light non-aqueous phase liquid [LNAPL]). Field notes documented whether an odor, sheen, or measurable free product (>0.01 feet thickness) was present. If greater than 0.01 feet of free-product was present, the product was removed via absorbent pads until no measurable product remained. Free product recovery was not required at any of the monitoring wells sampled during the July 2000 sampling event.

3.3 MONITORING WELL/CHEMICAL ANALYSIS SELECTION

Seventeen plume monitoring wells were scheduled for analytical sampling in October 2000 as described in the Final 2000 GSAP (HydroGeoLogic, 2000b). One monitoring well, HM-112, was scheduled to be sampled by HydroGeoLogic in October, however it was sampled by Jacobs for AFP4. Recovery well WHGLRW017 was sampled in its place to provide additional plume delineation. The monitoring wells selected for analytical sampling were further divided based on whether the monitoring wells were selected primarily to evaluate plume characteristics, the potential for off-site migration, or for the extent of natural attenuation. The reason for selection of the monitoring well dictated the chemical parameters selected for analysis at each monitoring well. Table 3.1 includes a list of the monitoring wells selected for the October sampling event and the chemical parameters selected for analysis at each monitoring well. Table 3.2 includes a list of monitoring wells selected for monitoring for current regulatory requirements and the chemical parameters selected for analysis at each well. The monitoring wells sampled during the October 2000 event are depicted on Figure 3.1.

Components considered in developing the sampling approach included monitoring well location relative to an area/source of contamination, type of contamination suspected and/or detected, and specified monitoring requirements resulting from ongoing or previous investigations. The analysis proposed for a selected monitoring well reflects the monitoring objective(s) that it supports. For example, when a selected monitoring well supports both the plume delineation objective as well as the natural attenuation objective, the list of analytical tests reflects the analysis needed to fulfill both objectives (i.e., VOCs and natural attenuation parameters). Natural attenuation parameters are sampled on a semi-annual basis in April and October 2000.

Table 3.1
Monitoring Wells Selected for October 2000 Basewide Sampling

Area	Monitoring Well	Sample Parameters[1]		
		VOCS	Metals	Natural Attenuation[2]
TCE Plume Monitoring Wells	GMI-22-04M	X		
	GMI-22-07M	X		
	HM-116	X	X[3]	
	HM-123	X		X
	ITMW-01T	X	X	X
	LF03-3D	X	X[3]	
	LF05-01	X		
	LF05-5G	X		X
	MW-53	X		
	W-153	X		
	WHGLRW015	X		
	WHGLRW017	X		
	WHGLTA025	X		
	WHGLTA203[4]	X	X	
	WITCTA010	X	X	
	WITCTA024[5]	X		X
	WJETA535[5]	X		X

Notes
[1] Samples from all monitoring wells were also tested for the following standard field parameters temperature, pH, specific conductance (EC), dissolved oxygen (DO), oxidation-reduction potential (Eh), and turbidity
[2] Natural attenuation parameters include common anions (chloride, nitrate, sulfate), total organic carbon (TOC), Fe(II), alkalinity, and methane, ethane, and ethene
[3] The metals analysis performed on this well was only for chromium (EPA Method SW6010B) to support the Jacobs semi-annual monitoring
[4] WHGLTA203 was not sampled during the October 2000 sampling event because it was dry.
[5] This well was sampled for natural attenuation to provide background conditions for comparison

VOCs - Volatile organic compounds (EPA Method SW8260B)
Metals - Total metals plus mercury (EPA Methods SW6010B/SW7470)
Natural Attenuation – sulfate, nitrate, chloride (SW9056), TOC (SW9060), alkalinity (E310 1), methane, ethane, ethene (Method RSK-175)

Table 3.2
Monitoring Wells Selected for Current Regulatory Requirements
Sampled During October 2000 Basewide Sampling[1]

Area	Monitoring Well	Sample Parameters[2] VOCs
AOC 4 Monitoring Wells	SPOT35-8	X
	WCHMHTA008	X
	WCHMHTA009	X
	WHGLTA009	X
	WHGLTA010	X
	WHGLTA012	X
	WHGLTA014	X
SWMU 68 and AOC 7 Monitoring Wells	SD13-01	X
	SD13-02	X
	SD13-04	X
	ST14-03	X
	ST14-W11	X
	ST14-27	X
	ST14-28[3]	X
	ST14-W16	X
	ST14-W21	X
AOC 1 Monitoring Wells	BGSMW03	X
	BGSMW05	X
	BGSMW06	X
	MW-5	X
	MW-10	X
	MW-11[4]	X
	SAV-2	X
	WHGLTA036	X
	WHGLTA037	X
	WHGLTA038[3]	X

Notes.

[1] Additional monitoring wells, not listed in this table were sampled as part of ongoing RFI Investigations for waste accumulation areas (WAAs), AOC 13, and the delineation of the southern plume using newly installed monitoring wells Detected October and November results can be found in the Appendix, Table B 4

[2] Samples from all monitoring wells were also tested for the following standard field parameters temperature, pH, specific conductance (EC), dissolved oxygen (DO), oxidation-reduction potential (Eh), and turbidity

[3] ST14-28 and WHGLTA038 were dry and therefore not sampled during the October 2000 sampling event.

[4] MW-11 was not sampled during the October 2000 sampling event due to the well being compromise by tree roots It is proposed to be abandoned in 2001

VOCs - Volatile organic compounds (EPA Method SW8260B)

3.3.1 Additional Source and Plume Delineation

A total of 17 existing monitoring wells located within and around the TCE plume were selected to provide additional source and plume delineation. These monitoring wells were selected in areas which have been evaluated in the past, as well as areas where little data has been collected to date (e.g., the runway area between the two lobes of the plume). Monitoring wells selected for plume delineation were analyzed for VOCs using EPA Method SW8260B.

3.3.2 Natural Attenuation Monitoring

Five monitoring wells were sampled for natural attenuation parameters to provide continuous baseline data to determine whether biodegradation is acting to reduce contaminant concentrations in groundwater. Natural attenuation parameters include common anions (chloride, nitrate, and sulfate by EPA Method SW9056), methane, ethane, ethene (Method RSK-175), TOC (EPA Method SW9060), and alkalinity (EPA Method E310 1), as well as several of the standard field parameters (temperature, pH, specific conductance [EC], DO, oxidation-reduction potential [Eh], and turbidity) measured at every monitoring well. The monitoring wells selected for natural attenuation are located several hundred feet down gradient from the highest TCE concentrations (HM-123 and LF05-5G) and the most down gradient well (ITMW-01T). Two monitoring wells along the plume perimeter were also sampled for "background" conditions (WITCTA024 and WJETA535). These five monitoring wells were sampled for natural attenuation parameters semi-annually.

3.3.3 Current Regulatory Requirements

A LTM program, consisting of semi-annual sampling (April and October) of a total of seven groundwater monitoring wells, was being conducted for AOC 4. These seven monitoring wells were sampled and analyzed for VOCs (EPA Method SW8260B). A complete discussion of the sampling conducted at AOC 4 will be presented in an annual report once the October data has been evaluated and analyzed.

Since January 1998, a LTM program has been in place for SWMUs 64, 67, and 68, and AOC 7, based on the requirements specified in the RAP for these sites (Parsons, 1997). In a letter from the TNRCC dated February 8, 2000, it was determined that SWMU 64 and 67 will be regulated by the TNRCC Industrial Hazardous Waste (IHW) Regulations and that monitoring at SWMU 68 and AOC 7 will be conducted according to the requirements in the TNRCC Petroleum Storage Tank (PST) Regulations (TNRCC, 2000a). Semi-annual sampling of nine SWMU 68 and AOC 7 monitoring wells was conducted in April and October 2000 for VOCs (EPA Method SW8260B). A complete discussion of the sampling conducted at SWMU 68 and AOC 7 will be presented in an annual report once the October data has been evaluated and analyzed.

A semi-annual monitoring program, consisting of April and October sampling at ten groundwater monitoring wells was conducted for AOC 1 in 2000. After submitting a proposed "closure" report for AOC 1 in 1999, the TNRCC required additional sampling to verify plume stability and that no off-site migration has occurred close to the Trinity River (TNRCC, 2000b). In April 2000, seven monitoring wells in the vicinity of AOC 1 were sampled for VOCs (EPA

Method SW8260B). Three additional monitoring wells were installed in May 2000 and were included in the October 2000 groundwater sampling. A complete discussion of the sampling at AOC 1 will be presented in an annual report that is scheduled to be submitted to the TNRCC PST Division at the completion of the 2000 monitoring events.

Groundwater sampling was conducted for the RFI Investigations at the waste accumulation areas (WAAs) in 2000. In addition, four paluxy wells were installed and sampled and five Terrace Alluvium monitoring wells were installed and sampled as part of the data gap investigation of the southern plume. All detected analytical results can be seen in Appendix Table B.4.

3.3.4 Air Force Plant 4 Monitoring

Twenty-four monitoring wells were sampled in October 2000 by Jacobs as a part of the AFP 4 LTM. Of the 24 monitoring wells, 16 are located at AFP 4 and 8 are located at NAS Fort Worth JRB. The sampling protocol for AFP 4 LTM is included in the February 1998 LTM Plan (Jacobs, 2000).

Table 3.3 includes a list of the monitoring wells selected for sampling and the chemical parameters selected for analysis at each well. The analytical data collected by Jacobs for the AFP 4 LTM program are used to supplement groundwater data collected for the NAS Fort Worth JRB GSAP. All analytical results are presented on the figures within Section 5.0 of this report.

3.3.5 Variances from the 2000 GSAP

Due to fluctuations in groundwater elevations, slight variations in the wells selected for sampling were necessary from quarter to quarter. These changes are noted below.

January 2000
Sampling was not conducted in January 2000 due to delays in contracting. No sampling was required under regulatory actions during that quarter. Historically, January groundwater sampling events are conducted to monitor the presence and extent of groundwater contamination and potential surface water contamination.

April 2000
A severe drought caused a significant decrease in groundwater levels such that WHGLTA203 could not be sampled.

Free product was detected in monitoring well WITCTA036 and was therefore not sampled.

July 2000
Per AFCEE request, monitoring wells HM-126 and WHGLRW017 were sampled by HydroGeoLogic to provide additional plume delineation data.

October 2000
WHGLTA203 was dry and could not be sampled.

Table 3.3
Terrace Alluvium Monitoring Wells Selected for October 2000
Air Force Plant 4 Long Term Monitoring

Area	Monitoring Well	VOCs[1]	Chromium[2]
AFP 4 Terrace Alluvium Monitoring Wells	F-209	X	
	F-218	X	X
	HM-31	X	X
	HM-36	X	
	HM-50	X	
	HM-65	X	
	HM-88	X	X
	HM-93	X	X
	HM-95	X	X
	HM-98	X	X
	HM-102	X	
	HM-112	X	X
	MW-5	X	X
	W-135	X	
	W-149	X	X
	W-157	X	X
NAS Fort Worth JRB Terrace Alluvium Monitoring Wells	GMI-22-02M	X	
	GMI-22-03M	X	
	GMI-22-05M	X	
	HM-119	X	
	HM-120	X	
	HM-127	X	
	LF03-3D[3]	X	X
	LF04-10	X	
	ITMW-01T[3]	X	
	USGS06T	X	
	WHGLTA009[3]	X	

Notes
1 Volatile organic compounds (VOCs) were sampled for *cis*-1,2-dichloroethene, *trans*-1,2-dichloroethene, TCE, and vinyl chloride (VC) by EPA Method SW8260B
2 Chromium was sampled by EPA Method SW6010B.
3 Monitoring well sampled by HydroGeoLogic and results reported to Jacobs

Monitoring well HM-112 was sampled by AFP 4 to avoid duplication of effort. WHGLRW017 was sampled by HydroGeoLogic to provide additional plume delineation data.

3.4 MONITORING WELL PURGING AND ANALYTICAL SAMPLING

The selected monitoring wells were sampled using a low-flow purge technique, the procedure recommended for AFCEE projects (AFCEE, 1996). Detailed sampling protocol is included in Appendix C of the Final 2000 GSAP (HydroGeoLogic, 2000b).

3.4.1 Purging Procedures

Dedicated MicroPurge® Well Wizard® bladder pumps were used to purge and sample 15 of the 16 monitoring wells designated as plume monitoring wells on Table 3.1. A non-dedicated stainless steel bladder pump was used on the seven (AOC 4) monitoring wells and one plume monitoring well. The bladder pump is ideal for low-flow purging and can sustain pumping rates between 0.1 to 0.5 liter/minute minimizing turbidity, oxygenation, mixing of chemically distinct zones, and potential loss of VOCs. Continuity of the groundwater sampling is achieved in the majority of the sampling through using the same dedicated equipment each event and minimizing the disturbance to the water column. With non-dedicated equipment, pumps that are lowered into the monitoring well will cause some mixing of the stagnant and dynamic water zones, and resuspension of solids that have settled in the monitoring well. The dedicated pump system requires no equipment blanks or equipment decontamination.

During all purging, water quality stabilization criteria (pH, temperature, DO, Eh, turbidity, and EC) were continuously monitored using a flow-thru cell. The measurements were recorded on groundwater field sampling data sheets (Appendix A.1). The criteria for sample collection was the stabilization of water quality parameters as follows:

- Temperature: +/1 °C
- pH: +/-0.1 units
- EC: +/-3% full scale range
- DO: +/- 0.10 milligrams per liter (mg/L) or 10% of value (whichever is greater)
- Eh: +/-10 units
- Turbidity: +/-10% and less than 10 nephelometric turbidity units

3.4.2 Sampling Procedures

A monitoring well was sampled when the water quality stabilization criteria were met. If the parameters did not stabilize, the sample was collected when a minimum subset of the above parameters stabilized as described in Appendix C of the Final 2000 GSAP (HydroGeoLogic, 2000b).

Samples for VOC analysis were collected first at each monitoring well. The remaining samples were collected based on the approximate order of susceptibility to artificial aeration (i.e., methane, total metals, TOC, ferrous iron [Fe^{2+}], alkalinity, and anions). Required sample containers, preservation methods, volumes, and holding times are provided in Section 5.0 of the Final 2000 QAPP (HydroGeoLogic, 2000c).

3.5 INVESTIGATION-DERIVED WASTE MANAGEMENT

IDW management procedures were followed as outlined in Section C.9 2 of the Final 2000 GSAP (HydroGeoLogic, 2000c). All purge and decontamination water was stored in the poly farm tank at the recreational vehicle storage area. Disposal of the purge water and decontamination water from the October 2000 event will be conducted prior to the next groundwater sampling event.

3.6 LABORATORY AND FIELD ANALYSIS

The methods selected for the chemical analyses for the 2000 sampling event are summarized in the following paragraphs. All October samples, excluding those for Fe^{2+} analyses, were delivered by overnight courier to Severn Trent Laboratory (STL) in Chicago, Illinois. Fe^{2+} analyses were conducted on-site. Each sample was submitted for analysis of the constituents outlined in Table 3.1, and analyzed according to the specifications in the QAPP. Samples were collected from five monitoring wells selected for natural attenuation monitoring and were analyzed on-site for Fe^{2+}, one of the parameters necessary to evaluate the potential occurrence of natural attenuation. A HACH® Method 8146 spectrophotometer and a 1,10-phenanthroline reagent was used. This method is described in detail in the Final GSAP (HydroGeoLogic, 2000b). The reagent reacts with Fe^{2+} in the sample to produce an orange color in proportion to the iron concentration. Ferric iron (Fe^{3+}) does not react in this test. All Fe^{2+} analyses were performed in the field immediately following sample collection. All results of the on-site analyses were recorded in a field log book or on the groundwater field sampling data sheets; copies are provided in Appendices A 1 and A.2, respectively.

TAB

SECTION 4.0

4.0 QUALITY ASSURANCE/QUALITY CONTROL PROGRAM

This section describes the analytical methods and QC program utilized for the basewide quarterly monitoring events at NAS Fort Worth JRB and provides a data quality evaluation (DQE) of the October 2000 quarterly groundwater sampling event. The analytical methods used for the collection of data are described in the Final 2000 Basewide QAPP (HydroGeoLogic, 2000c).

4.1 FIELD QUALITY CONTROL

The field QC program for the collection of samples at NAS Fort Worth JRB included specific procedures for the collection of groundwater samples as described in the Final 2000 Basewide GSAP (HydroGeoLogic, 2000b). Sample bottles met EPA requirements for environmentally clean containers. Sample labels were pre-printed to facilitate sample tracking from the field through the laboratory to the final report. Documentation of sample collection is performed in the field to ensure that sample labeling, contaminants of concern, and request for analysis are in agreement and traceable back to the correct field sample. Custody seals were placed on each cooler before shipment by an overnight courier.

Field QC samples were collected to evaluate sampling technique and decontamination procedures. The samples including ambient blanks, equipment blanks, trip blanks, and field duplicates are described below. A summary of the QC samples, including the number of each type collected as part of the October 2000 sampling event, are included in Table 4.1.

4.1.1 Ambient Blanks

Ambient blanks consist of American Society for Testing and Materials (ASTM) Type II reagent grade water poured into a VOC sample vial at a sampling site (in the same vicinity as the associated samples). Ambient blanks are used to assess the potential introduction of VOCs from ambient sources (e.g., active runways, engine test cells, gasoline motors in operation) to the samples during sample collection. Ambient blanks are handled like environmental samples and transported to the laboratory for analysis.

No results were qualified as ambient artifacts during the October 2000 sampling event.

4.1.2 Equipment Blanks

An equipment blank is a sample of ASTM Type II reagent grade water poured into, poured over, or pumped through a sampling device, collected in a sample container, and transported to the laboratory for analysis. Equipment blanks are used to assess the effectiveness of equipment decontamination procedures. During the October 2000 sampling event, one equipment blank was collected for each type of sample equipment used on each day that equipment decontamination activities occurred. Equipment blanks were collected immediately after the equipment was decontaminated. Each blank was analyzed for all laboratory analyses requested for the environmental samples collected at any associated site on that day. On days where only

Table 4.1
Field Quality Control Samples
Collected for October 2000 Sampling Event

Type of Sample	Purpose	Frequency	Total Number	Time	Analysis
Ambient Blank	Used to assess the impact of ambient conditions	1 ambient blank/sampling event	1	During normal sample collection conditions	VOCs
Equipment Blank	Used to assess the effectiveness of equipment decontamination procedures	1 equipment blank/day that equipment is decontaminated	2	Immediately after equipment had been decontaminated	All laboratory analyses consistent with daily sampling
Trip Blank	Used to assess the potential contaminants from sample containers or other foreign sources during sample transportation and storage	1 trip blank/ sample cooler	4	When VOC, BTEX and MTBE, or dissolved gases samples were collected	VOCs
Field Duplicate (blind)	Used to assess sample collection procedures, sample preparation, and improper analytical instrument use	1 duplicate/10 environmental samples	2	Collected at the same time and location of original sample	Same as original sample

Notes
BTEX - benzene, toluene, ethylbenzene, and xylenes
MTBE - methyl *tert*-butyl ether
VOC - volatile organic compound

dedicated equipment was used, equipment blanks were not required as there was no potential for cross-contamination between monitoring wells.

No results were qualified as sampling artifacts during the October 2000 sampling event.

4.1.3 Trip Blanks

Trip blanks consist of VOC sample vials filled in the laboratory with ASTM Type II reagent grade water, transported to the sampling site, handled as environmental samples, and returned to the laboratory for analysis. Trip blanks are not opened in the field and are submitted only when VOC samples are collected for analysis. Trip blanks are used to assess the potential introduction of contaminants from sample containers, and during sample transportation and storage. For the October 2000 sampling event, a set of trip blanks was included in each sample cooler containing sampling requiring VOCs.

No results were qualified as transportation/storage artifacts during the October 2000 sampling event.

4.1.4 Field Duplicates

A field duplicate is a second sample collected in the same location as a field sample ("parent" sample). Duplicate samples are collected simultaneously, or in immediate succession, to collection of parent sample, using identical recovery techniques. The parent and duplicate are treated in an identical manner during transportation, storage, preparation, and analysis. Any data qualification required by duplicates not meeting the precision criteria for the October 2000 event are discussed in Section 4.5 of this report.

Two field duplicates were submitted in association with the October 2000 quarterly sampling event.

4.2 SAMPLE TRACKING PROTOCOL

Each field sample was assigned a unique identification number that described where the sample was collected. The number consists of a maximum 12-digit alphanumeric code as follows:

xxxxxxxxxzzaa

where:

xxxxxxxxx represents the well identification or well name (e.g., LF05-01, WHGLTA025)

zz represents the medium (WG for water-ground)

aa indicates the sampling event number for groundwater, surface water, and soil (e.g., 01, 02, 03, etc.)

For example, the groundwater sample collected during the thirteenth sampling event from LF05-01 would be identified as "LF05-01WG13."

In order to ensure that field duplicates were analyzed 'blind' by the laboratory, each field duplicate sample was assigned a unique sample identification number that did not associate the duplicate with its parent sample. The locations from which field duplicate samples were to be collected were determined prior to mobilization. Documentation was maintained in the field sampling log book, and on the sample collection log, to track these field duplicate samples. For example, a blind duplicate sample would be identified as DUP01WG13.

QC samples were identified by use of a similar system of identifiers with a maximum of 10 characters. The QC sampling number system is summarized below:

xxyyyyyy

where:

xx represents the medium (EB for equipment blank, TB for trip blank, AB for ambient blank)

yyyyyy represents the date (month, day, year)

For example, an equipment blank obtained on October 16, 2000, would be identified as EB101600.

The Project Geologist/Field Coordinator maintained a list detailing the connection between each QC sample and specific environmental samples. For instance, each trip blank was correlated with a particular set of samples shipped to the laboratory, and each equipment blank was correlated to those samples collected on a specific date, using a particular set of sampling tools.

After the laboratory data were received and validated, data entry and QC operations were performed on the laboratory's electronic data deliverables (EDDs) to ensure that each EDD was complete, correct, and compliant with the Environmental Resources Program Information Management System (ERPIMS) format. An EDD report in the ERPIMS format will be provided.

For the purpose of this report, samples will be referred to by their location identification numbers (LOCIDs) and will not contain the suffix "WG13". The suffix of "DL" is applied to indicate a sample result reported from a diluted analysis, and the suffix "RE" indicates a sample result reported from a reanalysis.

4.3 LABORATORY QUALITY CONTROL

The laboratory QC program, including sample handling, laboratory QC elements, and data reporting, is fully documented in the Final 2000 Basewide QAPP (HydroGeoLogic, 2000c). Sample handling includes documentation of sample receipt, placement in storage, controlled sample access, and disposal. Laboratory QC elements consist of instrument calibration and maintenance, laboratory control samples (LCSs), method blanks, matrix spike/matrix spike duplicate (MS/MSD) samples, and method-specific QC checks. Reporting of the laboratory control data was planned prior to the collection of the data, allowing the laboratory to place the appropriate information into each data package so that the DQE could be performed in a timely manner.

4.4 QUALITY CONTROL ELEMENTS

The basis for assessing each element of data quality (precision, accuracy, representativeness, completeness, and comparability) is discussed in the following subsections.

4.4.1 Precision

Precision measures the reproducibility of measurements. It is strictly defined as the degree of mutual agreement among independent measurements as the result of repeated application of the same process under similar conditions. Analytical precision is the measurement of the variability associated with duplicate (two) or replicate (more than two) analyses. Total precision is the measurement of the variability associated with the entire sampling and analysis process, and is determined by analysis of duplicate or replicate field samples and measures variability introduced by both the laboratory and field operations. Field duplicate samples and MSD samples were analyzed to assess field and analytical precision, and the precision measurement was determined using the relative percent difference (RPD) between the duplicate sample results For replicate analyses, the relative standard deviation was determined. Acceptable values for precision for each analyte are listed by analysis method in the Final 2000 Basewide QAPP (HydroGeoLogic, 2000c).

4.4.2 Accuracy

Accuracy is a statistical measurement of correctness and includes components of random error (variability due to imprecision) and system error. It therefore reflects the total error associated with a measurement. A measurement was accurate when the value reported did not differ from the true value or known concentration of the spike or standard. Analytical accuracy was measured by comparing the percent recovery (%R) of analytes spiked into an LCS to a control limit. For most organic analytical methods, surrogate compound recoveries were also used to assess accuracy and method performance for each sample analyzed. Analysis of performance evaluation (PE) samples were also used to provide additional information for assessing the accuracy of the analytical data being produced.

Both accuracy and precision were calculated for each AFCEE analytical batch, and the associated sample results were interpreted by considering these specific measurements. The formula for calculation of accuracy is %R from pure and sample matrices. Acceptable values for %R for each analyte are listed by analytical method in the Final 2000 Basewide QAPP (HydroGeoLogic, 2000c). Accuracy and precision for the October 2000 sampling event are discussed in Section 4.5 of this report.

4.4.3 Representativeness

Objectives for representativeness were defined for each sampling and analysis task and were a function of the investigative objectives. Representativeness was achieved through use of the standard field, sampling, and analytical procedures. Representativeness was also determined

by appropriate program design with consideration of elements such as proper sampling locations.

The same analytical methods are maintained from quarter to quarter (with the exceptions cited in Section 4.4.5 below). The dedicated bladder pumps help to ensure representative samples are collected each sampling round.

Table 4.2
Data Qualifiers

Qualifiers[1]	Positive Results	Negative Results
Qualifiers for Data Within Acceptance Limits (Usable as Reported)		
(no qualifier)	The result is a detection with the indicated value and units. (Use datum without qualification)	(Not applicable)
U	(Not applicable)	The analyte was analyzed for, but not detected. The associated numerical value is at the PQL. (Use datum without qualification)
Qualifier for Data Within Action Limits (Usable with Qualification)		
F	The analyte was positively identified, but the associated numerical value is below the PQL	(Not applicable)
J	The analyte was positively identified, the quantitation is an estimation.	(Not applicable)
UJ	(Not applicable)	The analyte was not detected; the associated numerical value is a PQL which is estimated due to deficiencies in the QC data.
Qualifiers for Data Outside of Action Limits (Unusable)		
R	The datum is unusable due to serious deficiencies in the ability to meet QC criteria	The datum is unusable due to serious deficiencies in the ability to meet QC criteria.

Notes
[1] If a combination of QC results suggest contradictory qualifiers, the following hierarchy is used to select the appropriate qualifier to assign

R > UJ > U > F > J > (no qualifier)

PQL - practical quantitation limit
QC - quality control

4.4.4 Completeness

Completeness was calculated for the aggregation of data for each analyte measured for any particular sampling event or other defined set of samples. The number of valid results divided by the number of possible individual analyte results, expressed as a percentage, determines the completeness of the data set. In evaluating sampling event completeness, valid results were all results not qualified with an "R" qualifier (see Table 4.2 for an explanation of qualifiers used). The project requirement for completeness is 95 percent for aqueous samples. In instances where samples could not be analyzed for any reason (holding time violations in which resampling and analysis were not possible, samples spilled or broken, etc.), the numerator of this calculation becomes the number of valid results minus the number of possible results not reported.

The formula for calculation of completeness follows.

$$\%\ \text{completeness} = \frac{\text{number of valid (i.e., non – R qualified) results}}{\text{number of possible results}} \text{X}100$$

Table 4.3
Data Quality Evaluation and Result Rejection Summary

Monitoring Well	Dichlorodifluoromethane
DUP03	CC
DUP04	CC
GMI-22-04M	CC
GMI-22-07M	CC
HM-116	CC
HM-123	CC
ITMW-01T	CC
LF03-3D	CC
LF05-01	CC
LF05-5G	CC
MW-53	CC
W-153	CC
WHGLRW015	CC
WHGLRW017	LCS
WHGLTA025	CC
WITCTA010	CC
WITCTA024	CC
WJETA535	CC
Total Analyses	18
Rejected Analyses	18
Percent Complete	0 0

Notes
LCS The designated sample result was rejected because of a low laboratory control sample recovery (%R)
CC The designated sample result was rejected because of high continuing-calibration verification values (%D)

The October 2000 sampling event generated a total of 1,214 data points (from environmental samples and field duplicates); 1,196 of these data points were considered usable. Overall project completeness was calculated to be 98.5 percent, which meets project completeness requirements. Completeness calculated on a per-analyte basis is evaluated in the discussion of individual analytical method subsections in Section 4.5. All rejected and missing data points are summarized in Table 4.3.

4.4.5 Comparability

Comparability is the confidence with which one data set can be compared to another data set. The objective for this QC program is to produce data with the greatest possible degree of comparability. The number of matrices that are sampled and the range of field conditions encountered are considered in determining comparability. Comparability is achieved by using standard methods for sampling and analysis, reporting data in standard units, normalizing results to standard conditions and using standard and comprehensive reporting formats. Complete field documentation using standardized data collection forms supports the assessment of comparability. Analyses of PE samples and reports from audits are used to provide additional information for assessing the comparability of analytical data produced among subcontracting laboratories. Historical comparability is achieved through consistent use of methods and documentation procedures throughout the project. Analytical methods have remained the same

since the beginning of the Groundwater Sampling Program, with the exception of dissolved gases.

The method for dissolved gases used in previous rounds of sampling had been a modification of method SW8015. Starting with the April 2000 sampling event, Method RSK-175 has been used. Both methods involve analysis of headspace by gas chromatography, and have similar detection limits. The control limits required by the QAPP have been used in all rounds of sampling and have remained unchanged.

Note that the methods used for petroleum hydrocarbons and for BTEX also changed over the course of this investigation; however, these tests were not analyzed for during October 2000 and are not discussed further in this report.

4.5 DATA QUALITY EVALUATION

This section describes the analytical methods and QC program utilized for the October 2000 basewide groundwater sampling event at NAS Fort Worth JRB. The analytical methods used for the analysis of the field samples are described in the Final 2000 Basewide QAPP (HydroGeoLogic, 2000c).

The objective of the DQE is to provide a professional review of the analytical data packages submitted by the laboratory. The DQE consists of laboratory QC data and field QC data review, to indicate which data are usable, usable with qualification, or unusable. The analytical procedures used to generate field sample data are evaluated in accordance with the general and method specific QC criteria listed in Sections 5.0, 6.0, 7.0, and 8.0 of the Final 2000 Basewide QAPP (HydroGeoLogic, 2000c). The DQE for each analytical procedure (or set of procedures) is presented in the subsections below. Each subsection summarizes those results which have been found to be unusable and those results which are usable with qualification.

Some analytes will have more than one qualifier assigned due to multiple QC issues with that result. In such cases, the qualifier with the highest priority is assigned; the other qualifiers are considered to be overridden and are not discussed in the method DQE.

Note that some samples have more than one analysis, due to reanalysis for dilution or QC issues. Where multiple analyses are available for a sample, the DQE discusses only QC issues affecting the definitive result for each analyte in that sample. The definitive result is determined by evaluating the hierarchy of data qualifiers (with the lower priority qualifier indicating a 'better' result), practical quantitation limits (PQLs), and calibrated range.

The following items of laboratory QC data are reviewed:

- Sample integrity
- Sample completeness
- Preparation and analysis holding times
- Laboratory preparation and analysis methods
- Method accuracy and precision (e.g., MS/MSDs, dilution tests)

- Laboratory performance criteria (e.g., blanks, LCS recoveries, surrogates, internal standards)
- Instrument initial and continuing calibration checks

Field QC performance is evaluated through evaluating field duplicates, field blanks, field documentation, and shipping criteria.

All project analytical data were validated to Level III standards by Environmental Data Services or HydroGeoLogic. As requested by AFCEE, 10 percent of the data were validated to Level IV standards by IT Corporation. The data selected for this comparison were from the April 2000 Quarterly Sampling Event. The results of Level IV validation were compared to the results of the Level III validation of the associated data packages by HydroGeoLogic's Project Chemist. The comparison of the two levels of validation showed no major discrepancies in the qualifiers applied to the data and it is concluded that the Level III validation is sufficient to meet the DQOs of the 2000 Basewide Groundwater Sampling and Analysis Program The Level IV validation reports, along with other related information, will be submitted to AFCEE as a separate submission.

4.5.1 Volatile Organic Compounds

A total of 16 groundwater samples, 2 duplicate samples, and 7 field QC samples were analyzed for VOCs by method SW8260B. Of the 1,210 VOC results generated by field samples and duplicate samples, 18 were rejected. Overall completeness of the VOC results was calculated to be 98.5 percent. All results for dichlorodifluoromethane were rejected, and the completeness for this compound is 0.0 percent, which does not meet the completeness goal of 95 percent. All other VOCs met the project completeness goal with 100 percent completeness. All result rejections (with a reason code) are presented in Table 4.3.

The remaining data results are usable with qualification as described below.

One of the four sample data packages contained two sets of MS/MSD results. The MS/MSD results within a data package were used to qualify the results for the parent sample as described below:

> The MS/MSD performed on sample GMI-22-07M had low recoveries for methylene chloride and MTBE. These compounds were non-detects in the parent sample and were qualified "UJ" in GMI-22-07M. This MS/MSD pair also had high recoveries for 1-chlorohexane, and high RPDs for MTBE, bromochloromethane, and 1,1,2-trichloroethane; however, these compounds were not detected in any associated sample and no further qualification was required.
>
> The MS/MSD performed on WITCTA010 had high recoveries for 1-chlorohexane. This compound was not detected in the parent sample and no further qualification was required.

The MS/MSD discrepancies appear to be outliers and are not indicative of a pervasive matrix effect for these analytes, and no qualification of other samples is warranted.

Sample LF05-5G is associated with field duplicate DUP03. This duplicate pair showed acceptable precision with the exceptions of 1,1-dichloroethene and chlorobenzene, which had RPDs of 22 and 67, respectively. The detections of both compounds have been qualified "J" in both members of this duplicate pair.

Sample W-153 is associated with field duplicate DUP04. This duplicate pair showed acceptable precision with the exception of trichloroethene. This compound was detected in both members of the duplicate pair, but the RPD acceptance criterion of 20% was exceeded. The detections of this compound have been qualified "J" in both W-153 and DUP04.

Detected values for specific analytes have been qualified "F" in several samples due to results between the method detection level (MDL) and PQL.

4.5.2 Metals

A total of two groundwater samples were analyzed for metals, and two other samples, HM-116 and LF03-3D, were analyzed for chromium only. The analyses were performed by a combination of method SW6010B and the analyte-specific methods of the SW7000 series. All 50 metals results were found to be usable and overall completeness of the metals results and the completeness of each of the 24 metals analytes is 100%.

The following data results are usable with qualification as described below.

Preparation blanks, initial calibration blanks, and continuing calibration blanks exhibited occasional metals contamination or negative baseline drift. This resulted in the following qualifications:

> Cadmium and copper non-detects were qualified "UJ" in sample ITMW-01T.
>
> Antimony, beryllium, cadmium, copper, and nickel non-detects were qualified "UJ", and the aluminum detection was qualified "U" in sample WITCTA010.

The post-digestion spike recovery result was out of control for thallium in sample WITCTA010. This caused the thallium non-detection to be qualified "UJ" in this sample.

Detected values for specific analytes have been qualified "F" in all samples due to results between the MDL and PQL.

4.5.3 Natural Attenuation Parameters

Five groundwater samples and one duplicate sample were analyzed for dissolved gases (methane, ethane, and ethene) by method RSK-175. There were no rejections of data for dissolved gases. All 18 dissolved gases results were found to be usable and overall completeness

of the dissolved gases results is 100 percent, as is the completeness for each of the three individual analytes. All dissolved gas results are usable without qualification, with the exception of one result reported between the MDL and PQL which is reported as a detection qualified "F."

Five groundwater samples and one duplicate sample were analyzed for anions (chloride, sulfate, and nitrate), TOC, and alkalinity. All 18 anions results, 6 alkalinity results, and 6 TOC results were found to be usable and overall completeness for each of these methods is 100 percent, as is the completeness for each of the five individual analytes. The following data results are usable without qualification

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TAB

SECTION 5.0

5.0 FIELD AND ANALYTICAL RESULTS

Monitoring well inspection observations, groundwater elevation measurements, and analytical results for the three sampling events are presented in the following section. Details of the October sampling event are presented with reference to the previous two quarterly reports (HydroGeoLogic, 2000h; HydroGeoLogic, 2000l) for the April and July sampling events, respectively.

5.1 FIELD RESULTS

5.1.1 Monitoring Well Inspections

Of the 285 monitoring wells scheduled for inspection, only 272 were actually inspected during the July 2000 quarterly sampling event. The inspection consisted of noting the integrity and condition of each monitoring well and the water level in a field log book. The locations of these monitoring wells are provided in Figure 5.1 and copies of the field notes for this sampling event are provided in Appendix A.2. Of the six monitoring wells that were not inspected, one monitoring well, WITCTA001, was paved over with asphalt; four of the monitoring wells (MW-13, MW-18, MW-58, and MW-59) have been covered over with a concrete pad and an above-ground diesel fuel tank; and one monitoring well, LF04-04, could not be located in the debris of a demolished house and is assumed to be destroyed.

5.1.2 Groundwater Elevations

Groundwater elevations for the 272 monitoring wells on-base are typically measured during the quarterly groundwater investigations occurring in January and July each year. However, quarterly groundwater sampling was not performed in January 2000. Groundwater elevations were obtained during the July 2000 sampling events for 272 monitoring wells and are included in Table 5.1. The groundwater elevations could not be determined for six monitoring wells. Of these six monitoring wells, two could not be located; three did not contain any water at the time of gauging; and one monitoring well contained a dedicated bladder pump installed by Jacobs. These six monitoring wells are listed on Table 5.2, along with the monitoring wells that were not able to be inspected and the monitoring wells that have been abandoned.

Groundwater elevations measured during the July 2000 sampling events from 272 monitoring wells screened in the Terrace Alluvium were used to construct the potentiometric maps presented in Figure 5.1. In general, the regional groundwater flow direction is from west to east. Groundwater elevation varied from 620 feet above NGVD in the southwestern portion of the site to 529 feet NGVD in the eastern portion of the site during July 2000. The head gradients toward the eastern end of the site are considerably higher than those on the western portion. The groundwater gradient ranges from approximately 0.009 to 0.015 feet NGVD in July 2000.

Some local variations in groundwater flow direction are reflected on the potentiometric maps. The groundwater flow direction in the Terrace Aquifer is primarily eastward towards the basin formed by the West Fork Trinity River, however, in the southeastern portion of the base, groundwater flow is toward the basin formed by Farmers Branch Creek.

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Figure 5.1

Water Level Elevations
Terrace Alluvium
July 2000

U.S. Air Force Center For Environmental Excellence

Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- 600 Groundwater Elevation Contour (ft msl)
- Monitoring Well
- 533 76 Groundwater Elevation (ft msl)

N

0 500 1000 2000

SCALE IN FEET

Filename X:\AFC001\33ddba_2000 Annual\Report\ groundwater elev july2000.apr
Project AFC001-33DDBA
Created. 01/22/00 jbelcher
Revised. 01/29/01 jb
Map Source HydroGeoLogic, Inc GIS Database

HYDRO GeoLogic

Table 5.1
Groundwater Elevations for July 2000

Monitoring Well	Coordinates		Top of Casing Elevation (ft above msl)	Groundwater Elevation (ft above msl)
	Easting	Northing		
15B	2301032 08	6963338.74	567 59	558.57
17I	2299626 67	6963642 66	578 13	565.32
17J	2299584 43	6963780 05	579 94	566 71
17K	2299799 21	6963578 34	575 47	564.21
17L	2299741 17	6963812 74	577 32	564.97
17M	2300037 62	6963761.95	574.28	563.59
BGSMW01	2299511.00	6964916 44	578 64	570.45
BGSMW02	2299618 19	6965006 79	577 57	565 21
BGSMW03	2299690 06	6965067.50	576.72	565.14
BGSMW04	2299589.50	6965084.53	578.49	565 55
BGSMW05	2299961.23	6965150.67	571.66	564 81
BGSMW06	2299910 09	6964981.31	576 51	565 12
BGSMW07	2299737.83	6964990.68	574 88	565.69
BSS-A	2300115 43	6965491.10	566.49	561 20
BLDG1040-1	2298699.62	6963528.01	604.27	585 40
CAR-RW7	2296407.22	6961213.98	618 96	591 26
FT08-11A	2295876 40	6962318.10	608 15	595.54
FT08-11B	2295928 50	6962030.90	608 05	595.93
FT09-12A	2295439.20	6960549 80	635.38	617 34
FT09-12B	2295697 40	6960709 30	627 36	593.60
FT09-12C	2295771 50	6960590 30	627.86	593 12
GMI-04-01M	2296728.53	6960930 74	613.79	--[1]
GMI-22-02M	2296187 40	6966632 90	619 13	607 92
GMI-22-03M	2298539.40	6966219 90	608.03	586 98
GMI-22-04M	2297340 50	6967250.50	610.70	590 23
GMI-22-05M	2299432.10	6966940 30	584 28	572 62
GMI-22-06M	2298186.60	6967004 50	606 84	587.89
GMI-22-07M	2298322.50	6969018.70	605 66	588 80
GMI-22-08M	2298971.50	6970323 60	606.94	589.12
HM-110	2293163.20	6963667.50	637.33	609.41
HM-111	2293265 66	6963623 55	636 49	606.70
HM-112	2293141.65	6964217 56	638.06	607 45
HM-114	2294352 00	6963912.10	627.77	607.80

Table 5.1 (continued)
Groundwater Elevations for July 2000

Monitoring Well	Coordinates		Top of Casing Elevation (ft above msl)	Groundwater Elevation (ft above msl)
	Easting	Northing		
HM-116	2294283.70	6966411.40	634 06	609 53
HM-117	2294274 30	6967355.40	633 32	609 83
HM-118	2294780 50	6968035.20	626 23	609 26
HM-119	2294271 80	6968726.00	625 04	609 97
HM-120	2295343 20	6969489 00	616 84	610 00
HM-121	2295279 20	6967390 20	627.66	608.31
HM-123	2295272 60	6961638.50	624 85	595 95
HM-124	2295223 30	6963957 80	623.26	607 28
HM-125	2295220 29	6965893 46	629 37	609 22
HM-126	2294300 20	6963121 00	622 99	606 43
HM-127	2294853.30	6961588 50	624.04	596.97
ITMW-01T	2298967 14	6961062 05	602 77	588 34
LF01-1B	2301057.01	6964700.81	560 18	545 02
LF01-1D	2301412 72	6964288.18	563 91	544 12
LF01-1E	2301174 30	6964606 03	562.11	543 97
LF01-1F	2301376.05	6964438 04	562.26	543 67
LF03-3D	2293269 12	6962056 65	625.25	612 42
LF04-01	2295382.89	6961027 72	629 16	595 16
LF04-02	2296309 10	6961113 10	623 44	591 50
LF04-04	2297170.07	6960946 90	612 13	--[2]
LF04-10	2297078 90	6960411.80	626 47	591 12
LF04-4A	2295852.98	6960300 48	625.84	611.08
LF04-4B	2296274.34	6960323 91	619 95	599 75
LF04-4C	2296593.50	6960604.00	612 96	591.41
LF04-4D	2296416.39	6960831.59	615.13	591.72
LF04-4E	2296411 00	6961036 04	618 49	591.60
LF04-4F	2296058.77	6961061 85	625.28	592.78
LF04-4G	2296658.93	6961224 13	619.75	590 75
LF05-01	2294577 80	6962728 30	621.88	601.18
LF05-02	2295278.90	6962653 10	622.61	596 32
LF05-18	2297075.40	6961555.60	611.71	590 85
LF05-19	2297461.40	6961239.90	606 05	589.38
LF05-5A	2295580.90	6961438.56	623.00	595.19
LF05-5B	2296078.25	6961901.56	600.40	593 40

Table 5.1 (continued)
Groundwater Elevations for July 2000

Monitoring Well	Coordinates		Top of Casing Elevation (ft above msl)	Groundwater Elevation (ft above msl)
	Easting	Northing		
LF05-5C	2295993.73	6961720 05	608.56	594.36
LF05-5D	2295757.04	6961740.47	611.40	595 82
LF05-5E	2295550 36	6961177.87	626 70	595.11
LF05-5G	2296536 32	6961581.32	615 28	591.51
LF05-5H	2296343 46	6961735.72	610 54	--[1]
LSA1628-1	2297802 10	6967936.20	601 67	590.81
LSA1628-2	2297846 50	6967943 30	601.93	590.64
LSA1628-3	2297791 26	6967993.08	601 73	590.71
LSA1628-14	2297896 92	6967908 30	601 60	590 22
LSA1628-15	2297860 79	6967862.87	601 35	590.24
MW-10	2300541 58	6965836.20	558.85	544 02
MW-11	2300791 96	6965706.66	558 17	530 96
MW-11A	2297057.28	6965810.34	612.17	588 85
MW-12	2300142 02	6966149.32	559 62	549 36
MW-19	2295368.85	6963512.61	611.28	592 75
MW-2	2300555 92	6965704.96	557 55	545.51
MW-3	2299750 34	6965242.67	576 48	564 45
MW-36	2299356 66	6965034 80	604 11	599 06
MW-37	2299384 99	6965061 35	590.53	581 49
MW-38	2298153 08	6965981.09	604 11	587.60
MW-39	2298171 12	6965999 01	604 12	587 74
MW-40	2298224.98	6966053.10	604.16	587.44
MW-41	2298204 57	6966088 85	604 66	587.71
MW-42	2298144.90	6966031.04	604.60	587.82
MW-5	2300138 61	6965803 45	563 69	558.77
MW-50	2295621.70	6968528 65	619.27	608 23
MW-51	2295639 96	6968536.47	619 36	608 25
MW-52	2296182.56	6964355 17	616 29	596 91
MW-53	2296200.24	6964378.18	616.75	599.97
MW-56	2296055.93	6968789 53	614.32	606.23
MW-57	2297112.98	6967217.16	613.37	601 01
MW-6	2300173.70	6965734.92	562 87	560.43
MW-7	2300055.24	6965967.11	567.37	558.63
MW-8	2300491.79	6965584 18	557.04	548.78

Table 5.1 (continued)
Groundwater Elevations for July 2000

Monitoring Well	Coordinates		Top of Casing Elevation (ft above msl)	Groundwater Elevation (ft above msl)
	Easting	Northing		
MW-9	2300329 17	6966001 96	559 54	548 56
MWMTAC-001	2296520 35	6959115 80	645.04	609.84
OT-15C	2300947.51	6963316.34	564.25	555 37
SAV-1	2300298 89	6965776 36	560 15	547 70
SAV-2	2300280 42	6965807 58	560 07	547 97
SD13-01	2300621 42	6963391 74	573 09	560.36
SD13-02	2300753.03	6963487.70	573 28	559.91
SD13-03	2300699.63	6963362.92	571 41	560 26
SD13-04	2300770.96	6963361 52	569.08	559.16
SD13-05	2300775 29	6963904 28	571.54	562 09
SD13-06	2300907 83	6963164 35	557 68	545 91
SD13-07	2301009 34	6963167 04	560 44	541 75
SPOT35-1	2296878.53	6966202.40	613 59	590.30
SPOT35-3	2296850.62	6966108 75	612 02	591 06
SPOT35-4	2296777 88	6966174 92	612 74	591 19
SPOT35-5	2296846 73	6966020 04	614 09	591.16
SPOT35-6	2296634 63	6966234 61	615 68	591 62
SPOT35-7	2296508.59	6966534.79	616.41	607 94
SPOT35-8	2296970.16	6966428 55	613 50	590 11
SPOT35-9	2296780.62	6966581 53	615.04	591.96
ST14-01	2300090.80	6963295 30	575 95	561 92
ST14-02	2300091 70	6963511 60	575 51	562 76
ST14-03	2299891.60	6964080 00	576 68	565 81
ST14-04	2300345.30	6963642 70	575 61	562.58
ST14-24	2299084.20	6964017 89	594.14	582.81
ST14-25	2299065 36	6964563.76	592 94	586.46
ST14-27	2300212.35	6964257.94	573 85	564 43
ST14-28	2300495 99	6963728 32	574.45	562 40
ST14-29	2300512.78	6963527 79	571.45	561.48
ST14-30	2300466 18	6963211 53	566 87	560 51
ST14-W05	2299093.85	6963726.06	593.63	584.61
ST14-W06	2299330.79	6963806.56	581 42	568.91
ST14-W07	2299393 81	6963614 61	579.96	566.18
ST14-W08	2299479.59	6964323 98	580.54	568.75

Table 5.1 (continued)
Groundwater Elevations for July 2000

Monitoring Well	Coordinates		Top of Casing Elevation (ft above msl)	Groundwater Elevation (ft above msl)
	Easting	Northing		
ST14-W09	2299550.10	6963471 69	575 54	565.67
ST14-W10	2299730 13	6963949.34	573 99	565 78
ST14-W11	2299657 97	6964128 60	576 31	567.30
ST14-W12	2299581 06	6963953 27	575 52	567 91
ST14-W13	2299776.44	6963695 16	574.49	564 31
ST14-W15	2299923 11	6963315 79	573.47	562 41
ST14-W16	2300128 30	6964064.61	573 62	564 76
ST14-W18	2300162 47	6963906 73	573.79	564 33
ST14-W19	2300203.61	6963699 80	573.31	563 08
ST14-W20	2300275 36	6964009.08	573 48	563.77
ST14-W21	2300242.02	6963417.82	572 88	562.06
ST14-W22	2301016 39	6963649 64	571 30	560 79
ST14-W23	2300410 37	6962949 06	565.60	558.14
ST14-W31	2300830 86	6963549 67	571 23	560 38
ST14-W32	2300815 07	6963239.02	564.15	559 12
USGS03T	2300610 00	6968704 70	575.02	570.40
USGS04T	2299177 61	6968758 34	604.97	--[2]
USGS06T	2297542.16	6963763 04	606 61	--[3]
USGS07T	2295246 50	6960182 50	632 43	620 54
W-153	2294096.20	6965106 30	631.57	609.14
WCHMHTA001	2293437 60	696528.17	639.08	609.20
WCHMHTA002	2294553 41	6966740.53	631 32	608.87
WCHMHTA003	2294774 14	6967153 88	631 00	608 57
WCHMHTA004	2294776 10	6967144 61	631.25	608 61
WCHMHTA005	2295397.82	6966691.19	626 95	608 04
WCHMHTA006	2295406 97	6966690 11	626.73	607 98
WCHMHTA007	2295645.39	6967105 89	623.93	607 74
WCHMHTA008	2295597 48	6967889 89	622 85	607.45
WCHMHTA009	2296395.01	6967635.29	615.55	607.37
WCHMHTA010	2296398 80	6967640.08	615.35	608.18
WCHMHTA011	2297063.01	6968490.51	605 80	592 36
WCHMHTA012	2297425 82	6967840 86	605.85	591.18
WCHMHTA013	2299786 18	6966251.26	578 26	561 01
WCHMHTA014	2294072.81	6970403 90	619 11	610.66

Table 5.1 (continued)
Groundwater Elevations for July 2000

Monitoring Well	Coordinates		Top of Casing Elevation (ft above msl)	Groundwater Elevation (ft above msl)
	Easting	Northing		
WHGLPA001	2296096 76	6961282 67	620 44	543 32 [5]
WHGLPA002	2296645 31	6962607 06	591 74	586.26 [5]
WHGLPA003	2295286 48	6961976.31	622 61	549.21 [5]
WHGLPA004	2296655.89	6962601 66	591 41	552 61 [5]
WHGLRW015	2298662.64	6960871 43	604.64	588 94
WHGLRW016	2299201.47	6961034 95	602 35	587 87
WHGLRW017	2299000.59	6960727 11	604 66	588 06
WHGLRW018	2298744.63	6960532 93	608.05	589.34
WHGLRW019	2298620 19	6960684 23	605 39	589 52
WHGLTA002	2296111 39	6962377.91	608 52	593 85
WHGLTA003	2298029 84	6961043.88	614.22	590 58
WHGLTA004	2295760.62	6962943.38	614 35	595 62
WHGLTA005	2301043 78	6963469 85	570 56	558 59
WHGLTA007	2301093.17	6963162.46	552 88	537.35
WHGLTA008	2300016 84	6963955 17	572 37	564 99
WHGLTA009	2297528 70	6965211 65	612 09	588 22
WHGLTA010	2296770 93	6965580 03	618 13	591 44
WHGLTA011	2295873 87	6968356.67	619 71	607 65
WHGLTA012	2297740.00	6965920.84	606 64	587.89
WHGLTA013	2297177.07	6965957 77	611 13	588 33
WHGLTA014	2297373.92	6966295 34	610 26	588 94
WHGLTA020	2299684 95	6962285 83	568 80	556 70
WHGLTA022	2297691.54	6960401.65	614 94	591.04
WHGLTA023	2298565.43	6960492.16	608.52	590.14
WHGLTA025	2298942.63	6961608 26	601 46	584.73
WHGLTA026	2297200.73	6967204.01	612 10	591.04
WHGLTA027	6967173 21	2297196 85	612 33	591 38
WHGLTA028	2297450 94	6967760.51	605 76	591 47
WHGLTA029	2298574.35	6965736.08	603.13	--[2]
WHGLTA030	2299155.33	6964327.76	589.07	585 90
WHGLTA031	2299198.98	6964366.12	592 78	585.89
WHGLTA033	2295656.05	6964665.24	581 29	568.67
WHGLTA034	2301060 21	6963889 66	570 75	561 04
WHGLTA035	2301048.39	6963823 75	571 06	561.25

Table 5.1 (continued)
Groundwater Elevations for July 2000

Monitoring Well	Coordinates		Top of Casing Elevation (ft above msl)	Groundwater Elevation (ft above msl)
	Easting	Northing		
WHGLTA036	2300458 39	6966001.70	554.95	544 59
WHGLTA037	2300596.51	6965905 87	555.73	540.26
WHGLTA038	2300726 46	6965829 45	556.05	--[1]
WHGLTA039	2299277 71	6964408.76	589 68	569 27
WHGLTA043	2297021.32	6961771 99	602 17	590 78 [5]
WHGLTA044	2297347.37	6961721 40	582.93	578 43 [5]
WHGLTA045	2298368 80	6961321 90	598 52	588 23 [5]
WHGLTA048	2298714 83	6960916 20	604 89	582.09 [5]
WHGLTA049	2299269 36	6962329.24	574 26	562.56 [5]
WHGLTA101	2301220.30	6964633 49	559 35	543 19
WHGLTA102	2301388.56	6964448.94	559 86	543 50
WHGLTA103	2301522 24	6964314.53	559 77	536.29
WHGLTA104	2301608 27	6964225 38	560 39	529 27
WHGLTA201	2298660 88	6963198 14	603 21	584 52
WHGLTA202	2298832.59	6963326 21	603.45	584 55
WHGLTA203	2298400 38	6963058 53	600.98	584 72
WHGLTA204	2298104 66	6963625 62	605 57	587 58
WHGLTA302	2294422 27	6962602 64	621.70	606.72
WHGLTA303	2294400 77	6962351 21	622.77	600 47
WHGLTA601	2297473 69	6962697 81	600.00	585 36
WHGLTA602	2297625 01	6962752 66	612.09	596 74
WHGLTA603	2297727.19	6962713 38	600 92	584 28
WHGLTA604	2297530.02	6963195.39	607.43	587 93
WHGLTA701	2295332.86	6961835 73	623.08	596.24
WHGLTA702	2295882 07	6961920 16	609 41	595.43
WHGLTA703	2295741.23	6961680 70	615 07	595 75
WHGLTA704	2295831 51	6962141 07	608 84	596.25
WHGLTA705	2296026 58	6962002 86	598.79	593 08
WHGLTA706	2296030.82	6962146 24	607 15	593.46
WHGLTA801	2295857 80	6962790.06	601.48	592.36
WHGLTA803	2296040.83	6962524 15	602.13	593.58
WHGLTA901	2299642.88	6967831 58	583 57	573.63
WHGLTA902	2299952 24	6967670.51	558 75	541.40
WHGLTA903	2300086 28	6967830 13	559 37	532 49

Table 5.1 (continued)
Groundwater Elevations for July 2000

Monitoring Well	Coordinates		Top of Casing Elevation (ft above msl)	Groundwater Elevation (ft above msl)
	Easting	Northing		
WHGLTA904	2300173 98	6968031 10	563.27	532 28
WHGLTA905	2299782 00	6967573.60	562 36	542 76
WHGLTA952	2299956 02	6967676 53	558 76	532 57
WHGLTA953	2300078 45	6967825 90	559.36	532 51
WHGLTA954	2300179 00	6968032 47	563.07	533 76
WITCTA001	2296447.95	6969591 17	609 82	--[4]
WITCTA002	2296135.48	6969258 49	613.36	609.19
WITCTA003	2297405 05	6969111 30	607 58	592 69
WITCTA004	2297490 47	6968938 83	606.62	592 59
WITCTA005	2298166.79	6968458.46	602 81	589 56
WITCTA006	2298261 86	6968425.94	602 76	589 38
WITCTA007	2298432 07	6968309 56	603 03	587 87
WITCTA008	2298030 12	6967939 66	600.62	591.41
WITCTA009	2298232 90	6967860 60	597 15	590.23
WITCTA010	2298752 18	6967693 53	600 31	585 01
WITCTA011	2297357.31	6967455 26	610.27	592.60
WITCTA012	2298224 39	6967348 77	599 93	589 09
WITCTA013	2297750.98	6967015 62	605 39	589 70
WITCTA014	2297417 51	6966903 57	611 74	590 48
WITCTA015	2298395 02	6966332.67	606 84	588 41
WITCTA016	2298061.33	6966238.29	607.85	588 71
WITCTA017	2299305 78	6967298.15	592 94	583.58
WITCTA019	2298838.01	6963107.25	600 82	585 57
WITCTA020	2296316.79	6963895 32	616.78	594.46
WITCTA021	2298718 16	6963794.40	604 19	588 32
WITCTA022	2298742.85	6963649.92	604 17	586 45
WITCTA024	2298956.02	6965971 78	604.86	587.54
WITCTA025	2299534.28	6966004.92	595 20	584 26
WITCTA026	2299480 09	6965456 85	584.37	578 66
WITCTA027	2299510 86	6965193 74	581 44	569 72
WITCTA028	2300621.25	6965160.62	558.11	547.22
WITCTA031	2299152 20	6964689 93	592.10	587 64
WITCTA032	2299195.64	6964500 67	587 37	579.98
WITCTA033	2300475.24	6964323.67	574 06	564.46

Table 5.1 (continued)
Groundwater Elevations for July 2000

Monitoring Well	Coordinates		Top of Casing Elevation (ft above msl)	Groundwater Elevation (ft above msl)
	Easting	Northing		
WITCTA034	2300951 49	6963956 68	571.95	562 91
WITCTA035	2299093.68	6963387 12	599 37	585 49
WITCTA037	2297784.44	6963424.04	604.19	588 84
WITCTA039	2295415 41	6962339 77	619.47	597 72
WITCTA040	2299514.54	6963259.78	579 03	565 85
WITCTA041	2299642 10	6963168 75	577 97	563 24
WITCTA042	2299653.16	6963108 38	576.76	563 05
WITCTA043	2299724 86	6963110 05	576 72	563 07
WITCTA044	2299836 00	6963055 72	575.76	562 23
WJETA530	2296533.87	6959546.93	639.39	602.97
WJETA534	2296341 54	6958941 15	647 38	613 87
WJETA535	2296794.44	6959722 27	634 61	599.87
WP07-10A	2295807 30	6961290 00	626 50	594 76
WP07-10B	2296040 40	6961277 50	624.22	592 63
WP07-10C	2296062 40	6961575 60	617.18	593 29

Notes
[1] Monitoring well was dry
[2] Monitoring well was not located
[3] Groundwater elevation could not be measured, monitoring well contains Jacobs dedicated pump
[4] Monitoring well was damaged
[5] Monitoring well was installed and sampled in October 2000 Groundwater elevations were taken from the October Sampling Elevations are reported in feet above mean sea level (ft above msl)
-- Groundwater Elevation could not be determined

Table 5.2
Summary of Well Inspection Observations During 2000 Quarterly Sampling Events

Well Condition	Well ID
Wells containing free product	January. LSA1628-1 WITCTA036[1] SPOT35-6 April: WHGLTA007 WITCTA036[1] July: No monitoring wells were inspected in July, however no product was detected during June and August October. No monitoring wells were inspected during October, however product was detected in September at monitoring wells. 17M LSA1628-1 SD13-04 SD13-07 SPOT35-3 WHGLTA007
Dry Monitoring Wells	April: WHGLTA203 July GMI-22-01M WHGLTA038 LF05-5H October: ST14-28 WHGLTA203
Monitoring Wells Abandoned in 2000 by HydroGeoLogic	HM-122MW-49 LF04-4H MW-57B LF05-5F SPOT25-2 MW1-16 ST14-14 MW-12A ST14-26 MW-20 WITCTA036 MW-21 WITCTA057 MW-48 WJETA531 LF05-5D
Monitoring Wells Abandoned by the Navy	BSS-B MW-4
Monitoring Wells Destroyed	July LF04-04 MW-58 MW-13 MW-59
Monitoring Well Contained Dedicated Pump (installed by different contractor)	USGS06T
Monitoring Wells Damaged	WITCTA001
Unable to Locate	July WHGLTA029 USGS04T

Notes
[1] WITCTA036 was plugged and abandoned in May 2000

5.2 CONTAMINANT EVALUATION

To facilitate discussion of contamination at NAS Fort Worth JRB, contaminant levels determined from analytical sampling were compared to several threshold values. The results of metals analyses were compared to established background concentrations (Jacobs, 1998), and the results of the organic analyses were compared to method quantitation limits (MQLs) (see Section 5.2.2). These comparisons identified locations where contamination is likely, and monitoring should be continued to provide further characterization. In addition, all data, both inorganic and organic constituent concentrations, were compared to the TNRCC Risk Reduction Standard 2 (RRS 2) values. Comparison of contaminant concentrations to their respective RRS 2 value provides a basis for risk assessment. Concentrations of contaminants that exceed their respective RRS 2 values indicate areas where continued monitoring or remedial action may be necessary.

5.2.1 Background Concentrations

Background concentrations were determined for 24 inorganic constituents at NAS Fort Worth JRB (Jacobs, 1998) in December 1996. A single groundwater sample was collected from 12 background monitoring wells using a low-stress technique to approximate filtered samples The groundwater monitoring wells sampled, both newly installed and existing, were located up- and cross-gradient from monitoring wells known to contain VOC and SVOC compounds.

The tolerance interval (TI) method suggested by the EPA (USEPA, 1989, 1992) was used to estimate background concentrations for the 24 inorganic constituents for comparison to compliance monitoring wells. TIs are useful for groundwater data analysis because it is important to ensure that, at most, a small fraction of the compliance monitoring wells sampled exceed a specific concentration level (USEPA, 1992). Two coefficients are associated with any TI. One is the proportion of the population the interval is supposed to contain, called the coverage. The second is the degree of confidence with which the interval reaches the specified coverage, known as the tolerance coefficient. The upper tolerance limit $(UTL)_{95,95}$ is the UTL of a TI with coverage of 95 percent and a tolerance coefficient of 95 percent. The $UTL_{95,95}$ was determined by Jacobs (1998) as the background concentration for comparison to contaminant concentrations. These values are provided in Table 5.3.

5.2.2 Detection and Quantitation Limits

A practical quantitation limit (PQL) is the lowest analytical result level that can reasonably be achieved within specified limits of precision and accuracy during routine laboratory conditions. Each PQL value is higher than the associated method detection limit (MDL), which is the minimum concentration of a substance that can be measured and reported with 99-percent confidence the analyte concentration is greater than zero. Both MDLs and PQLs are adjusted for sample-specific conditions such as moisture, subsample mass, and dilution. Sample concentrations falling between the sample-specific MDL and sample-specific PQL are assigned an "F" qualifier indicating the variability of the result (HydroGeoLogic, 2000d). In July 1998, the TNRCC issued an Interoffice Consistency Memorandum (TNRCC, 1998a), followed in September 1998 by an Erratum Sheet (TNRCC 1998b). The Consistency Memorandum defined a MQL as the demonstrated lower limit of the linear range for that analyte. As defined, an

Table 5.3
Background and Risk Reduction Standard 2
Values for Inorganic Constituents in Groundwater

Metal	Background Value (µg/L)	RRS 2 Value (µG/L)	RRS 2 Value Source[1]
Aluminum	1,332	100,000	Derived
Antimony	2	6	TNRCC
Arsenic	4.9	50	TNRCC
Barium	587	2,000	TNRCC
Beryllium	0 3	4	TNRCC
Cadmium	0 5	5	TNRCC
Calcium	226,300	--	Essential Nutrient[2]
Chromium	6	100	TNRCC
Cobalt	8 9	6,100	Derived
Copper	2 8	1,300	Derived
Iron	224	300	Derived
Lead	1.6	15	TNRCC
Magnesium	37,800	--	Essential Nutrient[2]
Manganese	175	1,400	Derived
Mercury	0 1	2	TNRCC
Molybdenum	14 4	510	Derived
Nickel	20 4	2000	TNRCC
Potassium	15,030	--	Essential Nutrient[2]
Selenium	7.7	50	TNRCC
Silver	0 2	510	TNRCC
Sodium	167,000	--	Essential Nutrient[2]
Tin[3]	--	61,000	Derived
Thallium	63 2	2	Derived
Vanadium	12	720	Derived
Zinc	118	31,000	Derived

Notes
[1] Source of all values was TNRCC RRS 2 (30 TAC 335). Those noted as "Derived" were derived based on procedures presented in the regulations
[2] Essential Nutrient - no risk values available
[3] Tin was not included in the background study
-- No value.

analyte's MQL is analogous to the PQL reported by the laboratory without adjustment for sample-specific conditions. The Erratum Sheet also defined an analyte sample quantitation limit (SQL) as that analyte's MDL adjusted for sample-specific conditions. Because a background concentration for organic compounds is not appropriate, the MQL is used for comparison purposes

5.2.3 Risk Reduction Standard 2

RRS 2 values are the chemical-specific cleanup levels for remediation of groundwater contaminated by a release(s) from a SWMU or AOC. These values are established from health-based standards and criteria (Texas and/or Federal) pursuant to TNRCC Regulations, 30 Texas Administrative Code (TAC) 335.551-335.569. If the MQL or background concentration for a given chemical is greater than the RRS 2 level, either the MQL or the background value, whichever is greater, is to be used for determining compliance with requirements of groundwater remediation. If RRS 2 values are not available or do not provide appropriate protection for human health or the environment, cleanup levels based on other numeric criteria, referred to as medium specific concentrations (MSCs), must be established. Formulas to develop MSCs, based on exposure factors and pathways and chemical-specific toxicity, are provided in 30 TAC 335.558 (i.e., MSCs for RRS 2). RRS 2 values for inorganic and organic compounds are provided in Table 5.3 and Table 5.4, respectively.

5.3 ANALYTICAL RESULTS

Specific discussions on the monitoring wells sampled and the analytical results for each quarter can be found in the individual quarterly sampling reports (HydroGeoLogic, 2000h; HydroGeoLogic, 2000l). Out of the 17 plume monitoring wells proposed for sampling in the GSAP, 16 were sampled during the fourth quarter October 2000 event. One well, WHGLTA203 was dry and could not be sampled. A complete listing of the analytical results from the October 2000 sampling event is provided in Appendix Table B.1. Analytical results for all three quarters are summarized in Appendix B, Table B.2.

5.3.1 Volatile Organic Compounds

A total of 16 TCE plume monitoring wells were sampled for VOCs during the October 2000 basewide sampling event using EPA Analytical Method SW8260B. The VOCs detected above PQLs during the sampling event are presented in Table 5.5. Locations of the monitoring wells are provided in Figure 3.1. Chlorinated solvents and their daughter products were detected in groundwater samples collected from 12 of the 16 monitoring wells sampled during the October 2000 sampling event.

The VOCs detected above their PQL during 2000 basewide quarterly sampling at NAS Fort Worth JRB are presented in Appendix B. These detected VOCs have been divided into three categories:

- Chlorinated solvents and degradation compounds;

Table 5.4
Risk Reduction Standard 2 Values
for Organic Compounds in Groundwater

VOC	RRS 2 Value (µg/L)	RRS 2 Value Source[1]
1,1-Dichloroethane	10,000	TNRCC
1,1-Dichloroethene	7	TNRCC
2-Methylnaphthalene	4,100	TNRCC
Benzene	5	TNRCC
Bis(2-Ethylhexyl)phthalate	6	TNRCC
Chlorobenzene	100	TNRCC
Chloroform	100	TNRCC
cis-1,2-Dichloroethene	70	TNRCC
Ethylbenzene	700	TNRCC
Isopropylbenzene (cumene)	10,000	TNRCC
m-Xylene & *p*-Xylene	10,000	Derived
Methyl *tert*-butyl ether	1,000	TNRCC
n-Butylbenzene	1,000	Derived
n-Propylbenzene	10,000	Derived
Naphthalene	2,000	TNRCC
o-Xylene	10,000	TNRCC
Isopropylbenzene	10,000	TNRCC
p-Isopropyltoluene (p-cymene)	1,000	Derived
sec-Butylbenzene	1,020	Derived
tert-Butylbenzene	1,020	Derived
Tetrachloroethene	5	TNRCC
Toluene	1,000	TNRCC
trans-1,2-Dichloroethene	100	TNRCC
Trichloroethene	5	TNRCC
Trichlorofluoromethane	31,000	TNRCC
1,2,4-Trimethylbenzene	5,100	Derived
1,3,5-Trimethylbenzene	5,100	Derived
Vinyl chloride	2	TNRCC

Notes.
[1] Source of all values was TNRCC RRS 2 (30 TAC 335) Those noted as "Derived" were derived based on procedures presented in the regulations

- BTEX compounds associated with gasoline fuels and industrial solvents;

- Other compounds, including petroleum-related compounds that originate from fuel oils such as naphthalene, butylbenzene, and isopropyltoluene.

5.3.1.1 Chlorinated Solvents and Degradation Compounds

The chlorinated solvents most commonly found at NAS Fort Worth JRB are tetrachloroethene (PCE), TCE, and their daughter products, *cis*-1,2-DCE, *trans*-1,2-DCE, 1,1-dichloroethene (1,1-DCE), and vinyl chloride (VC).

Source Areas

Two likely sources of these contaminants include neighboring AFP 4 to the west of the base and SWMU 24 (Waste Burial Area 7), located southeast of the flightline. At AFP 4, past spills of TCE have been reported in the Chemical Process Facility (Building 181). It is believed that the TCE has been migrating down a paleochannel towards NAS Fort Worth JRB to the site boundary. From this point, the plume appears to be spreading east along another paleochannel on NAS Fort Worth JRB property. It is also thought that a secondary source of TCE may have existed at SWMU 24 in an area where 34 drums were removed in October 1991. Inspection of the drums revealed that 25 were empty. The remaining drums contained approximately 111 gallons of liquid, which tested positively for TCE, PCE, and total petroleum hydrocarbons (TPH) (USACE, 1992).

Additionally, as part of the RFI at SWMU 24, an electromagnetic survey was performed in April 2000 for the purpose of confirming drum removal activities performed by the Corps of Engineers in 1991. The confirmation survey identified twelve geophysical anomalies possibly caused by buried metal objects. Ten of the anomalies were assessed as having a low to moderate potential for being caused by buried metal objects large enough to be individual or multiple drums. Two of the twelve locations were assessed as having a high potential for being caused by buried metal large enough to be multiple drums. In the summer of 2000, IT Corporation excavated these two areas and removed a total of 21 metal 55-gallon drums. Of the 21 drums, 17 were empty, compressed, or corroded, and contained no liquids. Three of the drums were still in tact and partially full with an unknown liquid. The remaining in tact drum contained a blue, wet, powdery substance. Analysis of the contents of the in tact drums indicated mixed waste, including at least a fraction of TCE A post removal geophysical survey performed in August 2000 verified that all metal has been removed from SWMU 24.

Table 5.5
Volatile Organic Compounds Detected Above the PQL in TCE Plume Monitoring Wells Sampled Using Analytical Method SW8260B

Monitoring Well	Analyte	Result (µg/L)
GM1-22-04M	Chloroform	0 4
	cis-1,2-Dichloroethene	66 [1]
	Tetrachloroethene (PCE)	1
	trans-1,2-Dichloroethene	4
	Trichloroethene (TCE)	360 [1]
	Trichlorofluoromethane	0 7
HM-116	1,1-Dichloroethene	1
	Chloroform	0 5
	cis-1,2-Dichloroethene	38 [1]
	Tetrachloroethene (PCE)	8
	trans-1,2-Dichloroethene	0 9
	Trichloroethene (TCE)	300 [1]
	Trichlorofluoromethane	2
HM-123	1,1-Dichloroethane	0 9
	1,1-Dichloroethene	2
	Chloroform	0 6
	cis-1,2-Dichloroethene	550 [1]
	Tetrachloroethene (PCE)	0 6
	trans-1,2-Dichloroethene	10
	Trichloroethene (TCE)	2700 [1]
	Vinyl Chloride	1
ITMW-01T	*cis*-1,2-Dichloroethene	10
	trans-1,2-Dichloroethene	0 6
	Trichloroethene (TCE)	22
LF05-01	*cis*-1,2-Dichloroethene	140 [1]
	trans-1,2-Dichloroethene	4
	Trichloroethene (TCE)	5
	Vinyl Chloride	200 [1]
LF05-5G	1,1-Dichloroethene	5 J
	1,4-Dichlorobenzene	1
	Chlorobenzene	2 J
	cis-1,2-Dichloroethene	300 [1]
	trans-1,2-Dichloroethene	37 [2]
	Trichloroethene (TCE)	920 [1]
	Vinyl Chloride	16
MW-53	Chloroform	0 4
	cis-1,2-Dichloroethene	9

Table 5.5 (continued)
Volatile Organic Compounds Detected Above the PQL in TCE Plume Monitoring Wells Sampled Using Analytical Method SW8260B

Monitoring Well	Analyte	Result (µg/L)
	Trichloroethene (TCE)	50 [1]
W-153	1,1-Dichloroethene	2
	Chloroform	0 7
	cis-1,2-Dichloroethene	87 [1,2]
	Tetrachloroethene (PCE)	5
	trans-1,2-Dichloroethene	2
	Trichloroethene (TCE)	530 [1,2]
	Trichlorofluoromethane	3
WHGLRW015	*cis*-1,2-Dichloroethene	17
	trans-1,2-Dichloroethene	0 6
	Trichloroethene (TCE)	36
WHGLRW017	Vinyl Acetate	3
WHGLTA025	*cis*-1,2-Dichloroethene	0 8
	Trichloroethene (TCE)	4
WITCTA010	*cis*-1,2-Dichloroethene	0 6
	Isopropylbenzene (cumene)	1
	n-Butylbenzene	1
	n-propylbenzene	1
	sec-butylbenzene	0 8
WITCTA024	*tert*-Butylbenzene	2
	Vinyl Chloride	4

Notes

[1] Analytical results were taken from the reanalysis of this sample

Underline results represent values detected above RRS 2 levels

J - The analyte was positively identified, but the quantitation is an estimate

Rejected results are not included within this table.

VOCs were analyzed using EPA Method SW8260B

Analytical Results

PCE was detected in nine plume monitoring wells, GMI-22-04M, GMI-22-06M, HM-112, HM-116, HM-123, HM-126, W-153, WITCTA004, and USGS07T during 2000. For the year 2000, the analytical results for PCE ranged from 0.6 µg/L (WITCTA004 and HM-123) to 8 µg/L (HM-116). PCE was detected in four monitoring wells during the October 2000 sampling event. These monitoring wells are identified and the results from the October event are presented and contoured in Figure 5.2. The October concentrations of PCE range from 0.6 µg/L to 8 µg/L. One monitoring well (HM-116), had a concentration of 8 µg/L, which is above the RRS 2 value of 5 µg/L.

TCE was detected above RRS 2 in 14 of the plume monitoring wells sampled during 2000 as listed in Appendix B.2. For the year 2000, the analytical results for TCE ranged from below detection limits to 7,400 µg/L in HM-112. During the October sampling event, TCE was detected in 10 wells ranging from 4 µg/L (WHGLTA025) to 2,700 µg/L (HM-123). Eight of the monitoring wells had concentrations above the RRS 2 value of 5 µg/L. The results of the October event are presented and contoured in Figure 5.3.

Cis-1,2-DCE was detected above RRS 2 in 7 of the monitoring wells sampled during 2000. For the year 2000, the analytical results for *cis*-1,2-DCE ranged from below detection limits to 550 µg/L in HM-123. *Cis*-1,2-DCE was detected in 11 monitoring wells above the MQL during October and concentrations ranged from 0.6 µg/L (WITCTA010) to 550 µg/L (HM-123). Four of the October samples had concentrations above the RRS 2 of 70 µg/L. The results of the October event are presented and contoured in Figure 5 4.

VC was detected above RRS 2 in 4 of the monitoring wells sampled during 2000. For the year 2000, the analytical results for VC range from below the detection limit to 200 J µg/L in LF05-01. VC was detected in four wells during the October sampling event with concentrations ranging from 1 µg/L to 200 µg/L (LF05-01). Three of the monitoring wells had VC at concentrations at or above the RRS 2 value of 2 µg/L. The results of the October event are presented and contoured in Figure 5.5.

Figures 5.3 and 5.4 show the extent of the TCE and *cis*-1,2-DCE plumes for the October sampling event. Data from the AFP 4 Basewide sampling, as well as other available data, were also used in developing Figures 5.3 and 5.4. The general extent of these plumes has remained fairly consistent throughout the year and is characterized by a north and a south lobe. Overall, TCE and DCE concentrations have decreased or remained stable with minor seasonal fluctuations. Historical data indicates the downgradient extent of the plume has remained relatively constant over the past 3 to 4 years.

Other solvents including chloroform, chlorobenzene, 1,2,3-trichlorobenzene, 1,4-dichlorobenzene, 1,1-dichloroethane, 1,1-DCE, *trans*-1,2-DCE, and trichlorofluoromethane were detected above their respective MQLs during 2000.

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Figure 5.2
Tetrachloroethene Concentrations
Terrace Alluvium
October 2000

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

Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- MW-53 / 89 — NAS Fort Worth JRB Basewide Sampling Well; Tetrachloroethene Concentration (µg/L)
- WHGLTA028 / ND — Monitoring well data collected as part of investigations during October and November 2000; Tetrachloroethene Concentration (µg/L)

ND = Not Detected at Laboratory Method Detection Limit of 0.5µg/L

J = The analyte was positively indentified, but the quantitation is an estimation.

Filename X:\AFC001\33ddba_2000 Annual\Report\pce_oct2000.apr
Created 09/20/99 jbelcher
Revised 01/29/01 jb
Project AFC001-33DDBA
Map Source. HydroGeoLogic, Inc. GIS Database, Jacobs Engineering

HYDRO GeoLogic INC.

Figure 5.3
Trichloroethene Concentrations
Terrace Alluvium
October 2000

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

Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- –500– TCE Concentration Contour (µg/L)
- MW-53 ⊕ NAS Fort Worth JRB Basewide Sampling Well
- 50 TCE Concentration (µg/L)
- WHGLTA028 ⊕ Monitoring well data collected as part of other investigations during October and November 2000
- 54 TCE Concentration (µg/L)
- HM-119 ⊕ AFP 4 Semi-Annual Monitoring Well
- 17 TCE Concentration (µg/L)
- ⊕ Previous data from WHGLTA704 and GMI-22-06M have been used to shape the contours.

ND = Not Detected at Laboratory Method Detection Limit of 0.5µg/L

F = The analyte was positively identified, but the associated value is below the PQL.

J = The analyte was positively identified, but the quantitation is an estimation.

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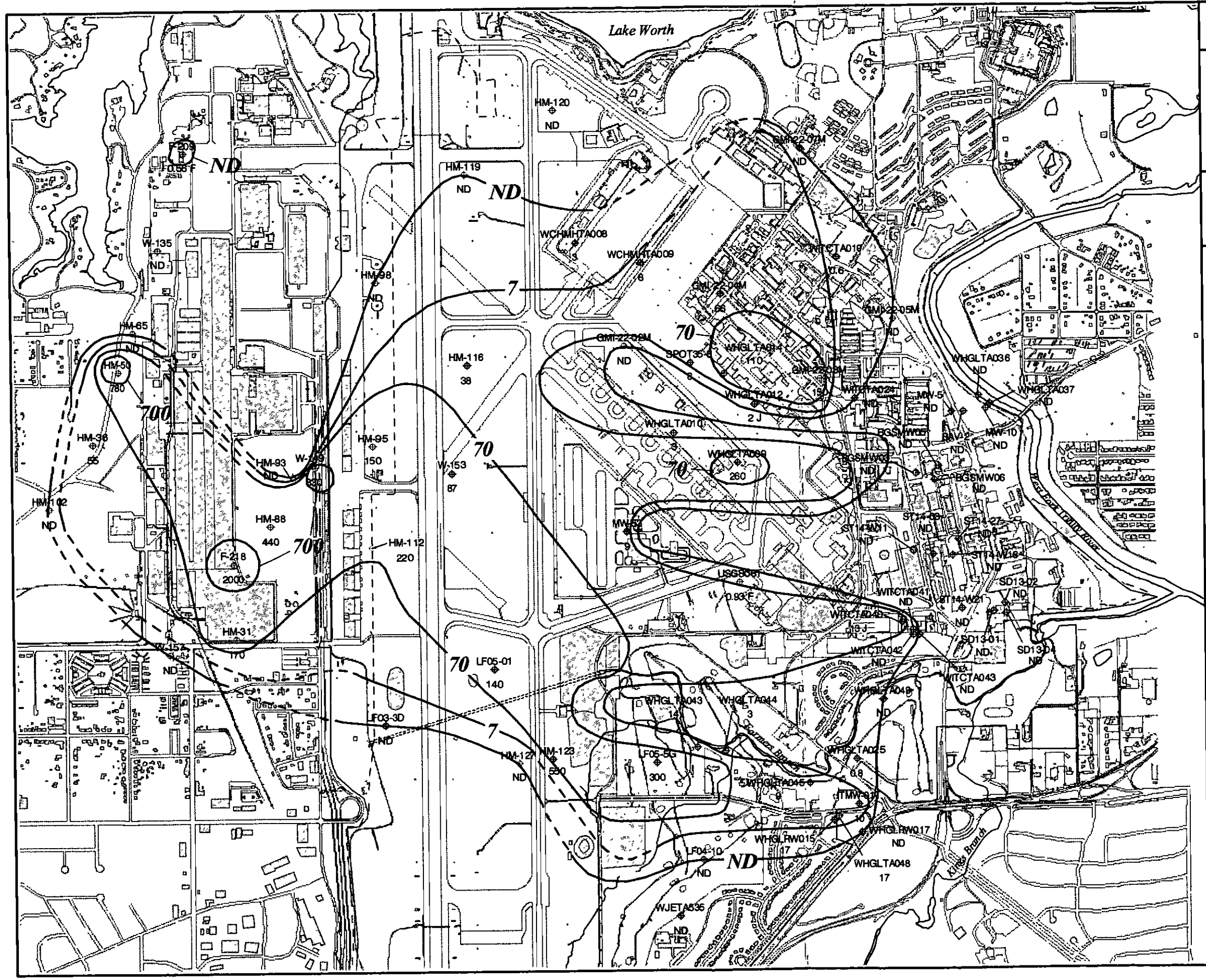
Project AFC001-33DDBA
Map Source HydroGeoLogic, Inc GIS Database, Jacobs Engineering

HYDRO GeoLogic INC.

Figure 5.4

cis-1,2-Dichl roethene C ncentrati ns, Terrace Alluvium October and November 2000

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



Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- 70 — cis-1,2-DCE Concentration Contour (µg/L)
- MW-53 ◆ — NAS Fort Worth JRB Basewide Sampling Well
- 38 — cis-1,2-DCE Concentration (µg/L)
- WHGLTA028 ◆ — Monitoring well data collected as part of other investigations during October and November 2000
- 260 — cis-1,2-DCE Concentration (µg/L)
- USGS06T ◆ — AFP 4 Semi-Annual Monitoring Well
- 150 — cis-1,2-DCE Concentration (µg/L)

ND = Not Detected at Laboratory Method Detection Limit of 0.5µg/L

F = The analyte was positively identified, but the associated value is below PQL.

J = The analyte was positively identified, but the quantitation is an estimation.

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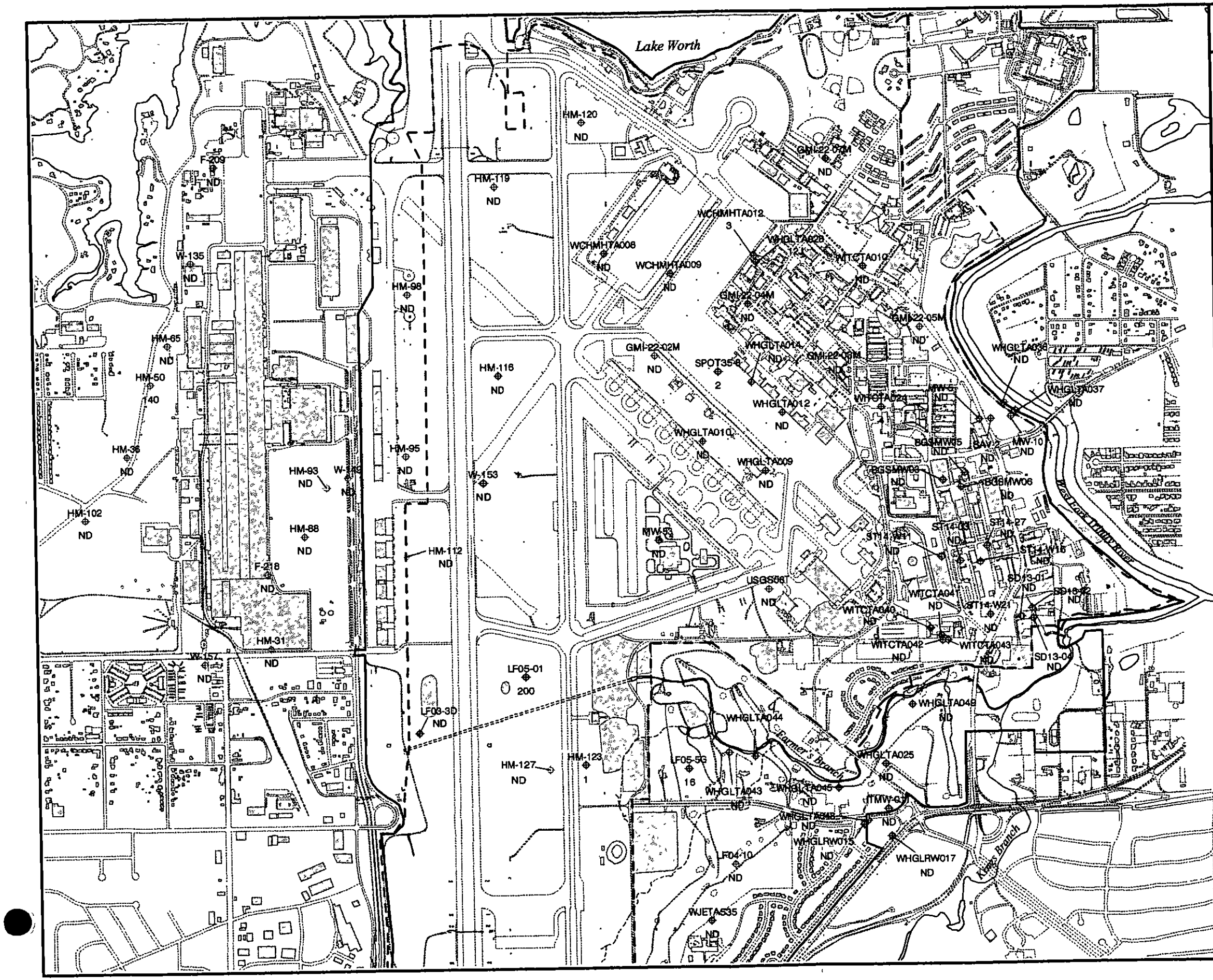
Project: AFC001-33DDBA
Map Source: HydroGeoLogic, Inc. GIS Database, Jacobs Engineering

HYDRO GeoLogic

Figure 5.5
Vinyl Chloride Concentrations
October 2000

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



Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- LF05-5G / 16 — NAS Fort Worth Basewide Sampling Well; Vinyl Chloride (µg/L)
- ST14-03 / 1 — Monitoring well data collected as part of investigations during October and November 2000; Vinyl Chloride (µg/L)
- HM-50 / 140 — AFP 4 Semiannual Monitoring Well; Vinyl Chloride (µg/L)

ND = Not Detected at Laboratory Method Detection Limit of 0.5µg/L

J = The analyte was positively identified, but the quantitation is an estimation.

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Project: AFC001-33DDBA
Map Source: HydroGeoLogic, Inc. GIS Database, Jacobs Engineering

HYDRO GeoLogic INC.

5.3.1.2 Natural Attenuation

TCE can be present in a groundwater environment either as an original component of a release or as a reductive dechlorination product of PCE. At NAS Fort Worth JRB and AFP 4, the TCE appears to be an original component rather than a dechlorination product, although some PCE has been detected at the sites. TCE undergoes sequential reductive dechlorination initially forming the DCE isomers (mainly *cis*-1,2-DCE), then VC, and finally ethene and ethane. The completeness of the sequential dechlorination of TCE to less chlorinated compounds is dependent on the redox conditions in the aquifer (Environmental Science Center, 1997).

Since 1995, natural attenuation parameters have been collected at the site on a regular basis (semi-annually prior to July 1997, and quarterly since July 1997). These parameters include common anions (chloride, nitrate, sulfate by EPA Method SW 9056), methane, ethane, ethene (Method RSK-175), TOC (EPA Method SW 9060) and alkalinity (EPA Method 310.1), as well as several of the standard field parameters collected at every well. During that same time period, CH2MHILL conducted a RFI at AOC 2 (CH2MHILL, 1999). Data evaluations from both the AOC 2 RFI report and from the quarterly natural attenuation data have virtually the same conclusions: while some reductive dechlorination has occurred with the TCE plume at NAS Fort Worth JRB, as evidenced by the large extent of *cis*-1,2-DCE, it is limited in extent and is unlikely to be a sufficient remedial approach. The percentage of *cis*-1,2-DCE compared to *trans*-1,2-DCE is approximately 70 percent based on DCE data collected in 2000. This ratio is a strong indicator that the DCE is present from dechlorination rather than from a direct source. An in depth discussion regarding natural attenuation can be found in Section 5.3.1.2 of the 1999 Annual Report (HydroGeoLogic, 2000a).

5.3.1.3 BTEX Compounds

LF05-5G was the only plume monitoring well, which detected benzene at 0.3F μg/L. Two wells sampled at AOC 4 and one well sampled at SWMU 68 and AOC 7 contained detections of benzene. Toluene, ethylbenzene, and total xylenes were not detected during the October event in the plume monitoring wells. For more information on BTEX at AOC 4 and SWMU 68 and AOC 7, please refer to their respective site-specific documents.

Figure 5.6 shows the most recent depiction of the extent of benzene compounds as measured during the October 2000 sampling event.

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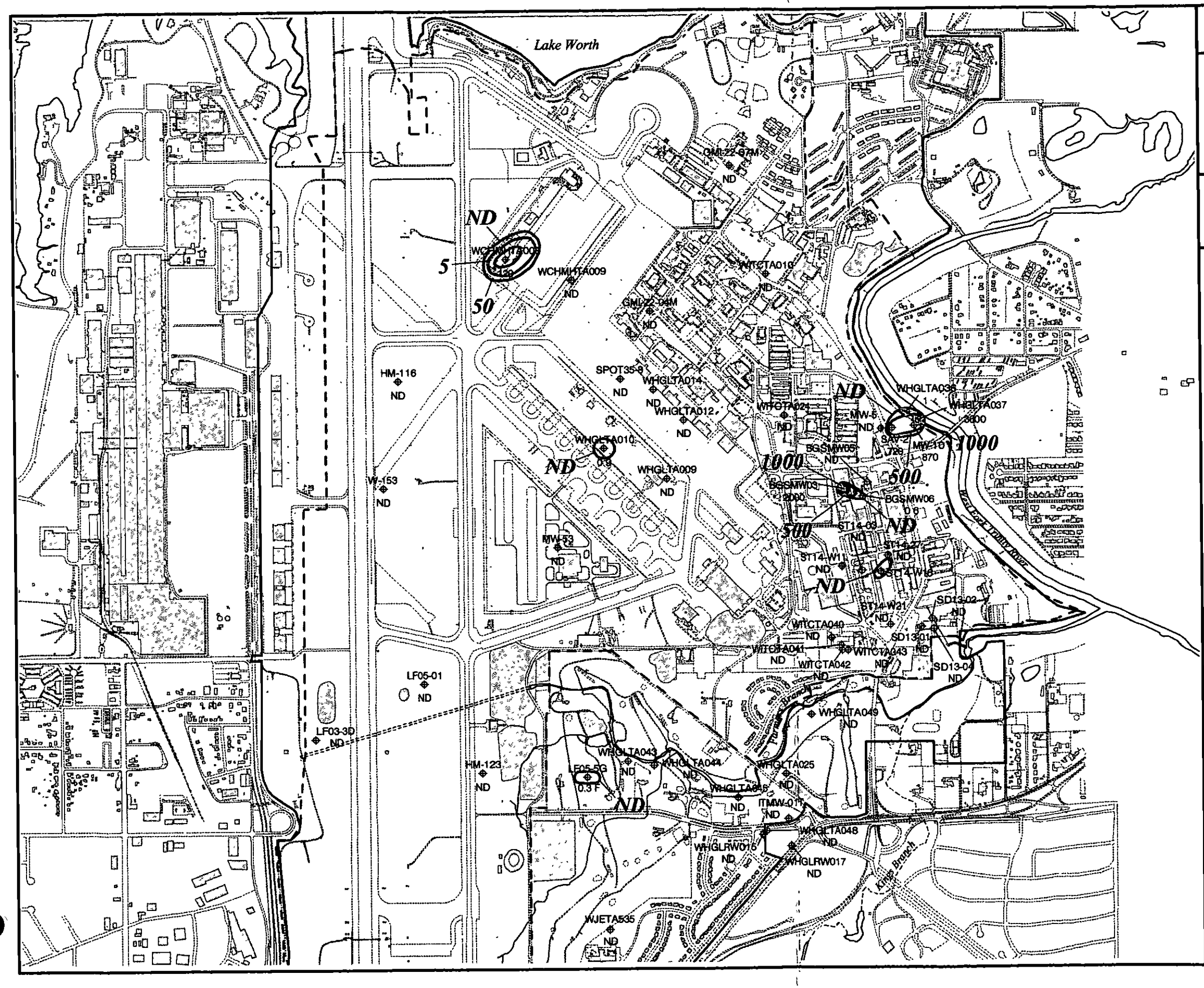

HydroGeoLogic, Inc.—2000 Annual Report
NAS Fort Worth JRB, Texas

Figure 5.6

Benzene Concentrations Terrace Alluvium October and November 2000

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

Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- —500— Benzene Concentration Contour (µg/L)
- MW-53 ◆ 89 — NAS Fort Worth JRB Basewide Sampling Well; Benzene Concentration (µg/L)
- WHGLTA028 ◆ 120 — Monitoring well data collected as part of other investigations during October and November 2000; Benzene Concentration (µg/L)

ND = Not Detected at Laboratory Method Detection Limit of 0 4 µg/L

F = The analyte was positively identified, but the associated value is below PQL.

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Project AFC001-33DDBA
Map Source HydroGeoLogic, Inc GIS Database, Jacobs Engineering

HYDRO GeoLogic INC.

5.3.1.4 Other Compounds

Other petroleum-related compounds were detected in three monitoring wells (SPOT35-5, WITCTA010, and WITCTA024) above their respective PQLs during 2000 NAS Fort Worth JRB basewide sampling. These compounds include naphthalene, *p*-isopropyltoluene, *sec*-butylbenzene, *tert*-butylbenzene, isopropylbenzene (cumene), *n*-butylbenzene, and *n*-propylbenzene (Appendix B.2).

During the October sampling event, the following petroleum related compounds were detected with the number of wells at which the analyte was detected noted in parentheses: *t*-butylbenzene (1), isopropylbenzene (1), *n*-butylbenzene (1), *sec*-butylbenzene (1), and *n*-propylbenzene (1). The only other non-petroleum and non-chlorinated compound detected during October 2000 was trichlorofluoromethane in monitoring wells GMI-22-04M, HM-116, and W-153.

5.4 ADDITIONAL DATA USED FOR EVALUATION

In addition to the VOC analytical data collected as part of the quarterly basewide sampling effort, other groundwater studies conducted simultaneously at NAS Fort Worth JRB and AFP 4 were reviewed to evaluate the nature and extent of groundwater contamination. This includes the following: semi-annual AFP 4 Basewide Sampling; WAA investigations; AOC 1; AOC 4; AOC 13; SWMU 68 and AOC 7 investigations; data gap information pertaining to the southern plume delineation and paluxy investigation. Appendix Table B.3 presents the results of the semi-annual sampling conducted at AFP 4. Appendix Table B.4 presents the detected VOC results from the additional groundwater investigations.

The additional sampling conducted during 2000 has provided supplemental data between the southern and northern lobes. In addition, these data have further increased certainty in evaluating the extent of the plume. The contour maps depicted in Figures 5 3 and 5.4 provide a more complete picture of contamination at the site than the contour maps generated in 2000.

5.5 ANALYTICAL RESULTS FOR METALS SAMPLING

Three plume perimeter monitoring wells were scheduled to be sampled for metals during the NAS Fort Worth JRB quarterly sampling events during the year 2000 (April, July, and October). Some additions to the metals sampling were made each quarter to support site-specific efforts. During the October event only two wells were sampled for metals. One well was dry and could not be sampled. Metals included in the analyses were: aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, potassium, selenium, silver, sodium, thallium, vanadium, and zinc. Figure 5.7 shows the metals detected above background for each well sampled during the October event. Appendix B.1 provides concentrations of metals above background and RRS 2.

Aluminum, arsenic, chromium, iron, manganese, and mercury were detected above background levels and below RRS 2 values in samples collected from the perimeter wells during 2000 (Table 5.6). Arsenic, iron, and manganese were detected above background values in WITCTA010 during two quarters of 2000. Manganese was detected above background in ITMW-01T during

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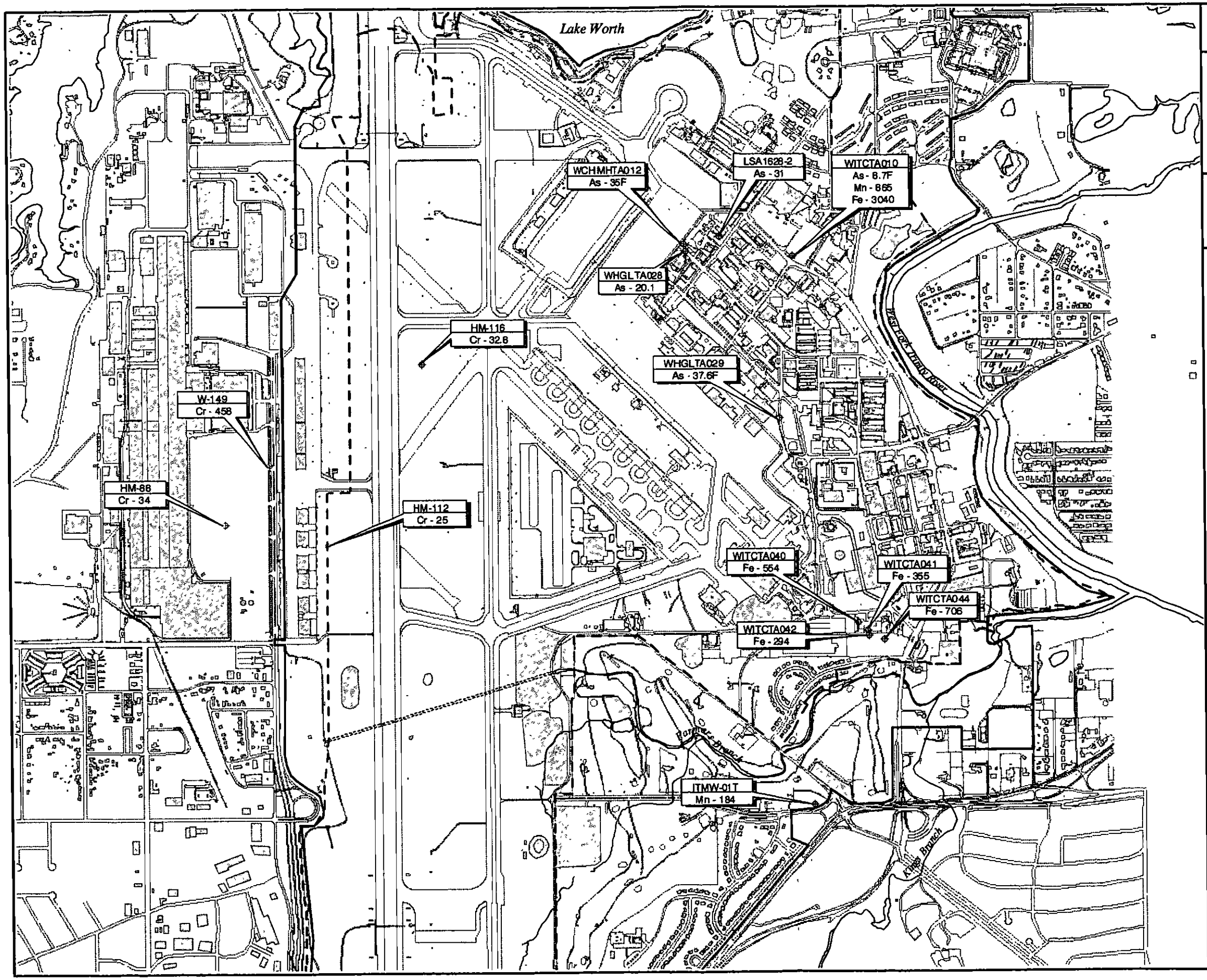

HydroGeoLogic, Inc.—2000 Annual Report
NAS Fort Worth JRB, Texas

Figure 5.7
Metals Concentrations Detected Above Background October and November 2000

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

Legend

- NAS Fort Worth JRB (Carswell Field)
- Former Carswell Air Force Base
- HM-116 — NAS Fort Worth JRB Basewide Sampling Well (Sampled for metals)
- WITCTA040 — Monitoring well sampled as part of investigations during October & November 2000
- HM-31 — AFP 4 Semiannual Monitoring Well
- Mn-86 — Metals detected above background

F = The analyte was positively identified, but the associated value is below PQL.

Note: All concentrations in µg/L.

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Revised 02/01/01 jb
Project AFC001-33DDBA
Map Source HydroGeoLogic, Inc GIS Database, Jacobs Engineering

HYDRO GeoLogic INC.

Table 5.6
Detections of Metals Above Background Concentrations in TCE Plume Monitoring Wells

Well	Analyte	Background µg/L	RRS 2 µg/L	April 2000 µg/L	July 2000 µg/L	October 2000 µg/L
HM-116	Chromium	6	100	29.80	NA	32 8
ITMW-01T	Manganese	175	14,000	227	228	184
USGS07T	Aluminum	1,332	100,000	NA	1,440 J	NA
	Iron	224	NV	NA	976	NA
WITCTA010	Arsenic	4 9	50	17 5 F	NA	6 7 F
	Iron	224	100,000	9,330	NA	3,040
	Manganese	175	14,000	2,070	NA	865
WJETA535	Mercury	0 1	2	NA	0 51	NA

Note
NA = Not Analyzed
NV = No value for RRS 2
J = The analyte was positively identified, the quantitation is an estimate.
F = The analyte was positively identified, but the quantitation is below the PQL

all three quarterly sampling events. Total chromium was detected in HM-116 during two quarters of 2000.

In general, concentrations of metals in base groundwater monitoring wells have fluctuated over the year. Overall trends for each metal, or total metals in a given well, could not be established. Continued monitoring is needed to establish temporal and spatial trends and interpret the existing analytical data.

5.5.1 Comparison to Background and RRS 2 Values

To fully evaluate the extent of metals contamination, the analytical results for all metals detected in groundwater were compared to background concentrations (Jacobs, 1998). The background concentrations used for comparison are provided in Table 5.3.

The following metals were detected in October above background levels in the wells indicated: manganese (ITMW-01T and WITCTA010), iron (WITCTA010), arsenic (WITCTA010), and chromium (HM-116). The concentrations of these metals for each quarter in which they exceeded RRS 2 values are listed in Appendix B.2.

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SECTION 6.0

6.0 OBSERVATIONS AND RECOMMENDATIONS

LTM objectives were specified in the 2000 GSAP to guide the monitoring activities for the three quarterly sampling events conducted during the year. In 2000, a basewide groundwater sampling and analysis program was not a regulatory requirement, but was implemented to facilitate the development of remedial actions throughout the base. The sections below identify each monitoring objective from the 2000 GSAP and discuss the extent to which the objectives were fulfilled.

6.1 CRITICAL GROUNDWATER EXPOSURE PATHWAYS EVALUATION

The first GSAP objective was to collect data to investigate (1) off-site exposure to groundwater sources used for drinking water; and (2) on-site and off-site exposure to surface water bodies.

Data from 1998 and 1999 suggested that perimeter monitoring should continue in order to track potential off-site migration of TCE near the main entrance of the base, in the area of the southern lobe. During a Risk Assessment and Focus Feasibility Study for the southern plume area, five additional Terrace Alluvium wells (WHGLTA043, WHGLTA044, WHGLTA045, WHGLTA048, and WHGLTA049) were installed in October. Groundwater samples collected in October 2000 indicated that three of the five wells contained TCE at concentrations above the RRS 2 value of 5 µg/L, and ranged from a minimum of non-detect (WHGLTA044) to a maximum of 49 µg/L (WHGLTA043). *Cis*-1,2-DCE concentrations at the same five monitoring wells were below the RRS 2 value of 70 µg/L, and ranged from non-detect (WHGLTA049) to 17 µg/L (WHGLTA048). The new Terrace Alluvium monitoring wells, in conjunction with other southern plume area monitoring wells sampled under the 2000 GSAP (HydroGeoLogic, 2000b), provide delineation of the southern portion of the TCE plume. Exposure to groundwater from the Terrace Alluvium is not considered a potential exposure pathway, since this groundwater is not used as a drinking water source.

Three Terrace Alluvium monitoring wells (WITCTA010, GMI-22-07M, and WITCTA024) were sampled in October 2000 to monitor plume stability in the northern lobe, near the West Fork Trinity River. Groundwater samples collected from the three wells were analyzed for VOCs. *Cis*-1,2-DCE and vinyl chloride were detected above the MQL in WITCTA010 and WITCTA024, respectively. Of these three wells, WITCTA010 is the closest to the West Fork Trinity River, located a distance of approximately 1200 feet from the river's western bank. However, GMI-22-05M, which was sampled by Jacobs is approximately 500 feet from the river's western bank. GMI-22-05M contained no chlorinated solvents above the associated MQLs. The nearest well with a chlorinated solvent detection above RRS-2 in October 2000 was monitoring well WICTA024, which had a vinyl chloride concentration of 4 µg/L. Monitoring well WITCT024 is located approximately 1350 feet from the west bank of the river. Data collected in October 2000, and in previous sampling events, indicates that the northern portion of the TCE plume is not an immediate threat to infiltrate the surface waters of the river. However, since the surface water of the river is a potential exposure pathway, continued monitoring of Terrace Alluvium groundwater in the northern-portion of the TCE plume is meaningful and will be proposed in the 2001 GSAP.

Potential contaminant discharge into Farmers Branch Creek is monitored by AFP 4 sampling efforts. In October 2000, AFP4 collected two surface water samples from Farmers Branch Creek (EGL-2 and LF05-S6), and analyzed these samples for VOCs. TCE was not detected above MQL in either of the surface water samples. *Cis*-1,2-DCE was not detected in surface water sample location LF05-S6, but was detected at 3.2 µg/L in the surface water sample collected at location EGL-2. Terrace Alluvium monitoring wells WHGLTA043, WHGLTA044, WHGLTA045, and WHGLTA049 identified above as part of the data gap investigation of the southern TCE plume, are located directly adjacent to, and south of, Farmers Branch Creek. Samples collected from these wells were analyzed for VOCs, presenting concentrations of TCE above the RRS-2 of 5 µg/L in two of the four well locations. TCE was detected at a concentration of 49 µg/L at monitoring well WHGLTA043 and 22 µg/L at monitoring well WHGLTA045. The sample collected from WHGLTA044 did not indicate the presence of TCE and the sample collected from WHGLTA048 contained a concentration of TCE at 2 µg/L, which is below the RRS 2 value of 5 µg/L. These data indicate that chlorinated solvents are likely infiltrating Farmers Branch Creek through seepages and springs, and then volatizing rapidly once exposed to the surface water. However, with the presence of chlorinated solvents in the surface waters of Farmers Branch Creek, potential exposure could occur. Analytical data collected during 2000, in conjunction with the exposure potential, indicate that continued monitoring of the groundwater-surface water interface is meaningful, and will be proposed in the 2001 GSAP.

Data previous to 2000 showed no evidence of groundwater contamination in the Paluxy Aquifer, in the area of the golf coarse. The Paluxy aquifer is a drinking water source in the area of the site However, during October 2000, four Paluxy monitoring wells (WHGLPA001, WHGLPA002, WHGLPA003, and WHGLPA004) were installed in conjunction with the Risk Assessment and Focus Feasibility Study of the southern lobe of the TCE plume Three of these monitoring wells were installed east of the NAS Fort Worth JRB property line into the Paluxy upper sands (WHGLPA001, WHGLPA002, and WHGLPA004), and one was installed west of the NAS Fort Worth JRB property line in the Walnut Limestone formation (WHGLPA003). Groundwater samples were collected from these four wells in October 2000 and analyzed for VOCs In this initial sampling round, TCE was not detected above the MQL in Paluxy wells WHGLPA002, WHGLPA003, and WHGLPA004. The initial sample collected from WHGLPA001 revealed a TCE concentration of 4 µg/L, below the RRS 2 of 5 µg/L. The Paluxy Aquifer is considered a potential exposure pathway, since this groundwater is used as a drinking water source in the region of the site. Continued monitoring of the Paluxy Aquifer in the southern area of the TCE plume is meaningful, and will be proposed in the 2001 GSAP.

Additional sampling was conducted in December/January 2000/2001 at both the Terrace Alluvium and Paluxy monitoring wells installed for the data gap investigation supporting the Risk Assessment and Focused Feasibility Study. Validated laboratory results are pending and will be presented in site-specific documents to be prepared under the Risk Assessment and Focused Feasibility Study project.

6.2 CURRENT REGULATORY REQUIREMENTS

The second monitoring objective for the 2000 GSAP was to conduct sampling to fulfill current LTM requirements associated with the closure of SWMUs and AOCs. Several sites are currently

regulated by the TNRCC Petroleum Storage Tank (PST) Division, including AOC 1, AOC 4, and SWMU 68 and AOC 7 Each of these sites had requirements for semi-annual groundwater sampling in 2000, which were conducted simultaneously with the GSAP. The results of sampling conducted in 2000 at each of these sites will be discussed in the site-specific documents scheduled for submission in the Spring of 2000. However, the October 2000 analytical results are included in this Annual Report, and were used to provide additional plume delineation data, particularly in the eastern portion of the TCE plume. Regulatory requirements for continued groundwater sampling will no longer exist in 2001 for AOC 4 and SWMU 68 and AOC7. Regulatory requirements for groundwater sampling will continue in 2001 for AOC 1; the results of which will be considered in the 2001 GSAP.

6.3 ADDITIONAL SOURCE AND PLUME DELINEATION

The third monitoring objective for the 2000 GSAP was to further define horizontal or vertical migration of contamination associated with miscellaneous hot spots and potential source areas where data are not currently available. Seventeen monitoring wells located within and around the TCE plume were selected to provide additional source and plume delineation. All 17 monitoring wells were sampled for VOCs and selected monitoring wells were sampled for metals and natural attenuation. In addition to the GSAP wells, VOC data resulting from the previously discussed PST investigations and the data gap work from the southern plume delineation, were used to provide additional characterization of the TCE, *cis*-1,2-DCE, and daughter product plumes in the northern and southern areas of the base; as well as in the Landfill Area and along the southeastern base boundary. Figures 5.3, 5.4, and 5.6 provide the approximate extent of the TCE, *cis*-1,2-DCE, and benzene plumes on NAS Fort Worth JRB property. The data collected in 2000, provided a reasonably complete picture of the Terrace Alluvial contamination at the site.

A comparison of TCE data over time indicates a fairly stabilized plume, with little variance in the downgradient extent of the plume. In the southern area of the TCE plume, the decreasing trend of TCE concentrations at HM-123, historically the well with highest detections in the Landfills Area, is noteworthy. At monitoring well HM-123, TCE was detected at a concentration of 4800 µg/L in July 1999, 3500J µg/L in October 1999, 3100 µg/L in April 2000, 3000 µg/L in July 2000, and 2700 µg/L, most recently in October 2000. Monitoring well LF05-5G, located downgradient of well HM-123, has not presented the same trend of decreasing TCE concentrations, but instead has remained fairly stable over time. At monitoring well LF05-5G, TCE was detected at a concentration of 920J µg/L in July 1999, 1200 µg/L in October 1999, 880 µg/L in April 2000, 790 µg/L in July 2000, and 920 µg/L, most recently in October 2000. The southern portion of the TCE plume is well delineated to the south by monitoring wells HM-127, LF04-10, WJETA535, and WHGLRW017.

Monitoring wells ITMW-01T and WHGLRW015 are located downgradient of the Landfills Area, just inside the Former Carswell AFB boundary line. Concentrations of TCE have increased slightly in previous sampling events at these two wells. At monitoring well ITMW-01T, TCE was detected at a concentration of 6 µg/L in July 1999, 8 µg/L in October 1999, 8 µg/L in April 2000, 13 µg/L in July 2000, and 22 µg/L, most recently in October 2000. At the more recently installed monitoring well WHGLRW015, TCE was detected at a concentration of

22 µg/L in April 2000, 26 µg/L in July 2000, and 36 µg/L, most recently in October 2000. These data suggest that some migration of TCE to the east in the southern area of the plume may be occurring.

Monitoring well WHGLTA048, installed as part of the data gap investigation for the southern area of the TCE plume, is located off-site, just east of the Former Carswell AFB property boundary and adjacent to monitoring wells WHGLRW015 and 1TMW-01T. In October 2000, TCE was detected at WHGLTA048 at a concentration of 35 µg/L, indicating the presence of TCE off-site in the Terrace Alluvium at a concentration above the RRS-2 value of 5 µg/L. However, monitoring well WHGLRW017, located a short distance southeast of WHGLRW015 and WHGLTA048, and south of 1TMW-01T, has consistently been non-detect for TCE, suggesting that significant migration of the TCE plume off Federal Property has not occurred.

In the mid-portion of the TCE plume, the Flightline Area, it is worth noting a small trend of decreasing TCE concentrations detected at monitoring well HM-116. At monitoring well HM-116, TCE was detected at a concentration of 520 µg/L in July 1999, 490 µg/L in October 1999, 370 µg/L in April 2000, and 300 µg/L, most recently in October 2000. Monitoring well HM-116 was not sampled in July 2000. Monitoring well W-153, located south of HM-116, has revealed fairly stable concentrations over recent sampling events. At monitoring well W-153, TCE was detected at a concentration of 730 µg/L in July 1999, 680 µg/L in October 1999, 700 µg/L in April 2000, 730 µg/L in July 2000, and 530J µg/L, most recently in October 2000

Monitoring wells GMI-22-04M and WCHMHTA009 are located within the area of highest TCE concentrations in the northern area of the plume In general, TCE concentrations have remained fairly stable in the northern area of the plume, including monitoring wells GMI-22-04M and WCHMHTA009. At monitoring well GMI-22-04M, TCE was detected at a concentration of 380 µg/L in July 1999, 490 µg/L in October 1999, 500 µg/L in April 2000, and 360 µg/L, most recently in October 2000. Monitoring well GMI-22-04M is sampled by Jacobs and was not sampled in July 2000. At monitoring well WCHMHTA009, TCE was detected at a concentration of 330 µg/L in July 1999, 430 µg/L in April 2000, and 420 µg/L, most recently in October 2000. WCHMHTA009 was not sampled in October 1999 and July 2000. Not presented as part of the data for October 2000, are detections of TCE at concentrations of 540 µg/L at GMI-22-06M in July 2000 and 500 µg/L at GMI-22-04M in April 2000. These 2000 GSAP concentrations of TCE were taken into account in the development of the isoconcentration contours in the northern area of the TCE Plume (Figure 5.3). The leading edge of migration of the northern portion of the plume is signified by the 180 µg/L detection of TCE at GMI-22-03M in October 2000. Recent detections of TCE at GMI-22-03M have included concentrations of 110 µg/L in October 1999 and 98 µg/L in April 2000. Downgradient delineation of the northern area of the plume (i.e., to the east of GMI-22-03M) is accomplished by the non-detect results at wells WITCTA010, GMI-22-05M, and WITCTA024.

Additional source and plume delineation objectives of the 2000 GSAP appear to have been met. Groundwater monitoring wells will be proposed for sampling in the 2001 GSAP for the purpose of continuing to monitor the stability of the northern and southern portions of the TCE Plume, as well as which continue monitor changes in concentrations at miscellaneous hot spots and potential source areas.

6.4 NATURAL ATTENUATION MONITORING

The fourth GSAP objective was to collect a limited amount of data to support evaluating the effectiveness of natural attenuation of TCE plume. Considerably more natural attenuation data was collected during the 1999 GSAP. The evaluation of this data, summarized in Section 5.3.1.2 of the 1999 Annual Basewide Groundwater Monitoring Report (HydroGeoLogic, 2000a), revealed evidence that the effectiveness of natural attenuation as a remedy for the TCE Plume is minimal. While some degradation of TCE is occurring as evidenced by the concentrations of *cis*-1,2-DCE at the base, other natural attenuation data collected, including alkalinity, DO, ethane, ethene, ethane, chloride, sulfate, nitrate, and TOC, did not indicate that conditions are favorable for complete dechlorination (HydroGeoLogic, 2000a). Natural attenuation data collected during October 2000 are presented in Appendix B.1. It is recommended that the natural attenuation sampling continue to be conducted at a limited number of wells semi-annually to support possible future remedial action alternative studies.

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TAB

SECTION 7.0

7.0 REFERENCES

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TAB

APPENDIX A

APPENDIX A

OCTOBER FIELD DATA

APPENDIX A.1

GROUNDWATER FIELD SAMPLING DATA SHEETS

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No : GMI-22-04M	Location: NAS Fort Worth JRB, Texas
Sampler(s): K. Doran, D. Martinez	Project Name: October 2000 Quarterly Sampling
Well Depth: 25.27	Project #. AFC001-33DDA Date: 10-26-00 Time: 1446
DTW (ft): * DTP (ft): —	Courier: ✓ FedEx ___ UPS ___ Hand ___ Other
MP Ht Above/Below Ground Surface: 2.28	Sampling Method : Low Flow
Condition of Bottom of Well: —	Type of Pump: BP
Screen Interval (ft): 15.28 - 25.28	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): S/SE 60°F
Well Diameter (in): 2	
Placement of Pump (ft): 19.65	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp (C)	Cond (mhos/cm)	ORP (mV)	DO (mg/L)	Turb (NTU)	Type, Size, and Amount of Sediment Discharged
1446	*	.12	0	7.1	25.7	705	126	4.2	7.4	
1449		.12	.36	6.9	25.8	706	137	2.6	2.0	
1452		.12	.72	6.8	25.5	703	140	2.49	4.1	
1455		.12	1.08	6.8	25.1	698	143	2.1	7.5	
1458		.12	1.44	6.6	24.9	696	146	1.77	1.1	
1501		.12	1.8	6.8	25.0	697	146	1.67	1.1	
1504		.12	2.16	6.6	25.1	695	146	1.59	0.5	
1507		.12	2.52	6.9	25.2	699	147	1.58	0.6	
1510		.12	2.88	6.6	25.3	699	149	1.54	0.6	
1513		.12	3.24	6.8	25.2	700	150	1.53	0.6	
1517		.12	3.6	6.6	25.2	700	150	1.53	0.6	
			END Collecting Parameters							

Observations

Color: (Clear) Other (describe): clear

Odor. (None) Low Medium High Very Strong H2S Fuel-like none

Notes: * top of pump above water level

Signed/Sampler(s): K. Doran D. Martinez

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GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: GMI-22-07M	Location: NAS Fort Worth JRB, Texas
Sampler(s): K. Duran	Project Name: October 2000 Quarterly Sampling
Well Depth: 23	Project #: AFC001-33DDA Date: 10/25/00 Time: 1207
DTW (ft): — DTP (ft): —	Courier: ✓ FedEx ___ UPS ___ Hand ___ Other
MP Ht. Above/Below Ground Surface: 2.75	Sampling Method: Low Flow
Condition of Bottom of Well: —	Type of Pump: BP
Screen Interval (ft): 12.75 - 22.75	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): SSE 70°F
Well Diameter (in): 2	
Placement of Pump (ft): 19.1' (intake)	

Field Parameters

Time (Military)	Depth to Water (ft)	Flow Rate (L/min)	Total Volume (L)	pH (units)	Temp. (°C)	Cond. (µmhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
1207	*	.1	0	7.0	25.4	736	209	3.5	91	
1210		.1	.1	7.0	25.9	724	212	3.3	44	
1213		.1	.2	7.0	26.1	724	216	3.5	42	
1215		.1	.3	7.0	26.2	725	218	3.7	33	
1218		.1	.4	7.0	26.3	726	219	3.6	31	
1221		.1	.5	7.0	26.4	726	220	3.7	25	
1224		.1	.6	7.0	26.3	726	222	4.4	19.1	
1227		.1	.7	7.0	26.4	727	226	4.4	11.2	
1231		.1	.8	7.0	26.4	726	228	4.4	9.8	
1234		.1	.9	7.0	26.4	725	231	4.3	9.1	
1237		.1	1.0	7.0	26.3	724	233	4.5	8.7	
1240		.1	1.1	7.0	26.4	723	236	3.6	10.1	
1243		.1	1.2	7.0	26.4	723	237	3.6	9.4	
1246		.1	1.3	7.0	26.4	724	237	3.6	8.8	
1249		.1	1.4	7.0	26.4	724	238	3.6	8.7	
		END Collecting Parameters								

Observations

Color: (Clear) Other (describe): Clear

Odor: (None) Low Medium High Very Strong H2S Fuel-like NONE

Notes: * DTW below top of pump

Signed/Sampler(s): Kevin Duran, JWalker

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GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: HM-116	Location: NAS Fort Worth JRB, Texas
Sampler(s): J. Wallace	Project Name: October 2000 Quarterly Sampling
Well Depth: ~~25.45~~ 32.40	Project #: AFC001-33DDA Date: 10/26/00 Time: 1023
DTW (ft): 25.45 DTP (ft): —	Courier: X FedEx ___UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface: -0.43	Sampling Method: LOW FLOW
Condition of Bottom of Well: firm	Type of Pump: BLADDER
Screen Interval (ft): 22.57 - 32.57	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): overcast, SE, 70°
Well Diameter (in): 4	
Placement of Pump (ft): unable to determine	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (l/m)	Total Volume (l)	pH	Temp (C)	Cond (mhos/cm)	ORP (mV)	DO (mg/L)	Turb (NTU)	Type, Size and Amount of Sediment Discharged
1023	~~25.55~~ 25.50	0.05	0	6.40	22.15	484	229.9	4.28	1.93	
1026	25.50	0.05	0.15	6.48	22.10	484	222.0	3.91	1.76	
1029	25.50	0.05	0.30	6.45	22.09	483	221.9	3.84	1.51	
1032	25.50	0.05	0.45	6.41	21.98	483	222.9	3.72	1.34	
1035	25.50	0.05	0.60	6.51	21.95	483	228.1	3.62	1.50	
1038	25.50	0.10	0.75	6.52	21.94	483	224.9	3.54	1.87	
1041	25.50	0.10	1.05	6.53	21.93	482	225.8	3.50	1.81	
1044	25.50	0.10	1.35	6.55	21.97	483	231.0	3.48	1.79	
1047	collect	samples								

Observations

Color: (Clear) Other (describe): Clear

Odor: (None) Low Medium High Very Strong H2S Fuel-like none

Notes:

Signed/Sampler(s): J. Wall

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GROUNDWATER FIELD SAMPLING DATA SHEET

Well No : HM-123	Location: NAS Fort Worth JRB, Texas
Sampler(s): K. Dornan, D. Matthews	Project Name: October 2000 Quarterly Sampling
Well Depth: 38.38	Project #: AFC001-33DDA Date: 10/27/00 Time: 834
DTW (ft): 30.09 DTP (ft): –	Courier: ✓FedEx ___UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface: -0.41	Sampling Method: Low Flow
Condition of Bottom of Well: firm	Type of Pump: BP
Screen Interval (ft): 20.09 - 40.09	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): S/SE 71°F
Well Diameter (in): 4	
Placement of Pump (ft): 31.5' (intake)	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Qtnty (L)	pH	Temp (C)	Cond (mmhos/cm)	ORP (mV)	DO (mg/L)	Turb (NTU)	Type, Size, and Amount of Sediment Discharged
834	30.09	.175	0	7.3	20.8	425	234	1.61	.6	
837	30.09	.175	.525	6.9	20.7	433	233	1.05	.9	
840	30.09	.175	1.05	6.7	20.9	433	230	0.90	.6	
843	30.09	.175	1.575	6.7	20.9	435	229	0.87	.6	
846	30.09	.175	2.1	6.7	20.9	434	228	0.85	.6	
849	30.09	.175	2.625	6.7	21.0	435	221	0.92	.6	
852	30.09	.175	3.15	6.7	21.0	425	215	0.92		
~~855~~		~~.175~~	~~3.675~~							K2 see below
858	30.1	.175	4.2	6.7	21.0	426	214	0.97	2.2	
901	30.09	.175	4.725	6.7	21.6	440	213	1.16	2.0	
904	30.09	.175	5.25	6.7	21.6	441	212	1.16	1.8	
907	30.09	.175	5.75	6.7	21.4	439	210	1.05	1.1	
910	30.09	.175	6.275	6.7	21.3	437	209	1.09	1.0	
913	30.09	.175	6.8	6.7	21.2	438	209	1.06	0.9	
			End collecting parameters							

Observations

Color: (Clear) Other (describe): Clear

Odor: (None) Low Medium High Very Strong H2S Fuel-like none

Notes: fine at 855 not collected - control box malfunction

Signed/Sampler(s): Kevin Dornan D. Matthews

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: ITMW-01T	Location: NAS Fort Worth JRB, Texas
Sampler(s): J.Wallace, K. Duran	Project Name: October 2000 Quarterly Sampling
Well Depth: 21.55	Project #: AFC001-33DDA Date: 10/24/00 Time: 1601
DTW (ft): 15.07 DTP (ft): —	Courier: X FedEx ___UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface. -0.3	Sampling Method: LOW-FLOW
Condition of Bottom of Well: firm	Type of Pump: bladder
Screen Interval (ft): - 21.57	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): overcast, SE, 70°
Well Diameter (in): 4	
Placement of Pump (ft): (inlet) 17.1	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (Gal.)	pH	Temp (C)	Cond. (mmhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	Type, Size and Amount of Sediment Discharged
1601	15.1	.25	0	6.3	23.6	666	131	1.9	2.1	
1606	15.11	.25	.25	6.2	23.4	662	133	1.3	0.3	
1611	15.11	.25	.5	6.1	23.3	661	130	1.0	0.2	
1616	15.10	.25	.75	6.1	23.3	661	129	0.96	0.1	
1621	15.1	.25	1.0	6.1	23.3	660	129	0.9	0.2	
1626	15.1	.25	1.25	6.1	23.3	660	128	0.84	0.1	
1631	15.1	.25	1.5	6.1	23.7	661	126	0.82	0.1	
1636	15.1	.25	1.75	6.1	23.3	660	126	0.80	0.1	
		END Collecting Parameters								

Observations

Color: (Clear) Other (describe): clear

Odor: (None) Low Medium High Very Strong H2S Fuel-like none

Notes:

Signed/Sampler(s): Kent Duran JWall

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GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: LF03-3D	Location: NAS Fort Worth JRB, Texas
Sampler(s): K. Dunn, D. Martinez	Project Name: October 2000 Quarterly Sampling
Well Depth: –	Project #: AFC001-33DDA Date: 10-26-00 Time: 1117
DTW (ft): * DTP (ft): —	Courier: ✓ FedEx ___ UPS ___ Hand ___ Other
MP Ht. Above/Below Ground Surface: 3.65	Sampling Method: Low Flow
Condition of Bottom of Well: —	Type of Pump: BP
Screen Interval (ft): 11.15 - 18.05	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): S/SE 75°F
Well Diameter (in): 2	
Placement of Pump (ft): 16.19 (intake)	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp. (C)	Cond. (mhos/cm)	ORP (mv)	DO (mg/l)	Turb. (NTU)	Type, Size and Amount of Sediment Discharged
1117	*	.075	0	6.7	29.4	695	233	4.8	39	
1120		.075	.225	6.7	24.3	692	233	3.7	37	
1123		.075	.450	6.7	24.3	690	234	3.4	29	
1126		.075	.675	6.7	24.1	682	235	2.8	19	
1129		.075	.9	6.7	24.4	676	235	2.6	17	
1132		.075	1.125	6.7	24.0	674	235	2.6	15	
1135		.075	1.350	6.7	24.0	673	234	2.6	11	
1138		.075	1.575	6.7	24.0	673	234	2.5	10.5	
1141		.075	1.8	6.7	24.1	670	234	2.47	9.9	
1144		.075	2.025	6.7	24.2	670	234	2.52	8.8	
1147		.075	2.250	6.7	24.4	672	231	2.44	6.6	
1150		.075	2.475	6.7	24.5	672	231	2.57	5.9	
				End Parameter Collection						

Observations

Color: (Clear) Other (describe): clear

Odor: (None) Low Medium High Very Strong H2S Fuel-like none

Notes: * Pump above water Level

Signed/Sampler(s): Kent Dunn

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GROUNDWATER FIELD SAMPLING DATA SHEET

Well No : LF05-01	Location: NAS Fort Worth JRB, Texas
Sampler(s): K Duran, D Martinez	Project Name: October 2000 Quarterly Sampling
Well Depth: 27.5	Project #. AFC001-33DDA Date: 10 26 00 Time: 1304
DTW (ft): * DTP (ft): —	Courier: ✓ FedEx ___ UPS ___ Hand ___ Other
MP Ht. Above/Below Ground Surface: 2.66	Sampling Method : Low Flow
Condition of Bottom of Well: —	Type of Pump: BP
Screen Interval (ft): 17.61 - 27.36	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): S/SE 75°F
Well Diameter (in): 2	
Placement of Pump (ft): 17.0	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp (C)	Cond (umhos/cm)	ORP (mV)	DO (mg/L)	Turb (NTU)	Type, Size, and Amount of Sediment Discharged
1304	*	.126	0	6.8	24.3	641	-105	2.9	15.1	
1307		125	.375	6.8	23.5	621	-113	1.6	11.1	
1310		.125	.75	6.6	23.2	620	-112	1.6	4.2	
1313		.126	1.25	6.8	23.4	619	-115	1.55	2.5	
1316		.126	1.525	6.8	23.7	623	-116	1.45	3.7	
1319		.125	1.9	6.8	23.9	626	-117	1.42	5.5	
1322		.125	2.275	6.8	23.8	631	-118	1.34	2.0	
1325		.125	2.65	6.8	23.7	632	-119	1.26	2.5	
1328		.125	3.25	6.8	23.7	633	-120	1.18	2.6	
1331		.125	3.575	6.8	23.9	634	-121	1.17	2.5	
1334		.125	3.95	6.8	23.7	627	-121	1.14	2.0	
			Cease collecting parameters							

Observations

Color: (Clear) Other (describe): Clear

Odor: (None) Low Medium High Very Strong H2S Fuel-like none

Notes: * top of pump above water level

Signed/Sampler(s): K Duran D Martinez

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GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: LF05-5G	Location: NAS Fort Worth JRB, Texas
Sampler(s): J. Wallace, K. Duran	Project Name: October 2000 Quarterly Sampling
Well Depth: 30'	Project #: AFC001-33DDA Date: 10/25/00 Time: 0920
DTW (ft): – DTP (ft): –	Courier: ✓FedEx ___UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface: 3.39	Sampling Method: Low Flow
Condition of Bottom of Well: –	Type of Pump: BP
Screen Interval (ft): 17.64 - 29.39	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): 5/SE 75°
Well Diameter (in): 2	
Placement of Pump (ft) 24.5' (intake)	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp (C)	Cond. (mhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	Type, Size and Amount of Sediment Discharged
920	*	0.15	0	6.4	22.8	586	173	4.65	4.2	
923		.15	.15	6.3	22.5	595	56	3.32	~~3.7~~ 3.3	
926		.15	.3	6.3	22.3	596	17	2.97	3.3	
929		.15	.45	6.3	22.4	598	2.4	2.12	1.7	
932		.1	.6	6.3	22.3	598	-6.5	1.97	1.4	
935		.1	.7	6.3	22.3	599	-2.8	1.92	1.7	
938		.1	.8	6.4	22.4	601	-19.6	1.83	1.3	
941		.1	.9	6.4	22.4	602	-17.3	1.83	1.7	
944		1	1.0	6.4	22.5	603	-18.2	1.81	1.4	
		END Collecting Parameters								

Observations

Color: (Clear) Other (describe): Clear

Odor: (None) Low Medium High Very Strong H2S Fuel-like none

Notes: * Pump above water level

* ORP flustuating over wide range of numbers at rapid pace.

Signed/Sampler(s): K. Duran, J. Wallace

GROUNDWATER FIELD SAMPLING DATA SHEET

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Well No.: MW-53	Location: NAS Fort Worth JRB, Texas
Sampler(s): J. Wallace K. Duran	Project Name: October 2000 Quarterly Sampling
Well Depth: 19.44	Project #: AFC001-33DDA Date: 10/25/00 Time: 1615
DTW (ft): 16.55 DTP (ft): —	Courier: x FedEx ___UPS ___Hand ___Other
MP Ht Above/Below Ground Surface: -0.5	Sampling Method: LOW FLOW
Condition of Bottom of Well: —	Type of Pump: BLADDER
Screen Interval (ft): 9.54 - 19.54	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): Overcast, SE, 80°
Well Diameter (in): 4	
Placement of Pump (ft): *Unable to determine	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/min)	Total Volume (L)	pH	Temp (°C)	Cond. (mmhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	TS / Size and Amount of Sediment Discharged
1615	16.74	0.1	0	6.88	24.55	485	115.0	7.25	3.8	
1618	16.80	0.05	0.3	6.71	24.36	512	115.1	6.21	3.6	
1621	16.79	0.05	0.45	6.67	24.57	516	117.2	6.12	3.6	
1624	16.77	0.05	0.60	6.67	24.68	519	119.1	6.10	3.2	
1627	16.76	0.05	0.75	6.70	24.80	521	119.9	6.08	3.1	
1630	Collect Samples									

Observations

Color: (Clear) Other (describe): clear

Odor: (None) Low Medium High Very Strong H2S Fuel-like none

Notes:

Signed/Sampler(s): J Wallace, Kent Duran

666 130

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: W-153	Location. NAS Fort Worth JRB, Texas
Sampler(s): J. Wallace	Project Name October 2000 Quarterly Sampling
Well Depth: 39.25	Project #: AFC001-33DDA Date: 10/26/00 Time: 1248
DTW (ft): 23.21 DTP (ft): —	Courier: X FedEx ___UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface: -0.13	Sampling Method . LOW FLOW
Condition of Bottom of Well. —	Type of Pump BLADDER
Screen Interval (ft): 29.77 - 39.27	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): OVERCAST, S, 75°
Well Diameter (in): 2	
Placement of Pump (ft): 34.74' (intake)	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp (C)	Cond (umhos/cm)	ORP (mv)	DO (mg/L)	Turb (NTU)	Type, Size, and Amount of Sediment Discharged
1248	23.24	0.2	0	6.84	23.72	487	148.1	4.67	23.6	
1251	23.25	0.2	0.6	6.61	23.91	493	153.0	4.00	24.0	
1254	23.24	0.2	1.2	6.54	23.24	487	154.1	3.54	21.9	
1257	23.23	0.2	1.8	6.55	23.30	488	152.8	3.34	16.45	
1300	23.23	0.1	2.4	6.58	23.52	497	144.6	3.34	16.30	
1303	23.23	0.1	2.7	6.59	24.76	505	140.7	3.36	15.81	
1306	23.23	0.1	3.0	6.58	25.50	509	137.2	3.47	15.15	
1309	23.22	0.1	3.3	6.65	25.55	513	131.9	3.48	14.69	
4W 1312	23.21	0.1	3.6	6.67	25.57	513	130.2	3.49	13.98	
1315	23.22	0.1	3.9	6.67	25.82	515	127.5	3.56	13.81	
1318	23.22	0.1	4.2	6.69	26.02	517	124.8	3.62	13.25	
1321	23.22	0.1	4.5	6.68	26.05	513	122.2	3.62	10.82	
1324	23.22	0.1	4.8	6.68	26.17	518	116.9	3.64	9.87	
1327	23.22	0.1	5.1	6.70	26.40	519	113.4	3.68	9.85	
1330	23.23	0.1	5.4	6.70	24.41	498	115.5	3.53	7.91	
1333	23.23	0.1	5.7	6.65	23.85	493	116.3	3.37	7.85	
1336	23.24	0.1	6.0	6.63	23.77	492	116.7	3.29	7.03	
1338	collect samples									

Observations

Color: Clear Other (describe): Clear

Odor: None Low Medium High Very Strong H2S Fuel-like none

Notes.

Signed/Sampler(s): JWall

GROUNDWATER FIELD SAMPLING DATA SHEET

666 131

Well No : ~~gw WHGLTA025~~ WHGLRW015	Location: NAS Fort Worth JRB, Texas
Sampler(s): J. Wallace, K. Duran	Project Name: October 2000 Quarterly Sampling
Well Depth: 23.16	Project #: AFC001-33DDA Date: 10/24/00 Time: 0940
DTW (ft) 16.55 DTP (ft). —	Courier X FedEx ___UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface: 0	Sampling Method : LOW FLOW
Condition of Bottom of Well: firm	Type of Pump: BLADDER
Screen Interval (ft): ~~10.5 - 20.5~~ gw	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): overcast, SE, 70°
Well Diameter (in) gw 4	
Placement of Pump (ft): ~~gw 18 40' (intake)~~	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp (C)	Cond. (umhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
0940	16.55	0.05	0	6.59	21.45	592	282.4	3.96	7.10	
0943	16.55	0.1	0.15	6.59	21.35	591	289.3	4.01	5.29	
0946	16.55	0.1	0.45	6.23	21.30	591	289.1	3.99	5.61	
0949	16.55	0.05	0.75	5.95	21.30	592	290.6	3.68	5.40	
0952	16.55	0.05	0.90	5.95	21.26	592	230.9	3.77	5.30	
0955	16.55	0.05	1.05	5.90	21.20	592	236.7	3.95	5.02	
0958	16.55	0.05	1.20	5.95	21.10	592	238.1	3.87	5.19	
1000	collect samples.									

Observations

Color: (Clear) Other (describe): clear

Odor: (None) Low Medium High Very Strong H2S Fuel-like none

Notes:

Signed/Sampler(s): J Wallace K Duran

666 132

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLRW017	Location: NAS Fort Worth JRB, Texas
Sampler(s): K. Dunn, D. Martinez	Project Name: October 2000 Quarterly Sampling
Well Depth: 24'	Project # AFC001-33DDA Date: 10/24/00 Time: 1435
DTW (ft). 17.43 DTP (ft): —	Courier. ✓ FedEx ___ UPS ___ Hand ___ Other
MP Ht Above/Below Ground Surface: -0 4	Sampling Method : Low Flow
Condition of Bottom of Well: NA	Type of Pump: BP
Screen Interval (ft): 13.9 - 23.9	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): S/SE 78°F
Well Diameter (in). 4	
Placement of Pump (ft): 20.5'	

Field Parameters

Volume (L)	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp (C)	Cond. (mhos/cm)	ORP (mV)	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Disposed
1435	17.43	.350	0	7.0	22.0	570	273	19.4	7.5	
1440	17.43	.35	.35	6.5	22.1	569	273	29.1	9.3	
1445	17.43	.35	.7	6.6	21.5	563	275	31.9	5.1	
1450	17.43	.35	1.05	6.8	21.5	563	277	33.6	3.3	
1455	17.43	.35	1.40	6.7	21.5	560	280	28.0	3.1	
1500	17.42	.35	1.75	6.7	22.0	570	281	29.1	3.0	
1505	17.42	.35	2.1	6.7	21.5	564	283	28.8	2.4	
1510	17.42	.35	2.45	6.7	21.5	564	285	30.3	2.3	
1515	17.42	.35	2.80	6.7	21.5	564	286	29.9	2.7	
		END	Collecting	Parameters						

Observations

Color: (Clear) Other (describe): Clear

Odor: (None) Low Medium High Very Strong H2S Fuel-like none

Notes:

Signed/Sampler(s): Ken Dunn D. Martinez

666 133

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WHGLTA025	Location: NAS Fort Worth JRB, Texas
Sampler(s): J. Wallace, K. Duran	Project Name: October 2000 Quarterly Sampling
Well Depth: 21.26	Project #: AFC001-33DDA Date: 10/25/00 Time: 0811
DTW (ft): * DTP (ft): —	Courier: X FedEx ___ UPS ___ Hand ___ Other
MP Ht. Above/Below Ground Surface: 0	Sampling Method: Low Flow
Condition of Bottom of Well: unable to determine	Type of Pump: Bladder
Screen Interval (ft): 10.5 - 20.5	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): Cloudy, EAST, 70°
Well Diameter (in): 2	
Placement of Pump (ft): 18 40' (intake)	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH (SU)	Temp (°C)	Cond (umhos/cm)	ORP (mV)	DO (mg/L)	Turb. (NTU)	Type, Size, and Amount of Sediment Discharged
0811	*	0.2	0	7.03	22.02	409	247.5	10.97	37	DO readings looked off. Switched Flow cells.
0814		0.15	0.6	7.00	21.96	409	250.3	11.52	22.4	
0817		0.15	1.05	6.25	21.98	406	196.2	5.37	12.4	
0820		0.15	1.50	6.28	21.98	405	207.5	5.34	10.9	
0823		0.15	1.95	6.34	21.97	405	203.4	5.30	9.6	
0826		0.15	2.40	6.39	21.95	405	212.2	5.29	8.7	
0829		0.15	2.85	6.41	21.95	406	218.0	5.23	7.0	
0832		0.15	3.30	6.47	21.94	407	217.5	5.20	6.1	
0835	collect	samples								

Observations

Color: (Clear) (Other) (describe) cloudy

Odor. (None) Low Medium High Very Strong H2S Fuel-like none

Notes: * DTW below Top of pump

Signed/Sampler(s): J. Wall, Kat Duran

666 134

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WITCTA010	Location: NAS Fort Worth JRB, Texas
Sampler(s): J.Wallace, K.Duran	Project Name: October 2000 Quarterly Sampling
Well Depth: 18.47'	Project #: AFC001-33DDA Date: 10/25/00 Time: 1352
DTW (ft): * DTP (ft): —	Courier: X FedEx ___UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface: -0.43	Sampling Method : LOW FLOW
Condition of Bottom of Well —	Type of Pump: Bladder
Screen Interval (ft): 10.97 - 18 22	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): overcast, SE, 75°
Well Diameter (in): 2	
Placement of Pump (ft): 14.8' (TOP)	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp. (C)	Cond. (mmhos/cm)	ORP (mv)	DO (mg/L)	Turb. (NTU)	Typ, Size, and Amount of Sediment Discharged
1352	*	0.1	0	7.00	26.96	423	-176.8	1.14	15.9	
1355		0.15	0.3	6.93	27.00	422	-184.7	0.97	15.3	
1358		0.15	0.75	6.89	26.81	421	-183.4	0.75	14.7	
1401		0.15	1.20	6.91	26.80	420	-188.6	0.68	11.7	
1404		0.15	1.65	6.91	26.87	420	-181.9	0.68	9.9	
1407		0.15	2.10	6.88	26.94	422	-186.5	0.63	8.5	
1410		0.15	2.55	6.91	26.99	422	-191.1	0.62	5.7	
1413		0.10	3.00	6.90	27.02	422	-193.3	0.63	4.5	
1415	Collect samples									

Observations

Color: (Clear) Other (describe): clear

Odor: None Low Medium High (Very Strong) H2S Fuel-like hydrocarbon odor

Notes: * DTW below top of pump.

Signed/Sampler(s): J.Wall, K.Duran

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WITCTA024	Location: NAS Fort Worth JRB, Texas
Sampler(s): J.Wallace, K.Duran	Project Name: October 2000 Quarterly Sampling
Well Depth: 23.34	Project #: AFC001-33DDA Date: 10/25/00 Time: 1202
DTW (ft): * DTP (ft): —	Courier: X FedEx ___UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface: -0.47	Sampling Method: LOW FLOW
Condition of Bottom of Well: —	Type of Pump: BLADDER
Screen Interval (ft): 12.76 - 22.51	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): overcast, SE, 70°
Well Diameter (in): 2	
Placement of Pump (ft): (TOP) 17.47	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp (C)	Cond (umhos/cm)	ORP (mv)	DO (mg/L)	Turb (NTU)	Type, Size, and Amount of Sediment Discharged
1207	*	0.2	0	6.57	25.23	680	-21.8	1.19	28.7	
1210		0.2	0.6	6.73	25.11	677	-77.1	0.78	19.7	
1213		0.2	1.2	6.82	25.29	676	-99.2	0.67	17.79	
1216		0.1	1.8	6.89	25.34	676	-105.2	0.69	12.57	
1219		0.1	2.1	6.79	25.66	681	-108.1	0.75	11.45	
1222		0.1	2.4	6.80	26.04	685	-106.2	0.76	10.69	
1225		0.1	2.7	6.81	26.12	686	-110.4	0.71	9.10	
1228		0.1	3.0	6.83	26.20	686	-114.8	0.67	7.05	
1231		0.1	3.3	6.85	26.08	684	-115.3	0.64	6.22	
1234		0.15	3.6	6.87	25.53	677	-117.1	0.59	5.16	
1237		0.15	4.05	6.87	25.45	676	-119.4	0.58	4.67	
1240	Collect samples									

Observations

Color: (Clear) Other (describe): clear

Odor (None) Low Medium High Very Strong H2S Fuel-like none

Notes: * DTW below top of pump

Signed/Sampler(s): JWall Kat Dan

666 136

GROUNDWATER FIELD SAMPLING DATA SHEET

Well No.: WJETA535	Location: NAS Fort Worth JRB, Texas
Sampler(s): J. Wallace	Project Name: October 2000 Quarterly Sampling
Well Depth: 42.56	Project #: AFC001-33DDA Date: 10/26/00 Time: 1605
DTW (ft): * DTP (ft): —	Courier: X FedEx ___UPS ___Hand ___Other
MP Ht. Above/Below Ground Surface: -0 21	Sampling Method: LOW FLOW
Condition of Bottom of Well: —	Type of Pump: Bladder
Screen Interval (ft): 33.14 - 42.14	Weather (sun/clear, overcast/rain, wind direction, ambient temperature): overcast, SE, 75°
Well Diameter (in): 2	
Placement of Pump (ft): 37.75' (intake)	

Field Parameters

Time	Depth to Water (ft)	Flow Rate (L/m)	Total Volume (L)	pH	Temp (C)	Cond (mmhos/cm)	ORP (mv)	DO (mg/L)	Turb (NTU)	Type, Size and Amount of Sediment Discharged
1605	*	0.15	0	6.89	24.55	495	180.6	7.59	33.9	
1608		0.15	0.45	6.72	23.81	494	184.0	7.05	37.0	
1611		0.15	0.90	6.42	23.38	493	187.5	6.80	24.3	
1614		0.15	1.35	6.49	23.06	492	188.1	6.66	15.92	
1617		0.15	1.80	6.48	23.02	492	189.1	6.59	9.01	
1620		0.15	2.25	6.48	22.97	492	193.8	6.56	6.27	
1623		0.15	2.70	6.48	22.97	491	194.1	6.54	3.98	
1625	Collect samples									

Observations

Color: (Clear) Other (describe): clear

Odor: (None) Low Medium High Very Strong H2S Fuel-like none

Notes: DTW below top of pump

Signed/Sampler(s): J Wall

APPENDIX A.2

FIELD NOTES

Location NAS Fort Worth JRB Date 10/24/00 71

Project / Client October 2000 Quarterly
AFL001 - 33DDA

0730 Arrive at field house. Calibrate equipment. Organize field papers.

0855 Arrive at WHGL RW015. Set up to sample. DTW = 16.55 TD = 23.16 PID = 0.00 ppm

0920 Begin purging

1000 Collect [WHGLRW015WG-13]
Final DTW = 16.55

1015 Pack Van.
Assist Kent w/ development of WHGLTA039.

1145 Arrive at ITMW-01T. Set up PID = 0.00 ppm DTW = 15.16
TD = 21.55. Unable to determin DTpump

1211 Begin purging
stopped purging to pull pump & measure.

1415 DTpump inlet determined to be at 17.1. Begin purging.
DTW = 15.07 TD = 21.55

1435 Problems w/ controller. Stopped purging to call QED for assistance. Controller not fixable QED sending new one for tomorrow.

72 Location NASFW JRB, Texas Date 10/25/00

Project / Client October 2000 Quarterly
AFC001 - 3300A

1500	Assist	Kent	&	David	as	they
	attempt	to	sample	ITMW-01T.		
1545	Take	samples	back	to	field	
	house	to	pack.			
1700	Take	EB102400	from			
	nondedicated	pump	used	to		
	sample	WHGLRW017WG13	for			
	Volatiles					
	Complete	all	paperwork.			
1800	Leave	site	for	the	day.	

JWall

Location NAFW JRB, Texas Date 10/25/00 73

Project / Client October 2000 Quarterly

0610 Arrive at field house.
Calibrate equipment. Assist Kent w/ sampling wells during AM.
1140 Arrive at WITCTA024. Set up. PID = 505 ppm * Believed not to be functioning properly. PID=0 BZ 0.0 ppm
DTW = below Top of pump TD = 23.34
old custody seal: 0438790
Top of pump = 17.47
1200 Begin purging.
1240 Collect WITCTA024WG13
New custody seal: 0438909
1340 Arrive at WITCTA010. Set up.
Old custody: 0180722
PID: 188 ppm BZ: 0.0 ppm
Top of pump = 14.12
DTW below top of pump
Very strong hydrocarbon odor.
1352 Begin purging
1415 Collect samples
WICTA010WG13
WICTA010WG13ms
WICTA010WG13msD
New custody seal: 0438685

74 Location NASEW JRB, Texas Date 10/25/00

Project / Client October 2000 Quarterly
AFC001-33DDA

1500	Arrive at WHGLTA203. Set up.
	Old Custody seal: 0438846
	Top of pump = 15.38
	DTW below Top of pump.
1515	Begin purging
1530	Stop purging. Well appears to be dry. Pull pump.
	DTW=16.95 TD = 17.6; Pump inlet @ 16.88
	Well dry.
1540	Pack van.
	New seal: 0438768
1550	Arrive at MW-53. Set up.
	Old custody seal: 0438657
	PID = 933 ppm
	PID bz = 0.00 ppm
	DTW = 16.55 TD = 19.78 (soft)
	Pump location is unable to be determined in 4" well.
1604	Begin purging MW-53.
1615	Begin collecting parameters
1630	Collect samples MW-53WG13 Final DTW=16.90
	New Custody seal: 0438736
1645	Head to field house to pack samples & complete paperwork.
1815	Leave site for day.

Location NASFW JRB, Texas Date 10/26/00 75

Project / Client October 2000 Quarterly
AFC001 - 33DDA

0630 Arrive at field house.
Calibrate equipment. Pack vans.
0650 Conduct Health & Safety Mtg
0745 Arrive @ WHGCPA004.
DTW = 45.13
PID = not functioning correctly
0855 Arrive @ HM-123 Set up.
PID = not functioning
DTW =
DTpump =
Unable to open well lid. Pack van
0940 Arrive at HM-116. Set up.
DTW = 25.45 TD = 32.40; PID = 0.9 ppm
Old custody seal: 0438643
†unable to determine DTpump in 4" well
1011 Begin purging well
1023 Collect parameters
1047 Collect HM-116WG13 Final DTW = 25.51
1110 Close well, new custody: 0438908
1122 Arrive at W-153. Set up.
Open well. Custody seal was broken. Old custody seal # 0438642

76 Location NASFW JRB Texas Date 10/26/00

Project / Client October 2000 Quarterly AEC001 - 330D A

	Well cap/lid in place but screws were not tight.
	PID = 0.00ppm (used Kents PID - mine not working)
	DTW = 23.21 Pump Inlet = 34.74
1236	Begin purging well.
1248	Begin collecting parameters
1338	Collect W-153WG13 & DUP04WG13
	Dup04 has time of 12:00 associated w/ it.
	new custody # 0438686
	Final DTW = 23.20, Pack van.
1400	Head back to field house to recalibrate PID w/ vendor.
1430	Go to proshop to find out how to get to WJETA535. Fenced in for golf course renovation.
1505	~~Leyland Etemons~~ AW arrives to open gate. Gary Robinson
1530	Locate well WJETA535. Set up.
	Custody seal # 0438606
	PID = 18.4 ppm PID(BZ) = 0.00 ppm
	DTW = below top of pump
	Top of pump @ 34.75.
1558	Begin purging well.
1605	Begin collecting parameters.

Location NASFW JRB, Texas Date 10/26/00 77

Project / Client October 2000 Quarterly
AFC001 – 33DDA

1625 Collect samples
WJETA535WG13
Fe^{2+} = 7 mg/L
New custody seal # 0438687
Pack van
1505 Dump ~~IDW~~ GW purge water in IDW area.
1525 Pick up samples from Kent & David.
1535 Arrive back at field house. Pack samples, Do paperwork
1900 Leave site for day.

JWall

Location NAS Fort Worth JRB Date 10/24/00

Project / Client Oct 00 Quarterly 15 DEH

700 Arrive at field house [illegible]
Hr safety meeting

927 DTW - 16.77
Set up at WHGLTA035
to develop

940 Surge #1

945 Surge #2 water very turbid

1001 Surge #3

1011 place pump at ~~21.5~~ 19.5' bgs
Bail [illegible] 12 gallons prior to collecting
parameters

1042 Flow rate 450 mL/min

1207 Began collecting parameters

1315 DTW 16.76 Final

1403 Arrive at WHGLFW?. [illegible]

666 146

84 Location NAS Fort Worth JRB Date 10/24/0[illegible]

Project / Client 10/[illegible] Quarterly ~~[illegible]~~ GW

AFC001 - 33DDA

	Set up Equipment to Sample well					
	PID = 0.0ppm					
	broke tag 0438604.					
1414		DTW	17.43			
		TD -	24.0	Feet		
	Placement of pump at 20.5' bgs					
1432	Turbidity = 11 NTU					
	Begin taking Parameters					Battery bad!
35	22.0	570	19.4	273	7.0	7.5
40	22.1	565	29.0	273	6.4	9.3
45	21.5	562	[illegible]	275	6.4	5.1
	Flow rate 200 ml/min					
50	21.5	563	33.6	277	6.6	3.3
55						
1509	Sample HGLKAN017					
1525	Final DTW - 17.42					
1527	Collect AB102400					
1534	Attach tag # 0438695					
	Dis on pump					
1544	Leave Site					

Location NAS Fort Worth JRB Date 10/24/00

Project / Client 10/00 Quarterly SEAD-33

AFC001 - 33DDA

85

1543 ITMW-01T 33014

DTW 15.03

1601 Begin Collecting Parameters

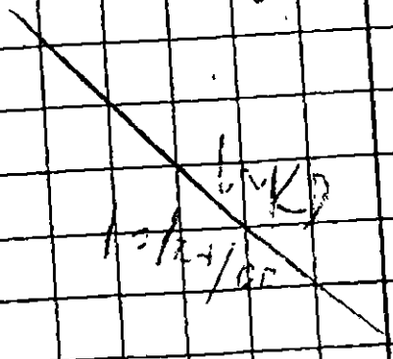
1633 END Collecting Parameters

1643 Collect ITMW-01T

1710 RD Pack Equipment

1740 Pack Samples

1745 END of Day



86 Location DGS Fortunat JRB Date 10/25/00

Project / Client 10/00 Quarterly GW (AFC001 - 33DDA)

625	Arrive at Fieldhouse for Sampling. Calibrate Equipment.
645	H+S meeting
735	Arrive at WHGCTA025 to collect sample PID - 0.0 broke tag # 038611
757	Water Level below top of pump made TP 10/25/00 at 700
811	Began taking parameters
825	Collect VOC for WHGCTA025 tag # 038951
845	Leave Site
845	Arrive at LFOS-56
0911	Begin purging.
0920	Begin collecting parameters.

Location NASFW JRB, TEXAS Date 10/25/00 87

Project / Client October 2000 Quarterly
(AFC001-3300A)

0948 Collect SW LA05-SGWG13
& DW DUP03WG13 with time of
(1200).
1045 7 mg/L FC
Leave s.t.
1104 Arrive at GMI-22-07M
Set up equipment
Broke seal # 0438712
PID read 2000 ppm - faulty
Microtip

1130 Placement of top of pump = 16.45'
Above Water - not measureable

1135 Begin purge
1140 DO > 17 mg/L
Replace membrane
1145 Restart pump
1207 Begin collecting parameters
1209 Beginning to sprinkle
1253 Collect SW GMI-22-07WG13
along with MS/MSD
1321 Leave site
Attach tag # 0438759

666 150

88 Location NAS Fort Worth JRB Date 10.20.00

Project / Client AFC001-33DDA

1332	Arrive at WITCTA010, & BX Cool
1456	Arrived at WAGLTA203
1546	WitGLTA203 DRY
1548	Arrive at MW-53
1643	Leave MW-53
1801	Pack & Coolers of Samples Refer to other Field Book (J. Wallace) for accurate field activities & times.
1805	END of DAY

JWKS
10/25/00

Location NAS Fort Worth JRB Date 10/26/00 89

Project / Client 33DDA

October 2000 Quarterly

0633 Arrive at Field House for H & S meeting and calibrate equipment

0911 Arrive at WHGLTA039 to sample
PID = 1878 ppm 100D
faulty
DTW - 16.73

0913 Begin pump
0927 Begin parameter collection
0956 Collect sample WHGLTA039 (VOC only)
1003 Pack equip.
Decon pump
DTW - 16.63
Attach tag # 0438767
1013 Cease sampling
1050 Arrive at LF03-3D
PID = 2000 (bkgd 1.0)
Breaker seal 0438678
Depth to top of pipe 12.7'
1100 Begin pump

90 Location N41 Eastward Dr. Date 10-26-00

Project / Client 33DDA

October 2000 Quarterly

1117	Begin Collecting parameters
1154	Collect sw LF03-3dup13
	VOC + Metals
	Pack equipment
	Attach tag # 0438758
1205	Leave site
1215	Take PID to S. wall line
1253	Arrive at LF05-16D13
	PID = 0.0 ppm typ of pump 19.0'
	remove tag # 0438641
1252	Begin pump
1334	Cease Collecting parameters
1342	Collect sw LF05-1dup13
	VOC only
1351	pack equipment
	attach tag # 0438757
1358	Leave site
1424	Arrive at LGM1-22-04ML13
	Set up equipment
	PID - 0.0 ppm
	remove tag # 0438716
1432	typ of pump 19.65'
1439	Began pump
	Began Collecting Parameters

Location NAS Fort Worth JRB Date 10-26-00

Project / Client 3300A

91

October 2000 Quarterly

1519 End Collecting Parameter

1522 Collect gw samples of
GMW-22-04m WG13
VOC only

1527 Pack equipment
Attach tag # 04387 KO 766

1540 Leave site

1615 Arrive at Spot 35-6
on South Apron
PID = 0.0ppm
remove tag # 043884
Set up equipment
begin pump
DTW = 23.81'
TP = 26.74
Place pump at 24.5' bgs

1641 Begin purging GW 25

1744 Collected gw for Spot 35-8W G13
VOC only

1801 Pack equipment
Final DTW = 23.98
Attach tag # 04387-35

1809 Leave site to dump purge
water at TPW

666 151

92 Location Nas Fort Worth JRB Date 10/24/00

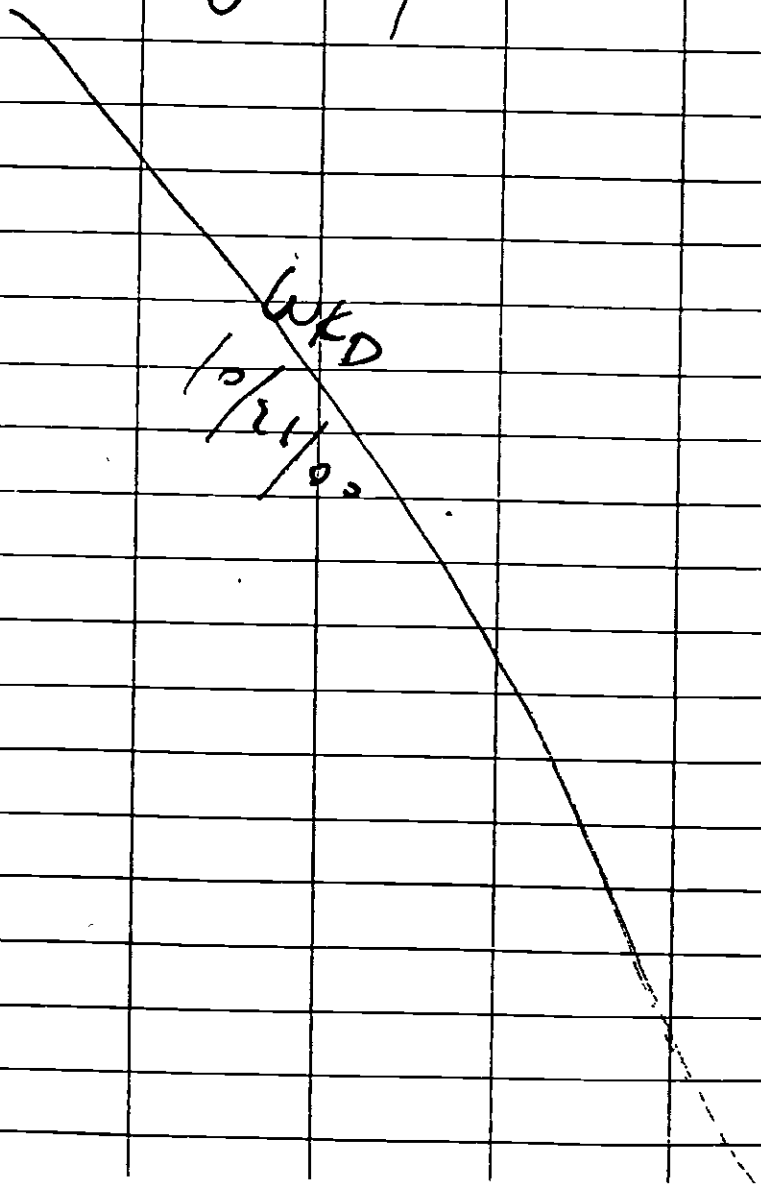
Project / Client 33DDA

October 2000 Quarterly

1827 Collect EB 10200

1847 Pack 1 Cooler for fed ex.

1848 End of day



Location NAS Fort Worth JRB Date 10/27/00

Project / Client Oct 2.00 Quarterly

620 Arrive at Fuel house. Calibrate equipment, H&S meeting

812 Arrive at HM-123

Set up equipment

PID - 103 BZ - 0.00 ppm

Break seal 0438636

829 Begin pump

DTW - 30.09

Pump depth - Could not determine

1/2 4" well

834 Begin collecting parameters

910 End Collecting parameters

Set up for sample

1915 Collect sw (HM-123 thru 13

V.C, alk, methane

932 Fe content = 3 mg/L

Attach tag # 0438746

937 Leave site

1003 Arrive at HMGCTA-012 DPA

Set up equipment

1011 Manhole full of water.

Bailed w/ c-p.

PID - 510 BZ - 0.0

broke tag # 0439848

666 156

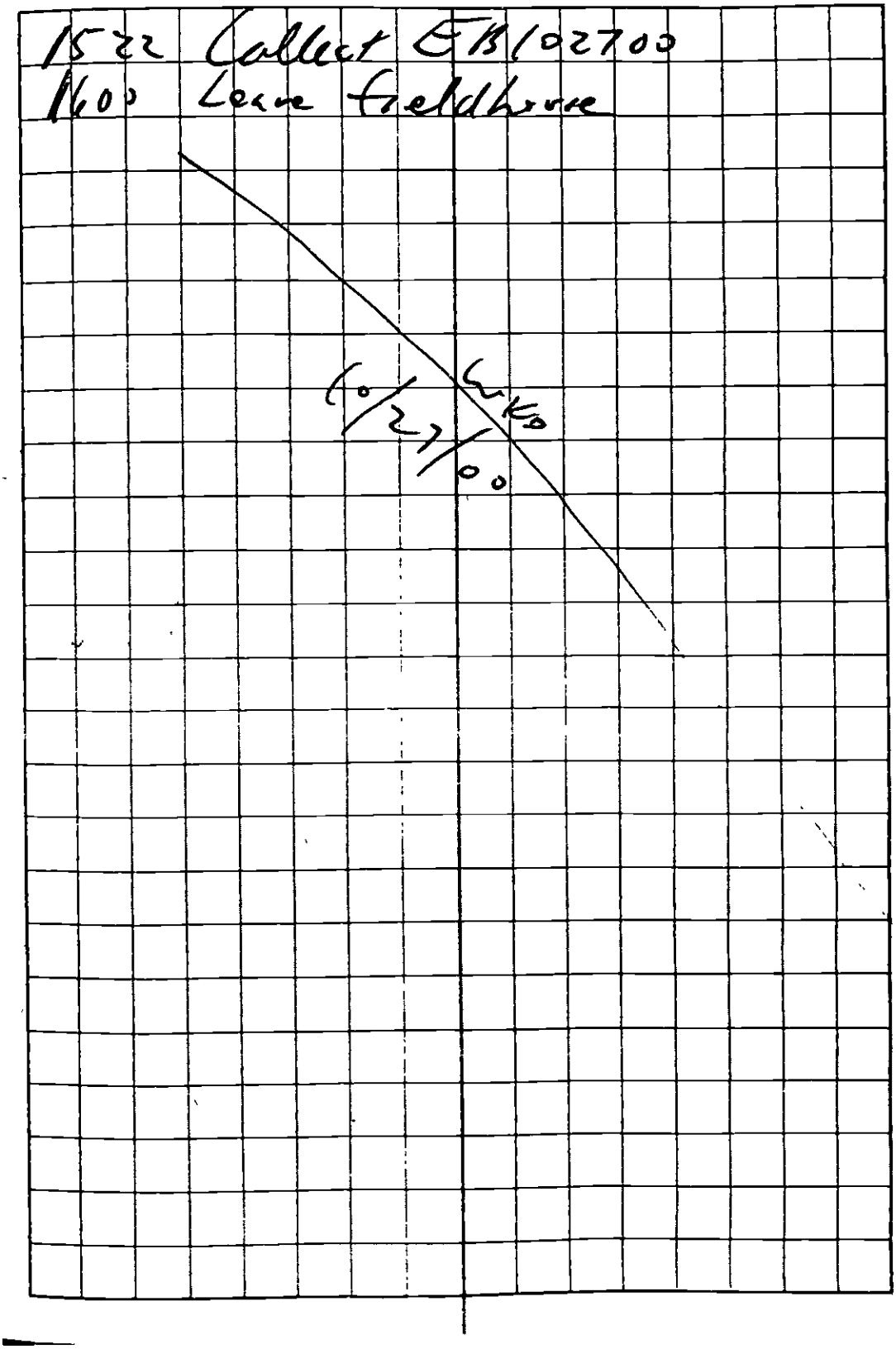
94 Location NAS Fort Worth JRB Date 10-2700

Project / Client Oct 2000 Quarterly

	DTW – 19.11' TD – 23.58'
1029	Begin pumping at 21.3'
1037	Begin collecting parameters
1146	END collecting parameters
1149	Collect sw from WHGLTA012WGR
	VOC only
1156	Pack equipment
	Attach tag # 0478916
	Final DTW = 19.11
12-4	Leave site
1206	Arrive at WHGLTA014
	Set up equip. Broke tag # 0436883
	Decon pump
	PID – 0.76 BZ – 0.0ppm
	DTW – 21.51'
	FD – 25.15' pump @ 23.25'
1327	Begin pump
1332	Begin Collecting parameters
1401	End Collecting Parameters
1409	Sample SW # WHGLTA014WG13
	VOC only
	Final DTW – 21.61'
	Attach tag # 0438925
1438	Leave site

Location NAS Fort Worth JRB Date 10/27/00 95

Project / Client Oct 2000 Quarterly



APPENDIX A.3

FIELD SAMPLING REPORTS

HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB — PROJECT NAME: October Quarterly Sampling

SITE _____ — PROJECT NAME: AFC001 33DDA

SAMPLE INFORMATION

SAMPLE ID: GMI-22-04MWG13 — DATE: 10.26.00 — TIME: 1522

MATRIX TYPE: WG

SAMPLING METHOD: Low Flow

LOT CONTROL #: 0 0 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT) —

SAMPLE END DEPTH (FT) —

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE.

MATRIX SPIKE (MS) —

MATRIX SPIKE DUP (SD) —

FIELD DUP (FD) —

AMBIENT BLANK (AB) —

EQUIPMENT BLANK (EB) ~~EB102603~~ 4W

TRIP BLANK (TB) TB102600

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	0.0 ppm	COLOR	clear	
2nd	0.0 ppm	ODOR	none	
		OTHER		

pH 6.8 Temperature 25.2 (C) Dissolved Oxygen 1.53 (mg/L) Conductivity 700 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 150 (mv) Turbidity 0.6 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR ✓ OVERCAST/RAIN _____ WIND DIRECTION S/SE AMBIENT TEMPERATURE 80°F

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL - Chicago

COMMENTS _____

SAMPLER D. Martinez OBSERVER K. Duran

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB PROJECT NAME October Quarterly Sampling

SITE: _____ PROJECT NAME AFC001 33DDA

SAMPLE INFORMATION

SAMPLE ID GMI-22-07MWG13 DATE: 10/25/00 TIME: 1253

MATRIX TYPE: WG

SAMPLING METHOD: BP

LOT CONTROL #: 0 0 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT) —

SAMPLE END DEPTH (FT) —

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE

MATRIX SPIKE (MS) GMI-22-07MWG13 MS

MATRIX SPIKE DUP (SD) GMI-22-07MWG13 MSD

FIELD DUP (FD) —

AMBIENT BLANK (AB) —

EQUIPMENT BLANK (EB) —

TRIP BLANK (TB) TB102500

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS | SAMPLE CHARACTERISTICS | MISCELLANEOUS

1st NA COLOR Clear

2nd NA ODOR None

OTHER

pH 7.0 Temperature 26.4 (C) Dissolved Oxygen 3.64 (mg/L) Conductivity 7284 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 238 (mv) Turbidity 8.7 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN ✓ WIND DIRECTION S/SE AMBIENT TEMPERATURE 70°F

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL - Chicago

COMMENTS _____

SAMPLER. K. Drian OBSERVER J. Wallace

MATRIX TYPE CODES

DC=DRILL CUTTINGS
SL=SLUDGE
WG=GROUND WATER
SO=SOIL
LH=HAZARDOUS LIQUID WASTE
GS=SOIL GAS
SH=HAZARDOUS SOLID WASTE
WS=SURFACE WATER
SE=SEDIMENT
SW=SWAB/WIPE

SAMPLING METHOD CODES

B=BAILER
G=GRAB
BP=BLADDER PUMP
HA=HAND AUGER
BR=BRASS RING
H=HOLLOW STEM AUGER
CS=COMPOSITE SAMPLE
HP=HYDRO PUNCH
C=CONTINUOUS FLIGHT AUGER
SS=SPLIT SPOON
DT=DRIVEN TUBE
SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB — PROJECT NAME: October Quarterly Groundwater Sampling

SITE: _____ — PROJECT NAME: AFC001-33DDA

SAMPLE INFORMATION

SAMPLE ID: GMI-22-07MWG13MS — DATE: 10-25-00 — TIME: 1253

MATRIX TYPE: WG

SAMPLING METHOD: BP

LOT CONTROL #: 0 0 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG. DEPTH (FT) —

SAMPLE END DEPTH (FT) —

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS) GMI-22-07MWG13MS

MATRIX SPIKE DUP (SD) GMI-22-07MWG13MSD

FIELD DUP (FD) —

AMBIENT BLANK (AB) —

EQUIPMENT BLANK (EB) —

TRIP BLANK (TB) TB102500

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	NA	COLOR clear	
2nd	NA	ODOR. none	
		OTHER	

pH 7.0 Temperature 26.4 (C) Dissolved Oxygen 3.64 (mg/L) Conductivity 724 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 238 (mv) Turbidity 8.7 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN — WIND DIRECTION S/SE AMBIENT TEMPERATURE 70°F

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL - Chicago

COMMENTS _____

SAMPLER K. Duran OBSERVER J. Wallace

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION. NAS Fort Worth JRB PROJECT NAME October Quarterly Groundwater Sampling

SITE: _____ PROJECT NAME AFC001-33DDA

SAMPLE INFORMATION

SAMPLE ID GMI-22-07MWG13MSD DATE 10.25.00 TIME: 1253

MATRIX TYPE: WG

SAMPLING METHOD:

LOT CONTROL #: 0 0 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT) —

SAMPLE END DEPTH (FT) —

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE.

MATRIX SPIKE (MS) GMI-22-07MWG13MS

MATRIX SPIKE DUP (SD) GMI-22-07MWG13MSD

FIELD DUP (FD) —

AMBIENT BLANK (AB) —

EQUIPMENT BLANK (EB) —

TRIP BLANK (TB) TB102500

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	NA	COLOR Clear	
2nd	NA	ODOR none	
		OTHER	

pH 7.0 Temperature 26.4 (C) Dissolved Oxygen 3.64 (mg/L) Conductivity 724 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 239 (mv) Turbidity 8.7 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN ✓ WIND DIRECTION S/SE AMBIENT TEMPERATURE 70°F

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL - Chicago

COMMENTS _____

SAMPLER K. Doran OBSERVER J. Wallace

MATRIX TYPE CODES

DC=DRILL CUTTINGS
WG=GROUND WATER
LH=HAZARDOUS LIQUID WASTE
SH=HAZARDOUS SOLID WASTE
SE=SEDIMENT
SL=SLUDGE
SO=SOIL
GS=SOIL GAS
WS=SURFACE WATER
SW=SWAB/WIPE

SAMPLING METHOD CODES

B=BAILER
BP=BLADDER PUMP
BR=BRASS RING
CS=COMPOSITE SAMPLE
C=CONTINUOUS FLIGHT AUGER
DT=DRIVEN TUBE
G=GRAB
HA=HAND AUGER
H=HOLLOW STEM AUGER
HP=HYDRO PUNCH
SS=SPLIT SPOON
SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC

FIELD SAMPLING REPORT

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LOCATION: NAS Fort Worth JRB, Texas PROJECT NAME October 2000 Quarterly Sampling

SITE: _____ PROJECT NAME AFC001-33DDA

SAMPLE INFORMATION

SAMPLE ID HM-116WG13 DATE: 10/26/00 TIME: 1047

MATRIX TYPE: WG

SAMPLING METHOD: LOW FLOW

LOT CONTROL #: 0 0 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT) N/A

SAMPLE END DEPTH (FT) N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS) —

MATRIX SPIKE DUP (SD). —

FIELD DUP (FD). —

AMBIENT BLANK (AB). —

EQUIPMENT BLANK (EB): —

TRIP BLANK (TB) TB102600

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
1 L poly	1	Cool to 4C/HNO3 pH<2	SW6010B	Chromium
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 0.00 ppm	COLOR Clear	
2nd 0.00 ppm	ODOR none	
	OTHER	

pH 6.55 Temperature 21.97 (C) Dissolved Oxygen 3.48 (mg/L) Conductivity 483 (umhos/cm)

Iron N/A (mg/L) Oxidation/Reduction Potential 231.0 (mv) Turbidity 1.79 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN X WIND DIRECTION SE AMBIENT TEMPERATURE 70°

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS _____

SAMPLER: J. Wallace OBSERVER: _____

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas PROJECT NAME October 2000 Quarterly Sampling

SITE: _____ PROJECT NAME AFC001-33DDA

SAMPLE INFORMATION

SAMPLE ID HM-123WG13

DATE: 10-27-00 TIME: 919

MATRIX TYPE: WG

SAMPLING METHOD: RP

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT) —

SAMPLE END DEPTH (FT) —

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS) —

MATRIX SPIKE DUP (SD) —

FIELD DUP (FD) —

AMBIENT BLANK (AB). —

EQUIPMENT BLANK (EB) EB102700

TRIP BLANK (TB): TB102700

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
1 L Poly	1	Cool to 4C	E310 1/SW9056	Alkalinity/Anions
40 mL VOA	3	Cool to 4C/HCl pH<2	RSK-175	Methane, Ethene, Ethane
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260B	VOCs
500 mL poly	1	Cool to 4C/H2SO4	SW9060	TOC

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	103	COLOR clear	
2nd	0.0	ODOR none	
		OTHER	

pH 6.7 Temperature 21.2 (C) Dissolved Oxygen 1.06 (mg/L) Conductivity 438 (umhos/cm)

Iron 3 (mg/L) Oxidation/Reduction Potential 209 (mv) Turbidity 0.9 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR ✓ OVERCAST/RAIN _____ WIND DIRECTION S/SE AMBIENT TEMPERATURE 71°F

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL - Chicago

COMMENTS. _____

SAMPLER D. Martinez OBSERVER K. Dugan

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION. NAS Fort Worth JRB — PROJECT NAME October Quarterly Sampling

SITE. _____ — PROJECT NAME AFC001 33DDA

SAMPLE INFORMATION

SAMPLE ID ITMW-01TWG13 — DATE: 10 24 00 — TIME: 1643

MATRIX TYPE: WG

SAMPLING METHOD: BP

LOT CONTROL #. 1 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #. —

SAMPLE BEG DEPTH (FT) —

SAMPLE END DEPTH (FT) —

GRAB (✓) COMPOUND ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS) —

MATRIX SPIKE DUP (SD) —

FIELD DUP (FD) —

AMBIENT BLANK (AB) AB102403

EQUIPMENT BLANK (EB) EB 102403

TRIP BLANK (TB) TB 102403

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
1 L Poly	1	Cool to 4C	E310 1/SW9056	Alkalinity/Anions
40 mL VOA	3	Cool to 4C/HCl pH<2	RSK-175	Methane, Ethene, Ethane
1 L Poly	1	Cool to 4C/HNO3 pH<2	SW6010A/SW7470A	Total Metals + mercury
mL VOA	3	Cool to 4C/HCl to pH<2	SW8260B	VOCs
500 mL poly	1	Cool to 4C/H2SO4	SW9060	TOC

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	0.0	COLOR	Clear	
2nd	0.0	ODOR	None	
		OTHER		

pH 6.1 Temperature 23.3 (C) Dissolved Oxygen 0.80 (mg/L) Conductivity 660 (umhos/cm)

Iron 0.0 (mg/L) Oxidation/Reduction Potential 126 (mv) Turbidity 0.1 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN ✓ WIND DIRECTION S/SE AMBIENT TEMPERATURE 70°F

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL - Chicago

COMMENTS _____

SAMPLER D. Martinez OBSERVER K. Dugan

MATRIX TYPE CODES

DC=DRILL CUTTINGS
WG=GROUND WATER
LH=HAZARDOUS LIQUID WASTE
SH=HAZARDOUS SOLID WASTE
SD=SEDIMENT
SL=SLUDGE
SO=SOIL
GS=SOIL GAS
WS=SURFACE WATER
SW=SWAB/WIPE

SAMPLING METHOD CODES

B=BAILER
BP=BLADDER PUMP
BR=BRASS RING
CS=COMPOSITE SAMPLE
C=CONTINUOUS FLIGHT AUGER
DT=DRIVEN TUBE
G=GRAB
HA=HAND AUGER
H=HOLLOW STEM AUGER
HP=HYDRO PUNCH
SS=SPLIT SPOON
SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas
PROJECT NAME: October 2000 Quarterly Sampling
SITE: _____
PROJECT NAME: AFC001-33DDA

SAMPLE INFORMATION

SAMPLE ID: LF03-3DWG13
DATE: 10·26·00 TIME: 1158

MATRIX TYPE: WG
SAMPLING METHOD: Low Flow
LOT CONTROL #: 0 0 1 A
(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)
CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT) —
SAMPLE END DEPTH (FT) —
GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS) —
MATRIX SPIKE DUP (SD). —
FIELD DUP (FD) —
AMBIENT BLANK (AB) —
EQUIPMENT BLANK (EB) ~~EB102600~~ qw
TRIP BLANK (TB). TB102600

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
1 L poly	1	Cool to 4C/HNO3 pH<2	SW6010B	Chromium
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	0.00	COLOR Clear	
2nd	0.00	ODOR None	
		OTHER	

pH 6.7 Temperature 24.5 (C) Dissolved Oxygen 2.57 (mg/L) Conductivity 672 (umhos/cm)
Iron — (mg/L) Oxidation/Reduction Potential 231 (mv) Turbidity 5.8 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN ✓ WIND DIRECTION S/SE AMBIENT TEMPERATURE 75°F
SHIPMENT VIA: FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____
SHIPPED TO: STL - Chicago
COMMENTS. _____
SAMPLER D. Martinez OBSERVER K. Duran

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB — PROJECT NAME: October Quarterly Sampling

SITE. _____ — PROJECT NAME: AFC001 33DDA

SAMPLE INFORMATION

SAMPLE ID: LF05-01WG13 — DATE: 10·26·00 — TIME: 1342

MATRIX TYPE: WG

SAMPLING METHOD: Low Flow

LOT CONTROL #: 0 0 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT) —

SAMPLE END DEPTH (FT) —

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS) —

MATRIX SPIKE DUP (SD) —

FIELD DUP (FD) —

AMBIENT BLANK (AB) —

EQUIPMENT BLANK (EB) EB102600-4W

TRIP BLANK (TB) TB102600

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	0.2	COLOR Clear	
2nd	0.0	ODOR None	
		OTHER	

pH 6.8 Temperature 23.7 (C) Dissolved Oxygen 1.14 (mg/L) Conductivity 627 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential -121 (mv) Turbidity 2.0 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN ✓ WIND DIRECTION S/SE AMBIENT TEMPERATURE 75°F

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL - Chicago

COMMENTS _____

SAMPLER D. Martinez OBSERVER K. Duran

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB PROJECT NAME October Quarterly Sampling

SITE: _____ PROJECT NAME AFC001 33DDA

SAMPLE INFORMATION

SAMPLE ID LF05-5GWG13 DATE. 10·25·00 TIME: 948

MATRIX TYPE WG

SAMPLING METHOD: BP

LOT CONTROL #: 0 0 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY # _____

SAMPLE BEG DEPTH (FT) —

SAMPLE END DEPTH (FT) —

GRAB (→) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE

MATRIX SPIKE (MS) —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD) DUP03GWG13

AMBIENT BLANK (AB). —

EQUIPMENT BLANK (EB) —

TRIP BLANK (TB) TB102500

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
1 L Poly	1	Cool to 4C	E310 1/SW9056	Alkalinity/Anions
40 mL VOA	3	Cool to 4C/HCl pH<2	RSK-175	Methane, Ethene, Ethane
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260B	VOCs
500 mL poly	1	Cool to 4C/H2SO4	SW9060	TOC

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	0.0	COLOR Clear	
2nd	0.0	ODOR None	
		OTHER	

pH 6.9 Temperature 22.5 (C) Dissolved Oxygen 1.81 (mg/L) Conductivity 607 (umhos/cm)

Iron 7 (mg/L) Oxidation/Reduction Potential -18.2 (mv) Turbidity 1.4 (NTU)

GENERAL INFORMATION

WEATHER. SUN/CLEAR _____ OVERCAST/RAIN ✓ WIND DIRECTION S/SE AMBIENT TEMPERATURE 70°F

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL - Chicago

COMMENTS _____

SAMPLER J. Wallace OBSERVER K. Duran

MATRIX TYPE CODES

DC=DRILL CUTTINGS
WG=GROUND WATER
LH=HAZARDOUS LIQUID WASTE
SH=HAZARDOUS SOLID WASTE
SE=SEDIMENT
SL=SLUDGE
SO=SOIL
GS=SOIL GAS
WS=SURFACE WATER
SW=SWAB/WIPE

SAMPLING METHOD CODES

B=BAILER
BP=BLADDER PUMP
BR=BRASS RING
CS=COMPOSITE SAMPLE
C=CONTINUOUS FLIGHT AUGER
DT=DRIVEN TUBE
G=GRAB
HA=HAND AUGER
H=HOLLOW STEM AUGER
HP=HYDRO PUNCH
SS=SPLIT SPOON
SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB PROJECT NAME: October Quarterly Groundwater Sampling

SITE: _____ PROJECT NAME: AFC001-33DDA

SAMPLE INFORMATION

SAMPLE ID: DUP03GW13 (gw) DATE: 10/25/00 TIME: 1200

MATRIX TYPE: WG

SAMPLING METHOD: LOW FLOW

LOT CONTROL #: 00 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT): N/A

SAMPLE END DEPTH (FT): N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): LF05-5GWG13

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): —

TRIP BLANK (TB): TB102500

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
1 L Poly	1	Cool to 4C	E310 1/SW9056	Alkalinity/Anions
40 mL VOA	3	Cool to 4C/HCl pH<2	RSK-175	Methane, Ethene, Ethane
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260B	VOCs
0 mL poly	1	Cool to 4C/H2SO4	SW9060	TOC

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	0.0	COLOR	Clear	
2nd	0.0	ODOR	None	
		OTHER		

pH 6.4 Temperature 22.5 (C) Dissolved Oxygen 1.81 (mg/L) Conductivity 603 (umhos/cm)

Iron 7 (mg/L) Oxidation/Reduction Potential -18.2 (mv) Turbidity 1.4 (NTU)

GENERAL INFORMATION

WEATHER. SUN/CLEAR _____ OVERCAST/RAIN _____ WIND DIRECTION S/SE AMBIENT TEMPERATURE 70°F

SHIPMENT VIA: FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER. J. Wallace OBSERVER K. Duran

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB — PROJECT NAME: October Quarterly Sampling

SITE: _____ — PROJECT NAME: AFC001 33DDA

SAMPLE INFORMATION

SAMPLE ID: MW-53WG13 — DATE: 10/25/00 — TIME: 1630

MATRIX TYPE: WG

SAMPLING METHOD: LOW FLOW

LOT CONTROL #: 0 0 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT): N/A

SAMPLE END DEPTH (FT): N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): —

TRIP BLANK (TB): TB102500

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS: 1st 933 ppm; 2nd 0.00 ppm

SAMPLE CHARACTERISTICS: COLOR clear; ODOR none; OTHER

MISCELLANEOUS:

pH 6.70 Temperature 24.50 (C) Dissolved Oxygen 6.08 (mg/L) Conductivity 521 (umhos/cm)

Iron N/A (mg/L) Oxidation/Reduction Potential 119.9 (mv) Turbidity 3.1 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN X WIND DIRECTION SE AMBIENT TEMPERATURE 80

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL - Chicago

COMMENTS _____

SAMPLER: K. Duran OBSERVER: J. Wallace

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB — PROJECT NAME: October Quarterly Sampling

SITE: _____ — PROJECT NAME: AFC001 33DDA

SAMPLE INFORMATION

SAMPLE ID: W-153WG13 — DATE: 10/26/00 — TIME: 1338

MATRIX TYPE: WG

SAMPLING METHOD: LOW FLOW

LOT CONTROL # 0 0 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT): N/A

SAMPLE END DEPTH (FT): N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): DUP04WG13 (Time 1200)

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): —

TRIP BLANK (TB): TB102600

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS: 1st 0.00 ppm; 2nd 0.00 ppm

SAMPLE CHARACTERISTICS: COLOR clear; ODOR none; OTHER

MISCELLANEOUS

pH 6.63 Temperature 23.77 (C) Dissolved Oxygen 3.29 (mg/L) Conductivity 492 (umhos/cm)

Iron N/A (mg/L) Oxidation/Reduction Potential 116.7 (mv) Turbidity 7.03 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN X WIND DIRECTION S AMBIENT TEMPERATURE 75°

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL - Chicago

COMMENTS _____

SAMPLER: J. Wallace OBSERVER _____

MATRIX TYPE CODES

DC=DRILL CUTTINGS; SL=SLUDGE; WG=GROUND WATER; SO=SOIL; LH=HAZARDOUS LIQUID WASTE; GS=SOIL GAS; SH=HAZARDOUS SOLID WASTE; WS=SURFACE WATER; SE=SEDIMENT; SW=SWAB/WIPE

SAMPLING METHOD CODES

B=BAILER; BP=BLADDER PUMP; BR=BRASS RING; CS=COMPOSITE SAMPLE; C=CONTINUOUS FLIGHT AUGER; DT=DRIVEN TUBE; G=GRAB; HA=HAND AUGER; H=HOLLOW STEM AUGER; HP=HYDRO PUNCH; SS=SPLIT SPOON; SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB — PROJECT NAME: October Quarterly Groundwater Sampling

SITE: _____ — PROJECT NAME: AFC001-33DDA

SAMPLE INFORMATION

SAMPLE ID: DUP04WG13 GW — DATE: 10/26/00 — TIME: 1200

MATRIX TYPE: WG

SAMPLING METHOD: LOW-FLOW

LOT CONTROL #: A0 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT): N/A

SAMPLE END DEPTH (FT): N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): W-153WG13 (Time 1338)

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): —

TRIP BLANK (TB): TB102600

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS: 1st 0.00 ppm; 2nd 0.00 ppm

SAMPLE CHARACTERISTICS: COLOR clear; ODOR none; OTHER

MISCELLANEOUS

pH 6.63 Temperature 23.77 (C) Dissolved Oxygen 3.29 (mg/L) Conductivity 492 (umhos/cm)

Iron N/A (mg/L) Oxidation/Reduction Potential 116.7 (mv) Turbidity 7.03 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN X WIND DIRECTION S AMBIENT TEMPERATURE 75°

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL - Chicago

COMMENTS. _____

SAMPLER. J. Wallace OBSERVER _____

MATRIX TYPE CODES

DC=DRILL CUTTINGS; SL=SLUDGE; WG=GROUND WATER; SO=SOIL; LH=HAZARDOUS LIQUID WASTE; GS=SOIL GAS; SH=HAZARDOUS SOLID WASTE; WS=SURFACE WATER; SE=SEDIMENT; SW=SWAB/WIPE

SAMPLING METHOD CODES

B=BAILER; BP=BLADDER PUMP; BR=BRASS RING; CS=COMPOSITE SAMPLE; C=CONTINUOUS FLIGHT AUGER; DT=DRIVEN TUBE; G=GRAB; HA=HAND AUGER; H=HOLLOW STEM AUGER; HP=HYDRO PUNCH; SS=SPLIT SPOON; SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION NAS Fort Worth JRB — PROJECT NAME October Quarterly Sampling

SITE: _____ — PROJECT NAME AFC001 33DDA

SAMPLE INFORMATION

SAMPLE ID WHGLRW015WG13 — DATE: 10/24/00 — TIME: 0940

MATRIX TYPE: WG

SAMPLING METHOD: LOW FLOW

LOT CONTROL # 0 0 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #. _____

SAMPLE BEG DEPTH (FT). N/A

SAMPLE END DEPTH (FT) N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS) —

MATRIX SPIKE DUP (SD) —

FIELD DUP (FD) —

AMBIENT BLANK (AB) 1

EQUIPMENT BLANK (EB) —

TRIP BLANK (TB) TB102400

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	0.00ppm	COLOR	Clear	
2nd	0.00ppm	ODOR	none	
		OTHER		

pH 5.95 Temperature 21.10 (C) Dissolved Oxygen 3.87 (mg/L) Conductivity 592 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 238.1 (mv) Turbidity 5.19 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN X WIND DIRECTION SE AMBIENT TEMPERATURE 70

SHIPMENT VIA: FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL - Chicago

COMMENTS _____

SAMPLER J. Wallace OBSERVER K. Duran

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB — PROJECT NAME: October Quarterly Sampling

SITE: Off Hwy 183 — PROJECT NAME: AFC001 33DDA

SAMPLE INFORMATION

SAMPLE ID: WHGLRW017WG13 — DATE: 10/24/00 — TIME: 1519

MATRIX TYPE: WG

SAMPLING METHOD: BP (Low Flow)

LOT CONTROL #: 1 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT): —

SAMPLE END DEPTH (FT): —

GRAB (✓) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): AB 102400

EQUIPMENT BLANK (EB): EB 102400

TRIP BLANK (TB): TB 102400

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 0.3	COLOR Clear	
2nd 0.2	ODOR None	
	OTHER	

pH 6.7 Temperature 21.5 (C) Dissolved Oxygen 2.89 (mg/L) Conductivity 564 (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential 286 (mv) Turbidity 2.7 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN ✓ WIND DIRECTION S/SE AMBIENT TEMPERATURE 78°F

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL - Chicago

COMMENTS _____

SAMPLER D Martinez OBSERVER K. DUGAN

MATRIX TYPE CODES

DC=DRILL CUTTINGS
WG=GROUND WATER
LH=HAZARDOUS LIQUID WASTE
SH=HAZARDOUS SOLID WASTE
SE=SEDIMENT
SL=SLUDGE
SO=SOIL
GS=SOIL GAS
WS=SURFACE WATER
SW=SWAB/WIPE

SAMPLING METHOD CODES

B=BAILER
BP=BLADDER PUMP
BR=BRASS RING
CS=COMPOSITE SAMPLE
C=CONTINUOUS FLIGHT AUGER
DT=DRIVEN TUBE
G=GRAB
HA=HAND AUGER
H=HOLLOW STEM AUGER
HP=HYDRO PUNCH
SS=SPLIT SPOON
SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB — PROJECT NAME: October Quarterly Sampling

SITE: _____ — PROJECT NAME: AFC001 33DDA

SAMPLE INFORMATION

SAMPLE ID: WHGLTA025WG13 — DATE: 10/25/00 — TIME: 0835

MATRIX TYPE: WG

SAMPLING METHOD: LOW FLOW

LOT CONTROL #: 0 0 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #. _____

SAMPLE BEG DEPTH (FT) N/A

SAMPLE END DEPTH (FT) N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS) —

MATRIX SPIKE DUP (SD) —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB) ~~EB102500~~ GW

TRIP BLANK (TB): TB102500

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	0.00 ppm	COLOR: cloudy	
2nd	0.00 ppm	ODOR: none	
		OTHER	

pH 6.47 Temperature 21.94 (C) Dissolved Oxygen 5.20 (mg/L) Conductivity 407 (umhos/cm)

Iron N/A (mg/L) Oxidation/Reduction Potential 217.5 (mv) Turbidity 6.1 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN X WIND DIRECTION E AMBIENT TEMPERATURE 70°

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL - Chicago

COMMENTS. _____

SAMPLER J. Wallace OBSERVER K. Duran

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION. NAS Fort Worth JRB PROJECT NAME October Quarterly Sampling

SITE: _____ PROJECT NAME AFC001 33DDA

SAMPLE INFORMATION

SAMPLE ID WITCTA010WG13 DATE: 10/25/00 TIME. 1415

MATRIX TYPE: WG

SAMPLING METHOD. LOW FLOW

LOT CONTROL #: 0 0 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT) N/A

SAMPLE END DEPTH (FT) N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS) WITCTA010WG13MS

MATRIX SPIKE DUP (SD) WITCTA010WG13MSD

FIELD DUP (FD) —

AMBIENT BLANK (AB) —

EQUIPMENT BLANK (EB) —

TRIP BLANK (TB) TB102500

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
1 L Poly	1	Cool to 4C/HNO3 pH<2	SW6010A/SW7470A	Total Metals + mercury
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 188 ppm	COLOR Clear	
2nd 0.0 ppm	ODOR strong hydrocarbon	
	OTHER	

pH 6.90 Temperature 27.2 (C) Dissolved Oxygen 0.63 (mg/L) Conductivity 422 (umhos/cm)

Iron N/A (mg/L) Oxidation/Reduction Potential -193.7 (mv) Turbidity 4.5 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN X WIND DIRECTION SE AMBIENT TEMPERATURE 75°

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS _____

SAMPLER J. Wallace OBSERVER K. Duran

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION. NAS Fort Worth JRB — PROJECT NAME. October Quarterly Groundwater Sampling

SITE. _____ — PROJECT NAME AFC001-33DDA

SAMPLE INFORMATION

SAMPLE ID ~~WITCTA024WG13MS~~ ~~gw~~ WITCTA010WG13MS — DATE 10/25/00 — TIME: 1415

MATRIX TYPE. WG

SAMPLING METHOD:

LOT CONTROL #: 0 0 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT) N/A

SAMPLE END DEPTH (FT) N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS) WITCTA010WG13MS

MATRIX SPIKE DUP (SD) WITCTA010WG13MSD

FIELD DUP (FD) —

AMBIENT BLANK (AB) —

EQUIPMENT BLANK (EB) —

TRIP BLANK (TB) TB102500

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
1 L Poly	1	Cool to 4C /HNO3	SW6010B ~~E310.1/SW9056~~ 7470	Metals + Hg ~~Alkalinity/Anions~~
~~40 mL VOA~~	~~3~~	~~Cool to 4C/HCl pH<2~~	~~RSK-175~~	Methane, Ethene, Ethane gw
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260B	VOCs
~~0 mL poly~~	~~1~~	~~Cool to 4C/H2SO4~~	~~SW9060~~	TOC gw

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st	188 ppm	COLOR Clear	
2nd	0.0 ppm	ODOR Strong petroleum	
		OTHER	

pH 6.90 Temperature 27.02 (C) Dissolved Oxygen 0.63 (mg/L) Conductivity 422 (umhos/cm)

Iron N/A (mg/L) Oxidation/Reduction Potential -193.7 (mv) Turbidity 4.5 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN X WIND DIRECTION SE AMBIENT TEMPERATURE 75°

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL - Chicago

COMMENTS _____

SAMPLER J. Wallace OBSERVER K. Duran

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION. NAS Fort Worth JRB — PROJECT NAME October Quarterly Groundwater Sampling

SITE. _____ — PROJECT NAME AFC001-33DDA

SAMPLE INFORMATION

SAMPLE ID ~~WITCTA024WG13MSD~~ WITCTA010WG13MSD

DATE: 10/25/00 TIME: 1415

MATRIX TYPE: WG

SAMPLING METHOD. LOW FLOW

LOT CONTROL #: 0 0 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT) N/A

SAMPLE END DEPTH (FT) N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS) WITCTA010WG13MS

MATRIX SPIKE DUP (SD). WITCTA010WG13MSD

FIELD DUP (FD) —

AMBIENT BLANK (AB) —

EQUIPMENT BLANK (EB) —

TRIP BLANK (TB) TB102500

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
1 L Poly	1	Cool to 4C /HNO_3	SW6010B ~~E310.1/SW9056~~ 7470	metals + Hg ~~Alkalinity/Anions~~
~~40 mL VOA~~	~~3~~	~~Cool to 4C/HCl pH<2~~	~~RSK-175~~	~~Methane, Ethene, Ethane~~ gw
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260B	VOCs
~~500 mL poly~~	1	~~Cool to 4C/H2SO4~~	~~SW9060~~	~~TOC~~ gw

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	188 ppm	COLOR	clear	
2nd	0.00 ppm	ODOR	strong petroleum	
		OTHER		

pH 6.90 Temperature 27.02 (C) Dissolved Oxygen 0.63 (mg/L) Conductivity 428 (umhos/cm)

Iron N/A (mg/L) Oxidation/Reduction Potential -193.3 (mv) Turbidity 4.5 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN X WIND DIRECTION SE AMBIENT TEMPERATURE 75°

SHIPMENT VIA. FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL - Chicago

COMMENTS _____

SAMPLER J. Wallace OBSERVER K. Duran

MATRIX TYPE CODES

DC=DRILL CUTTINGS
SL=SLUDGE
WG=GROUND WATER
SO=SOIL
LH=HAZARDOUS LIQUID WASTE
GS=SOIL GAS
SH=HAZARDOUS SOLID WASTE
WS=SURFACE WATER
SE=SEDIMENT
SW=SWAB/WIPE

SAMPLING METHOD CODES

B=BAILER
G=GRAB
BP=BLADDER PUMP
HA=HAND AUGER
BR=BRASS RING
H=HOLLOW STEM AUGER
CS=COMPOSITE SAMPLE
HP=HYDRO PUNCH
C=CONTINUOUS FLIGHT AUGER
SS=SPLIT SPOON
DT=DRIVEN TUBE
SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB — PROJECT NAME: October Quarterly Sampling

SITE: _____ — PROJECT NAME: AFC001 33DDA

SAMPLE INFORMATION

SAMPLE ID: WITCTA024WG13 — DATE: 10/25/00 — TIME: 1240

MATRIX TYPE: WG

SAMPLING METHOD: LOW FLOW

LOT CONTROL #: 0 0 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT): N/A

SAMPLE END DEPTH (FT): N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD): —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): —

TRIP BLANK (TB): TB102500

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
1 L Poly	1	Cool to 4C	E310 1/SW9056	Alkalinity/Anions
40 mL VOA	3	Cool to 4C/HCl pH<2	RSK-175	Methane, Ethene, Ethane
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260B	VOCs
250 mL poly	1	Cool to 4C/H2SO4	SW9060	TOC

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st 5 * ppm	COLOR Clear	
2nd 0.00 ppm	ODOR none	
	OTHER	

pH 6.87 Temperature 25.45 (C) Dissolved Oxygen 0.58 (mg/L) Conductivity 676 (umhos/cm)

Iron 1.3 (mg/L) Oxidation/Reduction Potential -119.4 (mv) Turbidity 4.67 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN X WIND DIRECTION SE AMBIENT TEMPERATURE 70°

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL - Chicago

COMMENTS * PID reading high - possibly

SAMPLER. J. Wallace OBSERVER. K. Duran

MATRIX TYPE CODES

DC=DRILL CUTTINGS; SL=SLUDGE; WG=GROUND WATER; SO=SOIL; LH=HAZARDOUS LIQUID WASTE; GS=SOIL GAS; SH=HAZARDOUS SOLID WASTE; WS=SURFACE WATER; SD=SEDIMENT; SW=SWAB/WIPE

SAMPLING METHOD CODES

B=BAILER; BP=BLADDER PUMP; BR=BRASS RING; CS=COMPOSITE SAMPLE; C=CONTINUOUS FLIGHT AUGER; DT=DRIVEN TUBE; G=GRAB; HA=HAND AUGER; H=HOLLOW STEM AUGER; HP=HYDRO PUNCH; SS=SPLIT SPOON; SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB PROJECT NAME October Quarterly Sampling

SITE: _____ PROJECT NAME AFC001 33DDA

SAMPLE INFORMATION

SAMPLE ID WJETA535WG13 DATE: 10/26/00 TIME: 1625

MATRIX TYPE: WG

SAMPLING METHOD: Low - Flow

LOT CONTROL #. 0 0 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT) N/A

SAMPLE END DEPTH (FT) N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS) —

MATRIX SPIKE DUP (SD) —

FIELD DUP (FD) —

AMBIENT BLANK (AB). —

EQUIPMENT BLANK (EB) —

TRIP BLANK (TB) TB102600

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
1 L Poly	1	Cool to 4C	E310 1/SW9056	Alkalinity/Anions
40 mL VOA	3	Cool to 4C/HCl pH<2	RSK-175	Methane, Ethene, Ethane
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260B	VOCs
500 mL poly	1	Cool to 4C/H2SO4	SW9060	TOC

NOTABLE OBSERVATIONS

PID READINGS

1st 18.4 ppm

2nd 0.00 ppm

SAMPLE CHARACTERISTICS

COLOR clear

ODOR none

OTHER

MISCELLANEOUS

pH 6.48 Temperature 22.97 (C) Dissolved Oxygen 6.54 (mg/L) Conductivity 491 (umhos/cm)

Iron ~~N/A~~ 7.0 (mg/L) Oxidation/Reduction Potential 194.1 (mv) Turbidity 3.98 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN X WIND DIRECTION SE AMBIENT TEMPERATURE 75°

SHIPMENT VIA FEDEX __x__ HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL - Chicago

COMMENTS _____

SAMPLER J. Wallace OBSERVER _____

MATRIX TYPE CODES

DC=DRILL CUTTINGS
WG=GROUND WATER
LH=HAZARDOUS LIQUID WASTE
SH=HAZARDOUS SOLID WASTE
SE=SEDIMENT
SL=SLUDGE
SO=SOIL
GS=SOIL GAS
WS=SURFACE WATER
SW=SWAB/WIPE

SAMPLING METHOD CODES

B=BAILER
BP=BLADDER PUMP
BR=BRASS RING
CS=COMPOSITE SAMPLE
C=CONTINUOUS FLIGHT AUGER
DT=DRIVEN TUBE
G=GRAB
HA=HAND AUGER
H=HOLLOW STEM AUGER
HP=HYDRO PUNCH
SS=SPLIT SPOON
SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas — PROJECT NAME: October 2000 Quarterly Sampling

SITE: WHCLRW017 (Mg Hwy 183) — PROJECT NAME: AFC001-33DDA

SAMPLE INFORMATION

SAMPLE ID: AB102400 — DATE: 10/24/00 — TIME: 1527

MATRIX TYPE: WG

SAMPLING METHOD: Low Flow

LOT CONTROL #: 1 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT) –

SAMPLE END DEPTH (FT) –

GRAB (X) COMPOUND ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS) –

MATRIX SPIKE DUP (SD) –

FIELD DUP (FD) –

AMBIENT BLANK (AB) AB 102400

EQUIPMENT BLANK (EB) EB 102400

TRIP BLANK (TB) TB 102400

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	0.0	COLOR	Clear	
2nd	0.0	ODOR	None	
		OTHER		

pH 6.7 Temperature 21.5 (C) Dissolved Oxygen 2.19 (mg/L) Conductivity 562 (umhos/cm)

Iron – (mg/L) Oxidation/Reduction Potential 286 (mv) Turbidity 2.7 (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN – WIND DIRECTION S/SE AMBIENT TEMPERATURE 70°F

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO: STL - Chicago

COMMENTS: _____

SAMPLER: D. Martinez OBSERVER: K. Dunn

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas PROJECT NAME October 2000 Quarterly Sampling

SITE: _____ PROJECT NAME AFC001-33DDA

SAMPLE INFORMATION

SAMPLE ID EB102400 DATE: 10/24/00 TIME: 1700

MATRIX TYPE: WG

SAMPLING METHOD: GRAB

LOT CONTROL #: 1 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #. _____

SAMPLE BEG DEPTH (FT) N/A

SAMPLE END DEPTH (FT) N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE.

MATRIX SPIKE (MS) —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD) —

AMBIENT BLANK (AB) AB102400

EQUIPMENT BLANK (EB) EB102400

TRIP BLANK (TB) TB102400

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st —	COLOR —	
2nd —	ODOR —	
	OTHER	

pH — Temperature — (C) Dissolved Oxygen — (mg/L) Conductivity — (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential — (mv) Turbidity — (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE _____

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL - Chicago

COMMENTS: _____

SAMPLER J. Wallace OBSERVER K. Duran

MATRIX TYPE CODES

DC=DRILL CUTTINGS
WG=GROUND WATER
LH=HAZARDOUS LIQUID WASTE
SH=HAZARDOUS SOLID WASTE
SE=SEDIMENT
SL=SLUDGE
SO=SOIL
GS=SOIL GAS
WS=SURFACE WATER
SW=SWAB/WIPE

SAMPLING METHOD CODES

B=BAILER
BP=BLADDER PUMP
BR=BRASS RING
CS=COMPOSITE SAMPLE
C=CONTINUOUS FLIGHT AUGER
DT=DRIVEN TUBE
G=GRAB
HA=HAND AUGER
H=HOLLOW STEM AUGER
HP=HYDRO PUNCH
SS=SPLIT SPOON
SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas PROJECT NAME October 2000 Quarterly Sampling

SITE: _____ PROJECT NAME AFC001-33DDA

SAMPLE INFORMATION

SAMPLE ID TB102400 DATE: 10/24/00 TIME: 0800

MATRIX TYPE: WG

SAMPLING METHOD: GRAB

LOT CONTROL #: 1 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #. _____

SAMPLE BEG DEPTH (FT) N/A

SAMPLE END DEPTH (FT) N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —

MATRIX SPIKE DUP (SD): —

FIELD DUP (FD) —

AMBIENT BLANK (AB): AB102400

EQUIPMENT BLANK (EB) EB102400

TRIP BLANK (TB) TB102400

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	—	COLOR	—	
2nd	—	ODOR	—	
		OTHER		

pH — Temperature — (C) Dissolved Oxygen — (mg/L) Conductivity — (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential — (mv) Turbidity — (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE _____

SHIPMENT VIA FEDEX __x__ HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO STL-Chicago

COMMENTS _____

SAMPLER J. Wallace OBSERVER K. Duran

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas
PROJECT NAME: October 2000 Quarterly Sampling
SITE: _____
PROJECT NAME: AFC001-33DDA

SAMPLE INFORMATION

SAMPLE ID: TB102500
DATE: 10/26/00 TIME: 0700

MATRIX TYPE: WG
SAMPLING METHOD: GRAB
LOT CONTROL #: 0 0 1 A
(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)
CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT): N/A
SAMPLE END DEPTH (FT): N/A
GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS): —
MATRIX SPIKE DUP (SD): —
FIELD DUP (FD): —
AMBIENT BLANK (AB): —
EQUIPMENT BLANK (EB): —
TRIP BLANK (TB): TB102600

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS	SAMPLE CHARACTERISTICS	MISCELLANEOUS
1st —	COLOR —	
2nd —	ODOR —	
	OTHER	

pH — Temperature — (C) Dissolved Oxygen — (mg/L) Conductivity — (umhos/cm)
Iron — (mg/L) Oxidation/Reduction Potential — (mv) Turbidity — (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE _____
SHIPMENT VIA: FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____
SHIPPED TO: STL - Chicago
COMMENTS: _____
SAMPLER: J. Wallace OBSERVER: K. Duran

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

HYDRO GeoLogic INC.

FIELD SAMPLING REPORT

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LOCATION: NAS Fort Worth JRB, Texas — PROJECT NAME: October 2000 Quarterly Sampling

SITE: _____ — PROJECT NAME: AFC001-33DDA

SAMPLE INFORMATION

SAMPLE ID: TB102600 — DATE: 10/26/00 — TIME: 0700

MATRIX TYPE: WG

SAMPLING METHOD.

LOT CONTROL #: 001A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY #: _____

SAMPLE BEG DEPTH (FT) N/A

SAMPLE END DEPTH (FT) N/A

GRAB (X) COMPOUND ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS) —

MATRIX SPIKE DUP (SD). —

FIELD DUP (FD) —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB): —

TRIP BLANK (TB) TB102600

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH<2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	—	COLOR	—	
2nd	—	ODOR	—	
		OTHER		

pH — Temperature — (C) Dissolved Oxygen — (mg/L) Conductivity — (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential — (mv) Turbidity — (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR _____ OVERCAST/RAIN _____ WIND DIRECTION _____ AMBIENT TEMPERATURE _____

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO. STL - Chicago

COMMENTS _____

SAMPLER: J. Wallace OBSERVER. K. Duran

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

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HYDRO GeoLogic INC

FIELD SAMPLING REPORT

LOCATION: NAS Fort Worth JRB, Texas PROJECT NAME October 2000 Quarterly Sampling

SITE: _____ PROJECT NAME AFC001-33DDA

SAMPLE INFORMATION

SAMPLE ID TB102700 DATE: 10/27/00 TIME: 0700

MATRIX TYPE: WG

SAMPLING METHOD: LOW FLOW

LOT CONTROL #: 0 1 1 A

(Ambient Blank # - Equipment Blank # - Trip Blank # - Cooler #)

CHAIN-OF-CUSTODY # _____

SAMPLE BEG DEPTH (FT) N/A

SAMPLE END DEPTH (FT) N/A

GRAB (X) COMPOSITE ( )

ENTER SAMPLE NUMBERS FOR QC SAMPLES/ BLANKS ASSOCIATED WITH THIS SAMPLE:

MATRIX SPIKE (MS) —

MATRIX SPIKE DUP (SD). —

FIELD DUP (FD) —

AMBIENT BLANK (AB): —

EQUIPMENT BLANK (EB) ER102700

TRIP BLANK (TB) TB102700

CONTAINER SIZE/TYPE	#	PRESERVATIVE/ PREPARATION	ANALYTICAL METHOD	ANALYSIS
40 mL VOA	3	Cool to 4C/HCl to pH < 2	SW8260B	VOCs

NOTABLE OBSERVATIONS

PID READINGS		SAMPLE CHARACTERISTICS		MISCELLANEOUS
1st	—	COLOR	—	
2nd	—	ODOR	—	
		OTHER		

pH — Temperature — (C) Dissolved Oxygen — (mg/L) Conductivity — (umhos/cm)

Iron — (mg/L) Oxidation/Reduction Potential — (mv) Turbidity — (NTU)

GENERAL INFORMATION

WEATHER SUN/CLEAR — OVERCAST/RAIN — WIND DIRECTION — AMBIENT TEMPERATURE —

SHIPMENT VIA FEDEX x HAND DELIVER _____ COURIER _____ OTHER _____

SHIPPED TO. STL - Chicago

COMMENTS _____

SAMPLER J. Wallace OBSERVER K. Duran

MATRIX TYPE CODES		SAMPLING METHOD CODES	
DC=DRILL CUTTINGS	SL=SLUDGE	B=BAILER	G=GRAB
WG=GROUND WATER	SO=SOIL	BP=BLADDER PUMP	HA=HAND AUGER
LH=HAZARDOUS LIQUID WASTE	GS=SOIL GAS	BR=BRASS RING	H=HOLLOW STEM AUGER
SH=HAZARDOUS SOLID WASTE	WS=SURFACE WATER	CS=COMPOSITE SAMPLE	HP=HYDRO PUNCH
SE=SEDIMENT	SW=SWAB/WIPE	C=CONTINUOUS FLIGHT AUGER	SS=SPLIT SPOON
		DT=DRIVEN TUBE	SP=SUBMERSIBLE PUMP

APPENDIX A.4

CHAINS OF CUSTODY

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Shaded Areas For Internal Use Only ____ of ____

SEVERN TRENT SERVICES

STL Chicago
2417 Bond Street
University Park, IL 60466
Phone. 708-534-5200
Fax 708-534-5211

Report To:
Contact: Kim Evers
Company: HydroGeoLogic
Address: 1155 Herndon Pkwy Suite 900, Herndon VA 20170
Phone: 703-478-5186
Fax: 703-471-4180
E-Mail: KEVERS@HGL.COM

Bill To:
Contact: (same)
Company:
Address:
Phone:
Fax:
PO#: Quote:

Lab L t#

Package Sealed Yes No	Samples Sealed Yes No
Received on Ice Yes No	Samples Intact Yes No
Temperature °C of Cooler	
Within Hold Time Yes No	Preserv. Indicated Yes No NA
pH Check OK Yes No NA	Res Cl_2 Check OK Yes No NA
Sample Labels and COC Agree Yes No COC not present	

Sampler Name: JENNIFER WALLACE
Signature: Jennifer Wallace
Project Name: October 2000 Quarterly
Project Number: AF(00)1-33DDA
Project Location: NASFW JRB, TEXAS
Date Required Hard Copy: ___/___/___ Fax: ___/___/___
Lab PM: Donna Ingersol

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	Refrg #	# / Cont.	Volume	Preserv	Volatiles (SW8260B)	Metals + Hg (SW6010B/7471)	Alkalinity/Anions (E310.1/SW9056)	Methane, Ethane, Ethene (RSK-175)	TOC (SW9060)	Additional Analyses / Remarks
		WHGLRW015WG13	10/24/00	1000	WG	G		2	40mL	1	3					
		WHGLRW017WG13	10/24/00	1519	WG	G		1	1L	3	3					
		ITMW-01TWG13	10/24/00	1643	WG	G		1	1L	7	3	1	1	3	1	
		EB102400	10/24/00	1700	WG	G		2	40mL	1	3					
		TB102400	10/24/00	0800	WG	G		1	500mL	2	2					
		AB102400	10/24/00	1527	WG	G					3					

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
Ken Dunn	HGL	10/24/00	1733				
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater, W = Water, S = Soil, SL = Sludge, MS = Miscellaneous, OL = Oil, A = A, SE = Sediment, SO = Solid, DS = Drum Solid, DL = Drum Liquid, L = Leachate, WI = Wipe, O

Container Key
1 Plastic, 2 VOA Vial, 3 Sterile Plastic, 4 Amber Glass, 5 Widemouth Glass, 6 Other

Preservative Key
1 HCl, Cool to 4°, 2 H2SO4, Cool to 4°, 3 HNO3, Cool to 4°, 4 NaOH, Cool to 4°, 5 NaOH/Zn, Cool to 4°, 6 Cool to 4°, 7 None

COMMENTS: Associate EB102400 and AB102400 to WHGLRW017WG13 ONLY!

Date Received ___/___/___
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666 189

Shaded Areas For Internal Use Only ____ of ____

SEVERN TRENT SERVICES

STL Chicago
2417 Bond Street
University Park, IL 60466
Phone: 708-534-5200
Fax 708-534-5211

Report To:
Contact: Kim Evers
Company: HydroGeologic
Address: 1155 Herndon Pkwy Suite 900 Herndon VA 20170
Phone: 703-478-5186
Fax: 703-471-4180
E-Mail: KEVERS@HGL.com

Bill To: (same)
Contact: ____
Company: ____
Address: ____
Phone: ____
Fax: ____
PO#: ____ Quote: ____

Lab L t#

Package Sealed Yes No	Samples Sealed Yes No
Received on Ice Yes No	Samples Intact Yes No
Temperature °C of Cooler	

Sampler Name: JENNIFER WALLACE
Signature: Jennifer Wallace
Project Name: October 2000 Quarterly
Project Number: AF(001-33DDA
Project Location: NASEW JRB, TEXAS
Date Required Hard Copy: ___/___/___ Fax: ___/___/___
Lab PM: DONNA INGERSILL

Within Hold Time Yes No	Preserv. Indicated Yes No NA
pH Check OK Yes No NA	Res Cl_2 heck OK Yes No NA
Sample Labels and COC Agree Yes No	COC not present

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	Refrg #	# / Cont.	Volume	Preserv	Volatiles (SW8260B)	Alkalinity/Anions E310.1/SW9056	Methan, Ethane Ethene RSK-175	TOC (SW9060)	Metals + Hg (SW6010/7470)	Additional Analyses / Remarks
		TB102500	10/25/00	0700	WG	G		2	40mL	1	2					
		WITCTA024WG13	10/25/00	1240	WG	G		3	1L	7		1	3	1		
		WHGLTA025WG13	10/25/00	0835	WG	G		3	40mL	1						
		WITCTA010WG13	10/25/00	1415	WG	G		3	50mL	2					1	*Serial dilution on metals
	X	WITCTA010WG13MS	10/25/00	1415	WG	G		3	1L	3					1	
	X	WITCTA010WG13MSD	10/25/00	1415	WG	G		3							1	
		MW-53WG13	10/25/00	1630	WG	G		3								
		LF05-5GWG13	10/25/00	0948	WG	G		3				1	3	1		
		DUP03WG13	10/25/00	1200	WG	G		3				1	3	1		
		GMI-22-07mWG13	10/25/00	1253	WG	G		3								
	X	GMI-22-07mWG13MS	10/25/00	1253	WG	G		3								
	X	GMI-22-07mWG13MSD	10/25/00	1253	WG	G		3								

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
[signature]	HGL	10/25/00	1800				
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater, W = Water, S = Soil, SL = Sludge, MS = Miscellan, OL = Oil, A = Air
SE = Sediment, SO = Solid, DS = Drum Solid, DL = Drum Liquid, L = Leachate, WI = Wipe, O = ____

Container Key
1 Plastic, 2 VOA Vial, 3. Sterile Plastic, 4 Amber Glass, 5 Widemouth Glass, 6 Other ____

Preservative Key
1 HCl, Cool to 4°, 2 H_2SO_4, Cool to 4°, 3 HNO_3, Cool to 4°, 4 NaOH, Cool to 4°, 5 NaOH/Zn, Cool to 4°, 6 Cool to 4°, 7 None

COMMENTS

Date Received ___/___/___
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SEVERN TRENT SERVICES

STL Chicago
2417 Bond Street
University Park, IL 60466
Phone 708-534-5200
Fax 708-534-5211

Report To:
Contact: Kim Evers
Company: HydroGeoLogic
Address: 1155 Herndon Pkwy Suite 900, Herndon VA 20170
Phone: 703-478-5186
Fax: 703-471-4180
E-Mail: KEVERS@HGL.COM

Bill To:
Contact: (same)
Company:
Address:
Phone:
Fax:
PO#: Quote:

Lab Lot#

Package Sealed	Samples Sealed
Yes No	Yes No
Received on Ice	**Samples Intact**
Yes No	Yes No

Temperature °C of Cooler

Within Hold Time	Preserv. Indicated
Yes No	Yes No NA
pH Check OK	**Res Cl_2 Check OK**
Yes No NA	Yes No NA

Sample Labels and COC Agree
Yes No COC not present

Sampler Name: JENNIFER WALLACE
Signature: Jennifer Wallace
Project Name: October 2000 Quarterly
Project Number: AFCW01-33DDA
Project Location: NAS FW JRB, TEXAS
Date Required
Hard Copy: ___/___/___
Fax: ___/___/___
Lab PM: Dana Ingersol

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	Refrg #	# / Cont.	Volume	Preserv	Volatiles (SW8260B)	Chromium (Soluble)	Alkalinity/Anions E300.1/SW9056	Methane, Ethane, Ethene RSK-175	TOC (SW9060A)	Additional Analyses / Remarks
		TB102600	10/26/00	0700	W	G		2	40mL	1	2					
		LF03-3DWG13	10/26/00	1158	WG	G		3	1L	3	1					
		LF05-01WG13	10/26/00	1342	WG	G		3	1L	7						
		GMI-22-04MWG13	10/26/00	1522	WG	G		3	40mL	1						
		WETA535WG13	10/26/00	1605	WG	G		3	50mL	2			1	3	1	
		HM-116WG13	10/26/00	1047	WG	G		3			1					
		W-153WG13	10/26/00	1338	WG	G		3								
		DUP04WG13	10/26/00	1200	WG	G		3								
		SPOT35-8WG13	10/26/00	1744	WG	G		3								

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
Kent Dem	HGL	10-26-00	1840				
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater, W = Water, S = Soil, SL = Sludge, MS = Miscellaneous, OL = Oil, A = Air, SE = Sediment, SO = Solid, DS = Drum Solid, DL = Drum Liquid, L = Leachate, WI = Wipe, O =

Container Key
1 Plastic, 2 VOA Vial, 3 Sterile Plastic, 4 Amber Glass, 5 Widemouth Glass, 6 Other

Preservative Key
1 HCl, Cool to 4°, 2 H_2SO_4, Cool to 4°, 3 HNO_3, Cool to 4°, 4 NaOH, Cool to 4°, 5 NaOH/Zn, Cool to 4°, 6 Cool to 4°, 7 None

COMMENTS
EB102600 is in AFCW01-36EACA & only associated w/ SPOT35-8WG13

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SEVERN TRENT SERVICES

STL Chicago
2417 Bond Street
University Park, IL 60466
Phone 708-534-5200
Fax 708-534-5211

Report To:
Contact Kim Evers
Company HydroGeologic
Address 1155 Herndon Pkwy Suite 900, Herndon VA 20170
Phone 703/478-5186
Fax 703/471-4180
E-Mail KEVERS@HGL.com

Bill To: (same)
Contact
Company
Address
Phone
Fax
PO# Quote

Shaded Areas For Internal Use Only ____ of ____

Lab Lot#

Package Sealed	Samples Sealed
Yes No	Yes No
Received on Ice	**Samples Intact**
Yes No	Yes No

Temperature °C of Cooler

Sampler Name: Jennifer Wallace
Signature: Jennifer Wallace
Project Name: October 2000 Quarterly
Project Number: AFCOO1-33DDA
Project Location: NASFW JRB, TEXAS
Lab PM: Donna Ingrisoi
Date Required Hard Copy: ___/___/___ Fax: ___/___/___

Within Hold Time	Preserv. Indicated
Yes No	Yes No NA
pH Check OK	**Res Cl_2 Check OK**
Yes No NA	Yes No NA
Sample Labels and COC Agree	
Yes No	COC not present

Laboratory ID	MS-MSD	Client Sample ID	Sampling Date	Sampling Time	Matrix	Comp/Grab	Refrg #	# / Cont.	Volume	Preserv	Volatiles (SW8260B)	MTBE, ethers, ethene RSK-175	TOC (SW9060)	Alkalinity, Anions E300.1/SM5054	Additional Analyses / Remarks
		TB102700	10/27/00	0700	W	G		2	40mL	1	2				
		SD13-02WG13	10/27/00	0825	WG	G		3	40mL	1	3				
		ST14-W11WG13	10/27/00	1450	WG	G		3	40mL	1	3				
		DUP07WG13	10/27/00	1200	WG	G		3	40mL	1	3				
		ST14-03WG13	10/27/00	1104	WG	G		3	40mL	1	3				
		HM-123WG13	10/27/00	0919	WG	G		3	40mL	1	3	3	1	1	
		WHGLTA014WG13	10/27/00	1409	WG	G		3	40mL	1	3				
		WHGLTA012WG13	10/27/00	1149	WG	G		3	40mL	1	3				
		EB102700	10/27/00	1522	WG	G		3	40mL	1	3				
									500mL	2			1		
									1L	7				1	

RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME
[signature]	HGL	10/27/00	1545				
RELINQUISHED BY	COMPANY	DATE	TIME	RECEIVED BY	COMPANY	DATE	TIME

Matrix Key
WW = Wastewater
W = Water
S = Soil
SL = Sludge
MS = Miscellaneous
OL = Oil
A = Air
SE = Sediment
SO = Solid
DS = Drum Solid
DL = Drum Liquid
L = Leachate
WI = Wipe
O =

Container Key
1. Plastic
2 VOA Vial
3 Sterile Plastic
4 Amber Glass
5 Widemouth Glass
6 Other

Preservative Key
1 HCl, Cool to 4°
2 H_2SO_4, Cool to 4°
3 HNO_3, Cool to 4°
4 NaOH, Cool to 4°
5 NaOH/Zn, Cool to 4°
6 Cool to 4°
7 None

COMMENTS
EB102700 associated w/ WHGLTA012WG13 & WHGLTA014WG13

Date Received / /
Courier: **Hand Delivered** ☐
Bill of Lading

TAB

APPENDIX B

APPENDIX B

2000 ANALYTICAL RESULTS

TABLE B.1

TCE PLUME MONITORING WELL LABORATORY RESULTS
OCTOBER 2000

Table B.1
TCE Plume Monitoring Well
Laboratory Results October 2000
NAS Fort Worth JRB

Analytical Method/Analyte	Units	Reporting Limit	GMI-22-04M N 10/26/00	GMI-22-07M N 10/25/00	HM-116 N 10/26/00	HM-123 N 10/27/00	ITMW-01T N 10/24/00
Alkalinity - E310.1							
Alkalinity, Total (As CaC03)	mg/L	5	--	--	--	305 S	391 S
Nonhalogenated Volatile Organics - RSK-175							
Ethane	µg/L	0.5	--	--	--	0.65	0.5 U
Ethene	µg/L	0.5	--	--	--	0.5 U	0.5 U
Methane	µg/L	0.5	--	--	--	70	1.7
Trace Elements (Metals) by ICP Plasma Emissions Spectrometry - SW6010B							
Aluminum	µg/L	500	--	--	--	--	500 U
Antimony	µg/L	10	--	--	--	--	10 U
Arsenic	µg/L	50	--	--	--	--	50 U
Barium	µg/L	200	--	--	--	--	93.8 F
Beryllium	µg/L	3	--	--	--	--	3 U
Cadmium	µg/L	5	--	--	--	--	5 UJ
Calcium	µg/L	500	--	--	--	--	157000
Cobalt	µg/L	10	--	--	--	--	10 U
Copper	µg/L	100	--	--	--	--	100 UJ
Iron	µg/L	70	--	--	--	--	70 U
Magnesium	µg/L	500	--	--	--	--	10000
Manganese	µg/L	20	--	--	--	--	184
Molybdenum	µg/L	10	--	--	--	--	10 U
Nickel	µg/L	20	--	--	--	--	20 U
Potassium	µg/L	5000	--	--	--	--	1680 F
Silver	µg/L	5	--	--	--	--	5 U
Sodium	µg/L	1000	--	--	--	--	42100
Vanadium	µg/L	10	--	--	--	--	10 U
Zinc	µg/L	100	--	--	--	--	100 U
Chromium - SW7191							
Chromium, Total	µg/L	5	--	--	32.8	--	5 U

Table B.1 (continued)
TCE Plume Monitoring Well
Laboratory Results October 2000
NAS Fort Worth JRB

Analytical Method/Analyte	Units	Reporting Limit	GMI-22-04M N 10/26/00	GMI-22-07M N 10/25/00	HM-116 N 10/26/00	HM-123 N 10/27/00	ITMW-01T N 10/24/00
Lead by Graphite Furnance AA Technique - SW7421							
Lead	µg/L	10	--	--	--	--	10 U
Mercury in Liquied Waste - SW7470							
Mercury	µg/L	0.2	--	--	--	--	0.2 U
Selenium by Graphite Furnace AA Technique - SW7740							
Selenium	µg/L	5	--	--	--	--	5 U
Thallium - SW7841							
Thallium	µg/L	50	--	--	--	--	50 U
Volatile Organic Compounds - SW 8260B							
1,1,1,2-Tetrachloroethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,1-Trichloroethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.9	0.4 U
1,1-Dichloroethene	µg/L	0.5	0.5 U	0.5 U	1	2	0.5 U
1,1-Dichloropropene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichloropropane	µg/L	0 5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	µg/L	0 4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-Trimethylbenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromo-3-Chloropropane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,2-Dichloroethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,3,5-Trimethylbenzene (Mesitylene)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-Dichloropropane	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U

Table B.1 (continued)
TCE Plume Monitoring Well
Laboratory Results October 2000
NAS Fort Worth JRB

S/C/S Analytical Method/Analyte	Units	Reporting Limit	GMI-22-04M N 10/26/00	GMI-22-07M N 10/25/00	HM-116 N 10/26/00	HM-123 N 10/27/00	ITMW-01T N 10/24/00
1,4-Dichlorobenzene	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1-Chlorohexane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2,2-Dichloropropane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Chlorotoluene	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
4-Chlorotoluene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzene	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Bromobenzene	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Bromochloromethane	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Bromodichloromethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromoform	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromomethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon Tetrachloride	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chlorobenzene	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Chloroethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	µg/L	0.3	0.4	0.3 U	0.5	0.6	0.3 U
Chloromethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethylene	µg/L	12	66	0.5 U	38	550	10
cis-1,3-Dichloropropene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibromochloromethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibromomethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane	µg/L	0.5	0.5 R	0.5 R	0.5 R	0.5 R	0.5 R
Ethylbenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Hexachlorobutadiene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene (cumene)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
m,p-Xylene (sum of isomers)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene Chloride	µg/L	0.5	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
Methyl *tert*-butyl ether	µg/L	0.5	0.5 U	0.5 UJ	0.5 U	0 5 U	0.5 U
Naphthalene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table B.1 (continued)
TCE Plume Monitoring Well
Laboratory Results October 2000
NAS Fort Worth JRB

Analytical Method/Analyte	Units	Reporting Limit	GMI-22-04M N 10/26/00	GMI-22-07M N 10/25/00	HM-116 N 10/26/00	HM-123 N 10/27/00	ITMW-01T N 10/24/00
N-Butylbenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
N-Propylbenzene	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
o-Xylene (1,2-Dimethylbenzene)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
p-Cymene (p-Isopropyltoluene)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
sec-Butylbenzene	µg/L	0 5	0.5 U	0 5 U	0.5 U	0.5 U	0.5 U
Styrene	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
tert-Butylbenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene (PCE)	µg/L	0.5	1	0.5 U	8	0.6	0.5 U
Toluene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	µg/L	0.5	4	0.5 U	0.9	10	0.6
trans-1,3-Dichloropropene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene (TCE)	µg/L	12	360	0.5 U	300	2700	22
Trichlorofluoromethane	µg/L	0.5	0.7	0.5 U	2	0.5 U	0.5 U
Vinyl Acetate	µg/L	2	2 U	2 U	2 U	2 U	2 U
Vinyl Chloride	µg/L	0.5	0.5 U	0 5 U	0.5 U	1	0.5 U
Common Anions - SW9056							
Chloride (As Cl)	mg/L	0.2	--	--	--	18.61	37.8
Nitrogen, Nitrate (As N)	mg/L	0.1	--	--	--	3	0.72
Sulfate (As So4)	mg/L	0.2	--	--	--	62.8	92
Total Organic Carbon - SW9060							
Total Orgainc Carbon	mg/L	1	--	--	--	1.7 S	1.1 S

Notes:
Not analyzed
FD - Field Duplicate
N - Original Sample

Table B.1 (continued)
TCE Plume Monitoring Well
Laboratory Results October 2000
NAS Fort Worth JRB

Analytical Method/Analyte	Units	Reporting Limit	LF03-3D N 10/26/00	LF05-01 N 10/26/00	LF05-5G N 10/25/00	LF05-5G FD 10/25/00	MW-53 N 10/25/00
Alkalinity - E310.0							
Alkalinity, Total (As CaC03)	mg/L	5	--	--	387 S	360 S	--
Nonhalogenated Volatile Organics - RSK-175							
Ethane	µg/L	0.5	--	--	0.59	0.58	--
Ethene	µg/L	0.5	--	--	0.54	0.5	--
Methane	µg/L	0.5	--	--	440	420	--
Chromium - SW7191							
Chromium, Total	µg/L	5	5 U	--	--	--	--
Volatile Organic Compounds - SW 8260B							
1,1,1,2-Tetrachloroethane	µg/L	0.5	0.5 U	0 5 U	0.5 U	0.5 U	0.5 U
1,1,1-Trichloroethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.5	0 5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,1-Dichloroethene	µg/L	0.5	0.5 U	0.4 F	5 J	4 J	0.5 U
1,1-Dichloropropene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichloropropane	µg/L	0.5	0 5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-Trimethylbenzene	µg/L	0.5	0 5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromo-3-Chloropropane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	µg/L	0.3	0.3 U	0.2 F	0.3 U	0.3 U	0.3 U
1,2-Dichloroethane	µg/L	0 5	0.5 U	0 5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,3,5-Trimethylbenzene (Mesitylene)	µg/L	0.5	0 5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table B.1 (continued)
TCE Plume Monitoring Well
Laboratory Results October 2000
NAS Fort Worth JRB

Analytical Method/Analyte	Units	Reporting Limit	LF03-3D N 10/26/00	LF05-01 N 10/26/00	LF05-5G N 10/25/00	LF05-5G FD 10/25/00	MW-53 N 10/25/00
1,3-Dichloropropane	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,4-Dichlorobenzene	µg/L	0.3	0.3 U	0.3 U	1	1	0.3 U
1-Chlorohexane	µg/L	0.5	0.5 U	0 5 U	0.5 U	0.5 U	0.5 U
2,2-Dichloropropane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Chlorotoluene	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
4-Chlorotoluene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Benzene	µg/L	0.4	0.4 U	0 4 U	0.4 U	0.3 F	0.4 U
Bromobenzene	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Bromochloromethane	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Bromodichloromethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromoform	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromomethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon Tetrachloride	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chlorobenzene	µg/L	0.4	0.4 U	0.4 U	2 J	1 J	0.4 U
Chloroethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.4
Chloromethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethylene	µg/L	0.5	0.5 U	140	300	280	9
cis-1,3-Dichloropropene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibromochloromethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibromomethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0 5 U	0.5 U
Dichlorodifluoromethane	µg/L	0.5	0.5 R	0.5 R	0.5 R	0.5 R	0.5 R
Ethylbenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Hexachlorobutadiene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene (cumene)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
m,p-Xylene (sum of isomers)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene Chloride	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table B.1 (continued)
TCE Plume Monitoring Well
Laboratory Results October 2000
NAS Fort Worth JRB

Analytical Method/Analyte	Units	Reporting Limit	LF03-3D N 10/26/00	LF05-01 N 10/26/00	LF05-5G N 10/25/00	LF05-5G FD 10/25/00	MW-53 N 10/25/00
Methyl *tert*-butyl ether	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Naphthalene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
N-Butylbenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
N-Propylbenzene	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
o-Xylene (1,2-Dimethylbenzene)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
p-Cymene (*p*-Isopropyltoluene)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
sec-Butylbenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Styrene	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
tert-Butylbenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene (PCE)	µg/L	0 5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	µg/L	0.5	0.5 U	4	36	37	0.5 U
trans-1,3-Dichloropropene	µg/L	0.5	0 5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene (TCE)	µg/L	0.5	0.5 U	5	920	860	50
Trichlorofluoromethane	µg/L	0 5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Vinyl Acetate	µg/L	2	2 U	2 U	2 U	2 U	2 U
Vinyl Chloride	µg/L	0.5	0.5 U	200	16	15	0.5 U
Common Anions - SW9056							
Chloride (As Cl)	mg/L	0.2	--	--	51.6	50.6	--
Nitrogen, Nitrate (As N)	mg/L	0.1	--	--	0.1 U	0.1 U	--
Sulfate (As So4)	mg/L	0.2	--	--	70.5	70.6	--
Total Organic Carbon - SW9060							
Total Orgainc Carbon	mg/L	1	--	--	3 S	3 S	--

Notes:
Not analyzed
FD - Field Duplicate
N - Original Sample

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Table B.1 (continued)
TCE Plume Monitoring Well
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Analytical Method/Analyte	Units	Reporting Limit	W-153 N 10/26/00	W-153 FD 10/26/00	WHGLRW015 N 10/24/00	WHGLRW017 N 10/24/00	WHGLTA025 N 10/25/00
Volatile Organic Compounds - SW 8260B							
1,1,1,2-Tetrachloroethane	μg/L	0.5	0 5 U	0.5 U	0 5 U	0.5 U	0.5 U
1,1,1-Trichloroethane	μg/L	0 5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	μg/L	0 5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	μg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	μg/L	0 4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,1-Dichloroethene	μg/L	0.5	2	2	0.5 U	0.5 U	0.5 U
1,1-Dichloropropene	μg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	μg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,3-Trichloropropane	μg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	μg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,2,4-Trimethylbenzene	μg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromo-3-Chloropropane	μg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane (Ethylene Dibromide)	μg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	μg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
1,2-Dichloroethane	μg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	μg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,3,5-Trimethylbenzene (Mesitylene)	μg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	μg/L	0.5	0 5 U	0.5 U	0.5 U	0.5 U	0.5 U
1,3-Dichloropropane	μg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,4-Dichlorobenzene	μg/L	0.3	0 3 U	0.3 U	0.3 U	0.3 U	0.3 U
1-Chlorohexane	μg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2,2-Dichloropropane	μg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
2-Chlorotoluene	μg/L	0.4	0 4 U	0.4 U	0.4 U	0.4 U	0.4 U
4-Chlorotoluene	μg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Table B.1 (continued)
TCE Plume Monitoring Well
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Analytical Method/Analyte	Units	Reporting Limit	W-153 N 10/26/00	W-153 FD 10/26/00	WHGLRW015 N 10/24/00	WHGLRW017 N 10/24/00	WHGLTA025 N 10/25/00
Benzene	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Bromobenzene	µg/L	0.3	0.3 U	0.3 U	0.3 U	0.3 U	0.3 U
Bromochloromethane	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Bromodichloromethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromoform	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Bromomethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Carbon Tetrachloride	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chlorobenzene	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Chloroethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Chloroform	µg/L	0.3	0.7	0.7	0.3 U	0.3 U	0.3 U
Chloromethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethylene	µg/L	0.5	80	87	17	0.5 U	0.8
cis-1,3-Dichloropropene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibromochloromethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dibromomethane	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane	µg/L	0.5	0.5 R	0.5 R	0.5 R	0.5 R	0.5 R
Ethylbenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Hexachlorobutadiene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Isopropylbenzene (cumene)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
m, p-Xylene (sum of isomers)	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methylene Chloride	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Methyl *tert*-butyl ether	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Naphthalene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
N-Butylbenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
N-Propylbenzene	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U

Table B.1 (continued)
TCE Plume Monitoring Well
Laboratory Results October 2000
NAS Fort Worth JRB

Analytical Method/Analyte	Units	Reporting Limit	W-153 N 10/26/00	W-153 FD 10/26/00	WHGLRW015 N 10/24/00	WHGLRW017 N 10/24/00	WHGLTA025 N 10/25/00
o-Xylene (1,2-Dimethylbenzene)	µg/L	0.5	0.5 U	0 5 U	0.5 U	0.5 U	0.5 U
p-Cymene (*p*-Isopropyltoluene)	µg/L	0.5	0.5 U	0 5 U	0.5 U	0.5 U	0.5 U
sec-Butylbenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Styrene	µg/L	0.4	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
tert-Butylbenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Tetrachloroethene (PCE)	µg/L	0.5	5	5	0.5 U	0.5 U	0.5 U
Toluene	µg/L	0.5	0.5 U	0.5 U	0 5 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	µg/L	0.5	2	2	0.6	0.5 U	0.5 U
trans-1,3-Dichloropropene	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Trichloroethene (TCE)	µg/L	2	430	530	36	0.5 U	4
Trichlorofluoromethane	µg/L	0.5	3	3	0.5 U	0.5 U	0.5 U
Vinyl Acetate	µg/L	2	2 U	2 U	2 U	3	2 U
Vinyl Chloride	µg/L	0.5	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:
Not analyzed
FD - Field Duplicate
N - Original Sample

Table B.1 (continued)
TCE Plume Monitoring Well
Laboratory Results October 2000
NAS Fort Worth JRB

Analytical Method/Analyte	Units	Reporting Limit	WITCTA010 N 10/25/00	WITCTA024 N 10/25/00	WJETA535 N 10/26/00
Alkalinity - E310.0					
Alkalinity, Total (As CaC03)	mg/L	5	--	338 S	364 S
Nonhalogenated Volatile Organics - RSK-175					
Ethane	µg/L	0.5	--	0.59	0.5 U
Ethene	µg/L	0.5	--	0.65	0.5 U
Methane	µg/L	0.5	--	1500	0.099 F
Trace Elements (Metals) by ICP Plasma Emissions Spectrometry - SW6010B					
Aluminum	µg/L	500	500 U	--	--
Antimony	µg/L	10	10 UJ	--	--
Arsenic	µg/L	50	6.7 F	--	--
Barium	µg/L	200	117 F	--	--
Beryllium	µg/L	3	3 UJ	--	--
Cadmium	µg/L	5	5 UJ	--	--
Calcium	µg/L	500	80600	--	--
Cobalt	µg/L	10	10 U	--	--
Copper	µg/L	100	100 UJ	--	--
Iron	µg/L	70	3040	--	--
Magnesium	µg/L	500	9570	--	--
Manganese	µg/L	20	865	--	--
Molybdenum	µg/L	10	5.2 F	--	--
Nickel	µg/L	20	20 UJ	--	--
Potassium	µg/L	5000	5490	--	--
Silver	µg/L	5	5 U	--	--
Sodium	µg/L	1000	31200	--	--
Vanadium	µg/L	10	10 U	--	--
Zinc	µg/L	100	100 U	--	--
Chromium - SW7191					
Chromium, Total	µg/L	5	5 U	--	--

Table B.1 (continued)
TCE Plume Monitoring Well
Laboratory Results October 2000
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Analytical Method/Analyte	Units	Reporting Limit	WITCTA010 N 10/25/00	WITCTA024 N 10/25/00	WJETA535 N 10/26/00
Lead by Graphite Furnance AA Technique - SW7421					
Lead	µg/L	2	2 U	--	--
Mercury in Liquied Waste - SW7470					
Mercury	µg/L	0.2	0.2 U	--	--
Selenium by Graphite Furnace AA Technique - SW7740					
Selenium	µg/L	5	5 U	--	--
Thallium - SW7841					
Thallium	µg/L	50	50 UJ	--	--
Volatile Organic Compounds - SW 8260B					
1,1,1,2-Tetrachloroethane	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,1,1-Trichloroethane	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,1,2,2-Tetrachloroethane	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,1,2-Trichloroethane	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,1-Dichloroethane	µg/L	0.4	0.4 U	0.4 U	0.4 U
1,1-Dichloroethene	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,1-Dichloropropene	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,2,3-Trichlorobenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,2,3-Trichloropropane	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,2,4-Trichlorobenzene	µg/L	0.4	0.4 U	0.4 U	0.4 U
1,2,4-Trimethylbenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,2-Dibromo-3-Chloropropane	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,2-Dibromoethane (Ethylene Dibromide)	µg/L	0.5	0 5 U	0.5 U	0.5 U
1,2-Dichlorobenzene	µg/L	0.3	0.3 U	0.3 U	0.3 U
1,2-Dichloroethane	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,2-Dichloropropane	µg/L	0.4	0.4 U	0.4 U	0.4 U
1,3,5-Trimethylbenzene (Mesitylene)	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,3-Dichlorobenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U
1,3-Dichloropropane	µg/L	0.4	0.4 U	0.4 U	0.4 U

Table B.1 (continued)
TCE Plume Monitoring Well
Laboratory Results October 2000
NAS Fort Worth JRB

Analytical Method/Analyte	Units	Reporting Limit	WITCTA010 N 10/25/00	WITCTA024 N 10/25/00	WJETA535 N 10/26/00
1,4-Dichlorobenzene	µg/L	0.3	0.3 U	0.3 U	0.3 U
1-Chlorohexane	µg/L	0.5	0.5 U	0.5 U	0.5 U
2,2-Dichloropropane	µg/L	0.5	0.5 U	0.5 U	0.5 U
2-Chlorotoluene	µg/L	0.4	0.4 U	0.4 U	0.4 U
4-Chlorotoluene	µg/L	0.5	0.5 U	0.5 U	0.5 U
Benzene	µg/L	0.4	0.4 U	0.4 U	0.4 U
Bromobenzene	µg/L	0.3	0.3 U	0.3 U	0.3 U
Bromochloromethane	µg/L	0.4	0.4 U	0.4 U	0.4 U
Bromodichloromethane	µg/L	0.5	0.5 U	0.5 U	0.5 U
Bromoform	µg/L	0.5	0.5 U	0.5 U	0.5 U
Bromomethane	µg/L	0.5	0.5 U	0.5 U	0.5 U
Carbon Tetrachloride	µg/L	0.5	0.5 U	0.5 U	0.5 U
Chlorobenzene	µg/L	0.4	0.4 U	0.4 U	0.4 U
Chloroethane	µg/L	0.5	0 5 U	0.5 U	0.5 U
Chloroform	µg/L	0.3	0.3 U	0 3 U	0.3 U
Chloromethane	µg/L	0.5	0.5 U	0.5 U	0.5 U
cis-1,2-Dichloroethylene	µg/L	0.5	0.6	0.5 U	0.5 U
cis-1,3-Dichloropropene	µg/L	0.5	0.5 U	0.5 U	0.5 U
Dibromochloromethane	µg/L	0.5	0.5 U	0.5 U	0.5 U
Dibromomethane	µg/L	0.5	0.5 U	0.5 U	0.5 U
Dichlorodifluoromethane	µg/L	0.5	0 5 R	0.5 R	0.5 R
Ethylbenzene	µg/L	0.5	0.5 U	0.5 U	0.5 U
Hexachlorobutadiene	µg/L	0.5	0.5 U	0.5 U	0.5 U
Isopropylbenzene (cumene)	µg/L	0.5	1	0.5 U	0.5 U
m, p -Xylene (sum of isomers)	µg/L	0.5	0.5 U	0.5 U	0.5 U
Methylene Chloride	µg/L	0.5	0.5 U	0.5 U	0.5 U
Methyl *tert*-butyl ether	µg/L	0.5	0.5 U	0.5 U	0.5 U
Naphthalene	µg/L	0.5	0 5 U	0.5 U	0.5 U

Table B.1 (continued)
TCE Plume Monitoring Well
Laboratory Results October 2000
NAS Fort Worth JRB

Analytical Method/Analyte	Units	Reporting Limit	WITCTA010 N 10/25/00	WITCTA024 N 10/25/00	WJETA535 N 10/26/00
N-Butylbenzene	µg/L	0.5	1	0.5 U	0.5 U
N-Propylbenzene	µg/L	0 4	1	0.4 U	0.4 U
o-Xylene (1,2-Dimethylbenzene)	µg/L	0 5	0.5 U	0.5 U	0.5 U
p-Cymene (*p*-Isopropyltoluene)	µg/L	0.5	0.5 U	0.5 U	0.5 U
sec-Butylbenzene	µg/L	0.5	0.8	0.5 U	0.5 U
Styrene	µg/L	0 4	0.4 U	0.4 U	0.4 U
tert-Butylbenzene	µg/L	0.5	0.5 U	2	0.5 U
Tetrachloroethene (PCE)	µg/L	0.5	0.5 U	0.5 U	0.5 U
Toluene	µg/L	0.5	0.5 U	0.5 U	0.5 U
trans-1,2-Dichloroethene	µg/L	0.5	0.5 U	0.5 U	0.5 U
trans-1,3-Dichloropropene	µg/L	0.5	0.5 U	0.5 U	0.5 U
Trichloroethene (TCE)	µg/L	0.5	0.5 U	0.5 U	0.5 U
Trichlorofluoromethane	µg/L	0.5	0.5 U	0.5 U	0.5 U
Vinyl Acetate	µg/L	2	2 U	2 U	2 U
Vinyl Chloride	µg/L	0.5	0.5 U	4	0.5 U
Common Anions - SW9056					
Chloride (As Cl)	mg/L	0.2	--	137	16.3
Nitrogen, Nitrate (As N)	mg/L	0.1	--	0.1 U	2.3
Sulfate (As So4)	mg/L	0.2	--	2.5	45.2
Total Organic Carbon - SW9060					
Total Orgainc Carbon	mg/L	1	--	2.4 S	1 US

Notes
Not analyzed
FD - Field Duplicate
N - Original Sample

TABLE B.2

DETECTED ANALYTICAL RESULTS FROM 2000 QUARTERLY TCE PLUME MONITORING

Table B.2
Detected Analytical Results From 2000
Quarterly TCE Plume Monitoring
NAS For Worth JRB

Analytical Method/Analyte	Reporting Limit	GMI-22-04M April 2000	GMI-22-04M July 2000	GMI-22-04M October 2000
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
Chloroform	0.3	0.4	--	0 4
cis-1,2-Dichloroethene	0.5	84 [1]	--	66
trans-1,2-Dichloroethene	0.5	5	--	4
Tetrachloroethene (PCE)	0.5	1	--	1
Trichloroethene (TCE)	0.5	500 [1]	--	360
Trichlorofluoromethane	0.5	0.8 J [2]	--	0.7
Analytical Method/Analyte	**Reporting Limit**	**GMI-22-06M April 2000**	**GMI-22-06M July 2000**	**GMI-22-06M October 2000**
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
1,1-Dichloroethene	0.5	--	0.5	--
Chloroform	0.3	--	0.6	--
cis-1,2-Dichloroethene	0.5	--	91 [1]	--
trans-1,2-Dichloroethene	0.5	--	6	--
Tetrachloroethene (PCE)	0.5	--	1	--
Trichloroethene (TCE)	0.5	--	540 [1]	--
Analytical Method/Analyte	**Reporting Limit**	**HM-112 April 2000**	**HM-112 July 2000**	**HM-112 October 2000**
Alkalinity - E310.1 (mg/L)				
Alkalinity, Total (as CaCO3)	5	294 S	--	--
Methane, Ethane, and Ethene - RSK-175 (µg/L)				
Ethene	0.5	0.68	--	--
Methane	0.5	290 [1]	--	--
Chromium (SW6010B) - (µg/L)				
Chromium (total)	5	--	--	25 [3]
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
1,1-Dichloroethane	0.4	2	--	--
1,1-Dichloroethene	0.5	4	--	--
cis-1,2-Dichloroethene	0.5	200 [1]	--	220 [3]
trans-1,2-Dichloroethene	0.5	5	--	--
Bromodichloromethane	0.5	0.7	--	--
Chlorobenzene	0.4	0.6	--	--
Chloroform	0.3	1	--	--
Tetrachloroethene (PCE)	0.5	2	--	--
Trichloroethene (TCE)	0.5	7400 [1]	--	6900 J [3]

Table B.2 (continued)
Detected Analytical Results from 2000 Quarterly Sampling
NAS For Worth JRB

Common Anions - SW9056 (mg/L)				
Chloride (as Cl)	0.2	27.1	--	--
Nitrogen, Nitrate (as N)	0.1	7.6	--	--
Sulfate (as SO4)	0.2	83.5	--	--
Analytical Method/Analyte	**Reporting Limit**	**HM-116 April 2000**	**HM-116 July 2000**	**HM-116 October 2000**
Chromium (AA Furnace Technique) - SW7191 (µg/L)				
Chromium (total)	5	29.8	--	32.8
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
Chloroform	0.3	0.3	--	0.5
1,1-Dichloroethene	0.5	1	--	1
cis-1,2-Dichloroethene	0.5	32 [1]	--	38
trans-1,2-Dichloroethene	0.5	0.9	--	0.9
Tetrachloroethene (PCE)	0.5	7 J	--	8
Trichloroethene (TCE)	0.5	370 [1]	--	300
Trichlorofluoromethane	0.5	1	--	2
Analytical Method/Analyte	**Reporting Limit**	**HM-123 April 2000**	**HM-123 July 2000**	**HM-123 October 2000**
Alkalinity - E310.1 (mg/L)				
Alkalinity, Total (as CaCO3)	5	334 S	--	305 S
Methane, Ethane, and Ethene - RSK-175 (µg/L)				
Ethane	0 5	0.83	--	0.65
Methane	0.5	110 [1]	--	70
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
1,1-Dichloroethane	0.4	0.9	1	0.9
1,1-Dichloroethene	0.5	3	3	2
Chloroform	0.3	0.6	0.7	0.6
cis-1,2-Dichloroethene	0.5	540 [1]	550 [1]	550
trans-1,2-Dichloroethene	0.5	14	14	10
Tetrachloroethene (PCE)	0 5	0.7	0.7	0.6
Trichloroethene (TCE)	0.5	3100 [1]	3000 [1]	2700
Trichlorofluoromethane	0.5	ND	0.6	ND
Vinyl chloride	0.5	3	2	1
Common Anions - SW9056 (mg/L)				
Chloride (as Cl)	0 2	18.7	--	18.6 [1]
Nitrogen, Nitrate (as N)	0 1	2.8	--	3
Sulfate (as SO4)	0.2	59.8	--	62.8 [1]
Total Organic Carbon - SW9060 (mg/L)				
Total Organic Carbon	1	ND	--	1.7

Table B.2 (continued)
Detected Analytical Results from 2000 Quarterly Sampling
NAS For Worth JRB

Analytical Method/Analyte	Reporting Limit	HM-126 April 2000	HM-126 July 2000	HM-126 October 2000
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
Chloroform	0.3	--	0.6	--
1,1-Dichloroethane	0.4	--	0.4	--
1,1-Dichloroethene	0.5	--	1	--
cis-1,2-Dichloroethene	0.5	--	70 [1]	--
trans-1,2-Dichloroethene	0.5	--	3	--
Tetrachloroethene (PCE)	0.5	--	1	--
Trichloroethene (TCE)	0.5	--	1500 [1]	--
Analytical Method/Analyte	**Reporting Limit**	**ITMW-01T April 2000**	**ITMW-01T July 2000**	**ITMW-01T October 2000**
Alkalinity - E310.1 (mg/L)				
Alkalinity, Total (as CaCO3)	5	400 S	--	391 S
Methane, Ethane, and Ethene - RSK-175 (µg/L)				
Methane	0.5	3.4	--	1.7
Trace Elements (Metals) by ICP - SW6010B (µg/L)				
Calcium	500	167000	172000	157000
Magneseum	500	10900	10900	10000
Manganese	20	227	228	184
Molybdenum	10	2.3 F	2.9 F	ND
Sodium	1000	41900	37500	42100
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
cis-1,2-Dichloroethene	0.5	3	5	10
trans-1,2-Dichloroethene	0.5	ND	ND	0 6
m- & *p*-Xylene (sum of isomers)	0.5	ND	0.2 F	ND
Trichloroethene (TCE)	0.5	8	13	22
Common Anions - SW9056 (mg/L)				
Chloride (as Cl)	0.2	39.4 [1]	--	37.8
Nitrogen, Nitrate (as N)	0.1	0.94	--	0.72 [1]
Sulfate (as SO4)	0.2	104 [1]	--	92 [1]
Total Organic Carbon - SW9060 (mg/L)				
Total Organic Carbon	1	1.1 S	--	1.1 S
Analytical Method/Analyte	**Reporting Limit**	**LF03-3D April 2000**	**LF03-3D July 2000**	**LF03-3D October 2000**
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
Methyl *tert*-butyl ether	0 5	R	2	--
Analytical Method/Analyte	**Reporting Limit**	**LF05-01 April 2000**	**LF05-01 July 2000**	**LF05-01 October 2000**
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
1,1-Dichloroethane	0.4	0.7	0.5	ND
1,1-Dichloroethene	0.5	0.7	ND	ND

Table B.2 (continued)
Detected Analytical Results from 2000 Quarterly Sampling
NAS For Worth JRB

1,2-Dichlorobenzene	0.3	0.3	ND	ND
Benzene	0.4	0.4	ND	ND
cis-1,2-Dichloroethene	0.5	180 J[1]	60[1]	140
trans-1,2-Dichloroethene	0.5	9	4	4
Trichloroethene (TCE)	0.5	4 J	6	5
Vinyl chloride	0.5	200 J[1]	79[1]	200
Analytical Method/Analyte	**Reporting Limit**	**LF05-5G April 2000**	**LF05-5G July 2000**	**LF05-5G October 2000**
Alkalinity - E310.1 (mg/L)				
Alkalinity, Total (as CaCO3)	5	410 S[2]	--	387 S
Methane, Ethane, and Ethene - RSK-175 (µg/L)				
Ethane	0.5	ND	--	0.59
Ethene	0.5	0.66	--	0.54
Methane	0.5	310 J[1]	--	440[1]
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
1,1-Dichloroethane	0.4	0.4	0.4	ND
1,1-Dichloroethene	0.5	6	5 J[2]	5 J
1,4-Dichlorobenzene	0.3	2	2	1
Benzene	0.4	0.4	ND	ND
Chlorobenzene	0.4	2[2]	1	2 J
cis-1,2-Dichloroethene	0.5	220[1,2]	280[1,2]	300
trans-1,2-Dichloroethene	0.5	28[2]	28[2]	37[2]
Trichloroethene (TCE)	0.5	880[1,2]	790[1,2]	920
Vinyl chloride	0.5	16[2]	19 J[2]	16
Common Anions - SW9056 (mg/L)				
Chloride (as Cl)	0.2	46.5[1,2]	--	51.6[1]
Sulfate (as SO4)	0.2	47.6[1,2]	--	70.6[1,2]
Total Organic Carbon - SW9060 (mg/L)				
Total Organic Carbon	1	4.6 S[2]	--	3 S
Analytical Method/Analyte	**Reporting Limit**	**MW-53 April 2000**	**MW-53 July 2000**	**MW-53 October 2000**
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
Chloroform	0 3	ND	ND	0.4
cis-1,2-Dichloroethene	0.5	0.8	ND	9
Trichloroethene (TCE)	0.5	10	5	50
Methyl *tert*-butyl ether	0.5	ND	1	--
Analytical Method/Analyte	**Reporting Limit**	**SPOT35-5 April 2000**	**SPOT35-5 July 2000**	**SPOT35-5 October 2000**
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
Isopropylbenzene (cumene)	0.5	--	28	--
Naphthalene	0.5	--	44[1]	--

Table B.2 (continued)
Detected Analytical Results from 2000 Quarterly Sampling
NAS For Worth JRB

n-Propylbenzene	0.4	--	36	--
sec-Butylbenzene	0.5	--	9	--
tert-Butylbenzene	0.5	--	2	--
Analytical Method/Analyte	**Reporting Limit**	**USGS07T April 2000**	**USGS07T July 2000**	**USGS07T October 2000**
Trace Elements (Metals) by ICP - SW6010B (µg/L)				
Aluminum	500	--	1440 J	--
Calcium	500	--	106000	--
Iron	70	--	976	--
Magneseum	500	--	4830	--
Manganese	20	--	35.3	--
Sodium	1000	--	29600	--
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
Tetrachloroethene (PCE)	0.5	--	1	--
Analytical Method/Analyte	**Reporting Limit**	**W-153 April 2000**	**W-153 July 2000**	**W-153 October 2000**
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
1,1-Dichloroethane	0.4	0.5	0.4	ND
1,1-Dichloroethene	0.5	2	2 J	2
Chloroform	0.3	0.6	0.6	0.7
cis-1,2-Dichloroethene	0.5	100 [1]	110 [1]	87 [1,2]
trans-1,2-Dichloroethene	0.5	2	1	2
Tetrachloroethene (PCE)	0.5	5 J	5	5
Trichloroethene (TCE)	0.5	700 [1]	730 [1]	530 J [1,2]
Trichlorofluoromethane	0.5	4	3	3
Analytical Method/Analyte	**Reporting Limit**	**WHGLRW015 April 2000**	**WHGLRW015 July 2000**	**WHGLRW015 October 2000**
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
cis-1,2-Dichloroethene	0.5	8	10	17
trans-1,2-Dichloroethene	0.5	ND	ND	0.6
Trichloroethene (TCE)	0.5	22	26	36
Analytical Method/Analyte	**Reporting Limit**	**WHGLRW017 April 2000**	**WHGLRW017 July 2000**	**WHGLRW017 October 2000**
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
Vinyl acetate	2	--	--	3
Analytical Method/Analyte	**Reporting Limit**	**WHGLTA011 April 2000**	**WHGLTA011 July 2000**	**WHGLTA011 October 2000**
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
Trichloroethene (TCE)	0.5	--	8	--

Table B.2 (continued)
Detected Analytical Results From 2000
Quarterly TCE Plume Monitoring
NAS For Worth JRB

Analytical Method/Analyte	Reporting Limit	WHGLTA025 April 2000	WHGLTA025 July 2000	WHGLTA025 October 2000
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
cis-1,2-Dichloroethene	0.5	4	2	0.8
Trichloroethene (TCE)	0 5	14	7	4
Analytical Method/Analyte	**Reporting Limit**	**WITCTA004 April 2000**	**WITCTA004 July 2000**	**WITCTA004 October 2000**
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
1,1-Dichloroethene	0.5	--	1 J	--
cis-1,2-Dichloroethene	0.5	--	19	--
trans-1,2-Dichloroethene	0.5	--	0.8 J	--
Tetrachloroethene (PCE)	0.5	--	0.6	--
Trichloroethene (TCE)	0.5	--	180 [1]	--
Analytical Method/Analyte	**Reporting Limit**	**WITCTA010 April 2000**	**WITCTA010 July 2000**	**WITCTA010 October 2000**
Trace Elements (Metals) by ICP - SW6010B (µg/L)				
Calcium	500	93000	--	80600
Iron	70	9330	--	3040
Magneseum	500	11400	--	9570
Manganese	20	2070	--	865
Potassium	5000	ND	--	5490
Sodium	1000	39700	--	31200
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
cis-1,2-Dichloroethene	0.5	2	1	0.6
Isopropylbenzene (cumene)	0.5	ND	0.6	1
trans-1,2-Dichloroethene	0.5	2	0.6	ND
Vinyl chloride	0.5	1	2	ND
n-proplybenzene	0.5	--	--	1
sec-Butylbenzene	0 5	--	--	0.8
n-Butlybenzene	0.5	--	--	1
Analytical Method/Analyte	**Reporting Limit**	**WITCTA017 April 2000**	**WITCTA017 July 2000**	**WITCTA017 October 2000**
Trace Elements (Metals) by ICP - SW6010B (µg/L)				
Arsenic	50	--	--	--
Calcium	500	--	122000	--
Magneseum	500	--	14600	--
Manganese	20	--	ND	--
Potassium	5000	--	5060	--
Sodium	1000	--	35200	--

Table B.2 (continued)
Detected Analytical Results From 2000
Quarterly TCE Plume Monitoring
NAS For Worth JRB

Analytical Method/Analyte	Reporting Limit	WITCTA024 April 2000	WITCTA024 July 2000	WITCTA024 October 2000
Alkalinity - E310.1 (mg/L)				
Alkalinity, Total (as CaCO3)	5	349	--	338
Methane, Ethane, and Ethene - RSK-175 (µg/L)				
Ethane	0.5	1.3	--	0.59
Ethene	0.5	0.51	--	0.65
Methane	0.5	590 [1]	--	1500 [1]
Volatile Organic Compounds by GC/MS - SW8260B (µg/L)				
tert-Butylbenzene	0.5	2	2	2
Vinyl chloride	0.5	2	3	4
Common Anions - SW9056 (mg/L)				
Chloride (as Cl)	0.2	122 J[1]	--	137 [1]
Sulfate (as SO4)	0.2	2 1 [1]	--	2.5
Total Organic Carbon - SW9060 (mg/L)				
Total Organic Carbon	1	2.4 [1]	--	2.4 [1]
Analytical Method/Analyte	**Reporting Limit**	**WJETA535 April 2000**	**WJETA535 July 2000**	**WJETA535 October 2000**
Alkalinity - E310.1 (mg/L)				
Alkalinity, Total (as CaCO3)	5	349 S	--	364 S
Trace Elements (Metals) by ICP - SW6010B (µg/L)				
Calcium	500	--	155000	--
Magneseum	500	--	6930	--
Sodium	1000	--	23300	--
Mercury in Liquid Waste - SW7470 (µg/L)				
Mercury	0.2	--	0.51	--
Common Anions - SW9056 (mg/L)				
Chloride (as Cl)	0.2	17.1	--	16.3 [1]
Nitrogen, Nitrate (as N)	0.1	2 3	--	2.3
Sulfate (as SO4)	0.2	46.4	--	45.2 [1]

Notes
[1] Analytical results were taken from the reanalysis of this sample.
[2] Field duplicate result of the parent sample was used
[3] Source Jacobs
J - The analyte was positively identified, the quantitation is an estimate.
S - Screening analytical method
R - The datum was unusable due to serious deficiencies in the ability to meet QC criteria.
ND - Not detected above the PQL.
-- - Not analyzed

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TABLE B.3

DETECTED ANALYTICAL RESULTS FROM 2000 SEMI-ANNUAL AFP 4 SAMPLING

Table B.3
Detected analytical Results from
2000 Semi-Annual AFP 4 Sampling

Area	Well Identification	Date	Method	Analyte	Result (µg/L)
Air Force Plant 4 Terrace Alluvium Wells	F-218	April	SW6010	Chromium, Total	19
			SW8260B	*cis*-1,2-Dichloroethene	3,000
				Trichloroethene	19,000 J
		October	SW8260B	*cis*-1,2-Dichloroethene	2,000
				Trichloroethene	13,000
	HM-31	April	SW8260B	*cis*-1,2-Dichloroethene	99
				Trichloroethene	340 J
		October	SW8260B	*cis*-1,2-Dichloroethene	170
				trans-1,2-Dichloroethene	14
				Trichloroethene	500
	HM-36	April	SW8260B	*cis*-1,2-Dichloroethene	54
				trans-1,2-Dichloroethene	3 8
				Trichloroethene	31
		October	SW8260B	*cis*-1,2-Dichloroethene	55
				trans-1,2-Dichloroethene	4 5
				Trichloroethene	38 J
	HM-50	April	SW8260B	*cis*-1,2-Dichloroethene	130
				Trichloroethene	36
				Vinyl Chloride	21
		October	SW8260B	*cis*-1,2-Dichloroethene	780 [2]
				Trichloroethene	59 J[2]
				Vinyl Chloride	140
	HM-65	April	SW8260B	Trichloroethene	1.4 J
	HM-88	April	SW6010B	Chromium, Total	32
			SW8260B	*cis*-1,2-Dichloroethene	280 [1]
				trans-1,2-Dichloroethene	3.5
				Trichloroethene	7,200 [1]
		October	SW6010B	Chromium, Total	34
			SW8260B	*cis*-1,2-Dichloroethene	440
				Trichloroethene	5900
	HM-95	April	SW6010B	Chromium, Total	37
			SW8260B	*cis*-1,2-Dichloroethene	49
				Trichloroethene	260 [1]
		October	SW8260B	*cis*-1,2-Dichloroethene	150
				Trichloroethene	610 J
	HM-102	April	SW8260B	Trichloroethene	3.7 J

Table B.3 (continued)
Detected analytical Results from
2000 Semi-Annual AFP 4 Sampling

Area	Well Identification	Date	Method	Analyte	Result (µg/L)
Air Force Plant 4 Terrace Alluvium Wells (cont'd)	HM-112	April	SW6010B	Chromium, Total	30
			SW8260B	*cis*-1,2-Dichloroethene	230
				Trichloroethene	4,600J
		October	SW6010B	Chromium, Total	25
			SW8260B	*cis*-1,2-Dichloroethene	220
				Trichloroethene	6900 J
	MW-5	April	SW8260B	Trichloroethene	550,000 J [1]
		October	SW8260B	Trichloroethene	820,000
	W-149	April	SW6010B	Chromium, Total	436
			SW8260B	*cis*-1,2-Dichloroethene	1,000
				trans-1,2-Dichloroethene	5.3
				Trichloroethene	11,000 [1]
	W-157	April	SW7471	Lead	101
NAS Fort Worth JRB Terrace Alluvium Wells	GMI-22-03M	April	SW8260B	*cis*-1,2-Dichloroethene	91
				trans-1,2-Dichloroethene	49
				Trichloroethene	98
		October	SW8260B	*cis*-1,2-Dichloroethene	150
				trans-1,2-Dichloroethene	99 [2]
				Trichloroethene	180
	HM-119	April	SW8260B	*cis*-1,2-Dichloroethene	1
				Trichloroethene	29 J
		October	SW8260B	Trichloroethene	20
	USGS06T	April	SW8260B	Trichloroethene	12 J
		October	SW8260B	Trichloroethene	17

Notes:
[1] Analytical results were taken from the reanalysis of this sample.
[2] Analytical results were taken from the associated field duplicate.

J - The analyte was positively identified, the quantitation is an estimate.
Analytical results were obtained from Jacobs Engineering Group, Inc

TABLE B.4

DETECTED VOC RESULTS FROM ADDITIONAL 2000 GROUNDWATER INVESTIGATIONS

Table B.4
Detected VOC Results from Additional 2000 Groundwater Investigations

GROUNDWATER INVESTIGATION	MONITORING WELL	ANALYTE	APRIL RESULT (µg/L)	JULY RESULT (µg/L)	OCTOBER RESULT (µg/L)
AOC 4	SPOT35-8	cis-1,2-Dichloroethene	43[1]	--	8
		trans-1,2-Dichloroethene	53[1]	--	10
		Trichloroethene (TCE)	25	--	3
		Vinyl Chloride	ND	--	2
	WCHMHTA008	1,2,4-Trimethylbenzene	150[1]	--	180 [1]
		1,3,5-Trimethylbenzene (Mesitylene)	ND	--	4
		Benzene	130[1]	--	120 [1]
		cis-1,2-Dichloroethene	2	--	3
		Ethylbenzene	130[1]	--	150 [1]
		Isopropylbenzene (cumene)	18	--	24
		Naphthalene	46[1]	--	60 J[1]
		n-Butylbenzene	2	--	3
		n-Propylbenzene	21	--	28
		o-Xylene (1,2-dimethylbenzene)	0.6	--	0.5
		p-Cymene (p-isopropyltoluene)	2	--	3
		sec-Butylbenzene	4	--	5
		tert-Butylbenzene	1	--	2
		Trichloroethene (TCE)	27[1]	--	5
	WCHMHTA009	Chloroform	0.4	--	0.4
		cis-1,2-Dichloroethene	6	--	8
		Tetrachloroethene (PCE)	3 J	--	4 J
		Trichloroethene (TCE)	430[1]	--	420 [1,2]
	WHGLTA009	1,1-Dichloroethene	1	--	1
		cis-1,2-Dichloroethene	130[1]	--	260 [1]
		Isopropylbenzene (cumene)	0.7 J[2]	--	1
		Naphthalene	1 J[2]	--	ND
		sec-Butylbenzene	3 J[2]	--	5
		tert-Butylbenzene	1 J[2]	--	2
		trans-1,2-Dichloroethene	0.9 J[2]	--	0.9
		Trichloroethene (TCE)	190[1]	--	72 [1]
	WHGLTA010	Benzene	1	--	0.9
		cis-1,2-Dichloroethene	4	--	3
		tert-Butylbenzene	0.6	--	0.5
		Trichloroethene (TCE)	16	--	14

Table B.4 (continued)
Detected VOC Results from Additional 2000 Groundwater Investigations

GROUNDWATER INVESTIGATION	MONITORING WELL	ANALYTE	APRIL RESULT (µg/L)	JULY RESULT (µg/L)	OCTOBER RESULT (µg/L)
AOC 4 (cont'd)	WHGLTA012	1,1,2-Trichloroethane	ND	--	200 J
		Benzene	5 J	--	ND
		cis-1,2-Dichloroethene	2 J	--	2 J
		Isopropylbenzene (cumene)	40 J	--	37 J
		Naphthalene	8 J	--	9 J
		n-Butylbenzene	ND	--	9 J
		n-Propylbenzene	39 J	--	33 J
		sec-Butylbenzene	ND	--	18 J
		tert-Butylbenzene	4 J	--	5 J
		trans-1,2-Dichloroethene	0.6 J	--	0 8 J
	WHGLTA014	1,1-Dichloroethene	0.6	--	0.7
		Benzene	2	--	ND
		cis-1,2-Dichloroethene	98[1]	--	110 [1]
		tert-Butylbenzene	0.9	--	0.9
		trans-1,2-Dichloroethene	130[1]	--	140 [1]
		Trichloroethene (TCE)	10	--	36
SWMU 68 and AOC 7	SD13-01	1,2,3-Trichlorobenzene	ND	--	6
		Chlorobenzene	2	--	1
		Chloromethane	ND	--	0 5
		Hexachlorobutadiene	ND	--	0.5
		Isopropylbenzene (cumene)	16	--	9
		n-Butylbenzene	3	--	3
		n-Propylbenzene	13	--	6
		sec-Butylbenzene	10	--	8
		tert-Butylbenzene	9	--	8
	SD13-02	Isopropylbenzene (cumene)	9	--	ND
		n-Butylbenzene	0.6	--	ND
		n-Propylbenzene	4	--	ND
		sec-Butylbenzene	2	--	ND
		tert-Butylbenzene	5	--	1
		Toluene	ND	--	0.7
		Methyl tert-butyl ether	1	--	--
	SD13-04	Chlorobenzene	0.8	--	ND
		Isopropylbenzene (cumene)	42[1]	--	13
		n-Butylbenzene	3	--	2

Table B.4 (continued)
Detected VOC Results from Additional 2000 Groundwater Investigations

GROUNDWATER INVESTIGATION	MONITORING WELL	ANALYTE	APRIL RESULT (µg/L)	JULY RESULT (µg/L)	OCTOBER RESULT (µg/L)
SWMU 68 and AOC 7 (cont'd)	SD13-04 (cont'd)	n-Propylbenzene	35	--	7
		sec-Butylbenzene	8	--	5
		tert-Butylbenzene	6	--	7
	ST14-03	Isopropylbenzene (cumene)	ND	--	0.7
		tert-Butylbenzene	3	--	3
		Toluene	3	--	ND
		Trichloroethene (TCE)	0.8	--	ND
	ST14-27	tert-Butylbenzene	ND	--	3
	ST14-W16	Benzene	ND	--	1
		Isopropylbenzene (cumene)	10	--	7
		Methylene Chloride	ND	--	0.5 J
		Naphthalene	5 J	--	2 J
		n-Propylbenzene	8	--	6
		sec-Butylbenzene	0 6	--	ND
		tert-Butylbenzene	5	--	5
	ST14-W21	1,1,2-Trichloroethane	ND	--	2
		Isopropylbenzene (cumene)	15	--	17
		n-Propylbenzene	0.9 J	--	0 9
		tert-Butylbenzene	4	--	3
AOC 1	BGSMW03	1,2,4-Trimethylbenzene	77	--	12
		1,3,5-Trimethylbenzene (Mesitylene)	12	--	3
		Benzene	2,300[1]	--	2000[1]
		Ethylbenzene	220[1]	--	20
		Isopropylbenzene (cumene)	66	--	45[1]
		m, p-Xylene (sum of isomers)	140	--	54
		Naphthalene	300[1]	--	310[1]
		n-Butylbenzene	13	--	ND
		n-Propylbenzene	180	--	110[1]
		o-Xylene (1,2-Dimethylbenzene)	8	--	3
		sec-Butylbenzene	8	--	6
		Methyl tert-butyl ether	ND	--	11
		Toluene	21	--	19
	BGSMW05	m, p-Xylene (sum of isomers)	0.4 F	--	0.6
		1,2,4-Trimethylbenzene	0.7	--	0.8
		m, p-Xylene (sum of isomers)	0.9	--	0.8
		Naphthalene	0.8	--	11

Table B.4 (continued)
Detected VOC Results from Additional 2000 Groundwater Investigations

GROUNDWATER INVESTIGATION	MONITORING WELL	ANALYTE	APRIL RESULT (µg/L)	JULY RESULT (µg/L)	OCTOBER RESULT (µg/L)
AOC 1 (Cont'd)	BGSMW06 (cont'd)	n-Propylbenzene	0 6	--	0.4
		Benzene	ND	--	0.6
		Ethylbenzene	ND	--	0.6
	MW-5	Methyl tert-butyl ether	ND	--	4 J
	MW-10	1,2,4-Trimethylbenzene	2,700[1]	--	2100[1]
		1,3,5-Trimethylbenzene (Mesitylene)	550[1]	--	650
		Benzene	1,400[1]	--	870[1]
		Ethylbenzene	3,500[1]	--	3300[1]
		Isopropylbenzene (cumene)	220[1]	--	230
		m, p-Xylene (sum of isomers)	7,800[1]	--	5300[1]
		Naphthalene	1,100[1]	--	820[1]
		n-Butylbenzene	42	--	ND
		n-Propylbenzene	380[1]	--	410
		o-Xylene (1,2-Dimethylbenzene)	1,900[1]	--	1500[1]
		p-Cymene (p-Isopropyltoluene)	11	--	16
		sec-Butylbenzene	12	--	20
		Methyl tert-butyl ether	ND	--	100 J
		Toluene	490[1]	--	410
	SAV-2	1,2,4-Trimethylbenzene	150[1]	--	610 [2]
		1,3,5-Trimethylbenzene (Mesitylene)	43[1]	--	110 J[2]
		Benzene	330[1]	--	720 [2]
		Chloroform	3 J	--	ND
		Ethylbenzene	260[1]	--	860
		Isopropylbenzene (cumene)	ND	--	330 [2]
		m, p-Xylene (sum of isomers)	200[1]	--	780 [2]
		Naphthalene	590[1]	--	700 [2]
		n-Butylbenzene	90[1]	--	ND
		n-Propylbenzene	720[1]	--	940 [2]
		o-Xylene (1,2-Dimethylbenzene)	4 J	--	ND
		p-Cymene (p-Isopropyltoluene)	2 J	--	ND
		sec-Butylbenzene	47[1]	--	ND
		Methyl tert-butyl ether	ND	--	180 J[2]
		Toluene	12 J	--	22 [2]

Table B.4 (continued)
Detected VOC Results from Additional 2000 Groundwater Investigations

GROUNDWATER INVESTIGATION	MONITORING WELL	ANALYTE	APRIL RESULT (µg/L)	JULY RESULT (µg/L)	OCTOBER RESULT (µg/L)
AOC 1 (Cont'd)	WHGLTA036	1,2,4-Trimethylbenzene	--	--	0.8
		Benzene	--	--	1
		Isopropylbenzene (cumene)	--	--	7
		m, p-Xylene (sum of isomers)	--	--	0.6
		n-Propylbenzene	--	--	4
		sec-Butylbenzene	--	--	1
		tert-Butylbenzene	--	--	1
	WHGLTA037	1,2,4-Trimethylbenzene	--	--	2000 [1]
		1,3,5-Trimethylbenzene (Mesitylene)	--	--	550 [1]
		Benzene	--	--	3600 [1]
		Chloromethane	--	--	6
		Ethylbenzene	--	--	3900 [1]
		Isopropylbenzene (cumene)	--	--	170
		m, p-Xylene (sum of isomers)	--	--	9100 [1]
		Naphthalene	--	--	1100 [1]
		n-Butylbenzene	--	--	40
		n-Propylbenzene	--	--	270 [1]
		o-Xylene (1,2-Dimethylbenzene)	--	--	400 [1]
		p-Cymene (p-Isopropyltoluene)	--	--	29
		Toluene	--	--	3400 [1]
AOC 13	WITCTA040	cis-1,2-Dichloroethene	--	--	13
		m, p-Xylene (sum of isomers)	--	--	0.8
		trans-1,2-Dichloroethene	--	--	0.9
		Trichloroethene (TCE)	--	--	54 [1]
	WITCTA041	1,1-Dichloroethane	--	--	2
		m, p-Xylene (sum of isomers)	--	--	0.8
		Trichloroethene (TCE)	--	--	1
	WITCTA042	Trichloroethene (TCE)	--	--	0.7
	WITCTA043	1,2,4-Trimethylbenzene	--	--	0.6
		Ethylbenzene	--	--	1
		m, p-Xylene (sum of isomers)	--	--	3
		o-Xylene (1,2-Dimethylbenzene)	--	--	0.7
		Toluene	--	--	0.5

Table B.4 (continued)
Detected VOC Results from Additional
2000 Groundwater Investigations

GROUNDWATER INVESTIGATION	MONITORING WELL	ANALYTE	APRIL RESULT (µg/L)	JULY RESULT (µg/L)	OCTOBER RESULT (µg/L)
RFI Phase III Landfills	LF01-1F	sec-Butylbenzene	4 J	--	--
		tert-Butylbenzene	2 J	--	--
	HM-127	Calcium	132,000	--	--
		Iron	196 J	--	--
		Magnesium	7,330	--	--
		Sodium	35,000	--	--
	WHGLTA703	Chlorobenzene	0.4 J	--	--
	WHGLTA704	Benzene	4	25	--
		Isopropylbenzene (cumene)	1	ND	--
		sec-Butylbenzene	8	ND	--
		tert-Butylbenzene	1	ND	--
		cis-1,2-Dichloroethene	ND	0.7	--
		Vinyl Chloride	ND	0 9	--
	WHGLTA705	cis-1,2-Dichloroethene	--	12	--
		trans-1,2-Dichloroethene	--	3	--
		Vinyl Chloride	--	2	--
	WHGLTA706	cis-1,2-Dichloroethene	--	20	--
		trans-1,2-Dichloroethene	--	1	--
		Trichloroethene (TCE)	--	5	--
		Vinyl Chloride	--	2	--
WAA's	WCHMHTA012	Vinyl Chloride	--	--	3
	WHGLTA026	1,1-Dichloroethene	0.9	--	--
		cis-1,2-Dichloroethene	79[1]	--	--
		Tetrachloroethene	1	--	--
		trans-1,2-Dichloroethene	5	--	--
		Trichloroethene (TCE)	440[1]	--	--
		Trichlorofluoromethane	0.7	--	--
	WHGLTA028	Benzene	--	--	2
		Vinyl Chloride	--	--	12 J
	WITCTA031	cis-1,2-Dichloroethene	2	--	--
		trans-1,2-Dichloroethene	1	--	--
		Vinyl chloride	3	--	--
	WITCTA034	Tetrachloroethene (PCE)	3	--	4

Table B.4 (continued)
Detected VOC Results from Additional 2000 Groundwater Investigations

GROUNDWATER INVESTIGATION	MONITORING WELL	ANALYTE	APRIL RESULT (µg/L)	JULY RESULT (µg/L)	OCTOBER RESULT (µg/L)
Paluxy Wells	WHGLPA001	cis-1,2-Dichloroethene	--	--	2
		Bromochloromethane	--	--	0.4
		Chloroform	--	--	4
		Methylene Chloride	--	--	0.5 J
		Trichloroethene (TCE)	--	--	4

Note: The April 2000, Final Basewide Groundwater Sampling and Analysis Program contained data for WHGLTA027 in Appendix Table B.6 This well name, WHGLTA027, was inadvertently duplicated and results presented in the April 2000 Quarterly, Appendix Table B.6 are associated with the UST Investigation, not the Waste Accumulation Areas (WAA). The new UST well name is WHGL1427-2 and the WAA well will remain as WHGLTA027

[1] Analytical results were taken from the reanalysis of this sample.
[2] The results were taken from the associated field duplicate.
-- Not analyzed
ND - Not detected or detected below the PQL
J - The analyte was positively identified, the quantitation is an estimate
Underlined results represent values detected above RRS 2 levels

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FINAL PAGE

ADMINISTRATIVE RECORD

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