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BASEWIDE GROUNDWATER MONITORING QUARTERLY LETTER REPORT FOR AIR
FORCE PLANT 4 NAS FORT WORTH TX
8/1/1995
JACOBS ENGINEERING

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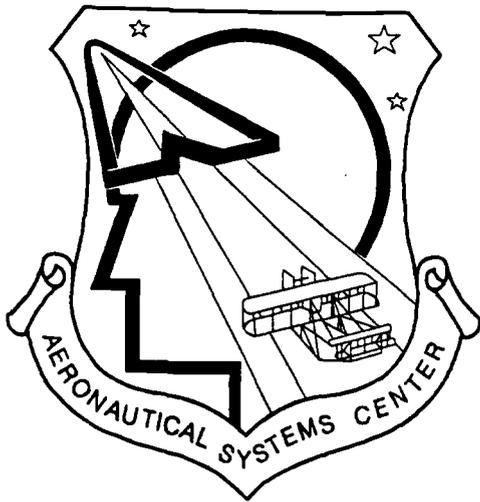
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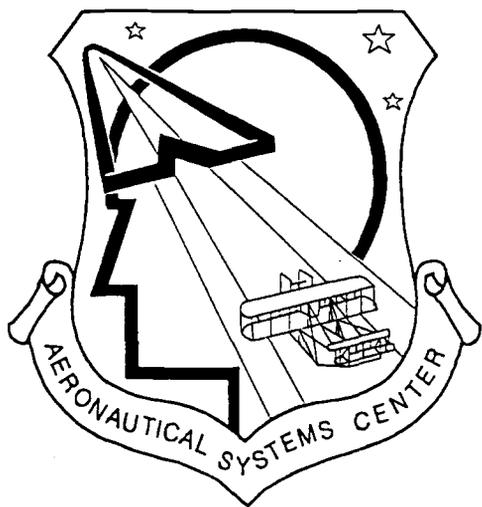


United States Air Force Aeronautical Systems Center

Air Force Plant 4
Fort Worth, Texas

INSTALLATION RESTORATION
PROGRAM (IRP)
BASEWIDE GROUNDWATER
MONITORING
QUARTERLY LETTER REPORT

AUGUST 1995



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PROGRAM (IRP)
BASEWIDE GROUNDWATER
MONITORING
QUARTERLY LETTER REPORT

AUGUST 1995

By:



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1.0 BACKGROUND

In March 1991, the Environmental Systems Division of Jacobs Engineering Group Inc. (Jacobs) was contracted to perform quarterly groundwater monitoring activities at U.S. Air Force (Air Force) Plant 4 (AFP4), Fort Worth, Texas. These activities are being conducted to aid in the implementation of a final remedial action plan under the Air Force Installation Restoration Program. The objectives of quarterly sampling at AFP4 are to monitor changes in water quality in the Terrace Alluvium and Paluxy aquifers and in surface waters adjacent to AFP4, and to monitor contaminant plumes and the effect of interim remedial actions on plume concentrations.

In July 1991, under Delivery Order 3, contract number F33615-90-D-4009, a draft sampling and analysis plan (SAP), detailing the quarterly sampling methodology, was submitted to the Air Force. Subsequently, at the request of the Air Force, changes were made to the Scope of Work, including changes and additions to the wells to be sampled, the addition of surface-water sampling sites, and the addition of several quarterly sampling rounds. An updated version of the SAP, incorporating these additions and comments by Mitre Corporation, was submitted in April 1992 (Jacobs 1992). The SAP was amended in April 1995.

This work is a continuation of previous quarterly sampling and is being conducted under Delivery Order 12, contract number F41624-94-D-8046. Jacobs submits all acquired data to the Air Force Center for Environmental Excellence for entry into the Installation Restoration Program Information Management System database. Submission of data from the first 13 sampling rounds, including the round discussed here, is complete.

2.0 SUMMARY OF SAMPLING ACTIVITIES

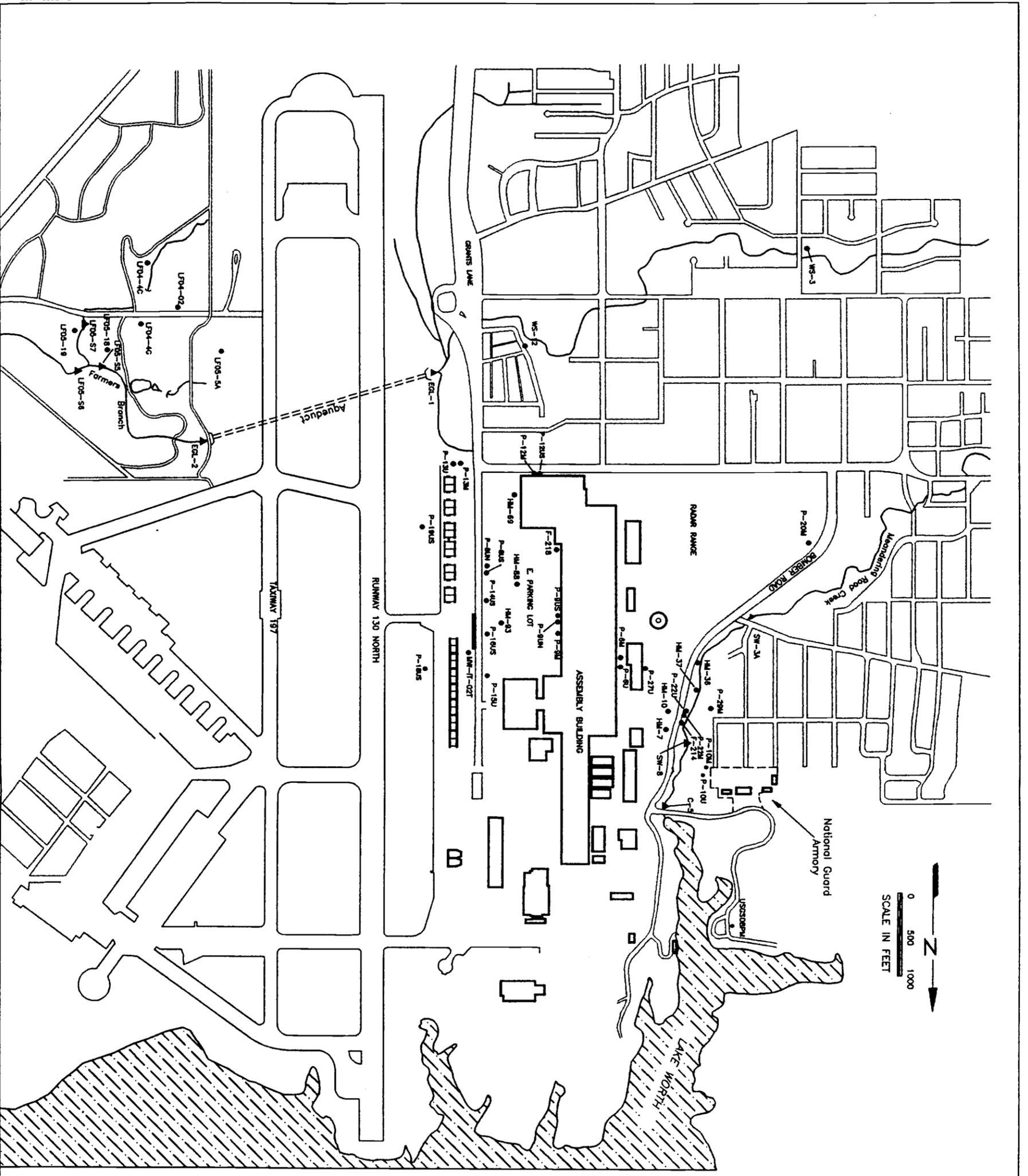
This quarterly sampling letter report discusses sampling activities and analytical results from the thirteenth sampling round, conducted between 18 April and 2 May 1995 by Jacobs personnel Kathryn Stewart, Tom Bond, and Michael Petring. During this period, a total of 40 groundwater monitoring wells, two water production wells, and eight surface-water sites were sampled on AFP4 property, Naval Air Station (NAS) Fort Worth, and in the community of White Settlement

(Figure 1, Table 1). Appendix A contains all thirteenth round analytical results reported by the analytical laboratory, Brown and Caldwell Analytical (BCA). Appendix B contains charts that graphically illustrate general trends in groundwater quality at locations where trichloroethene or its degradation byproducts were detected during the April-May 1995 sampling round. Appendix C provides photographs of thirteenth round sampling activities.

Groundwater and surface-water sampling procedures that were employed are described in detail in the April 1992 SAP and the April 1995 SAP addendum (Jacobs 1992, 1995). In general, the groundwater sampling procedure was carried out as follows: (1) three well casing volumes were purged and evaluated by measuring the pH, conductivity, temperature, and several other parameters; (2) when these parameters stabilized, samples were collected using a 1.88-inch Teflon bailer with a controlled-flow bottom-emptying device and stored at 4 degrees Celsius until they were shipped to the offsite laboratory for analysis. At each of the two White Settlement municipal water supply wells (WS-3 and WS-12), groundwater for the environmental sample and parameters measurement was collected directly from a faucet on the delivery pipe at each well while the production pumps were operating. Sampling equipment was usually decontaminated at the end of each day, but on several occasions equipment from two consecutive days was decontaminated together.

Surface-water samples were collected on 28 April 1995 using a polypropylene pond sampler or a 600-milliliter polypropylene beaker. No unusual stream flow volumes were observed. Table 1 summarizes purge and well information. Table 2 summarizes the analytical suite performed on samples from each location, including the field quality assurance and quality control samples collected.

Purge water from monitoring wells was collected in a portable 325-gallon tank and transferred to the groundwater treatment system in the east parking lot. Purge water was added to the system through a prefiltering system, with the assistance and under the direction of IT Corporation. All purge water generated during the April-May round was treated before the field team left the site at the end of the round.



- EXPLANATION**
- WELL SAMPLED DURING THE APRIL/MAY 1995 SAMPLING ROUND.
 - ▲ SURFACE WATER LOCATION SAMPLED DURING THE APRIL/MAY 1995 SAMPLING ROUND.

U.S. Air Force Plant 4 and
 Carswell Air Force Base
 Fort Worth, Texas

FIGURE 1
 LOCATIONS SAMPLED DURING
 THE THIRTEENTH ROUND
 APRIL/MAY 1995



TABLE 1
Field Parameter Measurements
Thirteenth Round - April/May 1995
Quarterly Groundwater Monitoring
Air Force Plant 4

260007

Location	Sample Date	Water Level (ft. BTOC)	Total Depth (ft. BTOC)	Casing Volume / Total Volume Purged (gal.)	Field Parameter Measurements				Observations / Comments
					Temperature (°C)	Specific Conductance (mmhos /cm)	pH	Dissolved Oxygen (mg/L)	
Middle Paluxy Wells									
USGS08PM	21-April-95	48.80	128.83	13 / 39	21.1	0.574	7.42	1.01	Light gray, slight turbidity, sulfur odor
P-6M	21-April-95	86.43	168.49	75.5 / 228	21.2	0.620	7.47	0.84	Clear, no odor
P-9M	22-April-95	89.72	162.21	67 / 201	21.2	0.680	7.60	1.60	Light gray, slight turbidity, no odor
P-10M	20-April-95	49.51	127.46	72 / 216	19.4	0.719	7.72	2.01	Clear, slight sulfur odor
P-12M	19-April-95	84.99	156.72	46.8 / 141	21.4	0.701	7.52	1.93	Clear, no odor
P-13M	23-April-95	81.21	166.84	56 / 168	21.1	0.661	7.57	1.92	Clear, no odor
P-20M	18-April-95	107.05	155.35	44.5 / 135	22.4	0.592	6.92	1.38	Clear, no odor
P-22M	25-April-95	57.95	132.84	49 / 147	19.8	0.539	7.52	2.27	Clear, sulfur odor
P-29M	18-April-95	59.94	132.92	11.8 / 36	21.5	0.728	7.05	0.65	Clear, sulfur odor
WS-3	18-Apr-95	NA	NA	NA	21.2	0.604	7.15	1.77	Clear, no odor
WS-12	18-Apr-95	NA	NA	NA	21.8	0.582	7.61	3.1	Clear, no odor
Upper Paluxy Wells									
P-6U	21-April-95	82.80	99.61	15.5 / 16	21.3	1.07	11.01	1.04	Gray, clear, sulfur odor. Dry at 16 gal.
P-8UN	24-April-95	85.68	95.78	6.6 / 26.4	21.5	0.471	8.17	4.16	Slight turbidity, slight sulfur odor
P-9UN	22-April-95	88.70	110.98	14.5 / 43.5	22.3	0.94	7.68	0.80	Light gray, clear, no odor
P-10U	20-April-95	34.72	56.66	20.2 / 63	19.0	1.06	7.64	2.86	Very slight turbidity, no odor
P-13U	23-April-95	81.11	89.62	5.5 / 16.5	20.8	0.553	7.99	2.67	Brown, very high turbidity, no odor
P-15U	25-April-95	79.79	91.07	7.4 / 12	20.6	0.489	7.23	2.01	Clear, no odor
P-22U	25-April-95	54.8	62.85	7.4 / 22.2	20.0	1.20	6.99	2.25	Dark gray, slight turbidity, sulfur odor
P-27U	26-April-95	83.94	94.48	1.7 / 5.1	21.1	1.25	6.80	1.98	Brown, very high turbidity, decreasing during purge, possible solvent odor
Paluxy Upper Sand Wells									
P-8US	22-April-95	55.86	66.69	7 / 8	23.6	0.415	11.15	1.94	Clear, no odor, dry at 8 gal.
P-9US	22-April-95	41.78	75.75	22 / 66	21.6	0.778	7.63	2.07	Clear, no odor
P-12US	19-April-95	41.43	60.46	12.4 / 26	20.4	0.603	11.51	2.86	Brownish-Gray, slight turbidity, no odor, dry at 26 gal.
P-14US	24-April-95	56.46	70.41	9 / 11.5	22.4	0.253	9.65	3.48	Clear, no odor, dry at 11.5 gal.
P-16US	25-April-95	38.69	69.82	20.3 / 19	22.8	0.363	6.73	1.11	Clear, no odor, dry at 19 gal.
P-18US	23-April-95	69.43	73.74	2.8 / 8.4	20.0	0.609	7.19	3.06	Light brown, high turbidity, no odor
P-19US	25-April-95	66.05	69.20	2 / 3	20.3	0.709	6.92	2.17	Gray-brown, high turbidity, no odor, dry at 3 gal.
Terrace Alluvium Wells									
F-214	29-April-95	14.83	21.69	4.5 / 13.5	19.2	6.45	5.95	2.58	Brown, very high turbidity, fuel odor and sheen
F-218	22-April-95	26.89	32.21	3.5 / 10.5	22.2	0.620	7.66	2.39	Light brownish-gray, very high turbidity in final purge, no odor
HM-7	29-April-95	8.54	14.12	3.6 / 8.7	20.2	0.970	6.90	2.76	Light brown, moderate turbidity, diesel odor, dry at 8.7 gal.

TABLE 1
Field Parameter Measurements
Thirteenth Round - April/May 1995
Quarterly Groundwater Monitoring
Air Force Plant 4

260008

Location	Sample Date	Water Level (ft. BTOC)	Total Depth (ft. BTOC)	Casing Volume / Total Volume Purged (gal.)	Field Parameter Measurements				Observations / Comments
					Temperature (°C)	Specific Conductance (mmhos /cm)	pH	Dissolved Oxygen (mg/L)	
Terrace Alluvium Wells - continued									
HM-10	29-April-95	11.11	20.73	6.3 / 18.9	22.1	2.45	7.02	2.60	Light brown, high turbidity, no odor
HM-36	26-April-95	6.63	15.55	1.5 / 4.5	17.4	1.74	6.65	1.65	Brown, very high turbidity, no odor
HM-37	26-April-95	5.01	13.45	1.4 / 4.2	16.6	1.94	6.75	1.41	Light brown, high turbidity, no odor
HM-69	20-April-95	9.88	36.54	15.3 / 25	21.6	0.454	7.84	3.95	Grayish-brown, high turbidity, no odor, dry at 25 gal.
HM-88	29-April-95	31.85	46.27	9.4 / 28.2	24.1	0.674	6.90	3.19	Clear, no odor
HM-93	20-April-95	28.16	39.71	7.5 / 11	23.4	2.44	7.02	3.73	Moderate turbidity, no odor, dry at 11 gal.
LF04-02	1-May-95	27.60	38.72	1.8 / 5.4	20.1	0.708	6.67	2.53	Reddish-brown, very high turbidity, slight fuel odor
LF04-4C	1-May-95	17.80	27.96	1.7 / 5.1	19.1	0.97	6.74	2.68	Light grayish-brown, very high turbidity, no odor
LF04-4G	1-May-95	25.09	33.20	1.3 / 3.9	19.2	0.728	6.63	3.05	Brown, very high turbidity, slight fuel odor
LF05-6A	26-April-95	23.57	30.35	1.1 / 3.3	19.7	0.809	6.70	3.51	Brown, very high turbidity, no odor
LF05-18	1-May-95	18.72	23.53	0.8 / 2.4	18.2	1.06	6.67	3.56	Light gray, moderate turbidity no odor
LF05-19	28-April-95	13.59	19.51	1 / 3	19.3	0.93	7.00	4.44	Light grayish-brown, very high turbidity, no odor
MW-IT-02T	29-April-95	31.81	57.69	17 / 51	24.2	0.698	6.93	3.26	Brown, very high turbidity, decreasing during purge, slight solvent odor
Surface Water Locations									
SW-3A	28-April-95	NA	NA	NA	18.50	0.591	8.17	7.48	Clear, no odor
SW-8	28-April-95	NA	NA	NA	16.1	0.691	7.76	5.24	Clear, no odor
C-6	28-April-95	NA	NA	NA	16	0.695	7.4	4.33	Gray, slight turbidity, no odor
EGL-1	28-April-95	NA	NA	NA	24.4	0.493	8.44	2.92	Clear, no odor
EGL-2	28-April-95	NA	NA	NA	19.9	0.572	8.28	7.1	Clear, no odor
LF05-S5	28-April-95	NA	NA	NA	18.2	0.597	7.96	5.6	Clear, no odor
LF05-S6	28-April-95	NA	NA	NA	18.4	0.793	7.67	6.5	Clear, no odor
LF05-S7	28-April-95	NA	NA	NA	19.2	0.784	7.07	2.73	Clear, no odor

Notes:
ft. BTOC = feet below top of casing
gal. = gallon
mg/L = milligrams per liter
mmhos/cm = millimhos per centimeter
NA = not analyzed
° C = degrees Celsius

When more than one field parameter measurement was taken (pH, temperature, etc.), the final, stabilized measurement is shown in this table.

TABLE 2
Analytical Suite
Thirteenth Round - April/May 1995
Quarterly Groundwater Monitoring
Air Force Plant 4

Location	VOCs E624.2	VOCs SW8240	Semi-VOCs SW8270	SW8016 Modified - DRO	Metals/ Lead SW6010/ SW7421	QA/QC Samples				
						Ambient Blank	Duplicate	Equipment Rinsate Blank	Trip Blank	
Middle Paluxy Wells										
USGS08PM		X								
P-6M		X			X			X		
P-9M	X									X
P-10M		X								
P-12M	X		X	X	X		X			X
P-13M		X								
P-20M	X									
P-22M		X					X			
P-29M	X		X	X				X		
WS-3	X									
WS-12	X									
Upper Paluxy Wells										
P-6U		X	X	X	X		X			
P-8UN		X						X		
P-9UN		X				X				
P-10U		X		X				X		
P-13U		X								
P-15U		X								
P-22U		X			X		X	X		
P-27U		X	X					X		X
Paluxy Upper Sand Wells										
P-8US		X								
P-9US		X								
P-12US		X								
P-14US		X								
P-16US		X								
P-18US		X						X		
P-19US		X			X		X			
Terrace Alluvium Wells										
F-214		X	X	X	X					
F-218		X	X	X	X		X	X		
HM-7		X	X	X						
HM-10		X	X	X						
HM-36		X			X			X		
HM-37		X			X					
HM-69		X								
HM-88		X	X	X	X			X		
HM-93		X								
LF04-02		X								
LF04-4C		X								
LF04-4G		X								
LF05-5A		X								
LF05-18		X						X		
LF05-19		X						X		X
MW-IT-02T		X	X	X	X		X			

TABLE 2
 Analytical Suite
 Thirteenth Round - April/May 1995
 Quarterly Groundwater Monitoring
 Air Force Plant 4

Location	VOCs E524.2	VOCs SW8240	Semi-VOCs SW8270	SW8015 Modified - DRO	Metals/ Lead SW6010/ SW7421	QA/QC Samples			
						Ambient Blank	Duplicate	Equipment Rinsate Blank	Trip Blank
Surface Water Locations									
SW-3		X							
SW-8		X					X		
C-5		X							
EGL-1		X							
EGL-2		X							
LF05-S5		X							
LF05-S6		X							
LF05-S7		X							
TOTALS	6	44	10	10	11	1	8	12	4

Notes:

- DRO = Diesel Range Organic
- VOC = Volatile Organic Compound
- QA/QC = Quality Assurance/Quality Control

VOC analyses at all locations; E524.2/SW8015 on selected Middle Paluxy wells.
 Additional groundwater analyses were performed based on previous results
 and/or the well's location relative to potential contaminant sources.
 Field quality control samples collected per Air Force Installation Restoration Program Handbook, September 1993

3.0 OBSERVATIONS AND PROBLEMS

LF05-14. Terrace Alluvium well LF05-14 was not sampled because the apparent volume of water in the well casing was insufficient for proper purging and sampling. Well LF05-18, located in the same general area, was substituted for LF05-14. Upon further investigation during the July 1995 sampling round, an obstruction was discovered in the well that had previously given a false, shallower well depth. The obstruction was removed (a small stick), and the well was purged and sampled normally during the July 1995 sampling round. Those results will be reported in the next quarterly report.

Farmers Branch Surface Locations. Samples from the aqueduct outlet (EGL-2), the unnamed tributary at the golf course (LF05-S7), and from the confluence of the unnamed tributary and Farmers Branch (LF05-S5, LF05-S6) all showed significant increases in concentrations of trichloroethene (TCE) and cis-1,2-dichloroethene (cis-1,2-DCE), reversing a general downward trend that had developed over the last two years (Appendix B). It is not known why this occurred, but it is possible that it is a seasonal fluctuation. Similar increases in concentration, although somewhat smaller in magnitude, were observed at some of the same locations in May 1993 (Appendix B).

Laboratory Quality Control. The laboratory, BCA, experienced problems with blank contamination, surrogate spikes, detection limits, and analytical batch control. Although some of the April-May data were qualified as estimated or undetected, none of the data were rejected because of laboratory problems. These problems are discussed in more detail in Section 4.4 and in the Data Validation Letter Report for this round of sampling.

4.0 SUMMARY OF ANALYTICAL RESULTS

All analyses during the thirteenth round were performed by BCA's laboratory in Glendale, California. Figure 2 shows TCE concentrations in the Upper Paluxy and Paluxy Upper Sand wells sampled during the April-May 1995 sampling round. Note that the highest concentrations continue to occur in Upper Paluxy Sand wells in the east parking lot and at P-19US.

Tables 3A, 3B, and 3C summarize the analytical results, maximum contaminant levels (MCLs), and practical quantitation limits (PQLs) for all locations sampled during the thirteenth round, and Figure 2 TCE Concentrations in the Upper Paluxy and Upper Paluxy Sand Wells, April-May 1995 include compounds that were detected in at least one of the environmental samples or duplicates. Appendix A contains all analytical results and laboratory quality data for the thirteenth round.

Volatile organic compound (VOC) analyses were performed on samples from all locations. VOC Method E524.2 was used for four Middle Paluxy monitoring wells and both City of White Settlement Middle Paluxy production wells. VOC method SW8240 was used for all other samples. Results for method E524.2 do not appear on Table 3 because no compounds were detected above the PQLs for this method. Semivolatile organics (SW8270), diesel-range organics (DRO) (SW8015 modified), metals (SW6010), and lead (SW7421) analyses were performed on selected wells based on their locations relative to potential contaminant sources.

Note that, starting with this sampling round, method SW8015 Modified has been substituted for oil and grease (method E413.2) and total petroleum hydrocarbons (method E418.1), and that SW8015 for nonhalogenated volatile organics has been dropped. These changes will remain in effect during future rounds of sampling at AFP4.

4.1 VOLATILE ORGANIC COMPOUNDS

TCE and its degradation products (cis-1,2-DCE, trans-1,2-DCE, and vinyl chloride) are the compounds of primary concern at AFP4. The charts in Appendix B depict general trends of concentrations of these compounds since Jacobs began sampling at AFP4 in October 1991. An additional, earlier data point, extracted from reports by Hargis & Associates, Rust Geotech, or Radian, is included in each chart for reference.

Middle Paluxy Wells. Results for Middle Paluxy wells were generally consistent with previous sampling rounds. Concentrations were reported above the PQLs at only one location, P-6M, which contained 9.5 micrograms per liter cis-1,2-DCE. The laboratory reported acetone in

TABLE 3A
Results - Volatile Organic Compounds
Thirteenth Round - April / May 1995
Quarterly Groundwater Monitoring
Air Force Plant 4

260014

Location	SW8240 (µg/L)									
	Trichloroethene	Cis-1,2-Dichloro-ethene	Trans-1,2-dichloro-ethene	Vinyl Chloride	1,1-Dichloroethene	Toluene	Total Xylenes	Chlorobenzene	Methylene Chloride	Chloroform
	PQL	5	5	5	10	5	5	5	5	5
MCL	5	70	100	2	7	1,000	10,000	none	none	80
Middle Paluxy Wells										
USGS08PM	-	-	-	-	-	-	-	-	-	-
P-6M	-	9.5	-	-	-	-	-	-	-	-
P-10M	-	-	-	-	-	-	-	-	-	-
P-13M	-	-	-	-	-	-	-	-	-	-
P-22M	-	-	-	-	-	-	-	-	-	-
P-22M (Duplicate)	-	-	-	-	-	-	-	-	-	-
Upper Paluxy Wells										
P-6U	-	-	-	-	-	-	-	-	-	-
P-6U (Duplicate)	-	-	-	-	-	-	-	-	-	-
P-8UN	-	-	-	-	-	-	-	-	-	-
P-9UN	-	-	-	-	-	-	-	-	-	-
P-10U	-	-	-	-	-	-	-	-	-	-
P-13U	-	-	-	-	-	-	-	-	-	-
P-15U	-	-	-	-	-	-	-	-	-	-
P-22U	45	180	-	29	-	-	-	-	-	-
P-27U	31UJ-B	560	-	-	-	-	-	-	-	-
Paluxy Upper Sand Wells										
P-8US	2,400	160	-	-	-	-	-	-	-	-
P-9US	120	-	-	-	-	-	-	-	-	-
P-12US	-	-	-	-	-	-	-	-	-	-
P-14US	110	19	-	-	-	-	-	-	-	-
P-16US	710	290	-	-	-	-	-	-	-	-
P-18US	-	-	-	-	-	-	-	-	-	-
P-19US	9,400	830	-	-	-	-	-	-	-	-
P-19US (Duplicate)	7,600	720	-	-	-	-	-	-	-	-
Terrace Alluvium Wells										
F-214	130,000	45,000	-	-	-	43,000	-	-	11,000	-
F-218	60,000	-	-	-	-	-	-	-	-	-
F-218 (Duplicate)	63,000	-	-	-	-	-	-	-	-	-
HM-7	-	-	-	-	-	42	370	1,100	-	310
HM-10	38	12	-	-	78	-	-	-	-	-
HM-36	9	7.6	-	-	-	-	-	-	-	-
HM-37	270	150	-	52	51	-	-	-	-	-

TABLE 3A
Results - Volatile Organic Compounds
Thirteenth Round - April / May 1995
Quarterly Groundwater Monitoring
Air Force Plant 4

260015

Location	SW8240 (µg/L)									
	Trichloroethene	Cis-1,2-Dichloro-ethene	Trans-1,2-dichloro-ethene	Vinyl Chloride	1,1-Dichloroethene	Toluene	Total Xylenes	Chlorobenzene	Methylene Chloride	Chloroform
	PQL	5	5	5	10	5	5	5	5	5
MCL	5	70	100	2	7	1,000	10,000	none	none	80*
Terrace Alluvium Wells - continued										
HM-69	-	-	-	-	-	-	-	-	-	-
HM-88	39,000	-	-	-	-	-	-	-	-	-
HM-93	-	-	-	-	-	-	-	-	-	-
LF04-02	2,200	290	-	-	-	-	-	-	-	-
LF04-4C	6.7	6	-	-	-	-	-	-	-	-
LF04-4G	1,500	170	-	-	-	-	-	-	-	-
LF05-5A	590	130	9.3	-	-	-	-	-	-	-
LF05-18	1,400	360	38	-	-	-	-	-	-	-
LF05-19	11	5.3	-	-	-	-	-	-	-	-
MW-IT-02T	3,400	590	-	-	-	-	-	-	-	-
MW-IT-02T (Duplicate)	3,500	620	-	-	-	-	-	-	-	-
Surface Water Locations										
SW-3A	-	-	-	-	-	-	-	-	-	-
SW-8	-	12	-	-	-	-	-	-	-	-
SW-8 (Duplicate)	-	13	-	-	-	-	-	-	-	-
C-5	-	-	-	-	-	-	-	-	-	-
EGL-1	-	-	-	-	-	-	-	-	-	-
EGL-2	58	7.2	-	-	-	-	-	-	-	-
LF05-S5	41	11	-	-	-	-	-	-	-	-
LF05-S6	92	39	-	-	-	-	-	-	-	-
LF05-S7	190	87	-	-	-	-	-	-	-	-

Notes:

- B = Laboratory method blank contamination
- J = Estimated
- MCL = Maximum Contaminant Level (EPA 1994)
- PQL = Practical Quantitation Limit; (Air Force 1993)
- U = Undetected
- = Compound not detected
- * = Proposed MCL for chloroform
- µg/L = Micrograms per liter

Samples from six locations (WS-3, WS-12, P-9M, P-12M, P-20M, and P-29M) were analyzed by method E524.2 in May 1995. Volatile organic compounds were not reported at any of these locations. Note that the E524.2 PQLs have increased from previous rounds: from 0.2 µg/L to 2.0 µg/L. Note also that volatile organic compounds were previously detected at P-9M, P-12M, and P-29M at or slightly above the previous lower PQL of 0.2 µg/L. Result qualifiers are based on laboratory method blanks only.

TABLE 3B
Results - Semivolatiles and Diesel-Range Organics
Thirteenth Round - April / May 1995
Quarterly Groundwater Monitoring
Air Force Plant 4

Location	8015M (mg/L)	SW8270 (µg/L)					
	Diesel-Range Organic Components	1,2-Dichloro- benzene	1,4-Dichloro- benzene	4-Methylphenol (p-cresol)	Naphthalene	Phenol	bis(2-Ethylhexyl) phthalate
	PQL	10	10	10	10	10	10
MCL	none	600	75	none	none	none	none
Middle Paluxy Wells							
P-12M	-	-	-	-	-	-	-
P-12M (Duplicate)	-	-	-	-	-	-	-
P-29M	-	-	-	-	-	10	-
Upper Paluxy Wells							
P-6U	14	-	-	-	-	-	76J-B
P-6U (Duplicate)	14	-	-	-	-	-	-
P-10U	-	n/a	n/a	n/a	n/a	n/a	n/a
P-27U	n/a	-	-	-	-	-	-
Terrace Alluvium Wells							
F-214	17	3,200	490	210	-	-	-
F-218	1.3	-	-	-	-	-	-
F-218 (Duplicate)	-	-	-	-	-	-	-
HM-7	2.4	130	110	-	44	-	-
HM-10	-	-	-	-	-	-	-
HM-88	-	-	-	-	-	-	-
MW-IT-02T	-	-	-	-	-	-	-
MW-IT-02T (Duplicate)	-	-	-	-	-	-	-

Notes:

- B = Laboratory method blank contamination
- J = Estimated
- MCL = Maximum Contaminant Level (EPA 1994)
- mg/L = Milligrams per liter
- n/a = Sample was not analyzed for this compound
- PQL = Practical Quantitation Limit (Air Force 1993)
- U = Undetected
- = Compound not detected
- µg/L = Micrograms per liter

Result qualifiers are based on laboratory method blanks only.

TABLE 3C
 Results - ICP Metals and Lead by SW7421
 Thirteenth Round - April / May 1995
 Quarterly Groundwater Monitoring
 Air Force Plant 4

LOCATION	SW6010 ICP Metals Screen (mg/L)															SW7421 (mg/L)
	Aluminum	Barium	Cadmium	Calcium	Chromium, Total	Cobalt	Iron	Lead	Magnesium	Manganese	Nickel	Potassium	Sodium	Vanadium	Zinc	Lead
	PQL	0.5	0.1	0.005	1.0	0.05	0.05	0.05	0.2	1.0	0.02	0.1	5.0	1.0	0.1	0.02
MCL	0.2	2.0	0.005	none	0.1	none	0.3	0.0*	none	0.05	0.1	none	none	0.002	5.0	0.0*
	Middle Paluxy Wells															
P-6M	-	0.14	-	63	-	-	0.12	-	26	0.024	-	5.0	27	-	0.44	-
P-12M	-	0.17	-	70	-	-	0.34	-	7.9	-	-	84	55	-	0.13J-B	-
	Upper Paluxy / Paluxy Upper Sand Wells															
P-6U	5.1	0.13	0.073	200	-	-	300	1.6	27	1.3	-	9.1	51	-	120.	-
P-22U	-	-	-	170	-	-	3.2	-	30	0.16	-	6.2	44	-	0.34J-B	-
P-22U (duplicate)	-	-	-	170	-	-	4.5	-	30	0.17	-	6.2	43	-	0.49J-B	0.0052
P-19US	16	0.14	-	150	0.11J-B	-	12	-	9.6	0.16	-	-	28	-	0.068J-B	0.045
P-19US (duplicate)	6	0.13	-	140	0.09J-B	-	5.3	-	7.8	0.094	-	-	29	-	0.048J-B	0.025
	Terrace Alluvium Wells															
F-214	0.62	-	-	340	0.085J-B	-	6.6	-	57	0.95	2.0	7.3	200	-	0.031UJ-B	-
F-218	56	0.25	0.01	900	0.36	-	42	-	15	0.58	-	9.2	35	0.11	0.11J-B	0.039
HM-36	27	0.16	-	810	0.059	-	23	-	21	1.7	-	5.1	130	-	0.062J-B	0.024
HM-37	20	0.16	-	500	-	0.1J-B	17	-	83	4.9	-	23	150	-	0.046J-B	0.025
HM-88	-	-	-	130	0.097J-B	-	0.44	-	4.0	-	-	-	26	-	0.03J-B	-
MV-IT-02T	-	-	-	48	0.18	-	0.24	-	2.4	-	-	87	62	-	-	-

Notes:

- B = Laboratory method blank contamination
- ICP = Inductively Coupled Plasma
- J = Estimated
- MCL = Maximum Contaminant Level (EPA 1994)
- mg/L = Milligrams per liter
- PQL = Practical Quantitation Limit (Air Force 1993)
- U = Undetected
- = Compound not detected
- * = The MCL shown for lead is a Maximum Contaminant Level Goal.

Result qualifiers are based on laboratory method blanks only.

samples from several Paluxy locations, but those amounts were attributed to laboratory contamination during data validation.

Upper Paluxy and Paluxy Upper Sand Wells Results at Upper Paluxy wells (P-22U and P-27U) were consistent with previous rounds of sampling. Paluxy Upper Sand wells in the East Parking Lot, with the exception showed a slight increase over previous rounds that would not have been notable, except that the increase was observed in four wells (Appendix B; pages B-2, B-3).

Terrace Alluvium Wells. Results for TCE and related compounds at Terrace Alluvium locations were generally in a range of expected values. Although methylene chloride is a common laboratory contaminant, it has previously been detected in groundwater samples at other monitoring well locations in Landfill 3, and it is possible that the amount detected in the sample from F-214 represents actual groundwater quality at the location. The laboratory reported acetone in samples from several Terrace Alluvium locations, but those amounts were attributed to laboratory contamination during data validation.

AFP4 and Carswell Air Force Base Surface Locations. Surface sites were sampled along Meandering Road Creek and along Farmers Branch on 28 April 1995. Results from Farmers Branch on NAS Fort Worth (EGL-2 and LF05-S6) reversed a distinct downward trend observed over the three previous rounds, but this may be a result of seasonal flow variations (Appendix B, pages B-7, B-8). Results from Meandering Road Creek locations were generally consistent with previous rounds.

4.2 SEMIVOLATILES AND DIESEL-RANGE ORGANICS

Several fuel-related semivolatile compounds occurred in Terrace Alluvium wells F-214 and HM-7 in Landfill 3, related to the fuel contamination there (Table 3B). Phenol and bis(2-ethylhexyl)phthalate were detected in two Paluxy wells, but both are thought to be due to laboratory contamination.

DRO compounds (SW8015 modified) were also detected at F-214 and HM-7 in Landfill 3, as well as at F-218 in the east parking lot, and Upper Paluxy well P-6U. See Table 3B for additional information.

4.3 METALS

Of the metals to which the U.S. Environmental Protection Agency (EPA) has assigned primary MCLs, barium, and chromium were detected above the PQLs during the thirteenth round. The MCL for barium was not exceeded in any of the samples analyzed. Total chromium was reported above its respective MCL at P-19US, F-218, and MW-IT-02T. Lead was reported near the detection limits in samples from three Paluxy wells and three Terrace Alluvium wells. Although there is not an MCL for lead, there is a Maximum Contaminant Level Goal of 0.0 milligrams per liter lead at the tap (EPA 1993).

Concentrations of aluminum, iron, and manganese were at or above their respective secondary MCLs in several samples.

4.4 DATA QUALITY

Data validation has been completed by Jacobs' subcontractor, EcoChem, Inc., and will be reported separately. Several issues merit explanation here, however.

During analysis of round 13 samples, the laboratory experienced problems with method and field blanks, surrogate spike recoveries, and analytical batch control. Although the laboratory took appropriate corrective actions, some of the concentrations reported in Tables 3A-3C have subsequently been qualified as estimated (J-B) or undetected and estimated (UJ-B). Appendix A of the Data Validation Letter Report summarizes all data qualified through the validation process. Although the validator qualified several values based on equipment or ambient blank results, these qualifiers are not shown in Table 3.

Data for all analytical methods exceeded the completeness requirement of 95 percent. No data were rejected from this sampling round.

5.0 RECOMMENDATIONS

Well and surface locations proposed for sampling are shown in Figure 3 and summarized in Table 4. This suite of 50 locations represents 10 Middle Paluxy wells, 20 Terrace Alluvium wells on AFP4, 12 Terrace Alluvium wells on NASFW, three surface-water locations along Meandering Road Creek, and five surface-water locations along Farmers Branch.

TABLE 4
Proposed Sampling Locations
Fourteenth Round - July 1995
Quarterly Groundwater Monitoring
Air Force Plant 4

260022

Location	VOCs E524.2	VOCs SW8240	Semi-VOCs SW8270	DRO SW8015M	Metals/ Lead SW6010/ SW7421
Middle Paluxy Wells					
P-5M		X			
P-11M	X				X
P-20M	X				
P-24M		X			
P-25M		X			X
P-26M		X			
P-29M	X		X	X	
P-30M	X		X	X	
WS-1	X				
WS-H3	X				
Terrace Alluvium Wells - AFP4					
F-214		X	X	X	X
F-218		X	X	X	X
F-219		X			
HM-7		X	X	X	
HM-10		X	X	X	
HM-24		X			
HM-31		X			
HM-36		X			
HM-37		X			
HM-69		X			
HM-88		X	X	X	X
HM-93		X			
HM-96		X			
HM-98		X			
HM-104		X			
HM-110		X			
HM-113		X			
MW-IT-02T		X	X	X	X
W-149		X	X	X	X
W-157		X			
Terrace Alluvium Wells - NASFW					
LF04-02		X			
LF04-4C		X			
LF04-4G		X			
LF05-5A		X			
LF05-14		X			
LF05-19		X			
HM-114		X			
HM-119		X			
HM-120		X			
HM-123		X			
HM-125		X			
HM-127		X			
Surface Locations					
SW-3A		X			
SW-8		X			
C-5		X			
EGL-1		X			
EGL-2		X			
LF05-S5		X			
LF05-S6		X			
LF05-S7		X			
TOTALS	6	44	9	9	7

Notes:

- VOC = volatile organic compound
- DRO = diesel-range organic
- NASFW = Naval Air Station Fort Worth
- AFP4 = Air Force Plant 4

6.0 REFERENCES

- Hargis+Associates, Inc. 1989a (April). *Water Quality Data, May 1987 Through January 1989. Volume I.*
- Hargis+Associates, Inc. 1989b (July). *Summary of Interim Remedial Investigations: January 1987 to April 1989. Volume III.*
- Jacobs Engineering Group Inc. 1995. *Installation Restoration Program (IRP) Basewide Groundwater Monitoring Sampling and Analysis Plan Addendum, Final. Air Force Plant 4, Texas.*
- Jacobs Engineering Group Inc. 1992. *Installation Restoration Program (IRP) Quarterly Groundwater Monitoring Sampling and Analysis Plan, Air Force Plant 4, Texas.*
- Radian Corporation. 1991 (October). *Remedial Investigation Report for the Flightline Area - Final.*
- U.S. Air Force. 1991 (September). *Handbook for the Installation Restoration Program (IRP) Remedial Investigation/Feasibility Studies (RI/FS).* Brooks Air Force Base, Texas: Air Force Center for Environmental Excellence.
- U.S. Department of Energy. 1992 (December). *Draft Final Preliminary Assessment/Site Inspection and Remedial Investigation Report.*
- U.S. Environmental Protection Agency. 1994 (November). *Drinking Water Regulations and Health Advisories.* Office of Water.
- U.S. Environmental Protection Agency. 1993 (May). *Drinking Water Regulations and Health Advisories.* Office of Water.

APPENDIX A

PRELIMINARY ANALYTICAL RESULTS

QUARTERLY GROUNDWATER SAMPLING LETTER REPORT-- AUGUST 1995

Control Number/Sample ID Cross-reference

260025

Control Number	Sample ID	Analytical Method	Comments
AF-L140301	MW3-P27U-13	SW8240	Equip. Blank
AF-L140302	MW3-P27U-13	SW8270	Equip. Blank
AF-L158601	MW-P1M-13	SW8240	
AF-L158701	MW-P6M-13	SW8240	
AF-L158702	MW-P6M-13	SW6010/SW7421	
AF-L158703	MW-P6U-13	SW8240	
AF-L158704	MW-P6U-13	SW8270	
AF-L158705	MW-P6U-13	SW8015	
AF-L158706	MW-P6U-13	SW6010/SW7421	
AF-L158707	MW2-P6U-13	SW8015	Duplicate
AF-L158708	MW3-P6M-13	SW8240	Equip. Blank
AF-L158709	MW3-P6M-13	SW6010/SW7421	Equip. Blank
AF-L158801	MW-P9M-13	E524.2	
AF-L158802	MW-P9US-13	SW8240	
AF-L158803	MW-P9UN-13	SW8240	
AF-L158804	MW1-P9UN-13	E524.2	Ambient Blank
AF-L158805	MW4-P9M-13	E524.2	Trip Blank
AF-L158901	MW-P10M-13	SW8240	
AF-L158902	MW-P10U-13	SW8240	
AF-L158903	MW-P10U-13	SW8015	
AF-L158904	MW3-P10U-13	SW8240	Equip. Blank
AF-L158905	MW3-P10U-13	SW8015	Equip. Blank
AF-L159001	MW-P12M-13	E524.2	
AF-L159002	MW-P12M-13	SW8270	
AF-L159003	MW-P12M-13	SW8015	
AF-L159004	MW-P12M-13	SW6010/SW7421	
AF-L159005	MW2-P12M-13	E524.2	Duplicate
AF-L159006	MW2-P12M-13	SW8270	Duplicate
AF-L159007	MW2-P12M-13	SW8015	Duplicate
AF-L159008	MW-P12US-13	SW8240	
AF-L159009	MW4-P12M-13	E524.2	Trip Blank
AF-L159101	MW-P13M-13	SW8240	
AF-L159102	MW-P13U-13	SW8240	
AF-L159201	MW-P20M-13	E524.2	
AF-L159202	MW-P29M-13	E524.2	
AF-L159203	MW-P29M-13	SW8270	
AF-L159204	MW-P29M-13	SW8015	
AF-L159205	MW3-P29M-13	SW8015	Equip. Blank
AF-L159206	MW3-P29M-13	SW8270	Equip. Blank
AF-L159207	MW3-P29M-13	E524.2	Equip. Blank
AF-L159301	MW-P22M-13	SW8240	
AF-L159302	MW-P22U-13	SW8240	
AF-L159303	MW-P22U-13	SW6010/SW7421	
AF-L159304	MW2-P22M-13	SW8240	Duplicate
AF-L159305	MW2-P22U-13	SW6010/SW7421	Duplicate
AF-L159306	MW3-P22U-13	SW8240	Equip. Blank
AF-L159307	MW3-P22U-13	SW6010/SW7421	Equip. Blank
AF-L159401	PW-WS3-13	E524.2	

Control Number/Sample ID Cross-reference

260026

Control Number	Sample ID	Analytical Method	Comments
AF-L159402	PW-WS12-13	E524.2	
AF-L159501	MW-P8US-13	SW8240	
AF-L159502	MW-P8UN-13	SW8240	
AF-L159506	MW3-P8UN-13	SW8240	Equip. Blank
AF-L159601	MW-P19US-13	SW8240	
AF-L159602	MW-P19US-13	SW6010/SW7421	
AF-L159603	MW2-P19US-13	SW8240	Duplicate
AF-L159604	MW2-P19US-13	SW6010/SW7421	Duplicate
AF-L159605	MW-P14US-13	SW8240	
AF-L159606	MW-P16US-13	SW8240	
AF-L159607	MW-P15U-13	SW8240	
AF-L159701	MW-P18US-13	SW8240	
AF-L159702	MW3-P18US-13	SW8240	Equip. Blank
AF-L159801	MW-P27U-13	SW8240	
AF-L159802	MW-P27U-13	SW8270	
AF-L159803	MW4-P27U-13	SW8240	Trip Blank
AF-L159901	MW-F214-13	SW8240	
AF-L159902	MW-F214-13	SW8270	
AF-L159903	MW-F214-13	SW8015	
AF-L159904	MW-F214-13	SW6010/SW7421	
AF-L160001	MW-F218-13	SW8240	
AF-L160002	MW-F218-13	SW8270	
AF-L160003	MW-F218-13	SW8015	
AF-L160004	MW-F218-13	SW6010/SW7421	
AF-L160005	MW2-F218-13	SW8240	Duplicate
AF-L160006	MW3-F218-13	SW8240	Equip. Blank
AF-L160007	MW3-F218-13	SW8270	Equip. Blank
AF-L160008	MW3-F218-13	SW8015	Equip. Blank
AF-L160009	MW3-F218-13	SW6010/SW7421	Equip. Blank
AF-L160101	MW-HM7-13	SW8240	
AF-L160102	MW-HM7-13	SW8270	
AF-L160103	MW-HM7-13	SW8015	
AF-L160104	MW-HM10-13	SW8240	
AF-L160105	MW-HM10-13	SW8270	
AF-L160106	MW-HM10-13	SW8015	
AF-L160201	MW-HM36-13	SW8240	
AF-L160202	MW-HM36-13	SW6010/SW7421	
AF-L160203	MW-HM37-13	SW8240	
AF-L160204	MW-HM37-13	SW6010/SW7421	
AF-L160205	MW3-HM36-13	SW6010/SW7421	Equip. Blank
AF-L160301	MW-HM69-13	SW8240	
AF-L160302	MW-HM93-13	SW8240	
AF-L160401	MW-HM88-13	SW8240	
AF-L160402	MW-HM88-13	SW8270	
AF-L160403	MW-HM88-13	SW8015	
AF-L160404	MW-HM88-13	SW6010/SW7421	
AF-L160405	MW3-HM88-13	SW8240	Equip. Blank
AF-L160406	MW3-HM88-13	SW8270	Equip. Blank

Control Number/Sample ID Cross-reference

260027

Control Number	Sample ID	Analytical Method	Comments
AF-L160407	MW3-HM88-13	SW8015	Equip. Blank
AF-L160408	MW3-HM88-13	SW6010/SW7421	Equip. Blank
AF-L160501	MW-LF0402-13	SW8240	
AF-L160502	MW-LF044C-13	SW8240	
AF-L160503	MW-LF044G-13	SW8240	
AF-L160504	MW-LF055A-13	SW8240	
AF-L160505	MW-LF0514-13	SW8240	Well Location for this sample is LF05-18
AF-L160506	MW-LF0519-13	SW8240	
AF-L160507	MW3-LF0519-13	SW8240	Equip. Blank
AF-L160508	MW4-LF0519-13	SW8240	Trip Blank
AF-L160509	MW3-LF0518-13	SW8240	Equip. Blank
AF-L160601	MW-MWIT02T-13	SW8240	
AF-L160602	MW-MWIT02T-13	SW8270	
AF-L160603	MW-MWIT02T-13	SW8015	
AF-L160604	MW-MWIT02T-13	SW6010/SW7421	
AF-L160605	MW2-MWIT02T-13	SW8240	Duplicate
AF-L160701	SW-SW3A-13	SW8240	
AF-L160702	SW-SW8-13	SW8240	
AF-L160703	SW2-SW8-13	SW8240	Duplicate
AF-L160704	SW-C5-13	SW8240	
AF-L160705	SW-EGL1-13	SW8240	
AF-L160706	SW-EGL2-13	SW8240	
AF-L160707	SW-LF05S5-13	SW8240	
AF-L160708	SW-LF05S6-13	SW8240	
AF-L160709	SW-LF05S7-13	SW8240	

260028

To conserve space and materials, and to control mailing costs, the appendix has not been included with this copy of the Quarterly Groundwater Sampling Letter Report.

Contact Jacobs Engineering Group Inc.
if this supplemental information is required.

260029

APPENDIX B

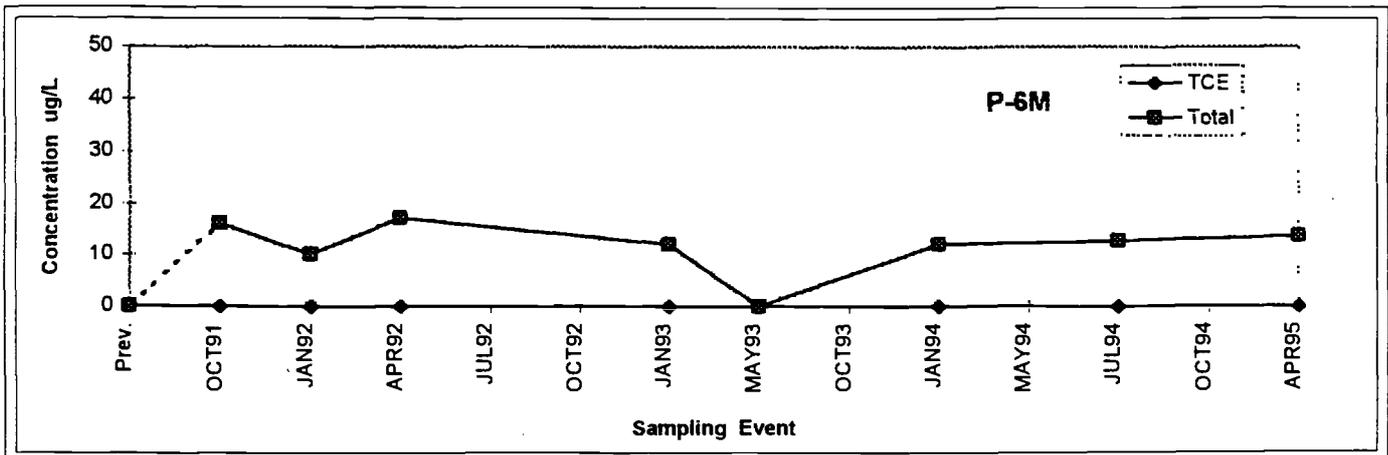
HISTORICAL RESULTS FOR TCE AND DEGRADATION PRODUCTS

QUARTERLY GROUNDWATER SAMPLING LETTER REPORT-- AUGUST 1995

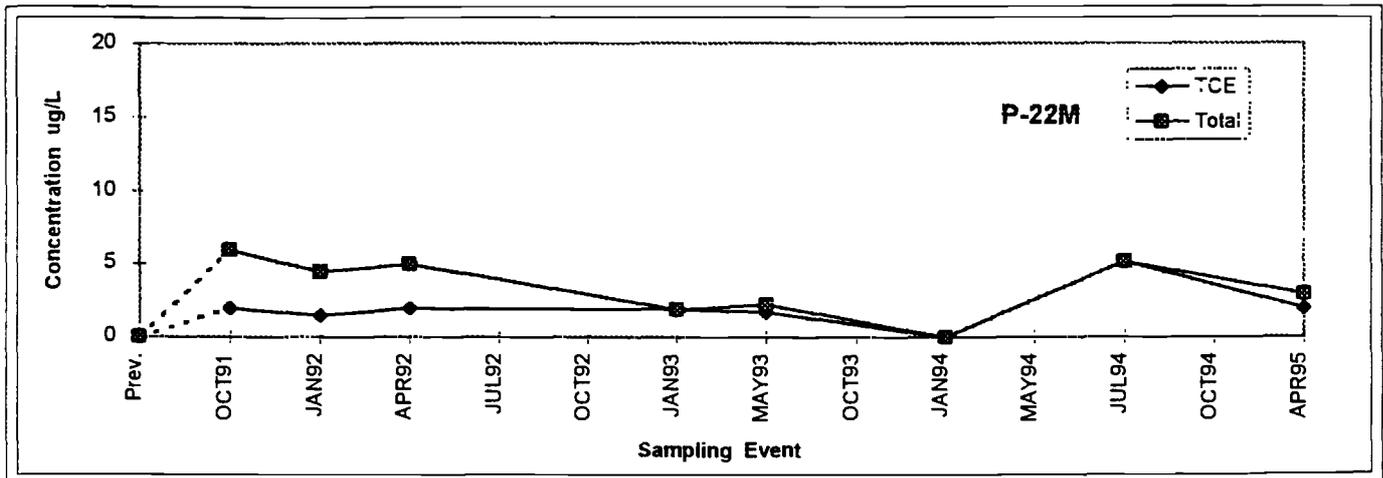
260030

Paluxy Wells (Middle and Upper)

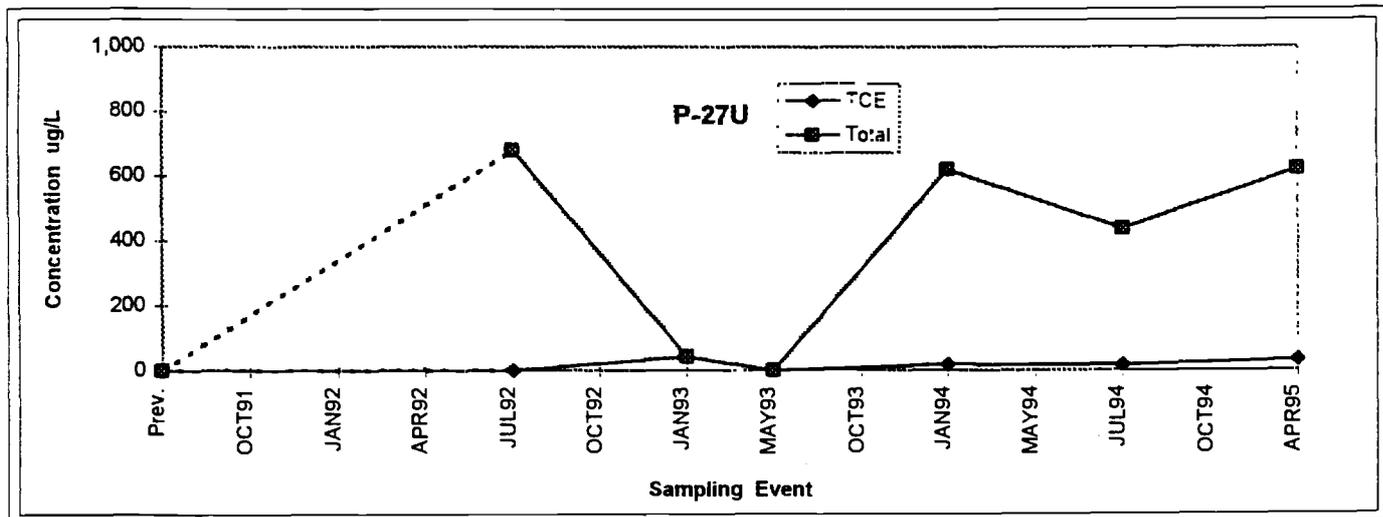
Historical Sampling results for TCE and degradation products through April 1995



Middle Paluxy well adjacent to west side of assembly bldg.



Middle Paluxy well in AFP4 Landfill 3



Upper Paluxy well west of Bldg. 14

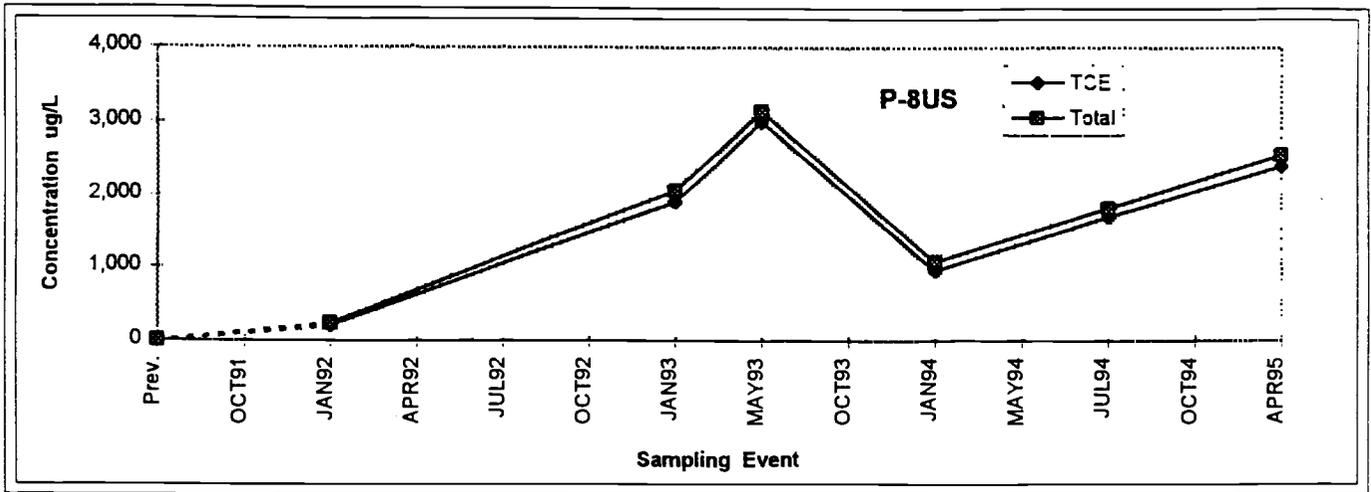
"Prev" data were acquired prior to Oct, 1991. See Appendix B notes.

"Total" concentration = TCE plus its degradation products. See Appendix B notes.

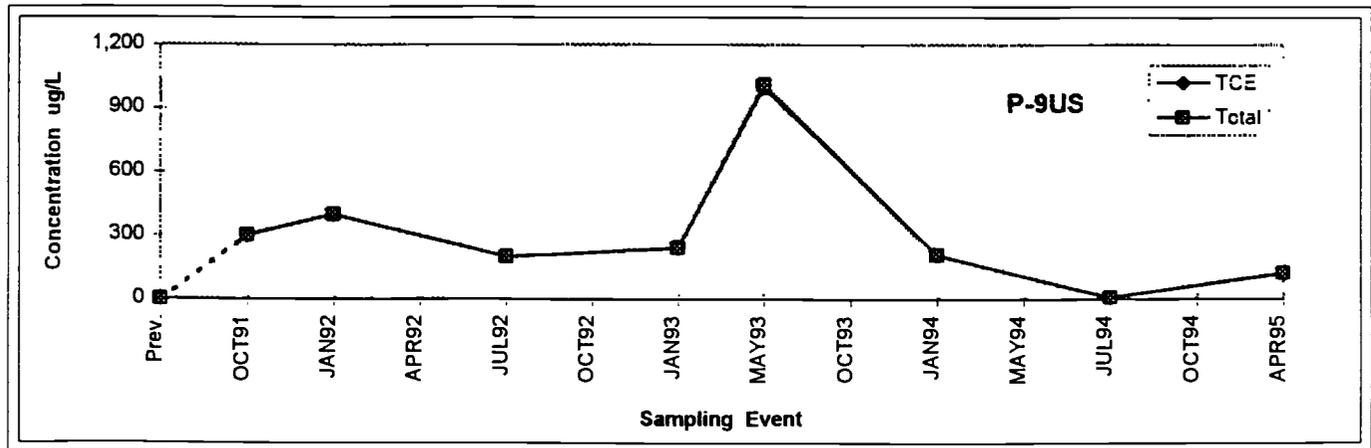
260031

Paluxy Upper Sand Wells

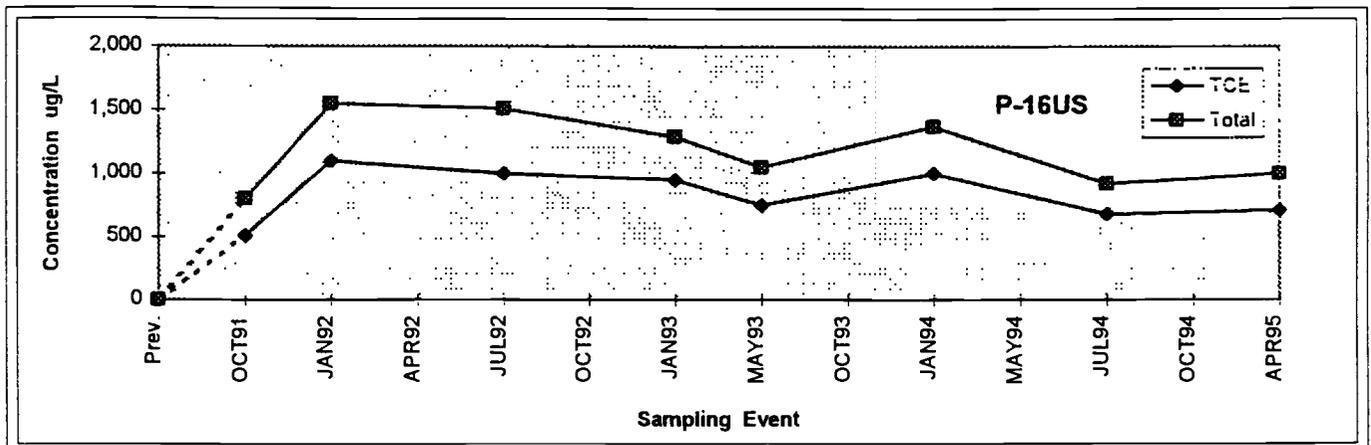
Historical Sampling results for TCE and degradation products through April 1995



Paluxy Upper Sand well along Lockheed-Martin Blvd.



Paluxy Upper Sand well in East Parking Lot



Paluxy Upper Sand well along Lockheed-Martin Blvd.

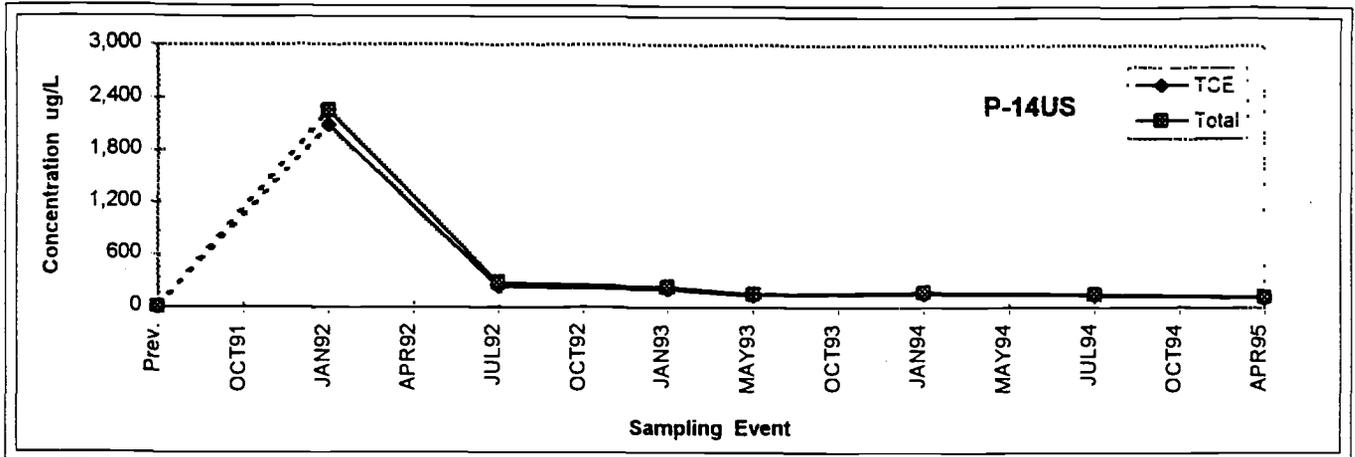
"Prev" data were acquired prior to Oct, 1991. See Appendix B notes.

"Total" concentration = TCE plus its degradation products. See Appendix B notes.

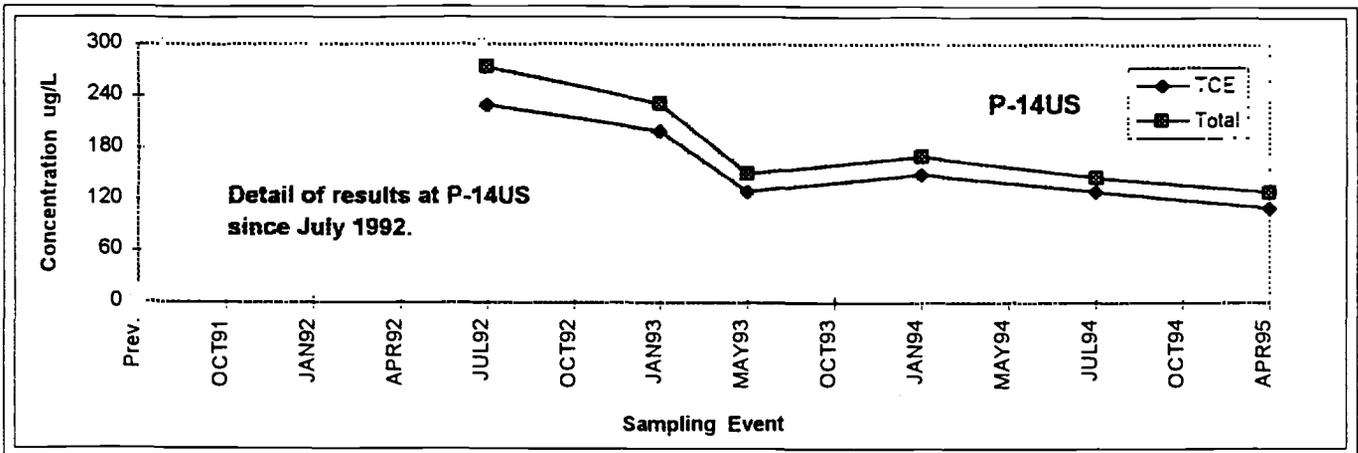
Paluxy Upper Sand Wells - continued

260032

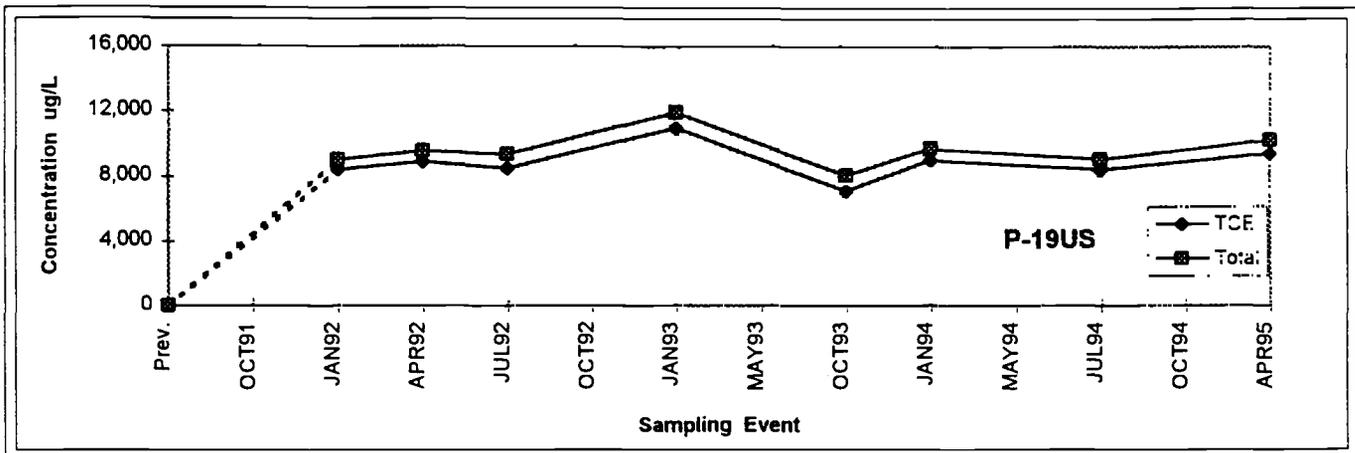
Historical Sampling results for TCE and degradation products through April 1995



Paluxy Upper Sand well along Lockheed-Martin Blvd.



Paluxy Upper Sand well along Lockheed-Martin Blvd.

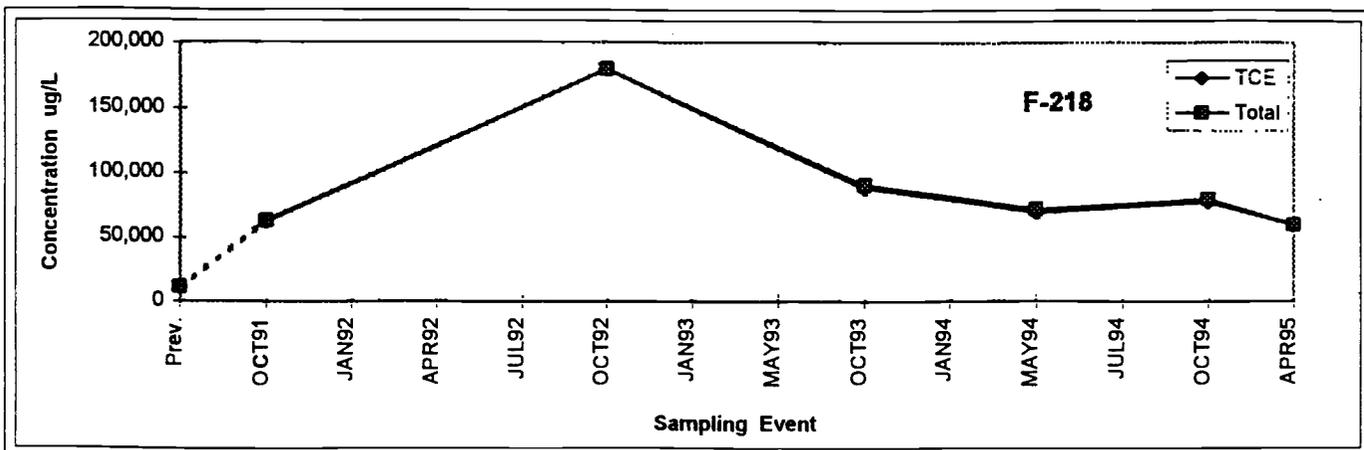


Paluxy Upper Sand well at south end of AFP4 flightline.

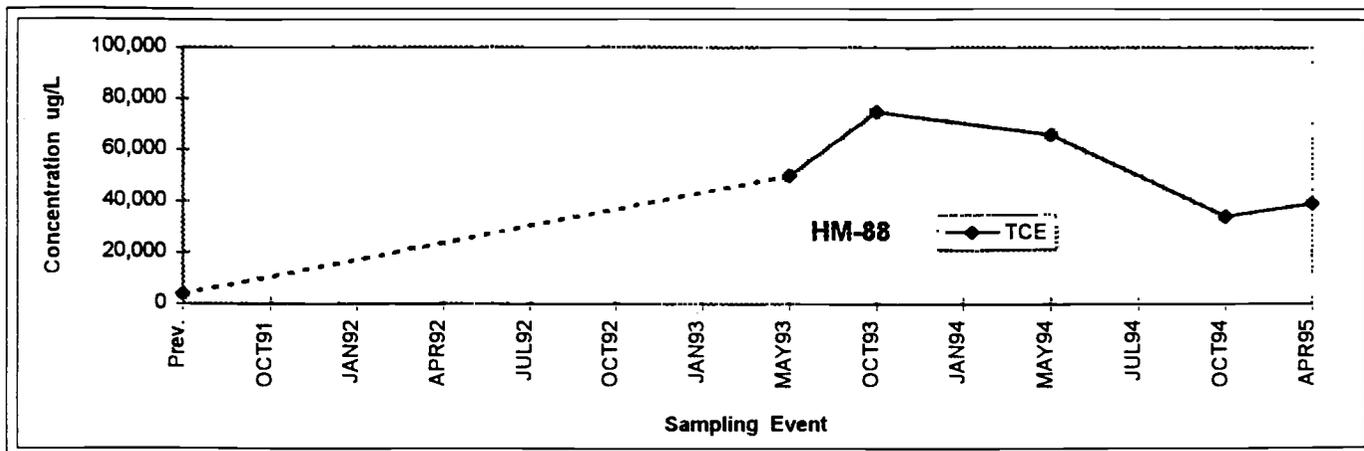
"Prev" data were acquired prior to Oct, 1991. See Appendix B notes.
 "Total" concentration = TCE plus its degradation products. See Appendix B notes.

Terrace Alluvium Wells - East Parking Lot 260033

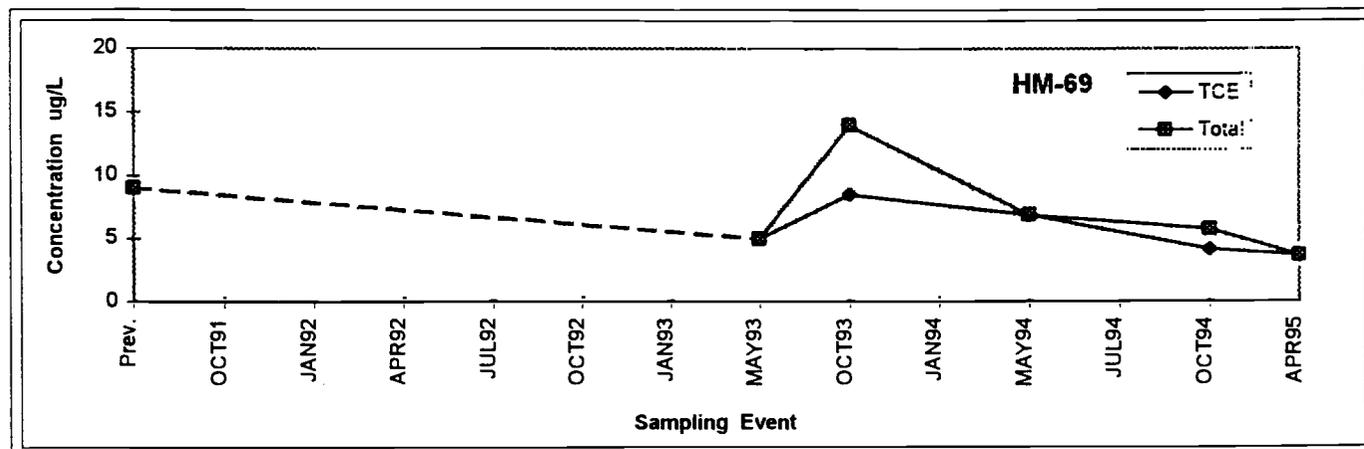
Historical Sampling results for TCE and degradation products through April 1995



Terrace Alluvium well - east parking lot



Terrace Alluvium well - East Parking Lot



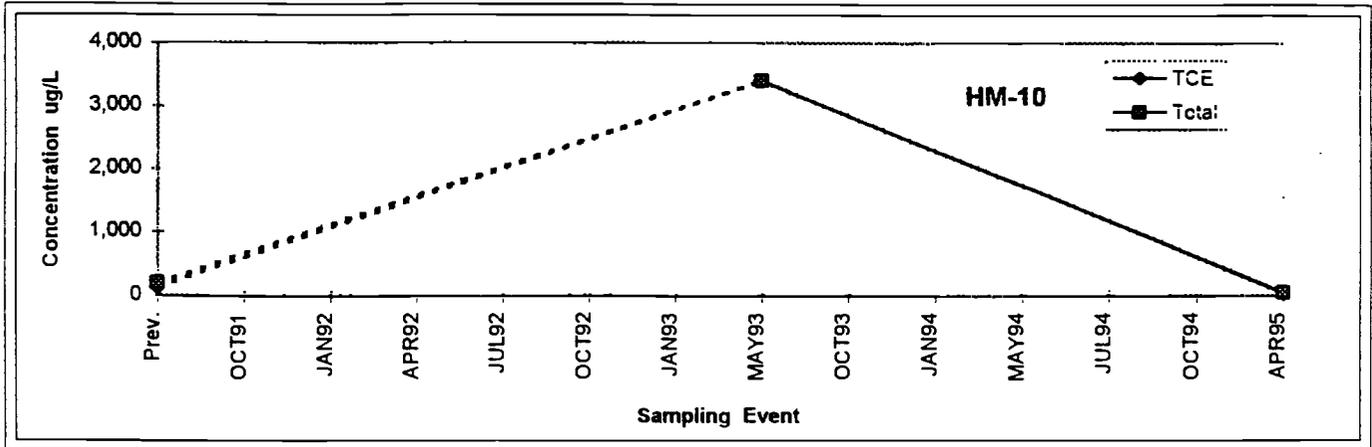
Terrace Alluvium well - east parking lot

"Prev" data were acquired prior to Oct, 1991. See Appendix B notes.
 "Total" concentration = TCE plus its degradation products. See Appendix B notes.

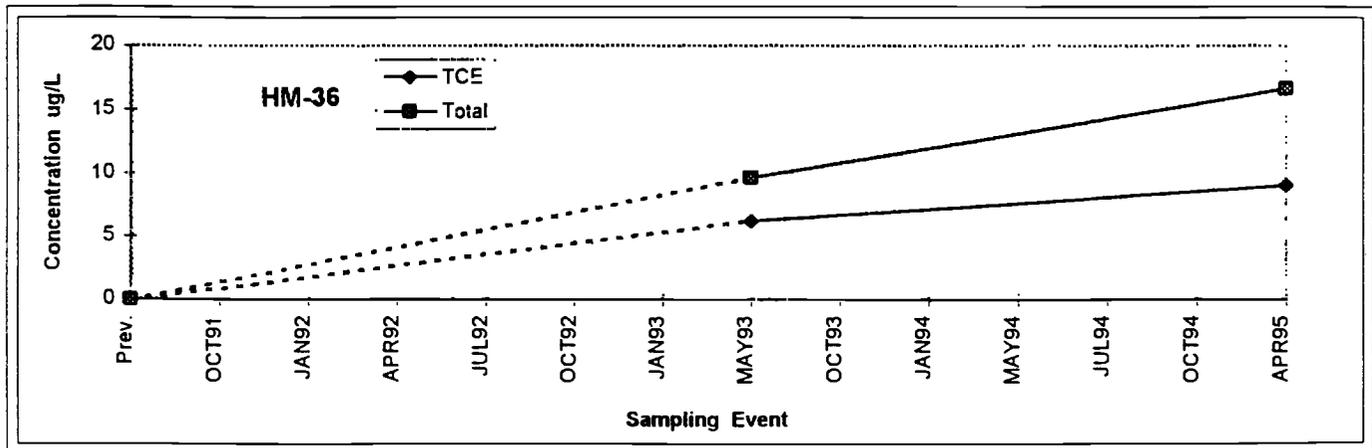
Terrace Alluvium Wells - AFP4 Landfill 3

260034

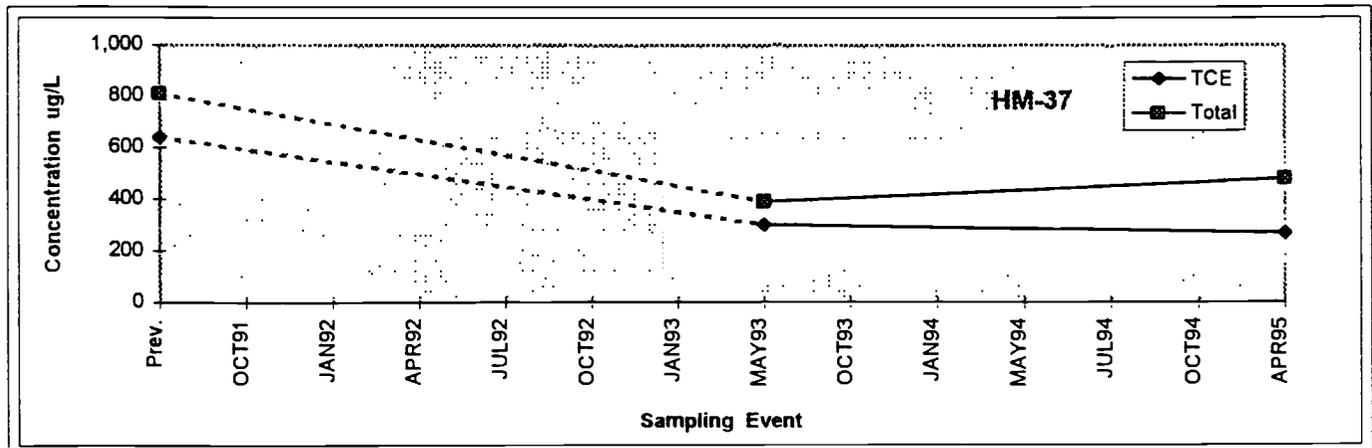
Historical Sampling results for TCE and degradation products through April 1995



Terrace Alluvium well - west parking lot.



Terrace Alluvium well - AFP4 Landfill 3



Terrace Alluvium well - AFP4 Landfill 3

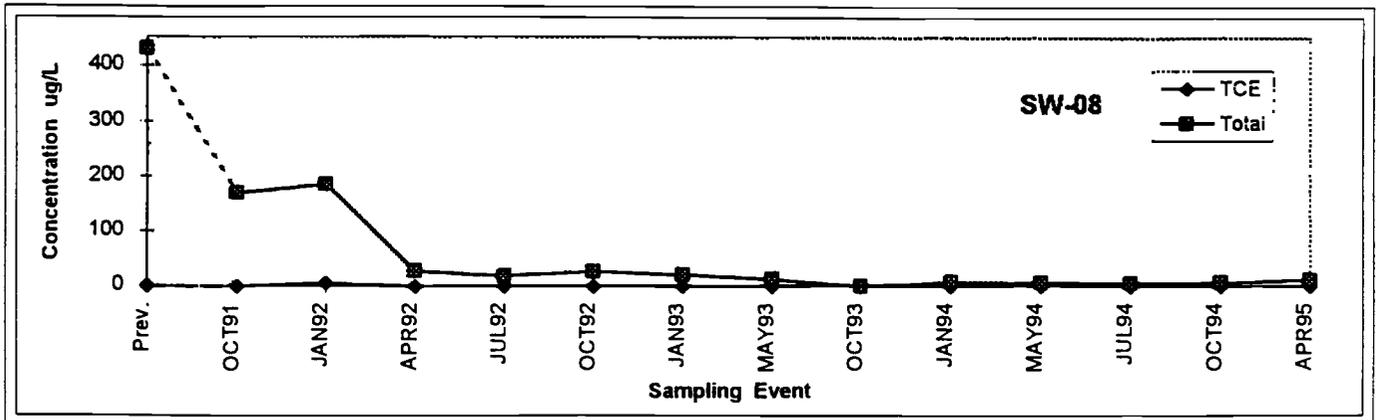
"Prev" data were acquired prior to Oct, 1991. See Appendix B notes.

"Total" concentration = TCE plus its degradation products. See Appendix B notes.

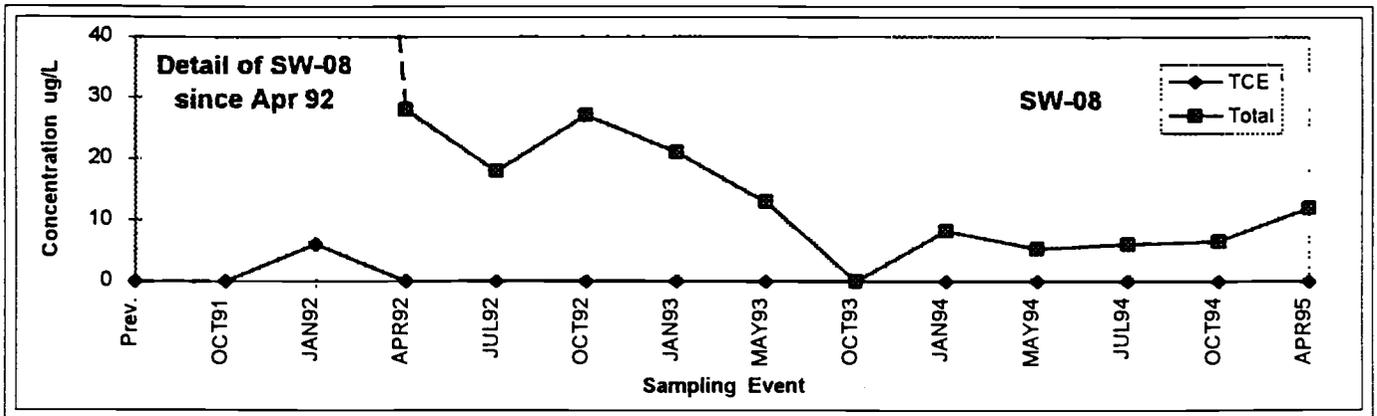
260035

Surface Water Locations - Meandering Road Creek

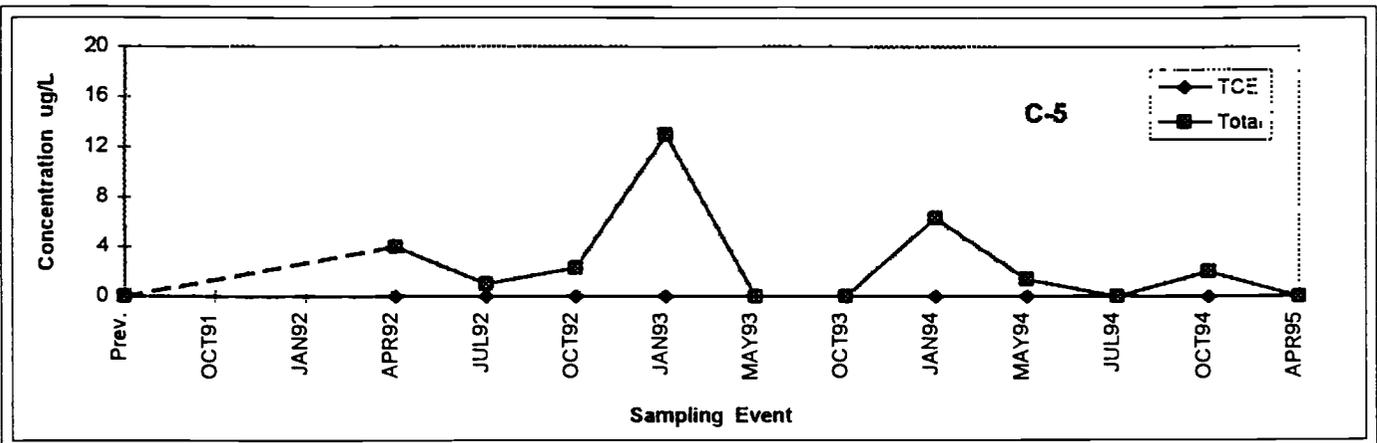
Historical Sampling results for TCE and degradation products through April 1995



Surface location - Meandering Road Creek



Surface location - Meandering Road Creek



Surface location - Meandering Road Creek

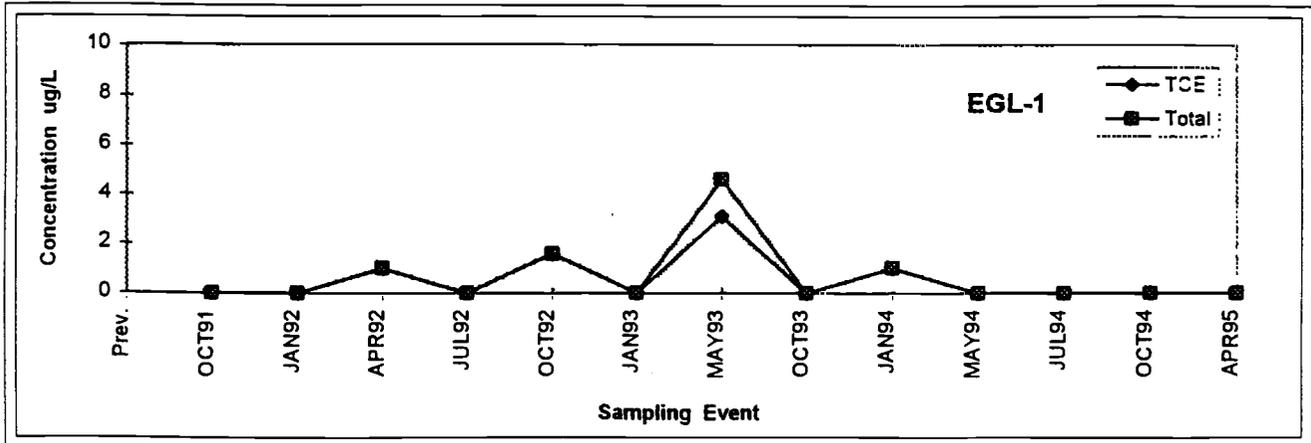
"Prev" data were acquired prior to Oct, 1991. See Appendix B notes.

"Total" concentration = TCE plus its degradation products. See Appendix B notes.

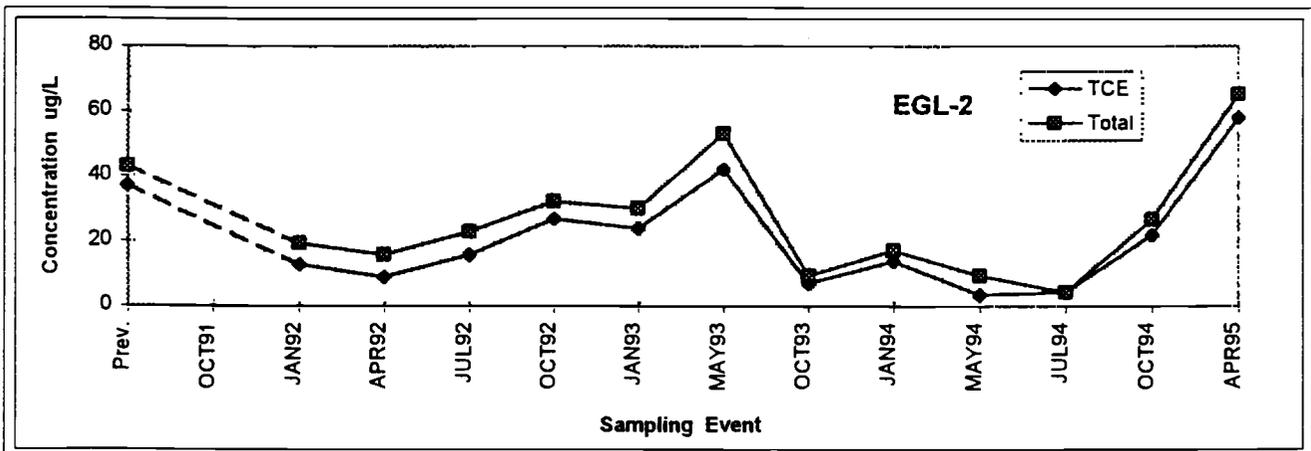
260036

Surface Water Locations - Farmers Branch Aqueduct inlet/outlet

Historical Sampling results for TCE and degradation products through April 1995



Surface location - Farmers Branch aqueduct inlet



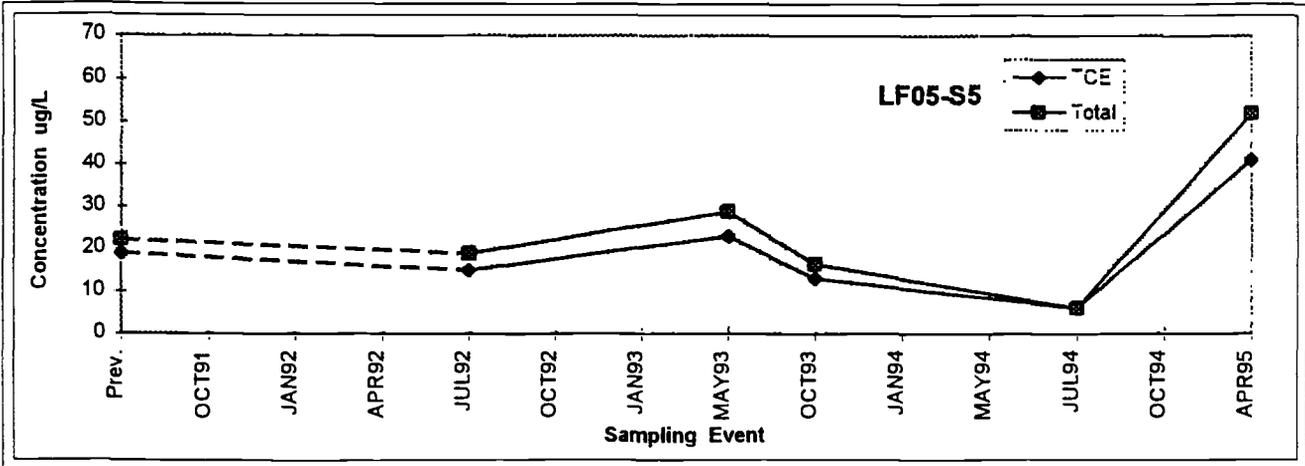
Surface location - Farmers Branch aqueduct outlet

"Prev" data were acquired prior to Oct, 1991. See Appendix B notes.

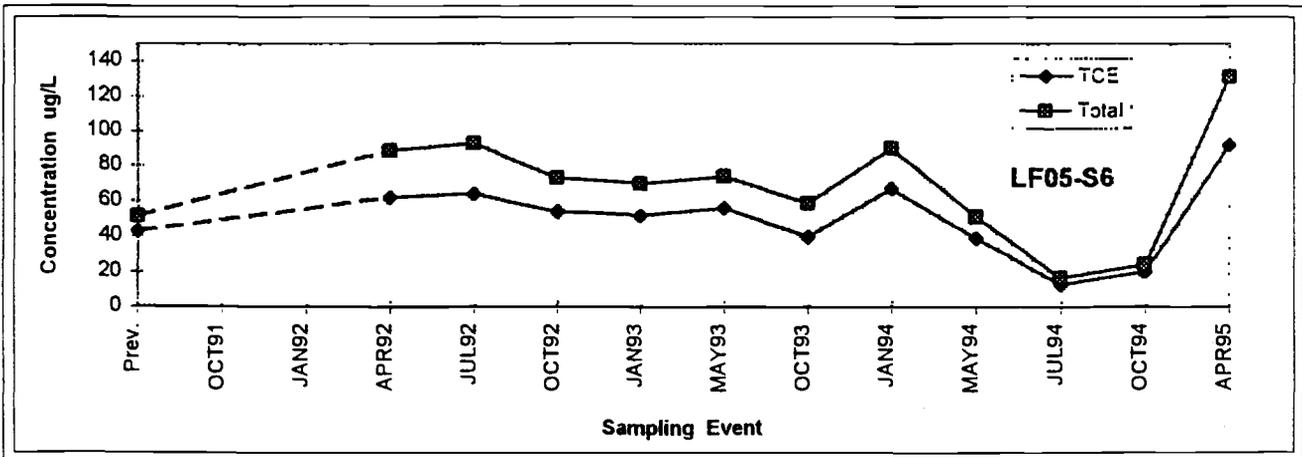
"Total" concentration = TCE plus its degradation products. See Appendix B notes.

Surface Water Locations - Farmers Branch, NAS Ft. Worth 260037

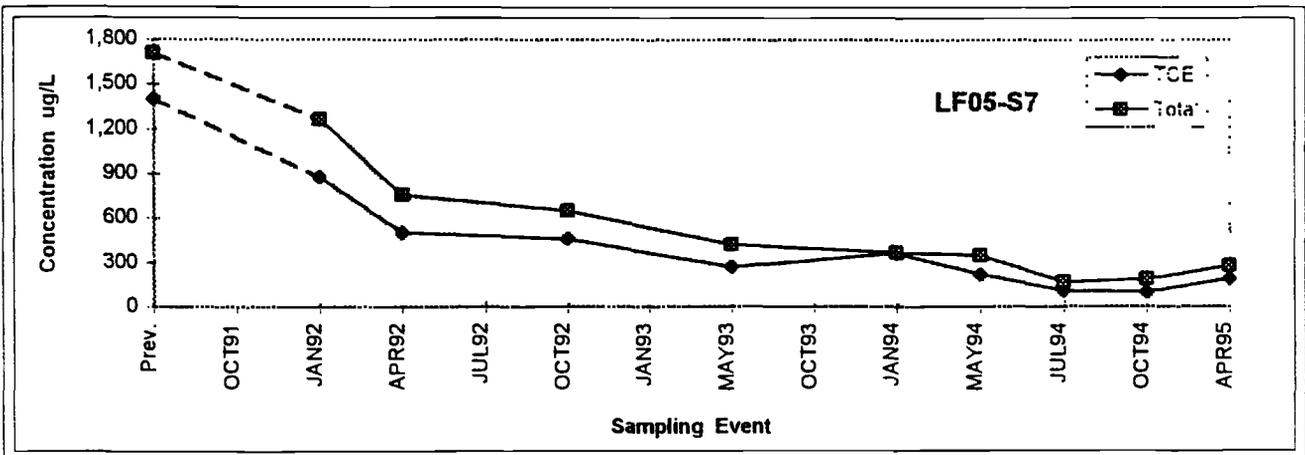
Historical Sampling results for TCE and degradation products through April 1995



Surface location - Farmers Branch, NAS Fort Worth, upstream from confluence with unnamed tributary



Surface location - Farmers Branch, NAS Fort Worth, downstream from confluence with unnamed tributary



Surface location - unnamed tributary, NAS Fort Worth

"Prev" data were acquired prior to Oct, 1991. See Appendix B notes.

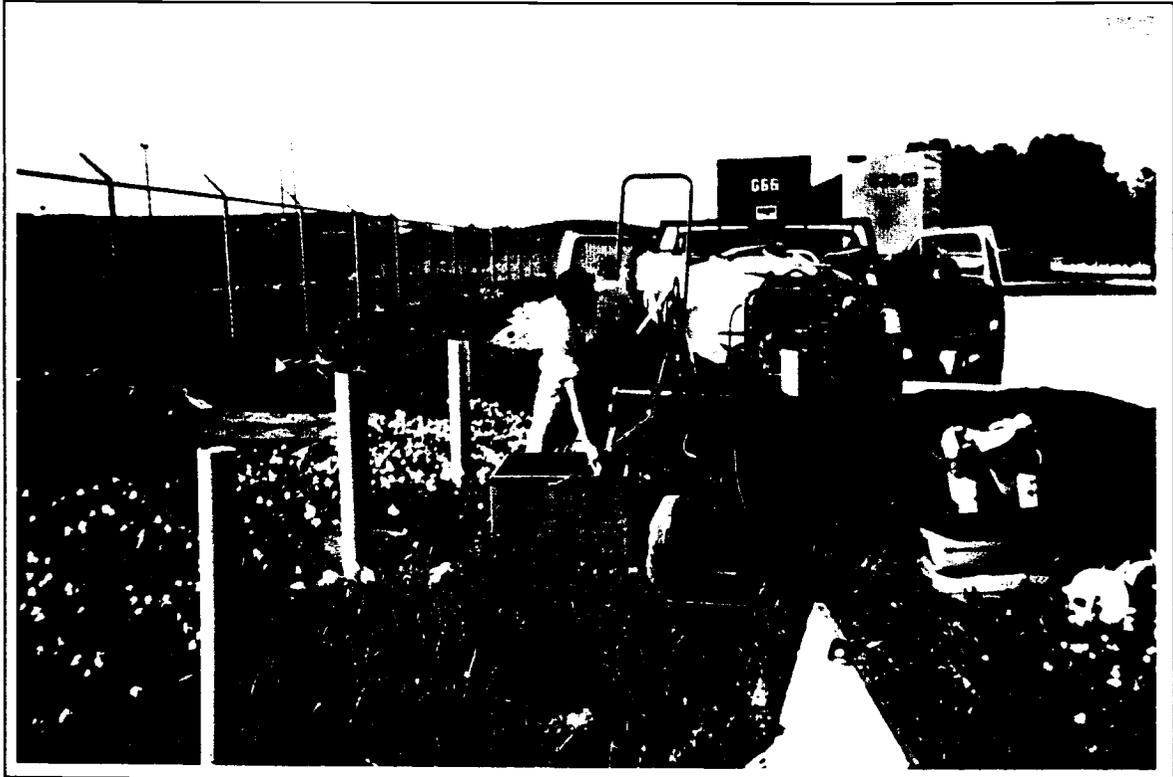
"Total" concentration = TCE plus its degradation products. See Appendix B notes.

260038

APPENDIX C

PHOTOGRAPHS - APRIL/MAY 1995

QUARTERLY GROUNDWATER SAMPLING LETTER REPORT-- AUGUST 1995



Lowering Grundfos pump down well P-22M for purging (0855, 4/25/95)



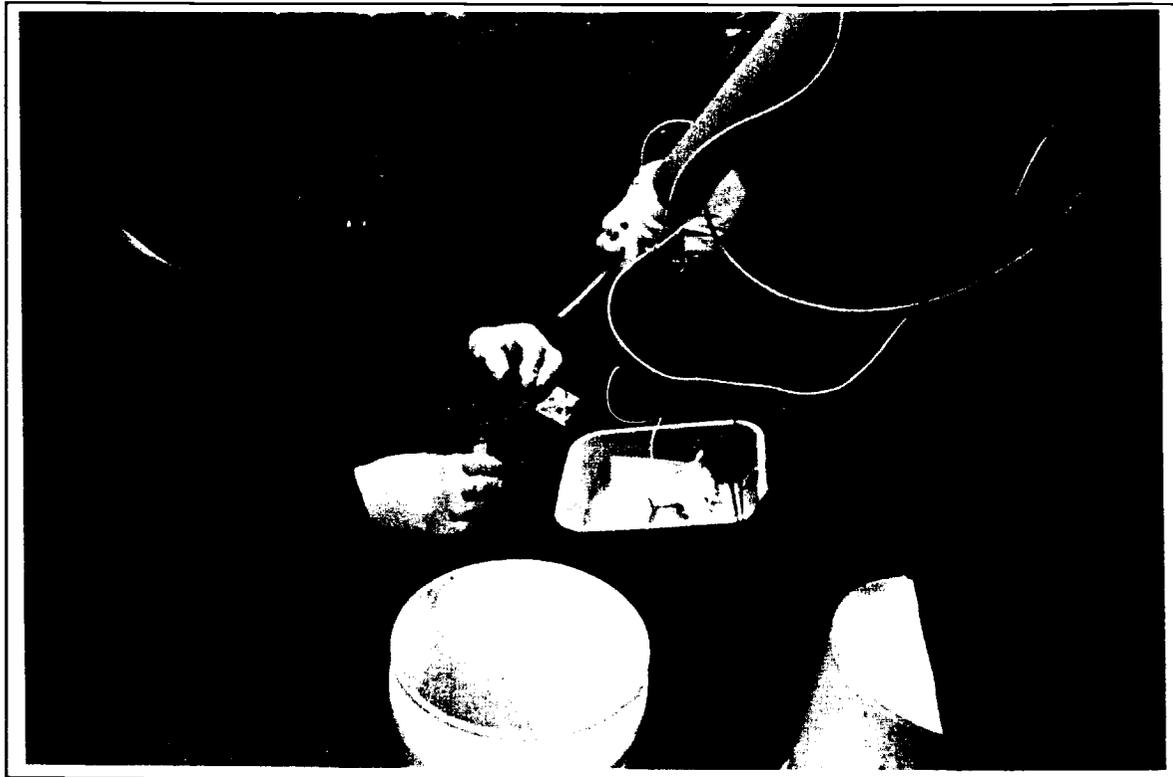
Measuring groundwater parameters at LF04-02 (0955, 5/1/95)



Purging groundwater from well HM-36 using a teflon bailer (0921, 4/26/95)



Collecting a surface water sample for parameter measurement at LF05-S5 (1040, 4/28/95)



Collecting a volatiles sample at well HM-36 (0930, 4/26/95)



Decontaminating bailer and other equipment at well P-22U (1015, 4/25/95)

FINAL PAGE

ADMINISTRATIVE RECORD

FINAL PAGE

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ADMINISTRATIVE RECORD

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