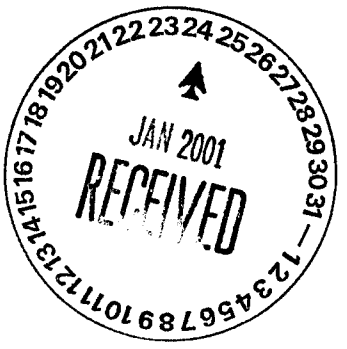
CAFB 01 CAFB-01-004

DEPARTMENT OF THE AIR FORCE
27TH CIVIL ENGINEER SQUADRON (ACC)
CANNON AIR FORCE BASE NEW MEXICO

JAN 22 2001

Robert S. Pyeatt
Deputy Base Civil Engineer
506 N DL Ingram Blvd
Cannon AFB NM 88103-5003



Mr. James Bearzi, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2044 Galisteo Street
PO Box 26110
Santa Fe NM 87502

Glenn

Dear Mr. Bearzi

Enclosed for your review and record is the Semi-Annual Monitoring Report for Aug 2000 sampling at Monitoring Well R, Landfill 25 (SWMU 97) at Cannon Air Force Base. Iron, chromium and nickel exceeded the maximum contaminant levels for drinking water. This has been an ongoing problem in this well since installation of a stainless steel screen. A plastic screen will be installed in a new well this fiscal year in an attempt to alleviate this problem.

If you have any questions, please contact Mr. Sanford Hutsell at (505)784-6378 or Mr. John Pike at (505)784-1092.

Sincerely

ROBERT S. PYEATT, GS-13

Attachment:
Semi-Annual Monitoring Report

cc:
NMED wo Atch (G. von Gonten)
NMED GW Bureau (J. Jacobs)
EPA Region VI wo Atch (D. Neleigh)
EPA Region VI (B. Sturdivant)

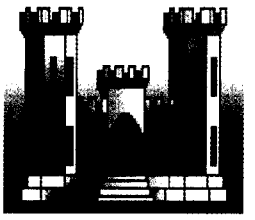
CAFB-01-004

FINAL

SEMI-ANNUAL MONITORING REPORT
AUGUST 2000 SAMPLING EVENT
LONG-TERM MONITORING, LANDFILL NO. 25 (MW-R)
CANNON AIR FORCE BASE
CLOVIS, NEW MEXICO
EPA ID Number NM7572124454

NOVEMBER 2000

Submitted to:
U. S. Army Corps of Engineers
Omaha District



Submitted by:
Parallax, Inc.
320 Interstate North Prkwy
Suite 320
Atlanta, GA 30339

Contract No.
DACA45-99-D-0015
Delivery Order No. 002

Parallax
INC.

CAFB – 01-004

FINAL

SEMI-ANNUAL MONITORING REPORT
AUGUST 2000 SAMPLING EVENT

LONG-TERM MONITORING
LANDFILL NO. 25 (MW-R)

CANNON AIR FORCE BASE
Clovis, New Mexico
EPA ID Number NM7572124454

U.S. Army Corps of Engineers
Omaha District
Contract No. DACA45-99-D-0015
Delivery Order No. 2

November 2000

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This report summarizes data obtained during the 2000 semi-annual sampling event of monitoring well R (Landfill 25) at the Cannon Air Force Base (CAFB) near Clovis, New Mexico, EPA ID Number NM7572124454 (Figure 1). Monitoring well R (MW-R) is located down-gradient of Landfill 25 (Figure 2). The August 2000 sample event represents the first of two semi-annual sample events planned under contract number DACA45-99-D-0015, Delivery Order No. 2 to the Omaha District of the U.S. Army Corps of Engineers (USACE).

The field activities began on August 17, 2000 after the field team mobilized to Amarillo, Texas and conducted the Contractor Chemical Quality Control Preparatory Phase meeting, the Pre-Entry Safety and Health Training, and verified receipt of necessary equipment and supplies. The field team arrived at Cannon Air Force Base at 0645 on August 18, 2000, met with the base representative and proceeded to Landfill 25. Following air monitoring at the well head and water level measurement, the pump was removed from monitoring well MW-R. Visual inspection of the support cable, hoses and pump indicated the equipment was in good condition and that the pump body had remained above the water table. Inspection of the drop tube and filter body indicated significant iron staining and sediment in the filter assembly. A rinsate sample of the pump body was collected, packed and shipped to Paragon Analytics via Federal Express for metals analysis. The pump was delivered to Bennett Pumps, Inc. for cleaning, inspection and rebuilding. Bennett Pumps indicated that the pump would be repaired by August 23, 2000.

Field activities resumed on August 24, 2000 when the rebuilt pump was returned from Bennett Pumps, Inc. Inspection of the pump by Bennett during rebuilding indicated no signs of internal corrosion or excessive wear. Further, Bennett indicated that the Department of Energy Pantex Facility had performed a previous rebuilding task on a similar pump and concluded that the elevated metal concentrations in groundwater were the result of corrosion from the stainless steel well screens. A new Teflon® drop tube and filter assembly were replaced on the pump and another rinsate sample was collected for metals analysis. The static water level in well MW-R was measured (287.39 ft below top of casing), and the rebuilt pump, hoses and support cable were re-installed in the well. During re-installation, it was noted that the male connector for the regulator hose had been damaged by the well cover and was replaced. The pump support cable was adjusted to prevent recurrence.

Prior to sampling, 81 gallons of groundwater, approximately 3 well volumes (24.92 gallons per well volume) were purged and discharged to the permanent holding tank maintained by Cannon AFB. Groundwater field parameters stabilized with a pH of 7.47, conductivity of 0.790 uS/cm^2, turbidity of 6 NTU, and temperature of 19.3 ^{0}C. Environmental and QC split groundwater samples were collected for volatile organic

compounds (VOCs), semi-volatile organic compounds (SVOCs), herbicides, pesticides, polychlorinated biphenyls (PCBs), and water quality parameters. The samples were packed on ice and transported to Amarillo, Texas for shipment. The samples were shipped on August 25, 2000 via Federal Express for priority Saturday delivery. Both Paragon Analytics and the USACE QA laboratory were notified to receive samples on Saturday. The first semi-annual sampling event demobilized on August 25, 2000.

The water samples collected were analyzed for the following parameters:

- Volatile Organic Compounds (VOCs), SW-846 Method 8260B, with specific target list of Appendix IX compounds
- Semi-Volatile Organic Compounds (SVOCs), SW-846 Method 8270C
- Polychlorinated Biphenyls (PCBs), SW-846 Method 8082
- Herbicides, SW-846 Method 8151
- TAL Metals, SW-846 Method 6010B
- Mercury, SW-846 Method 7470A
- Pesticides Organophosphorus, SW-846 Method 8140
- Pesticides Organochlorine, SW-846 Method 8081A
- Common Anions (chlorides, nitrates, sulfates), EPA Method 300.0A

Analytical results are summarized on Table 1. The New Mexico Environmental Department (NMED) Semi-Annual Assessment Monitoring Report for the August 2000 sample event is provided as Appendix A. Field forms completed for the August 2000 sampling event are presented as Appendix B. Analytical results and associated quality control (QC) data, as reported and submitted by Paragon Analytics laboratory, are presented in Appendix C. A data quality assessment summary for groundwater sample MW-R, containing a discussion of QC criteria that were evaluated, is included as Appendix D.

During September 2000, Paragon Analytics laboratory delivered the results of the first semi-annual sampling event to the Parallax, Inc. office in Atlanta, Georgia. Analysis of sample CAFB0824MWR indicated that polychlorinated biphenyl compounds, pesticides, herbicides, volatile organic compounds and semi volatile organic compounds were below detection limits in the ground water sample. Metals and major cations were detected at levels consistent with previous monitoring results.

Metals analysis for sample CAFB0824MWR showed slightly elevated levels of calcium, chromium, copper, iron, magnesium, manganese, nickel, potassium, selenium, sodium and vandium. Sample results for rinsate one, CAFB0818MER-R1, had detectable levels of chromium, copper iron, manganese, and zinc. Sample results for rinsate two, CAFB0824MWR-R2, indicated no elevated levels of metals. During the inspection of the well pump apparatus, Bennett Pump technicians confirmed that the corrosion of stainless steel parts had not occurred. This suggests that the well pump did not contribute to the

metals detected during previous sampling events. However, the metals detected in the groundwater sample and the first rinsate do correspond with constituents found in stainless steel. However, due to the geochemistry of the aquifer, the groundwater potentially reacted with the stainless steel well screen releasing trace amounts of metals into solution. This most likely is a function of the pH of the groundwater. As a result, the U.S. Army Corps of Engineers has performed preliminary modeling to show that the landfill is not the source of the metals. Retardation factors calculated for the metals detected and the distance of over 100 feet to groundwater indicate the metals could not have migrated to the water table in the time since the landfill has been in existence. Therefore the source of the metals is not considered to be the landfill.

Table 1
Summary of Analytical Results

Parameter	Units	Result	Qualifier
Arclor-1016	ug/L	0.98	U
Arclor-1221	ug/L	2	U
Arclor-1232	ug/L	0.98	U
Arclor-1242	ug/L	0.98	U
Arclor-1248	ug/L	0.98	U
Arclor-1254	ug/L	0.98	U
Arclor-1260	ug/L	0.98	U
Chloride	mg/L	97	
Nitrate	mg/L	5.5	
Sulfate	mg/L	130	
Dalapon	ug/L	2	U
Dicamba	ug/L	0.1	U
MCPP	ug/L	50	U
MCPA	ug/L	50	U
Dichloroprop	ug/L	0.5	U
2,4-D	ug/L	0.5	U
Silvex	ug/L	0.05	U
2,4,5-T	ug/L	0.05	U
Dinoseb	ug/L	0.25	U
2,4-DB	ug/L	0.5	U

Parameter	Units	Result	Qualifier
Alpha-bhc	ug/L	0.047	U
Gamma-bhc	ug/L	0.047	U
Heptachlor	ug/L	0.047	U
Aldrin	ug/L	0.047	U
Beta-bhc	ug/L	0.047	U
Delta-bhc	ug/L	0.047	U
Heptachlor epoxide	ug/L	0.047	U
endosulfan I	ug/L	0.047	U
Gamma-chlordane	ug/L	0.047	U
Alpha-chlordane	ug/L	0.047	U
4,4'-DDE	ug/L	0.095	U
Dieldrin	ug/L	0.095	U
Endrin	ug/L	0.095	U
4-4'-DDD	ug/L	0.095	U
Endosulfan II	ug/L	0.095	U
4,4'DDT	ug/L	0.095	U
Endrin aldehyde	ug/L	0.095	U
Methoxychlor	ug/L	0.47	U
Endosulphan sulfate	ug/L	0.095	U
Endrin ketone	ug/L	0.095	U
Toxaphene	ug/L	4.7	U

Parameter	Unit	Result	Qualifier	Result	Qualifier
Dichlorodifluoromethane	ug/L	10	U	10	U
Chloromethane	ug/L	10	U	10	U
Vinyl Chloride	ug/L	10	U	10	U
Bromomethane	ug/L	10	U	10	U
Chloroethane	ug/L	10	U	10	U
Trichlorofloromethane	ug/L	5	U	5	U
1,1-Dichloroethane	ug/L	5	U	5	U
Trichlorofloroethane	ug/L	5	U	5	U
Acetone	ug/L	20	U	12	J
Iodomethane	ug/L	5	U	5	U
Carbon disulfide	ug/L	5	U	5	U
Methylene chloride	ug/L	7.7	B	7.8	B
Trans-1,2-dichloroethene	ug/L	5	U	5	U
Methyl tertiary butyl ether	ug/L	5	U	5	U
1,1-dichloroethane	ug/L	5	U	5	U
Vinyl acetate	ug/L	20	U	20	U
Cis-1,2-dichloroethane	ug/L	5	U	5	U
2-butanone	ug/L	20	U	20	U
Bromochloromethane	ug/L	5	U	5	U
Chloroform	ug/L	5	U	5	U
1,1,1-trichloroethane	ug/L	5	U	5	U
2,2-dichloropropane	ug/L	5	U	5	U
Carbon tetrachloride	ug/L	5	U	5	U
1,1-dichloropropene	ug/L	5	U	5	U
1,2-dichloroethane	ug/L	5	U	5	U
Benzene	ug/L	5	U	5	U
Trichloroethene	ug/L	5	U	5	U

Parameter	Unit	Result	Qualifier	Result	Qualifier
1,2-dichloropropane	ug/L	5	U	5	U
Dibromomethane	ug/L	5	U	5	U
Bromodichloromethane	ug/L	5	U	5	U
Cis-1,2-dichloropropene	ug/L	5	U	5	U
4-methyl-2-pentanone	ug/L	20	U	20	U
Toluene	ug/L	5	U	5	U
Trans-1,3-dichloropropene	ug/L	5	U	5	U
1,1,2-trichloroethane	ug/L	5	U	5	U
2-hexanone	ug/L	20	U	20	U
Tetrachloroethene	ug/L	5	U	5	U
1,3-dichloropropane	ug/L	5	U	5	U
Dibromochloromethane	ug/L	5	U	5	U
1,2-dibromoethane	ug/L	5	U	5	U
1-chlorohexane	ug/L	5	U	5	U
Chlorobenzene	ug/L	5	U	5	U
1,1,1,2-tetrachloroethane	ug/L	5	U	5	U
Ethylbenzene	ug/L	5	U	5	U
m-p-xylene	ug/L	5	U	5	U
o-xylene	ug/L	5	U	5	U
Styrene	ug/L	5	U	5	U
Bromoform	ug/L	5	U	5	U
Isopropylbenzene	ug/L	5	U	5	U
1,2,3-trichloropropane	ug/L	5	U	5	U
1,1,2,2-tetrachloroethane	ug/L	5	U	5	U
Bromobenzene	ug/L	5	U	5	U
N-propylbenzene	ug/L	5	U	5	U
2-chlorotoluene	ug/L	5	U	5	U

Parameter	Unit	Result	Qualifier	Result	Qualifier
1,3,5-trimethylbenzene	ug/L	5	U	5	U
4-chlorotoluene	ug/L	5	U	5	U
Tetra-butylbenzene	ug/L	5	U	5	U
1,2,4-trimethylbenzene	ug/L	5	U	5	U
Sec-butylbenzene	ug/L	5	U	5	U
1,3-dichlorobenzene	ug/L	5	U	5	U
P-isopropyltoluene	ug/L	5	U	5	U
1,4-dichlorobenzene	ug/L	5	U	5	U
N-butylbenzene	ug/L	5	U	5	U
1,2-dichlorobenzene	ug/L	5	U	5	U
1,2-dibromo-3-chloropropane	ug/L	10	U	10	U
1,2,4-trichlorobenzene	ug/L	5	U	5	U
Hexachlorobutadiene	ug/L	5	U	5	U
Naphthalene	ug/L	5	U	5	U
1,2,3-trichlorobenzene	ug/L	5	U	5	U
Pyridine	ug/L	9.4	U		
N-nitrosodmethylamine	ug/L	9.4	U		
Aniline	ug/L	24	U		
Phenol	ug/L	9.4	U		
Bis(2-chloroethyl)ether	ug/L	9.4	U		
2-chlorophenol	ug/L	9.4	U		
1,3-dichlorobenzene	ug/L	9.4	U		
1,4-dichlorobenzene	ug/L	9.4	U		
1,2-dichlorobenzene	ug/L	9.4	U		
Benzyl alcohol	ug/L	9.4	U		
Bis(2-chloroisopropyl)ether	ug/L	9.4	U		

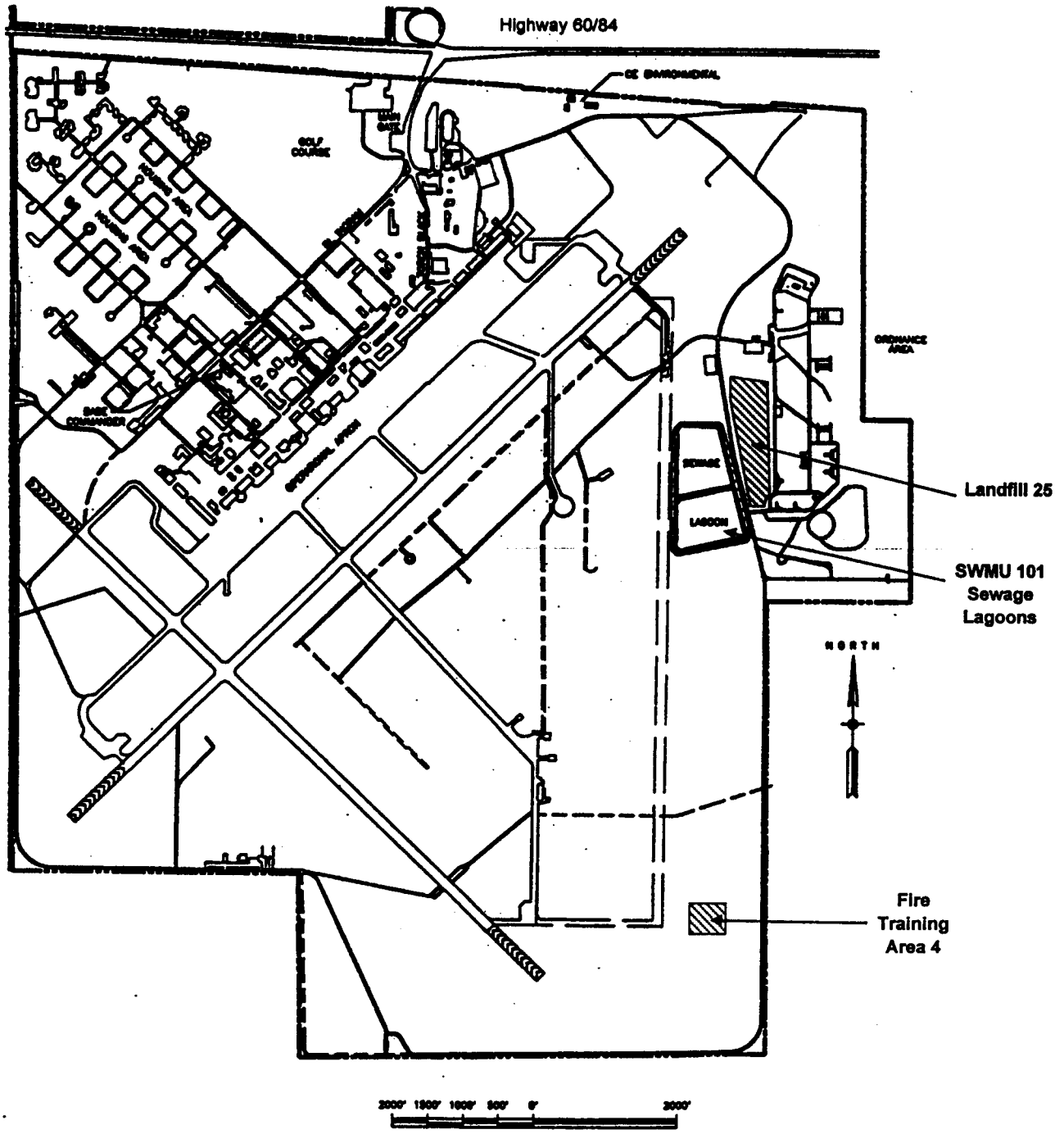
Parameter	Unit	Result	Qualifier
2-methylphenol	ug/L	9.4	U
N-nitroso-di-n-propylamine	ug/L	9.4	U
4-methylphenol	ug/L	9.4	U
Hexachloroethane	ug/L	9.4	U
Isophorone	ug/L	9.4	U
2-nitrophenol	ug/L	9.4	U
2,4-dimethylphenol	ug/L	9.4	U
Bis(2-chloroethoxy)methane	ug/L	9.4	U
2,4-dichlorophenol	ug/L	9.4	U
Benzoic Acid	ug/L	47	U
1,2,4-trichlorobenzene	ug/L	9.4	U
Naphthalene	ug/L	9.4	U
4-chloroaniline	ug/L	9.4	U
Hexachlorobutadiene	ug/L	24	U
4-chloro-3-methylphenol	ug/L	9.4	U
2-methylnaphthalene	ug/L	9.4	U
Hexachlorocyclopentadiene	ug/L	9.4	U
2,4,6-trichlorophenol	ug/L	9.4	U
2,5,6-trichlorophenol	ug/L	9.4	U
2-chloronaphthalene	ug/L	9.4	U
2-nitroaniline	ug/L	47	U
Dimethyl phthalate	ug/L	9.4	U
2,6-dinitrotoluene	ug/L	9.4	U
Acenaphthylene	ug/L	9.4	U
3-nitroaniline	ug/L	47	U
Acenaphthene	ug/L	9.4	U
2,4-dinitrophenol	ug/L	47	U

Parameter	Unit	Result	Qualifier
4-nitrophenol	ug/L	47	U
Dibenzofuran	ug/L	9.4	U
2,4-dinitrotoluene	ug/L	9.4	U
Diethyl phthalate	ug/L	9.4	U
Flourene	ug/L	9.4	U
4-chlorophenyl phenyl ether	ug/L	9.4	U
4-nitroanaline	ug/L	47	U
Azobenzene	ug/L	9.4	U
4,6-dinitro-2-methylphenol	ug/L	47	U
N-nitrosodiphenylamine	ug/L	9.4	U
4-bromophenyl phenyl ether	ug/L	9.4	U
Hexachlorobenzene	ug/L	9.4	U
2,3,4,6-tetrachlorophenol	ug/L	47	U
Pentachlorophenol	ug/L	47	U
Phenantrene	ug/L	9.4	U
Anthrancene	ug/L	9.4	U
Carbazole	ug/L	9.4	U
Di-n-butyl phthalate	ug/L	9.4	U
Flouranthene	ug/L	9.4	U
Pyrene	ug/L	9.4	U
Butyl benzyl phthalate	ug/L	9.4	U
Benzo (A) anthracene	ug/L	9.4	U
3,3'-dichlorobenzidine	ug/L	47	U
Chrysene	ug/L	9.4	U
Bis(2ethylhexyl)phthalate	ug/L	9.4	U
Benzo(b)fluoranthene	ug/L	9.4	U
Benzo(k)flouranthene	ug/L	9.4	U

Parameter	Unit	Result	Qualifier
Benzo(a)pyrene	ug/L	9.4	U
Indeno(1,2,3-cd)pyrene	ug/L	9.4	U
Dibenzo(a,h)anthracene	ug/L	9.4	U
Benzo(g,h,i)perylene	ug/L	9.4	U
Dichlorvos	ug/L	0.98	U
Mevinphos	ug/L	0.98	U
Demeton O + S	ug/L	0.98	U
Ethoprop	ug/L	0.98	U
Naled	ug/L	2.9	U
Phorate	ug/L	0.98	U
Diazinon	ug/L	0.98	U
Disulfoton	ug/L	3.9	U
Methyl parathion	ug/L	0.98	U
Ronnel	ug/L	0.98	U
Fenthion	ug/L	0.98	U
Chlorpyrifos	ug/L	0.98	U
Trichloronate	ug/L	0.98	U
Merphos A+B	ug/L	2	U
Tetrachlorvinphos	ug/L	0.98	U
Tokuthion	ug/L	0.98	U
Fensulfothion	ug/L	0.98	U
Sulprofos	ug/L	0.98	U
Methyl azinphos	ug/L	2	U
Coumaphos	ug/L	2	U

Parameter	Units	Result	Qualifier	Result	Qualifier	Result	Qualifier
Aluminum	mg/L	0.2	U	0.2	U	0.2	U
Antimony	mg/L	0.02	U	0.02	U	0.02	U
Arsenic	mg/L	0.01	U	0.01	U	0.01	U
Barium	mg/L	0.1	U	0.1	U	0.1	U
Beryllium	mg/L	0.005	U	0.005	U	0.005	U
Cadmium	mg/L	0.005	U	0.005	U	0.005	U
Calcium	mg/L	51		1	U	1	U
Chromium	mg/L	0.7		0.013	U	0.01	U
Cobalt	mg/L	0.01	U	0.01	U	0.01	U
Copper	mg/L	0.01		0.023	U	0.01	U
Iron	mg/L	2.3		0.12		0.1	U
Lead	mg/L	0.003	U	0.003	U	0.003	U
Magnesium	mg/L	54		1	U	1	U
Manganese	mg/L	0.05		0.013		0.01	U
Nickel	mg/L	0.37		0.02	U	0.02	U
Potassium	mg/L	8.2		1	U	1	U
Selenium	mg/L	0.0079		0.005	U	0.005	U
Silver	mg/L	0.01	U	0.01	U	0.01	U
Sodium	mg/L	35		1	U	1	U
Thallium	mg/L	0.01	U	0.01	U	0.01	U
Vanadium	mg/L	0.019		0.01	U	0.01	U
Zinc	mg/L	0.02	U	0.047		0.02	U
Total Recoverable Mercury	mg/L	0.002	U	0.002	U	0.002	U

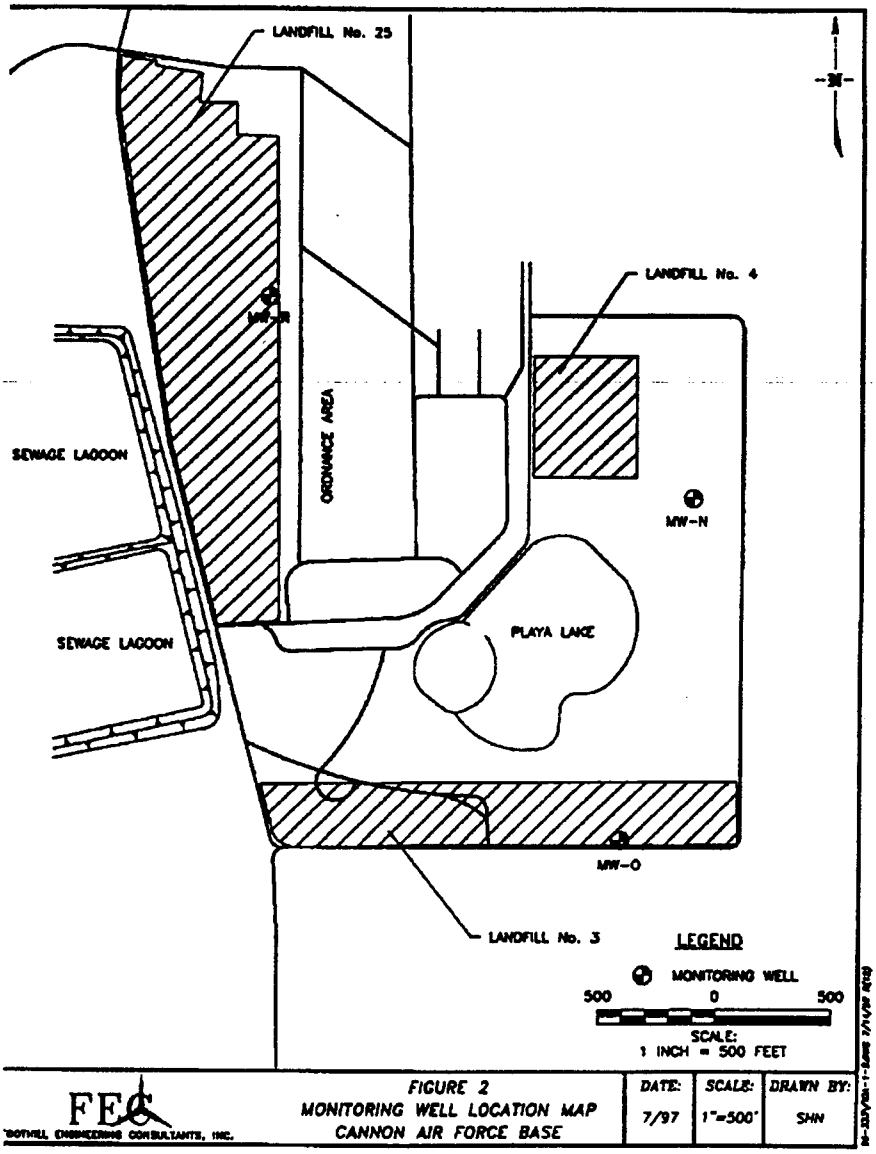
U-Non Detect
J-Estimated Value
B-Compound was detected in the Method Blank



Scale in Feet is Approximate

SEMI-ANNUAL MONITORING REPORT Cannon Air Force Base, New Mexico U.S. Army Corps of Engineers, Omaha District
Figure 1 Site Location Map
ES-13

Figure 2
Location of Landfill 2,4 and 25
Cannon Air Force Base, Clovis, New Mexico



APPENDIX A

NMED ASSESSMENT MONITORING REPORT

(Semi-Annual August 2000)

1.0 INTRODUCTION

This report summarizes the data obtained during the August 2000 semi-annual sampling event for the long-term monitoring program of Monitoring Well R (Landfill 25) at the Cannon Air Force Base (CAFB) near Clovis, New Mexico, EPA ID No. NM7572124454. Monitoring Well R is located downgradient of Landfill 25. The scope includes a semi-annual sampling event (August 2000) for MW-R and an annual sampling event, that includes monitoring wells MW-N and MW-O (December 2000) at Landfill 4 and 3 respectively.

2.0 SCOPE OF SERVICES

Parallax, Inc. mobilized to Amarillo, Texas on August 17, 2000, conducted a Preparatory Phase meeting, a Pre-Entry Safety and Health briefing, and verified receipt of necessary equipment and supplies. The field team arrived at Cannon Air Force Base on August 18, 2000 to begin work.

The work performed consisted of removal and inspection of the dedicated pump in Monitoring Well R at Landfill 25, pump maintenance and rebuilding, a pre and post maintenance pump rinsate sample, and collection of a groundwater sample from MW-R. Bennett Pumps, Inc performed the dedicated pump cleaning, inspection, and rebuilding. Pump reinstallation and groundwater sampling was performed on August 24, 2000.

Prior to sampling, 81 gallons of groundwater were purged to the permanent holding tank maintained by Cannon AFB. Field parameters of pH, conductivity, turbidity, and temperature were measured during purging and used to determine stabilization prior to sampling. Additional field parameters for dissolved oxygen (DO) and salinity were also measured. One groundwater sample and a QC split were collected and analyzed for VOCs, SVOCs, herbicides, pesticides, PCBs, and metals. The two rinsate samples were only analyzed for metals. Analyses were performed by Paragon Analytics.

3.0 REGULATORY CRITERIA

This report of the long-term monitoring was performed in accordance with the requirements of the Cannon Air Force Base Hazardous and Solid Waste Amendments Permit. The New Mexico Environmental Department is the lead agency overseeing the project.

The New Mexico Environmental Department (NMED) groundwater standards were used as guidance to determine if constituents that were detected in monitoring well MW-R exceeded applicable groundwater standards. If no NMED standard for a particular constituent existed, then the U.S. Environmental Protection Agency's (EPA) groundwater Maximum Contaminant Levels (MCLs) or EPA Health Advisories were applied.

4.0 GROUNDWATER MONITORING RESULTS

Purging and sampling was performed on well MW-R on August 24, 2000. Table 4-1 lists the measured field parameters and water level data. Only one well was sampled during this sampling event and groundwater flow direction was not determined. However, Figure 3 is included from water levels measured January-February 1982 to illustrate the general potentiometric surface and groundwater flow direction at the site.

Table 4-1
Groundwater Parameters

287.39	1.8	Initial	6.37	0.94	76	8.65	23.2	0.04
289.46	1.8	18	7.21	0.776	63	10.15	20.8	0.03
289.46	1.8	27	7.29	0.779	40	10.41	19.7	0.03
290.51	1.8	36	7.37	0.784	28	10.66	19.4	0.03
291.02	1.8	45	7.42	0.786	23	10.79	19.4	0.03
291.60	1.8	54	7.43	0.787	21	10.92	19.4	0.03
292.91	1.8	63	7.46	0.788	17	10.91	19.3	0.03
293.95	1.8	72	7.47	0.789	11	10.98	19.3	0.03
294.67	1.8	81	7.47	0.790	6	10.97	19.3	0.03

[1]WL – water level measured below top of casing (btc)
[2]Rate – gallons per minute (gpm)
[3]Volume – gallons (gal)
[4]Cond – Conductivity measured in micro siemens per centimeter squared (uS/cm[2])
[5]Turb – turbidity measured in Nephelometric Turbidity Units (NTUs)
[6]DO – Dissolved Oxygen measured in milligrams per liter (mg/l)
[7]Temp – temperature measured in degrees Centigrade (^{0}C)
[8]Sal – Salinity measured in parts per thousand (ppt)

5.0 GROUNDWATER CHEMICAL ANALYTICAL DATA

Parallax, Inc. collected one rinsate sample from the dedicated pump in MW-R on August 18, 2000. This rinsate sample was collected prior to having this pump serviced. A second rinsate sample, after pump servicing and prior to reinstallation, and a groundwater sample from MW-R were collected on August 24, 2000. A duplicate groundwater sample was collected from MW-R and sent to the USACE QA laboratory. Problems were encountered with the shipping of the duplicate sample and the sample was out of holding time and above the acceptable temperature range when it reached the USACE QA laboratory. The USACE QA laboratory made the decision not to analyze this sample and determined that the duplicate sample collected during the December sampling event would provide necessary Quality Assurance/Quality Control. Table 5-1 provides analytical results for the MW-R sample along with regulatory limits. Table 5-2 presents the metal analyses results for the two rinsate samples. Table 5-3 presents historical results along with the June 1999 Summary of Semiannual Groundwater Results.

Table 5-1
Groundwater Analytical Results for MW-R (August 2000) at Landfill 25

Aluminum	0.2U	0.05[1]
Antimony	0.02U	0.006[1]
Arsenic	0.01U	0.1
Barium	0.1U	1.0
Beryllium	0.005U	0.004[1]
Cadmium	0.005U	0.005[1]
Calcium	51	
Chromium	**0.7**	0.05
Cobalt	0.01U	0.05[2]
Copper	0.01	1.3[3]
Iron	**2.3**	1.0[4]/0.3[1]
Lead	0.003U	0.05
Magnesium	54	
Manganese	0.05	0.05[1]
Nickel	**0.37**	0.1[1]
Potassium	8.2	
Selenium	0.0079	0.05
Silver	0.01U	0.05
Sodium	35	20*
Thallium	0.01U	0.002[1]
Vanadium	0.019	0.02[5]
Zinc	0.02U	5.0[1]
Total Recoverable Mercury	0.002U	0.002
General Chemistry		
Chloride EPA 300.0A	97	250.0
Nitrate EPA 300.0A	5.5	10.0
Sulfate EPA 300.0A	130	400.0[1]

Table 5-1
(continued)

SVOCs SW-846 8270C	ND	
Chlorinated Herbicides SW-846 8151A	ND	
Organochlorine Pesticides SW-846 3520C	ND	
Organophosphorus Pesticides SW-846 3520B	ND	
PCBs SW-846 3520C/3665	ND	0.001

U – detection limit
ND – No analytes were detected above the detection limit
[1] – EPA MCL
[2] – Irrigation Use
[3] – Maximum Contaminant Level Goal (MCLG)
[4] – Domestic Water Supply
[5] – EPA Health Advisory

TABLE 5-2
Rinsate Analytical Results for MW-R (August 2000) at Landfill 25

Aluminum	0.2U	0.2U
Antimony	0.02U	0.02U
Arsenic	0.01U	0.01U
Barium	0.1U	0.1U
Beryllium	0.005U	0.005U
Cadium	0.005U	0.005U
Calcium	1U	1U
Chromium	0.013	0.01U
Cobalt	0.01U	0.01U
Copper	0.023	0.01U
Iron	0.12	0.1U
Lead	0.003U	0.003U
Magnesium	1U	1U
Manganese	0.013	0.01U
Nickel	0.02U	0.02U
Potassium	1U	1U
Selenium	0.005U	0.005U
Silver	0.01U	0.01U
Sodium	1U	1U
Thallium	0.01U	0.01U
Vanadium	0.01U	0.01U
Zinc	0.047	0.02U
Total Recoverable Mercury	0.002U	0.002U

Table 5-3. Historical Groundwater Sample Results Summary
Monitoring Well R
Cannon Air Force Base, Clovis, New Mexico

Analyte and Method	Range of Historical Results (mg/L)	MW-R (June 1999) (mg/L)	MW-X (June 1999) (Duplicate) (mg/L)	EPA MCLs (total) (mg/L)	New Mexico State Standards (dissolved) (mg/L)
Volatile Organic Compounds SW846 8260B					
Chloroform	ND-0.00018J	**0.18**	**0.18**	0.1	0.1
Methylene Chloride	ND-0.00012J	ND	ND	0.005	0.1
Trichloroethene	ND-0.00011J	ND	ND	0.005	0.1
TAL Metals (total) SW846 6010B					
Barium	0.058-0.091	0.052B	0.0483B	2	1
Calcium	58–59.3	55.7	52.4		
Chromium	ND-0.021	**0.333**	**0.0497**	0.1	0.05
Copper	ND- 0.0053J	0.0049	0.0014	1.3[3]/1.0[1]	1.0[4]
Iron	0.594-1.01	**1.48**	**0.948**	0.3[1]	1.0[4]
Lead	ND	0.003	0.001	0.015[3]	0.05
Magnesium	59.4-62.9	58.2	54.9		
Manganese	0.0756-0.0998	0.0543	0.0526	0.05[1]	0.2[4]
Nickel	0.042-0.52	**0.371**	**0.353**	0.1	0.2[5]
Potassium	7.66-8.59	8.19	8.42		
Selenium	ND-0.011	0.0096	0.0075	0.05	0.05
Sodium	42.9-43.6	42.4B	43.9B		
Vanadium	0.0073J-0.013	0.0152	0.0126		
TAL Metals (dissolved) SW846 6010B					
Barium	NA	0.0547	0.052		1.0
Cadmium	NA	0.0011	ND		0.01
Calcium	NA	56.8	56		
Magnesium	NA	60.3	59.4		
Manganese	NA	0.046	0.0513		0.2[4]
Nickel	NA	**0.302**	**0.322**		0.2[5]

Table 5-3. Historical Groundwater Sample Results Summary
Monitoring Well R
Cannon Air Force Base, Clovis, New Mexico (continued)

Analyte and Method	Range of Historical Results (mg/L)	MW-R (June 1999) (mg/L)	MW-X (June 1999) (Duplicate) (mg/L)	EPA MCLs (total) (mg/L)	New Mexico State Standards (dissolved) (mg/L)
TAL Metals (dissolved) SW846 6010B					
Potassium	NA	8.03	7.61		
Selenium	NA	0.0096	0.0068		0.05
Sodium	NA	43.1	42.3		
Vanadium	NA	0.013	0.0112		
Zinc	NA	0.0051	0.0034		10[4]
General Chemistry					
Nitrate EPA 300.0A	ND-5.2	5.1	5.2	10	10
Chloride EPA 300.0A	NA	125	119	250[1]	250
Sulfate S EPA 300.0A	NA	134	133	500[1]	600[4]
Other Constituents					
Semi-Volatile Organic Compounds SW-846 8270C	ND	ND	ND		
Herbicides- SW-846 8150	ND	ND	ND		
Organophosphorous Pesticides SW-846 8140	ND	ND	ND		
Organochlorine Pesticides SW-846 8081A	ND	ND	ND		
Phenols EPA 420.2	NA	ND	ND		0.005[4]
PCBs SW-846 8082	ND	ND	ND		

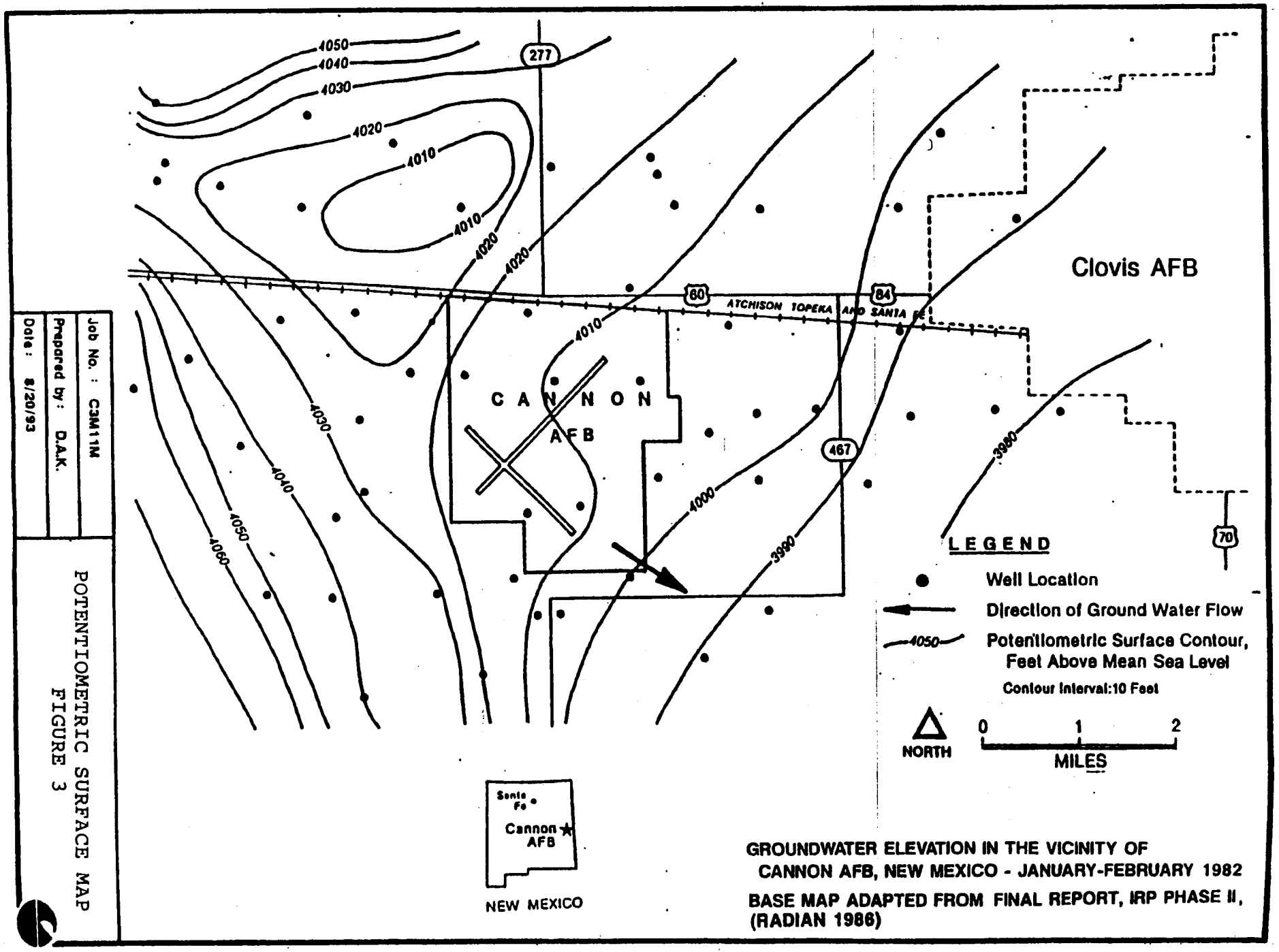
[1] Secondary Maximum Contaminant Level (SMCL)
[2] Maximum Contaminate Level Goal (MCLG)
[3] EPA Action Level
[4] Domestic Water Supply
[5] Irrigation Use

J = result is below the reporting limit; value is an estimated quantity
J1 = estimated concentration detected between method detection limit and reporting limit
MCL = maximum contaminant level
mg/L = milligrams per Liter
ND = analytes not detected above reporting limits
UB = not detected, result associated with blank contamination

Note: All samples collected on December 8, 1998; see Appendix II for reporting limits and method detection limits for all analytes.

6.0 SUMMARY

The semi-annual sampling of Monitoring Well R, downgradient of Landfill 25 was conducted in August 2000. Metals analysis for sample MW-R showed slightly elevated levels of calcium, chromium, copper, iron, magnesium, manganese, nickel, potassium, selenium, sodium and vandium. The results for chromium and iron exceeded New Mexico Groundwater Standards. Sample results for the first rinsate sample had detectable levels of chromium, copper, iron, manganese, and zinc. Sample results for the second rinsate sample had no elevated levels of metals. The metals detected in the groundwater sample and the first rinsate correspond with constituents found in stainless steel. However, due to the geochemistry of the aquifer, the groundwater potentially reacted with the stainless steel well screen releasing trace amounts of metals into solution. This most likely is a function of the pH of the groundwater. As a result, the U.S. Army Corps of Engineers has performed preliminary modeling to show that the landfill is not the source of the metals. Retardation factors calculated for the metal constituents detected and the distance of over 100 feet to groundwater indicate the metals could not have migrated to the water table in the time since the landfill has been in existence. Therefore the source of the metals is not considered to be the landfill.



Job No. : C3M11M
Prepared by: D.A.K.
Date : 8/20/93

POTENTIOMETRIC SURFACE MAP
FIGURE 3

APPENDIX B

Field Methods and Forms

FIELD METHODS

Field measurements collected during the semi-annual sampling included water level, health and safety monitoring and water quality parameters. The water level in MW-R was measured with an electrical water level indicator. Health and safety monitoring was performed using a Photoionization Detector (PID) for organic vapor measurements and an LEL meter for explosive atmosphere measurements. Water quality parameters were measured using a Horiba water quality meter.

Decontamination of the instrument probes and the pump body were performed during this sampling event. Monitoring Well R was purged prior to sampling using a dedicated pump. Purge water was pumped to a permanent holding tank maintained by Cannon Air Force Base. The dedicated pump installed in MW-R was used to collect the groundwater samples. The water samples were immediately placed on ice upon collection. Once the sampling was finished, chain-of-custody forms and air bills were completed, coolers were repacked and ice added if necessary, custody seals were attached to the coolers and the coolers were shipped to the laboratories for overnight delivery. Field forms and chain-of-custody records are included in Appendix B.

PAGE 1 OF 2

DATE: 8/17/00

TIME: 2238

MEETING LOCATION: Airport

DEFINABLE WORK FEATURE ADDRESSED: CAFB LTM SAMPLING EVENT

CQC REPRESENTATIVE: PHILLIP CUMMINGS

SUMMARY OF MEETING ACTIVITIES: CHRONOLOGY OF SAMPLING EVENT 18 AUG 00.

1. PULL PUMP TAKE FIRST RINSATE
2. PUMP OVERHAUL AT BENNETT PUMPS INC.
3. SECOND RINSATE
4. SAMPLE EVENT W/ SPLIT
5. FEDEX CLOSES AT 1900

Page 17 Aug 00

THE FOLLOWING INDIVIDUALS ATTENDED THE CCQC PREPARATORY PHASE MEETING:

NAME	SIGNATURE	COMPANY
PHILLIP CUMMINGS		PARALLAX
Gary L Vaughn		P2S

RECORDED BY: [signature] 17 Aug 00
(Signature and Date)

QA CHECK BY: Greg Schenk 10/24/00
(Signature and Date)

[redacted]

SUMMARY OF MEETING ACTIVITIES (Continued): INTENTIONALLY LEFT BLANK

17 Aug 00

RECORDED BY: [signature] 17 Aug 00
(Signature and Date)

QA CHECK BY: Greg Schenk 10/24/00
(Signature and Date)

DATE 8/18/99

DAY | S | M | T | W | TH | F X | S |

DAILY QUALITY CONTROL REPORT

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
	X				
TEMP	10-32°	32-30°	30-70°	70-85°	85° up
				X	
WIND	Still	Moder.	High	Report No.	
		X		1	
HUMIDITY	Dry X	Moder.	Humid		

COE PROJECT MANAGER Zink
PROJECT Cannon AFB - LTM
JOB NO. Del. Order #003
CONTRACT NO. DACA45-99-D-0015

SUB-CONTRACTORS ON SITE: Gary L. Vaughn (P25)

EQUIPMENT ON SITE: Bennett Pump and hardware,

WORK PERFORMED (INCLUDING SAMPLING):

0400 Equipment Calibration - see QC calibration
0430 Depart Amarillo, Tx
0645 Arrive Cannon AFB - Clovis N.M.
0700 H+S tailgate while waiting for Visters Center to open
0730 Vist. Cent open and receive pass
0745 Meet Sanford Hutsell and move to Landfill 25 MW-R. Well open on arrival.
0855 Water level 287.28 feet BTOC
TD 330 ft BTOC
PID headspace reading 0.02 ppm
Bz = 0.0 ppm
LEL = 0%
0915 Begin pulling pump - cable and hose onto new tarp (plastic).
0949 Pump, 285 ft of hose (3) & cable, and 15 ft tail hose & filter removed to plastic
1000 Cover pump and go buy proper tools to unscrew pump from hoses and cable.
1055 Return, remove pump, table fittings, bag pump, and return hoses and cable to well casing (above waters surface).
1100 Due to wind and dust did not preform QA rinse sample at well site, Wrap pumping hose

(Continuation Sheet)

PROJECT Cannon AFB LTM
JOB NO. Del Order #003

REPORT NO. 01
DATE: 8/18/00

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS): See cal section

1300 Returned to Amarillo TX - traffic heavy.
1315 Collect sample CAFB0818 MW8 Remote
1400 Take pump to Bennett Pump Inc.
1515 Remove tail and filter to return (heavy Fe staining)
1630 Pack sample to ship ~~8/17/00~~ 8/18 clean and pack equipment
1730 Fed Ex sample
2000 Transfer equipment to Dr Gary Baker.
2100 Off

HEALTH AND SAFETY LEVELS AND ACTIVITIES:

H&S Tailgate before entering site - n
No reportable PID or LEL reading above Background
PID reading of 0.02 ppm not repeated after 5 min. of open well cap.

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

Did not have tools to unhook pump from line. Action measured and purchased 2 open-end wrenches
Pump to repair turnaround time 8/22/00. Near Heavy traffic - None

SPECIAL NOTES: 8/18/00 None Heavy Fe staining ~~on~~ on hose and filter tail that hangs below pump into water table. Only mild discoloration on steel pump housing. Pump not in water table.

TOMORROW'S EXPECTATIONS: Travel

By: [signature] 8/16/00
(Signature and date)

QA Check by: Greg Schenk 10/24/00
(Signature and date)

96-006M8/063096

DATE 8/24/00

DAY | S | M | T | W | TH | F | S | (TH marked X)

DAILY QUALITY CONTROL REPORT

WEATHER: Bright Sun X | Clear | Overcast | Rain | Snow

TEMP: To 32° | 32-30° | 30-70° | 70-85° | 85° up (X)

WIND: Still | Moder. X | High | Report No. 2

HUMIDITY: Dry X | Moder. | Humid

COE PROJECT MANAGER Zink

PROJECT Cannon AFB - LTM

JOB NO. Del Order #003

CONTRACT NO. DACA45-99-D-0015

SUB-CONTRACTORS ON SITE: Gary L. Vaughn - ProServe (PS)

EQUIPMENT ON SITE: Bennett Pump, PID, LEL, Hnu 101, and 200 ft water level.

WORK PERFORMED (INCLUDING SAMPLING): 0638 - H+S meeting and calibrate Hnu-101, Micro TIP 2000, and DIG-IFL-HM 2000.
0748 Arrive Bennett Pumps (see contact report)
0825 Leave Amarillo TX to Cannon AFB-Clovis NM.
1125 Arrive Landfill 25 - MW-R (304 ft BTOC - TD, Water level 287.39 ft BTOC, 16.61 ft Water Column.
MW-R is 6" stainless w 30 ft screened interval.
6" = 1.5 gal/linear ft or 24.92 gal (2.5) per purge volume
1155 Pull hose setup from well and install pump & ho
1238 Universal coupling (male side) is bent off-centered and will not recieve high pressure hose from flow regulator.
1248 Call local hardware for replacement - told he must go to irrigation pump shop in Hereford TX (±65 miles)
1355 Return from Hereford TX & part and install. (±65 miles)
1354 Begin purge of MW-R - 1 purge vol. = 25 gal.
3 purge vol = 75 gal or 1.8 gal/min for 42 min.

Purge Record

Time	Wtr.	Rate	Vol.	pH	Cond.	Turb.	DO	Temp	Sal
1325	1400 287.39	1.8	Init.	6.37	0.94	76	8.65	23.2	.04
1335	1410 289.46		18	7.21	.776	63	10.15	20.8	.05
1345	1420 [illegible]		27	7.29	.779	48	10.41	19.7	.05
1355	1430 290.51		36	7.37	.784	28	10.[illegible]	19.4	.05
1425	291.[illegible]		45	7.42	.786	23	10.79	19.4	.05
1430	291.60		54	7.43	.787	21	10.92	19.4	.05

GW 8/24/00

DATE 8/24/00

DAY | S | M | T | W | TH | F | S |

DAILY QUALITY CONTROL REPORT

WEATHER	Bright Sun	Clear	Overcast	Rain	Snow
TEMP	To 32°	32-50°	50-70°	70-85°	85° up
WIND	Still	Moder.	High	Report No.	
HUMIDITY	Dry	Moder.	Humid		

COE PROJECT MANAGER

PROJECT

JOB NO.

CONTRACT NO.

8/24/00

SUB-CONTRACTORS ON SITE:

EQUIPMENT ON SITE:

WORK PERFORMED (INCLUDING SAMPLING):

1435 292.91 1.8 63 7.46 .788 17 18.98 19.3 .0
1440 293.95 | 72 7.47 .789 11 18.98 19.3 .0
1445 294.67 | 81 7.47 .798 6 18.97 19.3 .0
1446 Purge complete 81 gal. or 3.24 vol removed
1424 Collect sample and split - CAFB0824MWR
and CAFB0824MWS.
VOC - 3-40ml c Nitric
Semi VOC - 2/1lt Amber @ 4°C
TAL Metals - 1/500ml poly c Nitric
Herbicide - 2/1lt Amber @ 4°C
Pest 8081A - 2/1lt Amber @ 4°C
PCB - 2/1lt Amber @ 4°C
Pest (8140) - 2/1lt Amber @ 4°C
WQP (300.0) - 1/500ml @ 4°C
1520 Depart site after load up.
1540 Walmart for cooler, ice, and pack samples
1655 Leave for FedEx in Amarillo, TX
1730 Heavy traffic in Clovis call lab for instructions if
FedEx missed. See contact reports.
1850 Arrive FedEx closed @ 1830 will ship
8am 8/25/00
2330 Repack samples with 48lbs of ice.
8/25 0800 Ship FedEx
0830 Return tanks and regulator to Barnett's.

(Continuation Sheet)

PROJECT Cannon AFB - LTM
JOB NO. Del Order #003

REPORT NO. 2
DATE: 8/24/00

QUALITY CONTROL ACTIVITIES (INCLUDING FIELD CALIBRATIONS):

Collect - Rinsate sample on pump and tubing internal area. MW-? CAFB 0824 MWR
2 trip blanks collected before sample @ well.
Calibration - Horiba U-10, LEL, and PID

HEALTH AND SAFETY LEVELS AND ACTIVITIES: PID LEL readings

	PID	LEL
Background	0.0	0%
BZ	0.0	0%
at top of casing	.02	0%

Gloves, safety glasses, and st. toe boots. (Level C)

PROBLEMS ENCOUNTERED/CORRECTION ACTION TAKEN:

(1). Workplan did not have sample chart - called Paragon Labs for bottle info.
(2). Male universal coupling bent by well cover - replace and lower bailer lid.
(3). Short 1 cooler - replace.
(4). Ship sample to lab on Friday - OK from COE lab. Use schedule from week before.

SPECIAL NOTES: None

8/24/00 \ [signature]

TOMORROW'S EXPECTATIONS: Ship samples and return equipment to Bennett Pumps

8/24/00 \ [signature]

By: [signature] 8/24/00
(Signature and date)

QA Check by: Greg Schenk 10/28/00
(Signature and date)

INDIVIDUAL CONTACTED, TITLE, PHONE:
SANFORD HUTSELL 505 784-6378

ORIGINATOR:
PHILLIP CUMMINGS

ORGANIZATION:
BASE CIVIL ENGINEERING (ENVIRONMENTAL BR)

DATE CONTACTED: 10 AUG 00

ADDRESS: 506 NORTH DL. INGRAM BLVD CITY: CANNON AFB STATE: NM ZIP: 88103

Telecon: ☒ Visit: ☐

SUBJECT: LONG TERM MONITORING OF LANDFILLS 3, 4 & 25 CANNON AFB, NM

DISCUSSION: TALKED ABOUT WASTE LABLING PROCEDURES ON THE WELL PURGE TANKS, MR HUTSELL STATED THERE IS NO NEED TO PUT LABLES ON THE TANKS THE ~~BASE HAS NO REQUIREMENT TO DO SO.~~ TALKED ABOUT WHAT TO SAMPLE TEST ON RINSATE SAMPLES, MR HUTSELL STATED THAT THE TWO RINSATE SAMPLES SHOULD ONLY BE TESTED FOR METALS ONLY.

COMMENTS, ACTION, DATES

INDIVIDUAL CONTACTED, TITLE, PHONE: owner 8/24/00
Evan Bennett (806) 352 0264

ORIGINATOR:
Gary Vaughn

ORGANIZATION:
Bennett Env. Pumps

DATE CONTACTED:

ADDRESS: Starr St CITY: Amarillo STATE: TX ZIP: 79114

Telecon: ☐ Visit: ☒

SUBJECT: Pickup pump & Nitrogen gas bottles and Q A/Q C samples

DISCUSSION:

1. Inspect use of gas bottles and proper regulator hook-up.
2. Graft pump flow rate from 285 ft. (1.8 gal/min).
3. Install new 15 ft teflon drop tube & filter.
4. Flush rinsate sample through internal filter, tube and pump.

COMMENTS, ACTION, DATES

Worked Evan Bennett the pump + builder.

Arrived: 0740

Depart: 0825

INDIVIDUAL CONTACTED, TITLE, PHONE: L. Percifield

ORIGINATOR: Gary Vaughn

ORGANIZATION: CQAB Lab

DATE CONTACTED:

ADDRESS: 428 So 8th St CITY: Omaha STATE: NE ZIP: 68102

Telecon: ☒ Visit: ☐

SUBJECT: Split sample shipment

DISCUSSION: Split sample arrival Sat. 8/26/89 AM.

COMMENTS, ACTION, DATES: Request OK'd 402-444-4314

INDIVIDUAL CONTACTED, TITLE, PHONE: Ken Campbell

ORIGINATOR: Gary Vaughn

ORGANIZATION: Paragon Analytics Inc.

DATE CONTACTED:

ADDRESS: 225 Commerce Dr CITY: Ft. Collins STATE: CO ZIP: 80524

Telecon: ☒ Visit: ☐

SUBJECT: CAAB 0824 MW/R and split shipment

DISCUSSION: Sample to arrive Sat; AM.

COMMENTS, ACTION, DATES: Request on voice mail.

CALIBRATION STANDARD

PROJECT NAME: Cannon AFB - LTFM [illegible] 3

INCLUSIVE DATES FOR CALIBRATION MATERIAL USAGE	INSTRUMENT DESCRIPTION	CALIBRATION MATERIAL *	Psi/BOTTLE	LOT # AND MANUFACTURER	PERSON (INITIALS)
Start: 8/18/00 Finish:	Heron 3000A tape	Cal check seal in place		4277	
8/18/00-0400 —	Horiba VIQ # 803015	Auto-Cal'd	N/A	2200 Exp 4/16/02	
8/18/00	MicroTip HL-2000 #PAG10622 8	100 ppm Iso-Butylene	400 psi	LTF 180 CM	
8/18/00 LEL	DIGI FLAM 2000 #880000470	Methane 2.5% Qa 1570	240 psi	LTF-140 CM	
8/18/00 %by Vol	DIGI FLAM 2000	Methane 50% Air	240 PSI	LTF-139 CM	
8/24/00 Same as 8/18/00		no change in equipment or gas.			

10/24/00

* INCLUDE EXPIRATION DATES FOR STANDARD SOLUTIONS

QA CHECKED BY: [signature] 10/24/00
(Signature and Date)

EQUIPMENT CALIBRATION

PROJECT NAME: Cannon AFB - ATO

CATEGORY 1

M & TE CALIBRATION LOG

IDENTIFIER	ITEM	CALIBRATION MEASUREMENT			BACKGROUND CHECK	RESPONSE CHECK	NAME	DATE
		PRE	ADJUSTMENT	POST				
.EL 08800478	DIGIFLAM 2000	3%	-.5%	2.5%	Q.Q	None	[illegible]	8/18/00
PID PA91B628	MicroTip HL 2000	102ppm	-2ppm	100ppm	Q.Q	37.5ppm	[illegible]	8/18/00
Water 803815	Horiba U10	— Auto-cal complete			—	—	[illegible]	8/18/00
Water 803815	Horiba U10	— Auto-cal complete			—	—	[illegible]	8/24/00
.EL 08800478	DIGIFLAM 2000	2%	+.5%	2.5%	Q.Q	None	[illegible]	8/24/00
PID PA91B628	MicroTip HL2000	103ppm	-3ppm	100ppm	Q.Q	46.6ppm	[illegible]	8/24/00
				[illegible] 10/24/00				

QA CHECK BY: Greg Schenk 10/24/00
(Signature and Date)

COMPREHENSIVE WATER LEVEL MEASUREMENTS

PROJECT NAME: Lemoore AFB - TM [illegible] 2003

WELL NUMBER	DATE	TIME	DEPTH TO WATER * BTOC	INSTRUMENT	SERIAL NO.	REMARKS
MW-R	8/18/00	0855	287.28	Heron	4277	300 ft tape (dipper-T)
MW-R	8/24/00	1125	287.39	Heron	4277	Before purge
MW-R	8/24/00	1445	294.67	Heron	4277	Post purge @ sampling
				HS 10/24/00		

* All measurements from V-notch top of casing

RECORDED BY: [signature] 8/24/00
(Signature and Date)

QA CHECK BY: [signature] 10/24/00
(Signature and Date)

TYPE/NAME OF REAGENT: QAFB&818 NWR Rinsate

SUMMARY OF REAGENT CONTAINER LABEL INFORMATION: Metals TAL
8/18@1315 1-500ml ~~glass~~ QAFB 8/18 C Nitric Acid
Used Type II DI water over pump efferent
V-100 Red Bird Service - DI and Barnstead filtered
Grade II Lot #48626, Mfg. 6/26/00, Exp. 6/26/02

TYPE/NAME OF REAGENT: Nitric Acid

SUMMARY OF REAGENT CONTAINER LABEL INFORMATION: VOCs and Metals TAL
Preserve C Nitric Acid and Cool 4°C.
for groundwater sample and rinsate.

TYPE/NAME OF REAGENT:

SUMMARY OF REAGENT CONTAINER LABEL INFORMATION:

TYPE/NAME OF REAGENT:

SUMMARY OF REAGENT CONTAINER LABEL INFORMATION:

RECORDED BY: [signature] 8/18/00
(Signature & Date)

QA CHECK BY: [signature] 10/24/00
(Signature & Date)

PROJECT NAME: Lawrence [illegible] 345

DATE	AIR BILL NUMBER	RADIOLOGICAL	CLASS 3 FLAMMABLE LIQUID	CLASS 6, DIV.6.1 POISONOUS MATERIAL	CLASS 7 RADIOACTIVE MATERIAL	CLASS 9 MISC. HAZARDOUS MATERIAL	EPA HAZARDOUS WASTE/ SUBSTANCE	DANGEROUS GOODS	ENVIRONMENTAL	SHIPPER
	820802									814286457469
8/18/00	~~759992~~	N/A	N/A	N/A	N/A	N/A	N/A	N/A	X	FedEx 776
8/25/00	820802 759981	No	No	No	No	No	No	No	Yes	825
	820595 782519									745
	820593 782493									845
	820802 759992									New

AS
10/24/00

	CONTRACTOR LABORATORY					GOVERNMENT LABORATORY			REQUESTED LABORATORY ANALYSES						
SAMPLE LOCATION	SAMPLE TYPE	SAMPLE NUMBER	ASSOCIATED QC DUPLICATE NUMBER	ASSOCIATED QC RINSATE NUMBER	ASSOCIATED QC TRIP BLANK NUMBER	SAMPLE NUMBER	ASSOCIATED QA SPLIT NUMBER	ASSOCIATED QA TRIP BLANK NUMBER	TAL Metals	VOC	Semi VOC	Herb	PCB	Pest. (2)	WQP
1 MW-R	Rinsate	CAFB0818MWR-Rinsate			1-500ml w/ Nitric Acid				X		pre-overhaul				
2 MW-R	Rinsate	CAFB0824MWR-Rinsate							X		post overhaul				
3 MW-R	Trip Blk	CAFB0824MWR		See line #2						X					
4 MW-R	Trip Blk	CAFB0824MWS					CAFB0824MWS			X					
5 MW-R	Grab	CAFB0824MWR	—	Same	[illegible] 824	—	CAFB0824MWS	—	X	X	X	X	X	X	X
6 MW-R	Grab -	Split	—	—	~~CAFB0824MWS~~	CAFB0824MWS	Same	CAFB0824MWS	X	X	X	X	X	X	X

AS
10/24/00

Cannon AFB - LTM Del Order 005

[redacted]

DATE: 8/18/00 TIME: 0700

MEETING LOCATION: Cannon AFB - Visitor's Center Parking Area

SITE SAFETY & HEALTH OFFICER: Gary L. Vaughn

SUMMARY OF MEETING ACTIVITIES: Waiting Center to open @ 730

1. Heavy lifting at well head on pump @ 300 lbs.
2. Need to stay hydrated.
3. Biota threats.
4. Hospital location
5. Inventory - PID, LEL, Safety glasses, work gloves, nit. gloves, and check tools.
6. Sample preserving procedures.

8/18/00

THE FOLLOWING INDIVIDUALS ATTENDED THE PRE-ENTRY SAFETY & HEALTH TRAINING MEETING:

NAME	SIGNATURE	COMPANY
Gary L Vaughn		PZS
PHILLIP CUMMINGS		PARALLAX

8/18/00

RECORDED BY: 8/18/00 (Signature and Date)

QA CHECK BY: 10/24/00 (Signature and Date)

[redacted]

NAME: Caryl. Vaughn DATE: 8/18/00 TIME: 1900

M Tu W Th F Sa Su

TASKS PERFORMED: 1. Pull pump from MW-R in landfill 25.
Take Rise sample on pump body and skids.
1720 8/18/00
Turn over all equipment and sample bottles to Dr. Gary Baker to complete task after pump is overhauled.

8/18/00

OFF-NORMAL EVENTS: None

[redacted]

NAME: GARY L. Vaughn DATE: 8/24/00 TIME: 0630

M Tu W Th F Sa Su

TASKS PERFORMED:

1. Pick up equipment and Coolers
2. Pickup pump and grab-samples.
3. Install pump in MW-5
4. Purge well
5. Sample & split sample
6. Ship samples and return ice to Eagle.

8/24/00

OFF-NORMAL EVENTS: None that would involve health or safety.

8/24/00

[redacted]

REPORTING PERIOD: 8/17/00 to 8/25/00

SSHO NAME: Gary Vaughn

SUMMARY OF INJURIES: None

SUMMARY OF ACCIDENTS: None

SUMMARY OF NEAR ACCIDENTS: None

INTERPRETATIONS OF THE PROJECT SSHP/REGULATIONS: None

SUMMARY OF INTERACTIONS WITH AUDITORS/REGULATORS/USACE PERSONNEL: None

SUMMARY OF OFF-NORMAL EVENTS: None

RECORDED BY: Gary L Vaughn (Signature) DATE: 8/25/00

APPENDIX C

Analytical Results/Quality Control Data

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0008165
Client Name: Parallax, Inc.
ClientProject ID: Cannon AFB - LTM

Field ID: CAFB0824MWR
Lab ID: 0008165-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 24-Aug-00
Date Extracted: 01-Sep-00
Date Analyzed: 01-Sep-00

Prep Batch: VL000901-1
QCBatchID: VL000901-1-1
Run ID: VL000901-1A
Cleanup: NONE
Basis: As Received

Sample Aliquot: 5 ML
Final Volume: 5 ML
Result Units: UG/L
File Name: A11720

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
75-71-8	DICHLORODIFLUOROMETHANE	1	10	10	U	
74-87-3	CHLOROMETHANE	1	10	10	U	
75-01-4	VINYL CHLORIDE	1	10	10	U	
74-83-9	BROMOMETHANE	1	10	10	U	
75-00-3	CHLOROETHANE	1	10	10	U	
75-69-4	TRICHLOROFLUOROMETHANE	1	5	5	U	
75-35-4	1,1-DICHLOROETHENE	1	5	5	U	
76-13-1	TRICHLOROTRIFLUOROETHANE	1	5	5	U	
67-64-1	ACETONE	1	20	20	U	
74-88-4	IODOMETHANE	1	5	5	U	
75-15-0	CARBON DISULFIDE	1	5	5	U	
75-09-2	METHYLENE CHLORIDE	1	7.7	5	B	
156-60-5	TRANS-1,2-DICHLOROETHENE	1	5	5	U	
1634-04-4	METHYL TERTIARY BUTYL ETHER	1	5	5	U	
75-34-3	1,1-DICHLOROETHANE	1	5	5	U	
108-05-4	VINYL ACETATE	1	20	20	U	
156-59-2	CIS-1,2-DICHLOROETHENE	1	5	5	U	
78-93-3	2-BUTANONE	1	20	20	U	
74-97-5	BROMOCHLOROMETHANE	1	5	5	U	
67-66-3	CHLOROFORM	1	5	5	U	
71-55-6	1,1,1-TRICHLOROETHANE	1	5	5	U	
594-20-7	2,2-DICHLOROPROPANE	1	5	5	U	
56-23-5	CARBON TETRACHLORIDE	1	5	5	U	
563-58-6	1,1-DICHLOROPROPENE	1	5	5	U	
107-06-2	1,2-DICHLOROETHANE	1	5	5	U	
71-43-2	BENZENE	1	5	5	U	
79-01-6	TRICHLOROETHENE	1	5	5	U	
78-87-5	1,2-DICHLOROPROPANE	1	5	5	U	
74-95-3	DIBROMOMETHANE	1	5	5	U	

Data Package ID: *VL0008165-1*

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.

Work Order Number: 0008165

Client Name: Parallax, Inc.

ClientProject ID: Cannon AFB - LTM

[redacted]	CAFB0824MWR
[redacted]	0008165-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 24-Aug-00
Date Extracted: 01-Sep-00
Date Analyzed: 01-Sep-00

Prep Batch: VL000901-1
QCBatchID: VL000901-1-1
Run ID: VL000901-1A
Cleanup: NONE
Basis: As Received

Sample Aliquot: 5 ML
Final Volume: 5 ML
Result Units: UG/L

File Name: A11720

75-27-4	BROMODICHLOROMETHANE	1	5	5	U	
10061-01-5	CIS-1,3-DICHLOROPROPENE	1	5	5	U	
108-10-1	4-METHYL-2-PENTANONE	1	20	20	U	
108-88-3	TOLUENE	1	5	5	U	
10061-02-6	TRANS-1,3-DICHLOROPROPENE	1	5	5	U	
79-00-5	1,1,2-TRICHLOROETHANE	1	5	5	U	
591-78-6	2-HEXANONE	1	20	20	U	
127-18-4	TETRACHLOROETHENE	1	5	5	U	
142-28-9	1,3-DICHLOROPROPANE	1	5	5	U	
124-48-1	DIBROMOCHLOROMETHANE	1	5	5	U	
106-93-4	1,2-DIBROMOETHANE	1	5	5	U	
544-10-5	1-CHLOROHEXANE	1	5	5	U	
108-90-7	CHLOROBENZENE	1	5	5	U	
630-20-6	1,1,1,2-TETRACHLOROETHANE	1	5	5	U	
100-41-4	ETHYLBENZENE	1	5	5	U	
136777-61-2	M+P-XYLENE	1	5	5	U	
95-47-6	O-XYLENE	1	5	5	U	
100-42-5	STYRENE	1	5	5	U	
75-25-2	BROMOFORM	1	5	5	U	
98-82-8	ISOPROPYLBENZENE	1	5	5	U	
96-18-4	1,2,3-TRICHLOROPROPANE	1	5	5	U	
79-34-5	1,1,2,2-TETRACHLOROETHANE	1	5	5	U	
108-86-1	BROMOBENZENE	1	5	5	U	
103-65-1	N-PROPYLBENZENE	1	5	5	U	
95-49-8	2-CHLOROTOLUENE	1	5	5	U	
108-67-8	1,3,5-TRIMETHYLBENZENE	1	5	5	U	
106-43-4	4-CHLOROTOLUENE	1	5	5	U	
98-06-6	TERT-BUTYLBENZENE	1	5	5	U	
95-63-6	1,2,4-TRIMETHYLBENZENE	1	5	5	U	
135-98-8	SEC-BUTYLBENZENE	1	5	5	U	
541-73-1	1,3-DICHLOROBENZENE	1	5	5	U	
99-87-6	P-ISOPROPYLTOLUENE	1	5	5	U	

Data Package ID: *VL0008165-1*

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0008165
Client Name: Parallax, Inc.
ClientProject ID: Cannon AFB - LTM

[redacted]	CAFB0824MWR
[redacted]	0008165-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 24-Aug-00
Date Extracted: 01-Sep-00
Date Analyzed: 01-Sep-00

Prep Batch: VL000901-1
QCBatchID: VL000901-1-1
Run ID: VL000901-1A
Cleanup: NONE
Basis: As Received

Sample Aliquot: 5 ML
Final Volume: 5 ML
Result Units: UG/L
File Name: A11720

106-46-7	1,4-DICHLOROBENZENE	1	5	5	U	
104-51-8	N-BUTYLBENZENE	1	5	5	U	
95-50-1	1,2-DICHLOROBENZENE	1	5	5	U	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	1	10	10	U	
120-82-1	1,2,4-TRICHLOROBENZENE	1	5	5	U	
87-68-3	HEXACHLOROBUTADIENE	1	5	5	U	
91-20-3	NAPHTHALENE	1	5	5	U	
87-61-6	1,2,3-TRICHLOROBENZENE	1	5	5	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	42.7		50	85	82 - 123
1868-53-7	DIBROMOFLUOROMETHANE	43.7		50	87	75 - 127
2037-26-5	TOLUENE-D8	52.3		50	105	89 - 116

Data Package ID: *VL0008165-1*

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0008165
Client Name: Parallax, Inc.
ClientProject ID: Cannon AFB - LTM

Field ID: CAFB0824MWR-TB
Lab ID: 0008165-3

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 24-Aug-00
Date Extracted: 01-Sep-00
Date Analyzed: 01-Sep-00

Prep Batch: VL000901-1
QCBatchID: VL000901-1-1
Run ID: VL000901-1A
Cleanup: NONE
Basis: As Received

Sample Aliquot: 5 ML
Final Volume: 5 ML
Result Units: UG/L
File Name: A11721

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
75-71-8	DICHLORODIFLUOROMETHANE	1	10	10	U	
74-87-3	CHLOROMETHANE	1	10	10	U	
75-01-4	VINYL CHLORIDE	1	10	10	U	
74-83-9	BROMOMETHANE	1	10	10	U	
75-00-3	CHLOROETHANE	1	10	10	U	
75-69-4	TRICHLOROFLUOROMETHANE	1	5	5	U	
75-35-4	1,1-DICHLOROETHENE	1	5	5	U	
76-13-1	TRICHLOROTRIFLUOROETHANE	1	5	5	U	
67-64-1	ACETONE	1	12	20	J	
74-88-4	IODOMETHANE	1	5	5	U	
75-15-0	CARBON DISULFIDE	1	5	5	U	
75-09-2	METHYLENE CHLORIDE	1	7.8	5	B	
156-60-5	TRANS-1,2-DICHLOROETHENE	1	5	5	U	
1634-04-4	METHYL TERTIARY BUTYL ETHER	1	5	5	U	
75-34-3	1,1-DICHLOROETHANE	1	5	5	U	
108-05-4	VINYL ACETATE	1	20	20	U	
156-59-2	CIS-1,2-DICHLOROETHENE	1	5	5	U	
78-93-3	2-BUTANONE	1	20	20	U	
74-97-5	BROMOCHLOROMETHANE	1	5	5	U	
67-66-3	CHLOROFORM	1	5	5	U	
71-55-6	1,1,1-TRICHLOROETHANE	1	5	5	U	
594-20-7	2,2-DICHLOROPROPANE	1	5	5	U	
56-23-5	CARBON TETRACHLORIDE	1	5	5	U	
563-58-6	1,1-DICHLOROPROPENE	1	5	5	U	
107-06-2	1,2-DICHLOROETHANE	1	5	5	U	
71-43-2	BENZENE	1	5	5	U	
79-01-6	TRICHLOROETHENE	1	5	5	U	
78-87-5	1,2-DICHLOROPROPANE	1	5	5	U	
74-95-3	DIBROMOMETHANE	1	5	5	U	

Data Package ID: *VL0008165-1*

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0008165
Client Name: Parallax, Inc.
ClientProject ID: Cannon AFB - LTM

Client ID: CAFB0824MWR-TB
Lab ID: 0008165-3

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 24-Aug-00
Date Extracted: 01-Sep-00
Date Analyzed: 01-Sep-00

Prep Batch: VL000901-1
QCBatchID: VL000901-1-1
Run ID: VL000901-1A
Cleanup: NONE
Basis: As Received

Sample Aliquot: 5 ML
Final Volume: 5 ML
Result Units: UG/L

File Name: A11721

75-27-4	BROMODICHLOROMETHANE	1	5	5	U	
10061-01-5	CIS-1,3-DICHLOROPROPENE	1	5	5	U	
108-10-1	4-METHYL-2-PENTANONE	1	20	20	U	
108-88-3	TOLUENE	1	5	5	U	
10061-02-6	TRANS-1,3-DICHLOROPROPENE	1	5	5	U	
79-00-5	1,1,2-TRICHLOROETHANE	1	5	5	U	
591-78-6	2-HEXANONE	1	20	20	U	
127-18-4	TETRACHLOROETHENE	1	5	5	U	
142-28-9	1,3-DICHLOROPROPANE	1	5	5	U	
124-48-1	DIBROMOCHLOROMETHANE	1	5	5	U	
106-93-4	1,2-DIBROMOETHANE	1	5	5	U	
544-10-5	1-CHLOROHEXANE	1	5	5	U	
108-90-7	CHLOROBENZENE	1	5	5	U	
630-20-6	1,1,1,2-TETRACHLOROETHANE	1	5	5	U	
100-41-4	ETHYLBENZENE	1	5	5	U	
136777-61-2	M+P-XYLENE	1	5	5	U	
95-47-6	O-XYLENE	1	5	5	U	
100-42-5	STYRENE	1	5	5	U	
75-25-2	BROMOFORM	1	5	5	U	
98-82-8	ISOPROPYLBENZENE	1	5	5	U	
96-18-4	1,2,3-TRICHLOROPROPANE	1	5	5	U	
79-34-5	1,1,2,2-TETRACHLOROETHANE	1	5	5	U	
108-86-1	BROMOBENZENE	1	5	5	U	
103-65-1	N-PROPYLBENZENE	1	5	5	U	
95-49-8	2-CHLOROTOLUENE	1	5	5	U	
108-67-8	1,3,5-TRIMETHYLBENZENE	1	5	5	U	
106-43-4	4-CHLOROTOLUENE	1	5	5	U	
98-06-6	TERT-BUTYLBENZENE	1	5	5	U	
95-63-6	1,2,4-TRIMETHYLBENZENE	1	5	5	U	
135-98-8	SEC-BUTYLBENZENE	1	5	5	U	
541-73-1	1,3-DICHLOROBENZENE	1	5	5	U	
99-87-6	P-ISOPROPYLTOLUENE	1	5	5	U	

Data Package ID: *VL0008165-1*

GC/MS Volatiles

Method SW8260

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0008165
Client Name: Parallax, Inc.
ClientProject ID: Cannon AFB - LTM

[redacted]	CAFB0824MWR-TB
[redacted]	0008165-3

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 24-Aug-00
Date Extracted: 01-Sep-00
Date Analyzed: 01-Sep-00

Prep Batch: VL000901-1
QCBatchID: VL000901-1-1
Run ID: VL000901-1A
Cleanup: NONE
Basis: As Received

Sample Aliquot: 5 ML
Final Volume: 5 ML
Result Units: UG/L

File Name: A11721

106-46-7	1,4-DICHLOROBENZENE	1	5	5	U	
104-51-8	N-BUTYLBENZENE	1	5	5	U	
95-50-1	1,2-DICHLOROBENZENE	1	5	5	U	
96-12-8	1,2-DIBROMO-3-CHLOROPROPANE	1	10	10	U	
120-82-1	1,2,4-TRICHLOROBENZENE	1	5	5	U	
87-68-3	HEXACHLOROBUTADIENE	1	5	5	U	
91-20-3	NAPHTHALENE	1	5	5	U	
87-61-6	1,2,3-TRICHLOROBENZENE	1	5	5	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
460-00-4	4-BROMOFLUOROBENZENE	44.5		50	89	82 - 123
1868-53-7	DIBROMOFLUOROMETHANE	46.5		50	93	75 - 127
2037-26-5	TOLUENE-D8	51.3		50	103	89 - 116

Data Package ID: *VL0008165-1*

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0008165
Client Name: Parallax, Inc.
ClientProject ID: Cannon AFB - LTM

CAFB0824MWR	
0008165-2	

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 24-Aug-00
Date Extracted: 28-Aug-00
Date Analyzed: 01-Sep-00

Prep Batch: EX000828-9
QCBatchID: EX000828-9-1
Run ID: SV000901-2
Cleanup: NONE
Basis: As Received

Sample Aliquot: 1060 ML
Final Volume: 1 ML
Result Units: UG/L
File Name: P9363

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
110-86-1	PYRIDINE	1	9.4	9.4	U	
62-75-9	N-NITROSODIMETHYLAMINE	1	9.4	9.4	U	
62-53-3	ANILINE	1	24	24	U	
108-95-2	PHENOL	1	9.4	9.4	U	
111-44-4	BIS(2-CHLOROETHYL)ETHER	1	9.4	9.4	U	
95-57-8	2-CHLOROPHENOL	1	9.4	9.4	U	
541-73-1	1,3-DICHLOROBENZENE	1	9.4	9.4	U	
106-46-7	1,4-DICHLOROBENZENE	1	9.4	9.4	U	
95-50-1	1,2-DICHLOROBENZENE	1	9.4	9.4	U	
100-51-6	BENZYL ALCOHOL	1	9.4	9.4	U	
108-60-1	BIS(2-CHLOROISOPROPYL)ETHER	1	9.4	9.4	U	
95-48-7	2-METHYLPHENOL	1	9.4	9.4	U	
621-64-7	N-NITROSO-DI-N-PROPYLAMINE	1	9.4	9.4	U	
106-44-5	4-METHYLPHENOL	1	9.4	9.4	U	
67-72-1	HEXACHLOROETHANE	1	9.4	9.4	U	
98-95-3	NITROBENZENE	1	9.4	9.4	U	
78-59-1	ISOPHORONE	1	9.4	9.4	U	
88-75-5	2-NITROPHENOL	1	9.4	9.4	U	
105-67-9	2,4-DIMETHYLPHENOL	1	9.4	9.4	U	
111-91-1	BIS(2-CHLOROETHOXY)METHANE	1	9.4	9.4	U	
120-83-2	2,4-DICHLOROPHENOL	1	9.4	9.4	U	
65-85-0	BENZOIC ACID	1	47	47	U	
120-82-1	1,2,4-TRICHLOROBENZENE	1	9.4	9.4	U	
91-20-3	NAPHTHALENE	1	9.4	9.4	U	
106-47-8	4-CHLOROANILINE	1	24	24	U	
87-68-3	HEXACHLOROBUTADIENE	1	9.4	9.4	U	
59-50-7	4-CHLORO-3-METHYLPHENOL	1	9.4	9.4	U	
91-57-6	2-METHYLNAPHTHALENE	1	9.4	9.4	U	
77-47-4	HEXACHLOROCYCLOPENTADIENE	1	9.4	9.4	U	

Data Package ID: *SV0008165-1*

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0008165
Client Name: Parallax, Inc.
ClientProject ID: Cannon AFB - LTM

CAFB0824MWR
0008165-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 24-Aug-00
Date Extracted: 28-Aug-00
Date Analyzed: 01-Sep-00

Prep Batch: EX000828-9
QCBatchID: EX000828-9-1
Run ID: SV000901-2
Cleanup: NONE
Basis: As Received

Sample Aliquot: 1060 ML
Final Volume: 1 ML
Result Units: UG/L

File Name: P9363

88-06-2	2,4,6-TRICHLOROPHENOL	1	9.4	9.4	U	
95-95-4	2,4,5-TRICHLOROPHENOL	1	9.4	9.4	U	
91-58-7	2-CHLORONAPHTHALENE	1	9.4	9.4	U	
88-74-4	2-NITROANILINE	1	47	47	U	
131-11-3	DIMETHYL PHTHALATE	1	9.4	9.4	U	
606-20-2	2,6-DINITROTOLUENE	1	9.4	9.4	U	
208-96-8	ACENAPHTHYLENE	1	9.4	9.4	U	
99-09-2	3-NITROANILINE	1	47	47	U	
83-32-9	ACENAPHTHENE	1	9.4	9.4	U	
51-28-5	2,4-DINITROPHENOL	1	47	47	U	
100-02-7	4-NITROPHENOL	1	47	47	U	
132-64-9	DIBENZOFURAN	1	9.4	9.4	U	
121-14-2	2,4-DINITROTOLUENE	1	9.4	9.4	U	
84-66-2	DIETHYL PHTHALATE	1	9.4	9.4	U	
86-73-7	FLUORENE	1	9.4	9.4	U	
7005-72-3	4-CHLOROPHENYL PHENYL ETHER	1	9.4	9.4	U	
100-01-6	4-NITROANILINE	1	47	47	U	
103-33-3	AZOBENZENE	1	9.4	9.4	U	
534-52-1	4,6-DINITRO-2-METHYLPHENOL	1	47	47	U	
86-30-6	N-NITROSODIPHENYLAMINE	1	9.4	9.4	U	
101-55-3	4-BROMOPHENYL PHENYL ETHER	1	9.4	9.4	U	
118-74-1	HEXACHLOROBENZENE	1	9.4	9.4	U	
58-90-2	2,3,4,6-TETRACHLOROPHENOL	1	47	47	U	
87-86-5	PENTACHLOROPHENOL	1	47	47	U	
85-01-8	PHENANTHRENE	1	9.4	9.4	U	
120-12-7	ANTHRACENE	1	9.4	9.4	U	
86-74-8	CARBAZOLE	1	9.4	9.4	U	
84-74-2	DI-N-BUTYL PHTHALATE	1	9.4	9.4	U	
206-44-0	FLUORANTHENE	1	9.4	9.4	U	
129-00-0	PYRENE	1	9.4	9.4	U	
85-68-7	BUTYL BENZYL PHTHALATE	1	9.4	9.4	U	
56-55-3	BENZO(A)ANTHRACENE	1	9.4	9.4	U	

Data Package ID: *SV0008165-1*

GC/MS Semi-volatiles

Method SW8270

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0008165
Client Name: Parallax, Inc.
ClientProject ID: Cannon AFB - LTM

CAFB0824MWR
0008165-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 24-Aug-00
Date Extracted: 28-Aug-00
Date Analyzed: 01-Sep-00

Prep Batch: EX000828-9
QCBatchID: EX000828-9-1
Run ID: SV000901-2
Cleanup: NONE
Basis: As Received

Sample Aliquot: 1060 ML
Final Volume: 1 ML
Result Units: UG/L
File Name: P9363

91-94-1	3,3'-DICHLOROBENZIDINE	1	47	47	U	
218-01-9	CHRYSENE	1	9.4	9.4	U	
117-81-7	BIS(2-ETHYLHEXYL)PHTHALATE	1	9.4	9.4	U	
117-84-0	DI-N-OCTYL PHTHALATE	1	9.4	9.4	U	
205-99-2	BENZO(B)FLUORANTHENE	1	9.4	9.4	U	
207-08-9	BENZO(K)FLUORANTHENE	1	9.4	9.4	U	
50-32-8	BENZO(A)PYRENE	1	9.4	9.4	U	
193-39-5	INDENO(1,2,3-CD)PYRENE	1	9.4	9.4	U	
53-70-3	DIBENZO(A,H)ANTHRACENE	1	9.4	9.4	U	
191-24-2	BENZO(G,H,I)PERYLENE	1	9.4	9.4	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
118-79-6	2,4,6-TRIBROMOPHENOL	47.8		70.8	68	23 - 100
321-60-8	2-FLUOROBIPHENYL	29.4		47.2	62	21 - 106
367-12-4	2-FLUOROPHENOL	41.1		70.8	58	21 - 100
4165-60-0	NITROBENZENE-D5	30.8		47.2	65	34 - 111
4165-62-2	PHENOL-D5	48.3		70.8	68	15 - 104
1718-51-0	TERPHENYL-D14	39.7		47.2	84	33 - 111

Data Package ID: *SV0008165-1*

Organophosphorus Pesticides

Method SW8141

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0008165
Client Name: Parallax, Inc.
ClientProject ID: Cannon AFB - LTM

	CAFB0824MWR
	0008165-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 24-Aug-00
Date Extracted: 29-Aug-00
Date Analyzed: 01-Sep-00

Prep Batch: EX000829-3
QCBatchID: EX000829-3-1
Run ID: PT000901-7
Cleanup: NONE
Basis: As Received

Sample Aliquot: 1020 ML
Final Volume: 1 ML
Result Units: UG/L
File Name: 0901FA12

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
62-73-7	DICHLORVOS	1	0.98	0.98	U	
7786-34-7	MEVINPHOS	1	0.98	0.98	U	
8065-48-3	DEMETON O + S	1	0.98	0.98	U	
13194-48-4	ETHOPROP	1	0.98	0.98	U	
300-76-5	NALED	1	2.9	2.9	U	
298-02-2	PHORATE	1	0.98	0.98	U	
333-41-5	DIAZINON	1	0.98	0.98	U	
298-04-4	DISULFOTON	1	3.9	3.9	U	
298-00-0	METHYL PARATHION	1	0.98	0.98	U	
299-84-3	RONNEL	1	0.98	0.98	U	
55-38-9	FENTHION	1	0.98	0.98	U	
2921-88-2	CHLORPYRIFOS	1	0.98	0.98	U	
327-98-0	TRICHLORONATE	1	0.98	0.98	U	
150-50-5	MERPHOS A + B	1	2	2	U	
22248-79-9	TETRACHLORVINPHOS	1	0.98	0.98	U	
34643-46-4	TOKUTHION	1	0.98	0.98	U	
115-90-2	FENSULFOTHION	1	0.98	0.98	U	
35400-43-2	SULPROFOS	1	0.98	0.98	U	
86-50-0	METHYL AZINPHOS	1	2	2	U	
56-72-4	COUMAPHOS	1	2	2	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
115-86-6	TRIPHENYLPHOSPHATE	1.32		1.96	68	39 - 130

Data Package ID: *PT0008165-3*

PCBs

Method SW8082

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0008165
Client Name: Parallax, Inc.
ClientProject ID: Cannon AFB - LTM

CAFB0824MWR
0008165-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 24-Aug-00
Date Extracted: 29-Aug-00
Date Analyzed: 08-Sep-00

Prep Batch: EX000829-5
QCBatchID: EX000829-5-1
Run ID: PT000908-1
Cleanup: SW3665
Basis: As Received

Sample Aliquot: 1025 ML
Final Volume: 10 ML
Result Units: UG/L

File Name: EA001315

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
12674-11-2	AROCLOR-1016	1	0.98	0.98	U	
11104-28-2	AROCLOR-1221	1	2	2	U	
11141-16-5	AROCLOR-1232	1	0.98	0.98	U	
53469-21-9	AROCLOR-1242	1	0.98	0.98	U	
12672-29-6	AROCLOR-1248	1	0.98	0.98	U	
11097-69-1	AROCLOR-1254	1	0.98	0.98	U	
11096-82-5	AROCLOR-1260	1	0.98	0.98	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
2051-24-3	DECACHLOROBIPHENYL	0.23	*	0.488	47	48 - 143
877-09-8	TETRACHLORO-M-XYLENE	0.428		0.488	88	44 - 131

Data Package ID: *PT0008165-2*

Total Recoverable ICP Metals

Method SW6010

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0008165
Client Name: Parallax, Inc.
ClientProject ID: Cannon AFB - LTM

Client ID:	CAFB0818MWR-R1
Lab ID:	0008165-1

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 18-Aug-00
Date Extracted: 30-Aug-00
Date Analyzed: 30-Aug-00

Prep Batch: IP000830-2
QCBatchID: IP000830-2-3
Run ID: IT000830-1A1
Cleanup: NONE
Basis: As Received

Sample Aliquot: 50 G
Final Volume: 50 ML
Result Units: MG/L

File Name: TS00830

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	0.2	0.2	U	
7440-36-0	ANTIMONY	1	0.02	0.02	U	
7440-38-2	ARSENIC	1	0.01	0.01	U	
7440-39-3	BARIUM	1	0.1	0.1	U	
7440-41-7	BERYLLIUM	1	0.005	0.005	U	
7440-43-9	CADMIUM	1	0.005	0.005	U	
7440-70-2	CALCIUM	1	1	1	U	
7440-47-3	CHROMIUM	1	0.013	0.01		
7440-48-4	COBALT	1	0.01	0.01	U	
7440-50-8	COPPER	1	0.023	0.01		
7439-89-6	IRON	1	0.12	0.1		
7439-92-1	LEAD	1	0.003	0.003	U	
7439-95-4	MAGNESIUM	1	1	1	U	
7439-96-5	MANGANESE	1	0.013	0.01		
7440-02-0	NICKEL	1	0.02	0.02	U	
7440-09-7	POTASSIUM	1	1	1	U	
7782-49-2	SELENIUM	1	0.005	0.005	U	
7440-22-4	SILVER	1	0.01	0.01	U	
7440-23-5	SODIUM	1	1	1	U	
7440-28-0	THALLIUM	1	0.01	0.01	U	
7440-62-2	VANADIUM	1	0.01	0.01	U	
7440-66-6	ZINC	1	0.047	0.02		

Data Package ID: *IT0008165-1*

Total Recoverable ICP Metals

Method SW6010

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0008165
Client Name: Parallax, Inc.
ClientProject ID: Cannon AFB - LTM

Client ID:	CAFB0824MWR
Lab ID:	0008165-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 24-Aug-00
Date Extracted: 30-Aug-00
Date Analyzed: 30-Aug-00

Prep Batch: IP000830-2
QCBatchID: IP000830-2-3
Run ID: IT000830-1A1
Cleanup: NONE
Basis: As Received

Sample Aliquot: 50 G
Final Volume: 50 ML
Result Units: MG/L

File Name: TS00830

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	0.2	0.2	U	
7440-36-0	ANTIMONY	1	0.02	0.02	U	
7440-38-2	ARSENIC	1	0.01	0.01	U	
7440-39-3	BARIUM	1	0.1	0.1	U	
7440-41-7	BERYLLIUM	1	0.005	0.005	U	
7440-43-9	CADMIUM	1	0.005	0.005	U	
7440-70-2	CALCIUM	1	51	1		
7440-47-3	CHROMIUM	1	0.7	0.01		
7440-48-4	COBALT	1	0.01	0.01	U	
7440-50-8	COPPER	1	0.01	0.01		
7439-89-6	IRON	1	2.3	0.1		
7439-92-1	LEAD	1	0.003	0.003	U	
7439-95-4	MAGNESIUM	1	54	1		
7439-96-5	MANGANESE	1	0.05	0.01		
7440-02-0	NICKEL	1	0.37	0.02		
7440-09-7	POTASSIUM	1	8.2	1		
7782-49-2	SELENIUM	1	0.0079	0.005		
7440-22-4	SILVER	1	0.01	0.01	U	
7440-23-5	SODIUM	1	35	1		
7440-28-0	THALLIUM	1	0.01	0.01	U	
7440-62-2	VANADIUM	1	0.019	0.01		
7440-66-6	ZINC	1	0.02	0.02	U	

Data Package ID: *IT0008165-1*

Total Recoverable ICP Metals

Method SW6010

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0008165
Client Name: Parallax, Inc.
ClientProject ID: Cannon AFB - LTM

[redacted]	CAFB0824MWR-R2
[redacted]	0008165-4

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 24-Aug-00
Date Extracted: 30-Aug-00
Date Analyzed: 30-Aug-00

Prep Batch: IP000830-2
QCBatchID: IP000830-2-3
Run ID: IT000830-1A1
Cleanup: NONE
Basis: As Received

Sample Aliquot: 50 G
Final Volume: 50 ML
Result Units: MG/L

File Name: TS00830

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
7429-90-5	ALUMINUM	1	0.2	0.2	U	
7440-36-0	ANTIMONY	1	0.02	0.02	U	
7440-38-2	ARSENIC	1	0.01	0.01	U	
7440-39-3	BARIUM	1	0.1	0.1	U	
7440-41-7	BERYLLIUM	1	0.005	0.005	U	
7440-43-9	CADMIUM	1	0.005	0.005	U	
7440-70-2	CALCIUM	1	1	1	U	
7440-47-3	CHROMIUM	1	0.01	0.01	U	
7440-48-4	COBALT	1	0.01	0.01	U	
7440-50-8	COPPER	1	0.01	0.01	U	
7439-89-6	IRON	1	0.1	0.1	U	
7439-92-1	LEAD	1	0.003	0.003	U	
7439-95-4	MAGNESIUM	1	1	1	U	
7439-96-5	MANGANESE	1	0.01	0.01	U	
7440-02-0	NICKEL	1	0.02	0.02	U	
7440-09-7	POTASSIUM	1	1	1	U	
7782-49-2	SELENIUM	1	0.005	0.005	U	
7440-22-4	SILVER	1	0.01	0.01	U	
7440-23-5	SODIUM	1	1	1	U	
7440-28-0	THALLIUM	1	0.01	0.01	U	
7440-62-2	VANADIUM	1	0.01	0.01	U	
7440-66-6	ZINC	1	0.02	0.02	U	

Data Package ID: *IT0008165-1*

Total Recoverable MERCURY

Method SW7470

Sample Results

Lab Name: Paragon Analytics, Inc.
Client Name: Parallax, Inc.
Client Project ID: Cannon AFB - LTM
Work Order Number: 0008165
Reporting Basis: As Received

Final Volume: 20 G
Matrix: WATER
Result Units: MG/L

Client Sample ID	Lab ID	Date Collected	Date Prepared	Date Analyzed	Percent Moisture	Dilution Factor	Result	Reporting Limit	Flag	Sample Aliquot
CAFB0818MWR-R1	0008165-1	8/18/2000	8/30/2000	08/31/2000	N/A	1	0.0002	0.0002	U	20 G
CAFB0824MWR	0008165-2	8/24/2000	8/30/2000	08/31/2000	N/A	1	0.0002	0.0002	U	20 G
CAFB0824MWR-R2	0008165-4	8/24/2000	8/30/2000	08/31/2000	N/A	1	0.0002	0.0002	U	20 G

Comments:

1. ND or U = Not Detected at or above the client requested detection limit.

Data Package ID: *HG0008165-1*

Organochlorine Pesticides

Method SW8081

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0008165
Client Name: Parallax, Inc.
ClientProject ID: Cannon AFB - LTM

CAFB0824MWR
0008165-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 24-Aug-00
Date Extracted: 29-Aug-00
Date Analyzed: 06-Sep-00

Prep Batch: EX000829-4
QCBatchID: EX000829-4-1
Run ID: PT000905-1
Cleanup: NONE
Basis: As Received

Sample Aliquot: 1055 ML
Final Volume: 10 ML
Result Units: UG/L

File Name: EB002586

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
319-84-6	ALPHA-BHC	1	0.047	0.047	U	
58-89-9	GAMMA-BHC (LINDANE)	1	0.047	0.047	U	
76-44-8	HEPTACHLOR	1	0.047	0.047	U	
309-00-2	ALDRIN	1	0.047	0.047	U	
319-85-7	BETA-BHC	1	0.047	0.047	U	
319-86-8	DELTA-BHC	1	0.047	0.047	U	
1024-57-3	HEPTACHLOR EPOXIDE	1	0.047	0.047	U	
959-98-8	ENDOSULFAN I	1	0.047	0.047	U	
5103-74-2	GAMMA-CHLORDANE	1	0.047	0.047	U	
5103-71-9	ALPHA-CHLORDANE	1	0.047	0.047	U	
72-55-9	4,4'-DDE	1	0.095	0.095	U	
60-57-1	DIELDRIN	1	0.095	0.095	U	
72-20-8	ENDRIN	1	0.095	0.095	U	
72-54-8	4,4'-DDD	1	0.095	0.095	U	
33213-65-9	ENDOSULFAN II	1	0.095	0.095	U	
50-29-3	4,4'-DDT	1	0.095	0.095	U	
7421-93-4	ENDRIN ALDEHYDE	1	0.095	0.095	U	
72-43-5	METHOXYCHLOR	1	0.47	0.47	U	
1031-07-8	ENDOSULFAN SULFATE	1	0.095	0.095	U	
53494-70-5	ENDRIN KETONE	1	0.095	0.095	U	
8001-35-2	TOXAPHENE	1	4.7	4.7	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
2051-24-3	DECACHLOROBIPHENYL	0.211	*	0.474	45	48 - 143
877-09-8	TETRACHLORO-M-XYLENE	0.48		0.474	101	44 - 131

Data Package ID: *PT0008165-1*

Chlorinated Herbicides by GC/ECD

Method SW8151

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0008165
Client Name: Parallax, Inc.
ClientProject ID: Cannon AFB - LTM

CAFB0824MWR
0008165-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 24-Aug-00
Date Extracted: 29-Aug-00
Date Analyzed: 20-Sep-00

Prep Batch: EX000829-9
QCBatchID: EX000829-9-1
Run ID: PT000919-3
Cleanup: NONE
Basis: As Received

Sample Aliquot: 990 ML
Final Volume: 10 ML
Result Units: UG/L
File Name: EC000696

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
75-99-0	DALAPON	1	2	2	U	
1918-00-9	DICAMBA	1	0.1	0.1	U	
93-65-2	MCPP	1	51	51	U	
94-74-6	MCPA	1	51	51	U	
120-36-5	DICHLOROPROP	1	0.51	0.51	U	
94-75-7	2,4-D	1	0.51	0.51	U	
93-72-1	SILVEX	1	0.051	0.051	U	
93-76-5	2,4,5-T	1	0.051	0.051	U	
94-82-6	2,4-DB	1	0.51	0.51	U	
88-85-7	DINOSEB	1	0.25	0.25	U	

Surrogate Recovery

CASNO	Surrogate Analyte	Result	Flag	Spike Amount	Percent Recovery	Control Limits
	2,4-DICHLOROPHENYLACETIC ACID	1.65		2.02	82	47 - 154

Data Package ID: *PT0008165-4*

Ion Chromatography

Method EPA300.0

Sample Results

Lab Name: Paragon Analytics, Inc.
Work Order Number: 0008165
Client Name: Parallax, Inc.
ClientProject ID: Cannon AFB - LTM

CAFB0824MWR
0008165-2

Sample Matrix: WATER
% Moisture: N/A
Date Collected: 24-Aug-00
Date Extracted: 26-Aug-00
Date Analyzed: 26-Aug-00

Prep Batch: IC000826-2
QCBatchID: IC000826-2-1
Run ID: IC000826-1B
Cleanup: NONE
Basis: As Received

Sample Aliquot: 5 ML
Final Volume: 5 ML
Result Units: MG/L
File Name: aug26_039.

CASNO	Target Analyte	Dilution Factor	Result	Reporting Limit	Result Qualifier	EPA Qualifier
16887-00-6	CHLORIDE	10	97	2		
14797-55-8	NITRATE	1	5.5	0.2		
14808-79-8	SULFATE	10	130	10		

Data Package ID: *IC0008165-1*

00016

Paragon Analytics, Inc.

GC/MS Volatiles Case Narrative

Parallax, Inc.

Cannon AFB - LTM

Order Number - 0008165

1. This report consists of 2 water samples. The samples were received cool and intact by Paragon on 8/26/2000. All aqueous samples were free of head space prior to analysis.

2. These samples were prepared and analyzed according to SW-846, 3rd Edition procedures. Specifically, the samples were prepared by purging 5 mls using purge and trap procedures based on Method 5030.

3. The samples were analyzed using GC/MS with a RTX-624 capillary column according to protocols based on SW-846 Method 8260B utilizing Paragon SOP 525 Rev 4. All positive results were quantitated with the average response of the initial calibration standards using the internal standard technique. The identification of positive results was achieved by a comparison of the retention time and mass spectrum of the sample versus the daily calibration standard.

4. All initial calibration criteria for SPCC's and CCC's were met. Method 8260B states that the average response factor may be used for quantitation for all analytes if the mean of the RSD values for all analytes is less than or equal to 15%. The initial calibration had a mean RSD value of less than 15%.

5. All continuing calibration criteria were met.

6. Methylene chloride, acetone and 2-butanone are common laboratory contaminants. In order to minimize the levels of these compounds detected in the gc/ms analysis, Paragon has designated its volatile laboratory as a restricted access area. In addition, the laboratory has been equipped with a dedicated, conditioned air intake and exhaust system that operates under positive pressure in order to minimize cross contamination of these compounds. The method blank had methylene chloride detected below the

reporting limit. This compound was detected in the samples, so the data were flagged.

7. All laboratory control spike and laboratory control spike duplicate recoveries and RPDs were within the acceptance criteria.

8. A matrix spike and matrix spike duplicate were performed on an in house sample not provided by the client. The data have not been provided in this package.

9. The samples were analyzed within the established holding times.

10. All surrogate recoveries were within acceptable limits with the following exceptions:

Surrogate	Samples	Bias
4-Bromofluorobenzene	VL000901-1MB, -1LCS, -1LCSD	low

All target recoveries in the LCS and LCSD were within limits. The low 4-Bromofluorobenzene recovery in the method blank suggests that target recoveries in this retention time range are biased low. However, all surrogate recoveries in the samples were within control limits, and no target compounds were detected in the retention time range of 4-Bromofluorobenzene. No further action was taken.

11. All internal standard recoveries were within acceptance criteria.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Joe Kostelnik
Organic Chemist

September 19 2000
Date

JN
Reviewer's Initials

9-18-00
Date

Paragon Analytics, Inc.

GC/MS Semivolatiles Case Narrative

Parallax, Inc.

Cannon AFB - LTM

Order Number - 0008165

1. This report consists of one water sample. The sample was received cool and intact on August 26, 2000.

2. The sample was prepared and analyzed according to SW-846, 3rd Edition protocol utilizing Paragon Standard Operating Procedures. Specifically, it was extracted using continuous liquid-liquid extractors, according to SW-846 Method 3520 utilizing Paragon Standard Operating Procedure 617.

3. The sample was analyzed using GC/MS with a DB-5.625 capillary column according to Paragon Standard Operating Procedure 506 Revision 8 based on SW-846 Method 8270C. All positive results were quantitated against the initial calibration standards using the internal standard technique. The identification of positive results was achieved by a comparison of the retention time and mass spectrum of the sample versus the daily calibration standard.

4. All initial calibration criteria were met. Method 8270C states that if the average of the percent relative standard deviations (RSDs) is less than 15, the average response factors may be used for quantitation. We quantitated these compounds using the average responses.

5. All continuing calibration criteria were met.

6. There were no target compounds detected in the method blank.

7. All laboratory control spike and laboratory control spike duplicate recoveries and RPDs were within the acceptance criteria.

8. Matrix spikes and matrix spike duplicates were not designated for this sample delivery group. A laboratory control spike and laboratory control spike duplicate were performed instead.

9. The sample was extracted and analyzed within the established holding times.

10. All surrogate recoveries were within acceptance criteria.

11. All internal standard recoveries were within acceptance criteria.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Cheryl Jones — 9-20-2000

Cheryl Jones
Organic Chemist

Date

MMD — 09/19/00

Reviewer's Initials

Date

Paragon Analytics, Inc.

Pesticides Case Narrative

Parallax, Inc,

Cannon AFB - LTM

Order Number - 0008165

1. This report consists of 1 water sample received by Paragon on 8/26/2000.

2. This sample was extracted and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water sample was extracted using continuous liquid-liquid extractors, according to Paragon Analytics, Inc. Standard Operating Procedure 617 Revision 6 based on Method 3520C.

3. The extract was then analyzed using GC/ECD (electron capture detectors) with a RTX-CLPesticides column capillary column according to Paragon Analytics, Inc. Standard Operations Procedure 402 Revision 5 based on Method 8081A. All positive results were then confirmed on a RTX-CLPesticides II column. The quantitation of each analyte is the lower of the concentrations obtained from each column. This minimizes the chances of reporting elevated results based on interferences.

4. The breakdown for endrin and 4,4'-DDT met acceptance criteria.

5. All initial and continuing calibration criteria were within acceptance criteria.

6. The method blank associated with this project was below the reporting limits for all analytes.

7. All laboratory control spike and laboratory control spike duplicate recoveries and RPDs were within the acceptance criteria.

8. Matrix spikes and matrix spike duplicates could not be performed because of insufficient sample. A laboratory control spike and laboratory control spike duplicate were performed instead.

9. All samples were extracted and analyzed within the established holding times.

10. All surrogate recoveries were within acceptable limits with the following exceptions:

Surrogate	Sample	Direction
Decachlorobiphenyl	EX000829-4LCS, -4LCSD and -2	low

The method states that one surrogate may be outside control limits without further action.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Dan Sheneman — 9-21-00
Dan Sheneman, GC Analyst — Date

PAG — 21 Sept 2000
Reviewer's Initials — Date

Paragon Analytics, Inc.

Pesticides Case Narrative

Parallax, Inc,

Cannon AFB - LTM

Order Number - 0008165

1. This report consists of 1 water sample received by Paragon on 8/26/2000.

2. This sample was extracted and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water sample was extracted using continuous liquid-liquid extractors, according to Paragon Analytics, Inc. Standard Operating Procedure 617 Revision 6 based on Method 3520C.

3. The extract was then analyzed using GC/ECD (electron capture detectors) with a RTX-CLPesticides column capillary column according to Paragon Analytics, Inc. Standard Operations Procedure 402 Revision 5 based on Method 8081A. All positive results were then confirmed on a RTX-CLPesticides II column. The quantitation of each analyte is the lower of the concentrations obtained from each column. This minimizes the chances of reporting elevated results based on interferences.

4. The breakdown for endrin and 4,4'-DDT met acceptance criteria.

5. All initial and continuing calibration criteria were within acceptance criteria.

6. The method blank associated with this project was below the reporting limits for all analytes.

7. All laboratory control spike and laboratory control spike duplicate recoveries and RPDs were within the acceptance criteria.

8. Matrix spikes and matrix spike duplicates could not be performed because of insufficient sample. A laboratory control spike and laboratory control spike duplicate were performed instead.

9. All samples were extracted and analyzed within the established holding times.

10. All surrogate recoveries were within acceptable limits with the following exceptions:

Surrogate	Sample	Direction
Decachlorobiphenyl	EX000829-4LCS, -4LCSD and -2	low

The method states that one surrogate may be outside control limits without further action.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Dan Sheneman — 9-28-00
Dan Sheneman — Date
GC Analyst

PAG — 21 Sept 2000
Reviewer's Initials — Date

Paragon Analytics, Inc.

PCBs Case Narrative

Parallax, Inc.

Cannon AFB - LTM

Order Number - 0008165

1. This report consists of 1 water sample received by Paragon on 8/26/2000.

2. This sample was extracted and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water sample was extracted using continuous liquid-liquid extractors, according to Paragon Analytics, Inc. Standard Operating Procedure 617 Revision 6 based on Method 3520C. The extract was then processed using sulfuric acid cleanup according to Paragon Analytics Standard Operating Procedure 651 Revision 4 based on Method 3665 in an attempt to remove potential interferences.

3. The extract was then analyzed using GC/ECD (electron capture detectors) with a RTX-CLPesticides capillary column according to Paragon Analytics Standard Operating Protocol 409 Revision 0 based on SW-846 Method 8082. All positive results were then confirmed on a RTX-CLPesticidesII column. The quantitation of each analyte is the lower of the concentrations obtained from each column. This minimizes the chances of reporting elevated results based on interferences.

4. All initial and continuing calibration criteria were within acceptance criteria.

5. The method blank associated with this project was below the reporting limits for all analytes.

6. All laboratory control spike and laboratory control spike duplicate recoveries and RPDs were within the acceptance criteria.

7. Matrix spikes and matrix spike duplicates could not be performed because of insufficient sample. A laboratory control spike and laboratory control spike duplicate were performed instead.

8. All samples were extracted and analyzed within the established holding times.

9. All surrogate recoveries were within acceptable limits with the following exceptions:

Surrogate	Sample	Direction
decachlorobiphenyl	EX000829-5MB and -2	low

The method states that one surrogate may be outside control limits without further action.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Dan Sheneman — 9-25-00
Dan Sheneman, GC Analyst — Date

PAG — 25 September
Reviewer's Initials — Date

Paragon Analytics, Inc.

TOTAL RECOVERABLE METALS
CASE NARRATIVE

Parallax, Inc.

Cannon AFB - LTM

Order Number - 0008165

TABLE OF CONTENTS:

Section 1: Case Narrative

1.1 This report consists of 3 water samples.

1.2 The samples were received cool and intact on 08/19/00 and 8/26/00.

1.3 PAI sample IDs 0008165-2 and -4 had been preserved for the requested analyses. PAI sample ID 0008165-1 had not been preserved for the requested analyses. PAI sample ID 0008165-1 was preserved with nitric acid to a pH less than two prior to analysis.

1.4 The samples were prepared for analysis based on SW-846, 3rd Edition procedures.

For analysis by Trace ICP, the samples were digested following method 3005A and PAI SOP 806 Rev. 5.

For analysis by Cold Vapor AA (CVAA), the samples were digested following method 7470A and PAI SOP 812 Rev. 6.

1.5 The samples were analyzed following SW-846 3rd Edition procedures.

Analysis by Trace ICP followed method 6010B and PAI SOP 807 Rev. 4.

The relationship between intensity and concentration for each element is established using at least four standards, one of which is a blank solution. The equation which relates intensity to concentration is:

$$I = A_0 + (A_1 * c^n) + (A_2 * c^{2n})$$

where: I = intensity
c = concentration
A_0 = offset coefficient
A_1 = gain coefficient
A_2 = curvature coefficient
n = exponent coefficient

During sample analysis concentrations are computed by the software and the results are printed in mg/L. The instrument software does not provide a printout which gives both intensity and concentration. The validity of the calibration equation is tested by analyzing the following solutions: a blank, a low level check solution with concentrations near the reporting limit, an Initial Calibration Verification (ICV) standard from a 2nd source standard solution with concentrations near the middle of the analytical range, a Continuing Calibration Verification (CCV) standard with concentrations at two times those in the ICV, and a readback of the highest calibration standard.

These solutions provide verification that the calibration equations are functioning properly throughout the analytical range of the instrument. During sample analysis dilutions are made for analytes found at concentrations above the highest calibration standard. No results are taken from extrapolations beyond the highest standard.

Analysis by CVAA followed method 7470A and PAI SOP 812 Rev. 6.

The relationship between intensity and concentration is determined daily, prior to sample analysis. At least five standards and a blank solution are analyzed to establish the calibration curve. The instrument software performs a linear regression to fit the calibration data to a curve of the form:

$$conc. = B * I + C$$

where: conc. = concentration
B = slope coefficient
I = intensity
C = intercept coefficient

A printout summarizing the calibration data supplies the calibration curve and correlation coefficient. During sample analysis both intensity and concentration values are printed. Dilutions are made for concentrations above the highest calibration standard. No results are taken from extrapolations above the highest standard.

1.6 All standards and solutions are NIST traceable and were used within their recommended shelf life.

1.7 The samples were prepared and analyzed within the established hold times.

All in house quality control procedures were followed, as described below.

1.8 General quality control procedures.

- A preparation (method) blank and laboratory control sample were digested and analyzed with the samples in each digestion batch. There were not more than 20 samples in each digestion batch.
- The preparation (method) blank results associated with each batch were below the practical quantitation limits for the requested analytes.
- The laboratory control sample associated with each batch was within the acceptance limits. This indicates complete digestion according to the method.
- All initial and continuing calibration blanks associated with each batch were below the practical quantitation limits for the requested analytes.
- All initial and continuing calibration verifications associated with each batch were within the acceptance criteria for the requested analytes. This indicates a valid calibration and stable instrument conditions.
- The interference check samples, and high standard readbacks associated with Method 6010B analyses were within acceptance criteria.

1.9 Matrix specific quality control procedures.

PAI sample ID 0008214-21 was designated as the quality control sample for the ICP analyses. PAI sample ID 0008220-12 was designated as the quality control sample for the mercury analysis.

- A matrix spike and matrix spike duplicate were digested and analyzed with each batch. All acceptance criteria for accuracy were met.
- A sample duplicate and spike duplicate were digested and analyzed with each batch. All acceptance criteria for precision were met.
- A serial dilution was analyzed with the ICP batch. All acceptance criteria were met.

1.10 Sample dilutions were not required for the requested analyses.

The data contained in the following report have been reviewed and approved by the personnel listed below:

Ross E. Miller — 9/21/00
Ross E. Miller
Senior Inorganic Chemist
Date

SW — 9/21/00
Reviewer's Initials
Date

CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Paragon Analytics, Inc.

OP Pesticides Case Narrative

Parallax, Inc.

Cannon AFB - LTM

Order Number - 0008165

1. This report consists of data for 1 water sample received by Paragon on 08/26/2000.

2. This sample was extracted and analyzed according to SW-846, 3rd Edition procedures. Specifically, the water sample was extracted using a continuous liquid-liquid extractor, according to Paragon Analytics, Inc. Standard Operating Procedure 617 Revision 6 based on Method 3520B.

3. The extract was analyzed using GC/FPD with a RTx-1 capillary column according to Paragon Analytics, Inc. Standard Operating Procedure 407 Revision 4 based on SW-846 Method 8141A. All positive results were then confirmed on a RTx-OPPesticides column. For each analyte the concentration reported represents the lower of the quantitations obtained from each column. This minimizes the possibility of reporting results that are elevated because of interference.

4. All inital and continuing calibration criteria were met with the following exceptions:

   Initial calibration verification ICV-9/01 : Dichlorvos quantitated high on column-1. Naled quantitated high on column-2. Total Merphos and Fensulfothion quantitated low on column-2.

   The water solubility of Dichlorvos is 10g/L at 20 degrees C, and recovery is poor from aqueous solution. Naled can be converted to Dichlorvos on column by debromination. This reaction may also occur during sample preparation. The extent of debromination will depend on the nature of the matrix being analyzed. Therefore, Dichlorvos may be detected in samples which contain Naled.

   Demeton is a mixture of two compounds; Demeton-O and Demeton-S. Two peaks are observed in all the chromatograms corresponding to these two isomers. Quantitation is based on the sum of both peaks.

Merphos is a single-component pesticide that is readily oxidized to merphos oxone. Chromatographic analysis of merphos usually results in two peaks. Since the extent of merphos oxidation in the calibration standards is not likely to be the same as that in the samples (if merphos is found), quantitation based on the sum of both peaks is appropriate.

None of the target compounds that exceeded calibration in the ICV were detected in the sample. All reporting limits can be supported.

5. The method blank associated with this project was below the reporting limits for all analytes.

6. All laboratory control spike and laboratory control spike duplicate recoveries and RPDs were within the acceptance criteria. However, Demeton and Disulfoton can exhibit poor recoveries by this method.

7. Matrix spikes and matrix spike duplicates could not be performed because of insufficient sample. A laboratory control spike and laboratory control spike duplicate were performed instead.

8. All samples were analyzed within the established holding times.

9. All surrogate recoveries were within acceptable limits.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Robert Jump
Chemist

9/26/00
Date

Reviewer's Initials

26 Sept 2000
Date

Paragon Analytics, Inc.

Herbicides Case Narrative

Parallax, Inc.

Cannon AFB - LTM

Order Number - 0008165

1. This report consists of 1 water sample received by Paragon on 8/26/2000.

2. This sample was extracted according to SW-846, 3rd Edition procedures. Specifically, the water sample was extracted based on Method 8151A protocols using a separatory funnel. The sample was also processed through washing procedures to reduce interferences using the protocols listed in the method. The extract was then derivitized using the diazomethane procedure contained in the method.

3. The extract was then analyzed using GC/ECD (electron capture detectors) with a RTX-CLPesticides capillary column according to Paragon Analytics, Inc. Standard Operating Procedure 434 Revision 3 based on SW-846 Method 8151A. All positive results were then confirmed on a RTX-CLPesticides II column. The quantitation of each analyte is the lower of the concentrations obtained from each column. This minimizes the chances of reporting elevated results based on interferences.

4. All initial and continuing calibration criteria were within acceptance criteria.

5. The method blank associated with this project was below the reporting limits for all analytes.

6. All laboratory control spike and laboratory control spike duplicate recoveries and RPDs were within the acceptance criteria.

7. Matrix spikes and matrix spike duplicates could not be performed because of insufficient sample. A laboratory control spike and laboratory control spike duplicate were performed instead.

8. All samples were analyzed within the established holding times.

4.

9. All surrogate recoveries were within acceptance criteria.

The data contained in the following report have been reviewed and approved by the personnel listed below. In addition, Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

Dan Sheneman — 92500
Dan Sheneman — Date
GC Analyst

PHC — 25 Sept 2000
Reviewer's Initials — Date

Paragon Analytics, Inc.

INORGANICS CASE NARRATIVE

Parallax, Inc.

Cannon AFB - LTM

Order Number - 0008165

TABLE OF CONTENTS:

Case Narrative

1. This report consists of data for one water sample.
2. The sample was received cool and intact on 08/26/00.
3. The sample had been correctly preserved for the requested analyses.
4. The sample was prepared for analysis based on Methods for the Chemical Analysis of Waters and Wastes (MCAWW), May 1994 procedures.
5. The sample was analyzed following MCAWW procedures for the following methods:

Analyte	Method	SOP #
Chloride	300.0	1113 Rev 0
Nitrate as N	300.0	1113 Rev 0
Sulfate	300.0	1113 Rev 0

6. All standards and solutions were used within their recommended shelf life.

The data contained in the following report have been reviewed and approved by the personnel listed below:

Tony Briney — 9-16-00

Tony Briney
Inorganic Chemist — Date

Reviewer's Initials — 9-16-00

Date

CERTIFICATION

Paragon Analytics, Inc. certifies that the analyses reported herein are true, complete and correct within the limits of the methods employed.

APPENDIX D

DATA QUALITY ASSESSMENT SUMMARY

DATA QUALITY ASSESSMENT SUMMARY

1.0 INTRODUCTION

A groundwater sample and two rinsate samples were collected during the August 2000 sampling event at Cannon Air Force Base. The samples were collected downgradient of Landfill 25 from Monitoring Well R (MW-R) as part of the long-term monitoring program (LTMP).
Paragon Analytics, Inc. located in Fort Collins, Colorado performed laboratory analysis of the groundwater samples. Samples were analyzed by the following methods:

- VOCs, SW-846 Method 8260B
- SVOCs, SW-846 Method 8270C
- Polychlorinated Biphenyls (PCBs), SW-846 Method 8082
- Herbicides, SW-846 Method 8151A
- TAL Metals, SW-846 Method 6010B
- Mercury, SW-846 Method 7470A
- Pesticides Organophosphorus, SW-846 Method 8141A
- Pesticides Organochlorine, SW-846 Method 8081A
- Common Anions (chlorides, nitrates, sulfates), EPA Method 300.0

A data review and validation was performed by applying the quality control (QC) limits as defined in the quality assurance project plan (QAPP). The data validation consisted of a review of holding times, method blanks, field blanks, field duplicates, surrogate spikes, matrix spike/matrix spike duplicates (MS/MSDs), laboratory control samples (LCSs), and a case narrative review including sample receipt forms and custody. The validation guidelines are based upon the National Functional Guidelines for Organic Data Review (EPA, 1994a) and the National Functional Guidelines for Inorganic Data Review (EPA, 1994b).

1.1 QUALITY ASSESSMENT SUMMARY

The data quality assessment review found that accuracy and precision are in control and are considered acceptable. Samples were collected and analyzed as specified in the QAPP and the sampling and analysis plan (SAP). Sampling procedures and laboratory analytical methods are comparable with previous investigations.

SW8260, VOLATILE ORGANIC COMPOUNDS (VOCs)

Acetone was detected in the trip blank below the reporting limit and flagged as estimated (J). Acetone was also detected in all associated field samples at similar concentrations. Acetone results for these samples have been qualified as not detected. Methylene

chloride was detected in the method blank below the reporting limit. This compound was detected in the associated samples, so the data were flagged (B). These data are fully usable for project purposes.

SW8270C, SEMI-VOLATILE ORGANIC COMPOUNDS (SVOCs)

None of the SVOC results are qualified. These data are fully usable for project purposes.

SW8081, ORGANOCHLORINE PESTICIDES

None of the organochlorine pesticide sample results are qualified. These data are fully usable for project purposes.

SW8082, POLYCHLORINATED BIPHENYLS (PCBs)

None of the PCB sample results are qualified. These data are fully usable for project purposes.

SW6010, METALS

None of the metals sample results are qualified. These data are fully usable for project purposes.

SW7470A, MERCURY

None of the mercury sample results are qualified. These data are fully usable for project purposes.

SW8140, ORGANPHOSPHORUS PESTICIDES

None of the organophosphorus pesticide sample results are qualified. These data are fully usable for project purposes.

SW8150, HERBICIDES

None of the herbicide results are qualified. These data are fully usable for project purposes.

E300.0, COMMON ANIONS

The holding time for nitrate was exceeded for samples MW-R. The sample was received with less than five hours of holding time remaining for this analysis. Per request, the sample was analyzed out of holding time for nitrate. These data are considered fully usable for project purposes.