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RESPONSIVE TO THE NEEDS OF ENVIRONMENTAL MANAGEMENT

MONTHLY COMPLIANCE MONITORING AND ANALYSIS
NAVAL AIR STATION
JACKSONVILLE, FLORIDA

DOMESTIC SLUDGE DRYING BEDS AND
POLISHING POND
3RD MONTHLY SAMPLING, OCT 89
REPORT DATE, DECEMBER 1989

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MONTHLY COMPLIANCE MONITORING AND ANALYSIS
NAVAL AIR STATION
JACKSONVILLE, FLORIDA

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1.0 INTRODUCTION

IT Corporation (IT) has conducted the third of four monthly sampling events at the Naval Air Station, Jacksonville, Florida (NAS-JAX). Specifically, monitoring wells at the Domestic Sludge Drying Beds (DSDBs) and Polishing Pond (PP) were sampled in accordance with Amendment 4 of Navy Contract N62467-88-C-0181. Presented in this report is a description of the sampling event conducted in October 1989 and a summary of the data obtained from the compliance monitoring event.

2.0 GROUNDWATER SAMPLE COLLECTION

On October 30 and 31, 1989, ground water samples were collected from eleven monitoring wells at the DSDBs and PP at NAS-JAX. Six quality assurance samples (1-sample duplicate, 1-field blank, 2-trip blanks, and 1-equipment rinsate) were collected as part of this sampling event. Sample collection was performed in accordance with IT's site specific Quality Assurance Project Plan (QAPP) for NAS-JAX. All samples were analyzed for the list of parameters established in a draft NAS-JAX Closure Permit of the DSDBs and PP. Analytical methods used were performed in accordance with EPA manual SW-846 Test Methods for Evaluating Solid Waste. Water level measurements were obtained from all wells including those from the Installation Restoration (IR) Project. Table 1 contains the water level measurements from these wells. Based on these water level measurements, ground water flow is in general from south to north; from the area of the wastewater treatment plant towards the polishing ponds and the St. John's River.

IT's scope of work requires the field filtering of groundwater samples to determine dissolved metal concentrations. IT attempted to field filter all samples but because of difficulty encountered by excessive turbidity of samples, none of them were successfully filtered in the field. All samples for dissolved metal analysis were submitted to the laboratory unfiltered, unpreserved, and upon arrival, the samples were filtered and preserved.

3.0 SUMMARY OF WATER QUALITY DATA

All groundwater and quality assurance samples were analyzed by IT Analytical Services (ITAS). The Mixed Waste Lab at Oak Ridge, Tennessee performed the analysis of Total Organic Carbon (TOC), Total Organic Halide (TOX) and all radiological parameters. The ITAS Middlebrook Laboratory in Knoxville, Tennessee analyzed all other parameters. The following field records were kept and are included in the following appendices:

- Field Activity Daily Logs (Appendix A)
- Sample Collection Logs (Appendix B)
- Field Equipment Calibration Records (Appendix C)
- Chain of Custody/Request for Analysis Records (Appendix D)

The analytical results are summarized in Tables 2 and 3 and the Certificates of Analysis are in Appendix E.

The Ground Water Protection Standards (GWPS) are established in accordance with 40 CFR 264.94 for constituents detected in the ground water sampled from the monitoring wells. Analytical results for Monitoring well NAS 4-9 presented in the Jun89, Jul89, and Aug89 Quarterly Compliance Monitoring of the Industrial Sludge Drying Beds (ISDB) were used to establish the GWPS background concentrations for the parameters of F006, FAC 17-4.246, 17-28.700. Due to the use of a more extensive parameter list for monthly monitoring than was used for compliance monitoring, some parameters analyzed as part of the monthly sampling do not have background concentrations established. These parameters are indicated "NZ" in Tables 2 and 3. Background ground water quality levels for the drinking water supply parameters and zinc are set by the permit. Specific Condition 54 of the ISDB's operating permit (H016-119108) set the GWPS as the mean of the four most recent sampling events of Monitoring Well NAS 4-9.

To determine if the GWPS has been exceeded, the concentration of each GWPS constituent detected in the ground water downgradient monitoring wells was compared to that constituent's background ground water quality level. All GWPS constituents analyzed during the last four quarters in samples from Monitoring Well 4-9 with the exception of barium, cadmium, chromium, lead, vanadium, and zinc have been below analytical method detection limits. Therefore, for comparative purposes, all parameters detected in the downgradient monitoring wells at concentrations greater than their analytical method detection limits have exceeded the GWPS.

Inorganics in monitoring wells at both the DSDBs and PP (cadmium, chromium, nickel, barium, lead, mercury, arsenic, zinc, vanadium, selenium and silver) were detected above GWPS in varying concentrations. Phenols, methylene chloride and the pesticide 2-4,D was detected above GWPS at the DSDBs and no organics were detected above GWPS at the PP.

IT obtains its water purified for decontamination purposes from retail stores. This purified water, as its sold to the public, is expected to meet the standards set forth for public consumption. However, chloroform, barium, cadmium, chromium, iron, lead, manganese, nickel, sodium, zinc, nitrate and chlorides were detected in the field blank and the equipment rinse sample. Chloroform is typically formed as a by-product of chlorination in drinking water treatment and may not have been completely removed in the water purification process. However, this water still meets EPA's definition of an organic free water because chloroform was detected at 11 ug/l by GC/MS; the EPA allows organic free water to contain up to 50 ug/l of purgeable organics. Therefore, the presence of chloroform in the equipment rinsate and the field blank does not indicate a problem with the decontamination of equipment or quality control.

The presence of inorganics in the purified water indicates that the deionization process used to purify the water may need to be regenerated. These analytes are at their analytical detection limits, and their presence at these low concentrations indicates that the ion exchange process had just broken through resulting in water with detectable concentration of inorganics. The presence

of inorganics at the analytical detection limits in both the field blank and the equipment rinse indicate that equipment decontamination was properly performed because compounds found were present both before and after contact with the sampling equipment. The presence of these constituents in these samples does not indicate a quality control problem.

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Table 1
Ground Water Elevations
DSDBs Monitoring Wells
PP Monitoring Wells
NAS, Jacksonville, Florida
Project No. 453058

<u>Well No.</u>	<u>Top of Casing Elevation (ft) MSL¹</u>	<u>G.W. Levels Measured From TOC²</u>	<u>G.W. Elevations (ft) MSL</u>
Domestic Sludge Drying Beds			
41-1	19.52	5.28	14.24
41-2	19.56	5.09	14.47
41-3	20.09	5.03	15.06
41-4	20.64	5.65	14.99
41-5	19.81	4.84	14.97
41-6	20.25	4.95	15.30
Polishing Pond			
42-5	18.57	7.47	11.10
42-6	18.18	9.82	8.36
42-7	18.19	7.22	10.97
42-8	18.06	9.87	8.19
42-9	11.93	4.70	7.23
Installation Restoration (IR)			
42-4 (IR Well)	15.24	4.20	11.04
4-6 (IR Well)	19.27	8.05	11.22
4-8 (IR Well)	15.18	4.20	8.59

¹ Mean Sea Level

² TOC-Top of Casing

Table 2
Summary
Ground Water Sampling Analytical Results
Domestic Sludge Drying Beds
Naval Air Station
Jacksonville, Florida
Project No. 453058

Parameters	Analytical Method Detection Limits	Background 4-9 ¹	MONITORING WELLS								RINSATE	TRIP BLANK	FIELD BLANK
			41-1	41-2	DUP OF 41-2	41-3	41-4	41-5	41-6				
<u>Indicator Parameters (40 CFR 264.98(a))</u>													
pH (Field)	NA	6.25	5.25	6.10	6.10	6.00	9.40	6.00	7.20	NZ	NZ	NZ	
Specific Conductance (Field) (umho/cm)	NA	270	430	1750	1750	1050	2900	800	1150	NZ	NZ	NZ	
Total Organic Carbon (mg/l)	1	16	33.5	21.0	21.9	170	720	256	1480	5.9	NZ	2.90	
Total Organic Halogen (mg/l)	.01	0.053	0.036	0.020	0.025	0.105	0.136	0.170	0.172	<0.010	NZ	<0.010	
<u>F006 Parameters (40 CFR 261 Appendix VII)</u>													
Cadmium (mg/l)	.005	0.012	0.058	0.088	0.098	0.032	0.11	0.041	0.37	<0.005	NZ	0.037	
Cadmium, Dissolved (mg/l)	.005	<0.005	0.027	0.022	<0.005	0.030	0.035	0.19	0.058	<0.005	NZ	0.009	
Chromium, Hexavalent (mg/l)	.02 ³	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05 ²	<0.02	<0.05 ²	<0.02	NZ	<0.02	
Chromium, Hexavalent Dissolved (mg/l)	.02 ³	<0.02	<0.02	<0.02	<0.02	<0.02	<0.05 ²	<0.02	<0.10 ²	<0.02	NZ	<0.02	
Cyanide, Complexed (mg/l)	.01 ³	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NZ	<0.01	
Nickel (mg/l)	.02	<0.02	<0.02	<0.02	<0.02	0.03	0.18	<0.02	0.09	<0.02	NZ	0.02	
Nickel, Dissolved (mg/l)	.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.15	0.04	0.06	<0.02	NZ	<0.02	
Carbon Disulfide (ug/l)	5	NA	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Tetrachloroethene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	

¹ Background is mean of last four sampling events of Well 4-9.

² Elevated detection limits due to matrix influences.

³ Variances in detection limits are due to dilution factors.

⁴ Analyte was found in deionized water, but not in any samples.

⁵ Detection limit adjusted upward due to newer test information.

NA - Not Applicable

NZ - Not Analyzed

Table 2 (continued)
 Summary
 Ground Water Sampling Analytical Results
 Domestic Sludge Drying Beds
 Naval Air Station
 Jacksonville, Florida
 Project No. 453058

Parameters	Analytical Method Detection Limits	Background 4-9 ¹	MONITORING WELLS									
			41-1	41-2	DUP OF 41-2	41-3	41-4	41-5	41-6	RINSATE	TRIP BLANK	FIELD BLANK
<u>F006 Parameters (40 CFR 261 Appendix VII)</u>												
Trichloroethene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,1,2-Trichloroethane (ug/l)	5	NA	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,2-dichlorobenzene (ug/l)	5	NA	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Toluene (ug/l)	5	NA	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Pyridine (ug/l)	5,000	NA	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000
Benzene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Methylene Chloride (ug/l)	5	<5	<5	<5	<5	<5	18	<5	<5	<5	<5	<5
1,1,1-Trichloroethane (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Chlorobenzene (ug/l)	5	NA	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,2,2-trifluoroethane (ug/l)	200	NA	<200	<200	<200	<200	<200	<200	<200	<200	<200	<200
Trichlorofluoromethane (ug/l)	5	NA	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
2-butanone (ug/l)	10	NA	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Isobutanol (ug/l)	5,000	NA	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000
2-Ethoxyethanol (mg/l)	2,000 ⁵	NA	<2,000 ⁵									
2-Nitropropane (ug/l)	5	NA	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5

¹ Background is mean of last four sampling events of Well 4-9.
² Elevated detection limits due to matrix influences.
³ Variances in detection limits are due to dilution factors.
⁴ Analyte was found in deionized water, but not in any samples.
⁵ Detection limit adjusted upward due to newer test information.
 NA - Not Applicable
 NZ - Not Analyzed

Table 2 (continued)
 Summary
 Ground Water Sampling Analytical Results
 Domestic Sludge Drying Beds
 Naval Air Station
 Jacksonville, Florida
 Project No. 453058

Parameters	Analytical Method Detection Limits	Background 4-9 ¹	MONITORING WELLS								RINSATE	TRIP BLANK	FIELD BLANK
			41-1	41-2	DUP OF 41-2	41-3	41-4	41-5	41-6				
<u>Drinking Water Supply Parameters (40 CFR 264.94)</u>													
Arsenic (mg/l)	0.002	<0.03	0.009	0.016	<0.007 ²	0.004	0.052	<0.016 ²	<0.032 ²	<0.004 ²	NZ	<0.002	
Arsenic, Dissolved (mg/l)	0.002	<0.03	0.009	0.006	0.002	<0.008 ²	0.047	<0.020 ²	<0.021 ²	<0.002	NZ	<0.002	
Barium (mg/l)	0.002	0.088	0.30	0.093	0.072	0.24	0.26	0.24	0.72	<0.002	NZ	<0.002	
Barium, Dissolved (mg/l)	0.002	0.050	0.18	0.060	0.036	0.16	0.10	0.11	0.44	0.009	NZ	<0.002	
Chromium, (mg/l)	0.01	0.02	0.04	0.05	0.03	0.03	0.12	0.05	1.1	<0.01	NZ	0.02	
Chromium, Dissolved (mg/l)	0.01	0.02	0.02	0.01	<0.01	0.01	0.06	0.02	0.83	<0.01	NZ	<0.01	
Lead (mg/l)	0.002	0.04	0.036	0.015	0.016	<0.03 ³	0.07	<0.03 ³	0.20	<0.003 ²	NZ	0.002	
Lead, Dissolved (mg/l)	0.002	<0.03	<0.013 ²	0.005	<0.024 ²	<0.03 ³	0.04	0.16	0.09	<0.002	NZ	0.002	
Mercury (mg/l)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.003	<0.001	NZ	<0.001	
Mercury, Dissolved (mg/l)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	0.001	<0.001	NZ	<0.001	
Selenium (mg/l)	0.002	<0.06	<0.012 ²	<0.005 ²	<0.004 ²	<0.012 ²	<0.016 ²	<0.005 ²	0.018 ²	<0.004 ²	NZ	<0.003 ²	
Selenium, Dissolved (mg/l)	0.002	<0.06	<0.004 ²	<0.003 ³	<0.002	<0.005 ²	0.004	0.003	<0.012 ²	<0.003 ²	NZ	<0.003 ²	
Silver (mg/l)	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.028	<0.005	NZ	<0.005	
Silver, Dissolved (mg/l)	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.006	0.057	0.057	<0.005	NZ	<0.005	

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 Naval Air Station
 Jacksonville, Florida
 Project No. 453058

Parameters	Analytical Method Detection Limits	Background 4-9 ¹	MONITORING WELLS									
			41-1	41-2	DUP OF 41-2	41-3	41-4	41-5	41-6	RINSATE	TRIP BLANK	FIELD BLANK
<u>FAC Ch. 17-22.210 and Primary Drinking Water Standards</u>												
<u>FAC Ch. 17-28.700 and 17-4.246 Parameters</u>												
Carbon Tetrachloride (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Turbidity (ntu)	NA	NA	450	310	360	1400	270	400	500	0.11	NZ	0.22
1,2-dibromoethane (ug/l)	5	NA	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Sodium (mg/l)	0.2	NA	30.9	16.6	17.2	118	805	191	334	1.9	NZ	<0.2
Sodium, Dissolved (mg/l)	0.2	NA	33.7	16.3	16.2	116	807	191	320	0.4	NZ	<0.2
Total Coliform (colonies/100 ml)	1	NA	<200 ²	<200 ²	<200 ²	<200 ²	4,200	24,000	<200 ²	<1	NZ	<1
Chloroform (ug/l) ⁴	5	NA	<5	<5	<5	<5	<5	<5	<5	7	<5	11
Vinyl Chloride (ug/l)	10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Nitrate (as N) (mg/l)	0.05	NA	0.08	0.07	0.06	0.08	0.07	0.08	0.08	0.05	NZ	0.07
Radium 226	NA	NA	1.2	2.3	1.8	11.4	2.7	1.8	11.5	<1.0	NZ	<1.0
Radium 228	NA	NA	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	<3.0	NZ	<3.0
Gross Alpha/Gross Beta (pCi/l) (Total)	NA	NA	22/13	16/15	30/21	282/210	77/63	36/30	490/220	<1/<4	NZ	<1/<4

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Table 2 (continued)
 Summary
 Ground Water Sampling Analytical Results
 Domestic Sludge Drying Beds
 Naval Air Station
 Jacksonville, Florida
 Project No. 453058

Parameters	Analytical Method Detection Limits	Background 4-9 ¹	MONITORING WELLS									
			41-1	41-2	DUP OF 41-2	41-3	41-4	41-5	41-6	RINSATE	TRIP BLANK	FIELD BLANK
<u>FAC 17.55.320 Secondary Drinking Water Standards</u>												
Chloride (mg/l)	1	NA	48	23	24	72	160	120	120	1.2	NZ	1.5
Copper (mg/l)	0.01	NA	0.09	0.08	0.05	0.04	0.07	0.01	0.36	<0.01	NZ	0.09
Copper, Dissolved (mg/l)	0.01	NA	0.03	0.01	<0.01	0.01	0.05	0.13	0.17	<0.01	NZ	<0.01
Zinc (mg/l)	0.005	0.025	1.4	2.1	3.2	0.98	3.5	1.7	11.1	0.011	NZ	1.3
Zinc, Dissolved (mg/l)	0.005	0.051	0.74	0.80	0.70	1.1	1.4	0.33	1.7	0.023	NZ	0.96
Iron (mg/l)	0.01	NA	25.9	21.9	17.1	11.7	16.0	25.9	25.9	0.04	NZ	0.31
Iron, Dissolved (mg/l)	0.01	NA	19.5	9.2	0.62	6.7	3.2	7.8	7.6	0.08	NZ	0.76
Fluoride (mg/l)	0.1	NA	<0.1	<0.1	<0.1	0.11	1.7	0.10	<0.1	<0.1	NZ	<0.1
Manganese (mg/l)	0.002	NA	0.12	0.11	0.11	0.52	0.039	0.11	0.31	<0.002	NZ	0.006
Manganese, Dissolved (mg/l)	0.002	NA	0.11	0.081	0.057	0.48	0.021	0.078	0.22	<0.002	NZ	0.008
Sulfate (mg/l)	10 ³	NA	110	<10	<10	340	<25 ²	120	<50 ³	<10	NZ	<10

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 Summary
 Ground Water Sampling Analytical Results
 Domestic Sludge Drying Beds
 Naval Air Station
 Jacksonville, Florida
 Project No. 453058

Parameters	Analytical Method Detection Limits	Background 4-9 ¹	MONITORING WELLS										
			41-1	41-2	DUP OF 41-2	41-3	41-4	41-5	41-6	RINSATE	TRIP BLANK	FIELD BLANK	
<u>Previously Detected Appendix IX Parameters</u>													
Phenols (ug/l)	10 ³	<10	<10	<10	<10	<10	<10	94	<10	<10	<10	NZ	<10
1,1-dichloroethane (ug/l)	5	NA	7	<5	<5	33	<5	8	<5	<5	<5	<5	<5
Vanadium, (mg/l)	0.01	0.07	0.05	0.06	0.04	0.04	0.39	0.07	0.21	<0.01	NZ	<0.01	<0.01
Vanadium, Dissolved (mg/l)	0.01	0.05	0.02	0.02	<0.01	0.02	0.32	0.03	0.08	<0.01	NZ	<0.01	<0.01
Total Xylenes (ug/l)	5	NA	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
1,2-dichloroethane (ug/l)	5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5

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 Summary
 Ground Water Sampling Analytical Results
 Domestic Sludge Drying Beds
 Naval Air Station
 Jacksonville, Florida
 Project No. 453058

Parameters	Analytical Method Detection Limits	Background 4-9 ¹	MONITORING WELLS								TRIP BLANK	FIELD BLANK	
			41-1	41-2	DUP OF 41-2	41-3	41-4	41-5	41-6	RINSATE			
<u>PESTICIDES (40 CFR 264.94)</u>													
Lindane (mg/l)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	NZ	<0.0001
Endrin (mg/l)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	NZ	<0.0001
Methoxychlor (mg/l)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	NZ	<0.0001
Toxaphene (mg/l)	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	NZ	<0.0004
2-4,D (mg/l)	0.0002	<0.0002	0.0005	0.0002	<0.0002	0.0008	<0.0002	<0.0002	<0.0006 ³	<0.0002	<0.0002	NZ	<0.0002
Silvex (2,4,5-TP) (mg/l)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	NZ	<0.0001

¹ Background is mean of last four sampling events of Well 4-9.
² Elevated detection limits due to matrix influences.
³ Variances in detection limits are due to dilution factors.
⁴ Analyte was found in deionized water, but not in any samples.
⁵ Detection limit adjusted upward due to newer test information.
 NA - Not Applicable
 NZ - Not Analyzed

Table 3
Summary
Ground Water Sampling Analytical Results
Polishing Pond
Naval Air Station
Jacksonville, Florida
Project No. 453058

Parameters	Analytical Method Detection Limits	Background 4-9 ¹	MONITORING WELLS					TRIP BLANK
			42-5	42-6	42-7	42-8	42-9	
<u>Indicator Parameters (40 CFR 264.98(a))</u>								
pH (Field)	NA	6.25	6.00	5.40	6.25	5.55	5.55	NZ
Specific Conductance (Field) (umho/cm)	NA	270	1600	84	18	1800	79	NZ
Total Organic Carbon (mg/l)	1	16	40.3	72.2	235	139	12.6	NZ
Total Organic Halogen (mg/l)	.01	0.053	0.052	0.019	0.028	0.057	0.025	NZ
<u>F006 Parameters (40 CFR 261 Appendix VII)</u>								
Cadmium (mg/l)	.005	0.012	<0.060	<0.005	<0.005	<0.005	0.005	NZ
Cadmium, Dissolved (mg/l)	.005	<0.005	<0.010	<0.005	<0.005	0.005	<0.005	NZ
Chromium, Hexavalent (mg/l)	.02	<0.02	<0.02	<.02	<0.02	<0.02	<0.02	NZ
Chromium, Hexavalent Dissolved (mg/l)	.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	NZ
Cyanide, Complexed (mg/l)	.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	NZ
Nickel (mg/l)	.02	<0.02	0.03	<0.02	<0.02	0.04	<0.02	NZ
Nickel, Dissolved (mg/l)	.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	NZ
Carbon Disulfide (ug/l)	5	NA	<5	<5	<5	<5	<5	<5
Tetrachloroethene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5

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⁴ Analyte was found in blank but not in any sample.
⁵ Detection limit adjusted upward due to newer test information.
 NA - Not Applicable
 NZ - Not Analyzed

Table 3 (continued)
Summary
Ground Water Sampling Analytical Results
Polishing Pond
Naval Air Station
Jacksonville, Florida
Project No. 453058

Parameters	Analytical Method Detection Limits	Background 4-9 ¹	MONITORING WELLS					TRIP BLANK
			42-5	42-6	42-7	42-8	42-9	
<u>F006 Parameters (40 CFR 261 Appendix VII)</u>								
Trichloroethene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5
1,1,2-Trichloroethane (ug/l)	5	NA	<5	<5	<5	<5	<5	<5
1,2-dichlorobenzene (ug/l)	5	NA	<5	<5	<5	<5	<5	<5
Toluene (ug/l)	5	NA	<5	<5	<5	<5	<5	<5
Pyridine (ug/l)	5,000	NA	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000
Benzene (ug/l)	5	<5	<5	<5	<5	<5	<5	<5
Methylene Chloride (ug/l)	5	<5	<5	<5	<5	<5	<5	<5
1,1,1-Trichloroethane	5	<5	<5	<5	<5	<5	<5	<5
Chlorobenzene (ug/l)	5	NA	<5	<5	<5	<5	<5	<5
1,2,2-trifluoroethane (ug/l)	200	NA	<200	<200	<200	<200	<200	<200
Trichlorofluomethane (ug/l)	5	NA	<5	<5	<5	<5	<5	<5
2-butanone (ug/l)	10	NA	<10	<10	<10	<10	<10	<10
Isobutanol (ug/l)	5,000	NA	<5,000	<5,000	<5,000	<5,000	<5,000	<5,000
2-Ethoxyethanol (mg/l)	2,000 ⁵	NA	<2,000 ⁵					
2-Nitropropane (ug/l)	5	NA	<5	<5	<5	<5	<5	<5

¹ Background is mean of last four sampling events of Well 4-9.

² Elevated detection limits due to matrix influences.

³ Variances in detection limits are due to dilution factors.

⁴ Analyte was found in blank but not in any sample.

⁵ Detection limit adjusted upward due to newer test information.

NA - Not Applicable

NZ - Not Analyzed

Table 3 (continued)
 Summary
 Ground Water Sampling Analytical Results
 Polishing Pond
 Naval Air Station
 Jacksonville, Florida
 Project No. 453058

Parameters	Analytical Method Detection Limits	Background 4-9 ¹	MONITORING WELLS					TRIP BLANK
			42-5	42-6	42-7	42-8	42-9	
<u>Drinking Water Supply Parameters (40 CFR 264.94)</u>								
Arsenic (mg/l)	0.002	<0.03	0.026	<0.03 ³	<0.028 ²	<0.027 ²	<0.03 ²	NZ
Arsenic, Dissolved (mg/l)	0.002	<0.03	<0.03 ²	<0.021 ²	<0.003 ²	<0.027 ²	<0.031 ²	NZ
Barium (mg/l)	0.002	0.088	0.23	0.091	0.31	0.67	0.036	NZ
Barium, Dissolved (mg/l)	0.002	0.050	0.18	0.15	0.26	0.50	0.36	NZ
Chromium, (mg/l)	0.01	0.02	0.05	0.05	0.08	0.14	0.06	NZ
Chromium, Dissolved (mg/l)	0.01	0.02	0.04	0.08	0.04	0.06	0.04	NZ
Lead (mg/l)	0.002	0.04	0.03	0.042	<0.030 ³	<0.030 ³	0.015	NZ
Lead, Dissolved (mg/l)	0.002 ²	<0.03	<0.03	<0.042	<0.018 ²	<0.030 ³	0.013	NZ
Mercury (mg/l)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NZ
Mercury, Dissolved (mg/l)	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	NZ
Selenium (mg/l)	0.002 ²	<0.06	<0.026 ²	0.011 ²	<0.016 ²	<0.020 ²	0.011	NZ
Selenium, Dissolved (mg/l)	0.002 ²	<0.06	<0.020 ²	<0.014 ²	<0.013 ²	<0.017 ²	0.015 ²	NZ
Silver (mg/l)	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NZ
Silver, Dissolved (mg/l)	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NZ

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³ Variances in detection limits are due to dilution factors.
⁴ Analyte was found in blank but not in any sample.
⁵ Detection limit adjusted upward due to newer test information.
 NA - Not Applicable
 NZ - Not Analyzed

Table 3 (continued)
 Summary
 Ground Water Sampling Analytical Results
 Polishing Pond
 Naval Air Station
 Jacksonville, Florida
 Project No. 453058

Parameters	Analytical Method Detection Limits	Background 4-9 ¹	MONITORING WELLS					TRIP BLANK
			42-5	42-6	42-7	42-8	42-9	
<u>FAC Ch. 17-22.210 and Primary Drinking Water Standards</u>								
<u>FAC Ch. 17-28.700 and 17-4.246 Parameters</u>								
Carbon Tetrachloride (ug/l)	5	<5	<5	<5	<5	<5	<5	<5
Turbidity (ntu)	NA	NA	220	900	1,100	2,800	500	NZ
1,2-dibromoethane (ug/l)	5	NA	<5	<5	<5	<5	<5	<5
Sodium (mg/l)	0.2	NA	45.6	4.6	77.9	41.0	9.6	NZ
Sodium, Dissolved (mg/l)	0.2	NA	43.4	9.0	80.9	40.4	7.3	NZ
Total Coliform (colonies/100 ml)	100	NA	<200 ²	16,000	20,000	6,600	4,800	NZ
Chloroform (ug/l) ⁴	5	NA	<5	<5	<5	<5	<5	<5
Vinyl Chloride (ug/l)	10	<10	<10	<10	<10	<10	<10	<10
Nitrate (as N) (mg/l)	0.05	NA	<0.05	0.07	0.06	0.05	0.08	NZ
Radium 226 (pCi/l)	NA	NA	1.2	9.1	4.0	<3.0	1.4	NZ
Radium 228 (pCi/l)	NA	NA	<3.0	<3.0	<3.0	<1.0	<3.0	NZ
Gross Alpha/Gross Beta (pCi/l) (Total)	NA	NA	53/40	215/75	85/53	300/230	24/15	NZ

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⁵ Detection limit adjusted upward due to newer test information.
 NA - Not Applicable
 NZ - Not Analyzed

Table 3 (continued)
Summary
Ground Water Sampling Analytical Results
Polishing Pond
Naval Air Station
Jacksonville, Florida
Project No. 453058

Parameters	Analytical Method Detection Limits	Background 4-9 ¹	MONITORING WELLS					TRIP BLANK
			42-5	42-6	42-7	42-8	42-9	
<u>FAC 17.55.320 Secondary Drinking Water Standards</u>								
Chloride (mg/l)	1	NA	38	12	64	40	13	NZ
Copper (mg/l)	0.01	NA	0.06	0.02	<0.01	0.02	0.02	NZ
Copper, Dissolved (mg/l)	0.02	NA	<0.01	0.03	<0.01	0.02	0.05	NZ
Zinc (mg/l)	0.005	0.025	2.0	0.054	0.056	0.10	0.13	NZ
Zinc, Dissolved (mg/l)	0.005	0.051	0.59	0.081	0.037	0.067	0.038	NZ
Iron (mg/l)	0.01	NA	7.7	31.1	34.3	51.3	33.8	NZ
Iron, Dissolved (mg/l)	0.01	NA	8.0	53.5	23.3	22.4	17.4	NZ
Fluoride (mg/l)	0.1	NA	<0.1	<0.1	<0.1	<0.1	<0.1	NZ
Manganese (mg/l)	0.002	NA	0.21	0.030	0.16	0.27	0.040	NZ
Manganese, Dissolved (mg/l)	0.002	NA	0.20	0.055	0.16	0.26	0.016	NZ
Sulfate (mg/l)	10	NA	810	<10	540	810	10	NZ

¹ Background is mean of last four sampling events of Well 4-9.

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⁴ Analyte was found in blank but not in any sample.

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NA - Not Applicable

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Table 3 (continued)
Summary
Ground Water Sampling Analytical Results
Polishing Pond
Naval Air Station
Jacksonville, Florida
Project No. 453058

Parameters	Analytical Method Detection Limits	Background 4-9 ¹	MONITORING WELLS					TRIP BLANK
			42-5	42-6	42-7	42-8	42-9	
<u>Previously Detected Appendix IX Parameters</u>								
Phenols (ug/l)	10 ³	<10	<10	<10	<10	<10	<10	NZ
1,1-dichloroethane (ug/l)	5	NA	<5	<5	<5	<5	<5	<5
Vanadium, (mg/l)	0.01	0.07	0.03	0.06	0.07	0.17	0.04	NZ
Vanadium, Dissolved (mg/l)	0.01	0.05	0.04	0.12	0.04	0.07	0.02	NZ
Total Xylenes (ug/l)	5	NA	<5	<5	<5	<5	<5	<5
1,2-dichloroethane (ug/l)	5	<5	<5	<5	<5	<5	<5	<5

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⁴ Analyte was found in blank but not in any sample.
⁵ Detection limit adjusted upward due to newer test information.
NA - Not Applicable
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Table 3 (continued)
 Summary
 Ground Water Sampling Analytical Results
 Polishing Pond
 Naval Air Station
 Jacksonville, Florida
 Project No. 453058

Parameters	Analytical Method Detection Limits	Background 4-9 ¹	MONITORING WELLS					TRIP BLANK
			42-5	42-6	42-7	42-8	42-9	
<u>PESTICIDES (40 CFR 264.94)</u>								
Lindane (mg/l)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	NZ
Endrin (mg/l)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	NZ
Methoxychlor (mg/l)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	NZ
Toxaphene (mg/l)	0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	NZ
2-4,D (mg/l)	0.0002	<0.0002	<0.0002	<0.0002	<0.0003 ³	<0.0002	<0.0002	NZ
Silvex (2,4,5-TP) (mg/l)	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	NZ

¹ Background is mean of last four sampling events of Well 4-9.
² Elevated detection limits due to matrix influences.
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 NA - Not Applicable
 NZ - Not Analyzed

APPENDIX A
FIELD ACTIVITY DAILY LOGS



FIELD ACTIVITY DAILY LOG

PROJECT NAME <u>NAS JULLE</u>		PROJECT NO. <u>453058</u>
FIELD ACTIVITY SUBJECT: <u>G.W. SAMING</u>		
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:		
<p>Drive to JULLE base stopped in Orlando for isoperiod met w/ J. Walling, got keys to 7K wells, talked about map requirements</p> <p>set up at polishing pond area to do monitor wells, deconed all eq</p> <p>holding tank behind Bed is being repaired so they had to drain it, I placed well pts around it to keep it from popping out of the ground, pumping water onto ground & it flows to a drain, it reverses the "normal" water flow of the area & recharge to 41-5+6 was slower than usual</p>		
VISITORS ON SITE:	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS.	
WEATHER CONDITIONS: <u>WARM / CLOUDY</u>	IMPORTANT TELEPHONE CALLS:	
IT PERSONNEL ON SITE: <u>BEUDIA / BARRETT</u>		
SIGNATURE		DATE:



FIELD ACTIVITY DAILY LOG

PROJECT NAME <u>NAS JULLE</u>	PROJECT NO. <u>453058</u>
FIELD ACTIVITY SUBJECT: <u>G.W. SAMPLING EVENT</u>	
DESCRIPTION OF DAILY ACTIVITIES AND EVENTS:	
<p><i>finished polishing pond wells</i></p> <p><i>moved to Domestic Bed area</i></p> <p><i>set up on wells</i></p> <p><i>went to J. Walbrun office to return keys</i></p> <p><i>finish up Domestic Bed wells</i></p> <p><i>Accounted all eq for trip back to Tarras</i></p>	
VISITORS ON SITE:	CHANGES FROM PLANS AND SPECIFICATIONS, AND OTHER SPECIAL ORDERS AND IMPORTANT DECISIONS.
WEATHER CONDITIONS: <i>Hot / Cloudy</i>	IMPORTANT TELEPHONE CALLS:
IT PERSONNEL ON SITE: <u>BEUSER / BARRETT</u>	
SIGNATURE	DATE:



APPENDIX B
SAMPLE COLLECTION LOGS



DATE	1	0	3	0	8	9
TIME	1	6	0	0		
PAGE	OF					
PAGE						
PROJECT NO. 453058						

SAMPLE COLLECTION LOG

PROJECT NAME NAS JVILLE
SAMPLE NO. 42-9
SAMPLE LOCATION POLISHING POND
SAMPLE TYPE G.W.
COMPOSITE YES NO
COMPOSITE TYPE _____
DEPTH OF SAMPLE _____
WEATHER CLOUDY

CONTAINERS USED	AMOUNT COLLECTED
<u>Plastic + Glass</u>	<u>Full</u>

COMMENTS:
WL = 4.70'
pH = 5.55
Sp Cond = 79
T ^c = 25
All containers are full
all in 4- 1L Amber
3- 1L Plastic
4- 40 ml Amber
1- 500 ml Amber
1- 500 ml Plastic
1- 1 Gal Plastic

PREPARED BY: BRUBER

APPENDIX C
FIELD EQUIPMENT CALIBRATION RECORDS



FIELD EQUIPMENT CALIBRATION RECORD⁽¹⁾

PROJECT NAME NAS JAX DATE 10/30/89
PROJECT NUMBER 453058 PERSONNEL BB

EQUIPMENT IDENTIFICATION LA MOTTE CHEMICAL
EQUIPMENT NAME Conductivity Meter
REQUIRED CALIBRATION PERIOD daily

CALIBRATION TECHNIQUE⁽²⁾ compare readings vs standards

REMARKS	<u>cal. std</u>	<u>readings</u>
	<u>720</u>	<u>720</u>
	<u>418</u>	<u>1450</u>

- NOTES: (1) THIS RECORD SHALL BE COMPLETED FOR ALL EQUIPMENT CALIBRATED IN THE FIELD.
(2) IF APPLICABLE, CITE REFERENCE



FIELD EQUIPMENT CALIBRATION RECORD⁽¹⁾

PROJECT NAME NAS-JAX DATE 10/30/89
PROJECT NUMBER 453058 PERSONNEL BB

EQUIPMENT IDENTIFICATION LAUTTE Chemical
EQUIPMENT NAME pH meter
REQUIRED CALIBRATION PERIOD daily

CALIBRATION TECHNIQUE⁽²⁾ check reads against standard

REMARKS	pH	reads
	4.01	4.10
	7	7.00
	9.18	9.03

- NOTES: (1) THIS RECORD SHALL BE COMPLETED FOR ALL EQUIPMENT CALIBRATED IN THE FIELD.
(2) IF APPLICABLE, CITE REFERENCE



FIELD EQUIPMENT CALIBRATION RECORD⁽¹⁾

PROJECT NAME NAS-JAX DATE 10/31
 PROJECT NUMBER 453058 PERSONNEL wmb

EQUIPMENT IDENTIFICATION LAMOTTE
 EQUIPMENT NAME pH meter
 REQUIRED CALIBRATION PERIOD daily

CALIBRATION TECHNIQUE⁽²⁾ set meter vs. pH buffers

REMARKS	buffer	reading
	4.01	3.85
	7.00	7.00
	9.18	9.15

- NOTES: (1) THIS RECORD SHALL BE COMPLETED FOR ALL EQUIPMENT CALIBRATED IN THE FIELD.
 (2) IF APPLICABLE, CITE REFERENCE



FIELD EQUIPMENT CALIBRATION RECORD⁽¹⁾

PROJECT NAME NAS-JAX DATE 10/31
PROJECT NUMBER 45305-8 PERSONNEL WMB

EQUIPMENT IDENTIFICATION LAMOTTE
EQUIPMENT NAME conductivity meter
REQUIRED CALIBRATION PERIOD daily

CALIBRATION TECHNIQUE⁽²⁾ Set unit against standards

REMARKS	<u>Std</u>	<u>readings</u>
	<u>720</u>	<u>720</u>
	<u>1418</u>	<u>1420</u>

- NOTES: (1) THIS RECORD SHALL BE COMPLETED FOR ALL EQUIPMENT CALIBRATED IN THE FIELD.
(2) IF APPLICABLE, CITE REFERENCE

**APPENDIX D
CHAIN-OF-CUSTODY
REQUEST FOR ANALYSIS**



REQUEST FOR ANALYSIS

R/A Control No. 12 743
C/C Control No. 112409

PROJECT NAME NAS JULIE
PROJECT NUMBER 453058
PROJECT MANAGER M.H.
BILL TO TA MPA
PURCHASE ORDER NO. _____

DATE SAMPLES SHIPPED 10/31/89
LAB DESTINATION KNOX
LABORATORY CONTACT BETH
SEND LAB REPORT TO TA MPA
DATE REPORT REQUIRED _____
PROJECT CONTACT M.H.
PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
Pw-1	G.W.	4-16 Am	N	AS PER USUAL	
		3-16 Pl	N / HNO3		filter metals → present
		4-40ml Am	N / HCL		
		1-50ml Am	H2SO4		
		1-50ml Pl	N		
		1-16ml Pl	HNO3		

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
Normal Rush _____ (Subject to rush surcharge)
POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
Nonhazard Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
Return to Client _____ Disposal by Lab

FOR LAB USE ONLY
Received By _____ Date/Time _____

WHITE - Original, to accompany samples
YELLOW - Field copy



**INTERNATIONAL
TECHNOLOGY
CORPORATION**

CHAIN-OF-CUSTODY RECORD

R/A Control No. 12 2743

C/C Control No. 112409

PROJECT NAME/NUMBER NAS JULIE 453058

LAB DESTINATION KNOX

SAMPLE TEAM MEMBERS BRUER BARRETT

CARRIER/WAYBILL NO. 530955554

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
Pw-1		10/31/89 1630	G.W.	4 1L Am		
↓		↓		3 1L PL		
				4 40ml Am		
				1 500ml Am		
				1 500ml PL		
				1 Gal PL		

Special Instructions: filter metals → preserve

Possible Sample Hazards: _____

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [Signature] TIC 10/31/89 1700

3. Relinquished By: _____

Received By: _____

Received by: _____

2. Relinquished By: _____

4. Relinquished By: _____

Received By: _____

Received By: _____



**INTERNATIONAL
TECHNOLOGY
CORPORATION**

REQUEST FOR ANALYSIS

R/A Control No. 12744
C/C Control No. 112410

PROJECT NAME NAS JULIE
PROJECT NUMBER 453058
PROJECT MANAGER M. W.
BILL TO _____
TAMPA

DATE SAMPLES SHIPPED 10/31/89
LAB DESTINATION KNOX
LABORATORY CONTACT BETH
SEND LAB REPORT TO _____
TAMPA

PURCHASE ORDER NO. _____

DATE REPORT REQUIRED _____
PROJECT CONTACT M. W.
PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
RWSATC-2	WATER	4-16 Am	N	AS PER 4542L	filter out → present
		3-16 Pl	N / HNO ₃		
		4-40ml Am	N / HCl		
		1-500ml Am	H ₂ SO ₄		
		1-500ml Pl	N		
		1-16ml Pl	HNO ₃		
				EXTRACT + HOLD	

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____
(Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab

FOR LAB USE ONLY

Received By _____ Date/Time _____

WHITE - Original, to accompany samples
YELLOW - Field copy



CHAIN-OF-CUSTODY RECORD

R/A Control No. 100750
C/C Control No. 112416

PROJECT NAME/NUMBER NAS JULIE 453058

LAB DESTINATION KWox

SAMPLE TEAM MEMBERS BRUDER BARRETT

CARRIER/WAYBILL NO. 530955554

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
42-5	⊗ POLISHING POND	10/31/85 1030	G.w.	4-1L Am		
				3-1L Pl		
				4-40ml Am		
				1-500ml Am		
				1-500ml Pl		
				1-1Gal Pl		

Special Instructions: filter metal → preserve

Possible Sample Hazards: _____

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [Signature] ITC 10/31/85 DOW

3. Relinquished By: _____

Received By: _____

Received by: _____

2. Relinquished By: _____

4. Relinquished By: _____

Received By: _____

Received By: _____

WHITE - To accompany samples
YELLOW - Field copy



**INTERNATIONAL
TECHNOLOGY
CORPORATION**

REQUEST FOR ANALYSIS

R/A Control No. 12 150
C/C Control No. 112416

PROJECT NAME NAS JULIE
PROJECT NUMBER 453058
PROJECT MANAGER M.H.
BILL TO TAMPA
PURCHASE ORDER NO. _____

DATE SAMPLES SHIPPED 10/31/89
LAB DESTINATION KNOX
LABORATORY CONTACT BETH
SEND LAB REPORT TO TAMPA
DATE REPORT REQUIRED _____
PROJECT CONTACT M.H.
PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
42-5	G.W.	4-16 Am	N	AS PER USUAL	
		3-16 Pl	N/H ₂ O ₂		filter ret. → pres.
		4-40ml Am	N/H ₂ O ₂		
		1-500ml Am	H ₂ SO ₄		
		1-500ml Pl	N		
		1-16ml Pl	H ₂ O ₂		

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
 Normal Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
 Nonhazard Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____
 (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
 Return to Client _____ Disposal by Lab

FOR LAB USE ONLY
 Received By _____ Date/Time _____

WHITE - Original, to accompany samples
 YELLOW - Field copy



CHAIN-OF-CUSTODY RECORD

R/A Control No. 128751

C/C Control No. 112417

PROJECT NAME/NUMBER NAS JULIE 453058

LAB DESTINATION Knox

SAMPLE TEAM MEMBERS BRADY BARRETT

CARRIER/WAYBILL NO. 530955554

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
41-6	DOMESTIC BEDS	10/31/87 1030	G.W.	4-16 Am		
				3-16 Pl		
				4-40 ml Am		
				1-500 ml Am		
				1-500 ml Pl		
				1-16 ml Pl		

Special Instructions: filter metals -> preserve

Possible Sample Hazards:

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [Signature] ITC 10/31/87 Now

3. Relinquished By: _____

Received By: _____

Received by: _____

2. Relinquished By: _____

4. Relinquished By: _____

Received By: _____

Received By: _____



CHAIN-OF-CUSTODY RECORD

R/A Control No. 120752

C/C Control No. 130256

PROJECT NAME/NUMBER NAS JULIE 453058

LAB DESTINATION KNOX

SAMPLE TEAM MEMBERS BRUDER BARRITT

CARRIER/WAYBILL NO. 5309 55554

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
41-5	DOMESTIC BEANS	10/31/85 1100	G.W.	4-1L Am		
				3-1L PL		
				4-40ml Am		
				1-500ml Am		
				1-500ml PL		
				1-16ml PL		

Special Instructions: filter metals → preswr

Possible Sample Hazards: _____

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [Signature] ITC 10/31/85 1700

3. Relinquished By: _____

Received By: _____

Received by: _____

2. Relinquished By: _____

4. Relinquished By: _____

Received By: _____

Received By: _____



REQUEST FOR ANALYSIS

R/A Control No. 12706
C/C Control No. 130256

PROJECT NAME NAS JULIE
PROJECT NUMBER 453058
PROJECT MANAGER M.H.
BILL TO TAMPA

DATE SAMPLES SHIPPED 10/31/89
LAB DESTINATION KNOX
LABORATORY CONTACT CSH
SEND LAB REPORT TO TAMPA

PURCHASE ORDER NO. _____

DATE REPORT REQUIRED _____
PROJECT CONTACT M.H.
PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
41-5	G.W.	4-16 Am	N	AS PPR USUAL	
		3-16 PL	N / HNO ₃		filter metals → preser
		4-40ml Am	N / HCl		
		1-500ml Am	H ₂ SO ₄		
		1-500ml PL	N		
		1-16ml PL	HNO ₃		

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
Normal Rush _____ (Subject to rush surcharge)
POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
Nonhazard Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)
SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
Return to Client _____ Disposal by Lab

FOR LAB USE ONLY
Received By _____ Date/Time _____

WHITE - Original, to accompany samples
YELLOW - Field copy



**INTERNATIONAL
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CORPORATION**

CHAIN-OF-CUSTODY RECORD

R/A Control No. 128753

C/C Control No. **130398**

PROJECT NAME/NUMBER NAS JULIE 453058

LAB DESTINATION Knox

SAMPLE TEAM MEMBERS BRYDEN BARRETT

CARRIER/WAYBILL NO. 530955554

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
41-4	DOMESTIC BENS	10/31/87 1130	G.W.	4-16 Am		
↓	↓	↓	↓	2-16 PL		
				4-40ml Am		
				1-500ml Am		
				1-500ml PL		
				1-16ml PL		

Special Instructions: filter metals → preserve

Possible Sample Hazards: _____

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [Signature] ITC 10/31/87 DW

3. Relinquished By: _____

Received By: _____

Received by: _____

2. Relinquished By: _____

4. Relinquished By: _____

Received By: _____

Received By: _____



REQUEST FOR ANALYSIS

R/A Control No. 12 753
C/C Control No. 150398

PROJECT NAME NAS JULIE
PROJECT NUMBER 453058
PROJECT MANAGER M.H.
BILL TO TAMPA

DATE SAMPLES SHIPPED 10/31/89
LAB DESTINATION Knox
LABORATORY CONTACT B-711
SEND LAB REPORT TO TAMPA

PURCHASE ORDER NO. _____

DATE REPORT REQUIRED _____
PROJECT CONTACT M.H.
PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
41-4	G.W.	4-1L Am	N	AS PER USUAL	
		3-1L PL	N / HNO ₃		filter metals → present
		4-40ml Am	N / HCl		
		1-500ml Am	H ₂ SO ₄		
		1-500ml PL	N		
		1-1Gal PL	HNO ₃		

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab

FOR LAB USE ONLY

Received By _____ Date/Time _____

WHITE - Original, to accompany samples
YELLOW - Field copy



**INTERNATIONAL
TECHNOLOGY
CORPORATION**

CHAIN-OF-CUSTODY RECORD

R/A Control No. 120954

C/C Control No. **130399**

PROJECT NAME/NUMBER NAS JULIE 453058

LAB DESTINATION Knox

SAMPLE TEAM MEMBERS BRUDER / BARRETT

CARRIER/WAYBILL NO. 53095554

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
41-3	DOMESTIC BEDS	10/31/85 1200	G.W.	4-16 Am		
↓	↓	↓	↓	3-16 Pl		
				4-40ml Am		
				1-500ml Am		
				1-500ml Pl		
				1-16ml Pl		
↓	↓	↓	↓			

Special Instructions: filter metals → preser

Possible Sample Hazards: _____

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [Signature] ITC 10/31/85 1700

3. Relinquished By: _____

Received By: _____

Received by: _____

2. Relinquished By: _____

4. Relinquished By: _____

Received By: _____

Received By: _____

WHITE - To accompany samples
YELLOW - Field copy



**INTERNATIONAL
TECHNOLOGY
CORPORATION**

REQUEST FOR ANALYSIS

R/A Control No. 12 754
C/C Control No. 130 399

PROJECT NAME NAS JUICE
PROJECT NUMBER 453058
PROJECT MANAGER M.H.
BILL TO TAMPA
PURCHASE ORDER NO. _____

DATE SAMPLES SHIPPED 10/31/89
LAB DESTINATION KNOX
LABORATORY CONTACT BETH
SEND LAB REPORT TO TAMPA
DATE REPORT REQUIRED _____
PROJECT CONTACT M.H.
PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
41-3	G.W.	4-1L Ar	N	AS PER USUAL	
		3-1L PL	N / HNO ₃		filter metals → pres.
		4-10ml Ar	N / HCl		
		1-500ml Ar	H ₂ SO ₄		
		1-500ml PL	N		
		1-1Gal PL	HNO ₃		

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
 Normal Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
 Nonhazard Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
 Return to Client _____ Disposal by Lab

FOR LAB USE ONLY
 Received By _____ Date/Time _____

WHITE - Original, to accompany samples
 YELLOW - Field copy



**INTERNATIONAL
TECHNOLOGY
CORPORATION**

REQUEST FOR ANALYSIS

R/A Control No. 12 581
C/C Control No. 130900

PROJECT NAME NAS JULIE
PROJECT NUMBER 453058
PROJECT MANAGER M.H
BILL TO _____
TAMPA
PURCHASE ORDER NO. _____

DATE SAMPLES SHIPPED 10/31/89
LAB DESTINATION KNOX
LABORATORY CONTACT BEH
SEND LAB REPORT TO _____
TAMPA
DATE REPORT REQUIRED _____
PROJECT CONTACT M.H.
PROJECT CONTACT PHONE NO. 622-7174

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
41-a	G.W.	4-11 Am	N		
		3-11 PL	N / HNO ₃		
		4-11 Am	N / HCl		
		1-500 ml Am	H ₂ SO ₄		
		1-500 ml PL	N		
		1-1 Gal PL	HNO ₃		

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
Normal Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
Nonhazard Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
Return to Client _____ Disposal by Lab

FOR LAB USE ONLY
Received By _____ Date/Time _____

WHITE - Original, to accompany samples
YELLOW - Field copy



CHAIN-OF-CUSTODY RECORD

R/A Control No. 128681

C/C Control No. 130400

PROJECT NAME/NUMBER WAS JULIE 453058

LAB DESTINATION Knoxville

SAMPLE TEAM MEMBERS BRUCE / PARRETT

CARRIER/WAYBILL NO. 53095554

Table with 7 columns: Sample Number, Sample Location and Description, Date and Time Collected, Sample Type, Container Type, Condition on Receipt (Name and Date), Disposal Record No. Handwritten entries include 'DOMESTIC BEES', '10/21/85 1200', 'G.W.', and various container types like '4-16 Am', '3-16 Pl', etc.

Special Instructions: filter metals -> preserve

Possible Sample Hazards:

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [Signature] etc 10/21/85 now

3. Relinquished By:

Received By:

Received by:

2. Relinquished By:

4. Relinquished By:

Received By:

Received By:



**INTERNATIONAL
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CORPORATION**

CHAIN-OF-CUSTODY RECORD

R/A Control No. 118721

C/C Control No. **145286**

PROJECT NAME/NUMBER NAS JULIE 453058

LAB DESTINATION Knox

SAMPLE TEAM MEMBERS BAURSA BARRTI

CARRIER/WAYBILL NO. 530955554

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
41-24	DOMESTIC BEADS	10/21/85 1230	G.W.	4-16 Am		
✓	✓	✓	✓	7-11 Pl		
✓	✓	✓	✓	4-40 ml Am		
✓	✓	✓	✓	1-500 ml Am		
✓	✓	✓	✓	1-500 ml Pl		
✓	✓	✓	✓	1-16 ml Pl		

Special Instructions: filter melted → present

Possible Sample Hazards: _____

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: SAE Baur ITC 10/21/85 1200

3. Relinquished By: _____

Received By: _____

Received by: _____

2. Relinquished By: _____

4. Relinquished By: _____

Received By: _____

Received By: _____



REQUEST FOR ANALYSIS

R/A Control No. 11 721
C/C Control No. 145286

PROJECT NAME NAS JULIE
PROJECT NUMBER 453058
PROJECT MANAGER M.H.
BILL TO TAMP A.

DATE SAMPLES SHIPPED 10/31/85
LAB DESTINATION Knox
LABORATORY CONTACT BTW
SEND LAB REPORT TO _____

PURCHASE ORDER NO. _____

DATE REPORT REQUIRED _____
PROJECT CONTACT M.H.
PROJECT CONTACT PHONE NO. _____

STAMP

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
41-2A	G.W.	4-16 Am	N	AS PIR USMAC	filtered → pres
		3-16 PL	N / HNO ₃		
		4-40ml Am	N / HCl		
		1-500ml Am	H ₂ SO ₄		
		1-500ml PL	N		
		1-16ml PL	HNO ₃		

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab

FOR LAB USE ONLY

Received By _____ Date/Time _____

WHITE - Original, to accompany samples
YELLOW - Field copy



**INTERNATIONAL
TECHNOLOGY
CORPORATION**

CHAIN-OF-CUSTODY RECORD

R/A Control No. 128682

C/C Control No. **130202**

PROJECT NAME/NUMBER NASHVILLE 453058

LAB DESTINATION KNOX

SAMPLE TEAM MEMBERS BAUER / BARRETT

CARRIER/WAYBILL NO. 53095554

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
41-1	DOMESTIC BEOS	10/31/85 1300	S.W.	1-16 Ar		
↓	↓	↓	↓	3-16 PL		
↓	↓	↓	↓	4-40 ml Ar		
↓	↓	↓	↓	1-50 ml Ar		
↓	↓	↓	↓	1-50 ml PL		
↓	↓	↓	↓	1-16 ml PL		
↓	↓	↓	↓			
↓	↓	↓	↓			
↓	↓	↓	↓			
↓	↓	↓	↓			

Special Instructions: filter metals → preserve

Possible Sample Hazards: _____

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [Signature] ITC 10/31/85 1700

3. Relinquished By: _____

Received By: _____

Received by: _____

2. Relinquished By: _____

4. Relinquished By: _____

Received By: _____

Received By: _____



**INTERNATIONAL
TECHNOLOGY
CORPORATION**

REQUEST FOR ANALYSIS

R/A Control No. 12102
C/C Control No. 130202

PROJECT NAME NAS JULIE
PROJECT NUMBER 453058
PROJECT MANAGER M.H
BILL TO TAMPA
PURCHASE ORDER NO. _____

DATE SAMPLES SHIPPED 10/31/89
LAB DESTINATION Knox
LABORATORY CONTACT BETH
SEND LAB REPORT TO TAMPA
DATE REPORT REQUIRED NORMAL
PROJECT CONTACT M.H
PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
41-1	G.W.	4-1L An	N	AS PER USUAL	
		3-1L PL	N / HNO ₃		filter metal → preser.
		4-40ml An	N / HCl		
		1-500ml An	H ₂ SO ₄		
		1-500ml PL	N		
		1-1Gal PL	HNO ₃		

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab

FOR LAB USE ONLY

Received By _____ Date/Time _____

WHITE - Original, to accompany samples
YELLOW - Field copy



**INTERNATIONAL
TECHNOLOGY
CORPORATION**

CHAIN-OF-CUSTODY RECORD

R/A Control No. 128684

C/C Control No. 130235

PROJECT NAME/NUMBER NAS JAX 413058

LAB DESTINATION KNOX

SAMPLE TEAM MEMBERS BRODIE BARNETT

CARRIER/WAYBILL NO. 5309555543

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
R10-1	Polesheig Ponds	10/30/85 1500	G.W.	4-16 Ar		
				3-16 P.D		
				4-40ml Ar		
				1-500ml Ar		
				1-500ml P.D		
				1-16ml P.D		

Special Instructions: _____

Possible Sample Hazards: _____

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [Signature] Inc 10/30/85 2030

3. Relinquished By: _____

Received By: _____

Received by: _____

2. Relinquished By: _____

4. Relinquished By: _____

Received By: _____

Received By: _____



**INTERNATIONAL
TECHNOLOGY
CORPORATION**

REQUEST FOR ANALYSIS

R/A Control No. 120084
C/C Control No. 130231

PROJECT NAME NAS JAX
PROJECT NUMBER 453058
PROJECT MANAGER M.H.
BILL TO TAMM
PURCHASE ORDER NO. _____

DATE SAMPLES SHIPPED 10/30/83
LAB DESTINATION KJAX
LABORATORY CONTACT BETH
SEND LAB REPORT TO TAMM
DATE REPORT REQUIRED NORMAL
PROJECT CONTACT M.H.
PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
RW-1	G.W.	4-1L Am	N	AS PTA USUAL	
		3-1L PL	N/HNO3		
		4-40ml Am	N/HCL		
		1-500ml Am	H2SO4		
		1-500ml PL	N		
		1-1 Gal PL	NHNO3		

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
 Normal Rush _____ (Subject to rush surcharge)
 POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
 Nonhazard Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)
 SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
 Return to Client _____ Disposal by Lab

FOR LAB USE ONLY
 Received By _____ Date/Time _____

WHITE - Original, to accompany samples
 YELLOW - Field copy



REQUEST FOR ANALYSIS

R/A Control No. 120 46
 C/C Control No. 112410

PROJECT NAME NAS JULIE
 PROJECT NUMBER 453058
 PROJECT MANAGER M.H.
 BILL TO _____

 PURCHASE ORDER NO. _____

DATE SAMPLES SHIPPED 1/13/85
 LAB DESTINATION KWA
 LABORATORY CONTACT SETA
 SEND LAB REPORT TO _____

 DATE REPORT REQUIRED _____
 PROJECT CONTACT M.H.
 PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
42-9	G.W.	4-16 Am	N	AS PER USUAL	
		3-16 PL	N / HNO ₃		filter nitro → preserve
		4-400 ml Am	N / HCl		
		1-500 ml Am	H ₂ SO ₄		
		1-500 ml PL	N		
		1-100 ml PL	HNO ₃		

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
 Normal Rush _____ (Subject to rush surcharge)
 POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
 Nonhazard Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
 Return to Client _____ Disposal by Lab

FOR LAB USE ONLY
 Received By _____ Date/Time _____

WHITE - Original, to accompany samples
 YELLOW - Field copy



**INTERNATIONAL
TECHNOLOGY
CORPORATION**

CHAIN-OF-CUSTODY RECORD

R/A Control No. 128747

C/C Control No. 112413

PROJECT NAME/NUMBER NAS JUILLE 453058

LAB DESTINATION KNOX

SAMPLE TEAM MEMBERS BRUDER BARRETT

CARRIER/WAYBILL NO. 5309555543

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
42-8	POLISHING POND	10/30/81 1600	G.W.	4-1L Am		
				3-1L Pl		
				4-40ml Am		
				1-500 ml Am		
				1-500 ml Pl		
				1-16ml Pl		

Special Instructions: filter metals → preserve ↓ split for Cu

Possible Sample Hazards: _____

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [Signature] ITC 10/30/81 2030

3. Relinquished By: _____

Received By: _____

Received by: _____

2. Relinquished By: _____

4. Relinquished By: _____

Received By: _____

Received By: _____



**INTERNATIONAL
TECHNOLOGY
CORPORATION**

REQUEST FOR ANALYSIS

R/A Control No. 12-748
C/C Control No. 110-111

PROJECT NAME AAS JULIE
PROJECT NUMBER 453058
PROJECT MANAGER M.H.
BILL TO TAMPA

DATE SAMPLES SHIPPED 10/20/03
LAB DESTINATION KNOX
LABORATORY CONTACT BETU
SEND LAB REPORT TO TAMPA

PURCHASE ORDER NO. _____

DATE REPORT REQUIRED _____
PROJECT CONTACT M.H.
PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
42-7	G.W.	4-16 Am	N	AS PSM US411	
		3-16 PL	N/HNO ₃		filter metal → present
		4-40ml Am	N/HCl		
		1-500 ml Am	H ₂ SO ₄		
		1-500 ml PL	N		
		1-1 Gal PL	HNO ₃		

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)

Normal Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)

Nonhazard Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)

Return to Client _____ Disposal by Lab

FOR LAB USE ONLY

Received By _____ Date/Time _____

WHITE - Original, to accompany samples
YELLOW - Field copy



REQUEST FOR ANALYSIS

R/A Control No. 12749
 C/C Control No. 112415

PROJECT NAME NAS JULIE
 PROJECT NUMBER 453058
 PROJECT MANAGER M.H.
 BILL TO TAMPA
 PURCHASE ORDER NO. _____

DATE SAMPLES SHIPPED _____
 LAB DESTINATION Knox
 LABORATORY CONTACT BETH
 SEND LAB REPORT TO TAMPA
 DATE REPORT REQUIRED _____
 PROJECT CONTACT M.H.
 PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
42-6	G.W.	4-1L Am	N	AS PPA US4AL	
		3-1L PL	N / NaOH		analyze metals → filter → preserve
		4-40ml Am	N / HCl		
		1-500 ml Am	H ₂ SO ₄		
		1-500 ml PL	N		
		1-1Gal PL	HNO ₃		

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
 Normal Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
 Nonhazard Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
 Return to Client _____ Disposal by Lab

FOR LAB USE ONLY
 Received By _____ Date/Time _____

WHITE - Original, to accompany samples
 YELLOW - Field copy



CHAIN-OF-CUSTODY RECORD

R/A Control No. 128749
C/C Control No. 112415

PROJECT NAME/NUMBER NAS JULIE 453058
SAMPLE TEAM MEMBERS BRUDER BARRETT

LAB DESTINATION KNOX
CARRIER/WAYBILL NO. 5309555543

Table with 7 columns: Sample Number, Sample Location and Description, Date and Time Collected, Sample Type, Container Type, Condition on Receipt (Name and Date), Disposal Record No. Handwritten entries include '42-6', 'POLISHING POND', '10/30/89 1700', 'G.W.', and various container types like '4-1L Am', '2-1L Pd', etc.

Special Instructions: split metals -> filter -> preserve

Possible Sample Hazards:

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [Signature] ITC 10/30/89 2030
Received By:

3. Relinquished By:
Received by:

2. Relinquished By:
Received By:

4. Relinquished By:
Received By:



**INTERNATIONAL
TECHNOLOGY
CORPORATION**

REQUEST FOR ANALYSIS

R/A Control No. 12-747
C/C Control No. 112413

PROJECT NAME NAS JULIE
PROJECT NUMBER 453058
PROJECT MANAGER M.H.
BILL TO TAMPA

DATE SAMPLES SHIPPED 10/30/87
LAB DESTINATION KNOX
LABORATORY CONTACT SETH
SEND LAB REPORT TO TAMPA

PURCHASE ORDER NO. _____

DATE REPORT REQUIRED _____
PROJECT CONTACT M.H.
PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions
42-8	G.W.	4-1L Am	N	AS PER USUAL	
		3-1L Pl	N / HNO ₃		filter metal - preserve
		4-40ml Am	N / HCl		
		1-500ml Am	H ₂ SO ₄		
		1-500ml Pl	N		
		1-1Gal Pl	HNO ₃		

TURNAROUND TIME REQUIRED: (Rush must be approved by the Project Manager.)
Normal Rush _____ (Subject to rush surcharge)

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances)
Nonhazard Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, and disposal.)
Return to Client _____ Disposal by Lab

FOR LAB USE ONLY
Received By _____ Date/Time _____

WHITE - Original, to accompany samples
YELLOW - Field copy



CHAIN-OF-CUSTODY RECORD

R/A Control No. 128748
C/C Control No. 112414

PROJECT NAME/NUMBER NAS JULIE 453058

LAB DESTINATION KNOX

SAMPLE TEAM MEMBERS BRUDER BARRSTI

CARRIER/WAYBILL NO. 5309555543

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.
42-7	POLISHING POND	10/30/85 1700	G.W.	4-16 Am		
↓	↓	↓	↓	3-12 PL		
				4-40ml Am		
				1-500ml Am		
				1-500ml PL		
				1-1 Gal PL		
↓						

Special Instructions: filter metals then preserve & split for CW

Possible Sample Hazards: _____

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: [Signature] ITC 10/30/85 2030

Received By: _____

2. Relinquished By: _____

Received By: _____

3. Relinquished By: _____

Received by: _____

4. Relinquished By: _____

Received By: _____

APPENDIX E
CERTIFICATES OF ANALYSIS

CERTIFICATE OF ANALYSIS

IT Corporation
3012 US Highway 301 North, Suite 1000
Tampa, Florida 33619
ATTN: Mark Hampton

November 30, 1989

Job Number: ITET 44472

P.O. Number: 453058

This is the Certificate of Analysis for the following samples:

Client Project ID: NAS JAX
Date Received by Lab: 10/31/89
Number of Samples: Six (6)
Sample Type: Water-four (4), Rinsate-one (1), Trip Blank-one (1)

I. Introduction

On 10/31/89, four (4) water samples, one (1) rinsate and one (1) trip blank arrived at the ITAS-Knoxville, Tennessee laboratory from IT-Tampa, Florida. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

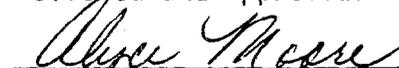
II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all data are blank corrected, i.e., if any compound is found in the corresponding laboratory blank, it is subtracted from the analytical result before it is reported.

The total organic carbon (TOC) and total organic halide (TOX) analyses were performed at the IT-Mixed Waste Laboratory (IT-MWL) in Oak Ridge, Tennessee. Copies of these reports are included.

The samples were analyzed for radiological parameters at the IT-Radiological Sciences Laboratory (IT-RSL). A copy of that laboratory report will follow.

Reviewed and Approved:


Alyce Moore
Laboratory Manager

II. Analytical Results/Methodology (continued)

The samples were analyzed for the requested volatile organic compounds by gas chromatography/mass spectroscopy (GC/MS) according to SW-846 method 8240.

The samples were analyzed for the requested semivolatile compounds by GC/MS according to SW-846 method 8270.

The samples were analyzed for the requested pesticides and herbicides by gas chromatography-electron capture detection (GC-ECD) based on EPA method 608 and Standard Methods for the Examination of Water and Wastewater, 16th edition, 1985, method 509B.

The samples were analyzed for the requested metals by cold vapor atomic absorption spectroscopy (CVAA), graphite furnace atomic absorption spectroscopy (GFAA) and inductively coupled plasma spectroscopy (ICP) using SW-846 methods 3010, 3020, 7421, 7740, 7470, and 6010.

The samples were analyzed for turbidity according to EPA method 180.1.

The samples were analyzed for nitrate and sulfate by colorimetric determination based on EPA methods 353.3 and 375.4, respectively.

The samples were analyzed for chloride by titration according to EPA method 325.3.

The samples were analyzed for fluoride using an ion-specific electrode according to EPA method 340.2.

The total coliform bacterial densities were determined using the membrane filter technique described in method 909A, Standard Methods for the Examination of Water and Wastewater, 16th edition, 1985.

The samples were analyzed for cyanide by manual distillation/colorimetric determination using EPA method 335.2.

The samples were analyzed for hexavalent chromium according to standard methods 312B.

III. Quality Control

Routine laboratory level I QC was followed.

III. Quality Control (continued)

The volatiles analyses were performed on 11/09/89 by purge and trap with J&W DB-624 Megabore column on a Finnigan OWA GC/MS/DS. The semivolatiles analyses were performed on 11/15/89 by direct injection of sample extract on a J&W DB-5 capillary column on a VG TRIO-1 GC/MS/DS. The volatiles runs went well. All target analytes were standardized for (although some "bad actors" were not run the same day due to their tendency to soil the system) except for trifluoroethane and 2-ethoxyethanol; these compounds were looked for as tentatively identified compounds (TIC's) by peak spectral match with entries in the NIH mass spectral data base. The detection limits for these two compounds were estimated based on previous studies and responses of similar species. There were indications that, especially for 2-ethoxyethanol, additional analyses with different methodology might provide lower detection limits. The semivolatiles (acid extractable phenols) runs went well. There were no other problems seen in final data review.

The samples were extracted for pesticides and herbicides on 11/02/89 and 11/03/89. The samples were analyzed for pesticides on 11/07-08/89 and for herbicides on 11/12/89. No problems were encountered.

The samples were digested on 11/01/89 for ICP and GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on 11/01/89; the GFAA analyses for lead and selenium were performed on 11/04-07/89; the remaining metals were analyzed by ICP on 11/02/89. All run QC was acceptable. Due to severe matrix problems, samples 42-6 and 42-9 for total arsenic, ICP values were used for reporting. Fairly large dilutions were used on these two samples causing elevated detection limits. The ICP detection limit was lower than the GFAA detection limit for these two samples. Matrix problems with samples 42-8 (dissolved), 42-7 (total), and 42-8 (total) also resulted in lower detection limits by ICP than by GFAA for lead analyses.

The samples were analyzed for turbidity on 10/31/89. No problems were encountered.

The samples were analyzed for nitrate and sulfate on 11/09/89 and 11/10/89, respectively. No problems were encountered.

The samples were analyzed for chloride and fluoride on 11/14/89 and 11/10/89, respectively. No problems were encountered.

The samples were analyzed for total coliform on 10/31/89. No problems were encountered.

The samples were analyzed for cyanide on 11/09/89. No problems were encountered.

The samples were analyzed for hexavalent chromium on 10/31/89. No problems were encountered.

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Method Blank
Lab Sample ID: VB11092

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	2 J	toluene	5 U
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	5 U	total xylenes	5 U
chloroform	5 U	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	10 U	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	5 U	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Analyzed: 11/09/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Trip Blank
Lab Sample ID: JJ8473

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	1 J	toluene	5 U
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	5 U	total xylenes	5 U
chloroform	5 U	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	10 U	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	5 U	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Analyzed: 11/09/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 42-6
Lab Sample ID: JJ8468

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	5 U	toluene	5 U
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	5 U	total xylenes	5 U
chloroform	5 U	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	10 U	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	5 U	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Analyzed: 11/09/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 42-7
Lab Sample ID: JJ8469

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	5 U	toluene	5 U
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	5 U	total xylenes	5 U
chloroform	5 U	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	10 U	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	2 J	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Analyzed: 11/09/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 42-8
Lab Sample ID: JJ8470

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	5 U	toluene	5 U
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	5 U	total xylenes	5 U
chloroform	5 U	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	10 U	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	5 U	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Analyzed: 11/09/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 42-9
Lab Sample ID: JJ8471

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	5 U	toluene	5 U
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	5 U	total xylenes	5 U
chloroform	5 U	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	10 U	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	5 U	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date Analyzed: 11/09/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: RIN-1
Lab Sample ID: JJ8472

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	5 U	toluene	5 U
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	5 U	total xylenes	5 U
chloroform	7	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	10 U	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	5 U	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Analyzed: 11/09/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

WATER SURROGATE PERCENT RECOVERY SUMMARY

Sample No.	VOLATILE		
	<u>Toluene-D8</u> <u>(88-110%)*</u>	<u>BFB</u> <u>(86-115%)*</u>	<u>1,2 Dichloroethane-D4</u> <u>(76-114%)*</u>
Method Blank	99	97	100
Trip Blank	94	94	96
42-6	98	99	102
42-7	94	94	96
42-8	95	95	96
42-9	93	93	93
RIN-1	97	93	92

*Values in parenthesis represent USEPA contract required QC limits.

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Method Blank
Lab Sample ID: BL0023

phenol	10 U
2-chlorophenol	10 U
2-nitrophenol	10 U
2,4-dimethylphenol	10 U
2,4-dichlorophenol	10 U
4-chloro-3-methylphenol	10 U
2,4,6-trichlorophenol	10 U
2,4-dinitrophenol	50 U
4-nitrophenol	50 U
4,6-dinitro-2-methylphenol	50 U
pentachlorophenol	50 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Extracted: 11/02/89
Date Analyzed: 11/15/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 42-6
Lab Sample ID: JJ8484

phenol	10 U
2-chlorophenol	10 U
2-nitrophenol	10 U
2,4-dimethylphenol	10 U
2,4-dichlorophenol	10 U
4-chloro-3-methylphenol	10 U
2,4,6-trichlorophenol	10 U
2,4-dinitrophenol	50 U
4-nitrophenol	50 U
4,6-dinitro-2-methylphenol	50 U
pentachlorophenol	50 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Extracted: 11/02/89
Date Analyzed: 11/15/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 42-7
Lab Sample ID: JJ8485

phenol	10 U
2-chlorophenol	10 U
2-nitrophenol	10 U
2,4-dimethylphenol	10 U
2,4-dichlorophenol	10 U
4-chloro-3-methylphenol	10 U
2,4,6-trichlorophenol	10 U
2,4-dinitrophenol	50 U
4-nitrophenol	50 U
4,6-dinitro-2-methylphenol	50 U
pentachlorophenol	50 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Extracted: 11/02/89
Date Analyzed: 11/15/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 42-8
Lab Sample ID: JJ8486

phenol	10 U
2-chlorophenol	10 U
2-nitrophenol	10 U
2,4-dimethylphenol	10 U
2,4-dichlorophenol	10 U
4-chloro-3-methylphenol	10 U
2,4,6-trichlorophenol	10 U
2,4-dinitrophenol	51 U
4-nitrophenol	51 U
4,6-dinitro-2-methylphenol	51 U
pentachlorophenol	51 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Extracted: 11/02/89
Date Analyzed: 11/15/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 42-9
Lab Sample ID: JJ8487

phenol	10 U
2-chlorophenol	10 U
2-nitrophenol	10 U
2,4-dimethylphenol	10 U
2,4-dichlorophenol	10 U
4-chloro-3-methylphenol	10 U
2,4,6-trichlorophenol	10 U
2,4-dinitrophenol	50 U
4-nitrophenol	50 U
4,6-dinitro-2-methylphenol	50 U
pentachlorophenol	50 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Extracted: 11/02/89
Date Analyzed: 11/15/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: RIN-1
Lab Sample ID: JJ8488

phenol	10 U
2-chlorophenol	10 U
2-nitrophenol	10 U
2,4-dimethylphenol	10 U
2,4-dichlorophenol	10 U
4-chloro-3-methylphenol	10 U
2,4,6-trichlorophenol	10 U
2,4-dinitrophenol	50 U
4-nitrophenol	50 U
4,6-dinitro-2-methylphenol	50 U
pentachlorophenol	50 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Extracted: 11/02/89
Date Analyzed: 11/15/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

WATER SURROGATE PERCENT RECOVERY SUMMARY

Sample No.	SEMI-VOLATILE					
	Nitro-Benzene-D5 (35-114%)*	2-Fluoro-Biphenyl (43-116%)*	Terphenyl-D14 (33-141%)*	Phenol-D5 (10-94%)*	2-Fluoro-Phenol (21-100%)*	2,4,6-Tribromo-Phenol (10-123%)*
42-6	61	52	64	24	35	64
42-7	66	58	56	25	38	77
42-8	85	69	81	32	47	89
42-9	93	80	113	38	54	86
RIN-1	95	90	139	40	59	92
Method Blank	78	69	102	29	44	70

*Values in parenthesis represent USEPA contract required QC limits.

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

PESTICIDES AND HERBICIDES ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID:	Method Blank	42-6	42-7	42-8	42-9
Lab Sample ID:	<u>BLA0035/A0023</u>	<u>JJ8479</u>	<u>JJ8480</u>	<u>JJ8481</u>	<u>JJ8482</u>
Lindane	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Endrin	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Methoxychlor	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Toxaphene	0.0004 U	0.0004 U	0.0004 U	0.0004 U	0.0004 U
2,4-D	0.0002 U	0.0002 U	0.0003 U	0.0002 U	0.0002 U
Silvex	0.0001 U	0.0001 U	0.0001 U	0.0001 U	0.0001 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Extracted: 11/02/89 and 11/03/89
Date Analyzed: 11/07-08/89 (Pesticides)
11/12/89 (Herbicides)

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

PESTICIDES AND HERBICIDES ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID:	RIN-1
Lab Sample ID:	<u>JJ8483</u>
Lindane	0.0001 U
Endrin	0.0001 U
Methoxychlor	0.0001 U
Toxaphene	0.0004 U
2,4-D	0.0002 U
Silvex	0.0001 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Extracted: 11/02/89 and 11/03/89
Date Analyzed: 11/07-08/89 (Pesticides)
11/12/89 (Herbicides)

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

DISSOLVED METALS ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID: Method Blank
Lab Sample ID: PBFC0914/C0906

Arsenic	0.002 U
Barium	0.002 U
Cadmium	0.005 U
Chromium	0.01 U
Copper	0.01 U
Iron	0.02
Lead	0.002
Manganese	0.002 U
Nickel	0.02 U
Selenium	0.002 U
Silver	0.005 U
Sodium	0.2 U
Vanadium	0.01 U
Zinc	0.017
Mercury	NR

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

NR - Not required.

Date Digested: 11/01/89
Date Analyzed: 11/02/89 (ICP)
 11/07/89 (GFAA)
 11/01/89 (CVAA)

IT Corporation
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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

DISSOLVED METALS ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID:	42-6	42-7	42-8	42-9	RIN-1
Lab Sample ID:	<u>JJ8504</u>	<u>JJ8505</u>	<u>JJ8506</u>	<u>JJ8507</u>	<u>JJ8508</u>
Arsenic	0.021 U*	0.003 U*	0.027 U*	0.031 U*	0.002 U
Barium	0.15	0.26	0.50	0.036	0.009
Cadmium	0.005 U				
Chromium	0.08	0.04	0.06	0.04	0.01 U
Copper	0.03	0.01 U	0.02	0.05	0.01 U
Iron	53.5	23.3	22.4	17.4	0.08
Lead	0.042	0.018 U*	0.030 U	0.013	0.002 U
Manganese	0.055	0.16	0.26	0.016	0.002 U
Nickel	0.02 U	0.02 U	0.03	0.02 U	0.02 U
Selenium	0.014 U*	0.013 U*	0.017 U*	0.015 *	0.003 U*
Silver	0.005 U				
Sodium	9.0	80.9	40.4	7.3	0.4
Vanadium	0.12	0.04	0.07	0.02	0.01 U
Zinc	0.081	0.037	0.067	0.038	0.023
Mercury	0.001 U				

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

* - Detection limit higher than normal due to sample matrix interferences.

Date Digested: 11/01/89
Date Analyzed: 11/02/89 (ICP)
11/07/89 (GFAA)
11/01/89 (CVAA)

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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

TOTAL METALS ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID: Method Blank
Lab Sample ID: PBWC0910/C0904

Arsenic	0.003 U
Barium	0.002 U
Cadmium	0.005 U
Chromium	0.01 U
Copper	0.01 U
Iron	0.01
Lead	0.002
Manganese	0.002 U
Nickel	0.02 U
Selenium	0.002 U
Silver	0.005 U
Sodium	0.2 U
Vanadium	0.01 U
Zinc	0.013
Mercury	NR

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

NR - Not required.

Date Digested: 11/01/89
Date Analyzed: 11/02/89 (ICP)
 11/07/89 (GFAA)
 11/01/89 (CVAA)

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November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

TOTAL METALS ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID:	42-6	42-7	42-8	42-9	RIN-1
Lab Sample ID:	<u>JJ8509</u>	<u>JJ8510</u>	<u>JJ8511</u>	<u>JJ8512</u>	<u>JJ8513</u>
Arsenic	0.03 U	0.028 U*	0.027 U*	0.03 U*	0.004 U*
Barium	0.091	0.31	0.67	0.036	0.002 U
Cadmium	0.005 U	0.005 U	0.005 U	0.005	0.005 U
Chromium	0.05	0.08	0.14	0.06	0.01 U
Copper	0.02	0.01 U	0.02	0.02	0.01 U
Iron	31.1	34.3	51.3	33.8	0.04
Lead	0.042	0.030 U	0.030 U	0.015	0.003 U*
Manganese	0.030	0.16	0.27	0.040	0.002 U
Nickel	0.02 U	0.02 U	0.04	0.02 U	0.02 U
Selenium	0.011 U*	0.016 U*	0.020 U*	0.011	0.004 U*
Silver	0.005 U				
Sodium	4.6	77.9	41.0	9.6	1.9
Vanadium	0.06	0.07	0.17	0.04	0.01 U
Zinc	0.054	0.056	0.10	0.13	0.011
Mercury	0.001 U				

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

* - Detection limit higher than normal due to sample matrix interferences.

Date Digested: 11/01/89
Date Analyzed: 11/02/89 (ICP)
11/07/89 (GFAA)
11/01/89 (CVAA)

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

TURBIDITY ANALYSIS

Results in NTU's

Sample Matrix: Water

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Result</u>
Method Blank	P0575	0.15
42-6	JJ8499	900
42-7	JJ8500	1,100
42-8	JJ8501	2,800
42-9	JJ8502	500
RIN-1	JJ8503	0.11

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Analyzed: 10/31/89

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November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Nitrate, as N</u>	<u>Sulfate</u>	<u>Fluoride</u>	<u>Chloride</u>
Method Blank	P0607/P0614/ P0612/P0622	0.05 U	10 U	0.10 U	0.75
42-6	JJ8499	0.07	10 U	0.10 U	12
42-7	JJ8500	0.06	540	0.10 U	64
42-8	JJ8501	0.05	810	0.10 U	40
42-9	JJ8502	0.08	10	0.10 U	13
RIN-1	JJ8503	0.05	10 U	0.10 U	1.2
Date of Analysis		11/09/89	11/10/89	11/10/89	11/14/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

IT Corporation
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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

TOTAL COLIFORM ANALYSIS
Results in colonies/100 ml
Sample Matrix: Water

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Result</u>
Method Blank	P0576	1 U
42-6	JJ8489	16,000
42-7	JJ8490	20,000
42-8	JJ8491	6,600
42-9	JJ8492	4,800
RIN-1	JJ8493	1 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Analyzed: 10/31/89

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November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

CYANIDE ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Result</u>
Method Blank	P0608	0.01 U
42-6	JJ8494	0.01 U
42-7	JJ8495	0.01 U
42-8	JJ8496	0.01 U
42-9	JJ8497	0.01 U
RIN-1	JJ8498	0.01 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Analyzed: 11/09/89

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November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

TOTAL HEXAVALENT CHROMIUM ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Result</u>
Method Blank	P0574	0.02 U
42-6	JJ8509	0.02 U
42-7	JJ8510	0.02 U
42-8	JJ8511	0.02 U
42-9	JJ8512	0.02 U
RIN-1	JJ8513	0.02 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Analyzed: 10/31/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44472

DISSOLVED HEXAVALENT CHROMIUM ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Result</u>
Method Blank	P0577	0.02 U
42-6	JJ8504	0.02 U
42-7	JJ8505	0.02 U
42-8	JJ8506	0.02 U
42-9	JJ8507	0.02 U
RIN-1	JJ8508	0.02 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Analyzed: 10/31/89



INTERNATIONAL
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ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

International Technology Corp.
ITAS-Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
Attn: Mary Tyler

Date: November 15, 1989

ITMWL Job Number: ITAB 35673
ITSTU Job Number: ITET 44472

This is the Certificate of Analysis for the following samples:

Client Project ID: ITET 44472
Date Received by Lab: 11/01/89
Number of Samples: Five (5)
Sample Type: Water

I. Introduction

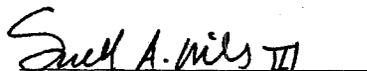
On November 1, 1989, five (5) water samples arrived at the ITAS Oak Ridge, Tennessee laboratory from ITAS-Knoxville, Knoxville, Tennessee. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

Data are reported with the qualifier "U" if the compound was analyzed for but not detected. Lists with concentration unit code and lab and client suffix code definitions are attached.

II. Analytical Results/Methodology

The samples were analyzed for Total Organic Halides. Results are presented in the following report and were determined using Method 9020, Test Methods for Evaluating Solid Waste, USEPA SW-846, 3rd edition, 1986.

Reviewed and Approved


Snell A. Mills III
Laboratory Manager

SAM/rdj

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

ITAS-Knoxville
ATTN: Mary Tyler
Date: November 15, 1989

IT ANALYTICAL SERVICES
OAK RIDGE, TN
Page 2 of 2
Job Number: ITAB 35673

Date Received: 11/01/89

Sample Description: Water Concentration Units: mg/L

Client ID:	42-6,	42-7,	42-8,	42-9,	RIN-1	
IT-MWL ID:	MM1121,	MM1122,	MM1123,	MM1124,	MM1125,	BLANK
IT-STU ID:	JJ8514,	JJ8515,	JJ8516,	JJ8517,	JJ8518	

Prep and Anal Date: 11/09/89

T O X

Client ID:	<u>42-6</u>	<u>42-7</u>	<u>42-8</u>	<u>42-9</u>	<u>RIN-1</u>	<u>BLANK</u>
Average Result:	0.019	0.028	0.057	0.025	<0.010	<0.010



ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

International Technology Corp.
ITAS-Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
Attn: Alyce Moore

Date: November 30, 1989

ITMWL Job Number: ITAB 35699
ITSTU Job Number: ITET 44472

This is the Certificate of Analysis for the following samples:

Client Project ID: ITET 44472
Date Received by Lab: 11/10/89
Number of Samples: Five (5)
Sample Type: Water

I. Introduction

On November 10, 1989, five (5) water samples arrived at the ITAS Oak Ridge, Tennessee laboratory from ITAS-Knoxville, Knoxville, Tennessee. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

Data are reported with the qualifier "U" if the compound was analyzed for but not detected. Lists with concentration unit code and lab and client suffix code definitions are attached.

II. Analytical Results/Methodology

The samples were analyzed for Total Organic Carbon. Results are presented in the following report and were determined using Method 9060, Test Methods for Evaluating Solid Waste, USEPA SW-846, 3rd edition, 1986.

Reviewed and Approved

Snell A. Mills III
Laboratory Manager

SAM/rdj

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

ITAS-Knoxville
ATTN: Alyce Moore
Date: November 30, 1989

IT ANALYTICAL SERVICES
OAK RIDGE, TN

Page 2 of 2
Job Number: ITAB 35699

Date Received: 11/10/89

Sample Description: Water Concentration Units: mg/L

Client ID: 41-6, 41-7, 41-8, 41-9, RIN-1
IT-MWL ID: MM1460, MM1461, MM1462, MM1463, MM1464, BLANK
IT-STU ID: JJ8474, JJ8475, JJ8476, JJ8477, JJ8478

Prep and Anal Date: 11/20/89

TOC

Client ID:	<u>42-6</u>	<u>42-7</u>	<u>42-8</u>	<u>42-9</u>	<u>RIN-1</u>	<u>BLANK</u>
Average Result:	72.2	235.	139.	12.6	5.90	<1.00
Sample Range:	70.9-73.5	231.-237.	138.-141.	12.4-13.0	5.35-6.52	<1.00-<1.00



INTERNATIONAL
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ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

IT Corporation
3012 US Highway 301 North, Suite 1000
Tampa, Florida 33619
ATTN: Mark Hampton

November 30, 1989

Job Number: ITET 44487

P.O. Number: 453058

This is the Certificate of Analysis for the following samples:

Client Project ID: NAS JAX
Date Received by Lab: 11/01/89
Number of Samples: Twelve (12)
Sample Type: Water-eight (8), Rinsate-two (2), Trip Blank-two (2)

I. Introduction

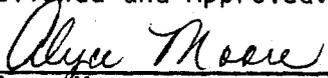
On 11/01/89, eight (8) water samples, two (2) rinsates and two (2) trip blanks arrived at the ITAS-Knoxville, Tennessee laboratory for the NAS/JAX project from the IT-Tampa office. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

II. Analytical Results/Methodology

The analytical results for this report are presented by analytical test. Each set of data will include sample identification information and the analytical results. Please note that all data are blank corrected, i.e., if any compound is found in the corresponding laboratory blank, it is subtracted from the analytical result before it is reported. As requested, the samples for dissolved metals analyses were filtered and preserved upon receipt. Analysis of rinsate sample RIN-2 was cancelled by Mark Hampton on 11/03/89.

The total organic carbon (TOC) analyses were performed at the IT-Mixed Waste Laboratory (IT-MWL) in Oak Ridge, Tennessee. A separate laboratory report is included.

Reviewed and Approved:


Alyce Moore
Laboratory Manager

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

II. Analytical Results/Methodology (continued)

The samples were analyzed for the requested volatile and semivolatile organic compounds by gas chromatography/mass spectroscopy (GC/MS) based on EPA SW-846 methods 8240 and 8270, respectively.

The samples were analyzed for the requested pesticides and herbicides by gas chromatography-electron capture detection (GC-ECD) based on EPA method 608 and method 509B, Standard Methods for the Examination of Water and Wastewater, 16th edition, 1985, respectively.

The samples were analyzed for the requested total and dissolved metals by inductively coupled plasma spectroscopy (ICP), graphite furnace atomic absorption spectroscopy (GFAA), and cold vapor atomic absorption spectroscopy (CVAA) based on EPA SW-846 methods 3010, 6010, 3020, 7421, 7740, and 7470.

The samples were analyzed for total and dissolved hexavalent chromium by colorimetric determination according to method 312B, Standard Methods for the Examination of Water and Wastewater, 16th edition, 1985.

The total coliform bacterial densities were determined using the membrane filter technique described in method 909A, Standard Methods for the Examination of Water and Wastewater, 16th edition, 1985.

The samples were analyzed for complexed cyanide by manual distillation/colorimetric determination using EPA method 335.2.

The samples were analyzed for turbidity according to EPA method 180.1.

The samples were analyzed for nitrate and sulfate by colorimetric determination based on EPA methods 353.3 and 375.4, respectively.

The samples were analyzed for chloride by titration according to EPA method 325.3.

The samples were analyzed for fluoride using an ion-specific electrode according to EPA method 340.2.

IT Corporation
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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

III. Quality Control

Routine laboratory level I QC was followed.

The volatiles analyses were performed on 11/09 and 11/10/89 by purge and trap with J&W DB-624 Megabore column on a Finnigan OWA GC/MS/DS. The semivolatiles analyses were performed on 11/13 and 11/14/89 by direct injection of sample extract on a J&W DB-5 capillary column on a VG TRIO-1 GC/MS/DS. The volatiles runs went well. Standardization was done for all analytes except trifluoroethane and 2-ethoxyethanol, which were looked for as tentatively identified compounds (TIC's) based on spectral matching of peaks with the NIH mass spectral data base. The quantitation limits for these compounds were estimated, based on earlier studies and response of similar compounds. There were indications that 2-ethoxyethanol, especially, might be more amenable to some alternate approach, for example, additional analysis by direct injection. Among other analytes, pyridine and isobutanol standards were run at separate times from the samples because these compounds tended to soil the system. We found we could see pyridine in a semivolatiles run. We looked for it in the samples and saw none; further studies on extraction efficiency would be required before quantitation limits for this approach could be reported. The semivolatiles runs went well. There were no other problems seen in final review of the data.

The samples were extracted for pesticides and herbicides on 11/07/89 and analyzed on 11/09/89 for pesticides and 11/12/89 for herbicides. No problems were encountered.

The samples were digested on 11/08/89 for ICP and GFAA. The samples for mercury analysis were prepared just prior to analysis. The CVAA analysis for mercury was performed on 11/03/89; the GFAA analyses for lead and selenium were performed on 11/13/89 and 11/28/89; the remaining metals were analyzed by ICP on 11/16/89. All run QC was acceptable. Due to matrix interferences, the values from ICP were reported for lead for samples 41-3, 41-4, 41-5, 41-6 and 42-5 both total and dissolved fractions. No other problems were encountered. The ICP value was used for sample 42-5 (dissolved) for selenium due to severe matrix problems.

The hexavalent chromium analyses were performed on 11/01/89. Elevated detection limits were reported for samples 41-4 and 41-6 due to the turbidity of the samples.

The total coliform determinations were performed on 11/01/89. Elevated detection limits were reported for most samples. Dilutions were necessary for these analyses due to the turbidity of the samples. No other problems were encountered.

The complexed cyanide determinations were performed on 11/09 and 11/14/89. No problems were encountered.

The turbidity of the samples was measured on 11/02/89. No problems were encountered.

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November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

III. Quality Control (continued)

The nitrate and sulfate determinations were performed on 11/13/89 and 11/10/89, respectively. Elevated detection limits were reported for sulfate for samples 41-4 and 41-6 due to the turbidity of the samples. No other problems were encountered.

The chloride analyses were performed on 11/14/89. No problems were encountered.

The fluoride determinations were performed on 11/10/89. No problems were encountered.

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Method Blank 1
Lab Sample ID: VB11092

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	2 J	toluene	5 U
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	5 U	total xylenes	5 U
chloroform	5 U	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	10 U	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	5 U	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Analyzed: 11/09/89

This method blank applies to the following samples: Trip Blank, Trip Blank, 41-1.

IT Corporation
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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 41-1
Lab Sample ID: JJ8593

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	5 U	toluene	5 U
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	7	total xylenes	5 U
chloroform	5 U	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	10 U	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	5 U	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Analyzed: 11/09/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

VOLATILE ORGANIC ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID: Trip Blank
Lab Sample ID: JJ8603

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	5 U	toluene	5 U
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	5 U	total xylenes	5 U
chloroform	5 U	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	10 U	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	5 U	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Analyzed: 11/09/89

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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Trip Blank
Lab Sample ID: JJ8604

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	5 U	toluene	5 U
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	5 U	total xylenes	5 U
chloroform	5 U	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	10 U	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	5 U	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Analyzed: 11/09/89

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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Method Blank 2
Lab Sample ID: VB1110

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	5 U	toluene	5 U
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	5 U	total xylenes	5 U
chloroform	5 U	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	10 U	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	5 U	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Analyzed: 11/10/89

This method blank applies to the following samples: 41-2, 41-2A, 41-3, 41-4, 41-5, 41-6, 42-5, PW-1, RIN-2.

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KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 41-2
Lab Sample ID: JJ8594

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	5 U	toluene	5 U
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	5 U	total xylenes	5 U
chloroform	5 U	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	10 U	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	5 U	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Analyzed: 11/10/89

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5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

VOLATILE ORGANIC ANALYSIS

Results in ug/liter (ppb)

Sample Matrix: Water

Client Sample ID: 41-2A
Lab Sample ID: JJ8595

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	5 U	toluene	5 U
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	5 U	total xylenes	5 U
chloroform	5 U	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	10 U	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	5 U	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Analyzed: 11/10/89

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IT ANALYTICAL SERVICES
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KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 41-3
Lab Sample ID: JJ8596

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	5 U	toluene	5 U
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	33	total xylenes	5 U
chloroform	5 U	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	10 U	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	5 U	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Analyzed: 11/10/89

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IT ANALYTICAL SERVICES
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KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 41-4
Lab Sample ID: JJ8597

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	18	toluene	2 J
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	3 J	total xylenes	5 U
chloroform	5 U	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	9 J	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	5 U	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Analyzed: 11/10/89

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IT ANALYTICAL SERVICES
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KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 41-5
Lab Sample ID: JJ8598

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	5 U	toluene	5 U
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	8	total xylenes	5 U
chloroform	5 U	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	10 U	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	5 U	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Analyzed: 11/10/89

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KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

VOLATILE ORGANIC ANALYSIS

Results in ug/liter (ppb)

Sample Matrix: Water

Client Sample ID: 41-6
Lab Sample ID: JJ8599

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	5 U	toluene	5 U
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	5 U	total xylenes	5 U
chloroform	5 U	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	10 U	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	5 U	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

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KNOXVILLE, TN

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Job Number: ITET 44487

VOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 42-5
Lab Sample ID: JJ8600

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	5 U	toluene	5 U
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	5 U	total xylenes	5 U
chloroform	5 U	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	10 U	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	5 U	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Analyzed: 11/10/89

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IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

VOLATILE ORGANIC ANALYSIS

Results in µg/liter (ppb)

Sample Matrix: Water

Client Sample ID: PW-1
Lab Sample ID: JJ8601

<u>Compound</u>		<u>Compound</u>	
vinyl chloride	10 U	tetrachloroethene	5 U
methylene chloride	5 U	toluene	5 U
carbon disulfide	5 U	chlorobenzene	5 U
1,1-dichloroethane	5 U	total xylenes	5 U
chloroform	11	trichlorofluoromethane	5 U
1,2-dichloroethane	5 U	isobutanol	5,000 U
2-butanone	10 U	2-nitropropane	5 U
1,1,1-trichloroethane	5 U	1,2-dibromoethane	5 U
carbon tetrachloride	5 U	1,2-dichlorobenzene	5 U
trichloroethene	5 U	1,2,2-trifluoroethane	200 U
1,1,2-trichloroethane	5 U	2-ethoxyethanol	2,000,000 U
benzene	5 U	pyridine	5,000 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Analyzed: 11/10/89

WATER SURROGATE PERCENT RECOVERY SUMMARY

Sample No.	VOLATILE		
	Toluene-D8 (88-110%)*	BFB (86-115%)*	1,2 Dichloroethane-D4 (76-114%)*
Method Blank 1	99	97	100
Trip Blank	95	94	91
Trip Blank	95	96	93
41-1	96	97	92
Method Blank 2	100	100	101
41-2	96	99	103
41-2A	95	96	97
41-3	94	99	101
41-4	99	102	102
41-5	92	97	99
41-6	98	102	105
42-5	90	95	101
PW-1	101	102	103

*Values in parenthesis represent USEPA contract required QC limits.

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IT ANALYTICAL SERVICES
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KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: Method Blank
Lab Sample ID: BL0040

phenol	10 U
2-chlorophenol	10 U
2-nitrophenol	10 U
2,4-dimethylphenol	10 U
2,4-dichlorophenol	10 U
4-chloro-3-methylphenol	10 U
2,4,6-trichlorophenol	10 U
2,4-dinitrophenol	50 U
4-nitrophenol	50 U
4,6-dinitro-2-methylphenol	50 U
pentachlorophenol	50 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Extracted: 11/06/89
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IT ANALYTICAL SERVICES
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KNOXVILLE, TN

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Job Number: ITET 44487

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 41-1
Lab Sample ID: JJ8625

phenol	10 U
2-chlorophenol	10 U
2-nitrophenol	10 U
2,4-dimethylphenol	10 U
2,4-dichlorophenol	10 U
4-chloro-3-methylphenol	10 U
2,4,6-trichlorophenol	10 U
2,4-dinitrophenol	50 U
4-nitrophenol	50 U
4,6-dinitro-2-methylphenol	50 U
pentachlorophenol	50 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Extracted: 11/06/89
Date Analyzed: 11/13/89

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KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 41-2
Lab Sample ID: JJ8626

phenol	10 U
2-chlorophenol	10 U
2-nitrophenol	10 U
2,4-dimethylphenol	10 U
2,4-dichlorophenol	10 U
4-chloro-3-methylphenol	10 U
2,4,6-trichlorophenol	10 U
2,4-dinitrophenol	52 U
4-nitrophenol	52 U
4,6-dinitro-2-methylphenol	52 U
pentachlorophenol	52 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Extracted: 11/06/89
Date Analyzed: 11/13/89

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KNOXVILLE, TN

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Job Number: ITET 44487

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 41-2A
Lab Sample ID: JJ8627

phenol	10 U
2-chlorophenol	10 U
2-nitrophenol	10 U
2,4-dimethylphenol	10 U
2,4-dichlorophenol	10 U
4-chloro-3-methylphenol	10 U
2,4,6-trichlorophenol	10 U
2,4-dinitrophenol	50 U
4-nitrophenol	50 U
4,6-dinitro-2-methylphenol	50 U
pentachlorophenol	50 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

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Date Analyzed: 11/13/89

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SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 41-3
Lab Sample ID: JJ8628

phenol	10 U
2-chlorophenol	10 U
2-nitrophenol	10 U
2,4-dimethylphenol	10 U
2,4-dichlorophenol	10 U
4-chloro-3-methylphenol	10 U
2,4,6-trichlorophenol	10 U
2,4-dinitrophenol	51 U
4-nitrophenol	51 U
4,6-dinitro-2-methylphenol	51 U
pentachlorophenol	51 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.
J - Indicates an estimated value less than the detection limit.

Date Extracted: 11/06/89
Date Analyzed: 11/13/89

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KNOXVILLE, TN

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SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 41-4
Lab Sample ID: JJ8629

phenol	94
2-chlorophenol	10 U
2-nitrophenol	10 U
2,4-dimethylphenol	10 U
2,4-dichlorophenol	10 U
4-chloro-3-methylphenol	10 U
2,4,6-trichlorophenol	10 U
2,4-dinitrophenol	51 U
4-nitrophenol	51 U
4,6-dinitro-2-methylphenol	51 U
pentachlorophenol	51 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Extracted: 11/06/89
Date Analyzed: 11/14/89

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KNOXVILLE, TN

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SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 41-5
Lab Sample ID: JJ8630

phenol	10 U
2-chlorophenol	10 U
2-nitrophenol	10 U
2,4-dimethylphenol	10 U
2,4-dichlorophenol	10 U
4-chloro-3-methylphenol	10 U
2,4,6-trichlorophenol	10 U
2,4-dinitrophenol	50 U
4-nitrophenol	50 U
4,6-dinitro-2-methylphenol	50 U
pentachlorophenol	50 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Extracted: 11/06/89
Date Analyzed: 11/13/89

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SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 41-6
Lab Sample ID: JJ8631

phenol	10 U
2-chlorophenol	10 U
2-nitrophenol	10 U
2,4-dimethylphenol	10 U
2,4-dichlorophenol	10 U
4-chloro-3-methylphenol	10 U
2,4,6-trichlorophenol	10 U
2,4-dinitrophenol	52 U
4-nitrophenol	52 U
4,6-dinitro-2-methylphenol	52 U
pentachlorophenol	52 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Extracted: 11/06/89
Date Analyzed: 11/14/89

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KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: 42-5
Lab Sample ID: JJ8632

phenol	10 U
2-chlorophenol	10 U
2-nitrophenol	10 U
2,4-dimethylphenol	10 U
2,4-dichlorophenol	10 U
4-chloro-3-methylphenol	10 U
2,4,6-trichlorophenol	10 U
2,4-dinitrophenol	50 U
4-nitrophenol	50 U
4,6-dinitro-2-methylphenol	50 U
pentachlorophenol	50 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Extracted: 11/06/89
Date Analyzed: 11/13/89

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KNOXVILLE, TN

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Job Number: ITET 44487

SEMIVOLATILE ORGANIC ANALYSIS

Results in $\mu\text{g/liter}$ (ppb)

Sample Matrix: Water

Client Sample ID: PW-1
Lab Sample ID: JJ8633

phenol	10 U
2-chlorophenol	10 U
2-nitrophenol	10 U
2,4-dimethylphenol	10 U
2,4-dichlorophenol	10 U
4-chloro-3-methylphenol	10 U
2,4,6-trichlorophenol	10 U
2,4-dinitrophenol	50 U
4-nitrophenol	50 U
4,6-dinitro-2-methylphenol	50 U
pentachlorophenol	50 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

J - Indicates an estimated value less than the detection limit.

Date Extracted: 11/06/89
Date Analyzed: 11/13/89

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KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

WATER SURROGATE PERCENT RECOVERY SUMMARY

Sample No.	SEMI-VOLATILE					
	Nitro-Benzene-D5 (35-114%)*	2-Fluoro-Biphenyl (43-116%)*	Terphenyl-D14 (33-141%)*	Phenol-D5 (10-94%)*	2-Fluoro-Phenol (21-100%)*	2,4,6-Tribromo-Phenol (10-123%)*
41-1	68	65	101	29	48	86
41-2	70	66	97	28	46	81
41-2A	73	66	102	29	48	78
41-3	68	66	73	29	45	78
41-4	64	51	54	26	43	74
41-5	68	63	86	28	45	82
41-6	62	50	43	30	47	81
42-5	62	61	95	34	50	74
PW-1	66	62	119	26	43	61
Method Blank	58	54	105	18	31	66

*Values in parenthesis represent USEPA contract required QC limits.

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

PESTICIDES AND HERBICIDES ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID: Lab Sample ID:	<u>41-1</u> <u>JJ8675</u>	<u>41-2</u> <u>JJ8676</u>	<u>41-2A</u> <u>JJ8677</u>	<u>41-3</u> <u>JJ8678</u>
Lindane	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Endrin	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Methoxychlor	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Toxaphene	0.0004 U	0.0004 U	0.0004 U	0.0004 U
2,4-D	0.0005	0.0002	0.0002 U	0.0002 U
Silvex	0.0001 U	0.0001 U	0.0001 U	0.0001 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Extracted: 11/07/89
Date Analyzed: 11/12/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

PESTICIDES AND HERBICIDES ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID:	41-4	41-5	41-6	42-5
Lab Sample ID:	<u>JJ8679</u>	<u>JJ8680</u>	<u>JJ8681</u>	<u>JJ8682</u>
Lindane	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Endrin	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Methoxychlor	0.0001 U	0.0001 U	0.0001 U	0.0001 U
Toxaphene	0.0004 U	0.0004 U	0.0004 U	0.0004 U
2,4-D	0.0002 U	0.0002 U	0.0006 U	0.0002 U
Silvex	0.0001 U	0.0001 U	0.0001 U	0.0001 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Extracted: 11/07/89
Date Analyzed: 11/12/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

PESTICIDES AND HERBICIDES ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID:	Method Blank	PW-1
Lab Sample ID:	<u>BLA0046/A0045</u>	<u>JJ8683</u>
Lindane	0.0001 U	0.0001 U
Endrin	0.0001 U	0.0001 U
Methoxychlor	0.0001 U	0.0001 U
Toxaphene	0.0004 U	0.0004 U
2,4-D	0.0002 U	0.0002 U
Silvex	0.0001 U	0.0001 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Extracted: 11/07/89

Date Analyzed: 11/12/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

TOTAL METALS ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID: Lab Sample ID:	Method Blank <u>PBWC0951/C0985</u>	<u>41-1</u> <u>JJ8655</u>	<u>41-2</u> <u>JJ8656</u>	<u>41-2A</u> <u>JJ8657</u>
arsenic	0.003 U	0.009	0.016	0.007 U*
barium	0.002 U	0.30	0.093	0.072
cadmium	0.005 U	0.058	0.088	0.098
chromium	0.01 U	0.04	0.05	0.03
copper	0.01 U	0.09	0.08	0.05
iron	0.01 U	25.9	21.9	17.1
lead	0.002 U	0.036	0.015	0.016
manganese	0.002 U	0.12	0.11	0.11
nickel	0.02 U	0.02 U	0.02 U	0.02 U
selenium	0.002 U	0.012 U*	0.005 U*	0.004 U*
silver	0.005 U	0.005 U	0.005 U	0.005 U
sodium	0.2 U	30.9	16.6	17.2
vanadium	0.01 U	0.05	0.06	0.04
zinc	0.005 U	1.4	2.1	3.2
mercury	NR	0.001 U	0.001 U	0.001 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

* - Detection limit higher than normal due to sample matrix interferences.

NR - Not required.

Date Digested: 11/08/89
Date Analyzed: 11/16/89 (ICP)
11/28/89 (GFAA)
11/03/89 (CVAA)

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

TOTAL METALS ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID:	41-3	41-4	41-5	41-6
Lab Sample ID:	<u>JJ8658</u>	<u>JJ8659</u>	<u>JJ8660</u>	<u>JJ8661</u>
arsenic	0.004	0.052	0.016 U*	0.032 U*
barium	0.24	0.26	0.24	0.72
cadmium	0.032	0.11	0.041	0.37
chromium	0.03	0.12	0.05	1.1
copper	0.04	0.07	0.01	0.36
iron	11.7	16.0	25.9	30.8
lead	0.03 U	0.07	0.03 U	0.20
manganese	0.52	0.039	0.11	0.31
nickel	0.03	0.18	0.02 U	0.09
selenium	0.012 U*	0.016 U*	0.005 U*	0.018 U*
silver	0.005 U	0.005 U	0.005 U	0.028
sodium	118	805	191	334
vanadium	0.04	0.39	0.07	0.21
zinc	0.98	3.5	1.7	11.1
mercury	0.001 U	0.001	0.001 U	0.003

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

* - Detection limit higher than normal due to sample matrix interferences.

Date Digested: 11/08/89
Date Analyzed: 11/16/89 (ICP)
11/28/89 (GFAA)
11/03/89 (CVAA)

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

TOTAL METALS ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID:	42-5	PW-1
Lab Sample ID:	<u>JJ8662</u>	<u>JJ8663</u>
arsenic	0.026	0.002 U
barium	0.23	0.002 U
cadmium	0.060	0.037
chromium	0.05	0.02
copper	0.06	0.09
iron	7.7	0.31
lead	0.03	0.002
manganese	0.21	0.006
nickel	0.03	0.02
selenium	0.026 U*	0.003 U*
silver	0.005 U	0.005 U
sodium	45.6	0.2 U
vanadium	0.03	0.01 U
zinc	2.0	1.3
mercury	0.001 U	0.001 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

* - Detection limit higher than normal due to sample matrix interferences.

Date Digested: 11/08/89
Date Analyzed: 11/16/89 (ICP)
11/28/89 (GFAA)
11/03/89 (CVAA)

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

DISSOLVED METALS ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID:	Method Blank	PW-1
Lab Sample ID:	<u>PBFC0952/C0986</u>	<u>JJ8673</u>
arsenic	0.002 U	0.002 U
barium	0.002 U	0.002 U
cadmium	0.005 U	0.009
chromium	0.01 U	0.01 U
copper	0.01 U	0.01 U
iron	0.01	0.76
lead	0.002 U	0.002
manganese	0.002 U	0.008
nickel	0.02 U	0.02 U
selenium	0.002 U	0.003 U*
silver	0.005 U	0.005 U
sodium	0.2 U	0.2 U
vanadium	0.01 U	0.01 U
zinc	0.010	0.96
mercury	NR	0.001 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

* - Detection limit higher than normal due to sample matrix interferences.

NR - Not required.

Date Digested: 11/08/89
Date Analyzed: 11/16/89 (ICP)
11/28/89 (GFAA)
11/03/89 (CVAA)

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

DISSOLVED METALS ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID:	41-1	41-2	41-2A	41-3
Lab Sample ID:	<u>JJ8665</u>	<u>JJ8666</u>	<u>JJ8667</u>	<u>JJ8668</u>
arsenic	0.009	0.006	0.002	0.008 U*
barium	0.18	0.060	0.036	0.16
cadmium	0.027	0.022	0.005 U	0.030
chromium	0.02	0.01	0.01 U	0.01
copper	0.03	0.01	0.01 U	0.01
iron	19.5	9.2	0.62	6.7
lead	0.013 U*	0.005	0.024 U*	0.03 U
manganese	0.11	0.081	0.057	0.48
nickel	0.02 U	0.02 U	0.02 U	0.02 U
selenium	0.004 U*	0.003 U	0.002 U	0.005 U*
silver	0.005 U	0.005 U	0.005 U	0.005 U
sodium	33.7	16.3	16.2	116
vanadium	0.02	0.02	0.01 U	0.02
zinc	0.74	0.80	0.70	1.1
mercury	0.001 U	0.001 U	0.001 U	0.001 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

* - Detection limit higher than normal due to sample matrix interferences.

Date Digested: 11/08/89
Date Analyzed: 11/16/89 (ICP)
11/28/89 (GFAA)
11/03/89 (CVAA)

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

DISSOLVED METALS ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

Client Sample ID:	41-4	41-5	41-6	42-5
Lab Sample ID:	<u>JJ8669</u>	<u>JJ8670</u>	<u>JJ8671</u>	<u>JJ8672</u>
arsenic	0.047	0.020 U*	0.021 U*	0.03 U*
barium	0.10	0.11	0.44	0.18
cadmium	0.035	0.19	0.058	0.010
chromium	0.06	0.02	0.83	0.04
copper	0.05	0.13	0.17	0.01 U
iron	3.2	7.8	7.6	8.0
lead	0.04	0.16	0.09	0.03 U
manganese	0.021	0.078	0.22	0.20
nickel	0.15	0.04	0.06	0.02 U
selenium	0.004	0.003	0.012 U*	0.020 U*
silver	0.006	0.057	0.057	0.005 U
sodium	807	191	320	43.4
vanadium	0.32	0.03	0.08	0.04
zinc	1.4	0.33	1.7	0.59
mercury	0.001 U	0.001 U	0.001	0.001 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

* - Detection limit higher than normal due to sample matrix interferences.

Date Digested: 11/08/89
Date Analyzed: 11/16/89 (ICP)
11/28/89 (GFAA)
11/03/89 (CVAA)

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

TOTAL HEXAVALENT CHROMIUM ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Result</u>
Method Blank	P0581	0.02 U
41-1	JJ8655	0.02 U
41-2	JJ8656	0.02 U
41-2A	JJ8657	0.02 U
41-3	JJ8658	0.02 U
41-4	JJ8659	0.05 U*
41-5	JJ8660	0.02 U
41-6	JJ8661	0.05 U*
42-5	JJ8662	0.02 U
PW-1	JJ8663	0.02 U
RIN-2	JJ8664	0.02 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

* - Elevated detection limit reported due to the turbidity of samples.

Date Analyzed: 11/01/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

DISSOLVED HEXAVALENT CHROMIUM ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Result</u>
Method Blank	P0582	0.02 U
41-1	JJ8665	0.02 U
41-2	JJ8666	0.02 U
41-2A	JJ8667	0.02 U
41-3	JJ8668	0.02 U
41-4	JJ8669	0.05 U*
41-5	JJ8670	0.02 U
41-6	JJ8671	0.10 U*
42-5	JJ8672	0.02 U
PW-1	JJ8673	0.02 U
RIN-2	JJ8674	0.02 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

* - Elevated detection limit reported due to the turbidity of samples.

Date Analyzed: 11/01/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

TOTAL COLIFORM ANALYSIS
Results in colonies/100 ml
Sample Matrix: Water

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Result</u>
Method Blank	P0583	1 U
41-1	JJ8615	200 U*
41-2	JJ8616	200 U*
41-2A	JJ8617	200 U*
41-3	JJ8618	200 U*
41-4	JJ8619	4,200
41-5	JJ8620	24,000 *
41-6	JJ8621	200 U*
42-5	JJ8622	200 U*
PW-1	JJ8623	1 U
RIN-2	JJ8624	1 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

* - Elevated detection limit reported due to the turbidity of samples.

Date Analyzed: 11/01/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

CYANIDE ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Result</u>
Method Blank	P0608	0.01 U
41-1	JJ8635	0.01 U
41-2	JJ8636	0.01 U
41-2A	JJ8637	0.01 U
41-3	JJ8638	0.01 U
41-4	JJ8639	0.01 U
41-5	JJ8640	0.01 U
41-6	JJ8641	0.01 U
42-5	JJ8642	0.01 U
PW-1	JJ8643	0.01 U

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Analyzed: 11/09, 11/14/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

TURBIDITY ANALYSIS

Results in NTU's

Sample Matrix: Water

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Result</u>
Method Blank	P0599	0.15
41-1	JJ8645	450
41-2	JJ8646	310
41-2A	JJ8647	360
41-3	JJ8648	1,400
41-4	JJ8649	270
41-5	JJ8650	400
41-6	JJ8651	500
42-5	JJ8652	220
PW-1	JJ8653	0.22
RIN-2	JJ8654	0.20

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

Date Analyzed: 11/02/89

IT Corporation
November 30, 1989

IT ANALYTICAL SERVICES
5815 MIDDLEBROOK PIKE
KNOXVILLE, TN

Client Project ID: NAS JAX

Job Number: ITET 44487

WASTEWATER ANALYSIS

Results in mg/liter (ppm)

Sample Matrix: Water

<u>Client Sample ID</u>	<u>Lab Sample ID</u>	<u>Nitrate, as N</u>	<u>Sulfate</u>	<u>Chloride</u>	<u>Fluoride</u>
Method Blank	P0607/P0614/ P0622/P0612	0.05 U	10 U	0.8	0.10 U
41-1	JJ8645	0.08	110	48	0.10 U
41-2	JJ8646	0.07	10 U	23	0.10 U
41-2A	JJ8647	0.06	10 U	24	0.10 U
41-3	JJ8648	0.08	340	72	0.11
41-4	JJ8649	0.07	25 U*	160	1.7
41-5	JJ8650	0.08	120	120	0.10
41-6	JJ8651	0.08	50 U*	120	0.10 U
42-5	JJ8652	0.05 U	810	38	0.10 U
PW-1	JJ8653	0.07	10 U	1.5	0.10 U
Date Analyzed:		11/09-13/89	11/10/89	11/15/89	11/10/89

U - Compound was analyzed for but not detected. The number is the detection limit for the sample.

* - Elevated detection limit reported due to the turbidity of samples.

CERTIFICATE OF ANALYSIS

International Technology Corp.
ITAS-Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
Attn: Alyce Moore

Date: November 30, 1989

ITMWL Job Number: ITAB 35700
ITSTU Job Number: ITET 44487

This is the Certificate of Analysis for the following samples:

Client Project ID: ITET 44487
Date Received by Lab: 11/10/89
Number of Samples: Nine (9)
Sample Type: Water

I. Introduction

On November 10, 1989, nine (9) water samples arrived at the ITAS Oak Ridge, Tennessee laboratory from ITAS-Knoxville, Knoxville, Tennessee. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report.

Data are reported with the qualifier "U" if the compound was analyzed for but not detected. Lists with concentration unit code and lab and client suffix code definitions are attached.

II. Analytical Results/Methodology

The samples were analyzed for Total Organic Carbon. Results are presented in the following report and were determined using Method 9060, Test Methods for Evaluating Solid Waste, USEPA SW-846, 3rd edition, 1986.

Reviewed and Approved

Snell A. Mills III

Snell A. Mills III
Laboratory Manager

SAM/rdj

ITAS-Knoxville
ATTN: Alyce Moore
Date: November 30, 1989

IT ANALYTICAL SERVICES
OAK RIDGE, TN

Page 2 of 2
Job Number: ITAB 35700

Date Received: 11/10/89

Sample Description: Water

Concentration Units: mg/L

Client ID: 41-1, 41-2, 41-2A 41-3, 41-4, 41-5, 41-6, 42-5, PW-1
IT-MWL ID: MM1465, MM1466, MM1467, MM1468, MM1469, MM1470, MM1471, MM1472, MM1473, blank
IT-STU ID: JJ8605, JJ8606, JJ8607, JJ8608, JJ8609, JJ8610, JJ8611, JJ8612, JJ8613

Prep and Anal Date: 11/21/89

T O C

Client ID:	<u>41-5</u>	<u>41-2</u>	<u>41-2A</u>	<u>41-3</u>	<u>41-4</u>	<u>41-5</u>
Average Result:	33.5	21.0	21.9	170.	720.	256.
Sample Range:	32.4-34.5	20.4-21.7	21.7-22.3	168.-172.	709.-725.	254.-258.

Client ID:	<u>41-6</u>	<u>42-5</u>	<u>PW-1</u>	<u>BLANK</u>
Average Result:	1480.	40.3	2.90	1.10
Sample Range:	1450.-1540.	39.6-40.9	2.70-3.07	<1.00-2.49



ANALYTICAL SERVICES

CERTIFICATE OF ANALYSIS

International Technology Corp.
ITAS-Knoxville
5815 Middlebrook Pike
Knoxville, TN 37921
Attn: Mary Tyler

Date: November 16, 1989

ITMWL Job Number: ITET 35677
ITSTU Job Number: ITET 44492

This is the Certificate of Analysis for the following samples:

Client Project ID: ITET 44492
Date Received by Lab: 11/2/89
Number of Samples: Ten (10)
Sample Type: Water

I. Introduction

On November 2, 1989, ten (10) water samples arrived at the ITAS Oak Ridge, Tennessee laboratory from ITAS-Knoxville, Knoxville, Tennessee. The list of analytical tests performed, as well as date of receipt and analysis, can be found in the attached report. One sample, RIN-2, JJ8721, MM1217 was cancelled per phone conversation with ITAS-Knoxville.

Data are reported with the qualifier "U" if the compound was analyzed for but not detected. Lists with concentration unit code and lab and client suffix code definitions are attached.

II. Analytical Results/Methodology

The samples were analyzed for Total Organic Halides. Results are presented in the following report and were determined using Method 9020, Test Methods for Evaluating Solid Waste, USEPA SW-846, 3rd edition, 1986.

Reviewed and Approved

Snell G. Mills III
Snell G. Mills III
Laboratory Manager

SAM/sca

American Council of Independent Laboratories
International Association of Environmental Testing Laboratories
American Association for Laboratory Accreditation

ITAS-Knoxville
ATTN: Mary Tyler
Date: November 16, 1989

IT ANALYTICAL SERVICES
OAK RIDGE, TN

Page 2 of 2
Job Number: ITET 35677

Date Received: 11/2/89

Sample Description: Water

Concentration Units: mg/L

Client ID:	41-1,	41-2,	41-2A,	41-3,	41-4,	41-5,	41-6
IT-MWL ID:	MM1206,	MM1207,	MM1210,	MM1211,	MM1212,	MM1213,	MM1214
IT-STU ID:	JJ8712,	JJ8713,	JJ8714,	JJ8715,	JJ8716,	JJ8717,	JJ8718

Client ID:	42-5,	PW-1,	
IT-MWL ID:	MM1215,	MM1216,	BLANK
IT-STU ID:	JJ8719,	JJ8720,	

Prep and Anal Date: 11/3/89

T O X

Client ID:	<u>41-1</u>	<u>41-2</u>	<u>41-2A</u>	<u>41-3</u>	<u>41-4</u>	<u>41-5</u>
Average Result:	0.036	0.020	0.025	0.105	0.136	0.170

Client ID:	<u>41-6</u>	<u>42-5</u>	<u>PW-1</u>	<u>BLANK</u>
Average Result:	0.172	0.052	<0.010	<0.010

Matrix Spike and Matrix Spike Duplicate % Recoveries

Client ID: 41-2

% Matrix Spike
154

% Matrix Spike Duplicate
153

Age 1
Received: 11/01/89

ITRSL Oak Ridge REPORT
12/15/89 12:42:25

Work Order # R9-11-012

REPORT IT CORPORATION/MIDDLEBROOK
TO 5815 MIDDLEBROOK PINE
KNOXVILLE, TN 37921

PREPARED BY IT/RADIOLOGICAL SCIENCES LAB.
BY 1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

Jim Dillard
CERTIFIED BY

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CLIENT ITAS SAMPLES 3
COMPANY IT CORPORATION/MIDDLEBROOK
FACILITY MIDDLEBROOK PINE

WORK ID WATER SAMPLES / ITET 44472
TAKEN _____
TRANS _____
TYPE _____
P.O. # 486000.04
INVOICE under separate cover

SAMPLE IDENTIFICATION

TEST CODES and NAMES used on this report

01 J8519. 42-
02 J8520. 42-
03 J8521. 42-
04 J8522. 42-
05 J8523. RT-1

ALPHA GROSS ALPHA
BETA GROSS BETA
RA226 RA-226
RA228 RA-228
SPEC SPECIAL FORM FOR REPORTING

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ITRGL Oak Ridge REPORT
Results by Sample

Work Order # R9-11-012

SAMPLE ID JJ819, 42-6 FRACTION Q1A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 10/30/89 Category 87197

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
RA-226	9.1	1.4	pCi/l
RA-228	13.0		pCi/l

PREPARED BY: C. P. N. 11/16/89
ANALYZED BY: C. P. N. 11/16/89

GROSS ALPHA	215	50	pCi/l
GROSS BETA	75	24	

PREPARED BY: D. M. N. 11/30/89
COUNTED BY: D. M. N. 12/01/89 12/03/89

SAMPLE ID JJ820, 42-7 FRACTION Q5A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 10/30/89 Category 87197

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
RA-226	4.0	0.5	pCi/l
RA-228	13.0		pCi/l

PREPARED BY: C. P. N. 11/16/89
ANALYZED BY: C. P. N. 11/16/89

GROSS ALPHA	85	30	pCi/l
GROSS BETA	53	22	pCi/l

PREPARED BY: D. M. N. 11/30/89
COUNTED BY: D. M. N. 12/01/89 12/03/89

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Results by Sample

Work Order # R9-11-012

SAMPLE ID 18521, 42-8 FRACTION Q3A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 10/30/89 Category 3/197

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
RA-226	<1.0		pCi/l
RA-228	<3.0		pCi/l

PREPARED BY: C. P. M. 11/16/89
ANALYZED BY: C. P. M. 11/16/89

GROSS ALPHA	300	100	pCi/l
GROSS BETA	230	70	pCi/l

PREPARED BY: D. M. N. 11/30/89
COUNTED BY: D. M. N. 12/01/89 12/03/89

SAMPLE ID 18522, 42-8 FRACTION Q3A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 10/30/89 Category 3/197

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
RA-226	1.4	0.3	pCi/l
RA-228	<3.0		pCi/l

PREPARED BY: C. P. M. 11/16/89
ANALYZED BY: C. P. M. 11/16/89

GROSS ALPHA	24	8	pCi/l
GROSS BETA	15	6	pCi/l

PREPARED BY: D. M. N. 11/30/89
COUNTED BY: D. M. N. 12/01/89 12/03/89

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Results by Sample

Work Order # R9-11-012

SAMPLE ID J8923, RIN-1 FRACTION 05A TEST CODE SPC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 10/30/89 Category B717

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
RA-226	<1.0		pCi/l
RA-228	<3.0		pCi/l

PREPARED BY: C.P.M. 11/16/89
ANALYZED BY: D.P.M. 11/16/89

GROSS ALPHA	<1.0		pCi/l
GROSS BETA	<4.0		pCi/l

PREPARED BY: D.M.N. 11/30/89
COUNTED BY: D.M.N. 12/01/89 12/03/89

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12/19/89 11:33:18

Work Order # R9-11-017

REPORT IT CORPORATION/MIDDLEBROOK
TO 5815 MIDDLEBROOK PIKE
KNOXVILLE, TN 37921

PREPARED BY IT/RADIOLOGICAL SCIENCES LAB.
BY 1550 BEAR CREEK ROAD
OAK RIDGE, TN 37831

James M. Dillard
CERTIFIED BY

ATTEN JANICE STERRETT

ATTEN ERS
PHONE 615-482-9707

CONTACT JIM DILLARD

CLIENT ITAS SAMPLES 9
COMPANY IT CORPORATION/MIDDLEBROOK
FACILITY MIDDLEBROOK PIKE

WORK ID WATER SAMPLES / ITET 4492
TAKEN _____
TRANS _____
TYPE _____
P.O. # 486000.09
INVOICE under separate cover

SAMPLE IDENTIFICATION
11 J08725, 41-1
12 J08725, 41-2
13 J08725, 41-2A
14 J08725, 41-3
15 J08725, 41-4
16 J08727, 41-5
17 J08725, 41-5
18 J08729, 42-5
19 J08730, 41-1

TEST CODES and NAMES used on this report
ALPHA GROSS ALPHA
BETA GROSS BETA
RA225 RA-225
RA228 RA-228
SPEC SPECIAL FORM FOR REPORTING

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ITRGL Oak Ridge REPORT
Results by Sample

Work Order # R9-11-017

SAMPLE ID JJ8722, 41-1

FRACTION 01A TEST CODE SPEC
Date & Time Collected 10/31/89

NAME SPECIAL FORM FOR REPORTING
Category 14509

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
RA-226	1.2	0.2	pCi/l
RA-228	<3.0		pCi/l
PREPARED ON: 11/20/89			
RA-226 ANALYZED ON:	11/20/89	228: 11/27/89	
GROSS ALPHA	22	9	pCi/l
GROSS BETA	13	4	pCi/l
PREPARED ON: 11/30/89			
COUNTED ON: 12/1/89			

SAMPLE ID JJ8723, 41-2

FRACTION 02A TEST CODE SPEC
Date & Time Collected 10/31/89

NAME SPECIAL FORM FOR REPORTING
Category 14509

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
RA-226	2.3	0.4	pCi/l
RA-228	<3.0		pCi/l
PREPARED ON: 11/20/89			
RA-226 ANALYZED ON:	11/20/89	228: 11/27/89	
GROSS ALPHA	16	6	pCi/l
GROSS BETA	15	4	pCi/l
PREPARED ON: 11/29/89			
ALPHA COUNTED ON: 12/3/89 BETA: 12/1/89			

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Results by Sample

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SAMPLE ID W8724, 41-2A

FRACTION 02A TEST CODE SPEC
Date & Time Collected 10/31/89

NAME SPECIAL FORM FOR REPORTING
Category 14502

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
RA-225	1.9	0.3	pCi/l
RA-228	3.0		pCi/l
PREPARED ON: 11/20/89			
RA-226 ANALYZED ON:	11/20/89	228: 11/27/89	
GROSS ALPHA	30	9	pCi/l
GROSS BETA	21	7	pCi/l
PREPARED ON: 11/20/89			
ALPHA COUNTED ON:	12/3/89	BETA: 12/1/89	

SAMPLE ID W8725, 41-3

FRACTION 04A TEST CODE SPEC
Date & Time Collected 10/31/89

NAME SPECIAL FORM FOR REPORTING
Category 14502

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
RA-226	11.4	1.7	pCi/l
RA-228	3.0		pCi/l
PREPARED ON: 11/20/89			
RA-226 ANALYZED ON:	11/20/89	228: 11/27/89	
GROSS ALPHA	282	101	pCi/l
GROSS BETA	210	70	pCi/l
PREPARED ON: 11/30/89			
ALPHA COUNTED ON:	12/3/89	BETA: 12/1/89	

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SAMPLE ID J8725, 41-4

FRACTION 05A TEST CODE SPEC
Date & Time Collected 10/31/89

NAME SPECIAL FORM FOR REPORTING
Category 14500

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
RA-226	2.7	0.8	pCi/l
RA-228	43.0		pCi/l
PREPARED ON: 11/20/89			
RA-226 ANALYZED ON:	11/20/89	228: 11/27/89	
GROSS ALPHA	77	39	pCi/l
GROSS BETA	63	30	pCi/l
PREPARED ON: 11/30/89			
ALPHA COUNTED ON:	12/3/89	BETA: 12/1/89	

SAMPLE ID J8727, 41-3

FRACTION 05A TEST CODE SPEC
Date & Time Collected 10/31/89

NAME SPECIAL FORM FOR REPORTING
Category 14500

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
RA-226	1.8	0.3	pCi/l
RA-228	43.0		pCi/l
PREPARED ON: 11/20/89			
RA-226 ANALYZED ON:	11/20/89	228: 11/27/89	
GROSS ALPHA	36	17	pCi/l
GROSS BETA	30	15	pCi/l
PREPARED ON: 11/30/89			
ALPHA COUNTED ON:	12/3/89	BETA: 12/1/89	

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ITRSL Oak Ridge REPORT
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SAMPLE ID 42729, 41-4 FRACTION 07A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 10/31/89 Category 13509

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
RA-226	11.9	1.7	pCi/l
RA-228	3.0		pCi/l
PREPARED ON: 11/20/89			
RA-226 ANALYZED ON: 11/20/89 228: 11/27/89			
GROSS ALPHA	190	110	pCi/l
GROSS BETA	220	49	pCi/l
PREPARED ON: 11/30/89			
ALPHA COUNTED ON: 12/3/89 BETA: 12/1/89			

SAMPLE ID 42729, 42-5 FRACTION 08A TEST CODE SPEC NAME SPECIAL FORM FOR REPORTING
Date & Time Collected 10/31/89 Category 13509

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
RA-226	1.2	0.5	pCi/l
RA-228	3.0		pCi/l
PREPARED ON: 11/20/89			
RA-226 ANALYZED ON: 11/20/89 228: 11/27/89			
GROSS ALPHA	53	22	pCi/l
GROSS BETA	40	20	pCi/l
PREPARED ON: 11/30/89			
ALPHA COUNTED ON: 12/3/89 BETA: 12/1/89			

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Results by Sample

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SAMPLE ID J18730, PW-1

FRACTION 09A TEST CODE SPEC
Date & Time Collected 10/31/89

NAME SPECIAL FORM FOR REPORTING
Category 14302

PARAMETER	RESULT	2-SIGMA ERROR	UNITS
RA-226	<1.0		pCi/l
RA-228	<3.0		pCi/l
	PREPARED ON: 11/20/89		
RA-226	ANALYZED ON: 11/20/89	228: 11/27/89	
GROSS ALPHA	<1.0		pCi/l
GROSS BETA	<4.0		pCi/l
	PREPARED ON: 11/30/89		
ALPHA COUNTED ON:	12/3/89	BETA: 12/1/89	