

Advanced Technologies & Testing Laboratories, Inc.



DACW17-03-M-0074

Wares Creek Flood Control Project Evaluation

Advanced Technologies & Testing Laboratories, Inc.

RESULT OF ANALYSIS

Submitted to
**USA ENGINEER DISTRICT,
 JACKSONVILLE**

DACW17-03-M-0074

Wares Creek Flood Control Project Evaluation

Submitted by
 Advanced Technologies & Testing Laboratories, Inc.
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 CAGE - 1DGD1
 CCR - 1998D044260

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TABLE 1
 Sediment and Elutriate Analytes with Analytical Methods

Analyte	Sediment Method Number	Elutriate Method Number
Arsenic	7061	ER 206.2
Cadmium	7131	ER 213.2
Chromium	7191	ER 218.2
Lead	7421	ER 239.2
Mcury	7471	ER 245.1
Ni	7521	ER 249.2
Silver	7761	ER 272.2
Zinc	7950	ER 289.1
Total Gas Carbon (TOC)	9060	415.1
Dissolved Gas	5W06-9071B	-
Pesticides-PP	8081-82	8081-82
Organic Solids	ASTD-422	N
Total Solids	ASTD-424	N
Ammonia-Nitrate	ASTD-4118	N
Sulfates	Comp S&D Methods	N
Specific Gravity	ASTD854	N



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Client: USA Engineer District, Jacksonville
 701 San Marco Blvd.
 Jacksonville, FL 32207

Sample: Sediment
 Chain Project Number: DACW17-03-M-0074
 Chain Sample ID: W001-10

Sample Date/Time: 7/14/03 13:44
 Received Date: 7/21/03
 Lab ID#: 307960

Matrix: Sediment

RESULT OF ANALYSIS

Parameter	Method	Units	Result	Detection Limit	Extraction Date	Analysis Date	Analysis
Lead	81	mg/kg	0.76	0.05	7/24/03	7/31/03	CG
Lead	81	mg/kg	0.24	0.05	7/24/03	7/31/03	CG
Cadmium	28	mg/kg	0.62	0.05	7/24/03	7/31/03	CG
Cadmium	28	mg/kg	0.18	0.05	7/24/03	7/31/03	CG
Chromium	49	mg/kg	0.39	0.05	7/24/03	7/31/03	CG
Chromium	49	mg/kg	0.05	0.05	7/24/03	7/31/03	CG
Chromium	49	mg/kg	0.23	0.05	7/24/03	7/31/03	CG
Chromium	77	mg/kg	0.19	0.05	7/24/03	7/31/03	CG
Chromium	87	mg/kg	0.46	0.05	7/24/03	7/31/03	CG
Chromium	101	mg/kg	0.20	0.05	7/24/03	7/31/03	CG
Chromium	103	mg/kg	0.70	0.05	7/24/03	7/31/03	CG
Chromium	118	mg/kg	0.26	0.05	7/24/03	7/31/03	CG
Chromium	169	mg/kg	0.36	0.05	7/24/03	7/31/03	CG
Chromium	176	mg/kg	0.76	0.05	7/24/03	7/31/03	CG
Chromium	178	mg/kg	0.59	0.05	7/24/03	7/31/03	CG
Chromium	178	mg/kg	0.38	0.05	7/24/03	7/31/03	CG
Chromium	179	mg/kg	1.70	0.05	7/24/03	7/31/03	CG
Chromium	181	mg/kg	0.39	0.05	7/24/03	7/31/03	CG
Chromium	170	mg/kg	0.40	0.05	7/24/03	7/31/03	CG
Chromium	180	mg/kg	0.35	0.05	7/24/03	7/31/03	CG
Chromium	184	mg/kg	0.97	0.05	7/24/03	7/31/03	CG
Chromium	187	mg/kg	0.68	0.05	7/24/03	7/31/03	CG
Chromium	197	mg/kg	0.05	0.05	7/24/03	7/31/03	CG
Chromium	206	mg/kg	0.70	0.05	7/24/03	7/31/03	CG
Chromium	209	mg/kg	1.00	1.00	7/24/03	7/31/03	CG

U: Results in Below Detection Limit

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- B. In Situ Field Measurements:-
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- C. Physical Testing Data:-
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 - Settling Rate Data
 - Percent Solids and Specific Gravity
- D. Chemistry Data:-
 - Metal data for Sediment, Elutriate and Reference water
 - PCB data for Sediment, Elutriate and Reference water
 - Pesticide data for Sediment, Elutriate and Reference water
 - Chain-of-Custody Forms

Executive Summary

Advanced Technologies & Testing Laboratories (ATTL), under contract to the Jacksonville District U.S. Army Corps of Engineers (DACW-17-03-M-0074) collected the sediment samples and reference water during the period of July 14-16, 2003 at sixteen sample stations. Station locations were established using GPS. Samples were collected as grab samples with Vibratory Core.

Sediments and the elutriate from the sediments were analyzed for metals, pesticides, PCB's, TOC, Oil and Grease. Grain size, total solids, Atterburg limits, settling rate and specific gravity was measured for sediments only.

In sediments, metal analyses show that arsenic, cadmium, chromium, lead, nickel, silver and zinc were present. Low levels of pesticides and PCBs were detected in the sediment samples. Percent TOC ranged from 0.0 to 2.02 and Oil and Grease results varied from 59U (below detection limit) to highest value of 64690 mg/kg. Specific gravity ranged from 2.461 to 2.698. The plasticity index varied from non-plastic to 52 and the percent solids varied from 50 to 85. Particle size analysis indicated that all the samples contained mostly sand and silt/clay.

Elutriate results showed presence of all metals except mercury and nickel. Very low levels of Pesticides and PCB's were detected in the elutriate samples. TOC ranged from 5.77 to 12.11 mg/L.

1 Introduction

This report presents the results of the physical and chemical analysis of sediments, elutriates and reference water from Ware Creek and Manatee River at Bradenton, Tampa, Florida, as part of Ware Creek Flood Control Project Evaluation

Advanced Technologies & Testing Laboratories (ATTL), under contract to the Jacksonville District U.S. Army Corps of Engineers (DACW-17-03-M-0074) collected the sediment samples and reference water during the period of July 14 through 16 at sixteen sample stations.

ATTL coordinated and directed all operations for this project and worked closely with its subcontractor to organize security issues, schedule of sampling, analyses of samples, and the final report. Sediment and water samples were properly labeled, iced, and then transported to ATTL at Gainesville, Florida for analysis. Elutriate preparation was done according to the "Green Book" procedures by ATTL personnel. Sample portions were delivered/shipped to MACTEC Engineering & Consulting, Inc. for physical testing. All testing was performed in accordance with published procedures.

2 Methods and Materials

2.1 Sample Collection Techniques

Samples were collected from sixteen (16) pre-established sample stations. Station locations were established using GPS and are shown in enclosed site maps (see Appendix A). Samples were collected as grab samples with Vibratory Core.

Sufficient sediment and water samples were collected to run sediment and water chemistry. Twenty-five gallons of water for elutriate preparation was collected from a disposal site in the Manatee River. Some photographs of sample collection are shown in Appendix A

Sediment samples were transferred from vibratory core into certified pre-cleaned one-gallon glass containers using stainless steel spoons and new disposable laboratory gloves. All containers were properly labeled and sampling information was recorded on individual project specific field sheets. Information documented on the field sheets included date and time, water depth, weather, sea state, station, tidal cycle, coordinates, field team members, number of containers, sample physical description, and comments. This information has been summarized in Table 2 -3 and copies of the field sheets have been included in Appendix B. Water for elutriate preparation was collected directly into new plastic bucket. Water for chemical analyses was collected in properly pre-cleaned and preserved containers. All samples were placed in coolers right after collection and were immediately iced. Samples were kept chilled with ice at all times, and then transported to Gainesville, Florida via surface transportation.

2.2 *In Situ* Field Measurements

Hydrographic measurements for water temperature, pH, water depth, turbidity, dissolved oxygen, turbidity, salinity, and conductivity were made at each sub-station using different meters. These meters were calibrated according to the manufacturer's specifications. *In Situ* field measurements were recorded in project-specific field sheets, copies of the field sheets have been included in Appendix B. Hydrographic measurements have been summarized in Table 2 and 3.

2.3 Sediment Analyses

The samples were thoroughly homogenized and divided for analysis, and elutriate preparation. Homogenization of all sub-samples for each individual station was performed in a clean environment using properly decontaminated stainless steel mixing equipment. Specific analytical methods for sediment analyses are listed in Table 1. All inorganic and organic analyses were performed at Advance Technologies & Testing Lab (ATTL). Physical analyses were performed by Mactec Jacksonville.

2.4 Elutriate Analysis

Elutriates were prepared in accordance with the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers standard testing manual, Evaluation of Dredged Material Proposed for Ocean Disposal – Testing manual (USEPA-503/8-91/001, February 1991), commonly referred to as the “Green Book.” Specific water and elutriate analyses and analytical methods are listed in Table 1.

3 Results and Discussion

3.1 Field Data

In Situ field measurements were taken at each sub-station at surface level (one foot), mid-depth, and three feet above bottom. Sampling occurred from July 14 through July 16, 2003 when water temperatures ranged from 27.46 to 30.48°C. Dissolved oxygen ranged from 2.37 to 4.82 ppm, while the range for pH was 7.58 to 8.40. Turbidity ranged from 0.64 to 2.90 NTUs. Salinity and conductivity ranged from 0.1 to 13.6 ppt and from 186 to 15632 mS/cm, respectively. Weather conditions varied from sunny to partly cloudy. Results of water column measurements, field observations, and tidal information are presented in Tables 3 and 4. Copies of field sheets and instrument calibrations are included in Appendix B.

3.2 Physical Testing Data

Results of physical testing for specific gravity, percent solids, grain size analysis, Atterberg limits, and settling rates are presented in Tables 4-6, and Appendix C. Specific gravity ranged from 2.461 to 2.698. The plasticity index varied from non-plastic to 52 and the percent solids varied from 50 to 85. Particle size analysis indicated that all the samples contained mostly sand and silt/clay.

3.3 Chemistry Data

3.3.1 Sediment Chemistry Data

Analytical results for sediments are presented in Tables 7-14. Results of metal analyses show that arsenic, cadmium, chromium, lead, nickel, silver and zinc were detected in all sediment. No mercury was found in the samples except in one sample where concentration close to MDL was detected. Percent TOC ranged from 0.0 to 2.02. Oil and Grease results varied from 59U (below detection limit) for sample WCO3-10 to highest value of 64690 mg/kg. Low levels of pesticides and PCBs were detected as given in Tables 10 - 13. Analysis of PCB's showed the presence of some congeners such as 49, 101 and 170 in most of the samples analyzed. Analysis of pesticides showed the presence of aldrin, dieldrin, heptachlor and lindane in most of the samples in ppb levels.

Laboratory blanks were below reporting detection limits for metals, organics and water quality parameters. Laboratory control samples and duplicates were within laboratory precision and accuracy limits for metals, organics and water quality parameters. Matrix spike/matrix spike Duplicate recoveries were within laboratory precision and accuracy limits and/or Sample

Duplicate analysis data demonstrated acceptable reproducibility of laboratory processes for metals, organics and water quality parameters. All other quality criteria were met.

All laboratory data pertaining sediment chemistry analyses has been included in Appendix D.

3.3.2 Elutriate Chemistry Data

Analytical results for elutriates and water chemistry are presented in Tables 7,9,11,13 and 14. Results of metal analyses show that except mercury and nickel, all other metals were present in the elutriate and reference water . TOC ranged from 5.77 to 12.11 mg/L. Very low levels of some pesticides and PCBs were detected in elutriates.

Laboratory blanks were below reporting detection limits for metals, organics and water quality parameters. Laboratory control samples and duplicates were within laboratory precision and accuracy limits for metals, organics and water quality parameters. Matrix spike/matrix spike Duplicate recoveries were within laboratory precision and accuracy limits and/or Sample Duplicate analysis data demonstrated acceptable reproducibility of laboratory processes for metals, organics and water quality parameters.

All laboratory data pertaining water and elutriate chemistry analyses has been included in Appendix D.

4 References

APHA. 1989. Standard Methods for the Analysis of Water and Waste Water. 17th ed. American Public Health Association, American Water Works Association, Water Pollution Control Federation, Washington, DC.

Environmental Protection Agency (EPA). 1983. Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020.

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