# Monitoring and Phytoremediation O&M Report - October 2008 through December 2008 Former Waste Area Behind Paint Hangar Building 87 (SWMU 33)

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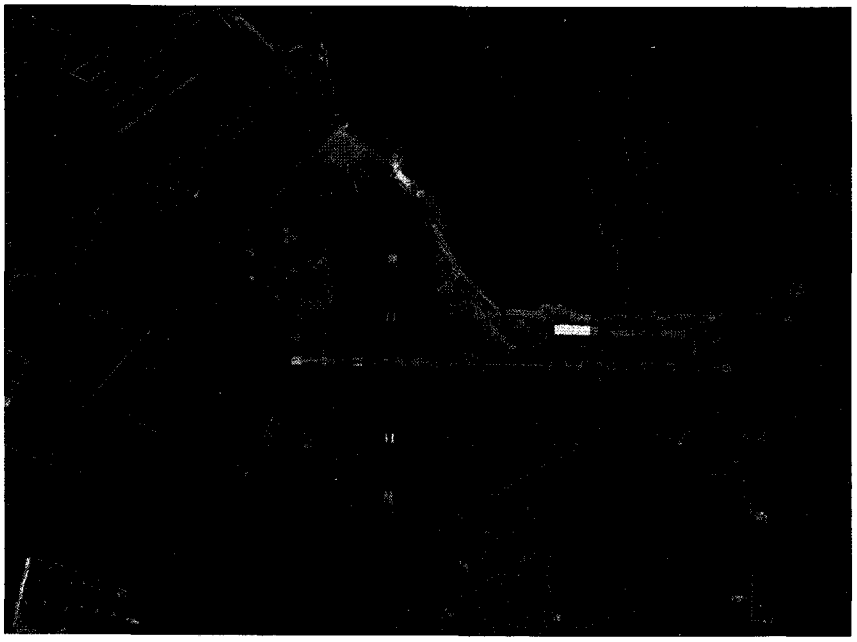

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# 1.0 Introduction

The United States Coast Guard (USCG) Civil Engineering Unit, Cleveland (CEU-Cleveland) retained ENSR to perform monitoring activities at the Solid Waste Management Unit (SWMU) 33 (Former Waste Storage Area Behind Paint Hanger Building 87) at the USCG Support Center, Elizabeth City (SCEC), North Carolina. Monitoring activities were designed to assess the progress of the phytoremediation system. The phytoremediation system was installed in 2007 in accordance with the Corrective Measures Study (ENSR 2007). This work was performed under contract number DTCG83-02-D-3CL375 and task order number HSCG83-06-J-3CL531.

## 1.1 Facility location

The SCEC is located approximately 3 miles south of Elizabeth City, Pasquotank County, in northeastern North Carolina along Highway 34. The facility is situated on approximately 800 acres and is located along the southern bank of the Pasquotank River approximately 8 miles upstream of the confluence of the Pasquotank River and the Albemarle Sound. The topography of the site is flat with an average elevation 7 feet above mean sea level (msl). The geographic facility location is latitude 36° 15' 07" north and longitude 76° 10' 05" west. Site location and facility layout maps are shown on Figures 1-1 and 1-2, respectively.

## 1.2 Facility operations

The primary functions of the SCEC are support, training, operation and maintenance associated with USCG aircraft. The facilities include aircraft hangers, aircraft wash racks, painting and paint removal areas, engine maintenance facilities, a jet-fuel storage area, aircraft refueling systems, three active runways and their associated taxiways, and other various support facilities. As part of operations, hazardous materials are used and stored at the facility. The USCG SCEC operates in accordance with a Resource Conservation and Recovery Act (RCRA) Part B Permit (NC2690308232).

## 1.3 SWMU 33 (Former waste storage area behind Paint Hanger Building 87)

SWMU 33 is located near the shoreline of the Pasquotank River between Buildings 87 and 96 (Figure 1-2). The topography of the area is relatively flat with a general slope to the north towards the Pasquotank River.

Previously, flammable lockers/storage cabinets and drums with hazardous materials and, potentially, wastes were stored in this area. During the RCRA Facility Assessment (RFA), the cabinets were observed to be in poor condition and unknown liquids were observed in the base of the cabinets. There are no records of the condition of the flammable lockers or drums (A.T. Kearney, 1986). The flammable lockers/storage cabinets and drums have been removed. The wastes that were managed were reportedly process materials such as ketones and naphtha (A.T. Kearney, 1986). The history of storage in the area is unknown. Although not noted in the historical documents, drum-like ring indentations in the asphalt between Buildings 87 and 96 were observed, which indicate historic storage of drums in this area. No releases have been reported in this area (ARCADIS, 2002).

## 1.4 Regulatory status

Corrective action is being performed by the USCG as directed under the RCRA Hazardous Waste Management permit issued on July 12, 1995. The State of North Carolina is authorized by United States Environmental Protection Agency (USEPA) Region IV to monitor corrective actions at RCRA facilities under the state RCRA program. Facility-wide compliance requirements for assessment activities and corrective actions are coordinated between the USCG and the NCDENR Hazardous Waste Section (HWS). The RFI was completed in 2006 followed by the CMS in 2007 (ENSR 2007). Prior to submission of the CMS, the USCG received concurrence of the proposed remedy from the HWS in an email correspondence on March 30,

2007, and during a subsequent on-site meeting (in April 2007) with the USCG. Implementation of the CMS was initiated in the spring of 2007 and is currently on-going.

## 1.5 Objectives

The CMS report specified phytoremediation as the best remedy to address soil and groundwater impacts at SWMU 33. A phytoremediation system consisting of four staggered rows of deep-rooted willow trees (*Salix alba*) was installed. The primary objective of the phytoremediation system is to control groundwater contaminant plume migration and remove contaminants from the saturated zone (via sorption to the organic fraction of the plant root tissue followed by slow degradation). A secondary objective of the system is remediation of the inorganic contaminants in the vadose zone soil (arsenic [As], chromium [Cr], and mercury Hg) as well as any residual organic contaminants.

The success of the system is evaluated by its ability to reduce constituent concentrations to below the remedial soil goals (USEPA Region 9 Residential preliminary remediation goals [PRGs]) and below the remedial groundwater goals (Title 15A North Carolina Administrative Code Subchapter 2L groundwater quality standards [2L Standards]).

This report presents the results of soil and groundwater monitoring activities that occurred in the fourth quarter of 2008 (October 2008 through December 2008). The sampling event performed in October 2008 consisted of soil and groundwater sample collection for analysis of target pesticides and metals. The analytical results of the October 2008 sampling event, in conjunction with the existing data set established during previous investigations, provides a basis for evaluating the effectiveness of the phytoremediation system as well as the progress toward achieving soil and groundwater remediation goals.

# 2.0 Sampling

The following section provides a discussion of the methodology and results of the sampling event conducted by ENSR in October 2008. The sampling methodology is in accordance with the CMS (ENSR 2006a). Sampling locations and analyses are consistent with those specified in the work plan (ENSR, 2007b). Field activities included collection of soil and groundwater samples for laboratory analysis as well as water level measurements.

## 2.1 Methods

### 2.1.1 Soil

Three grab soil samples (33SB-13, 33SB-14, and 33SB-15) were collected from SWMU 33 (Figure 2-1) using a decontaminated stainless steel hand auger. Continuous soil samples were collected at each location from the ground surface to a depth of 1 foot bls. Each core was manually mixed via the quartering method using a decontaminated stainless steel scoop and glass bowl. The samples were analyzed for metals (As, Cr, and Hg) via USEPA Method 6010 or Method 7470A and pesticides via USEPA Method 8081.

### 2.1.2 Groundwater

Water Level Measurements

ENSR collected depth to water level measurements prior to collecting groundwater samples. Depth to water measurements were converted to water level elevations using top of casing (TOC) elevation data and are summarized in Table 2-1 for the October 2008 sampling event. Water level measurements were performed by opening the well cap and allowing the static water level to equilibrate with atmospheric pressure for approximately 15 minutes. An electronic water level indicator was then slowly inserted into the well, and the measurements were recorded on the field data sheet. The water level indicator was decontaminated with a phosphate-free soap (i.e., Liquinox) and distilled-water rinse prior to use and between each well location.

Groundwater Sample Collection

ENSR collected groundwater samples from monitoring wells 33MW-01 through 33MW-03 and 33MW-05 through 33MW-09 during the October 2008 sampling event (Figure 2-1). Per the CMS, a groundwater sample was not collected from monitoring well 33MW-04 as it is located well outside the contaminant plume and target compounds were not detected in past sampling events. Wells were sampled using low-flow sampling techniques with peristaltic pumps and new, disposable polyethylene tubing. The water levels were monitored during purging and the flow rate was adjusted in order to maintain a stabilized water level (drawdown of 0.3 feet or less).

While purging the wells, field measurements were recorded and used to determine when parameters had stabilized over consecutive readings, indicating that an adequate purging volume had been removed. Field measurements, including pH, specific conductance, temperature, oxidation-reduction potential (ORP) and dissolved oxygen (DO) were recorded using a YSI 556 multi-parameter meter and a flow-through cell. In addition, groundwater turbidity measurements were collected with a Hach 2100P turbidimeter. The YSI 556 was calibrated prior to use and daily thereafter, in accordance with manufacturer instructions.

Once water quality parameters stabilized and turbidity levels were less than 10 NTUs, groundwater samples were collected into laboratory prepared sample containers, labeled, and placed on ice pending transfer to a laboratory courier. The samples were analyzed for pesticides via USEPA Method 8081, mercury via USEPA Method 7470A, and arsenic and chromium via USEPA Method 6010. Copies of the groundwater sample collection records are presented in Appendix A.

### 2.1.3 Quality assurance/Quality control procedures

Field work was performed according to ENSR standard operating procedures, which comply with the requirements in the USEPA Region IV Environmental Compliance Branch Standard Operating Procedures and Quality Assurance Manual (USEPA, 2001). Procedures were followed during the field program to ensure that groundwater samples were properly containerized, preserved, and transferred to the analytical laboratory.

After sampling, containers were appropriately labeled and immediately placed in an iced cooler to maintain them at or below a temperature of 4 degrees Celsius. The samples were packaged, sealed, and transferred to a laboratory courier. A complete chain-of-custody record was provided in the cooler to maintain a comprehensive record of personnel who had contact with the samples.

### 2.1.4 Investigative derived waste management

Water generated during well development and purging and sampling activities was temporarily contained in mobile tankers prior to on-site treatment and disposal by the USCG. Disposable materials generated during the sampling of the monitoring wells and decontamination of equipment were containerized in plastic garbage bags and disposed of in a solid-waste dumpster on the SCEC facility.

## 2.2 October 2008 Results

### 2.2.1 Soil analytical results

Soil analytical results are presented in Table 2-2 and Figure 2-2. Soil concentrations were compared to the residential and industrial criteria of the USEPA Region 9 PRGs (PRGs) (USEPA, 2002) and the NCDENR Hazardous Waste Section (HWS) Soil Screening Levels (SSLs) (NCDENR, 2005).

Metals

Laboratory results indicate that arsenic concentrations in the grab samples 33SB-13, 33SB-14, and 33SB-15 are 10 milligrams per kilogram (mg/kg), 12 mg/kg, and 49 mg/kg, respectively. Results for 33SB-13 and 33SB-14 are consistent with 2007 baseline and semi-annual sampling event results. Results for 33SB-13 are higher than April 2008 sampling results. Results for 33SB-15 are higher than 2007 baseline and semi-annual sampling event results as well as April 2008 sampling results. All three grab samples exceed the Region 9 Residential (0.39 mg/kg) and Industrial (1.6 mg/kg) PRGs, as well as the SSL (5.24 mg/kg).

Grab samples from 33SB-13, 33SB-14, and 33SB-15 contain 19 mg/kg, 47 mg/kg, and 23 mg/kg of chromium, respectively. Chromium in the 33SB-13 and 33SB-15 grab samples is below the residential and industrial PRGs (210 mg/kg and 450 mg/kg, respectively) and the SSL (27.2 mg/kg). Chromium in 33SB-14 is below the residential and industrial PRGs however exceeds the SSL. The results for 33SB-13 and 33SB-15 are consistent with sampling results from the 2007 baseline and semi-annual sampling results and April 2008 sampling results while 33SB-14 is higher than previous results.

Laboratory results indicate that mercury concentrations in the grab samples 33SB-13, 33SB-14, and 33SB-15 are 0.071 mg/kg, 0.098 mg/kg, and 0.077 mg/kg, respectively. Mercury in the 33SB-13, 33SB-14, and 33SB-15 grab samples is below the residential and industrial PRGs (23 mg/kg and 310 mg/kg, respectively) however above the SSL of 0.0154 mg/kg. The results for 33SB-13, 33SB-14, and 33SB-15 are slightly elevated in comparison to sampling results from the 2007 baseline and semi-annual sampling results as well as April 2008 results.

Pesticides

Grab samples 33SB-13, 33SB-14, and 33SB-15 were analyzed for twenty two pesticides. Two pesticides were detected in 33SB-13 including 4,4'-DDE and 4,4'-DDT at 0.011 mg/kg and 0.067 mg/kg, respectively. Concentrations of 4,4'-DDE and 4,4'-DDT did not exceed the residential PRG, industrial PRG, or the SSL.

4,4'-DDE and 4,4'-DDT were previously not detected in 33SB-13. No pesticides were detected above reporting limits in 33SB-14 or 33SB-15. Results for the remaining twenty pesticides analyzed in 33SB-13 as well as results for 33SB-14 and 33SB-15 are consistent with findings from the 2007 baseline and semi-annual sampling events as well as the April 2008 sampling event.

### 2.2.2 Groundwater gauging

Table 2-1 and Figure 2-3 summarize the depth to groundwater measurements and calculated elevation data during the October 2008 sampling event. Potentiometric elevations at the site ranged from 0.32 feet below mean sea level (ft msl) (33MW-08) to 1.05 ft above msl (33MW-05). The groundwater elevations measured during the October 2008 event are consistent with historical elevations.

During the October 2008 event, the shallow horizontal groundwater gradient is northward towards the Pasquotank River. Past groundwater flow directions at the site have varied, but were generally towards the Pasquotank River, which is consistent with site topography and other investigations conducted nearby at the SCEC.

Historical water level data at the SCEC indicate that groundwater flow rate and direction proximate to the Pasquotank River can be influenced by wind tides. Tidal influence on the groundwater table has been observed to retard the migration of impacted groundwater at other sites at the SCEC. It is expected that fluctuating groundwater flow direction will have a similar influence on the impacted groundwater at SWMU 33.

### 2.2.3 Groundwater analytical results

A summary of groundwater analytical results is presented in Table 2-3 and Figure 2-4. Figures 2-5 through 2-7 present concentrations of chlordane, dieldrin, and heptachlor epoxide over time. Laboratory and Data Validation Reports are presented in Appendix B. The analytical results were compared with the 2L Standards.

Metals

Arsenic was detected in groundwater collected from 33MW-09 (4.4 J µg/L). Laboratory results indicate that arsenic in groundwater samples collected from monitoring wells 33MW-01, 33MW-02, 33MW-03, 33MW-05, 33MW-06, 33MW-07, and 33MW-08 was below the reporting limit of 10 µg/L and therefore also below the 2L Standard of 10 µg/L. These results are consistent with historical groundwater sampling results.

Chromium was detected in groundwater samples collected from 33MW-01 (1.3 µg/L), 33MW-02 (3.3 J µg/L), 33MW-03 (5.6 µg/L), 33MW-05 (2.3 J µg/L), 33MW-06 (5.2 µg/L), 33MW-07 (2.5 J µg/L), 33MW-08 (1.8 J µg/L), and 33MW-09 (2.2 J µg/L). All sample concentrations are below the 2L Standard of 50 µg/L for chromium. October 2008 results are consistent with historical groundwater sampling results.

Laboratory results indicate that mercury concentrations in groundwater samples collected from monitoring wells 33MW-01 through 33MW-09 are below the reporting limit of 0.2 µg/L and the 2L Standard of 1.05 µg/L. October 2008 results are consistent with historical groundwater sampling results.

Pesticides

Results indicate that all pesticide concentrations in the groundwater samples are below the reporting limit with the exception of those collected from monitoring wells 33MW-01, 33MW-05, 33MW-06, and 33MW-09. Pesticides detected during the October 2008 event include chlordane, dieldrin, and heptachlor epoxide.

The chlordane concentration reported is representative of technical chlordane, which was the form of commercially available chlordane (e.g. Chlordan, Velsicol 1068®, or Octachlor®). Technical chlordane is composed of a mixture of many (over 40) closely related compounds that include a-chlordane (also known as α-chlordane and cis-chlordane), g-chlordane (also known as γ-chlordane, β-chlordane, and trans-chlordane), and heptachlor (ASTDR, 1994). a-chlordane and g-chlordane are stereoisomers (i.e. compounds with the same chemical bonds, but different arrangement of atoms) and typically represent the majority (over half) of technical chlordane (referred to here out simply as chlordane) (ASTDR, 1994). The concentrations of a-chlordane and g-chlordane are also presented below. Heptachlor is also a degradation product of cis- and trans-chlordane via dehydrochlorination. Oxidation of heptachlor results in the formation of heptachlor epoxide, which was detected in the October 2008 sampling event.

Chlordane was detected above its 2L Standard of 0.1 µg/L in monitoring wells 33MW-01 (16 µg/L), 33MW-06 (28 µg/L) and 33MW-09 (7.6 µg/L). Concentrations of chlordane detected during the October 2008 sampling event are consistent with historical results.

a-Chlordane was detected in monitor wells 33MW-01 (1.6 µg/L), 33MW-06 (2.9 µg/L), and 33MW-09 (0.66 µg/L). There is no 2L Standard for a-chlordane. Concentrations of a-chlordane detected during the October 2008 sampling event are consistent with historical results.

g-Chlordane was detected in monitor wells 33MW-01 (2.4 µg/L), 33MW-06 (4.4 µg/L), and 33MW-09 (0.91 µg/L). There is no 2L Standard for g-chlordane. Concentrations of g-chlordane detected during the October 2008 sampling event are consistent with historical results.

Dieldrin was detected above its 2L Standard of 0.0022 µg/L in monitoring wells 33MW-01 (0.31 µg/L), 33MW-06 (0.46 µg/L), and 33MW-09 (0.24 µg/L). Concentrations of dieldrin detected during the October 2008 sampling event are consistent with historical results.

Heptachlor epoxide was detected above its 2L Standard of 0.0038 µg/L in monitoring wells 33MW-01 (0.93 µg/L), 33MW-05 (0.16 µg/L), 33MW-06 (1.6 µg/L), and 33MW-09 (0.56 µg/L). Concentrations of heptachlor epoxide detected during the October 2008 sampling event are consistent with historical results.

# 3.0 Phytoremediation system

The phytoremediation system at SWMU 33 (Figure 3-1) was designed to control groundwater flow and remediate groundwater containing pesticides above applicable standards.

During the October 2008 site visit, a visual survey was conducted to assess general health of the phytoremediation system installed within SWMU 33. The tree stand appeared to be in good health. No tree mortality was observed during the site visit (Table 3-1).

The tree stand is developing well and is expected to reach full maturity approximately three years after installation (i.e. 2010 for the majority of the stand and 2011 for trees planted in 2008). An appreciable decrease in constituent concentrations is not expected during the first several growing seasons as the tree stand will not achieve maximum evapo-transpiration rates prior to maturity.

Per the CMS, the flushing of clean groundwater through the impacted zone resulting from evapo-transpiration will actively remove contaminants of concern (COCs) and eventually reduce groundwater concentrations below remediation goals. The remediation timeframe was evaluated using the SourceDK software (Farhat et al., 2004). Chlordane was assumed to be the rate limiting chemical, as it is the least soluble of the detected COCs. It was also assumed that the phytoremediation system would remove approximately 10,000 cubic feet of groundwater per growing season. Using these assumptions, it was predicted that remedial standards would be achieved after approximately five to ten years of operation. Further, it is expected that phytoaccumulation will reduce concentrations of heavy metals within the rhizosphere after several growing seasons.

Analytical data collected thus far support this idea. Groundwater concentrations detected in October 2008 are consistent with historical concentrations in previous sampling events (Table 2-3 and Figures 2-4 through 2-7).

# 4.0 Conclusions and summary

In October 2008, ENSR collected soil and groundwater samples from SWMU 33 to further assess the performance of phytoremediation activities. The soil and groundwater sample results were generally consistent with historical results.

Soil samples were collected from three locations within SWMU 33. Arsenic was detected in soil samples at concentrations above the Region 9 Residential and Industrial PRGs (0.39 mg/kg and 1.6 mg/kg, respectively), as well as the SSL (5.24 mg/kg). In addition, chromium and mercury were detected in soil samples at concentrations above SSLs (27.2 mg/kg and 0.0154 mg/kg, respectively). Pesticides were also detected in soil samples however were below respective Region 9 Residential and Industrial PRGs and SSLs.

Groundwater samples were collected from eight shallow monitoring wells. Arsenic was below the 2L Standard of 10 µg/L in groundwater in all eight wells. Chromium was detected in groundwater samples at concentrations below the respective 2L Standard of 50 µg/L. Mercury was not detected in groundwater samples. Pesticides detected during the October 2008 event included a-chlordane, g-chlordane, chlordane, dieldrin, and heptachlor epoxide. Currently, there are no 2L Standards for either a-chlordane or g-chlordane however, 2L Standards for chlordane, dieldrin, and heptachlor epoxide are 0.1 µg/L, 0.0022 µg/L, and 0.0038 µg/L, respectively. These COCs were detected above 2L Standards in groundwater samples.

The primary objective of the phytoremediation system was to control groundwater contaminant plume migration and remove contaminants from the saturated zone (via sorption to the organic fraction of the plant root tissue followed by slow degradation). Since the stand is not expected to achieve maturity until three years after installation (2010), an appreciable decrease in constituent concentrations is not expected during the first several growing seasons. Analytical data collected thus far support this idea with concentrations detected in October 2008 being consistent with historical concentrations in previous sampling events. Based on estimates in the CMS, the phytoremediation system was predicted to achieve remedial goals approximately five to ten years after reaching maturity. As the tree stand approaches maturity over the next several years, the system is expected to reduce pesticide and metal concentrations in soil.

Future steps for SWMU 33 include site maintenance as well as soil and groundwater sampling to monitor the progress of the phytoremediation system. Pending approval from NCDENR, sampling events will be conducted semi-annually for approximately two years beginning in April 2009 and then annually in following years.

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# Tables

**Table 2-1**
**Well Construction and Groundwater Elevation Data**
**SWMU 33 USCG Support Center**
**Elizabeth City, North Carolina**

| Well | Installation Date | Well Diameter (inches) | Screened Interval (ft bls) | Total Depth (ft bls) | MP Elevation (ft msl) | Date | Depth to Water (ft bTOC) | Groundwater Elevation (ft msl) |
|---|---|---|---|---|---|---|---|---|
| 33MW-01 | 09/20/05 | 1 | 5-15 | 15 | 5.92 | 03/29/07 | 5.59 | 0.33 |
| | | | | | | 06/20/07 | 4.01 | 1.91 |
| | | | | | | 09/11/07 | 4.49 | 1.43 |
| | | | | | | 01/08/08 | 5.42 | 0.50 |
| | | | | | | 04/30/08 | 4.53 | 1.39 |
| | | | | | | 07/23/08 | 4.74 | 1.18 |
| | | | | | | 10/07/08 | 5.1 | 0.82 |
| 33MW-02 | 09/20/05 | 1 | 5-15 | 15 | 5.86 | 03/29/07 | 5.26 | 0.60 |
| | | | | | | 06/20/07 | 4.65 | 1.21 |
| | | | | | | 09/11/07 | 4.51 | 1.35 |
| | | | | | | 01/08/08 | 5.45 | 0.41 |
| | | | | | | 04/30/08 | 4.38 | 1.48 |
| | | | | | | 07/23/08 | 4.85 | 1.01 |
| | | | | | | 10/07/08 | 5 | 0.86 |
| 33MW-03 | 09/20/05 | 1 | 5-15 | 15 | 7.14 | 03/29/07 | 6.57 | 0.57 |
| | | | | | | 06/20/07 | 5.81 | 1.33 |
| | | | | | | 09/11/07 | 5.88 | 1.26 |
| | | | | | | 01/08/08 | 6.83 | 0.31 |
| | | | | | | 04/30/08 | 5.91 | 1.23 |
| | | | | | | 07/23/08 | 6.11 | 1.03 |
| | | | | | | 10/07/08 | 6.53 | 0.61 |
| 33MW-04 | 09/20/05 | 1 | 5-15 | 15 | 7.46 | 03/29/07 | 6.51 | 0.95 |
| | | | | | | 06/20/07 | 5.83 | 1.63 |
| | | | | | | 09/11/07 | 6.08 | 1.38 |
| | | | | | | 01/09/08 | 6.99 | 0.47 |
| | | | | | | 04/30/08 | 5.75 | 1.71 |
| | | | | | | 07/23/08 | 6.32 | 1.14 |
| | | | | | | 10/07/08 | 6.60 | 0.86 |
| 33MW-05 | 03/28/07 | 1 | 6-8 | 8 | 6.10 | 03/29/07 | 5.68 | 0.42 |
| | | | | | | 06/20/07 | 4.52 | 1.58 |
| | | | | | | 09/11/07 | 4.68 | 1.42 |
| | | | | | | 01/09/08 | 5.63 | 0.47 |
| | | | | | | 04/30/08 | 4.55 | 1.55 |
| | | | | | | 07/23/08 | 4.95 | 1.15 |
| | | | | | | 10/08/08 | 5.05 | 1.05 |
| 33MW-06 | 03/28/07 | 1 | 12-14 | 14 | 6.24 | 03/29/07 | 5.91 | 0.33 |
| | | | | | | 06/20/07 | 4.70 | 1.54 |
| | | | | | | 09/11/07 | 4.75 | 1.49 |
| | | | | | | 01/09/08 | 5.69 | 0.55 |
| | | | | | | 04/30/08 | 4.72 | 1.52 |
| | | | | | | 07/23/08 | 4.8 | 1.44 |
| | | | | | | 10/07/08 | 5.31 | 0.93 |
| 33MW-07 | 03/28/07 | 1 | 19-21 | 21 | 6.33 | 03/29/07 | 6.00 | 0.33 |
| | | | | | | 06/20/07 | 4.84 | 1.49 |
| | | | | | | 09/11/07 | 6.33 | 0.00 |
| | | | | | | 01/09/08 | 5.81 | 0.52 |
| | | | | | | 04/30/08 | 4.9 | 1.43 |
| | | | | | | 07/23/08 | 5.21 | 1.12 |
| | | | | | | 10/08/08 | 5.61 | 0.72 |
| 33MW-08 | 03/28/07 | 1 | 26-28 | 28 | 6.40 | 03/29/07 | 5.60 | 0.80 |
| | | | | | | 06/20/07 | 5.81 | 0.59 |
| | | | | | | 09/11/07 | 6.20 | 0.20 |
| | | | | | | 01/09/08 | 6.78 | -0.38 |
| | | | | | | 04/30/08 | 5.00 | 1.40 |
| | | | | | | 07/23/08 | 6.66 | -0.26 |
| | | | | | | 10/08/08 | 6.72 | -0.32 |
| 33MW-09 | 03/28/07 | 1 | 5-15 | 15 | 5.73 | 03/29/07 | 5.69 | 0.04 |
| | | | | | | 06/20/07 | 4.26 | 1.47 |
| | | | | | | 09/11/07 | 4.19 | 1.54 |
| | | | | | | 01/08/08 | 5.13 | 0.60 |
| | | | | | | 04/30/08 | 4.51 | 1.22 |
| | | | | | | 07/23/08 | 4.6 | 1.13 |
| | | | | | | 10/07/08 | 5.16 | 0.57 |

**Notes:**
ft bls - feet below land surface
ft bTOC - feet below top of casing
ft msl - feet above mean sea level
MP - measuring point elevation

**Table 2-2**
**Soil Analytical Results**
**SWMU 33 USCG Support Center**
**Elizabeth City, North Carolina**

| Constituent | SSL | Region 9 Res. PRG | Region 9 Indus. PRG | 33SB-13 | | | | 33SB-14 | | | | 33SB-15 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | | | 33SB-13 | | | | 33SB-14 | | | | 33SB-15 | | | |
| Sample Depth | | | | 0 to 2 ft bls | | | | 0 to 2 ft bls | | | | 0 to 2 ft bls | | | |
| Sample Type | | | | Grab | | | | Grab | | | | Grab | | | |
| Sample Date | | | | 03/29/07 | 09/11/07 | 04/30/08 | 10/07/08 | 03/29/07 | 09/11/07 | 04/30/08 | 10/07/08 | 03/29/07 | 09/11/07 | 04/30/08 | 10/07/08 |
| **Inorganics by EPA 6010* (µg/kg)** | | | | | | | | | | | | | | | |
| Arsenic | 5,240 | 390 | 1,600 | **18,000** | **5,100** | **2,400** | **10,000** | **2,300** | **9,400** | **12,000** | **12,000** | **13,000** | **22,000** | **7,200** | **49,000** |
| Chromium | 27,200 | 210,000 | 450,000 | **21,000** | **19,000** | **9,200** | **19,000** | **30,000** | **26,000** | **23,000** | **47,000** | **21,000** | **23,000** | **24,000** | **23,000** |
| Mercury | 15.4 | 23,000 | 310,000 | **58** | **29** | **37** | **71** | **51** | **61** | **62** | **98** | **45** | **44** | **64** | **77** |
| **Pesticides by EPA 8081 (µg/kg)** | | | | | | | | | | | | | | | |
| 4,4'-DDD | 129 | 2,400 | 10,000 | <2.3 | <2.3 | <2.5 | <2.3 | <2.7 | <2.3 | <2.4 | <2.6 | <2.8 | <2.3 | <2.6 | <2.4 |
| 4,4'-DDE | NS | 1,700 | 7,000 | <2.3 | <2.3 | <2.5 | **11** | <2.7 | <2.3 | <2.4 | <2.6 | <2.8 | <2.3 | <2.6 | <2.4 |
| 4,4'-DDT | 1,360 | 1,700 | 7,000 | <2.3 | <2.3 | <2.5 | **67** | <2.7 | <2.3 | <2.4 | <2.6 | <2.8 | <2.3 | <2.6 | <2.4 |
| 4,4'-Methoxychlor | 56,100 | 310,000 | 3,100,000 | <4.6 | <4.6 | <5.1 | <4.6 | <5.4 | <4.6 | <4.8 | <5.1 | <5.7 | <4.6 | <5.2 | <4.8 |
| a-BHC | NS | 90 | 360 | <2.3 | <2.3 | <2.5 | <2.3 | <2.7 | <2.3 | <2.4 | <2.6 | <2.8 | <2.3 | <2.6 | <2.4 |
| a-Chlordane | NS | NS | NS | <2.3 | <2.3 | <2.5 | <2.3 | <2.7 | <2.3 | <2.4 | <2.6 | <2.8 | <2.3 | <2.6 | <2.4 |
| Aldrin | NS | 29 | 100 | <2.3 | <2.3 | <2.5 | <2.3 | <2.7 | <2.3 | <2.4 | <2.6 | <2.8 | <2.3 | <2.6 | <2.4 |
| b-BHC | NS | 320 | 1,300 | <2.3 | <2.3 | <2.5 | <2.3 | <2.7 | <2.3 | <2.4 | <2.6 | <2.8 | <2.3 | <2.6 | <2.4 |
| Chlordane | 103 | 1,600 | 6,500 | <58 | <58 | <63 | <58 | <67 | <58 | <60 | <64 | <71 | <57 | <64 | <60 |
| d-BHC | NS | NS | NS | <2.3 | <2.3 | <2.5 | <2.3 | <2.7 | <2.3 | <2.4 | <2.6 | <2.8 | <2.3 | <2.6 | <2.4 |
| Dieldrin | 1.13 | 30 | 110 | <1.2 | <1.2 | <1.3 | <1.2 | <1.3 | <1.2 | <1.2 | <1.3 | <1.4 | <1.1 | <1.3 | <1.2 |
| Endosulfan I | NS | 370,000 | 3,700,000 | <2.3 | <2.3 | <2.5 | <2.3 | <2.7 | <2.3 | <2.4 | <2.6 | <2.8 | <2.3 | <2.6 | <2.4 |
| Endosulfan II | NS | NS | NS | <2.3 | <2.3 | <2.5 | <2.3 | <2.7 | <2.3 | <2.4 | <2.6 | <2.8 | <2.3 | <2.6 | <2.4 |
| Endosulfan Sulfate | NS | NS | NS | <2.3 | <2.3 | <2.5 | <2.3 | <2.7 | <2.3 | <2.4 | <2.6 | <2.8 | <2.3 | <2.6 | <2.4 |
| Endrin | 440 | 18,000 | 180,000 | <2.3 | <2.3 | <2.5 | <2.3 | <2.7 | <2.3 | <2.4 | <2.6 | <2.8 | <2.3 | <2.6 | <2.4 |
| Endrin Aldehyde | NS | NS | NS | <2.3 | <2.3 | <2.5 | <2.3 | <2.7 | <2.3 | <2.4 | <2.6 | <2.8 | <2.3 | <2.6 | <2.4 |
| Endrin Ketone | NS | NS | NS | <2.3 | <2.3 | <2.5 | <2.3 | <2.7 | <2.3 | <2.4 | <2.6 | <2.8 | <2.3 | <2.6 | <2.4 |
| g-BHC | 6.2 | 440 | 1,700 | <2.3 | <2.3 | <2.5 | <2.3 | <2.7 | <2.3 | <2.4 | <2.6 | <2.8 | <2.3 | <2.6 | <2.4 |
| g-Chlordane | NS | NS | NS | <2.3 | <2.3 | <2.5 | <2.3 | <2.7 | <2.3 | <2.4 | <2.6 | <2.8 | <2.3 | <2.6 | <2.4 |
| Heptachlor | 2.3 | 110 | 380 | <2.3 | <2.3 | <2.5 | <2.3 | <2.7 | <2.3 | <2.4 | <2.6 | <2.8 | <2.3 | <2.6 | <2.4 |
| Heptachlor Epoxide | 6.34 | 53 | 190 | <2.3 | <2.3 | <2.5 | <2.3 | <2.7 | <2.3 | <2.4 | <2.6 | <2.8 | <2.3 | <2.6 | <2.4 |
| Toxaphene | 59.5 | 440 | 1,600 | <58 | <58 | <63 | <58 | <67 | <58 | <60 | <64 | <71 | <57 | <64 | <60 |

**Notes:**
* Mercury analyzed using EPA 7470A
SSL - North Carolina Hazardous Waste Section Soil Screening Level (NCDENR, December 2003)
PRG - Preliminary Remediation Goal
NS - no standard
Bolded data indicate a detection
Blue - Sample exceeds SSL
Orange - Sample exceeds Region 9 Residential PRG
Yellow - Sample exceeds Region 9 Industrial PRG
Green - Sample exceeds both SSL and the Region 9 Industrial PRG

**Table 2-3**
**Groundwater Analytical Results**
**SWMU 33 USCG Support Center**
**Elizabeth City, North Carolina**

| Parameters | Well ID / Screen Interval / Sample Date | 33MW-01 5-15 09/21/05 | 03/29/07 | 06/20/07 | 09/11/07 | 01/08/08 | 04/30/08 | 07/23/08 | 10/07/08 |
|---|---|---|---|---|---|---|---|---|---|
| **Field Parameters** | **2L Standard** | | | | | | | | |
| Temperature (°C) | NS | 21.4 | 16.7 | 20.1 | 22.3 | 19.6 | 17.0 | 21.6 | 21.3 |
| pH (standard units) | NS | 6.0 | 6.3 | 6.0 | 5.7 | 5.8 | 6.1 | 5.9 | 6.0 |
| Specific Conductivity (µS/cm) | NS | 325 | 446 | 414 | 364 | 641 | 808 | 439 | 732 |
| Dissolved Oxygen (mg/L) | NS | 1.2 | 1.4 | * | 1.8 | 0.5 | 0.7 | 0.7 | 0.4 |
| Oxidation-Reduction Potential (mV) | NS | 26.2 | 10.6 | 207 | 128.6 | 99.8 | 11.2 | 135.7 | -30 |
| Turbidity (NTUs) | NS | 12 | 45 | 8.5 | 1.0 | 6.2 | 6.5 | 3.7 | 2.3 |
| **Inorganics by EPA 6010$^{\Phi}$ (µg/L)** | | | | | | | | | |
| Arsenic | 10 | -- | <10 | <10 | <10 | <10 | **4.5 J** | **3.7 J** | <10 |
| Chromium | 50 | -- | **2.5 J** | **2.1 J** | **1.8 J** | **3 J** | **0.2 J** | **5** | **1.3 J** |
| Mercury | 1.05 | -- | <0.2 | <0.2 | **0.05 J** | <0.2 | <0.2 | <0.2 | <0.2 |
| **Pesticides by EPA 8081 (µg/L)** | | | | | | | | | |
| Chlordane | 0.1 | **10** | **18** | **10** | **11** | **16** | **3.2** | **20** | **16** |
| a-Chlordane | NS | **1.3** | **1.8** | **1.1** | **1.6** | **1.4** | **0.28** | **2.5** | **1.6** |
| g-Chlordane | NS | **2.0** | **2.0** | **1.8** | **2.4** | **2.3** | **0.29** | **4.0** | **2.4** |
| Dieldrin | 0.0022 | <0.050 | <0.050 | <0.050 | **0.24** | **0.23** | <0.053 | <0.050 | **0.31** |
| Heptachlor Epoxide | 0.0038 | <0.050 | **1.1** | **0.94** | **0.78** | **0.94** | **0.53** | **1.2** | **0.93** |

| Parameters | Well ID / Screen Interval / Sample Date | 33MW-02 5-15 09/21/05 | 03/29/07 | 06/20/07 | 09/11/07 | 01/08/08 | 04/30/08 | 07/23/08 | 10/07/08 |
|---|---|---|---|---|---|---|---|---|---|
| **Field Parameters** | **2L Standard** | | | | | | | | |
| Temperature (°C) | NS | 23.4 | 14.7 | 20.1 | 24.5 | 18.5 | 16.8 | 22.8 | 22.9 |
| pH (standard units) | NS | 6.7 | 6.9 | 6.8 | 3.0 | 6.5 | 6.7 | 6.7 | 6.8 |
| Specific Conductivity (µS/cm) | NS | 627 | 747 | 791 | 928 | 466 | 756 | 710 | 1100 |
| Dissolved Oxygen (mg/L) | NS | 0.5 | 0.8 | * | 0.2 | 0.5 | 0.3 | 0.7 | 0.2 |
| Oxidation-Reduction Potential (mV) | NS | -27.1 | -9.9 | 17.2 | 138.3 | -50.9 | -8.6 | -29.1 | -84.9 |
| Turbidity (NTUs) | NS | 31 | 18 | 9 | 9.9 | 7.6 | 3.2 | 6.7 | 0.9 |
| **Inorganics by EPA 6010$^{\Phi}$ (µg/L)** | | | | | | | | | |
| Arsenic | 10 | -- | <10 | <10 | <10 | **3.7 J** | **3.2 J** | **3.5 J** | <10 |
| Chromium | 50 | -- | **2.0 J** | **1.1 J** | **3.1 J** | **7.3** | **0.2 J** | **1.7 J** | **3.3 J** |
| Mercury | 1.05 | -- | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Pesticides by EPA 8081 (µg/L)** | | | | | | | | | |
| Chlordane | 0.1 | <0.050 | <0.50 | <0.50 | <0.50 | <0.50 | <0.51 | <0.53 | <0.50 |
| a-Chlordane | NS | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.051 | <0.053 | <0.050 |
| g-Chlordane | NS | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.051 | <0.053 | <0.050 |
| Dieldrin | 0.0022 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.051 | <0.053 | <0.050 |
| Heptachlor Epoxide | 0.0038 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.051 | <0.053 | <0.050 |

* - Equipment malfunction; dissolved oxygen sensor would not calibrate
$^{\Phi}$ - Mercury analyzed using EPA 7470A
▲ - Well went dry during purging and parameters were not measured
2L Standard - 15A NCAC 2L Groundwater Standard
Bolded data indicate a detection
Blue - Sample exceeds 2L Standard
J - Result estimated due to concentration between reporting limit and method detection limit
NM - not measured
NS - no standard
Only detected compounds are shown
-- parameter was not analyzed for or well was not sampled

**Table 2-3**
**Groundwater Analytical Results**
**SWMU 33 USCG Support Center**
**Elizabeth City, North Carolina**

| Parameters | Well ID / Screen Interval / Sample Date | 33MW-03 5-15 09/21/05 | 03/28/07 | 06/20/07 | 09/11/07 | 01/08/08 | 04/30/08 | 07/23/08 | 10/07/08 |
|---|---|---|---|---|---|---|---|---|---|
| **Field Parameters** | **2L Standard** | | | | | | | | |
| Temperature (°C) | NS | 22.2 | 17.0 | 20.4 | 25.2 | 19.8 | 16.2 | 22.2 | 21.3 |
| pH (standard units) | NS | 5.9 | 3.7 | 5.8 | 5.7 | 5.6 | 5.9 | 6.0 | 6.1 |
| Specific Conductivity (µS/cm) | NS | 228 | 229 | 262 | 283 | 291 | 712 | 547 | 386 |
| Dissolved Oxygen (mg/L) | NS | 1.1 | 1.0 | * | 2.4 | 1.8 | 1.1 | 0.7 | 1.3 |
| Oxidation-Reduction Potential (mV) | NS | 12.8 | 123.8 | 189.1 | 71.2 | 121.5 | 158.8 | 109.1 | 102.4 |
| Turbidity (NTUs) | NS | 21 | 49 | 7 | 2.2 | 9.0 | 3.1 | 5.4 | 6.8 |
| **Inorganics by EPA 6010$^{\Phi}$ (µg/L)** | | | | | | | | | |
| Arsenic | 10 | -- | <10 | <10 | <10 | <10 | **3.4 J** | <10 | <10 |
| Chromium | 50 | -- | **12** | **2.3 J** | **2 J** | **4.3 J** | **0.4 J** | **1.2 J** | **5.6** |
| Mercury | 1.05 | -- | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Pesticides by EPA 8081 (µg/L)** | | | | | | | | | |
| Chlordane | 0.1 | <0.050 | <0.50 | <0.50 | <0.50 | <0.50 | <0.56 | <0.50 | <0.50 |
| a-Chlordane | NS | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.056 | <0.050 | <0.050 |
| g-Chlordane | NS | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.056 | <0.050 | <0.050 |
| Dieldrin | 0.0022 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.056 | <0.050 | <0.050 |
| Heptachlor Epoxide | 0.0038 | <0.050 | <0.050 | <0.050 | <0.050 | <0.050 | <0.056 | <0.050 | <0.050 |

| Parameters | Well ID / Screen Interval / Sample Date | 33MW-05 6-8 09/21/05 | 03/30/07 | 06/20/07 | 09/11/07 | 01/09/08 | 04/30/08 | 07/23/08 | 10/08/08 |
|---|---|---|---|---|---|---|---|---|---|
| **Field Parameters** | **2L Standard** | | | | | | | | |
| Temperature (°C) | NS | -- | 15.1 | 20.6 | 25.8 | NM▲ | 18.4 | 25.6 | 22.2 |
| pH (standard units) | NS | -- | 6.3 | 6.3 | 6.3 | NM▲ | 6.2 | 6.5 | 6.3 |
| Specific Conductivity (µS/cm) | NS | -- | 504 | 669 | 617 | NM▲ | 570.0 | 529.0 | 581.0 |
| Dissolved Oxygen (mg/L) | NS | -- | 6.0 | * | 6.3 | NM▲ | 1.7 | 1.5 | 1.3 |
| Oxidation-Reduction Potential (mV) | NS | -- | 129.2 | 132.7 | -74.5 | NM▲ | 48.6 | -9.8 | -3.5 |
| Turbidity (NTUs) | NS | -- | NM | 12 | 9.2 | NM▲ | 8.1 | 6.2 | 8.8 |
| **Inorganics by EPA 6010$^{\Phi}$ (µg/L)** | | | | | | | | | |
| Arsenic | 10 | -- | **7.5 J** | <10 | <10 | <10 | **4.7 J** | **2.2 J** | <10 |
| Chromium | 50 | -- | **30** | **2.5 J** | **0.9 J** | **1.3 J** | **0.6 J** | <5 | **2.3 J** |
| Mercury | 1.05 | -- | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Pesticides by EPA 8081 (µg/L)** | | | | | | | | | |
| Chlordane | 0.1 | -- | <0.50 | <0.50 | <0.50 | <0.65 | <0.67 | <0.53 | <0.50 |
| a-Chlordane | NS | -- | <0.050 | <0.050 | <0.050 | <0.065 | <0.067 | <0.053 | <0.050 |
| g-Chlordane | NS | -- | <0.050 | <0.050 | <0.050 | <0.065 | <0.067 | <0.053 | <0.050 |
| Dieldrin | 0.0022 | -- | <0.050 | <0.050 | <0.050 | <0.065 | <0.067 | <0.053 | <0.050 |
| Heptachlor Epoxide | 0.0038 | -- | <0.050 | **0.32** | **0.35** | **0.33** | **0.23** | **0.27** | **0.16** |

* - Equipment malfunction; dissolved oxygen sensor would not calibrate
$^{\Phi}$ - Mercury analyzed using EPA 7470A
▲ - Well went dry during purging and parameters were not measured
2L Standard - 15A NCAC 2L Groundwater Standard
Bolded data indicate a detection
Blue - Sample exceeds 2L Standard
J - Result estimated due to concentration between reporting limit and method detection limit
NM - not measured
NS - no standard
Only detected compounds are shown
-- parameter was not analyzed for or well was not sampled

**Table 2-3**
**Groundwater Analytical Results**
**SWMU 33 USCG Support Center**
**Elizabeth City, North Carolina**

| Parameters | Well ID / Screen Interval / Sample Date | 33MW-06 12-14 09/21/05 | 03/29/07 | 06/20/07 | 09/11/07 | 01/09/08 | 04/30/08 | 07/23/08 | 10/07/08 |
|---|---|---|---|---|---|---|---|---|---|
| **Field Parameters** | **2L Standard** | | | | | | | | |
| Temperature (°C) | NS | -- | 15.6 | 19.8 | 22.8 | 19.5 | 17.6 | 20.9 | 21.4 |
| pH (standard units) | NS | -- | 6.1 | 5.9 | 5.7 | 5.9 | 5.8 | 5.8 | 5.9 |
| Specific Conductivity (µS/cm) | NS | -- | 254 | 282 | 298 | 400 | 282 | 294 | 290 |
| Dissolved Oxygen (mg/L) | NS | -- | 1.9 | * | 2.6 | 2.4 | 1.1 | 1.2 | 1.0 |
| Oxidation-Reduction Potential (mV) | NS | -- | -30.3 | 146.5 | 83.6 | 111.8 | 105.6 | 82.4 | 60.2 |
| Turbidity (NTUs) | NS | -- | 84.1 | 5.9 | 1.8 | 5.2 | 6.0 | 3.0 | 3.0 |
| **Inorganics by EPA 6010$^{\Phi}$ (µg/L)** | | | | | | | | | |
| Arsenic | 10 | -- | <10 | **2.7 J** | <10 | <10 | **2.2 J** | <10 | <10 |
| Chromium | 50 | -- | **8.9** | **12** | **1.2 J** | **4.8 J** | **3.6 J** | **6.8** | **5.2** |
| Mercury | 1.05 | -- | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Pesticides by EPA 8081 (µg/L)** | | | | | | | | | |
| Chlordane | 0.1 | -- | **21** | **13** | **15** | **29** | **23** | **18** | **28** |
| a-Chlordane | NS | -- | **2.1** | **2** | **2.2** | **3.1** | **3.1** | **2.2** | **2.9** |
| g-Chlordane | NS | -- | **2.4** | **2.1** | **2.7** | **4.8** | **4.8** | **3.5** | **4.4** |
| Dieldrin | 0.0022 | -- | <0.050 | <0.050 | <0.050 | **0.49** | <0.056 | **0.48** | **0.46** |
| Heptachlor Epoxide | 0.0038 | -- | **1.1** | **1.2** | **1** | **1.5** | **1.9** | **1.7** | **1.6** |

| Parameters | Well ID / Screen Interval / Sample Date | 33MW-07 19-21 09/21/05 | 03/29/07 | 06/20/07 | 09/11/07 | 01/09/08 | 04/30/08 | 07/23/08 | 10/08/08 |
|---|---|---|---|---|---|---|---|---|---|
| **Field Parameters** | **2L Standard** | | | | | | | | |
| Temperature (°C) | NS | -- | 17.3 | 19.2 | 22.4 | 19.9 | 18.2 | 20.6 | 20.5 |
| pH (standard units) | NS | -- | 6.2 | 6.0 | 5.9 | 5.9 | 5.9 | 6.0 | 6.0 |
| Specific Conductivity (µS/cm) | NS | -- | 191 | 198 | 220 | 210 | 214 | 208 | 242 |
| Dissolved Oxygen (mg/L) | NS | -- | 0.9 | * | 0.7 | 0.5 | 0.7 | 0.5 | 0.4 |
| Oxidation-Reduction Potential (mV) | NS | -- | 8.0 | 200.1 | 72.7 | 72.7 | 190.7 | 122.5 | 82.6 |
| Turbidity (NTUs) | NS | -- | 118 | 7 | 3.1 | 4.9 | 1.5 | 3.6 | 2.44 |
| **Inorganics by EPA 6010$^{\Phi}$ (µg/L)** | | | | | | | | | |
| Arsenic | 10 | -- | <10 | <10 | <10 | <10 | <10 | <10 | <10 |
| Chromium | 50 | -- | **14** | **3.2 J** | **2.3 J** | **6.3** | **2.8 J** | **2.9 J** | **2.5 J** |
| Mercury | 1.05 | -- | **0.13 J** | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Pesticides by EPA 8081 (µg/L)** | | | | | | | | | |
| Chlordane | 0.1 | -- | <0.50 | **5.6** | <0.50 | <0.50 | <0.56 | <0.51 | <0.50 |
| a-Chlordane | NS | -- | <0.050 | **0.63** | <0.050 | <0.050 | <0.056 | <0.051 | <0.050 |
| g-Chlordane | NS | -- | <0.050 | **0.94** | <0.050 | <0.050 | <0.056 | <0.051 | <0.050 |
| Dieldrin | 0.0022 | -- | <0.050 | <0.050 | <0.050 | <0.050 | <0.056 | <0.051 | <0.050 |
| Heptachlor Epoxide | 0.0038 | -- | <0.050 | **0.38** | <0.050 | <0.050 | <0.056 | <0.051 | <0.050 |

* - Equipment malfunction; dissolved oxygen sensor would not calibrate
$^{\Phi}$ - Mercury analyzed using EPA 7470A
▲ - Well went dry during purging and parameters were not measured
2L Standard - 15A NCAC 2L Groundwater Standard
Bolded data indicate a detection
Blue - Sample exceeds 2L Standard
J - Result estimated due to concentration between reporting limit and method detection limit
NM - not measured
NS - no standard
Only detected compounds are shown
-- parameter was not analyzed for or well was not sampled

**Table 2-3**
**Groundwater Analytical Results**
**SWMU 33 USCG Support Center**
**Elizabeth City, North Carolina**

| Parameters | Well ID / Screen Interval / Sample Date | 33MW-08 26-28 09/21/05 | 03/29/07 | 06/20/07 | 09/11/07 | 01/09/08 | 04/30/08 | 07/23/08 | 10/08/08 |
|---|---|---|---|---|---|---|---|---|---|
| **Field Parameters** | **2L Standard** | | | | | | | | |
| Temperature (°C) | NS | -- | 17.5 | 19.6 | 21.5 | 19.5 | 18.5 | 21.2 | 20.2 |
| pH (standard units) | NS | -- | 6.3 | 6.2 | 5.9 | 5.6 | 6.0 | 6.2 | 6.1 |
| Specific Conductivity (µS/cm) | NS | -- | 124 | 146 | 161 | 181 | 199 | 156 | 185 |
| Dissolved Oxygen (mg/L) | NS | -- | 0.2 | * | 0.4 | 0.2 | 0.3 | 0.2 | 0.3 |
| Oxidation-Reduction Potential (mV) | NS | -- | -41.1 | -68.7 | -18.4 | -44.4 | 39.6 | 49.1 | -18.8 |
| Turbidity (NTUs) | NS | -- | 393 | 8 | 3.1 | 6.3 | 6.9 | 8.9 | 7.25 |
| **Inorganics by EPA 6010$^{\Phi}$ (µg/L)** | | | | | | | | | |
| Arsenic | 10 | -- | **8.4 J** | **4.7 J** | **2.9 J** | **9.2 J** | <10 | <10 | <10 |
| Chromium | 50 | -- | **18** | **17** | **16** | **33** | **0.3 J** | **0.9 J** | **1.8 J** |
| Mercury | 1.05 | -- | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Pesticides by EPA 8081 (µg/L)** | | | | | | | | | |
| Chlordane | 0.1 | -- | <0.50 | <0.50 | <0.50 | <0.50 | <0.53 | <0.50 | <0.50 |
| a-Chlordane | NS | -- | <0.050 | <0.050 | <0.050 | <0.050 | <0.053 | <0.050 | <0.050 |
| g-Chlordane | NS | -- | <0.050 | <0.050 | <0.050 | <0.050 | **0.069** | <0.050 | <0.050 |
| Dieldrin | 0.0022 | -- | <0.050 | <0.050 | <0.050 | <0.050 | <0.053 | <0.050 | <0.050 |
| Heptachlor Epoxide | 0.0038 | -- | <0.050 | <0.050 | <0.050 | <0.050 | <0.053 | <0.050 | <0.050 |

| Parameters | Well ID / Screen Interval / Sample Date | 33MW-09 5-15 09/21/05 | 03/29/07 | 06/20/07 | 09/11/07 | 01/08/08 | 04/30/08 | 07/23/08 | 10/07/08 |
|---|---|---|---|---|---|---|---|---|---|
| **Field Parameters** | **2L Standard** | | | | | | | | |
| Temperature (°C) | NS | -- | 15.5 | 21.1 | 24.2 | 17.64 | 16.69 | 23.39 | 22.29 |
| pH (standard units) | NS | -- | 6.3 | 6.3 | 6.9 | 6.32 | 6 | 6.41 | 6.75 |
| Specific Conductivity (µS/cm) | NS | -- | 314 | 919 | 323 | 1853 | 399 | NM* | 5882 |
| Dissolved Oxygen (mg/L) | NS | -- | 0.3 | * | 1.4 | 0.4 | 0.56 | 0.85 | 0.22 |
| Oxidation-Reduction Potential (mV) | NS | -- | -37.5 | 145.4 | -15.3 | -8.1 | 20.3 | -71.8 | -151.7 |
| Turbidity (NTUs) | NS | -- | 45.8 | 3 | 3.3 | 5.1 | 3.7 | 5.47 | 0.03 |
| **Inorganics by EPA 6010$^{\Phi}$ (µg/L)** | | | | | | | | | |
| Arsenic | 10 | -- | **20** | <10 | <10 | <10 | <10 | **18** | **4.4 J** |
| Chromium | 50 | -- | **59** | **2.1 J** | **1 J** | **1.7 J** | **0.8 J** | <5 | **2.2 J** |
| Mercury | 1.05 | -- | **0.08 J** | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| **Pesticides by EPA 8081 (µg/L)** | | | | | | | | | |
| Chlordane | 0.1 | -- | <0.50 | <0.50 | **2.8** | **10** | **9.7** | **9.1** | **7.6** |
| a-Chlordane | NS | -- | <0.050 | <0.050 | **0.34** | **1.4** | **1.2** | **1.1** | **0.66** |
| g-Chlordane | NS | -- | <0.050 | <0.050 | **0.44** | **2.2** | **1.9** | **1.7** | **0.91** |
| Dieldrin | 0.0022 | -- | <0.050 | <0.050 | **0.088** | **0.26** | <0.053 | **0.24** | **0.24** |
| Heptachlor Epoxide | 0.0038 | -- | <0.050 | <0.050 | **0.34** | **0.92** | **0.9** | **0.98** | **0.56** |

* - Equipment malfunction; dissolved oxygen sensor would not calibrate
$^{\Phi}$ - Mercury analyzed using EPA 7470A
▲ - Well went dry during purging and parameters were not measured
2L Standard - 15A NCAC 2L Groundwater Standard
Bolded data indicate a detection
Blue - Sample exceeds 2L Standard
J - Result estimated due to concentration between reporting limit and method detection limit
NM - not measured
NS - no standard
Only detected compounds are shown
-- parameter was not analyzed for or well was not sampled

**Table 3-1**
**Summary of Tree Installation and Mortality**
**SWMU 33 USCG Support Center**
**Elizabeth City, North Carolina**

| Calender Year | Growing Season | Existing Trees | New Trees Installed | Mortality | | Surviving Trees |
|---|---|---|---|---|---|---|
| | | | | Number | Percentage | |
| 2007 | 1 | 0 | 22 | 3 | 13.6% | 19 |
| 2008 | 2 | 19 | 4 | 0 | 0.0% | 23 |

# Figures

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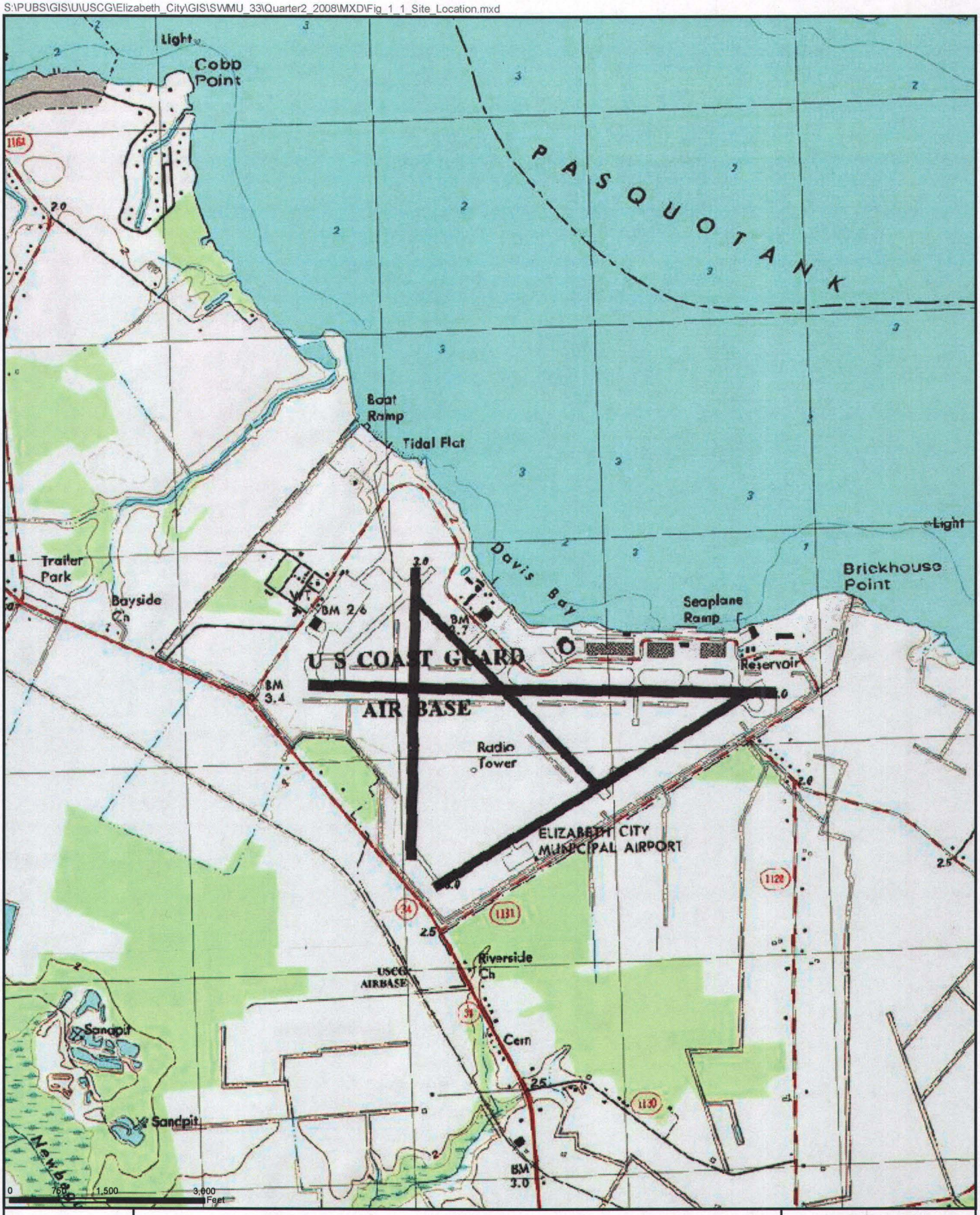


FIGURE NUMBER:

**1-1**

## Site Location Map

USCG SUPPORT CENTER
ELIZABETH CITY, NORTH CAROLINA

Image Source: USGS
Quadrangle: Elizabeth City, NC

N W E S

SCALE: 1:24000

DATE: December 2008

Project Number: 09020-066

ENSR | AECOM

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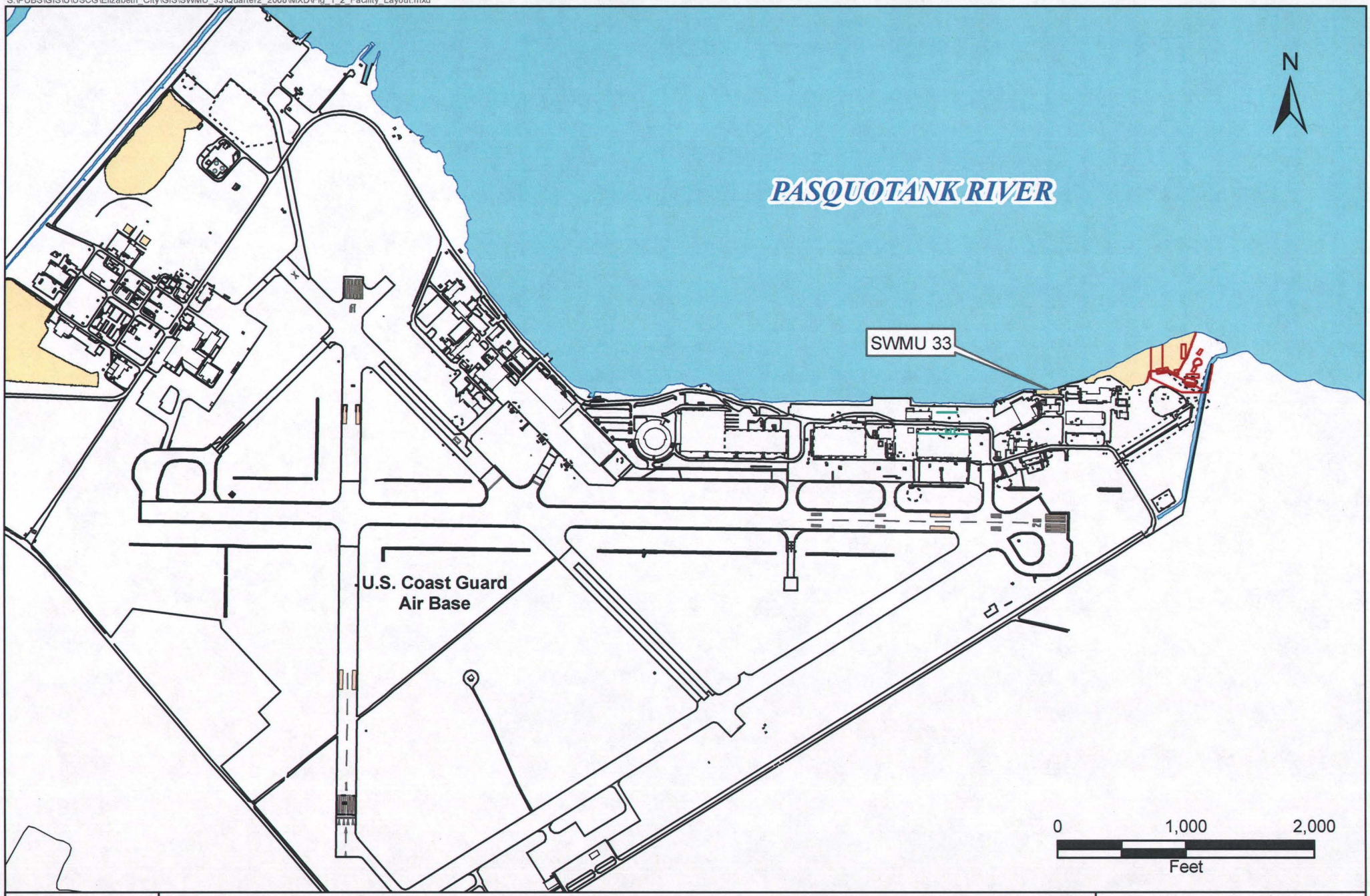
7041 Old Wake Forest Road
Suite 103
Raleigh, NC 27616

S:\PUBS\GIS\U\USCG\Elizabeth_City\GIS\SWMU_33\Quarter2_2008\MXD\Fig_1_2_Facility_Layout.mxd




| FIGURE NUMBER | Facility Layout | ENSR \| AECOM |
|---|---|---|
| 1-2 | USCG Support Center<br>Elizabeth City, North Carolina | ENSR Consulting and Engineering, (NC) Inc.<br>7041 Old Wake Forest Road<br>Suite 103<br>Raleigh, NC 27616 |
| | DATE: December 2008 SCALE: 1" = 1000' PROJECT NUMBER: 09020-066 | |

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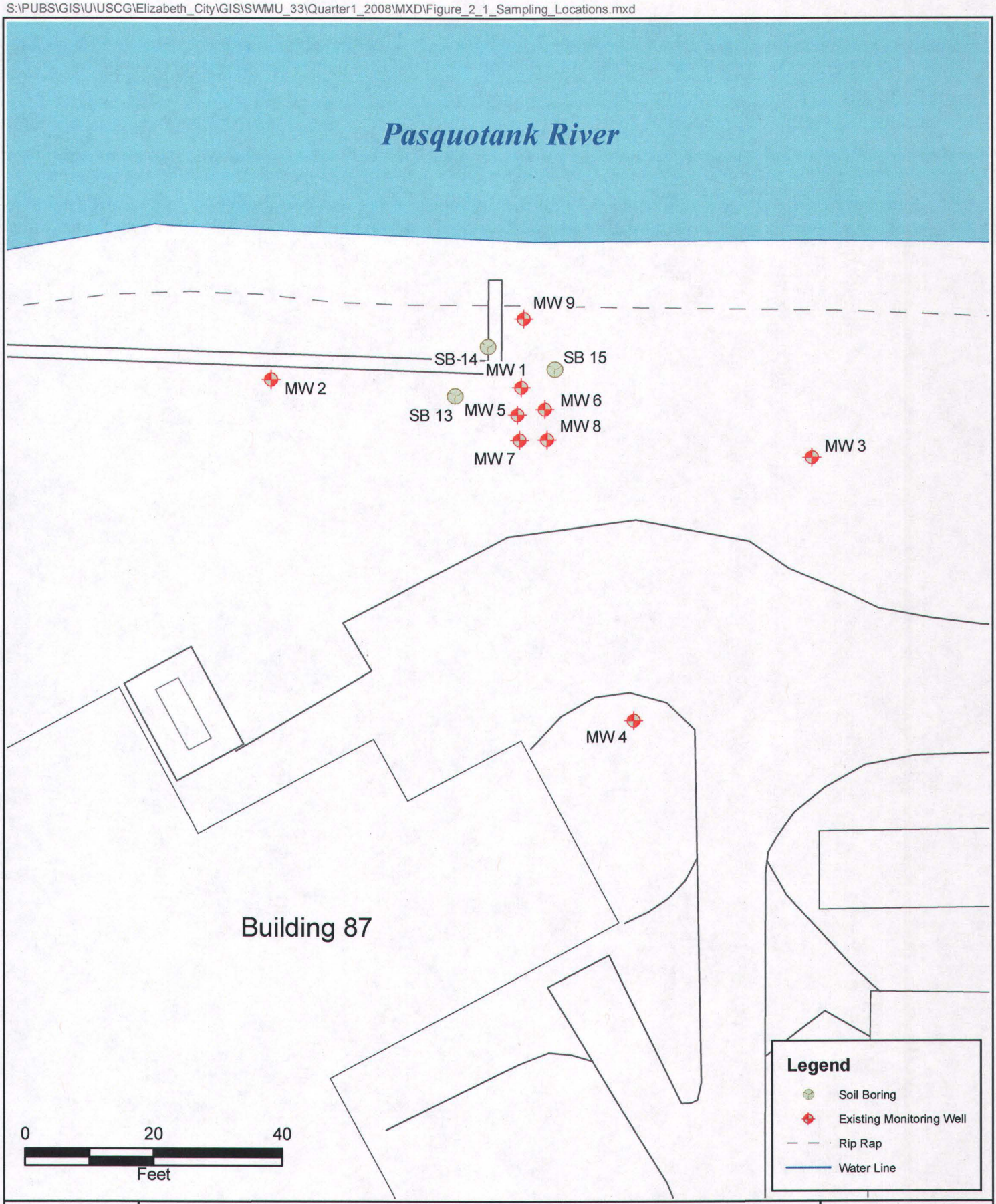


FIGURE NUMBER: **2-1**

**Sample Location Map**
**SWMU 33 FORMER WASTE STORAGE AREA**
USCG SUPPORT CENTER
ELIZABETH CITY, NORTH CAROLINA

N W E S

SCALE: 1" = 20' | DATE: December 2008 | DRAWN BY: NCR

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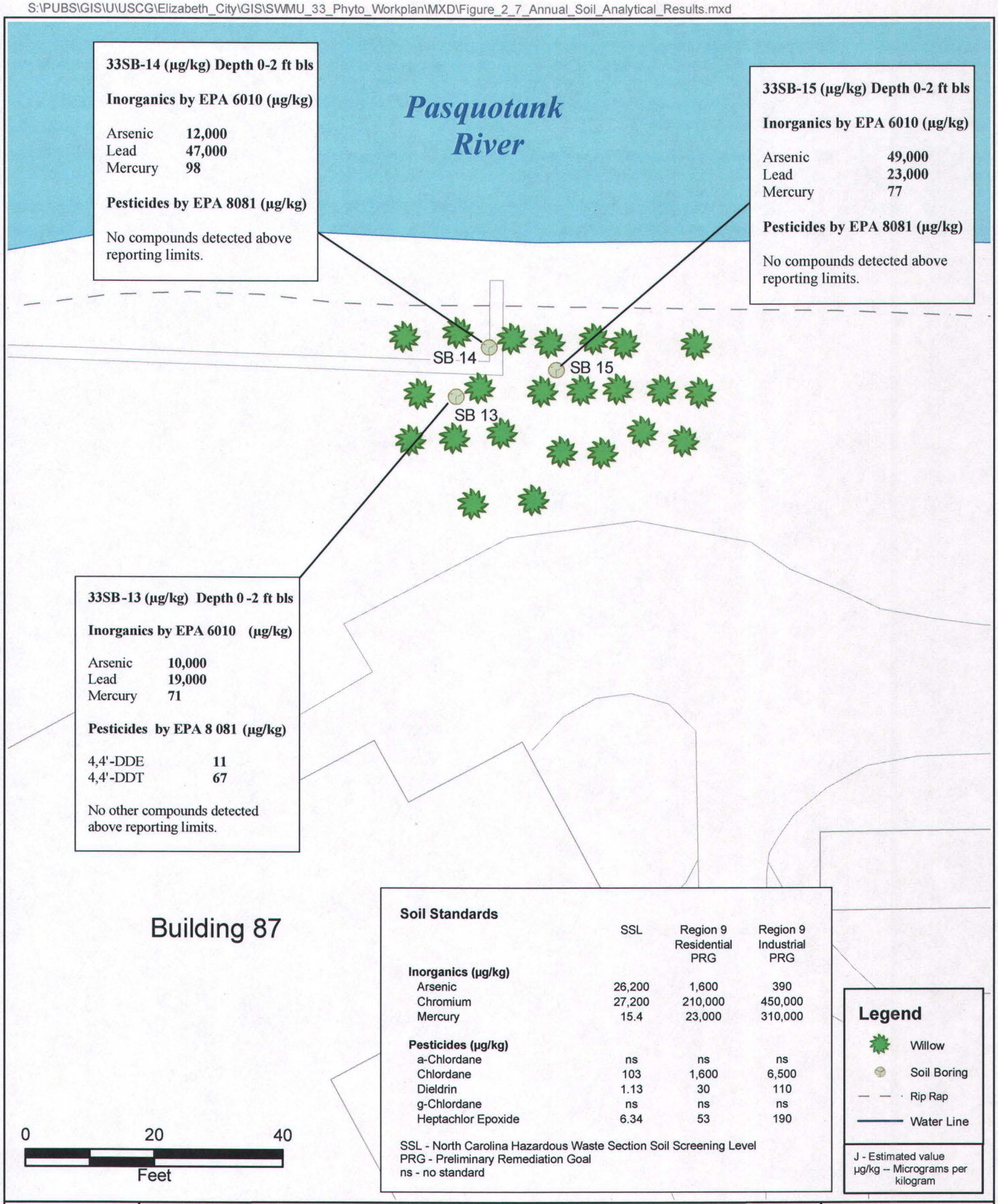
ENSR Consulting and Engineering (NC), Inc.
7041 Old Wake Forest Road
Suite 103
Raleigh, NC 27616

S:\PUBS\GIS\U\USCG\Elizabeth_City\GIS\SWMU_33_Phyto_Workplan\MXD\Figure_2_7_Annual_Soil_Analytical_Results.mxd




**33SB-14 (µg/kg) Depth 0-2 ft bls**

**Inorganics by EPA 6010 (µg/kg)**

| | |
|---|---|
| Arsenic | **12,000** |
| Lead | **47,000** |
| Mercury | **98** |

**Pesticides by EPA 8081 (µg/kg)**

No compounds detected above reporting limits.

**33SB-15 (µg/kg) Depth 0-2 ft bls**

**Inorganics by EPA 6010 (µg/kg)**

| | |
|---|---|
| Arsenic | **49,000** |
| Lead | **23,000** |
| Mercury | **77** |

**Pesticides by EPA 8081 (µg/kg)**

No compounds detected above reporting limits.

**33SB-13 (µg/kg) Depth 0 -2 ft bls**

**Inorganics by EPA 6010 (µg/kg)**

| | |
|---|---|
| Arsenic | **10,000** |
| Lead | **19,000** |
| Mercury | **71** |

**Pesticides by EPA 8 081 (µg/kg)**

| | |
|---|---|
| 4,4'-DDE | **11** |
| 4,4'-DDT | **67** |

No other compounds detected above reporting limits.

**Soil Standards**

| | SSL | Region 9 Residential PRG | Region 9 Industrial PRG |
|---|---|---|---|
| **Inorganics (µg/kg)** | | | |
| Arsenic | 26,200 | 1,600 | 390 |
| Chromium | 27,200 | 210,000 | 450,000 |
| Mercury | 15.4 | 23,000 | 310,000 |
| **Pesticides (µg/kg)** | | | |
| a-Chlordane | ns | ns | ns |
| Chlordane | 103 | 1,600 | 6,500 |
| Dieldrin | 1.13 | 30 | 110 |
| g-Chlordane | ns | ns | ns |
| Heptachlor Epoxide | 6.34 | 53 | 190 |

SSL - North Carolina Hazardous Waste Section Soil Screening Level
PRG - Preliminary Remediation Goal
ns - no standard

**Legend**

- Willow
- Soil Boring
- Rip Rap
- Water Line

J - Estimated value
µg/kg -- Micrograms per kilogram

FIGURE NUMBER: **2-2**

**Soil Analytical Results - October 2008**
**SWMU 33 FORMER WASTE STORAGE AREA**
USCG SUPPORT CENTER
ELIZABETH CITY, NORTH CAROLINA

SCALE: 1" = 20' | DATE: December 2008 | DRAWN BY: NCR

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Suite 103
Raleigh, NC 27616

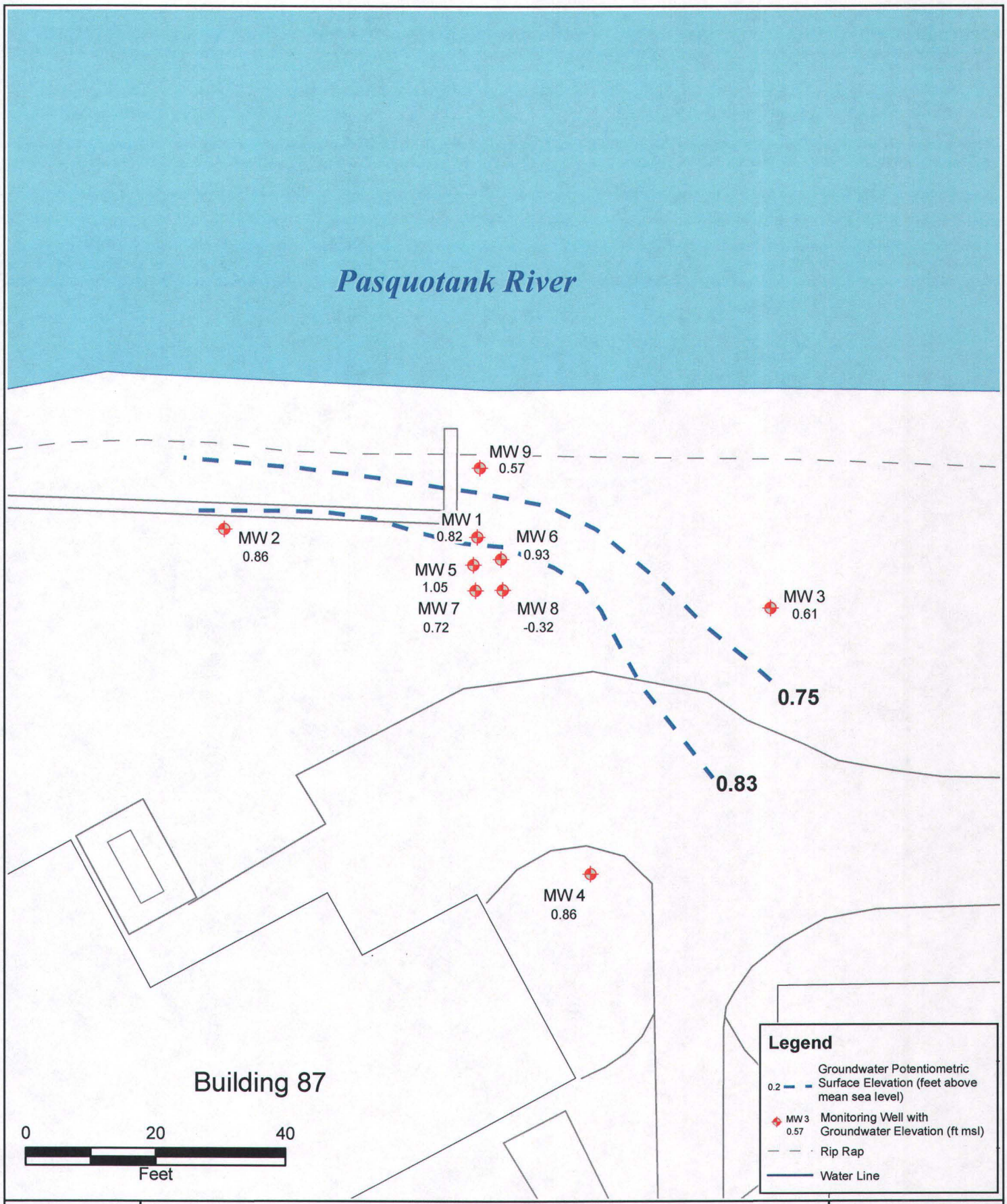


FIGURE NUMBER:

**2-3**

**Groundwater Potentiometric Surface Map - October 2008**
**SWMU 33 FORMER WASTE STORAGE AREA**

USCG SUPPORT CENTER
ELIZABETH CITY, NORTH CAROLINA

N W E S

SCALE: 1" = 20'

DATE: December 2008

DRAWN BY: NCR

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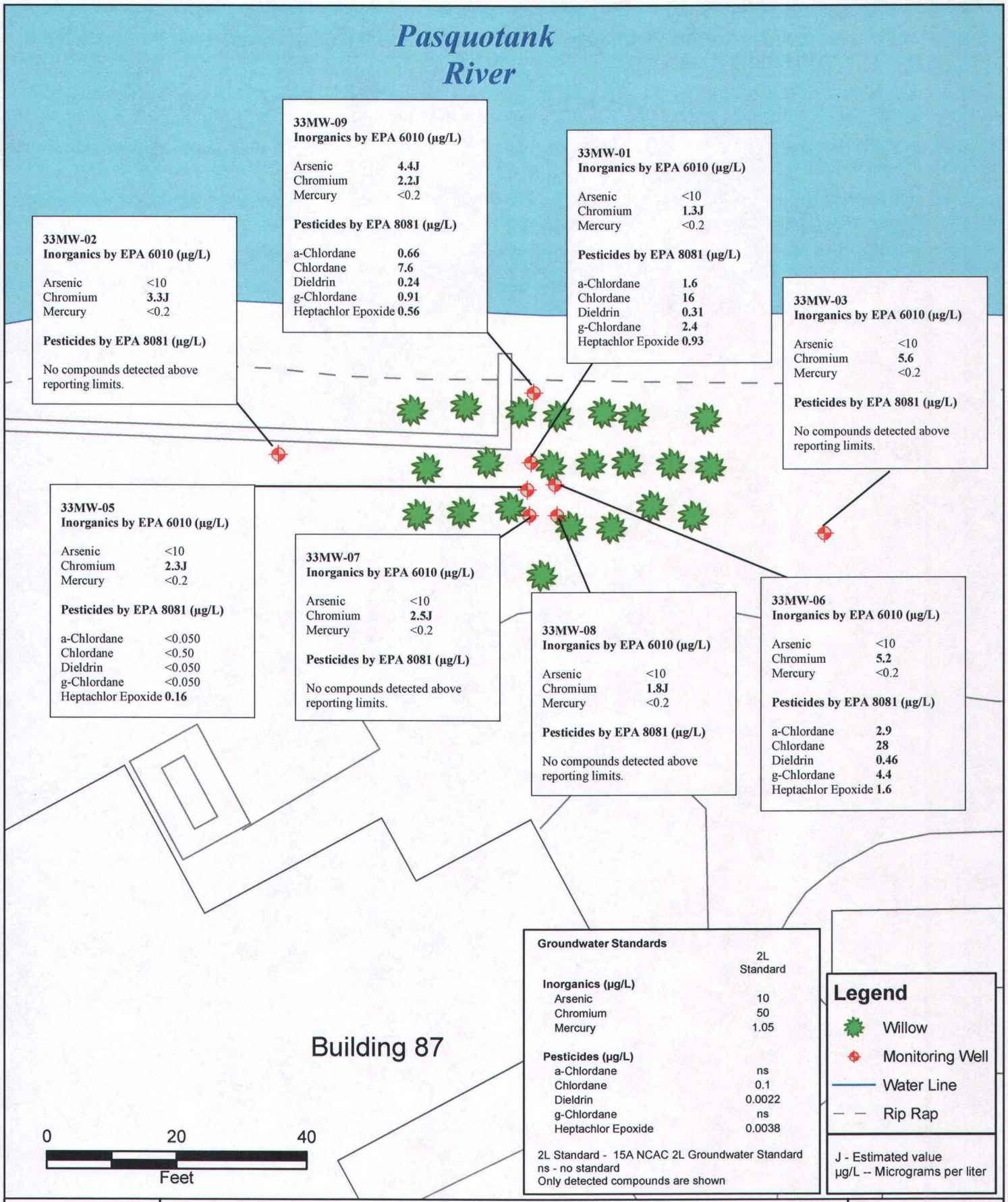
Raleigh, NC 27616




**Groundwater Standards**

| | 2L Standard |
|---|---|
| **Inorganics (µg/L)** | |
| Arsenic | 10 |
| Chromium | 50 |
| Mercury | 1.05 |
| **Pesticides (µg/L)** | |
| a-Chlordane | ns |
| Chlordane | 0.1 |
| Dieldrin | 0.0022 |
| g-Chlordane | ns |
| Heptachlor Epoxide | 0.0038 |

2L Standard - 15A NCAC 2L Groundwater Standard
ns - no standard
Only detected compounds are shown

FIGURE NUMBER: **2-4**

**Groundwater Analytical Results - October 2008**
**SWMU 33 FORMER WASTE STORAGE AREA**
USCG SUPPORT CENTER
ELIZABETH CITY, NORTH CAROLINA

SCALE: 1" = 20' | DATE: December 2008 | DRAWN BY: NCR

ENSR | AECOM
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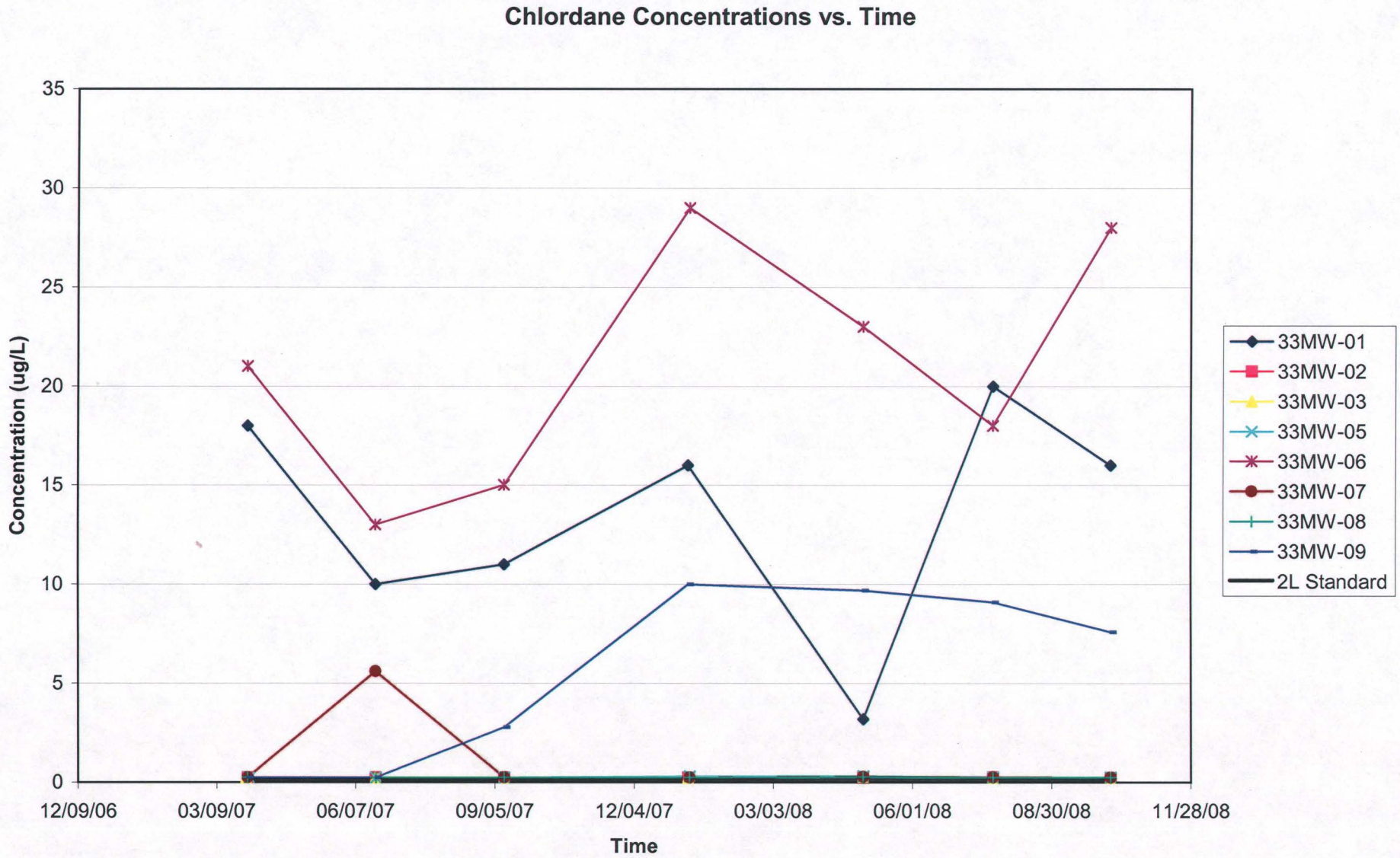
Suite 103
Raleigh, NC 27616



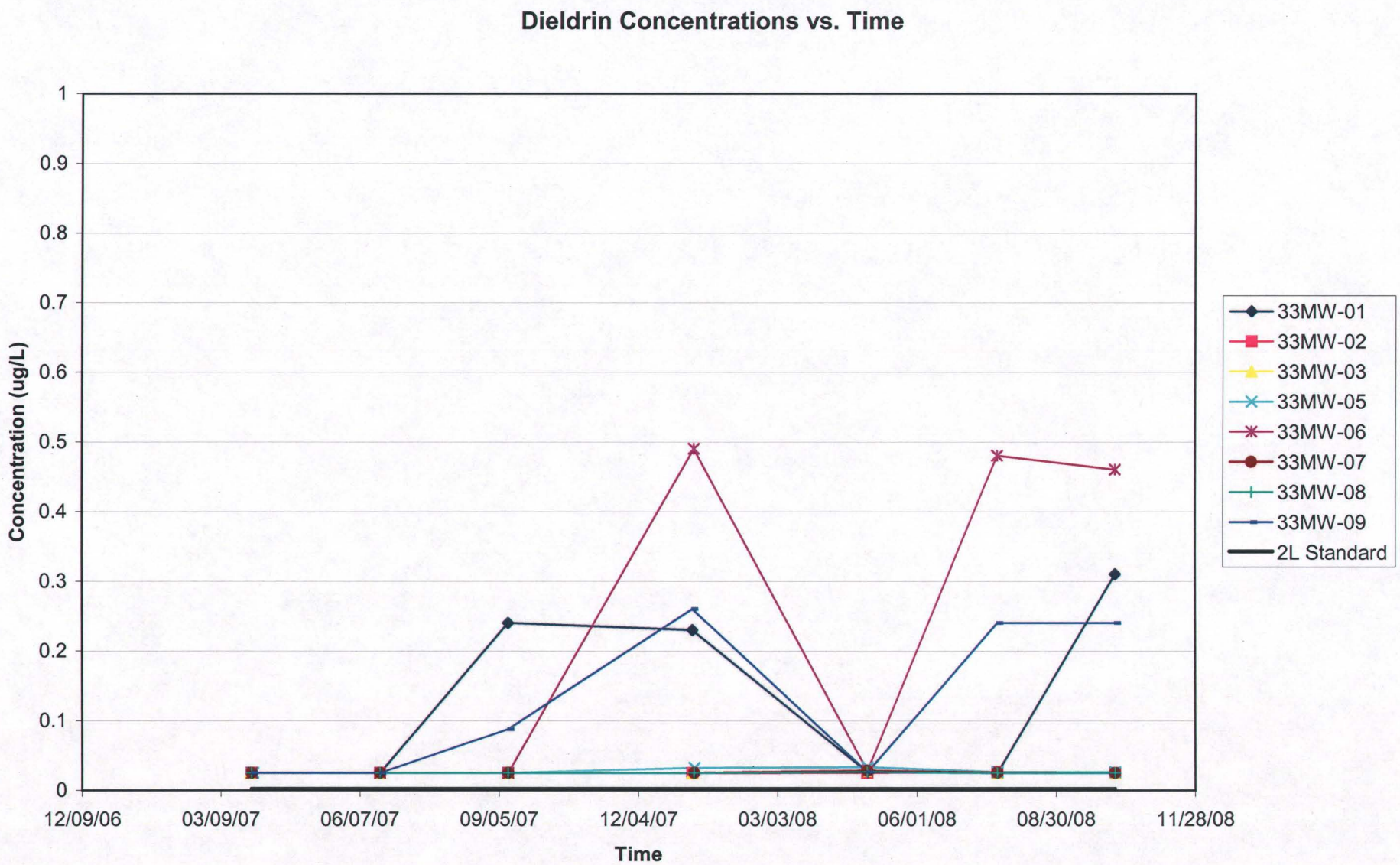

ENSR | AECOM

ENSR Consulting and Engineering (NC), Inc.
7041 Old Wake Forest Road Suite 103
Raleigh, North Carolina 27616

Drawn: MTJ
Date: 10/02/08
Project Number: 09020-066-1200

Chlordane Concentrations versus Time
SWMU 33 Former Waste Storage Area
USCG Support Center Elizabeth City, NC

FIGURE: 2-5




ENSR | AECOM

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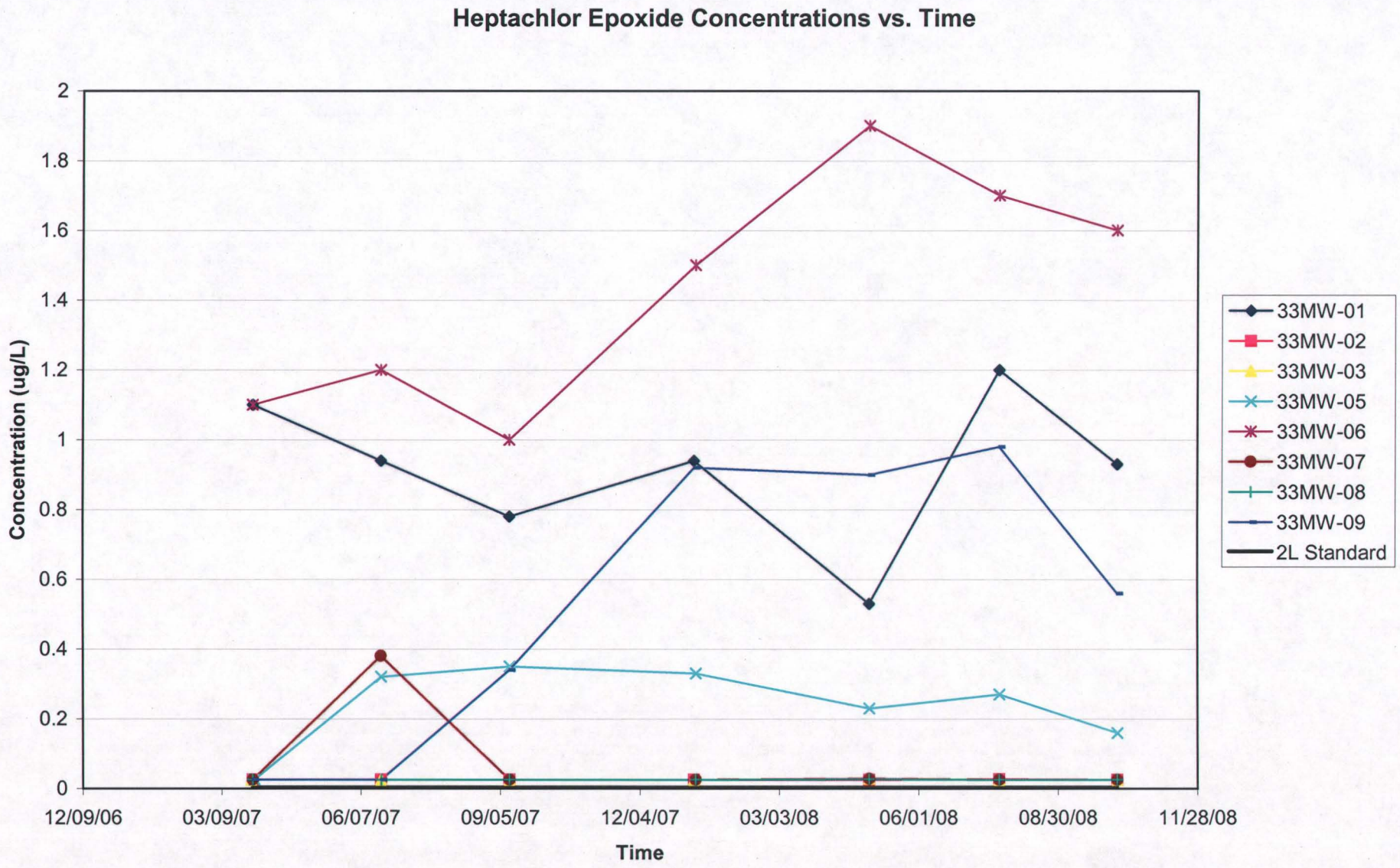
7041 Old Wake Forest Road Suite 103
Raleigh, North Carolina 27616

Drawn: MTJ
Date: 10/02/08
Project Number: 09020-066-1200

Dieldrin Concentrations versus Time
SWMU 33 Former Waste Storage Area
USCG Support Center Elizabeth City, NC

FIGURE: 2-6




ENSR | AECOM

ENSR Consulting and Engineering (NC), Inc.
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Raleigh, North Carolina 27616

Drawn: MTJ
Date: 10/02/08
Project Number: 09020-066-1200

Heptachlor Epoxide versus Time
SWMU 33 Former Waste Storage Area
USCG Support Center Elizabeth City, NC

FIGURE: 2-7

S:\PUBS\GIS\U\USCG\Elizabeth_City\GIS\SWMU_33\Quarter2_2008\MXD\Figure_3_1_Phyto System Layout.mxd

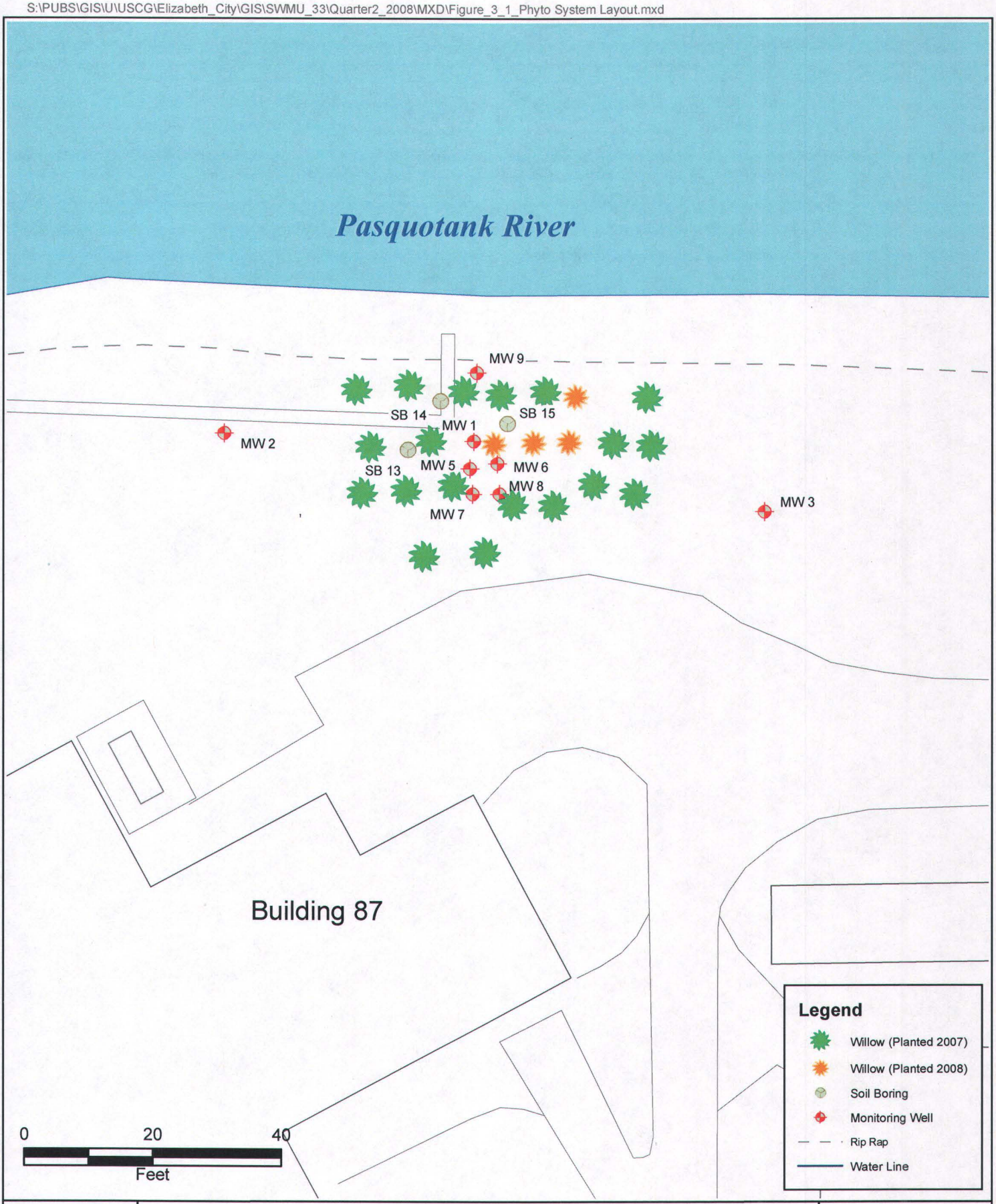


FIGURE NUMBER: **3-1**

**Phytoremediation System Layout**
**SWMU 33 FORMER WASTE STORAGE AREA**
USCG SUPPORT CENTER
ELIZABETH CITY, NORTH CAROLINA

N W E S

SCALE: 1" = 20' | DATE: June 2008 | DRAWN BY: NCR

ENSR | AECOM
ENSR Consulting and Engineering (NC), Inc.
7041 Old Wake Forest Road
Suite 103
Raleigh, NC 27616

# Appendix A

# Groundwater Sampling Logs

ENSR | AECOM

Well: 33MW-01

# Ground Water Sample Collection Record

| | | | |
|---|---|---|---|
| Client: | USCG | Date: | 10/7/08 |
| Project No: | 09020-066 | Start Time: | 1400 |
| Site Location: | SWMU 33 | Finish Time: | 1435 |
| Weather: | ~65 + sunny | Collector(s) | D. Babineau |

**WATER LEVEL DATA: (measured from Top of Casing)**

a. Total Well Length _____

b. Screen Interval 5-15 d. Well Material PVC f. Length of Water Column 9.90

c. Water Table Depth 5.10 e. Diameter 1 g. Calculated Well Volume 1.52

**WELL PURGING DATA**

a. Purge Method peristaltic

b. Acceptance Criteria
- Temperature: 5%
- pH: ± 0.5 unit
- Spec. Cond: 5%
- D.O.: 10%
- ORP: ± 10mV
- Drawdown: <0.3'
- Turbidity: <10 NTUs
- Volume: >1 well volume

c. Field Testing Equipment Used:

| Make | Model | Serial Number |
|---|---|---|
| YSI | 556 | 11446 |
| Lamotte | 2020 | 3349 |

| Time | Volume Removed (gal) | Temp (°C) | pH | Spec. Cond (µmhos) | DO (mg/L) | ORP (mV) | Turbidity (NTUs) | Color | Drawdown (feet) |
|---|---|---|---|---|---|---|---|---|---|
| 1410 | 1.0 | 21.65 | 6.04 | 792 | 1.55 | -48.8 | 29.0 | cloudy | 5.15 |
| 1413 | 1.5 | 21.50 | 6.02 | 713 | 1.19 | -44.4 | 11.2 | clear | 5.17 |
| 1416 | 2.0 | 21.40 | 6.00 | 713 | 0.48 | -37.7 | 5.33 | clear | 5.21 |
| 1419 | 2.5 | 21.36 | 5.99 | 727 | 0.45 | -31.7 | 5.01 | clear | 5.22 |
| 1422 | 3.0 | 21.33 | 5.99 | 729 | 0.43 | -30.9 | 4.21 | clear | 5.23 |
| 1425 | 3.5 | 21.32 | 5.99 | 732 | 0.43 | -30.0 | 2.34 | clear | 5.25 |
| | | | | | | | | | |

e. Acceptance criteria pass/fail

| | Yes | No | N/A |
|---|---|---|---|
| Has required volume been removed | ☒ | ☐ | ☐ |
| Has required turbidity been reached | ☒ | ☐ | ☐ |
| Have parameters stabilized | ☒ | ☐ | ☐ |

If no or N/A - Explain below.

**SAMPLE COLLECTION:** Method: Peristaltic

| Sample ID | Container Type | No. of Containers | Preservation | Analysis | Time |
|---|---|---|---|---|---|
| 33MW-01 | 1L Amber | 2 | none | 8081 | 1429 |
| 33MW-01 | 500mL Plastic | 1 | HNO3 | 6010 - As, Cr, Hg | 1429 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Comments Collect blind duplicate (33Dup-1)

Signature [signature] Date [signature]

ENSR | AECOM

Well: 33MW-02

# Ground Water Sample Collection Record

Client: USCG
Project No: 09020-066
Site Location: SWMU 33
Weather: upper 60's, sunny
Collector(s): D. Babineau, J. Musella
Date: 10/7/08
Start Time: 1456
Finish Time: 1540

**WATER LEVEL DATA: (measured from Top of Casing)**

a. Total Well Length: 15
b. Screen Interval: 5-15
c. Water Table Depth: 5.00
d. Casing Material: PVC
e. Diameter: 1
f. Length of Water Column: 10
g. Calculated Well Volume: 1.54

**WELL PURGING DATA**

a. Purge Method: peristaltic

b. Acceptance Criteria
- Temperature: 5%
- pH: ± 0.5 unit
- Spec. Cond: 5%
- D.O.: 10%
- ORP: ± 10mV
- Drawdown: <0.3'
- Turbidity: <10 NTUs
- Volume: >1 well volume

c. Field Testing Equipment Used:

| Make | Model | Serial Number |
|---|---|---|
| YSI 556 | MPS | 06 519 |
| LaMotte | 2020e | 07475 |

| Time | Volume Removed (gal) | Temp (°C) | pH | Spec. Cond (µmhos) | DO (mg/L) | ORP (mV) | Turbidity (NTUs) | Color | Drawdown (feet) |
|---|---|---|---|---|---|---|---|---|---|
| 1506 | 0.75 | 22.89 | 6.85 | 1.071 | 0.17 | -92.7 | 4.03 | clear | 5.39 |
| 1511 | 1.1 | 22.83 | 6.85 | 1.075 | 0.16 | -89.4 | 3.23 | clear | 5.38 |
| 1516 | 1.5 | 22.81 | 6.84 | 1.087 | 0.16 | -86.9 | 1.40 | clear | 5.37 |
| 1521 | 1.75 | 22.86 | 6.83 | 1.100 | 0.15 | -84.9 | 0.85 | clear | 5.36 |
| ~~1526~~ | | | | | | | | | |
| JM ~~1531~~ | | | | | | | | | |
| ~~1536~~ | | | | | | | | | |

e. Acceptance criteria pass/fail

| | Yes | No | N/A |
|---|---|---|---|
| Has required volume been removed | ☑ | ☐ | ☐ |
| Has required turbidity been reached | ☑ | ☐ | ☐ |
| Have parameters stabilized | ☑ | ☐ | ☐ |

If no or N/A - Explain below.

**SAMPLE COLLECTION:** Method: Peristaltic

| Sample ID | Container Type | No. of Containers | Preservation | Analysis | Time |
|---|---|---|---|---|---|
| 33MW-02 | 1L Amber | 2 | none | 8081 | 1524 |
| 33MW-02 | 500mL Plastic | 1 | HNO3 | 6010 - As, Cr, Hg | 1524 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Comments

Signature: [signature] Date: 10/7/08

ENSR | AECOM

Well: 33MW-03

# Ground Water Sample Collection Record

Client: USCG
Project No: 09020-066
Site Location: SWMU 33
Weather: Upper 60's, sunny breezy
Collector(s) D. Babineau

Date: 10/7/08
Start Time: 1330
Finish Time: 1430

**WATER LEVEL DATA: (measured from Top of Casing)**

a. Total Well Length: 15
b. Screen Interval: 5-15'
c. Water Table Depth: 6.53
d. Casing Material: PVC
e. Diameter: 1
f. Length of Water Column: 8.47
g. Calculated Well Volume: 1.30

**WELL PURGING DATA**

a. Purge Method: peristaltic

b. Acceptance Criteria
- Temperature: 5%
- pH: ± 0.5 unit
- Spec. Cond: 5%
- D.O.: 10%
- ORP: ± 10mV
- Drawdown: <0.3'
- Turbidity: <10 NTUs
- Volume: >1 well volume

c. Field Testing Equipment Used:

| Make | Model | Serial Number |
|---|---|---|
| YSI 556 | MPS | 06519 |
| LaMotte | 2020e | 07475 |

| Time | Volume Removed (gal) | Temp (°C) | pH | Spec. Cond (µmhos) | DO (mg/L) | ORP (mV) | Turbidity (NTUs) | Color | Drawdown (feet) |
|---|---|---|---|---|---|---|---|---|---|
| 1340 | 0.5 | 21.82 | 6.22 | 0.528 | 1.45 | 81.8 | 106.4 | cloudy | 6.91 |
| 1343 | 0.6 | 21.83 | 6.20 | 0.509 | 1.39 | 83.0 | 75.9 | cloudy | 6.87 |
| 1346 | 0.7 | 21.84 | 6.20 | 0.486 | 1.35 | 83.1 | 64.6 | cloudy | 6.85 |
| 1349 | 0.8 | 21.72 | 6.17 | 0.467 | 1.38 | 84.5 | 46.6 | cloudy | 6.90 |
| 1352 | 0.9 | 21.50 | 6.15 | 0.436 | 1.39 | 88.2 | 30.8 | cloudy | 6.83 |
| 1355 | 1.1 | 21.47 | 6.14 | 0.432 | 1.39 | 91.2 | 16.8 | clear | 6.94 |
| 1358 | 1.4 | 21.44 | 6.13 | 0.422 | 1.40 | 92.7 | 15.5 | clear | 6.81 |

↳ Cont. on back

e. Acceptance criteria pass/fail

| | Yes | No | N/A |
|---|---|---|---|
| Has required volume been removed | ☑ | ☐ | ☐ |
| Has required turbidity been reached | ☑ | ☐ | ☐ |
| Have parameters stabilized | ☑ | ☐ | ☐ |

If no or N/A - Explain below.

**SAMPLE COLLECTION:** Method: peristaltic

| Sample ID | Container Type | No. of Containers | Preservation | Analysis | Time |
|---|---|---|---|---|---|
| 33MW-03 | 1L Amber | 2 | none | 8081 | 1421 |
| 33MW-03 | 500mL Plastic | 1 | HNO3 | 6010 - As, Cr, Hg | 1421 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Comments

Signature [signature] Date 10/7/08

ENSR | AECOM

Well: 33MW-03 (cont.)

# Ground Water Sample Collection Record

| | | | |
|---|---|---|---|
| Client: | USCG | Date: | 10/7/08 |
| Project No: | 09020-066 | Start Time: | 1330 |
| Site Location: | SWMU ~~15~~ 33 (Jim) | Finish Time: | 1430 |
| Weather: | upper 60's, breezy | Collector(s) | D. Babineau + J. Musella |

**WATER LEVEL DATA: (measured from Top of Casing)**

a. Total Well Length _____

b. Screen Interval 5-15 d. Well Material PVC f. Length of Water Column 8.47

c. Water Table Depth 6.53 e. Diameter 1 g. Calculated Well Volume 1.30

**WELL PURGING DATA**

a. Purge Method peristaltic

b. Acceptance Criteria
- Temperature: 5%
- pH: ± 0.5 unit
- Spec. Cond: 5%
- D.O.: 10%
- ORP: ± 10mV
- Drawdown: <0.3'
- Turbidity: <10 NTUs
- Volume: >1 well volume

c. Field Testing Equipment Used:

| Make | Model | Serial Number |
|---|---|---|
| YSI | 556 MPS | 06519 |
| La Motte | 2020e | 07475 |

| Time | Volume Removed (gal) | Temp (°C) | pH | Spec. Cond (µmhos) | DO (mg/L) | ORP (mV) | Turbidity (NTUs) | Color | Drawdown (feet) |
|---|---|---|---|---|---|---|---|---|---|
| 1401 | 1.4 | 21.43 | 6.12 | 0.415 | 1.38 | 93.7 | 16.6 | clear | 6.82 |
| 1404 | 1.5 | 21.41 | 6.11 | 0.408 | 1.37 | 96.0 | 17.7 | ↓ | 6.79 |
| 1407 | 1.6 | 21.36 | 6.09 | 0.399 | 1.35 | 98.9 | 12.9 | ↓ | 6.80 |
| 1410 | 1.7 | 21.31 | 6.08 | 0.392 | 1.33 | 100.3 | 10.95 | ↓ | 6.80 |
| 1413 | 1.75 | 21.30 | 6.08 | 0.389 | 1.33 | 100.8 | 8.13 | ↓ | 6.82 |
| 1416 | 1.8 | 21.35 | 6.07 | 0.386 | 1.32 | 102.4 | 6.75 | ↓ | |
| | | | | | | | | | |

e. Acceptance criteria pass/fail

| | Yes | No | N/A |
|---|---|---|---|
| Has required volume been removed | ☑ | ☐ | ☐ |
| Has required turbidity been reached | ☑ | ☐ | ☐ |
| Have parameters stabilized | ☑ | ☐ | ☐ |

If no or N/A - Explain below.

**SAMPLE COLLECTION:** Method: peristaltic

| Sample ID | Container Type | No. of Containers | Preservation | Analysis | Time |
|---|---|---|---|---|---|
| | 1L Amber | 2 | none | 610 - PAHs | 1421 |
| | 500mL Plastic | 1 | HNO3 | 6010 - As, Pb | 1421 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Comments _____

Signature [signature] Date 10/7/08

ENSR | AECOM

Well: 33MW-05

# Ground Water Sample Collection Record

| | | | |
|---|---|---|---|
| Client: | USCG | Date: | 10/8/08 |
| Project No: | 09020-066 | Start Time: | 1045 |
| Site Location: | SWMU 33 | Finish Time: | 1500 |
| Weather: | ~70°&Sunny | Collector(s) | D. Babineau |

**WATER LEVEL DATA: (measured from Top of Casing)**

a. Total Well Length: 8

b. Screen Interval: 6-8

c. Water Table Depth: 5.05

d. Casing Material: PVC

e. Diameter: 1

f. Length of Water Column: 2.95

g. Calculated Well Volume: .45

**WELL PURGING DATA**

a. Purge Method: peristaltic

b. Acceptance Criteria
- Temperature: 5%
- pH: ± 0.5 unit
- Spec. Cond: 5%
- D.O.: 10%
- ORP: ± 10mV
- Drawdown: <0.3'
- Turbidity: <10 NTUs
- Volume: >1 well volume

c. Field Testing Equipment Used:

| Make | Model | Serial Number |
|---|---|---|
| YSI | 556 | 6516 |
| Lamotte | 2020 | 7475 |

| Time | Volume Removed (gal) | Temp (°C) | pH | Spec. Cond (µmhos) | DO (mg/L) | ORP (mV) | Turbidity (NTUs) | Color | Drawdown (feet) |
|---|---|---|---|---|---|---|---|---|---|
| 1055 | <1.0 | 22.09 | 6.29 | 0.582 | 1.32 | -2.6 | 12.5 | clear | 7.58 |
| 1058 | 1.0 | 22.10 | 6.28 | 0.582 | 1.22 | -2.9 | 10.3 | clear | Dry |
| 1102 | 1.5 | 22.23 | 6.30 | 0.581 | 1.27 | -3.5 | 8.78 | clear | Dry |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

e. Acceptance criteria pass/fail

| | Yes | No | N/A |
|---|---|---|---|
| Has required volume been removed | ☒ | ☐ | ☐ |
| Has required turbidity been reached | ☒ | ☐ | ☐ |
| Have parameters stabilized | ☐ | ☒ | ☐ |

If no or N/A - Explain below.

well went dry

**SAMPLE COLLECTION:** Method: peristaltic

| Sample ID | Container Type | No. of Containers | Preservation | Analysis | Time |
|---|---|---|---|---|---|
| 33MW-05 | 1L Amber | 2 | none | 8081 | 1105 |
| 33MW-05 | 500mL Plastic | 1 | HNO3 | 6010 - As, Cr, Hg | 1105 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Comments: Well went dry - allowed to recharge then re-due turbidity

Signature: [signature] Date: 10/8/08

ENSR | AECOM

Well: 33MW-06

# Ground Water Sample Collection Record

Client: USCG
Project No: 09020-066
Site Location: SWMU 33
Weather: ~65° Sunny
Collector(s) D. Babineau

Date: 10/7/08
Start Time: 1500
Finish Time: 1535

**WATER LEVEL DATA: (measured from Top of Casing)**

a. Total Well Length 14

b. Screen Interval 12-14

c. Water Table Depth 5.31

d. Casing Material PVC

e. Diameter 1

f. Length of Water Column

g. Calculated Well Volume

**WELL PURGING DATA**

a. Purge Method peristaltic

b. Acceptance Criteria
- Temperature: 5%
- pH: ± 0.5 unit
- Spec. Cond: 5%
- D.O.: 10%
- ORP: ± 10mV
- Drawdown: <0.3'
- Turbidity: <10 NTUs
- Volume: >1 well volume

c. Field Testing Equipment Used:

| Make | Model | Serial Number |
|---|---|---|
| YSI | 556 | 11446 |
| Lamotte | 2020 | 3344 |

| Time | Volume Removed (gal) | Temp (°C) | pH | Spec. Cond (µmhos) | DO (mg/L) | ORP (mV) | Turbidity (NTUs) | Color | Drawdown (feet) |
|---|---|---|---|---|---|---|---|---|---|
| 1510 | 1.0 | 21.40 | 6.00 | 313 | 2.40 | 68.7 | 18.8 | clear | 10.05 |
| 1513 | 1.5 | 21.56 | 6.09 | 303 | 1.50 | 64.4 | 12.0 | clear | 10.05 |
| 1516 | 2.0 | 21.50 | 5.85 | 291 | 1.03 | 60.1 | 4.03 | clear | 10.04 |
| 1519 | 2.5 | 21.43 | 5.88 | 290 | 0.99 | 60.1 | 3.97 | clear | 10.06 |
| 1522 | 3.0 | 21.42 | 5.87 | 290 | 0.97 | 60.2 | 3.02 | clear | 10.07 |
| | | | | | | | | | |
| | | | | | | | | | |

e. Acceptance criteria pass/fail

| | Yes | No | N/A |
|---|---|---|---|
| Has required volume been removed | ☒ | ☐ | ☐ |
| Has required turbidity been reached | ☒ | ☐ | ☐ |
| Have parameters stabilized | ☒ | ☐ | ☐ |

If no or N/A - Explain below.

**SAMPLE COLLECTION:** Method: Peristaltic

| Sample ID | Container Type | No. of Containers | Preservation | Analysis | Time |
|---|---|---|---|---|---|
| 33MW-06 | 1L Amber | 2 | none | 8081 | 1525 |
| 33MW-06 | 500mL Plastic | 1 | HNO3 | 6010 - As, Cr, Hg | 1525 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Comments

Signature

Date 10/7/08

ENSR | AECOM

Well: 33MW-07

# Ground Water Sample Collection Record

| | | | |
|---|---|---|---|
| Client: | USCG | Date: | 10/8/08 |
| Project No: | 09020-066 | Start Time: | 1150 |
| Site Location: | SWMU 33 | Finish Time: | 1230 |
| Weather: | ~70°F Sunny | Collector(s) | D. Babineau / S. Mussella |

**WATER LEVEL DATA: (measured from Top of Casing)**

a. Total Well Length: 21

b. Screen Interval: 19-21

c. Water Table Depth: 5.61

d. Casing Material: PVC

e. Diameter: 1

f. Length of Water Column: 15.39

g. Calculated Well Volume: 2.37

**WELL PURGING DATA**

a. Purge Method: peristaltic

b. Acceptance Criteria
- Temperature: 5%
- pH: ± 0.5 unit
- Spec. Cond: 5%
- D.O.: 10%
- ORP: ± 10mV
- Drawdown: <0.3'
- Turbidity: <10 NTUs
- Volume: >1 well volume

c. Field Testing Equipment Used:

| Make | Model | Serial Number |
|---|---|---|
| YSI | 556 | 11446 |
| Lamotte | 2020 | 7475 |

| Time | Volume Removed (gal) | Temp (°C) | pH | Spec. Cond (µmhos) | DO (mg/L) | ORP (mV) | Turbidity (NTUs) | Color | Drawdown (feet) |
|---|---|---|---|---|---|---|---|---|---|
| 1158 | 0.1 | 21.08 | 6.02 | 240 | 0.85 | 55.4 | 143 | cloudy | 5.56 |
| 1203 | 0.25 | 20.82 | 5.99 | 242 | 0.40 | 72.3 | 40.8 | cloudy | 5.58 |
| 1208 | 0.5 | 20.64 | 5.98 | 242 | 0.67 | 76.2 | 10.51 | clear | 5.59 |
| 1213 | 0.8 | 20.54 | 5.98 | 242 | 0.38 | 82.6 | 2.44 | clear | 5.59 |
| ~~1218~~ | | | | | | | | | |
| ON | | | | | | | | | |
| | | | | | | | | | |

e. Acceptance criteria pass/fail

| | Yes | No | N/A |
|---|---|---|---|
| Has required volume been removed | ☑ | ☐ | ☐ |
| Has required turbidity been reached | ☑ | ☐ | ☐ |
| Have parameters stabilized | ☑ | ☐ | ☐ |

If no or N/A - Explain below.

**SAMPLE COLLECTION:** Method: peristaltic

| Sample ID | Container Type | No. of Containers | Preservation | Analysis | Time |
|---|---|---|---|---|---|
| 33MW-07 | 1L Amber | 2 | none | 8081 | 1215 |
| 33MW-07 | 500mL Plastic | 1 | HNO3 | 6010 - As, Cr, Hg | 1215 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Comments

Signature [signature] Date 10/8/08

ENSR | AECOM

Well: 33MW-08

# Ground Water Sample Collection Record

Client: USCG
Project No: 09020-066
Site Location: SWMU 33
Weather: 60's sunny
Collector(s): D. Babineau

Date: 10/8/08
Start Time: 1051
Finish Time: 1150

**WATER LEVEL DATA: (measured from Top of Casing)**

a. Total Well Length: 28
b. Screen Interval: 26-28
c. Water Table Depth: 6.72
d. Casing Material: PVC
e. Diameter: 1
f. Length of Water Column: 21.28
g. Calculated Well Volume: 3.28

**WELL PURGING DATA**

a. Purge Method: peristaltic

b. Acceptance Criteria
- Temperature: 5%
- pH: ± 0.5 unit
- Spec. Cond: 5%
- D.O.: 10%
- ORP: ± 10mV
- Drawdown: <0.3'
- Turbidity: <10 NTUs
- Volume: >1 well volume

c. Field Testing Equipment Used:

| Make | Model | Serial Number |
|---|---|---|
| YSI | 556 MPS | 11446 |
| LaMotte | 2020e | 07475 |

| Time | Volume Removed (gal) | Temp (°C) | pH | Spec. Cond (µmhos) | DO (mg/L) | ORP (mV) | Turbidity (NTUs) | Color | Drawdown (feet) |
|---|---|---|---|---|---|---|---|---|---|
| 1101 | 0.6 | 20.14 | 6.04 | 191 | 1.14 | 67.6 | 30.3 | cloudy | 12.61 |
| 1106 | 0.75 | 20.24 | 6.05 | 184 | 0.72 | 32.1 | 19.1 | clear | 12.86 |
| 1111 | 0.8 | 20.12 | 6.06 | 184 | 0.52 | 17.0 | 12.0 | clear | 13.3 |
| 1116 | 1.2 | 19.97 | 6.09 | 184 | 0.43 | 1.2 | 8.82 | clear | 13.95 |
| 1121 | 1.3 | 19.97 | 6.05 | 184 | 0.38 | -8.8 | 17.3 | clear | 13.50 |
| 1126 | 1.5 | 20.39 | 6.06 | 185 | 0.34 | -12.3 | 15.4 | clear | 13.26 |
| 1131 | 1.7 | 20.17 | 6.09 | 185 | 0.34 | -18.8 | 15 | clear | 13.21 |

(DM) 7.25

e. Acceptance criteria pass/fail

| | Yes | No | N/A |
|---|---|---|---|
| Has required volume been removed | ☑ | ☐ | ☐ |
| Has required turbidity been reached | ☑ | ☐ | ☐ |
| Have parameters stabilized | ☑ | ☐ | ☐ |

If no or N/A - Explain below.

**SAMPLE COLLECTION:** Method: peristaltic

| Sample ID | Container Type | No. of Containers | Preservation | Analysis | Time |
|---|---|---|---|---|---|
| 33MW-08 | 1L Amber | 2 | none | 8081 | 1132 |
| 33MW-08 | 500mL Plastic | 1 | HNO3 | 6010 - As, Cr, Hg | 1132 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Comments

Signature: [signature]

Date: 10/8/08

ENSR | AECOM

Well: 33MW-01 DB

# Ground Water Sample Collection Record

| | | | |
|---|---|---|---|
| Client: | USCG | Date: | 10/7/08 |
| Project No: | 09020-066 | Start Time: | 1320 |
| Site Location: | SWMU 33 | Finish Time: | 1400 |
| Weather: | Clear/warm ~68° Collector(s) D. Babineau | | |

**WATER LEVEL DATA: (measured from Top of Casing)**

a. Total Well Length: 15

b. Screen Interval: 5-15 d. Casing Material: PVC f. Length of Water Column: 9.84

c. Water Table Depth: 5.16 e. Diameter: 1 g. Calculated Well Volume: 1.47

**WELL PURGING DATA**

a. Purge Method: peristaltic

b. Acceptance Criteria
- Temperature: 5%
- pH: ± 0.5 unit
- Spec. Cond: 5%
- D.O.: 10%
- ORP: ± 10mV
- Drawdown: <0.3'
- Turbidity: <10 NTUs
- Volume: >1 well volume

c. Field Testing Equipment Used:

| Make | Model | Serial Number |
|---|---|---|
| YSI | 556 | 11446 |
| Lamotte | 2020 | 3349 |

| Time | Volume Removed (gal) | Temp (°C) | pH | Spec. Cond (µmhos) | DO (mg/L) | ORP (mV) | Turbidity (NTUs) | Color | Drawdown (feet) |
|---|---|---|---|---|---|---|---|---|---|
| 1330 | 1.0 | 22.33 | 6.73 | 5.867 | 0.26 | -146.8 | 0.09 | Clear | 5.15 |
| 1333 | 2.0 | 22.32 | 6.74 | 5.872 | 0.25 | -148.7 | 0.05 | Clear | 5.16 |
| 1336 | 3.0 | 22.30 | 6.74 | 5880 | 0.23 | -149.3 | 0.04 | Clear | 5.16 |
| 1339 | 4.0 | 22.30 | 6.75 | 5881 | 0.22 | -150.0 | 0.04 | Clear | 5.17 |
| 1342 | 5.0 | 22.29 | 6.75 | 5882 | 0.22 | -151.7 | 0.03 | Clear | 5.17 |
| | | | | | | | | | |
| | | | | | | | | | |

e. Acceptance criteria pass/fail

| | Yes | No | N/A |
|---|---|---|---|
| Has required volume been removed | ☑ | ☐ | ☐ |
| Has required turbidity been reached | ☑ | ☐ | ☐ |
| Have parameters stabilized | ☒ | ☐ | ☐ |

If no or N/A - Explain below.

**SAMPLE COLLECTION:** Method: Peristaltic

| Sample ID | Container Type | No. of Containers | Preservation | Analysis | Time |
|---|---|---|---|---|---|
| 33MW-01 | 1L Amber | 2 | none | 8081 | 1345 |
| 33MW-01 | 500mL Plastic | 1 | HNO3 | 6010 - As, Cr, Hg | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |

Comments: collected ~~blind duplicate (33DUP-1)~~ DB

Signature: [signature] Date: 10/7/08

# Appendix B

# Laboratory and Data Validation Reports

# Case Narrative

PRISM LABORATORIES, INC.

| | | | |
|---|---|---|---|
| **Date:** | 10/22/08 | **Client Project ID:** | USCG Support Ctr. (SWMU-33) |
| **Company:** | ENSR C & E, Inc | **Prism COC Group No:** | G1008219 |
| **Contact:** | MICHAEL JORDAN | **Collection Date(s):** | 10/07/08 |
| **Address:** | 7041 Old Wake Forest Rd. Suite 103 Raleigh, NC 27616 | **Lab Submittal Date(s):** | 10/08/08 |
| | | **Client Project Name Or No:** | Elizabeth City, NC |

This data package contains the analytical results for the project identified above and includes a Case Narrative, Laboratory Report and Quality Control Data totaling 27 pages. A chain-of-custody is also attached for the samples submitted to Prism for this project.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative. Quality control statements and/or sample specific remarks are included in the sample comments section of the laboratory report for each sample affected.

**Semi Volatile Analysis**

Analysis Note for Q36092 MSD 4,4'-DDT: MSD recovery outside the control limits.

**Volatile Analysis**

No Anomalies Reported

**Metals Analysis**

Analysis Note for Q36185 Method Blank Mercury: MB is less than 1/2 the reporting limit of 0.05 mg/kg.

**Wet Lab and Micro Analysis**

N/A

Please call if you have any questions relating to this analytical report.

| | | | |
|---|---|---|---|
| **Date Reviewed by:** | Robbi A. Jones | **Project Manager:** | Robbi A. Jones |
| **Signature:** | Robbi A. Jones | **Signature:** | Robbi A. Jones |
| **Review Date:** | 10/22/08 | **Approval Date:** | 10/22/08 |

## Data Qualifiers Key Reference:

B: Compound also detected in the method blank.
#: Result outside of the QC limits.
DO: Compound diluted out.
E: Estimated concentration, calibration range exceeded.
J: The analyte was positively identified but the value is estimated below the reporting limit.
H: Estimated concentration with a high bias.
L: Estimated concentration with a low bias.
M: A matrix effect is present.

Notes: This report should not be reproduced, except in its entirety, without the writtten consent of Prism Laboratories, Inc. The results in this report relate only to the samples submitted for analysis.

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Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Water

Client Sample ID: 33MW06
Prism Sample ID: 227186
COC Group: G1008219
Time Collected: 10/07/08 15:25
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| **Organochlorine Pesticides by GC/ECD** | | | | | | | | | |
| 4,4'-DDD | **BRL** | µg/L | 0.050 | 0.014 | 1 | 8081A | 10/11/08 10:15 | jvogel | Q36227 |
| 4,4'-DDE | **BRL** | µg/L | 0.050 | 0.0086 | 1 | 8081A | 10/11/08 10:15 | jvogel | Q36227 |
| 4,4'-DDT | **BRL** | µg/L | 0.050 | 0.014 | 1 | 8081A | 10/11/08 10:15 | jvogel | Q36227 |
| 4,4'-Methoxychlor | **BRL** | µg/L | 0.050 | 0.017 | 1 | 8081A | 10/11/08 10:15 | jvogel | Q36227 |
| a-BHC | **BRL** | µg/L | 0.050 | 0.0075 | 1 | 8081A | 10/11/08 10:15 | jvogel | Q36227 |
| a-Chlordane | **2.9** | µg/L | 0.25 | 0.036 | 5 | 8081A | 10/16/08 14:02 | jvogel | Q36227 |
| Aldrin | **BRL** | µg/L | 0.050 | 0.015 | 1 | 8081A | 10/11/08 10:15 | jvogel | Q36227 |
| b-BHC | **BRL** | µg/L | 0.050 | 0.012 | 1 | 8081A | 10/11/08 10:15 | jvogel | Q36227 |
| Chlordane | **28** | µg/L | 2.5 | 0.72 | 5 | 8081A | 10/16/08 14:02 | jvogel | Q36227 |
| d-BHC | **BRL** | µg/L | 0.050 | 0.0077 | 1 | 8081A | 10/11/08 10:15 | jvogel | Q36227 |
| Dieldrin | **0.46** | µg/L | 0.050 | 0.0084 | 1 | 8081A | 10/11/08 10:15 | jvogel | Q36227 |
| Endosulfan I | **BRL** | µg/L | 0.050 | 0.0076 | 1 | 8081A | 10/11/08 10:15 | jvogel | Q36227 |
| Endosulfan II | **BRL** | µg/L | 0.050 | 0.0071 | 1 | 8081A | 10/11/08 10:15 | jvogel | Q36227 |
| Endosulfan Sulfate | **BRL** | µg/L | 0.050 | 0.0086 | 1 | 8081A | 10/11/08 10:15 | jvogel | Q36227 |
| Endrin | **BRL** | µg/L | 0.050 | 0.0082 | 1 | 8081A | 10/11/08 10:15 | jvogel | Q36227 |
| Endrin Aldehyde | **BRL** | µg/L | 0.050 | 0.016 | 1 | 8081A | 10/11/08 10:15 | jvogel | Q36227 |
| Endrin Ketone | **BRL** | µg/L | 0.050 | 0.0094 | 1 | 8081A | 10/11/08 10:15 | jvogel | Q36227 |
| g-BHC | **BRL** | µg/L | 0.050 | 0.0083 | 1 | 8081A | 10/11/08 10:15 | jvogel | Q36227 |
| g-Chlordane | **4.4** | µg/L | 0.25 | 0.044 | 5 | 8081A | 10/16/08 14:02 | jvogel | Q36227 |
| Heptachlor | **BRL** | µg/L | 0.050 | 0.016 | 1 | 8081A | 10/11/08 10:15 | jvogel | Q36227 |
| Heptachlor Epoxide | **1.6** | µg/L | 0.050 | 0.0088 | 1 | 8081A | 10/11/08 10:15 | jvogel | Q36227 |
| Toxaphene | **BRL** | µg/L | 0.50 | 0.15 | 1 | 8081A | 10/11/08 10:15 | jvogel | Q36227 |

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NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Full Service Analytical & Environmental Solutions

# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Water

Client Sample ID: 33MW06
Prism Sample ID: 227186
COC Group: G1008219
Time Collected: 10/07/08 15:25
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| Sample Preparation: | | | | 950 mL / | 10 mL | 3510C | 10/10/08 7:00 | smanivanh | P22756 |

| Surrogate | % Recovery | Control Limits |
|---|---|---|
| Tetrachloro-m-xylene (TCMX) | 121 | 40 - 134 |
| Decachlorobiphenyl (DCB) | 81 | 13 - 186 |

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury by CVAA** | | | | | | | | | |
| Mercury | **BRL** | mg/L | 0.0002 | 0.000011 | 1 | 7470A | 10/09/08 15:48 | heasler | Q36014 |
| Sample Preparation: | | | | 20 mL / | 30 mL | 7470A | 10/09/08 10:15 | mbarber | P22754 |
| **Metals by ICP** | | | | | | | | | |
| Arsenic | **BRL** | mg/L | 0.010 | 0.0022 | 1 | 6010B | 10/14/08 17:20 | mcampbell | Q36089 |
| Chromium | **0.0052** | mg/L | 0.0050 | 0.00015 | 1 | 6010B | 10/14/08 17:20 | mcampbell | Q36089 |
| Sample Preparation: | | | | 50 mL / | 50 mL | 3010A | 10/13/08 8:00 | mbarber | P22769 |

Sample Comment(s):

*BRL = Below Reporting Limit*
*J- Estimated value between the Reporting Limit and the MDL*
*The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.*
*All results are reported on a wet-weight basis*

Angela D. Overcash, V.P. Laboratory Services

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Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Water

Client Sample ID: 33MW02
Prism Sample ID: 227187
COC Group: G1008219
Time Collected: 10/07/08 15:24
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| **Organochlorine Pesticides by GC/ECD** | | | | | | | | | |
| 4,4'-DDD | BRL | µg/L | 0.050 | 0.014 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| 4,4'-DDE | BRL | µg/L | 0.050 | 0.0086 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| 4,4'-DDT | BRL | µg/L | 0.050 | 0.014 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| 4,4'-Methoxychlor | BRL | µg/L | 0.050 | 0.017 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| a-BHC | BRL | µg/L | 0.050 | 0.0075 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| a-Chlordane | BRL | µg/L | 0.050 | 0.0071 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| Aldrin | BRL | µg/L | 0.050 | 0.015 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| b-BHC | BRL | µg/L | 0.050 | 0.012 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| Chlordane | BRL | µg/L | 0.50 | 0.14 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| d-BHC | BRL | µg/L | 0.050 | 0.0077 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| Dieldrin | BRL | µg/L | 0.050 | 0.0084 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| Endosulfan I | BRL | µg/L | 0.050 | 0.0076 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| Endosulfan II | BRL | µg/L | 0.050 | 0.0071 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| Endosulfan Sulfate | BRL | µg/L | 0.050 | 0.0086 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| Endrin | BRL | µg/L | 0.050 | 0.0082 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| Endrin Aldehyde | BRL | µg/L | 0.050 | 0.016 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| Endrin Ketone | BRL | µg/L | 0.050 | 0.0094 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| g-BHC | BRL | µg/L | 0.050 | 0.0083 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| g-Chlordane | BRL | µg/L | 0.050 | 0.0089 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| Heptachlor | BRL | µg/L | 0.050 | 0.016 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| Heptachlor Epoxide | BRL | µg/L | 0.050 | 0.0088 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |
| Toxaphene | BRL | µg/L | 0.50 | 0.15 | 1 | 8081A | 10/11/08 10:57 | jvogel | Q36227 |

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Full Service Analytical & Environmental Solutions

# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Water

Client Sample ID: 33MW02
Prism Sample ID: 227187
COC Group: G1008219
Time Collected: 10/07/08 15:24
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| Sample Preparation: | | | | 980 mL / | 10 mL | 3510C | 10/10/08 7:00 | smanivanh | P22756 |

| Surrogate | % Recovery | Control Limits |
|---|---|---|
| Tetrachloro-m-xylene (TCMX) | 121 | 40 - 134 |
| Decachlorobiphenyl (DCB) | 76 | 13 - 186 |

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury by CVAA** | | | | | | | | | |
| Mercury | **BRL** | mg/L | 0.0002 | 0.000011 | 1 | 7470A | 10/09/08 15:59 | heasler | Q36014 |
| Sample Preparation: | | | | 20 mL / | 30 mL | 7470A | 10/09/08 10:15 | mbarber | P22754 |
| **Metals by ICP** | | | | | | | | | |
| Arsenic | **BRL** | mg/L | 0.010 | 0.0022 | 1 | 6010B | 10/14/08 17:38 | mcampbell | Q36089 |
| Chromium | **0.0033 J** | mg/L | 0.0050 | 0.00015 | 1 | 6010B | 10/14/08 17:38 | mcampbell | Q36089 |
| Sample Preparation: | | | | 50 mL / | 50 mL | 3010A | 10/13/08 8:00 | mbarber | P22769 |

Sample Comment(s):

*BRL = Below Reporting Limit*
*J- Estimated value between the Reporting Limit and the MDL*
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Angela D. Overcash, V.P. Laboratory Services

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# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Soil

Client Sample ID: 33SB13
Prism Sample ID: 227188
COC Group: G1008219
Time Collected: 10/07/08 15:55
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| **Percent Solids Determination** | | | | | | | | | |
| Percent Solids | **86.9** | % | | | 1 | SM2540 G | 10/13/08 10:45 | dsullivan | |
| **Organochlorine Pesticides by Gas Chromatography** | | | | | | | | | |
| 4,4'-DDD | **BRL** | µg/kg | 2.3 | 0.70 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| 4,4'-DDE | **11** | µg/kg | 2.3 | 0.49 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| 4,4'-DDT | **67** | µg/kg | 2.3 | 0.83 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| 4,4'-Methoxychlor | **BRL** | µg/kg | 4.6 | 1.6 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| a-BHC | **BRL** | µg/kg | 2.3 | 0.21 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| a-Chlordane | **BRL** | µg/kg | 2.3 | 0.40 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| Aldrin | **BRL** | µg/kg | 2.3 | 0.46 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| b-BHC | **BRL** | µg/kg | 2.3 | 0.58 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| Chlordane | **BRL** | µg/kg | 58 | 5.4 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| d-BHC | **BRL** | µg/kg | 2.3 | 0.32 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| Dieldrin | **BRL** | µg/kg | 1.2 | 0.48 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| Endosulfan I | **BRL** | µg/kg | 2.3 | 0.41 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| Endosulfan II | **BRL** | µg/kg | 2.3 | 0.52 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| Endosulfan Sulfate | **BRL** | µg/kg | 2.3 | 0.60 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| Endrin | **BRL** | µg/kg | 2.3 | 0.69 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| Endrin Aldehyde | **BRL** | µg/kg | 2.3 | 0.64 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| Endrin Ketone | **BRL** | µg/kg | 2.3 | 0.45 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| g-BHC | **BRL** | µg/kg | 2.3 | 0.27 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| g-Chlordane | **BRL** | µg/kg | 2.3 | 0.37 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| Heptachlor | **BRL** | µg/kg | 2.3 | 0.54 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| Heptachlor Epoxide | **BRL** | µg/kg | 2.3 | 0.42 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |
| Toxaphene | **BRL** | µg/kg | 58 | 5.9 | 1 | 8081A | 10/12/08 0:26 | jvogel | Q36092 |

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Full Service Analytical & Environmental Solutions

# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Soil

Client Sample ID: 33SB13
Prism Sample ID: 227188
COC Group: G1008219
Time Collected: 10/07/08 15:55
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| Sample Preparation: | | | 30.09 g | / | 10 mL | 3550B | 10/10/08 10:00 | jbarnette | P22766 |

| Surrogate | % Recovery | Control Limits |
|---|---|---|
| Tetrachloro-m-xylene (TCMX) | 143 | 40 - 162 |
| Decachlorobiphenyl (DCB) | 119 | 26 - 204 |

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury by CVAA** | | | | | | | | | |
| Mercury | **0.071** | mg/kg | 0.058 | 0.0026 | 1 | 7471A | 10/15/08 13:05 | heasler | Q36185 |
| Sample Preparation: | | | 0.6 g | / | 50 mL | 7471A | 10/15/08 10:30 | mbarber | P22800 |
| **Metals by ICP** | | | | | | | | | |
| Arsenic | **10** | mg/kg | 0.56 | 0.056 | 1 | 6010B | 10/14/08 20:50 | mcampbell | Q36093 |
| Chromium | **19** | mg/kg. | 0.28 | 0.036 | 1 | 6010B | 10/14/08 20:50 | mcampbell | Q36093 |
| Sample Preparation: | | | 2.05 g | / | 50 mL | 3050B | 10/13/08 7:30 | mbarber | P22770 |

Sample Comment(s):

*BRL = Below Reporting Limit*
*J- Estimated value between the Reporting Limit and the MDL*
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Angela D. Overcash, V.P. Laboratory Services

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# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Soil

Client Sample ID: 33SB14
Prism Sample ID: 227189
COC Group: G1008219
Time Collected: 10/07/08 15:50
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| **Percent Solids Determination** | | | | | | | | | |
| Percent Solids | **78.1** | % | | | 1 | SM2540 G | 10/13/08 10:45 | dsullivan | |
| **Organochlorine Pesticides by Gas Chromatography** | | | | | | | | | |
| 4,4'-DDD | **BRL** | µg/kg | 2.6 | 0.78 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| 4,4'-DDE | **BRL** | µg/kg | 2.6 | 0.55 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| 4,4'-DDT | **BRL** | µg/kg | 2.6 | 0.92 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| 4,4'-Methoxychlor | **BRL** | µg/kg | 5.1 | 1.8 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| a-BHC | **BRL** | µg/kg | 2.6 | 0.23 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| a-Chlordane | **BRL** | µg/kg | 2.6 | 0.45 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| Aldrin | **BRL** | µg/kg | 2.6 | 0.51 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| b-BHC | **BRL** | µg/kg | 2.6 | 0.65 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| Chlordane | **BRL** | µg/kg | 64 | 6.0 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| d-BHC | **BRL** | µg/kg | 2.6 | 0.36 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| Dieldrin | **BRL** | µg/kg | 1.3 | 0.53 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| Endosulfan I | **BRL** | µg/kg | 2.6 | 0.45 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| Endosulfan II | **BRL** | µg/kg | 2.6 | 0.58 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| Endosulfan Sulfate | **BRL** | µg/kg | 2.6 | 0.66 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| Endrin | **BRL** | µg/kg | 2.6 | 0.77 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| Endrin Aldehyde | **BRL** | µg/kg | 2.6 | 0.72 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| Endrin Ketone | **BRL** | µg/kg | 2.6 | 0.51 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| g-BHC | **BRL** | µg/kg | 2.6 | 0.30 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| g-Chlordane | **BRL** | µg/kg | 2.6 | 0.42 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| Heptachlor | **BRL** | µg/kg | 2.6 | 0.60 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| Heptachlor Epoxide | **BRL** | µg/kg | 2.6 | 0.47 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |
| Toxaphene | **BRL** | µg/kg | 64 | 6.5 | 1 | 8081A | 10/12/08 1:09 | jvogel | Q36092 |

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Full Service Analytical & Environmental Solutions

# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Soil

Client Sample ID: 33SB14
Prism Sample ID: 227189
COC Group: G1008219
Time Collected: 10/07/08 15:50
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| Sample Preparation: | | | | 29.9 g / | 10 mL | 3550B | 10/10/08 10:00 | jbarnette | P22766 |

| Surrogate | % Recovery | Control Limits |
|---|---|---|
| Tetrachloro-m-xylene (TCMX) | 136 | 40 - 162 |
| Decachlorobiphenyl (DCB) | 114 | 26 - 204 |

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury by CVAA** | | | | | | | | | |
| Mercury | **0.098** | mg/kg | 0.064 | 0.0029 | 1 | 7471A | 10/15/08 13:16 | heasler | Q36185 |
| Sample Preparation: | | | | 0.6 g / | 50 mL | 7471A | 10/15/08 10:30 | mbarber | P22800 |
| **Metals by ICP** | | | | | | | | | |
| Arsenic | **12** | mg/kg | 0.64 | 0.063 | 1 | 6010B | 10/14/08 21:08 | mcampbell | Q36093 |
| Chromium | **47** | mg/kg | 0.32 | 0.041 | 1 | 6010B | 10/14/08 21:08 | mcampbell | Q36093 |
| Sample Preparation: | | | | 2 g / | 50 mL | 3050B | 10/13/08 7:30 | mbarber | P22770 |

Sample Comment(s):

*BRL = Below Reporting Limit*
*J- Estimated value between the Reporting Limit and the MDL*
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Angela D. Overcash, V.P. Laboratory Services

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# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Soil

Client Sample ID: 33SB15
Prism Sample ID: 227190
COC Group: G1008219
Time Collected: 10/07/08 16:00
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| **Percent Solids Determination** | | | | | | | | | |
| Percent Solids | **83.1** | % | | | 1 | SM2540 G | 10/13/08 10:45 | dsullivan | |
| **Organochlorine Pesticides by Gas Chromatography** | | | | | | | | | |
| 4,4'-DDD | **BRL** | µg/kg | 2.4 | 0.73 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| 4,4'-DDE | **BRL** | µg/kg | 2.4 | 0.51 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| 4,4'-DDT | **BRL** | µg/kg | 2.4 | 0.87 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| 4,4'-Methoxychlor | **BRL** | µg/kg | 4.8 | 1.6 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| a-BHC | **BRL** | µg/kg | 2.4 | 0.22 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| a-Chlordane | **BRL** | µg/kg | 2.4 | 0.42 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| Aldrin | **BRL** | µg/kg | 2.4 | 0.48 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| b-BHC | **BRL** | µg/kg | 2.4 | 0.61 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| Chlordane | **BRL** | µg/kg | 60 | 5.7 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| d-BHC | **BRL** | µg/kg | 2.4 | 0.34 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| Dieldrin | **BRL** | µg/kg | 1.2 | 0.50 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| Endosulfan I | **BRL** | µg/kg | 2.4 | 0.43 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| Endosulfan II | **BRL** | µg/kg | 2.4 | 0.54 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| Endosulfan Sulfate | **BRL** | µg/kg | 2.4 | 0.62 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| Endrin | **BRL** | µg/kg | 2.4 | 0.72 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| Endrin Aldehyde | **BRL** | µg/kg | 2.4 | 0.67 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| Endrin Ketone | **BRL** | µg/kg | 2.4 | 0.48 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| g-BHC | **BRL** | µg/kg | 2.4 | 0.28 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| g-Chlordane | **BRL** | µg/kg | 2.4 | 0.39 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| Heptachlor | **BRL** | µg/kg | 2.4 | 0.57 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| Heptachlor Epoxide | **BRL** | µg/kg | 2.4 | 0.44 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |
| Toxaphene | **BRL** | µg/kg | 60 | 6.1 | 1 | 8081A | 10/12/08 1:52 | jvogel | Q36092 |

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NC Drinking Water Cert. No. 37735

# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Soil

Client Sample ID: 33SB15
Prism Sample ID: 227190
COC Group: G1008219
Time Collected: 10/07/08 16:00
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| Sample Preparation: | | | | 30.33 g / | 10 mL | 3550B | 10/10/08 10:00 | jbarnette | P22766 |
| **Mercury by CVAA** | | | | | | | | | |
| Mercury | **0.077** | mg/kg | 0.060 | 0.0028 | 1 | 7471A | 10/15/08 13:19 | heasler | Q36185 |
| Sample Preparation: | | | | 0.6 g / | 50 mL | 7471A | 10/15/08 10:30 | mbarber | P22800 |
| **Metals by ICP** | | | | | | | | | |
| Arsenic | **49** | mg/kg | 0.60 | 0.060 | 1 | 6010B | 10/14/08 21:14 | mcampbell | Q36093 |
| Chromium | **23** | mg/kg | 0.30 | 0.039 | 1 | 6010B | 10/14/08 21:14 | mcampbell | Q36093 |
| Sample Preparation: | | | | 2 g / | 50 mL | 3050B | 10/13/08 7:30 | mbarber | P22770 |

| Surrogate | % Recovery | Control Limits |
|---|---|---|
| Tetrachloro-m-xylene (TCMX) | 115 | 40 - 162 |
| Decachlorobiphenyl (DCB) | 102 | 26 - 204 |

Sample Comment(s):

*BRL = Below Reporting Limit*
*J- Estimated value between the Reporting Limit and the MDL*
*The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.*
*All results are reported on a dry-weight basis*

Angela D. Overcash, V.P. Laboratory Services

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# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Soil

Client Sample ID: 33DUP-02
Prism Sample ID: 227191
COC Group: G1008219
Time Collected: 10/07/08
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| **Percent Solids Determination** | | | | | | | | | |
| Percent Solids | **77.6** | % | | | 1 | SM2540 G | 10/10/08 14:30 | dsullivan | |
| **Organochlorine Pesticides by Gas Chromatography** | | | | | | | | | |
| 4,4'-DDD | **BRL** | µg/kg | 2.6 | 0.79 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| 4,4'-DDE | **BRL** | µg/kg | 2.6 | 0.55 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| 4,4'-DDT | **BRL** | µg/kg | 2.6 | 0.93 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| 4,4'-Methoxychlor | **BRL** | µg/kg | 5.2 | 1.8 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| a-BHC | **BRL** | µg/kg | 2.6 | 0.23 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| a-Chlordane | **BRL** | µg/kg | 2.6 | 0.45 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| Aldrin | **BRL** | µg/kg | 2.6 | 0.51 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| b-BHC | **BRL** | µg/kg | 2.6 | 0.65 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| Chlordane | **BRL** | µg/kg | 64 | 6.1 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| d-BHC | **BRL** | µg/kg | 2.6 | 0.36 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| Dieldrin | **BRL** | µg/kg | 1.3 | 0.53 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| Endosulfan I | **BRL** | µg/kg | 2.6 | 0.46 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| Endosulfan II | **BRL** | µg/kg | 2.6 | 0.58 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| Endosulfan Sulfate | **BRL** | µg/kg | 2.6 | 0.67 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| Endrin | **BRL** | µg/kg | 2.6 | 0.77 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| Endrin Aldehyde | **BRL** | µg/kg | 2.6 | 0.72 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| Endrin Ketone | **BRL** | µg/kg | 2.6 | 0.51 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| g-BHC | **BRL** | µg/kg | 2.6 | 0.30 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| g-Chlordane | **BRL** | µg/kg | 2.6 | 0.42 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| Heptachlor | **BRL** | µg/kg | 2.6 | 0.61 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| Heptachlor Epoxide | **BRL** | µg/kg | 2.6 | 0.47 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |
| Toxaphene | **BRL** | µg/kg | 64 | 6.6 | 1 | 8081A | 10/12/08 2:34 | jvogel | Q36092 |

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Full Service Analytical & Environmental Solutions

# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Soil

Client Sample ID: 33DUP-02
Prism Sample ID: 227191
COC Group: G1008219
Time Collected: 10/07/08
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| Sample Preparation: | | | 30.15 g | / | 0 mL | 3550B | 10/10/08 10:00 | jbarnette | P22766 |

| Surrogate | % Recovery | Control Limits |
|---|---|---|
| Tetrachloro-m-xylene (TCMX) | 128 | 40 - 162 |
| Decachlorobiphenyl (DCB) | 101 | 26 - 204 |

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury by CVAA** | | | | | | | | | |
| Mercury | **0.065** | mg/kg | 0.064 | 0.0030 | 1 | 7471A | 10/15/08 13:23 | heasler | Q36185 |
| Sample Preparation: | | | 0.6 g | / | 50 mL | 7471A | 10/15/08 10:30 | mbarber | P22800 |
| **Metals by ICP** | | | | | | | | | |
| Arsenic | **10** | mg/kg | 0.64 | 0.063 | 1 | 6010B | 10/14/08 21:20 | mcampbell | Q36093 |
| Chromium | **19** | mg/kg | 0.32 | 0.041 | 1 | 6010B | 10/14/08 21:20 | mcampbell | Q36093 |
| Sample Preparation: | | | 2.01 g | / | 50 mL | 3050B | 10/13/08 7:30 | mbarber | P22770 |

Sample Comment(s):

*BRL = Below Reporting Limit*
*J- Estimated value between the Reporting Limit and the MDL*
*The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.*
*All results are reported on a dry-weight basis*

Angela D. Overcash, V.P. Laboratory Services

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10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Water

Client Sample ID: 33MW09
Prism Sample ID: 227192
COC Group: G1008219
Time Collected: 10/07/08 13:45
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| **Organochlorine Pesticides by GC/ECD** | | | | | | | | | |
| 4,4'-DDD | **BRL** | µg/L | 0.050 | 0.014 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| 4,4'-DDE | **BRL** | µg/L | 0.050 | 0.0086 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| 4,4'-DDT | **BRL** | µg/L | 0.050 | 0.014 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| 4,4'-Methoxychlor | **BRL** | µg/L | 0.050 | 0.017 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| a-BHC | **BRL** | µg/L | 0.050 | 0.0075 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| a-Chlordane | **0.66** | µg/L | 0.050 | 0.0071 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| Aldrin | **BRL** | µg/L | 0.050 | 0.015 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| b-BHC | **BRL** | µg/L | 0.050 | 0.012 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| Chlordane | **7.6** | µg/L | 0.50 | 0.14 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| d-BHC | **BRL** | µg/L | 0.050 | 0.0077 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| Dieldrin | **0.24** | µg/L | 0.050 | 0.0084 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| Endosulfan I | **BRL** | µg/L | 0.050 | 0.0076 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| Endosulfan II | **BRL** | µg/L | 0.050 | 0.0071 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| Endosulfan Sulfate | **BRL** | µg/L | 0.050 | 0.0086 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| Endrin | **BRL** | µg/L | 0.050 | 0.0082 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| Endrin Aldehyde | **BRL** | µg/L | 0.050 | 0.016 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| Endrin Ketone | **BRL** | µg/L | 0.050 | 0.0094 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| g-BHC | **BRL** | µg/L | 0.050 | 0.0083 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| g-Chlordane | **0.91** | µg/L | 0.050 | 0.0089 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| Heptachlor | **BRL** | µg/L | 0.050 | 0.016 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| Heptachlor Epoxide | **0.56** | µg/L | 0.050 | 0.0088 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |
| Toxaphene | **BRL** | µg/L | 0.50 | 0.15 | 1 | 8081A | 10/11/08 11:40 | jvogel | Q36227 |

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Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Water

Client Sample ID: 33MW09
Prism Sample ID: 227192
COC Group: G1008219
Time Collected: 10/07/08 13:45
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| Sample Preparation: | | | | 950 mL / | 10 mL | 3510C | 10/10/08 7:00 | smanivanh | P22756 |
| **Mercury by CVAA** | | | | | | | | | |
| Mercury | **BRL** | mg/L | 0.0002 | 0.000011 | 1 | 7470A | 10/09/08 16:03 | heasler | Q36014 |
| Sample Preparation: | | | | 20 mL / | 30 mL | 7470A | 10/09/08 10:15 | mbarber | P22754 |
| **Metals by ICP** | | | | | | | | | |
| Arsenic | **0.0044 J** | mg/L | 0.010 | 0.0022 | 1 | 6010B | 10/14/08 17:45 | mcampbell | Q36089 |
| Chromium | **0.0022 J** | mg/L | 0.0050 | 0.00015 | 1 | 6010B | 10/14/08 17:45 | mcampbell | Q36089 |
| Sample Preparation: | | | | 50 mL / | 50 mL | 3010A | 10/13/08 8:00 | mbarber | P22769 |

| Surrogate | % Recovery | Control Limits |
|---|---|---|
| Tetrachloro-m-xylene (TCMX) | 120 | 40 - 134 |
| Decachlorobiphenyl (DCB) | 88 | 13 - 186 |

Sample Comment(s):

*BRL = Below Reporting Limit*

*J- Estimated value between the Reporting Limit and the MDL*

*The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.*

*All results are reported on a wet-weight basis*

Angela D. Overcash, V.P. Laboratory Services

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# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Water

Client Sample ID: 33MW03
Prism Sample ID: 227193
COC Group: G1008219
Time Collected: 10/07/08 14:21
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| **Organochlorine Pesticides by GC/ECD** | | | | | | | | | |
| 4,4'-DDD | **BRL** | µg/L | 0.050 | 0.014 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| 4,4'-DDE | **BRL** | µg/L | 0.050 | 0.0086 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| 4,4'-DDT | **BRL** | µg/L | 0.050 | 0.014 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| 4,4'-Methoxychlor | **BRL** | µg/L | 0.050 | 0.017 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| a-BHC | **BRL** | µg/L | 0.050 | 0.0075 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| a-Chlordane | **BRL** | µg/L | 0.050 | 0.0071 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| Aldrin | **BRL** | µg/L | 0.050 | 0.015 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| b-BHC | **BRL** | µg/L | 0.050 | 0.012 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| Chlordane | **BRL** | µg/L | 0.50 | 0.14 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| d-BHC | **BRL** | µg/L | 0.050 | 0.0077 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| Dieldrin | **BRL** | µg/L | 0.050 | 0.0084 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| Endosulfan I | **BRL** | µg/L | 0.050 | 0.0076 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| Endosulfan II | **BRL** | µg/L | 0.050 | 0.0071 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| Endosulfan Sulfate | **BRL** | µg/L | 0.050 | 0.0086 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| Endrin | **BRL** | µg/L | 0.050 | 0.0082 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| Endrin Aldehyde | **BRL** | µg/L | 0.050 | 0.016 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| Endrin Ketone | **BRL** | µg/L | 0.050 | 0.0094 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| g-BHC | **BRL** | µg/L | 0.050 | 0.0083 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| g-Chlordane | **BRL** | µg/L | 0.050 | 0.0089 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| Heptachlor | **BRL** | µg/L | 0.050 | 0.016 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| Heptachlor Epoxide | **BRL** | µg/L | 0.050 | 0.0088 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |
| Toxaphene | **BRL** | µg/L | 0.50 | 0.15 | 1 | 8081A | 10/11/08 12:23 | jvogel | Q36227 |

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Full Service Analytical & Environmental Solutions

# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Water

Client Sample ID: 33MW03
Prism Sample ID: 227193
COC Group: G1008219
Time Collected: 10/07/08 14:21
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| Sample Preparation: | | | | 1000 mL / | 10 mL | 3510C | 10/10/08 7:00 | smanivanh | P22756 |
| **Mercury by CVAA** | | | | | | | | | |
| Mercury | **BRL** | mg/L | 0.0002 | 0.000011 | 1 | 7470A | 10/09/08 16:07 | heasler | Q36014 |
| Sample Preparation: | | | | 20 mL / | 30 mL | 7470A | 10/09/08 10:15 | mbarber | P22754 |
| **Metals by ICP** | | | | | | | | | |
| Arsenic | **BRL** | mg/L | 0.010 | 0.0022 | 1 | 6010B | 10/14/08 17:52 | mcampbell | Q36089 |
| Chromium | **0.0056** | mg/L | 0.0050 | 0.00015 | 1 | 6010B | 10/14/08 17:52 | mcampbell | Q36089 |
| Sample Preparation: | | | | 50 mL / | 50 mL | 3010A | 10/13/08 8:00 | mbarber | P22769 |

| Surrogate | % Recovery | Control Limits |
|---|---|---|
| Tetrachloro-m-xylene (TCMX) | 120 | 40 - 134 |
| Decachlorobiphenyl (DCB) | 56 | 13 - 186 |

Sample Comment(s):

*BRL = Below Reporting Limit*
*J- Estimated value between the Reporting Limit and the MDL*
*The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.*
*All results are reported on a wet-weight basis*

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7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Water

Client Sample ID: 33MW01
Prism Sample ID: 227194
COC Group: G1008219
Time Collected: 10/07/08 14:29
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| **Organochlorine Pesticides by GC/ECD** | | | | | | | | | |
| 4,4'-DDD | **BRL** | µg/L | 0.050 | 0.014 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| 4,4'-DDE | **BRL** | µg/L | 0.050 | 0.0086 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| 4,4'-DDT | **BRL** | µg/L | 0.050 | 0.014 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| 4,4'-Methoxychlor | **BRL** | µg/L | 0.050 | 0.017 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| a-BHC | **BRL** | µg/L | 0.050 | 0.0075 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| a-Chlordane | **1.6** | µg/L | 0.050 | 0.0071 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| Aldrin | **BRL** | µg/L | 0.050 | 0.015 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| b-BHC | **BRL** | µg/L | 0.050 | 0.012 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| Chlordane | **16** | µg/L | 2.5 | 0.72 | 5 | 8081A | 10/16/08 13:18 | jvogel | Q36227 |
| d-BHC | **BRL** | µg/L | 0.050 | 0.0077 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| Dieldrin | **0.31** | µg/L | 0.050 | 0.0084 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| Endosulfan I | **BRL** | µg/L | 0.050 | 0.0076 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| Endosulfan II | **BRL** | µg/L | 0.050 | 0.0071 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| Endosulfan Sulfate | **BRL** | µg/L | 0.050 | 0.0086 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| Endrin | **BRL** | µg/L | 0.050 | 0.0082 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| Endrin Aldehyde | **BRL** | µg/L | 0.050 | 0.016 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| Endrin Ketone | **BRL** | µg/L | 0.050 | 0.0094 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| g-BHC | **BRL** | µg/L | 0.050 | 0.0083 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| g-Chlordane | **2.4** | µg/L | 0.050 | 0.0089 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| Heptachlor | **BRL** | µg/L | 0.050 | 0.016 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| Heptachlor Epoxide | **0.93** | µg/L | 0.050 | 0.0088 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |
| Toxaphene | **BRL** | µg/L | 0.50 | 0.15 | 1 | 8081A | 10/11/08 13:06 | jvogel | Q36227 |

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SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Full Service Analytical & Environmental Solutions

# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Water

Client Sample ID: 33MW01
Prism Sample ID: 227194
COC Group: G1008219
Time Collected: 10/07/08 14:29
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| Sample Preparation: | | | | 950 mL / | 10 mL | 3510C | 10/10/08 7:00 | smanivanh | P22756 |

| Surrogate | % Recovery | Control Limits |
|---|---|---|
| Tetrachloro-m-xylene (TCMX) | 121 | 40 - 134 |
| Decachlorobiphenyl (DCB) | 96 | 13 - 186 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury by CVAA** | | | | | | | | | |
| Mercury | **BRL** | mg/L | 0.0002 | 0.000011 | 1 | 7470A | 10/09/08 16:11 | heasler | Q36014 |
| Sample Preparation: | | | | 20 mL / | 30 mL | 7470A | 10/09/08 10:15 | mbarber | P22754 |
| **Metals by ICP** | | | | | | | | | |
| Arsenic | **BRL** | mg/L | 0.010 | 0.0022 | 1 | 6010B | 10/14/08 17:58 | mcampbell | Q36089 |
| Chromium | **0.0013 J** | mg/L | 0.0050 | 0.00015 | 1 | 6010B | 10/14/08 17:58 | mcampbell | Q36089 |
| Sample Preparation: | | | | 50 mL / | 50 mL | 3010A | 10/13/08 8:00 | mbarber | P22769 |

Sample Comment(s):

*BRL = Below Reporting Limit*
*J- Estimated value between the Reporting Limit and the MDL*
*The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.*
*All results are reported on a wet-weight basis*

Angela D. Overcash, V.P. Laboratory Services

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# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Water

Client Sample ID: 33DUP-1
Prism Sample ID: 227195
COC Group: G1008219
Time Collected: 10/07/08
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| **Organochlorine Pesticides by GC/ECD** | | | | | | | | | |
| 4,4'-DDD | **BRL** | µg/L | 0.050 | 0.014 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| 4,4'-DDE | **BRL** | µg/L | 0.050 | 0.0086 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| 4,4'-DDT | **BRL** | µg/L | 0.050 | 0.014 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| 4,4'-Methoxychlor | **BRL** | µg/L | 0.050 | 0.017 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| a-BHC | **BRL** | µg/L | 0.050 | 0.0075 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| a-Chlordane | **1.6** | µg/L | 0.050 | 0.0071 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| Aldrin | **BRL** | µg/L | 0.050 | 0.015 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| b-BHC | **BRL** | µg/L | 0.050 | 0.012 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| Chlordane | **17** | µg/L | 2.5 | 0.72 | 5 | 8081A | 10/16/08 15:18 | jvogel | Q36227 |
| d-BHC | **BRL** | µg/L | 0.050 | 0.0077 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| Dieldrin | **0.31** | µg/L | 0.050 | 0.0084 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| Endosulfan I | **BRL** | µg/L | 0.050 | 0.0076 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| Endosulfan II | **BRL** | µg/L | 0.050 | 0.0071 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| Endosulfan Sulfate | **BRL** | µg/L | 0.050 | 0.0086 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| Endrin | **BRL** | µg/L | 0.050 | 0.0082 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| Endrin Aldehyde | **BRL** | µg/L | 0.050 | 0.016 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| Endrin Ketone | **BRL** | µg/L | 0.050 | 0.0094 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| g-BHC | **BRL** | µg/L | 0.050 | 0.0083 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| g-Chlordane | **2.4** | µg/L | 0.050 | 0.0089 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| Heptachlor | **BRL** | µg/L | 0.050 | 0.016 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| Heptachlor Epoxide | **0.95** | µg/L | 0.050 | 0.0088 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |
| Toxaphene | **BRL** | µg/L | 0.50 | 0.15 | 1 | 8081A | 10/11/08 13:48 | jvogel | Q36227 |

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NC Certification No. 402
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# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Water

Client Sample ID: 33DUP-1
Prism Sample ID: 227195
COC Group: G1008219
Time Collected: 10/07/08
Time Submitted: 10/08/08 9:35

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| Sample Preparation: | | | | 1000 mL / | 10 mL | 3510C | 10/10/08 7:00 | smanivanh | P22756 |

| Surrogate | % Recovery | Control Limits |
|---|---|---|
| Tetrachloro-m-xylene (TCMX) | 118 | 40 - 134 |
| Decachlorobiphenyl (DCB) | 94 | 13 - 186 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury by CVAA** | | | | | | | | | |
| Mercury | **BRL** | mg/L | 0.0002 | 0.000011 | 1 | 7470A | 10/09/08 16:14 | heasler | Q36014 |
| Sample Preparation: | | | | 20 mL / | 30 mL | 7470A | 10/09/08 10:15 | mbarber | P22754 |
| **Metals by ICP** | | | | | | | | | |
| Arsenic | **BRL** | mg/L | 0.010 | 0.0022 | 1 | 6010B | 10/14/08 18:04 | mcampbell | Q36089 |
| Chromium | **0.0013 J** | mg/L | 0.0050 | 0.00015 | 1 | 6010B | 10/14/08 18:04 | mcampbell | Q36089 |
| Sample Preparation: | | | | 50 mL / | 50 mL | 3010A | 10/13/08 8:00 | mbarber | P22769 |

Sample Comment(s):

*BRL = Below Reporting Limit*
*J- Estimated value between the Reporting Limit and the MDL*
*The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.*
*All results are reported on a wet-weight basis*

Angela D. Overcash, V.P. Laboratory Services

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# Level II QC Report

10/21/2008

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)

COC Group Number: G1008219
Date/Time Submitted: 10/8/200 9:35

## Mercury by CVAA, method 7470A

**Method Blank**

| | Result | RL | Control Limit | Units | | | | | QC Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | -0.00009 | 0.0002 | <0.0001 | mg/L | | | | | Q36014 |

**Laboratory Control Sample**

| | Result | Spike Amount | | Units | Recovery % | Recovery Ranges % | | | QC Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.00907 | 0.0093 | | mg/L | 97 | 80-120 | | | Q36014 |

**Matrix Spike**

| Sample ID: | Result | Spike Amount | | Units | Recovery % | Recovery Ranges % | | | QC Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| 227186 Mercury | 0.00886 | 0.0093 | | mg/L | 95 | 80-120 | | | Q36014 |

**Matrix Spike Duplicate**

| Sample ID: | Result | Spike Amount | | Units | Recovery % | Recovery Ranges % | RPD % | RPD Range % | QC Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| 227186 Mercury | 0.00913 | 0.0093 | | mg/L | 98 | 80-120 | 3 | 0 - 20 | Q36014 |

## Metals by ICP, method 6010B

**Method Blank**

| | Result | RL | Control Limit | Units | | | | | QC Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | -0.001 | 0.01 | <0.005 | mg/L | | | | | Q36089 |
| Chromium | 0.0009 | 0.005 | <0.0025 | mg/L | | | | | Q36089 |

**Laboratory Control Sample**

| | Result | Spike Amount | | Units | Recovery % | Recovery Ranges % | | | QC Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 0.2565 | 0.25 | | mg/L | 103 | 80-120 | | | Q36089 |
| Chromium | 0.2557 | 0.25 | | mg/L | 102 | 80-120 | | | Q36089 |

**Matrix Spike**

| Sample ID: | Result | Spike Amount | | Units | Recovery % | Recovery Ranges % | | | QC Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| 227186 Arsenic | 0.2569 | 0.25 | | mg/L | 103 | 75-125 | | | Q36089 |
| Chromium | 0.2494 | 0.25 | | mg/L | 98 | 75-125 | | | Q36089 |

**Matrix Spike Duplicate**

| Sample ID: | Result | Spike Amount | | Units | Recovery % | Recovery Ranges % | RPD % | RPD Range % | QC Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| 227186 Arsenic | 0.257 | 0.25 | | mg/L | 103 | 75-125 | 0 | 0 - 20 | Q36089 |
| Chromium | 0.2495 | 0.25 | | mg/L | 98 | 75-125 | 0 | 0 - 20 | Q36089 |

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# Level II QC Report

10/21/2008

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)

COC Group Number: G1008219
Date/Time Submitted: 10/8/200 9:35

**Organochlorine Pesticides by Gas Chromatography, method 8081A**

**Method Blank**

| | Result | RL | Control Limit | Units | QC Batch ID |
|---|---|---|---|---|---|
| 4,4'-DDD | ND | 2 | <1 | µg/kg | Q36092 |
| 4,4'-DDE | ND | 2 | <1 | µg/kg | Q36092 |
| 4,4'-DDT | ND | 3 | <1.5 | µg/kg | Q36092 |
| 4,4'-Methoxychlor | ND | 2 | <1 | µg/kg | Q36092 |
| a-BHC | ND | 2 | <1 | µg/kg | Q36092 |
| a-Chlordane | ND | 2 | <1 | µg/kg | Q36092 |
| Aldrin | ND | 2 | <1 | µg/kg | Q36092 |
| b-BHC | ND | 2 | <1 | µg/kg | Q36092 |
| Chlordane | ND | 50 | <25 | µg/kg | Q36092 |
| d-BHC | ND | 2 | <1 | µg/kg | Q36092 |
| Dieldrin | ND | 2 | <1 | µg/kg | Q36092 |
| Endosulfan I | ND | 2 | <1 | µg/kg | Q36092 |
| Endosulfan II | ND | 2 | <1 | µg/kg | Q36092 |
| Endosulfan Sulfate | ND | 2 | <1 | µg/kg | Q36092 |
| Endrin | ND | 2 | <1 | µg/kg | Q36092 |
| Endrin Aldehyde | ND | 2 | <1 | µg/kg | Q36092 |
| Endrin Ketone | ND | 2 | <1 | µg/kg | Q36092 |
| g-BHC | ND | 2 | <1 | µg/kg | Q36092 |
| g-Chlordane | ND | 2 | <1 | µg/kg | Q36092 |
| Heptachlor | ND | 2 | <1 | µg/kg | Q36092 |
| Heptachlor Epoxide | ND | 2 | <1 | µg/kg | Q36092 |
| Toxaphene | ND | 50 | <25 | µg/kg | Q36092 |

**Laboratory Control Sample**

| | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | QC Batch ID |
|---|---|---|---|---|---|---|
| 4,4'-DDT | 41.1 | 33 | µg/kg | 125 | 75-141 | Q36092 |
| Aldrin | 33.7 | 33 | µg/kg | 102 | 66-132 | Q36092 |
| Dieldrin | 33.4 | 33 | µg/kg | 101 | 72-136 | Q36092 |
| Endrin | 38.0 | 33 | µg/kg | 115 | 74-147 | Q36092 |
| Heptachlor | 36.0 | 33 | µg/kg | 109 | 72-134 | Q36092 |

**Matrix Spike**

| Sample ID: | | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | QC Batch ID |
|---|---|---|---|---|---|---|---|
| 226778 | 4,4'-DDT | 51.2 | 33 | µg/kg | 155 | 56-163 | Q36092 |
| | Aldrin | 36.9 | 33 | µg/kg | 112 | 57-137 | Q36092 |
| | Dieldrin | 37.8 | 33 | µg/kg | 115 | 60-141 | Q36092 |

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# Level II QC Report

10/21/2008

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)

COC Group Number: G1008219
Date/Time Submitted: 10/8/200 9:35

**Matrix Spike**

| Sample ID: | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | QC Batch ID |
|---|---|---|---|---|---|---|
| 226778 Endrin | 51.2 | 33 | µg/kg | 155 | 65-164 | Q36092 |
| Heptachlor | 46.0 | 33 | µg/kg | 139 | 63-142 | Q36092 |

**Matrix Spike Duplicate**

| Sample ID: | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | RPD % | RPD Range % | QC Batch ID |
|---|---|---|---|---|---|---|---|---|
| 226778 4,4'-DDT | 54.4 | 33 | µg/kg | 165 # | 56-163 | 6 | 0 - 38 | Q36092 |
| Aldrin | 35.9 | 33 | µg/kg | 109 | 57-137 | 3 | 0 - 29 | Q36092 |
| Dieldrin | 37.5 | 33 | µg/kg | 114 | 60-141 | 1 | 0 - 30 | Q36092 |
| Endrin | 50.7 | 33 | µg/kg | 154 | 65-164 | 1 | 0 - 21 | Q36092 |
| Heptachlor | 46.5 | 33 | µg/kg | 141 | 63-142 | 1 | 0 - 27 | Q36092 |

**Metals by ICP, method 6010B**

**Method Blank**

| | Result | RL | Control Limit | Units | QC Batch ID |
|---|---|---|---|---|---|
| Arsenic | -0.0095 | 0.5 | <0.25 | mg/kg | Q36093 |
| Chromium | 0.0406 | 0.25 | <0.125 | mg/kg | Q36093 |

**Laboratory Control Sample**

| | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | QC Batch ID |
|---|---|---|---|---|---|---|
| Arsenic | 23.6831 | 25 | mg/kg | 95 | 80-120 | Q36093 |
| Chromium | 24.4271 | 25 | mg/kg | 98 | 80-120 | Q36093 |

**Matrix Spike**

| Sample ID: | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | QC Batch ID |
|---|---|---|---|---|---|---|
| 227188 Arsenic | 28.6692 | 24.630 | mg/kg | 81 | 75-125 | Q36093 |
| Chromium | 37.4073 | 24.630 | mg/kg | 83 | 75-125 | Q36093 |

**Matrix Spike Duplicate**

| Sample ID: | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | RPD % | RPD Range % | QC Batch ID |
|---|---|---|---|---|---|---|---|---|
| 227188 Arsenic | 29.1358 | 24.875 | mg/kg | 82 | 75-125 | 2 | 0 - 20 | Q36093 |
| Chromium | 37.5054 | 24.875 | mg/kg | 83 | 75-125 | 0 | 0 - 20 | Q36093 |

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# Level II QC Report

10/21/2008

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)

COC Group Number: G1008219
Date/Time Submitted: 10/8/200 9:35

**Mercury by CVAA, method 7471A**

| Method Blank | Result | RL | Control Limit | Units | QC Batch ID |
|---|---|---|---|---|---|
| Mercury | 0.02431 # | 0.02 | <0.01 | mg/kg | Q36185 |

| Laboratory Control Sample | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | QC Batch ID |
|---|---|---|---|---|---|---|
| Mercury | 0.46226 | 0.417 | mg/kg | 111 | 80-120 | Q36185 |

| Matrix Spike Sample ID: | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | QC Batch ID |
|---|---|---|---|---|---|---|
| 227188 Mercury | 0.46648 | 0.4162 | mg/kg | 97 | 80-120 | Q36185 |

| Matrix Spike Duplicate Sample ID: | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | RPD % | RPD Range % | QC Batch ID |
|---|---|---|---|---|---|---|---|---|
| 227188 Mercury | 0.46175 | 0.4111 | mg/kg | 97 | 80-120 | 1 | 0 - 20 | Q36185 |

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# Level II QC Report

10/21/2008

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Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)

COC Group Number: G1008219
Date/Time Submitted: 10/8/200 9:35

**Organochlorine Pesticides by GC/ECD, method 8081A**

**Method Blank**

| | Result | RL | Control Limit | Units | QC Batch ID |
|---|---|---|---|---|---|
| 4,4'-DDD | ND | 0.05 | <0.025 | µg/L | Q36227 |
| 4,4'-DDE | ND | 0.05 | <0.025 | µg/L | Q36227 |
| 4,4'-DDT | ND | 0.05 | <0.025 | µg/L | Q36227 |
| 4,4'-Methoxychlor | ND | 0.05 | <0.025 | µg/L | Q36227 |
| a-BHC | ND | 0.05 | <0.025 | µg/L | Q36227 |
| a-Chlordane | ND | 0.05 | <0.025 | µg/L | Q36227 |
| Aldrin | ND | 0.05 | <0.025 | µg/L | Q36227 |
| b-BHC | ND | 0.05 | <0.025 | µg/L | Q36227 |
| Chlordane | ND | 0.5 | <0.25 | µg/L | Q36227 |
| d-BHC | ND | 0.05 | <0.025 | µg/L | Q36227 |
| Dieldrin | ND | 0.05 | <0.025 | µg/L | Q36227 |
| Endosulfan I | ND | 0.05 | <0.025 | µg/L | Q36227 |
| Endosulfan II | ND | 0.05 | <0.025 | µg/L | Q36227 |
| Endosulfan Sulfate | ND | 0.05 | <0.025 | µg/L | Q36227 |
| Endrin | ND | 0.05 | <0.025 | µg/L | Q36227 |
| Endrin Aldehyde | ND | 0.05 | <0.025 | µg/L | Q36227 |
| Endrin Ketone | ND | 0.05 | <0.025 | µg/L | Q36227 |
| g-BHC | ND | 0.05 | <0.025 | µg/L | Q36227 |
| g-Chlordane | ND | 0.05 | <0.025 | µg/L | Q36227 |
| Heptachlor | ND | 0.05 | <0.025 | µg/L | Q36227 |
| Heptachlor Epoxide | ND | 0.05 | <0.025 | µg/L | Q36227 |
| Toxaphene | ND | 0.5 | <0.25 | µg/L | Q36227 |

**Laboratory Control Sample**

| | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | QC Batch ID |
|---|---|---|---|---|---|---|
| 4,4'-DDT | 1.21 | 1 | µg/L | 121 | 66-142 | Q36227 |
| Aldrin | 0.824 | 1 | µg/L | 82 | 62-124 | Q36227 |
| Dieldrin | 0.917 | 1 | µg/L | 92 | 69-130 | Q36227 |
| Endrin | 1.15 | 1 | µg/L | 115 | 69-144 | Q36227 |
| Heptachlor | 0.974 | 1 | µg/L | 97 | 61-136 | Q36227 |

**Matrix Spike**

| Sample ID: | | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | QC Batch ID |
|---|---|---|---|---|---|---|---|
| 227186 | 4,4'-DDT | 1.24 | 1 | µg/L | 124 | 15-171 | Q36227 |
| | Aldrin | 0.999 | 1 | µg/L | 100 | 24-142 | Q36227 |
| | Dieldrin | 1.16 | 1 | µg/L | 70 | 27-148 | Q36227 |

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NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Full Service Analytical & Environmental Solutions

# Level II QC Report

10/21/2008

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)

COC Group Number: G1008219
Date/Time Submitted: 10/8/200 9:35

**Matrix Spike**

| Sample ID: | | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | | | QC Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| 227186 | Endrin | 1.32 | 1 | µg/L | 132 | 35-165 | | | Q36227 |
| | Heptachlor | 1.13 | 1 | µg/L | 113 | 38-150 | | | Q36227 |

**Matrix Spike Duplicate**

| Sample ID: | | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | RPD % | RPD Range % | QC Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| 227186 | 4,4'-DDT | 1.35 | 1 | µg/L | 135 | 15-171 | 8 | 0 - 30 | Q36227 |
| | Aldrin | 1.08 | 1 | µg/L | 108 | 24-142 | 8 | 0 - 35 | Q36227 |
| | Dieldrin | 1.25 | 1 | µg/L | 79 | 27-148 | 7 | 0 - 28 | Q36227 |
| | Endrin | 1.44 | 1 | µg/L | 144 | 35-165 | 9 | 0 - 27 | Q36227 |
| | Heptachlor | 1.28 | 1 | µg/L | 128 | 38-150 | 12 | 0 - 36 | Q36227 |

**#-See Case Narrative**

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**PRISM LABORATORIES, INC.**

Full Service Analytical & Environmental Solutions

449 Springbrook Road • P.O. Box 240543 • Charlotte, NC 28224-0543
Phone: 704/529-6364 • Fax: 704/525-0409

# CHAIN OF CUSTODY RECORD

PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING: _____

Client Company Name: USCG
Report To/Contact Name: MICHAEL JORDAN
Reporting Address: ENSR RALEIGH

Phone: _____ Fax (Yes) (No): _____
Email (Yes) (No) Email Address _____
EDD Type: PDF (X) Excel (X) Other _____
Site Location Name: USCG SWMU 33
Site Location Physical Address: _____

Project Name: USCG SWMU 33
Short Hold Analysis: (Yes) (No) UST Project: (Yes) (No)
*Please ATTACH any project specific reporting (QC LEVEL I (II) III IV) provisions and/or QC Requirements
Invoice To: _____
Address: _____

Purchase Order No./Billing Reference 2058194

Requested Due Date ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days ☐ 5 Days
"Working Days" ☐ 6-9 Days ☐ Standard 10 days ☐ Rush Work Must Be Pre-Approved
Samples received after 15:00 will be processed next business day.
Turnaround time is based on business days, excluding weekends and holidays.
(SEE REVERSE FOR TERMS & CONDITIONS REGARDING SERVICES RENDERED BY PRISM LABORATORIES, INC. TO CLIENT)

**LAB USE ONLY**

| | YES | NO | N/A |
|---|---|---|---|
| Samples INTACT upon arrival? | ✓ | | |
| Received ON WET ICE? Temp 0.9 | ✓ | | |
| PROPER PRESERVATIVES indicated? | ✓ | | |
| Received WITHIN HOLDING TIMES? | ✓ | | |
| CUSTODY SEALS INTACT? | ✓ | | |
| VOLATILES rec'd W/OUT HEADSPACE? | | | ✓ |
| PROPER CONTAINERS used? | ✓ | | |

**TO BE FILLED IN BY CLIENT/SAMPLING PERSONNEL**
Certification: NELAC ____ USACE ____ FL ____ NC (X)
SC ____ OTHER ____ N/A ____
Water Chlorinated: YES ____ NO ____
Sample Iced Upon Collection: YES (X) NO ____

| CLIENT SAMPLE DESCRIPTION | DATE COLLECTED | TIME COLLECTED MILITARY HOURS | MATRIX (SOIL, WATER OR SLUDGE) | SAMPLE CONTAINER *TYPE SEE BELOW | NO. | SIZE | PRESERVATIVES | ANALYSES REQUESTED 8021 | PESTICIDES | As, Cr, Hg 6010 | | | | | REMARKS | PRISM LAB ID NO. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33MW06 | 10/07/08 | 1525 | WATER | | | | | 2 | 1 | | | | | | | 227186 |
| 33MW02 | ↓ | 1524 | ↓ | | | | | 2 | 1 | | | | | | | 227187 |
| 33SB13 | ↓ | 1555 | SOIL | | | | | 1 | 1 | | | | | | | 227188 |
| 33SB14 | ↓ | 1550 | ↓ | | | | | 1 | 1 | | | | | | | 227189 |
| 33SB15 | ↓ | 1600 | ↓ | | | | | 1 | 1 | | | | | | | 227190 |
| 33DUP-02 | ↓ | — | ↓ | | | | | 1 | 1 | | | | | | | 227191 |

Sampler's Signature [signature] Sampled By (Print Name) MICHAEL JORDAN Affiliation _____

**PRESS DOWN FIRMLY - 3 COPIES**

Upon relinquishing, this Chain of Custody is your authorization for Prism to proceed with the analyses as requested above. Any changes must be submitted in writing to the Prism Project Manager. There will be charges for any changes after analyses have been initialized.

| Relinquished By: (Signature) | Received By: (Signature) | Date | Military/Hours |
|---|---|---|---|
| Relinquished By: (Signature) | Received By: (Signature) | Date | |
| Relinquished By: (Signature) | Received For Prism Laboratories By: [signature] | Date 10/8/08 | 935 |

Method of Shipment: NOTE: ALL SAMPLE COOLERS SHOULD BE TAPED SHUT WITH CUSTODY SEALS FOR TRANSPORTATION TO THE LABORATORY. SAMPLES ARE NOT ACCEPTED AND VERIFIED AGAINST COC UNTIL RECEIVED AT THE LABORATORY.
(X) Fed Ex ☐ UPS ☐ Hand-delivered ☐ Prism Field Service ☐ Other _____
COC Group No. G1008219

Additional Comments:

**PRISM USE ONLY**
Site Arrival Time:
Site Departure Time:
Field Tech Fee:
Mileage:

| NPDES: | UST: | GROUNDWATER: | DRINKING WATER: | SOLID WASTE: | RCRA: | CERCLA | LANDFILL | OTHER: |
|---|---|---|---|---|---|---|---|---|
| ☐ NC ☐ SC | ☐ NC ☐ SC | ☐ NC ☐ SC | ☐ NC ☐ SC | ☐ NC ☐ SC | ☐ NC ☐ SC | ☐ NC ☐ SC | ☐ NC ☐ SC | ☐ NC ☐ SC |

**SEE REVERSE FOR TERMS & CONDITIONS**

ORIGINAL

# CHAIN OF CUSTODY RECORD

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions
449 Springbrook Road • P.O. Box 240543 • Charlotte, NC 28224-0543
Phone: 704/529-6364 • Fax: 704/525-0409

PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING: _____

Client Company Name: USCG
Report To/Contact Name: MICHAEL JORDAN
Reporting Address: ENSR RALEIGH

Phone: _____ Fax (Yes) (No): _____
Email (Yes) (No) Email Address _____
EDD Type: PDF X Excel X Other _____
Site Location Name: USCG SWMU 33
Site Location Physical Address: _____

Project Name: USCG SWMU 33
Short Hold Analysis: (Yes) (No) UST Project: (Yes) (No)
*Please ATTACH any project specific reporting (QC LEVEL I II III IV) provisions and/or QC Requirements
Invoice To: _____
Address: _____

Purchase Order No./Billing Reference _____
Requested Due Date ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days ☐ 5 Days
"Working Days" ☐ 6-9 Days ☐ Standard 10 days ☐ Rush Work Must Be Pre-Approved
Samples received after 15:00 will be processed next business day.
Turnaround time is based on business days, excluding weekends and holidays.
(SEE REVERSE FOR TERMS & CONDITIONS REGARDING SERVICES RENDERED BY PRISM LABORATORIES, INC. TO CLIENT)

**LAB USE ONLY**

| | YES | NO | N/A |
|---|---|---|---|
| Samples INTACT upon arrival? | ✓ | | |
| Received ON WET ICE? Temp 0.9 | ✓ | | |
| PROPER PRESERVATIVES indicated? | ✓ | | |
| Received WITHIN HOLDING TIMES? | ✓ | | |
| CUSTODY SEALS INTACT? | ✓ | | |
| VOLATILES rec'd W/OUT HEADSPACE? | | | ✓ |
| PROPER CONTAINERS used? | ✓ | | |

**TO BE FILLED IN BY CLIENT/SAMPLING PERSONNEL**
Certification: NELAC ____ USACE ____ FL ____ NC X
SC ____ OTHER ____ N/A ____
Water Chlorinated: YES ____ NO ____
Sample Iced Upon Collection: YES X NO ____

| CLIENT SAMPLE DESCRIPTION | DATE COLLECTED | TIME COLLECTED MILITARY HOURS | MATRIX (SOIL, WATER OR SLUDGE) | SAMPLE CONTAINER *TYPE SEE BELOW | NO. | SIZE | PRESERVATIVES | ANALYSES REQUESTED: 8081 PESTICIDES | As, Cr, Hg 6010 | | | | | REMARKS | PRISM LAB ID NO. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33MW09 | 10/07/08 | 1345 | WATER | | | | | 2 | 1 | | | | | | 227192 |
| 33MW03 | ↓ | 1421 | ↓ | | | | | 2 | 1 | | | | | | 227193 |
| 33MW01 | | 1429 | | | | | | 2 | 1 | | | | | | 227194 |
| 33DUP-1 | | — | | | | | | 2 | 1 | | | | | | 227195 |

Sampler's Signature [signature] Sampled By (Print Name) MICHAEL JORDAN Affiliation _____

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Upon relinquishing, this Chain of Custody is your authorization for Prism to proceed with the analyses as requested above. Any changes must be submitted in writing to the Prism Project Manager. There will be charges for any changes after analyses have been initialized.

| Relinquished By: (Signature) | Received By: (Signature) | Date | Military/Hours |
|---|---|---|---|
| [signature] | | | |
| Relinquished By: (Signature) | Received By: (Signature) | Date | |
| | | | |
| Relinquished By: (Signature) | Received For Prism Laboratories By: [signature] | Date 10/8/08 | 935 |

Method of Shipment: NOTE: ALL SAMPLE COOLERS SHOULD BE TAPED SHUT WITH CUSTODY SEALS FOR TRANSPORTATION TO THE LABORATORY. SAMPLES ARE NOT ACCEPTED AND VERIFIED AGAINST COC UNTIL RECEIVED AT THE LABORATORY.
☐ Fed Ex ☐ UPS ☐ Hand-delivered ☒ Prism Field Service ☐ Other _____
COC Group No. G1008219

Additional Comments:

**PRISM USE ONLY**
Site Arrival Time:
Site Departure Time:
Field Tech Fee:
Mileage:

| NPDES: | UST: | GROUNDWATER: | DRINKING WATER: | SOLID WASTE: | RCRA: | CERCLA | LANDFILL | OTHER: |
|---|---|---|---|---|---|---|---|---|
| ☐ NC ☐ SC | ☐ NC ☐ SC | ☐ NC ☐ SC | ☐ NC ☐ SC | ☐ NC ☐ SC | ☐ NC ☐ SC | ☐ NC ☐ SC | ☐ NC ☐ SC | ☐ NC ☐ SC |
| ☐ ____ | ☐ ____ | ☐ ____ | ☐ ____ | ☐ ____ | ☐ ____ | ☐ ____ | ☐ ____ | ☐ ____ |

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ORIGINAL

PRISM
LABORATORIES,INC.

# Case Narrative

| | | | |
|---|---|---|---|
| **Date:** | 10/21/08 | **Client Project ID:** | USCG Support Ctr. (SWMU-33) |
| **Company:** | ENSR C & E, Inc | **Prism COC Group No:** | G1008354 |
| **Contact:** | MICHAEL JORDAN | **Collection Date(s):** | 10/08/08 |
| **Address:** | 7041 Old Wake Forest Rd.<br>Suite 103<br>Raleigh, NC 27616 | **Lab Submittal Date(s):** | 10/09/08 |
| | | **Client Project Name Or No:** | Elizabeth City, NC |

This data package contains the analytical results for the project identified above and includes a Case Narrative, Laboratory Report and Quality Control Data totaling 10 pages. A chain-of-custody is also attached for the samples submitted to Prism for this project.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative. Quality control statements and/or sample specific remarks are included in the sample comments section of the laboratory report for each sample affected.

**Semi Volatile Analysis**

No Anomalies Reported

**Volatile Analysis**

N/A

**Metals Analysis**

No Anomalies Reported

**Wet Lab and Micro Analysis**

N/A

Please call if you have any questions relating to this analytical report.

| | | | |
|---|---|---|---|
| **Date Reviewed by:** | Robbi A. Jones | **Project Manager:** | Robbi A. Jones |
| **Signature:** | Robbi A. Jones | **Signature:** | Robbi A. Jones |
| **Review Date:** | 10/21/08 | **Approval Date:** | 10/21/08 |

## Data Qualifiers Key Reference:

B: Compound also detected in the method blank.
#: Result outside of the QC limits.
DO: Compound diluted out.
E: Estimated concentration, calibration range exceeded.
J: The analyte was positively identified but the value is estimated below the reporting limit.
H: Estimated concentration with a high bias.
L: Estimated concentration with a low bias.
M: A matrix effect is present.

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Full Service Analytical & Environmental Solutions

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SC Certification No. 99012
NC Drinking Water Cert. No. 37735

# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Water

Client Sample ID: 33MW-05
Prism Sample ID: 227538
COC Group: G1008354
Time Collected: 10/08/08 11:05
Time Submitted: 10/09/08 15:10

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| **Organochlorine Pesticides by GC/ECD** | | | | | | | | | |
| 4,4'-DDD | **BRL** | µg/L | 0.050 | 0.014 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| 4,4'-DDE | **BRL** | µg/L | 0.050 | 0.0086 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| 4,4'-DDT | **BRL** | µg/L | 0.050 | 0.014 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| 4,4'-Methoxychlor | **BRL** | µg/L | 0.050 | 0.017 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| a-BHC | **BRL** | µg/L | 0.050 | 0.0075 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| a-Chlordane | **BRL** | µg/L | 0.050 | 0.0071 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| Aldrin | **BRL** | µg/L | 0.050 | 0.015 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| b-BHC | **BRL** | µg/L | 0.050 | 0.012 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| Chlordane | **BRL** | µg/L | 0.50 | 0.14 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| d-BHC | **BRL** | µg/L | 0.050 | 0.0077 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| Dieldrin | **BRL** | µg/L | 0.050 | 0.0084 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| Endosulfan I | **BRL** | µg/L | 0.050 | 0.0076 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| Endosulfan II | **BRL** | µg/L | 0.050 | 0.0071 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| Endosulfan Sulfate | **BRL** | µg/L | 0.050 | 0.0086 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| Endrin | **BRL** | µg/L | 0.050 | 0.0082 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| Endrin Aldehyde | **BRL** | µg/L | 0.050 | 0.016 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| Endrin Ketone | **BRL** | µg/L | 0.050 | 0.0094 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| g-BHC | **BRL** | µg/L | 0.050 | 0.0083 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| g-Chlordane | **BRL** | µg/L | 0.050 | 0.0089 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| Heptachlor | **BRL** | µg/L | 0.050 | 0.016 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| Heptachlor Epoxide | **0.16** | µg/L | 0.050 | 0.0088 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |
| Toxaphene | **BRL** | µg/L | 0.50 | 0.15 | 1 | 8081A | 10/16/08 20:22 | jvogel | Q36221 |

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SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Full Service Analytical & Environmental Solutions

# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Water

Client Sample ID: 33MW-05
Prism Sample ID: 227538
COC Group: G1008354
Time Collected: 10/08/08 11:05
Time Submitted: 10/09/08 15:10

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| Sample Preparation: | | | | 900 mL / | 10 mL | 3510C | 10/14/08 8:00 | smanivanh | P22810 |
| **Mercury by CVAA** | | | | | | | | | |
| Mercury | **BRL** | mg/L | 0.0002 | 0.000011 | 1 | 7470A | 10/14/08 16:30 | heasler | Q36111 |
| Sample Preparation: | | | | 20 mL / | 30 mL | 7470A | 10/14/08 10:50 | mbarber | P22785 |
| **Metals by ICP** | | | | | | | | | |
| Arsenic | **BRL** | mg/L | 0.010 | 0.0022 | 1 | 6010B | 10/14/08 18:33 | mcampbell | Q36089 |
| Chromium | **0.0023 J** | mg/L | 0.0050 | 0.00015 | 1 | 6010B | 10/14/08 18:33 | mcampbell | Q36089 |
| Sample Preparation: | | | | 50 mL / | 50 mL | 3010A | 10/13/08 8:00 | mbarber | P22769 |

| Surrogate | % Recovery | Control Limits |
|---|---|---|
| Tetrachloro-m-xylene (TCMX) | 94 | 40 - 134 |
| Decachlorobiphenyl (DCB) | 168 | 13 - 186 |

Sample Comment(s):

*BRL = Below Reporting Limit*
*J- Estimated value between the Reporting Limit and the MDL*
*The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.*
*All results are reported on a wet-weight basis*

Angela D. Overcash, V.P. Laboratory Services

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Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Water

Client Sample ID: 33MW-07
Prism Sample ID: 227539
COC Group: G1008354
Time Collected: 10/08/08 12:15
Time Submitted: 10/09/08 15:10

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| **Organochlorine Pesticides by GC/ECD** | | | | | | | | | |
| 4,4'-DDD | **BRL** | µg/L | 0.050 | 0.014 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| 4,4'-DDE | **BRL** | µg/L | 0.050 | 0.0086 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| 4,4'-DDT | **BRL** | µg/L | 0.050 | 0.014 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| 4,4'-Methoxychlor | **BRL** | µg/L | 0.050 | 0.017 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| a-BHC | **BRL** | µg/L | 0.050 | 0.0075 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| a-Chlordane | **BRL** | µg/L | 0.050 | 0.0071 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| Aldrin | **BRL** | µg/L | 0.050 | 0.015 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| b-BHC | **BRL** | µg/L | 0.050 | 0.012 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| Chlordane | **BRL** | µg/L | 0.50 | 0.14 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| d-BHC | **BRL** | µg/L | 0.050 | 0.0077 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| Dieldrin | **BRL** | µg/L | 0.050 | 0.0084 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| Endosulfan I | **BRL** | µg/L | 0.050 | 0.0076 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| Endosulfan II | **BRL** | µg/L | 0.050 | 0.0071 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| Endosulfan Sulfate | **BRL** | µg/L | 0.050 | 0.0086 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| Endrin | **BRL** | µg/L | 0.050 | 0.0082 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| Endrin Aldehyde | **BRL** | µg/L | 0.050 | 0.016 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| Endrin Ketone | **BRL** | µg/L | 0.050 | 0.0094 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| g-BHC | **BRL** | µg/L | 0.050 | 0.0083 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| g-Chlordane | **BRL** | µg/L | 0.050 | 0.0089 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| Heptachlor | **BRL** | µg/L | 0.050 | 0.016 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| Heptachlor Epoxide | **BRL** | µg/L | 0.050 | 0.0088 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |
| Toxaphene | **BRL** | µg/L | 0.50 | 0.15 | 1 | 8081A | 10/16/08 21:47 | jvogel | Q36221 |

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NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Full Service Analytical & Environmental Solutions

# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Water

Client Sample ID: 33MW-07
Prism Sample ID: 227539
COC Group: G1008354
Time Collected: 10/08/08 12:15
Time Submitted: 10/09/08 15:10

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| Sample Preparation: | | | | 1000 mL / | 10 mL | 3510C | 10/14/08 8:00 | smanivanh | P22810 |

| Surrogate | % Recovery | Control Limits |
|---|---|---|
| Tetrachloro-m-xylene (TCMX) | 98 | 40 - 134 |
| Decachlorobiphenyl (DCB) | 167 | 13 - 186 |

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury by CVAA** | | | | | | | | | |
| Mercury | **BRL** | mg/L | 0.0002 | 0.000011 | 1 | 7470A | 10/14/08 16:41 | heasler | Q36111 |
| Sample Preparation: | | | | 20 mL / | 30 mL | 7470A | 10/14/08 10:50 | mbarber | P22785 |
| **Metals by ICP** | | | | | | | | | |
| Arsenic | **BRL** | mg/L | 0.010 | 0.0022 | 1 | 6010B | 10/14/08 18:39 | mcampbell | Q36089 |
| Chromium | **0.0025 J** | mg/L | 0.0050 | 0.00015 | 1 | 6010B | 10/14/08 18:39 | mcampbell | Q36089 |
| Sample Preparation: | | | | 50 mL / | 50 mL | 3010A | 10/13/08 8:00 | mbarber | P22769 |

Sample Comment(s):

*BRL = Below Reporting Limit*
*J- Estimated value between the Reporting Limit and the MDL*
*The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.*
*All results are reported on a wet-weight basis*

Angela D. Overcash, V.P. Laboratory Services

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Full Service Analytical & Environmental Solutions

# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Water

Client Sample ID: 33MW-08
Prism Sample ID: 227540
COC Group: G1008354
Time Collected: 10/08/08 11:32
Time Submitted: 10/09/08 15:10

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| **Organochlorine Pesticides by GC/ECD** | | | | | | | | | |
| 4,4'-DDD | BRL | µg/L | 0.050 | 0.014 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| 4,4'-DDE | BRL | µg/L | 0.050 | 0.0086 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| 4,4'-DDT | BRL | µg/L | 0.050 | 0.014 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| 4,4'-Methoxychlor | BRL | µg/L | 0.050 | 0.017 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| a-BHC | BRL | µg/L | 0.050 | 0.0075 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| a-Chlordane | BRL | µg/L | 0.050 | 0.0071 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| Aldrin | BRL | µg/L | 0.050 | 0.015 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| b-BHC | BRL | µg/L | 0.050 | 0.012 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| Chlordane | BRL | µg/L | 0.50 | 0.14 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| d-BHC | BRL | µg/L | 0.050 | 0.0077 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| Dieldrin | BRL | µg/L | 0.050 | 0.0084 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| Endosulfan I | BRL | µg/L | 0.050 | 0.0076 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| Endosulfan II | BRL | µg/L | 0.050 | 0.0071 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| Endosulfan Sulfate | BRL | µg/L | 0.050 | 0.0086 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| Endrin | BRL | µg/L | 0.050 | 0.0082 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| Endrin Aldehyde | BRL | µg/L | 0.050 | 0.016 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| Endrin Ketone | BRL | µg/L | 0.050 | 0.0094 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| g-BHC | BRL | µg/L | 0.050 | 0.0083 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| g-Chlordane | BRL | µg/L | 0.050 | 0.0089 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| Heptachlor | BRL | µg/L | 0.050 | 0.016 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| Heptachlor Epoxide | BRL | µg/L | 0.050 | 0.0088 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |
| Toxaphene | BRL | µg/L | 0.50 | 0.15 | 1 | 8081A | 10/16/08 23:13 | jvogel | Q36221 |

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Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

# Laboratory Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)
Sample Matrix: Water

Client Sample ID: 33MW-08
Prism Sample ID: 227540
COC Group: G1008354
Time Collected: 10/08/08 11:32
Time Submitted: 10/09/08 15:10

| Parameter | Result | Units | Report Limit | MDL | Dilution Factor | Method | Analysis Date/Time | Analyst | Batch ID |
|---|---|---|---|---|---|---|---|---|---|
| Sample Preparation: | | | | 1000 mL / | 10 mL | 3510C | 10/14/08 8:00 | smanivanh | P22810 |

| Surrogate | % Recovery | Control Limits |
|---|---|---|
| Tetrachloro-m-xylene (TCMX) | 109 | 40 - 134 |
| Decachlorobiphenyl (DCB) | 172 | 13 - 186 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury by CVAA** | | | | | | | | | |
| Mercury | BRL | mg/L | 0.0002 | 0.000011 | 1 | 7470A | 10/14/08 16:44 | heasler | Q36111 |
| Sample Preparation: | | | | 20 mL / | 30 mL | 7470A | 10/14/08 10:50 | mbarber | P22785 |
| **Metals by ICP** | | | | | | | | | |
| Arsenic | BRL | mg/L | 0.010 | 0.0022 | 1 | 6010B | 10/14/08 18:46 | mcampbell | Q36089 |
| Chromium | 0.0018 J | mg/L | 0.0050 | 0.00015 | 1 | 6010B | 10/14/08 18:46 | mcampbell | Q36089 |
| Sample Preparation: | | | | 50 mL / | 50 mL | 3010A | 10/13/08 8:00 | mbarber | P22769 |

Sample Comment(s):

*BRL = Below Reporting Limit*

*J- Estimated value between the Reporting Limit and the MDL*

*The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.*

*All results are reported on a wet-weight basis*

Angela D. Overcash, V.P. Laboratory Services

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# Level II QC Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)

COC Group Number: G1008354
Date/Time Submitted: 10/09/08 15:10

## Metals by ICP, method 6010B

**Method Blank**

| | Result | RL | Control Limit | Units | QC Batch ID |
|---|---|---|---|---|---|
| Arsenic | -0.001 | 0.01 | <0.005 | mg/L | Q36089 |
| Chromium | 0.0009 | 0.005 | <0.0025 | mg/L | Q36089 |

**Laboratory Control Sample**

| | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | QC Batch ID |
|---|---|---|---|---|---|---|
| Arsenic | 0.2565 | 0.25 | mg/L | 103 | 80-120 | Q36089 |
| Chromium | 0.2557 | 0.25 | mg/L | 102 | 80-120 | Q36089 |

**Matrix Spike**

| Sample ID: | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | QC Batch ID |
|---|---|---|---|---|---|---|
| 227186 Arsenic | 0.2569 | 0.25 | mg/L | 103 | 75-125 | Q36089 |
| Chromium | 0.2494 | 0.25 | mg/L | 98 | 75-125 | Q36089 |

**Matrix Spike Duplicate**

| Sample ID: | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | RPD % | RPD Range % | QC Batch ID |
|---|---|---|---|---|---|---|---|---|
| 227186 Arsenic | 0.257 | 0.25 | mg/L | 103 | 75-125 | 0 | 0 - 20 | Q36089 |
| Chromium | 0.2495 | 0.25 | mg/L | 98 | 75-125 | 0 | 0 - 20 | Q36089 |

## Mercury by CVAA, method 7470A

**Method Blank**

| | Result | RL | Control Limit | Units | QC Batch ID |
|---|---|---|---|---|---|
| Mercury | -0.00011 | 0.0002 | <0.0001 | mg/L | Q36111 |

**Laboratory Control Sample**

| | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | QC Batch ID |
|---|---|---|---|---|---|---|
| Mercury | 0.00982 | 0.0093 | mg/L | 105 | 80-120 | Q36111 |

**Matrix Spike**

| Sample ID: | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | QC Batch ID |
|---|---|---|---|---|---|---|
| 227538 Mercury | 0.00919 | 0.0093 | mg/L | 99 | 80-120 | Q36111 |

**Matrix Spike Duplicate**

| Sample ID: | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | RPD % | RPD Range % | QC Batch ID |
|---|---|---|---|---|---|---|---|---|
| 227538 Mercury | 0.00926 | 0.0093 | mg/L | 100 | 80-120 | 1 | 0 - 20 | Q36111 |

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Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

# Level II QC Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)

COC Group Number: G1008354
Date/Time Submitted: 10/09/08 15:10

**Organochlorine Pesticides by GC/ECD, method 8081A**

**Method Blank**

| | Result | RL | Control Limit | Units | QC Batch ID |
|---|---|---|---|---|---|
| 4,4'-DDD | ND | 0.05 | <0.025 | µg/L | Q36221 |
| 4,4'-DDE | ND | 0.05 | <0.025 | µg/L | Q36221 |
| 4,4'-DDT | ND | 0.05 | <0.025 | µg/L | Q36221 |
| 4,4'-Methoxychlor | ND | 0.05 | <0.025 | µg/L | Q36221 |
| a-BHC | ND | 0.05 | <0.025 | µg/L | Q36221 |
| a-Chlordane | ND | 0.05 | <0.025 | µg/L | Q36221 |
| Aldrin | ND | 0.05 | <0.025 | µg/L | Q36221 |
| b-BHC | ND | 0.05 | <0.025 | µg/L | Q36221 |
| Chlordane | ND | 0.5 | <0.25 | µg/L | Q36221 |
| d-BHC | ND | 0.05 | <0.025 | µg/L | Q36221 |
| Dieldrin | ND | 0.05 | <0.025 | µg/L | Q36221 |
| Endosulfan I | ND | 0.05 | <0.025 | µg/L | Q36221 |
| Endosulfan II | ND | 0.05 | <0.025 | µg/L | Q36221 |
| Endosulfan Sulfate | ND | 0.05 | <0.025 | µg/L | Q36221 |
| Endrin | ND | 0.05 | <0.025 | µg/L | Q36221 |
| Endrin Aldehyde | ND | 0.05 | <0.025 | µg/L | Q36221 |
| Endrin Ketone | ND | 0.05 | <0.025 | µg/L | Q36221 |
| g-BHC | ND | 0.05 | <0.025 | µg/L | Q36221 |
| g-Chlordane | ND | 0.05 | <0.025 | µg/L | Q36221 |
| Heptachlor | ND | 0.05 | <0.025 | µg/L | Q36221 |
| Heptachlor Epoxide | ND | 0.05 | <0.025 | µg/L | Q36221 |
| Toxaphene | ND | 0.5 | <0.25 | µg/L | Q36221 |

**Laboratory Control Sample**

| | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | QC Batch ID |
|---|---|---|---|---|---|---|
| 4,4'-DDT | 1.20 | 1 | µg/L | 120 | 66-142 | Q36221 |
| Aldrin | 0.931 | 1 | µg/L | 93 | 62-124 | Q36221 |
| Dieldrin | 1.02 | 1 | µg/L | 102 | 69-130 | Q36221 |
| Endrin | 1.14 | 1 | µg/L | 114 | 69-144 | Q36221 |
| Heptachlor | 1.01 | 1 | µg/L | 101 | 61-136 | Q36221 |

**Matrix Spike**

| Sample ID: | | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | QC Batch ID |
|---|---|---|---|---|---|---|---|
| 227540 | 4,4'-DDT | 1.20 | 1 | µg/L | 120 | 15-171 | Q36221 |
| | Aldrin | 0.915 | 1 | µg/L | 92 | 24-142 | Q36221 |
| | Dieldrin | 0.988 | 1 | µg/L | 99 | 27-148 | Q36221 |

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# Level II QC Report

10/21/08

ENSR C & E, Inc
Attn: MICHAEL JORDAN
7041 Old Wake Forest Rd.
Suite 103
Raleigh, NC 27616

Project Name: Elizabeth City, NC
Project ID: USCG Support Ctr. (SWMU-33)

COC Group Number: G1008354
Date/Time Submitted: 10/09/08 15:10

**Matrix Spike**

| Sample ID: | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | QC Batch ID |
|---|---|---|---|---|---|---|
| 227540 Endrin | 1.14 | 1 | µg/L | 114 | 35-165 | Q36221 |
| Heptachlor | 1.01 | 1 | µg/L | 101 | 38-150 | Q36221 |

**Matrix Spike Duplicate**

| Sample ID: | Result | Spike Amount | Units | Recovery % | Recovery Ranges % | RPD % | RPD Range % | QC Batch ID |
|---|---|---|---|---|---|---|---|---|
| 227540 4,4'-DDT | 1.15 | 1 | µg/L | 115 | 15-171 | 4 | 0 - 30 | Q36221 |
| Aldrin | 0.925 | 1 | µg/L | 93 | 24-142 | 1 | 0 - 35 | Q36221 |
| Dieldrin | 0.997 | 1 | µg/L | 100 | 27-148 | 1 | 0 - 28 | Q36221 |
| Endrin | 1.10 | 1 | µg/L | 110 | 35-165 | 4 | 0 - 27 | Q36221 |
| Heptachlor | 0.999 | 1 | µg/L | 100 | 38-150 | 1 | 0 - 36 | Q36221 |

**#-See Case Narrative**

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# CHAIN OF CUSTODY RECORD

PRISM LABORATORIES, INC.

Full Service Analytical & Environmental Solutions

449 Springbrook Road • P.O. Box 240543 • Charlotte, NC 28224-0543
Phone: 704/529-6364 • Fax: 704/525-0409

PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING:

Client Company Name: ENSR / Aecom
Report To/Contact Name: M. Jordan
Reporting Address: 7041 Old Wake Forest Rd Raleigh NC 27616
Phone: 919-872-6600 Fax (Yes) (No)
Email (Yes) (No) Email Address: Mike_Jordan@Aecom.com
EDD Type: PDF X Excel ___ Other ___
Site Location Name: USCG
Site Location Physical Address: Elizabeth City, NC

Project Name: USCG SWMU-33
Short Hold Analysis: (Yes) (No) UST Project: (Yes) (No)
*Please ATTACH any project specific reporting (QC LEVEL I II III IV) provisions and/or QC Requirements
Invoice To: ENSR
Address: 7041 Old Wake Forest Rd, Raleigh, NC
Purchase Order No./Billing Reference 09020-066-
Requested Due Date ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days ☐ 5 Days
"Working Days" ☐ 6-9 Days X Standard 10 days ☐ Rush Work Must Be Pre-Approved
Samples received after 15:00 will be processed next business day.
Turnaround time is based on business days, excluding weekends and holidays.
(SEE REVERSE FOR TERMS & CONDITIONS REGARDING SERVICES RENDERED BY PRISM LABORATORIES, INC. TO CLIENT)

**LAB USE ONLY**

| | YES | NO | N/A |
|---|---|---|---|
| Samples INTACT upon arrival? | ✓ | | |
| Received ON WET ICE? Temp 3.0 | ✓ | | |
| PROPER PRESERVATIVES indicated? | ✓ | | |
| Received WITHIN HOLDING TIMES? | ✓ | | |
| CUSTODY SEALS INTACT? | | | ✓ |
| VOLATILES rec'd W/OUT HEADSPACE? | | | ✓ |
| PROPER CONTAINERS used? | ✓ | | |

**TO BE FILLED IN BY CLIENT/SAMPLING PERSONNEL**
Certification: NELAC ___ USACE ___ FL ___ NC X SC ___ OTHER ___ N/A ___
Water Chlorinated: YES ___ NO X
Sample Iced Upon Collection: YES X NO ___

| CLIENT SAMPLE DESCRIPTION | DATE COLLECTED | TIME COLLECTED MILITARY HOURS | MATRIX (SOIL, WATER OR SLUDGE) | SAMPLE CONTAINER *TYPE SEE BELOW | NO. | SIZE | PRESERVATIVES | ANALYSES REQUESTED 8081 | 6010 Pb,Cr,Ba | | | | | REMARKS | PRISM LAB ID NO. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 33MW-05 | 10/8/08 | 1105 | Water | P/Amber | 1/2 | 500ml/1L | HNO3/None | X | X | | | | | | 227538 |
| 33MW-07 | 10/8/08 | 1215 | Water | " | " | " | " | X | X | | | | | | 227539 |
| 33MW-08 | 10/8/08 | 1132 | Water | " | " | " | " | X | X | | | | | | 227540 |

Sampler's Signature [signature] Sampled By (Print Name) David Babineau Affiliation ENSR / Aecom

PRESS DOWN FIRMLY - 3 COPIES

Upon relinquishing, this Chain of Custody is your authorization for Prism to proceed with the analyses as requested above. Any changes must be submitted in writing to the Prism Project Manager. There will be charges for any changes after analyses have been initialized.

| Relinquished By: (Signature) | Received By: (Signature) | Date | Military/Hours |
|---|---|---|---|
| [signature] | Alex Lassite | 10-9-8 | 1045 |
| Alex Lassite | [signature] | 10-9-08 | 1250 |
| David Morris 10-9-08 1500 | [signature] | 10/9/08 | 1510 |

Received For Prism Laboratories By: [signature]

Method of Shipment: NOTE: ALL SAMPLE COOLERS SHOULD BE TAPED SHUT WITH CUSTODY SEALS FOR TRANSPORTATION TO THE LABORATORY. SAMPLES ARE NOT ACCEPTED AND VERIFIED AGAINST COC UNTIL RECEIVED AT THE LABORATORY.

☐ Fed Ex ☐ UPS ☐ Hand-delivered X Prism Field Service ☐ Other ___

COC Group No. G1008354

Additional Comments:

**PRISM USE ONLY**
Site Arrival Time:
Site Departure Time:
Field Tech Fee:
Mileage:

| NPDES: | UST: | GROUNDWATER: | DRINKING WATER: | SOLID WASTE: | RCRA: | CERCLA | LANDFILL | OTHER: |
|---|---|---|---|---|---|---|---|---|
| ☐ NC ☐ SC | ☐ NC ☐ SC | X NC ☐ SC | ☐ NC ☐ SC | ☐ NC ☐ SC | ☐ NC ☐ SC | ☐ NC ☐ SC | ☐ NC ☐ SC | ☐ NC ☐ SC |
| ☐ ___ | ☐ ___ | ☐ ___ | ☐ ___ | ☐ ___ | ☐ ___ | ☐ ___ | ☐ ___ | ☐ ___ |

*CONTAINER TYPE CODES: A = Amber C = Clear G = Glass P = Plastic; TL = Teflon-Lined Cap VOA = Volatile Organics Analysis (Zero Head Space)

SEE REVERSE FOR TERMS & CONDITIONS

ORIGINAL

ENSR | AECOM

# Memorandum

| | | | |
|---|---|---|---|
| **To:** | Michael Jordan/Raleigh | **Date:** | November 13, 2008 |
| **From:** | Rob Davis/Atlanta | **File:** | SWMU-33_2008October.doc |
| **RE:** | Validation of soil and groundwater data SWMU-33 Site in Elizabeth City, North Carolina | **Project#:** | 09020-066-1100 |
| | | **CC:** | Jennifer Musella/Raleigh |

Data validation was performed on two data packages from Prism Laboratories on groundwater samples collected on October 7-8, 2008 at the SWMU-33 Site in Elizabeth City, North Carolina. The data were reviewed for conformance to the requirements of SW-846, *Test Methods for Evaluating Solid Waste Physical/Chemical Methods.* Prism processed the samples and reported the results under sample delivery groups (SDG) G1008219 and G1008354. The following analytical methods were requested on the chains-of-custody (COC) and/or by the project manager:

- Method 8081A – Organochlorine Pesticides by Gas Chromatography,
- Method 6010B – Metals by ICP (Arsenic and Lead),
- Method 7470A – Mercury by CVAA, and
- Method SM2540D – Percent Soilds.

Data qualifiers were applied using the United States Environmental Protection Agency (*USEPA) Contract Laboratory Program National Functional Guidelines for Organic Data Review* (July 2007) and (*USEPA) Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (October 2004) as they applied to the methods used.

**Review Elements**

Sample data were reviewed for the following parameters:

- Agreement of analyses conducted with the chain of custody (COC) requests;
- Holding times and sample preservation;
- Gas chromatography/mass spectrometry (GC/MS) tunes;
- Initial and continuing calibrations;
- Method blanks/trip blanks/equipment blanks;
- Matrix spike/matrix spike duplicate (MS/MSD) results;
- Field duplicate results;
- Laboratory control sample/laboratory control sample duplicate (LCS/LCSD) results; and
- Quantitation limits and sample results.

**Samples**

ENSR collected eleven (11) groundwater samples and two (2) duplicate on October 7-8, 2008.

The samples included in this review are listed below:

**Laboratory project number G1008219**

| Lab ID | Sample ID | Lab ID | Sample ID |
|---|---|---|---|
| 227186 | 33MW06 | 227191 | 33DUP-02 |
| 227187 | 33MW02 | 227192 | 33MW09 |
| 227188 | 33SB13 | 227193 | 33MW03 |
| 227189 | 33SB14 | 227194 | 33MW01 |
| 227190 | 33SB15 | 227195 | 33DUP-1 |

**Laboratory project number G1008354**

| Lab ID | Sample ID | Lab ID | Sample ID |
|---|---|---|---|
| 227538 | 33MW-05 | 227540 | 33MW-08 |
| 227539 | 33MW-07 | | |

**Analytical Results**

In general, the data are valid as reported and may be used for decision making purposes. Sample data are qualified with "J" (estimated) and "UJ" (not detected, approximate quantitation limit). See Table 1.

Positive results less than the reporting limit, but greater than the method detection limit (MDL) were qualified "J" by the laboratory, as estimated concentrations, due to increased uncertainty near the detection limit.

## DISCUSSION

**Agreement of Analyses Conducted with COC Requests**

Sample reports were checked to verify that the results corresponded to analytical requests as designated on the COC and subsequent communications with ENSR.

**Holding Times and Preservation**

All samples were analyzed within the holding times required by the methods.

Sample coolers were all received within the 4±2° C requirement for all analyses.

All samples were chemically preserved to the proper pH.

**Tunes and Calibrations**

Gas chromatography-mass spectrometry hardware tune summaries were not submitted for validation in this Level II data package. Initial and continuing calibration data were not submitted for validation.

**Blanks**

No target analytes were detected at concentrations exceeding the reporting limits in the laboratory blanks for the analyses requested on the COC.

**LCS/LCSD Results**

All LCS/LCSD recoveries were within the quality control limits.

**MS/MSD Recoveries**

All MS/MSD recoveries were within the advisory limits with the following exceptions:

Method 8081A: The MS/MSD was outside of the advisory limits biased high for compound 4,4'-DDT. The sample chosen by the laboratory for the MS/MSD was non-client specific; therefore, no data qualification was required.

**Surrogate Recoveries**

All of the surrogate recoveries were within the quality control limits.

**Field Duplicate Results**

Two field duplicates were collected on samples 33SB13 and 33MW01.The results for the primary and field duplicate samples were non-detects, with the exception of those listed in Table 2. The advisory limit for the %RPD is 30% for aqueous samples and 50% for soil samples, or the difference between the primary and field duplicate results must be less than or equal to the reporting limit for results less than five times the reporting limit. All field duplicate %RPDs were acceptable with the exception of the compounds in bold text. These compounds were qualified. See Table 1.

**Table 1**
**Qualified Analytical Data**

| Sample ID | Method | Analyte | Lab Result | Lab Qualifier | Validated Result | Validation Qualifier[1] | Units | Reason Codes[2] |
|---|---|---|---|---|---|---|---|---|
| 33SB13 | 8081A | 4,4'-DDE | 11 | | 11 | J | µg/Kg | FD |
| 33SB13 | 8081A | 4,4'-DDT | 67 | | 67 | J | µg/Kg | FD |
| 33DUP-02 | 8081A | 4,4'-DDE | BRL | | 2.6 | UJ | µg/Kg | FD |
| 33DUP-02 | 8081A | 4,4'-DDT | BRL | | 2.6 | UJ | µg/Kg | FD |

[1]. USEPA-defined data validation qualifiers applied in this data evaluation:
J: The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.
UJ: The analyte was analyzed for, but was not detected. The reported quantitation limit is approximated and may be inaccurate or imprecise.

[2]. Reason Codes:
FD: Field duplicate RPD is outside of the advisory limits.
µg/L: micrograms per liter

**Table 2A**
**Field Precision**

| Field ID | Analyte | Sample 33-MW-01 | Duplicate 33 DUP-01 | Units | % RPD |
|---|---|---|---|---|---|
| 33MW-01 33DUP-01 | a-Chlordane | 1.6 | 1.6 | µg/L | 0 |
| | Chlordane | 16 | 17 | µg/L | 6 |
| | Dieldrin | 0.31 | 0.31 | µg/L | 0 |
| | g-Chlordane | 2.4 | 2.4 | µg/L | 0 |
| | Heptachlor Epoxide | 0.93 | 0.95 | µg/L | 2 |
| | Chromium | 0.0013 J | 0.0013 J | mg/L | 0 |

J: The analyte was positively identified. The associated numerical value is the approximate concentration of the analyte in the sample.

**Table 2B**
**Field Precision**

| Field ID | Analyte | Sample 33-SB13 | Duplicate 33 DUP-02 | Units | % RPD |
|---|---|---|---|---|---|
| 33SB13 33DUP-02 | Percent Solid | 86.9 | 77.6 | % | 11 |
| | **4,4'-DDE** | **11** | **BRL** | **µg/Kg** | **NC** |
| | **4,4'-DDT** | **67** | **BRL** | **µg/Kg** | **NC** |
| | Mercury | 0.071 | 0.065 | mg/Kg | 9 |
| | Arsenic | 10 | 10 | mg/Kg | 0 |
| | Chromium | 19 | 19 | mg/Kg | 0 |

NC: RPD could not be calculated.
BRL: Below reporting limit.

# Appendix C

# Photo Log

Photo 1. View of willow trees at SWMU 33 facing east (October 2008).

Photo 2. View of 3 willow trees at SWMU 33 planted in April 2008 facing northeast (October 2008).

Photo 3. View of willow trees at SWMU 33 facing northwest (October 2008).

Photo 4. Willow tree at SWMU 33 facing northeast; installed April 2008 (October 2008).