

Prepared for:  
United States Coast Guard Support Center  
Elizabeth City, North Carolina

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Monitoring and Phytoremediation O&M Report –  
September 2008 through October 2008

Former Waste Area Behind Paint Hangar Building  
87 (SWMU 33)

United States Coast Guard Support Center  
Elizabeth City, North Carolina

Contract No. DTCG83-02-D-3CL375  
Task Order No. HSCG83-06-J-3CL531  
USCG Project No. 442689

ENSR Consulting and Engineering (NC), Inc.  
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January 2009



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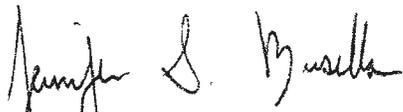


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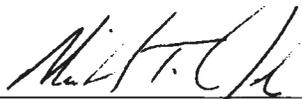
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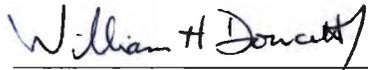
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## **1.0 Introduction**

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  $\mu\text{g/L}$ ). 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  $\mu\text{g/L}$  and therefore also below the 2L Standard of 10  $\mu\text{g/L}$ . These results are consistent with historical groundwater sampling results.

Chromium was detected in groundwater samples collected from 33MW-01 (1.3  $\mu\text{g/L}$ ), 33MW-02 (3.3 J  $\mu\text{g/L}$ ), 33MW-03 (5.6  $\mu\text{g/L}$ ), 33MW-05 (2.3 J  $\mu\text{g/L}$ ), 33MW-06 (5.2  $\mu\text{g/L}$ ), 33MW-07 (2.5 J  $\mu\text{g/L}$ ), 33MW-08 (1.8 J  $\mu\text{g/L}$ ), and 33MW-09 (2.2 J  $\mu\text{g/L}$ ). All sample concentrations are below the 2L Standard of 50  $\mu\text{g/L}$  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  $\mu\text{g/L}$  and the 2L Standard of 1.05  $\mu\text{g/L}$ . 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  $\alpha$ -chlordane and cis-chlordane), g-chlordane (also known as  $\gamma$ -chlordane,  $\beta$ -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  $\mu\text{g/L}$  in monitoring wells 33MW-01 (16  $\mu\text{g/L}$ ), 33MW-06 (28  $\mu\text{g/L}$ ) and 33MW-09 (7.6  $\mu\text{g/L}$ ). 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  $\mu\text{g/L}$ ), 33MW-06 (2.9  $\mu\text{g/L}$ ), and 33MW-09 (0.66  $\mu\text{g/L}$ ). 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  $\mu\text{g/L}$ ), 33MW-06 (4.4  $\mu\text{g/L}$ ), and 33MW-09 (0.91  $\mu\text{g/L}$ ). 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  $\mu\text{g/L}$  in monitoring wells 33MW-01 (0.31  $\mu\text{g/L}$ ), 33MW-06 (0.46  $\mu\text{g/L}$ ), and 33MW-09 (0.24  $\mu\text{g/L}$ ). 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  $\mu\text{g/L}$  in monitoring wells 33MW-01 (0.93  $\mu\text{g/L}$ ), 33MW-05 (0.16  $\mu\text{g/L}$ ), 33MW-06 (1.6  $\mu\text{g/L}$ ), and 33MW-09 (0.56  $\mu\text{g/L}$ ). 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.



## 5.0 References

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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	Sample ID Sample Depth Sample Type Sample Date	33SB-13 0 to 2 ft bls Grab				33SB-14 0 to 2 ft bls Grab				33SB-15 0 to 2 ft bls Grab				
				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	
<b>Inorganics by EPA 6010* (µg/kg)</b>			Region 9 Indus. PRG													
Arsenic	5,240	390	1,600	15,000	5,100	2,400	10,000	2,300	9,400	12,000	12,000	13,000	22,000	7,200	45,000	
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	31	61	62	98	45	44	64	77	
<b>Pesticides by EPA 8081 (µg/kg)</b>																
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**

Well ID		33MW-01							
Screen Interval		5-15							
Parameters	Sample Date	09/21/05	03/29/07	06/20/07	09/11/07	01/08/08	04/30/08	07/23/08	10/07/08
<b>Field Parameters</b>	<b>2L Standard</b>								
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
<b>Inorganics by EPA 6010<sup>o</sup> (µg/L)</b>									
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
<b>Pesticides by EPA 8081 (µg/L)</b>									
Chlordane	0.1	10	18	10	11	16	3.2	20	18
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

Well ID		33MW-02							
Screen Interval		5-15							
Parameters	Sample Date	09/21/05	03/29/07	06/20/07	09/11/07	01/08/08	04/30/08	07/23/08	10/07/08
<b>Field Parameters</b>	<b>2L Standard</b>								
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
<b>Inorganics by EPA 6010<sup>o</sup> (µg/L)</b>									
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
<b>Pesticides by EPA 8081 (µg/L)</b>									
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  
<sup>o</sup> - Mercury analyzed using EPA 7470A  
<sup>^</sup> - 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**

Well ID		33MW-03							
Screen Interval		5-15							
Parameters	Sample Date	09/21/05	03/28/07	06/20/07	09/11/07	01/08/08	04/30/08	07/23/08	10/07/08
<b>Field Parameters</b>	<b>2L Standard</b>								
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
<b>Inorganics by EPA 6010<sup>®</sup> (µg/L)</b>									
Arsenic	10	--	<10	<10	<10	<10	<b>3.4 J</b>	<10	<10
Chromium	50	--	<b>12</b>	<b>2.3 J</b>	<b>2 J</b>	<b>4.3 J</b>	<b>0.4 J</b>	<b>1.2 J</b>	<b>5.6</b>
Mercury	1.05	--	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
<b>Pesticides by EPA 8081 (µg/L)</b>									
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

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

\* - Equipment malfunction; dissolved oxygen sensor would not calibrate  
<sup>®</sup> - Mercury analyzed using EPA 7470A  
<sup>^</sup> - 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**

Well ID		33MW-06							
Screen Interval		12-14							
Parameters	Sample Date	09/21/05	03/29/07	06/20/07	09/11/07	01/09/08	04/30/08	07/23/08	10/07/08
<b>Field Parameters</b>	<b>2L Standard</b>								
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
<b>Inorganics by EPA 6010<sup>®</sup> (µg/L)</b>									
Arsenic	10	--	<10	<b>2.7 J</b>	<10	<10	<b>2.2 J</b>	<10	<10
Chromium	50	--	<b>8.9</b>	<b>12</b>	<b>1.2 J</b>	<b>4.8 J</b>	<b>3.6 J</b>	<b>6.8</b>	<b>5.2</b>
Mercury	1.05	--	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
<b>Pesticides by EPA 8081 (µg/L)</b>									
Chlordane	0.1	--	<b>21</b>	<b>13</b>	<b>15</b>	<b>29</b>	<b>23</b>	<b>18</b>	<b>28</b>
a-Chlordane	NS	--	<b>2.1</b>	<b>2</b>	<b>2.2</b>	<b>3.1</b>	<b>3.1</b>	<b>2.2</b>	<b>2.9</b>
g-Chlordane	NS	--	<b>2.4</b>	<b>2.1</b>	<b>2.7</b>	<b>4.8</b>	<b>4.8</b>	<b>3.5</b>	<b>4.4</b>
Dieldrin	0.0022	--	<0.050	<0.050	<0.050	<b>0.49</b>	<0.056	<b>0.48</b>	<b>0.46</b>
Heptachlor Epoxide	0.0038	--	<b>1.1</b>	<b>1.2</b>	<b>1</b>	<b>1.5</b>	<b>1.9</b>	<b>1.7</b>	<b>1.6</b>

Well ID		33MW-07							
Screen Interval		19-21							
Parameters	Sample Date	09/21/05	03/29/07	06/20/07	09/11/07	01/09/08	04/30/08	07/23/08	10/08/08
<b>Field Parameters</b>	<b>2L Standard</b>								
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
<b>Inorganics by EPA 6010<sup>®</sup> (µg/L)</b>									
Arsenic	10	--	<10	<10	<10	<10	<10	<10	<10
Chromium	50	--	<b>14</b>	<b>3.2 J</b>	<b>2.3 J</b>	<b>6.3</b>	<b>2.8 J</b>	<b>2.9 J</b>	<b>2.5 J</b>
Mercury	1.05	--	<b>0.13 J</b>	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
<b>Pesticides by EPA 8081 (µg/L)</b>									
Chlordane	0.1	--	<0.50	<b>5.6</b>	<0.50	<0.50	<0.56	<0.51	<0.50
a-Chlordane	NS	--	<0.050	<b>0.63</b>	<0.050	<0.050	<0.056	<0.051	<0.050
g-Chlordane	NS	--	<0.050	<b>0.94</b>	<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	<b>0.38</b>	<0.050	<0.050	<0.056	<0.051	<0.050

\* - Equipment malfunction; dissolved oxygen sensor would not calibrate  
<sup>®</sup> - Mercury analyzed using EPA 7470A  
<sup>^</sup> - 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**

		Well ID								
		33MW-08								
		26-28								
Parameters	Screen Interval	Sample Date	09/21/05	03/29/07	06/20/07	09/11/07	01/09/08	04/30/08	07/23/08	10/08/08
<b>Field Parameters</b>	<b>2L Standard</b>									
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	
<b>Inorganics by EPA 6010<sup>o</sup> (µg/L)</b>										
Arsenic	10	--	<b>8.4 J</b>	<b>4.7 J</b>	<b>2.9 J</b>	<b>9.2 J</b>	<10	<10	<10	
Chromium	50	--	<b>18</b>	<b>17</b>	<b>16</b>	<b>33</b>	<b>0.3 J</b>	<b>0.9 J</b>	<b>1.8 J</b>	
Mercury	1.05	--	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
<b>Pesticides by EPA 8081 (µg/L)</b>										
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	<b>0.069</b>	<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	

		Well ID								
		33MW-09								
		5-15								
Parameters	Screen Interval	Sample Date	09/21/05	03/29/07	06/20/07	09/11/07	01/08/08	04/30/08	07/23/08	10/07/08
<b>Field Parameters</b>	<b>2L Standard</b>									
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	
<b>Inorganics by EPA 6010<sup>o</sup> (µg/L)</b>										
Arsenic	10	--	<b>20</b>	<10	<10	<10	<10	<b>18</b>	<b>4.4 J</b>	
Chromium	50	--	<b>59</b>	<b>2.1 J</b>	<b>1 J</b>	<b>1.7 J</b>	<b>0.8 J</b>	<5	<b>2.2 J</b>	
Mercury	1.05	--	<b>0.08 J</b>	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
<b>Pesticides by EPA 8081 (µg/L)</b>										
Chlordane	0.1	--	<0.50	<0.50	<b>2.8</b>	<b>10</b>	<b>9.7</b>	<b>9.1</b>	<b>7.6</b>	
a-Chlordane	NS	--	<0.050	<0.050	<b>0.34</b>	<b>1.4</b>	<b>1.2</b>	<b>1.1</b>	<b>0.66</b>	
g-Chlordane	NS	--	<0.050	<0.050	<b>0.44</b>	<b>2.2</b>	<b>1.9</b>	<b>1.7</b>	<b>0.91</b>	
Dieldrin	0.0022	--	<0.050	<0.050	<b>0.088</b>	<b>0.26</b>	<0.053	<b>0.24</b>	<b>0.24</b>	
Heptachlor Epoxide	0.0038	--	<0.050	<0.050	<b>0.34</b>	<b>0.92</b>	<b>0.9</b>	<b>0.98</b>	<b>0.56</b>	

\* - Equipment malfunction; dissolved oxygen sensor would not calibrate

<sup>o</sup> - Mercury analyzed using EPA 7470A

<sup>^</sup> - 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**

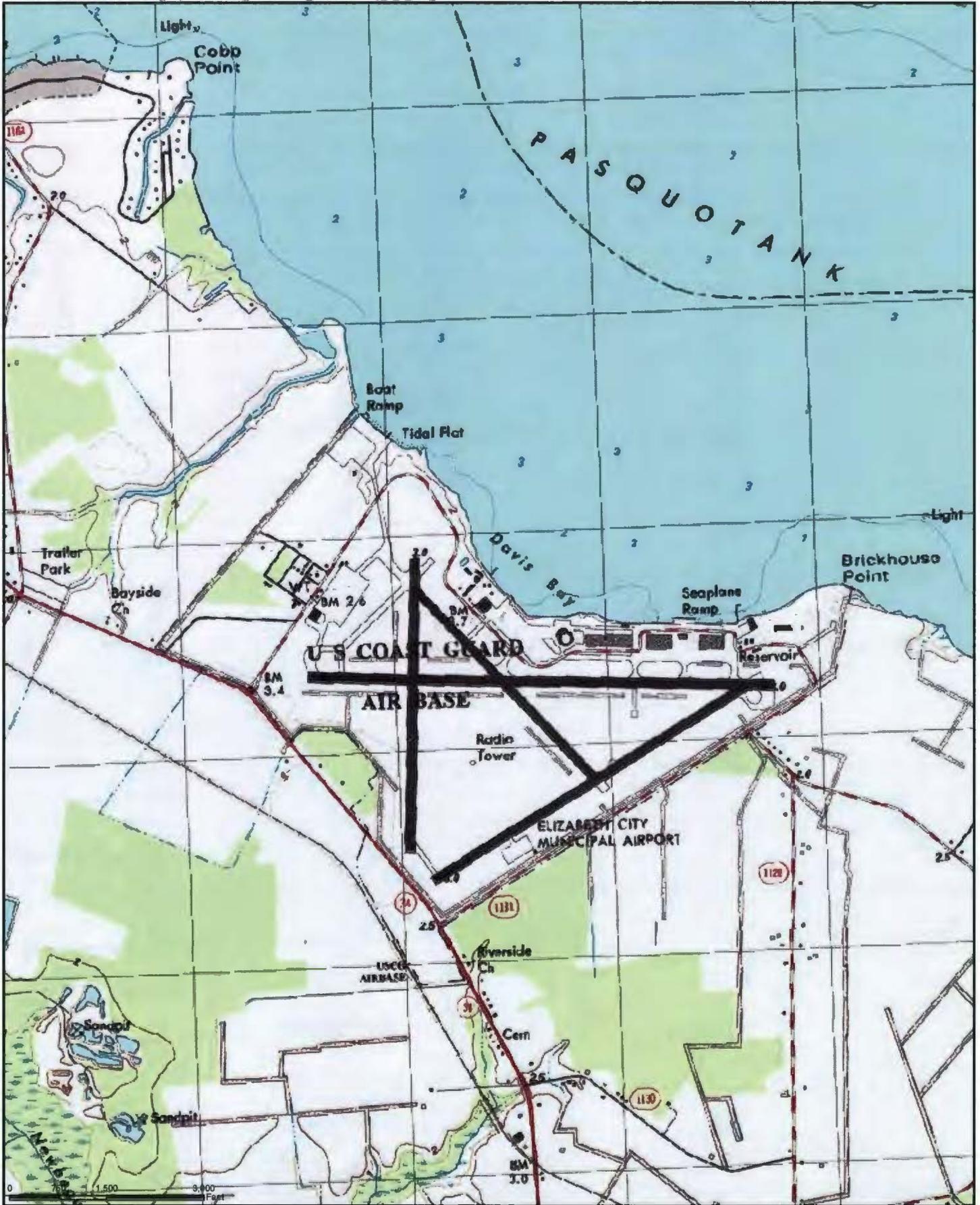
Calender Year	Growing Season	Existing Trees	New Trees Installed	Mortality		Surviving Trees
				Number	Percentage	
2007	1	0	22	3	13.6%	19
2008	2	19	4	0	0.0%	23





## Figures





<p>FIGURE NUMBER: <b>1-1</b></p> <p>Image Source: USGS Quadrangle: Elizabeth City, NC</p>	<p><b>Site Location Map</b></p> <p>USCG SUPPORT CENTER ELIZABETH CITY, NORTH CAROLINA</p>	<p><b>ENSR</b></p> <p>ENSR Consulting and Engineering (NC), Inc. 7041 Old Wake Forest Road Suite 103 Raleigh, NC 27616</p>
<p>SCALE: 1:24000</p>	<p>DATE: December 2008</p>	<p>Project Number: 09020-066</p>



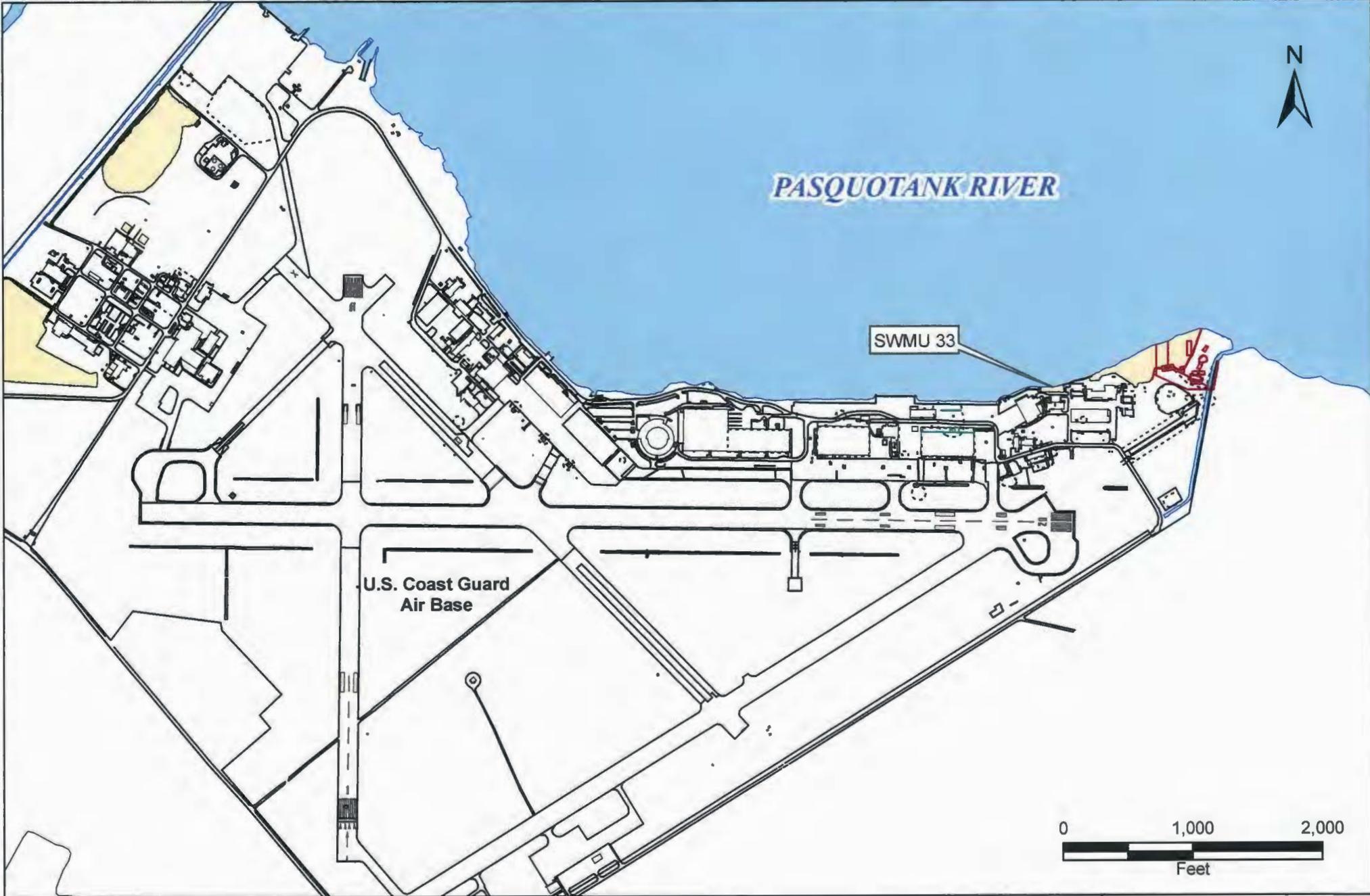


FIGURE NUMBER

1-2

### Facility Layout

USCG Support Center  
Elizabeth City, North Carolina

DATE: December 2008

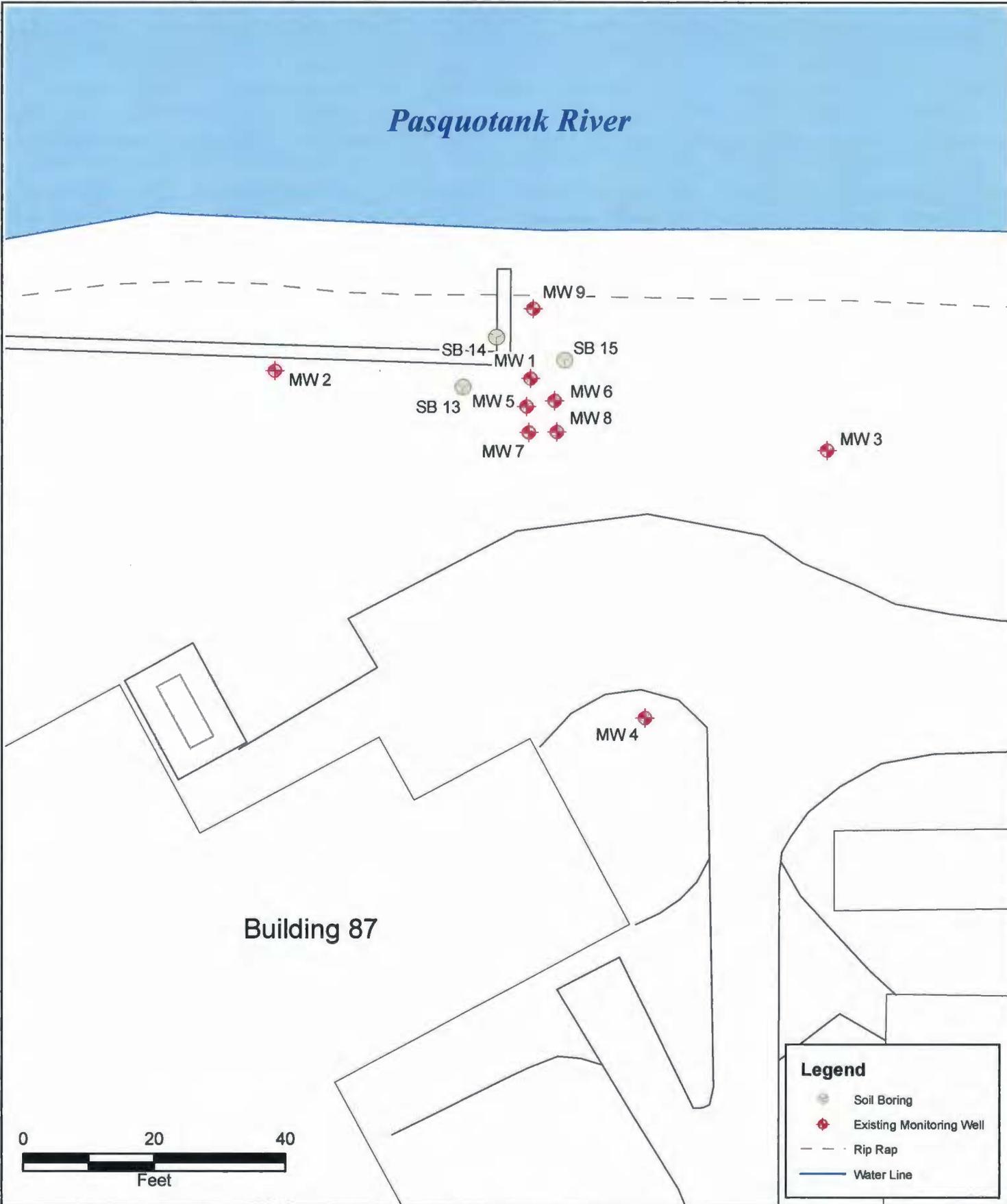
SCALE: 1" = 1000'

PROJECT NUMBER: 09020-066

## ENSR

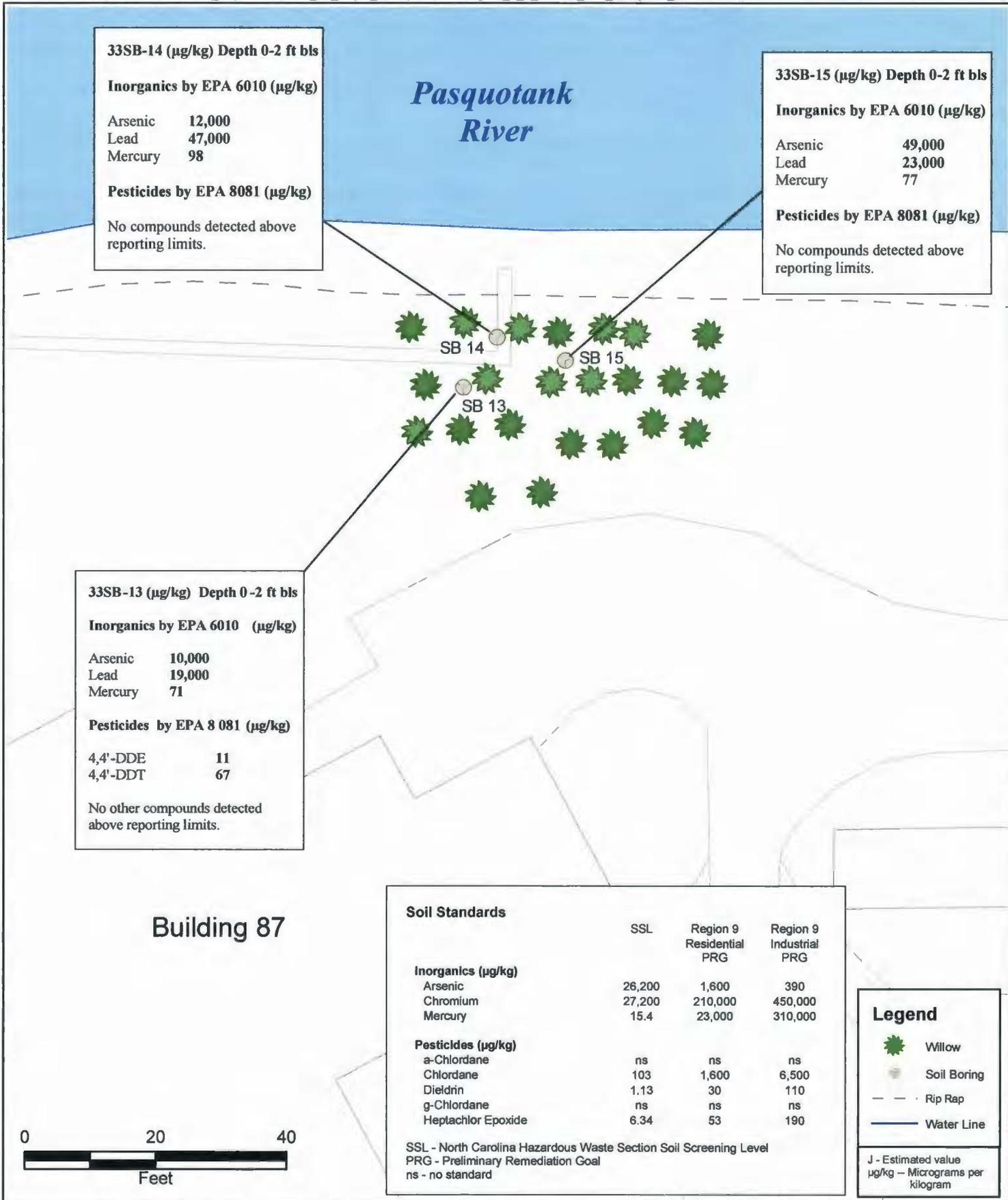
ENSR Consulting and Engineering, (NC) Inc.  
7041 Old Wake Forest Road  
Suite 103  
Raleigh, NC 27616





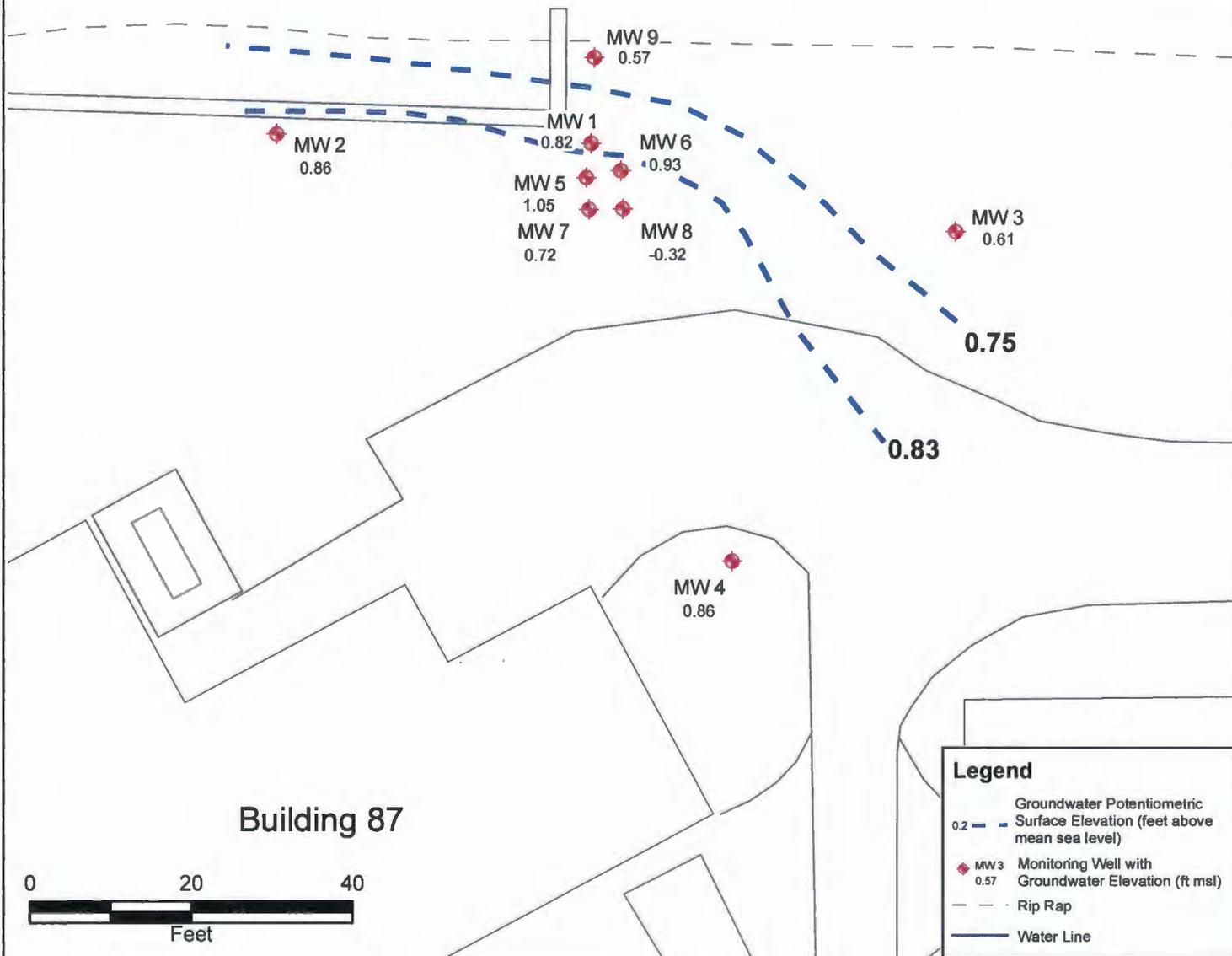
<p>FIGURE NUMBER: <b>2-1</b></p>	<p><b>Sample Location Map</b>  <b>SWMU 33 FORMER WASTE STORAGE AREA</b>                  USCG SUPPORT CENTER                  ELIZABETH CITY, NORTH CAROLINA</p>		<p><b>ENSR</b>                  ENSR Consulting and Engineering (NC), Inc.                  7041 Old Wake Forest Road                  Suite 103                  Raleigh, NC 27616</p>
<p>SCALE: 1" = 20'</p>	<p>DATE: December 2008</p>	<p>DRAWN BY: NCR</p>	





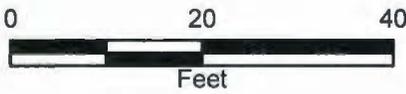


# Pasquotank River



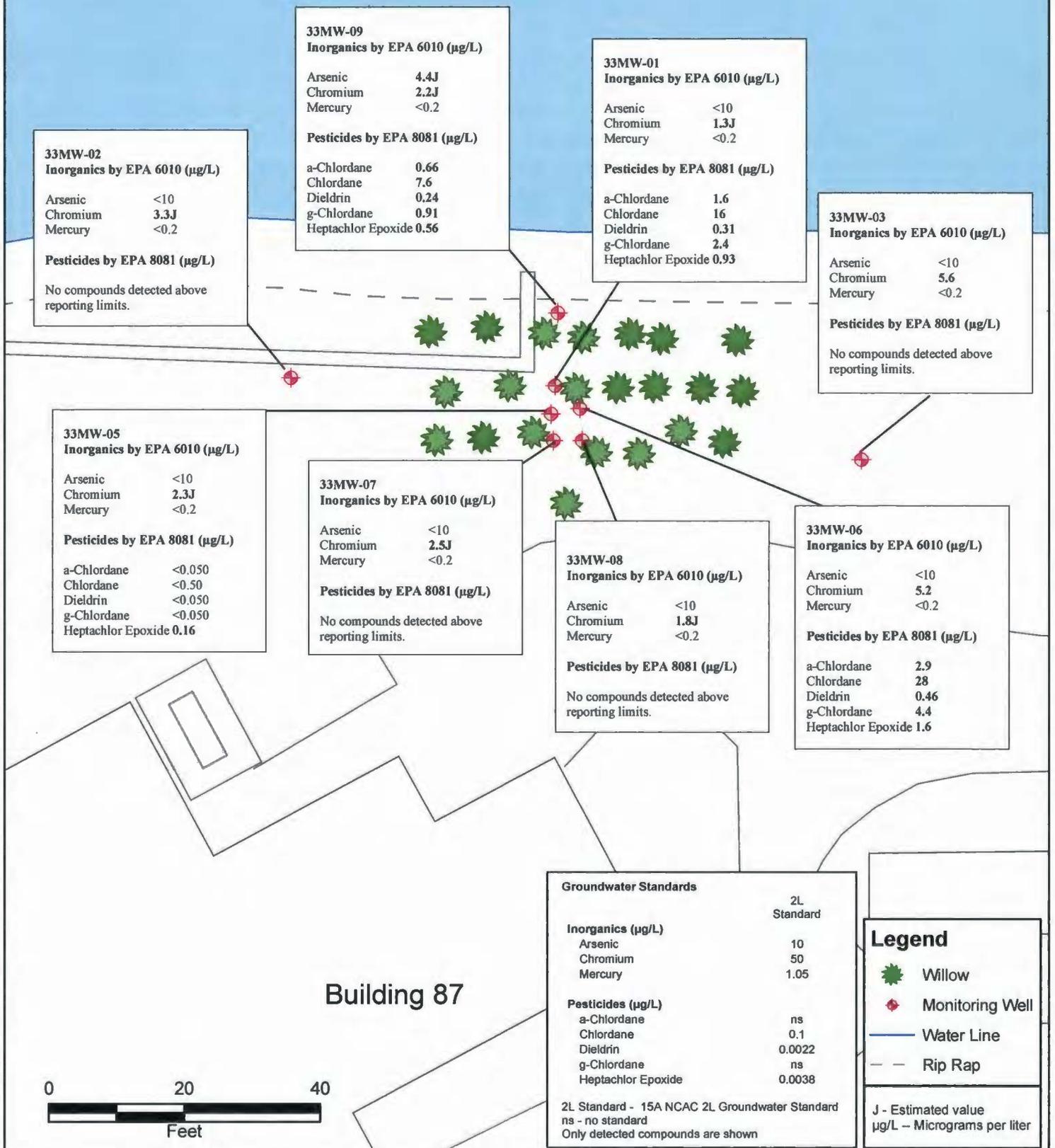
**Legend**

- 0.2 - - - Surface Elevation (feet above mean sea level)
- ◆ MW 3 0.57 Monitoring Well with Groundwater Elevation (ft msl)
- - - Rip Rap
- Water Line





# Pasquotank River



Building 87



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

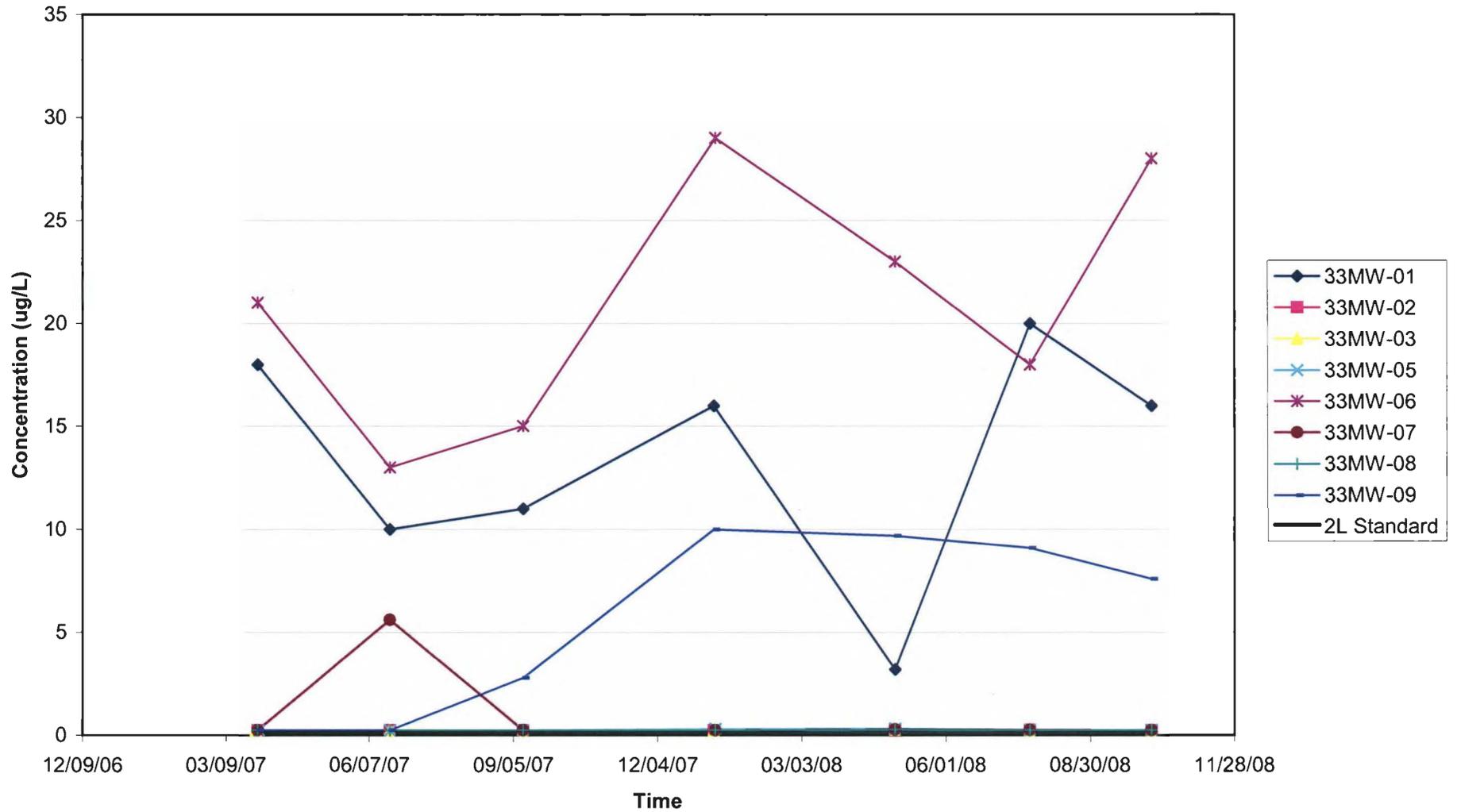


**ENSR | AECOM**

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

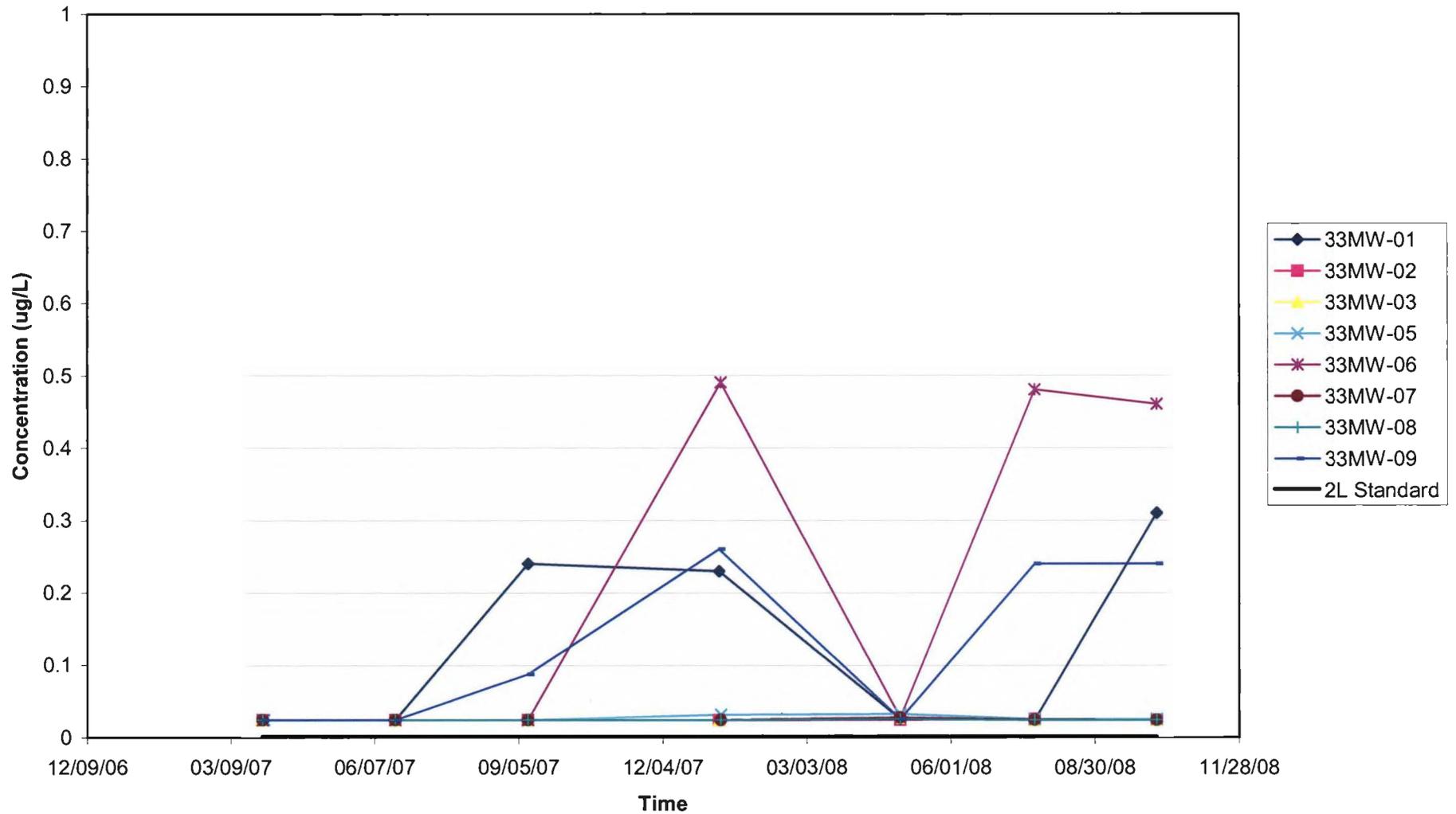


### Chlordane Concentrations vs. Time



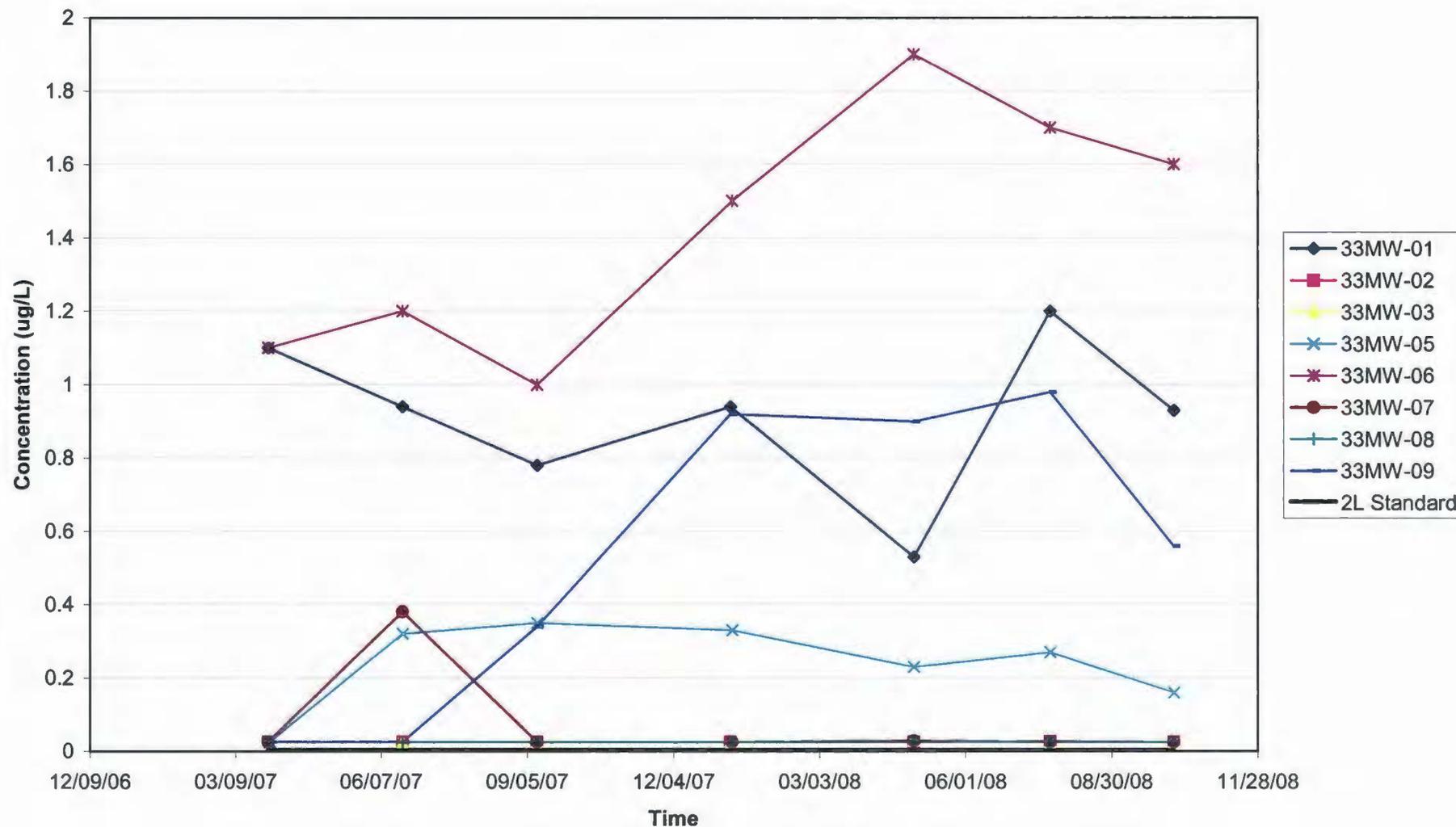


Dieldrin Concentrations vs. Time

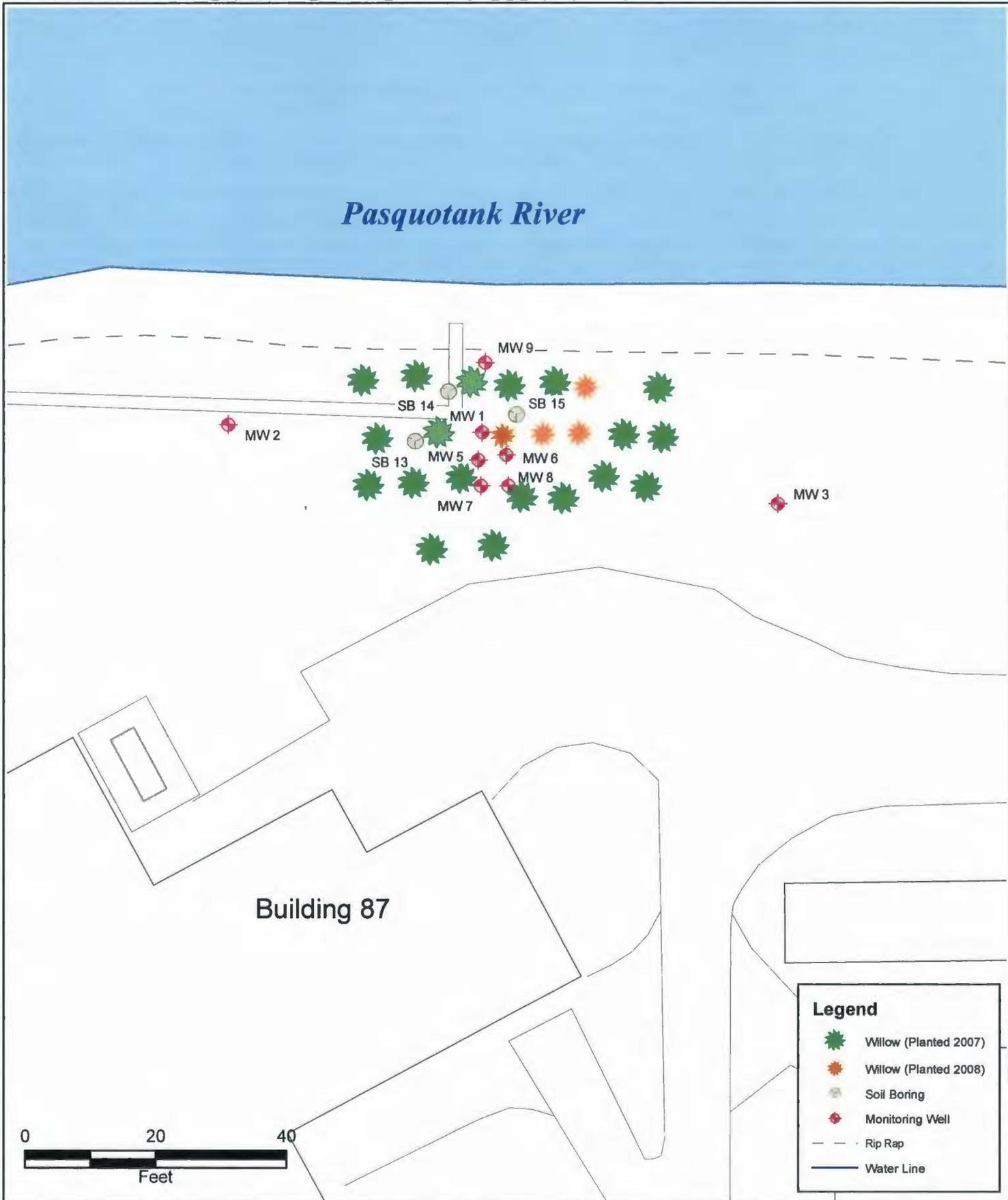




### Heptachlor Epoxide Concentrations vs. Time







**Legend**

- Willow (Planted 2007)
- Willow (Planted 2008)
- Soil Boring
- Monitoring Well
- Rip Rap
- Water Line



FIGURE NUMBER: <b>3-1</b>	<b>Phytoremediation System Layout</b> <b>SWMU 33 FORMER WASTE STORAGE AREA</b> USCG SUPPORT CENTER ELIZABETH CITY, NORTH CAROLINA			ENSR   AECOM ENSR Consulting and Engineering (NC), Inc. 7041 Old Wake Forest Road Suite 103 Raleigh, NC 27616
	SCALE: 1" = 20'	DATE: June 2008		



**Appendix A**

**Groundwater Sampling Logs**



**Ground Water Sample Collection Record**

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

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

a. Total Well Length	<u>                    </u>
b. Screen Interval	<u>5-15</u>
d. Well Material	<u>PVC</u>
f. Length of Water Column	<u>9.90</u>
c. Water Table Depth	<u>5.10</u>
e. Diameter	<u>1</u>
g. Calculated Well Volume	<u>1.52</u>

**WELL PURGING DATA**

a. Purge Method peristaltic

b. Acceptance Criteria

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

c. Field Testing Equipment Used:

Make	Model	Serial Number
<u>YSI</u>	<u>556</u>	<u>11446</u>
<u>Lamotte</u>	<u>2020</u>	<u>3349</u>

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	712	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	-33.7	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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has required turbidity been reached	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have parameters stabilized	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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]



**Ground Water Sample Collection Record**

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

**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 10  
 c. Water Table Depth 5.30 e. Diameter 1 g. Calculated Well Volume 1.54

**WELL PURGING DATA**

a. Purge Method peristaltic

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

c. Field Testing Equipment Used:

Make	Model	Serial Number
<u>YSI</u>	<u>556 MPS</u>	<u>06519</u>
<u>LaMotte</u>	<u>2020c</u>	<u>07475</u>

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
<del>1524</del>									
<del>1524</del>									
<del>1526</del>									

JA

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has required turbidity been reached	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have parameters stabilized	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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 J. Musella Date 10/7/08



**Ground Water Sample Collection Record**

Client:	<u>USCG</u>	Date:	<u>10/7/08</u>
Project No:	<u>09020-066</u>	Start Time:	<u>1330</u>
Site Location:	<u>SWMU 33</u>	Finish Time:	<u>1430</u>
Weather:	<u>Upper 60's, sunny breezy</u>		
Collector(s)	<u>D. Babineau</u>		

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

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

**WELL PURGING DATA**

a. Purge Method peristaltic

b. Acceptance Criteria

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

c. Field Testing Equipment Used:

Make	Model	Serial Number
<u>YSI 556</u>	<u>MPS</u>	<u>06519</u>
<u>LaMotte</u>	<u>2020e</u>	<u>07475</u>

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

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has required turbidity been reached	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have parameters stabilized	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If no or N/A - Explain below.

↳ cont. on back

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



**Ground Water Sample Collection Record**

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

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

a. Total Well Length	_____
b. Screen Interval	<u>5-15</u>
d. Well Material	<u>PVC</u>
f. Length of Water Column	<u>8.47</u>
c. Water Table Depth	<u>6.53</u>
e. Diameter	<u>1</u>
g. Calculated Well Volume	<u>1.30</u>

**WELL PURGING DATA**

a. Purge Method peristaltic

b. Acceptance Criteria

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

c. Field Testing Equipment Used:

Make	Model	Serial Number
<u>YSI</u>	<u>556 MPS</u>	<u>06519</u>
<u>La Motte</u>	<u>2020e</u>	<u>07475</u>

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

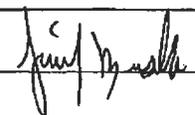
	Yes	No	N/A
Has required volume been removed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has required turbidity been reached	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have parameters stabilized	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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  Date 10/7/08



**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 d. Casing Material PVC f. Length of Water Column 2.95

c. Water Table Depth 5.05 e. Diameter 1 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
<u>YSS</u>	<u>556</u>	<u>6516</u>
<u>Lamson</u>	<u>2020</u>	<u>7475</u>

Time	Volume Removed (gal)	Temp (°C)	pH	Spec. Cond (µmhos)	DO (mg/L)	ORP (mV)	Turbidity (NTUs)	Color	Drawdown (feet)
1055	4.0	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
1107	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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has required turbidity been reached	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have parameters stabilized	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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-drew turbidity

Signature [Signature] Date 10/8/08



**Ground Water Sample Collection Record**

Client:	<u>USCG</u>	Date:	<u>10/2/08</u>
Project No:	<u>09020-066</u>	Start Time:	<u>1500</u>
Site Location:	<u>SWMU 33</u>	Finish Time:	<u>1535</u>
Weather:	<u>65° &amp; Sunny</u>	Collector(s)	<u>D. Babineau</u>

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

a. Total Well Length 14

b. Screen Interval 12-14 d. Casing Material PVC f. Length of Water Column \_\_\_\_\_

c. Water Table Depth 5.31 e. Diameter 1 g. Calculated Well Volume \_\_\_\_\_

**WELL PURGING DATA**

a. Purge Method peristaltic

b. Acceptance Criteria

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

c. Field Testing Equipment Used:

Make	Model	Serial Number
<u>YSS</u>	<u>556</u>	<u>11446</u>
<u>Lamotte</u>	<u>2020</u>	<u>3344</u>

Time	Volume Removed (gal)	Temp (°C)	pH	Spec. Cond (µmhos)	DO (mg/L)	ORP (mV)	Turbidity (NTUs)	Color	Drawdown (feet)
1510	1.0	21.46	6.06	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	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has required turbidity been reached	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have parameters stabilized	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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 [Signature]

Date 10/2/08



**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° & 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	d. Casing Material	PVC	f. Length of Water Column	15.39
c. Water Table Depth	5.61	e. Diameter	1	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
YSE	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	clear	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	70.51	clear	5.59
1213	0.8	20.54	5.98	242	0.38	82.6	2.44	clear	5.59
<del>1218</del>									
DN									

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has required turbidity been reached	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have parameters stabilized	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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



**Ground Water Sample Collection Record**

Client:	<u>USCG</u>	Date:	<u>10/8/08</u>
Project No:	<u>09020-066</u>	Start Time:	<u>1051</u>
Site Location:	<u>SWMU 33</u>	Finish Time:	<u>1150</u>
Weather:	<u>60S Sunny</u>	Collector(s)	<u>D. Babineau</u>

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

a. Total Well Length 28

b. Screen Interval 26-28 d. Casing Material PVC f. Length of Water Column 21.28

c. Water Table Depth 6.72 e. Diameter 1 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
<u>YSI</u>	<u>556</u>	<u>MPS</u>
<u>LaMotte</u>	<u>2020e</u>	<u>11446</u>
		<u>07475</u>

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

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has required turbidity been reached	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have parameters stabilized	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If no or N/A - Explain below.

(m) 7.25

SAMPLE COLLECTION: Method: peristaltic

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

Comments \_\_\_\_\_

Signature [Signature] Date 10/8/08



**Ground Water Sample Collection Record**

Client:	USCG	Date:	<u>10/7/08</u>
Project No:	09020-066	Start Time:	<u>1320</u>
Site Location:	SWMU 33	Finish Time:	<u>1400</u>
Weather:	<u>clay / worm ~ 60°</u> Collector(s) <u>D. Babineau</u>		

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

a. Total Well Length	<u>15</u>
b. Screen Interval	<u>5-15</u>
d. Casing Material	<u>PVC</u>
f. Length of Water Column	<u>7.84</u>
c. Water Table Depth	<u>5.16</u>
e. Diameter	<u>1</u>
g. Calculated Well Volume	<u>1.47</u>

**WELL PURGING DATA**

a. Purge Method peristaltic

b. Acceptance Criteria

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

c. Field Testing Equipment Used:

Make	Model	Serial Number
<u>YSS</u>	<u>556</u>	<u>11446</u>
<u>Leimatt</u>	<u>2020</u>	<u>3349</u>

Time	Volume Removed (gal)	Temp (°C)	pH	Spec. Cond (µmhos)	DO (mg/L)	ORP (mV)	Turbidity (NTUs)	Color	Drawdown (feet)
<u>1330</u>	<u>1.0</u>	<u>22.33</u>	<u>6.73</u>	<u>5.867</u>	<u>0.26</u>	<u>-148.8</u>	<u>0.09</u>	<u>clear</u>	<u>5.15</u>
<u>1333</u>	<u>2.0</u>	<u>22.32</u>	<u>6.74</u>	<u>5.872</u>	<u>0.25</u>	<u>-148.7</u>	<u>0.05</u>	<u>clear</u>	<u>5.16</u>
<u>1336</u>	<u>3.0</u>	<u>22.30</u>	<u>6.74</u>	<u>5880</u>	<u>0.23</u>	<u>-149.3</u>	<u>0.04</u>	<u>clear</u>	<u>5.16</u>
<u>1339</u>	<u>4.0</u>	<u>22.30</u>	<u>6.75</u>	<u>5881</u>	<u>0.22</u>	<u>-150.0</u>	<u>0.04</u>	<u>clear</u>	<u>5.17</u>
<u>1342</u>	<u>5.0</u>	<u>22.29</u>	<u>6.75</u>	<u>5882</u>	<u>0.22</u>	<u>-151.7</u>	<u>0.03</u>	<u>clear</u>	<u>5.17</u>

e. Acceptance criteria pass/fail

	Yes	No	N/A
Has required volume been removed	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Has required turbidity been reached	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have parameters stabilized	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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	<u>1345</u>
33MW-01	500mL Plastic	1	HNO3	6010 - As, Cr, Hg	

Comments collected blind duplicate (33DUP-1)

Signature [Signature]

Date 10/7/08



**Appendix B**

**Laboratory and Data Validation Reports**





## Case Narrative

**Date:** 10/22/08  
**Company:** ENSR C & E, Inc  
**Contact:** MICHAEL JORDAN  
**Address:** 7041 Old Wake Forest Rd.  
Suite 103  
Raleigh, NC 27616

**Client Project ID:** USCG Support Ctr. (SWMU-33)  
**Prism COC Group No:** G1008219  
**Collection Date(s):** 10/07/08  
**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:**

**Signature:**

**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 written consent of Prism Laboratories, Inc. The results in this report relate only to the samples submitted for analysis.



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
<b>Organochlorine Pesticides by GC/ECD</b>									
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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449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543

Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409



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
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			

**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



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
<b>Organochlorine Pesticides by GC/ECD</b>									
4,4'-DDD	BRL	µg/L	0.050	0.014	1	8081A	10/11/08 10:57	jbvogel	Q36227
4,4'-DDE	BRL	µg/L	0.050	0.0086	1	8081A	10/11/08 10:57	jbvogel	Q36227
4,4'-DDT	BRL	µg/L	0.050	0.014	1	8081A	10/11/08 10:57	jbvogel	Q36227
4,4'-Methoxychlor	BRL	µg/L	0.050	0.017	1	8081A	10/11/08 10:57	jbvogel	Q36227
a-BHC	BRL	µg/L	0.050	0.0075	1	8081A	10/11/08 10:57	jbvogel	Q36227
a-Chlordane	BRL	µg/L	0.050	0.0071	1	8081A	10/11/08 10:57	jbvogel	Q36227
Aldrin	BRL	µg/L	0.050	0.015	1	8081A	10/11/08 10:57	jbvogel	Q36227
b-BHC	BRL	µg/L	0.050	0.012	1	8081A	10/11/08 10:57	jbvogel	Q36227
Chlordane	BRL	µg/L	0.50	0.14	1	8081A	10/11/08 10:57	jbvogel	Q36227
d-BHC	BRL	µg/L	0.050	0.0077	1	8081A	10/11/08 10:57	jbvogel	Q36227
Dieldrin	BRL	µg/L	0.050	0.0084	1	8081A	10/11/08 10:57	jbvogel	Q36227
Endosulfan I	BRL	µg/L	0.050	0.0076	1	8081A	10/11/08 10:57	jbvogel	Q36227
Endosulfan II	BRL	µg/L	0.050	0.0071	1	8081A	10/11/08 10:57	jbvogel	Q36227
Endosulfan Sulfate	BRL	µg/L	0.050	0.0086	1	8081A	10/11/08 10:57	jbvogel	Q36227
Endrin	BRL	µg/L	0.050	0.0082	1	8081A	10/11/08 10:57	jbvogel	Q36227
Endrin Aldehyde	BRL	µg/L	0.050	0.016	1	8081A	10/11/08 10:57	jbvogel	Q36227
Endrin Ketone	BRL	µg/L	0.050	0.0094	1	8081A	10/11/08 10:57	jbvogel	Q36227
g-BHC	BRL	µg/L	0.050	0.0083	1	8081A	10/11/08 10:57	jbvogel	Q36227
g-Chlordane	BRL	µg/L	0.050	0.0089	1	8081A	10/11/08 10:57	jbvogel	Q36227
Heptachlor	BRL	µg/L	0.050	0.016	1	8081A	10/11/08 10:57	jbvogel	Q36227
Heptachlor Epoxide	BRL	µg/L	0.050	0.0088	1	8081A	10/11/08 10:57	jbvogel	Q36227
Toxaphene	BRL	µg/L	0.50	0.15	1	8081A	10/11/08 10:57	jbvogel	Q36227

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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
Sample Preparation:				980 mL /	10 mL	3510C	10/10/08 7:00	smanivanh	P22756
						<b>Surrogate</b>	<b>% Recovery</b>		<b>Control Limits</b>
						Tetrachloro-m-xylene (TCMX)	121		40 - 134
						Decachlorobiphenyl (DCB)	76		13 - 186

**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

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



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: 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
<b>Percent Solids Determination</b>									
Percent Solids	86.9	%			1	SM2540 G	10/13/08 10:45	dsullivan	
<b>Organochlorine Pesticides by Gas Chromatography</b>									
4,4'-DDD	BRL	µg/kg	2.3	0.70	1	8081A	10/12/08 0:26	javogel	Q36092
4,4'-DDE	11	µg/kg	2.3	0.49	1	8081A	10/12/08 0:26	javogel	Q36092
4,4'-DDT	67	µg/kg	2.3	0.83	1	8081A	10/12/08 0:26	javogel	Q36092
4,4'-Methoxychlor	BRL	µg/kg	4.6	1.6	1	8081A	10/12/08 0:26	javogel	Q36092
a-BHC	BRL	µg/kg	2.3	0.21	1	8081A	10/12/08 0:26	javogel	Q36092
a-Chlordane	BRL	µg/kg	2.3	0.40	1	8081A	10/12/08 0:26	javogel	Q36092
Aldrin	BRL	µg/kg	2.3	0.46	1	8081A	10/12/08 0:26	javogel	Q36092
b-BHC	BRL	µg/kg	2.3	0.58	1	8081A	10/12/08 0:26	javogel	Q36092
Chlordane	BRL	µg/kg	58	5.4	1	8081A	10/12/08 0:26	javogel	Q36092
d-BHC	BRL	µg/kg	2.3	0.32	1	8081A	10/12/08 0:26	javogel	Q36092
Dieldrin	BRL	µg/kg	1.2	0.48	1	8081A	10/12/08 0:26	javogel	Q36092
Endosulfan I	BRL	µg/kg	2.3	0.41	1	8081A	10/12/08 0:26	javogel	Q36092
Endosulfan II	BRL	µg/kg	2.3	0.52	1	8081A	10/12/08 0:26	javogel	Q36092
Endosulfan Sulfate	BRL	µg/kg	2.3	0.60	1	8081A	10/12/08 0:26	javogel	Q36092
Endrin	BRL	µg/kg	2.3	0.69	1	8081A	10/12/08 0:26	javogel	Q36092
Endrin Aldehyde	BRL	µg/kg	2.3	0.64	1	8081A	10/12/08 0:26	javogel	Q36092
Endrin Ketone	BRL	µg/kg	2.3	0.45	1	8081A	10/12/08 0:26	javogel	Q36092
g-BHC	BRL	µg/kg	2.3	0.27	1	8081A	10/12/08 0:26	javogel	Q36092
g-Chlordane	BRL	µg/kg	2.3	0.37	1	8081A	10/12/08 0:26	javogel	Q36092
Heptachlor	BRL	µg/kg	2.3	0.54	1	8081A	10/12/08 0:26	javogel	Q36092
Heptachlor Epoxide	BRL	µg/kg	2.3	0.42	1	8081A	10/12/08 0:26	javogel	Q36092
Toxaphene	BRL	µg/kg	58	5.9	1	8081A	10/12/08 0:26	javogel	Q36092

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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: 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
		<b>Surrogate</b>		<b>% Recovery</b>		<b>Control Limits</b>			
		Tetrachloro-m-xylene (TCMX)		143		40 - 162			
		Decachlorobiphenyl (DCB)		119		26 - 204			

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

Angela D. Overcash, V.P. Laboratory Services



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: 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
<b>Percent Solids Determination</b>									
Percent Solids	78.1	%			1	SM2540 G	10/13/08 10:45	dsullivan	
<b>Organochlorine Pesticides by Gas Chromatography</b>									
4,4'-DDD	BRL	µg/kg	2.6	0.78	1	8081A	10/12/08 1:09	javogel	Q36092
4,4'-DDE	BRL	µg/kg	2.6	0.55	1	8081A	10/12/08 1:09	javogel	Q36092
4,4'-DDT	BRL	µg/kg	2.6	0.92	1	8081A	10/12/08 1:09	javogel	Q36092
4,4'-Methoxychlor	BRL	µg/kg	5.1	1.8	1	8081A	10/12/08 1:09	javogel	Q36092
a-BHC	BRL	µg/kg	2.6	0.23	1	8081A	10/12/08 1:09	javogel	Q36092
a-Chlordane	BRL	µg/kg	2.6	0.45	1	8081A	10/12/08 1:09	javogel	Q36092
Aldrin	BRL	µg/kg	2.6	0.51	1	8081A	10/12/08 1:09	javogel	Q36092
b-BHC	BRL	µg/kg	2.6	0.65	1	8081A	10/12/08 1:09	javogel	Q36092
Chlordane	BRL	µg/kg	64	6.0	1	8081A	10/12/08 1:09	javogel	Q36092
d-BHC	BRL	µg/kg	2.6	0.36	1	8081A	10/12/08 1:09	javogel	Q36092
Dieldrin	BRL	µg/kg	1.3	0.53	1	8081A	10/12/08 1:09	javogel	Q36092
Endosulfan I	BRL	µg/kg	2.6	0.45	1	8081A	10/12/08 1:09	javogel	Q36092
Endosulfan II	BRL	µg/kg	2.6	0.58	1	8081A	10/12/08 1:09	javogel	Q36092
Endosulfan Sulfate	BRL	µg/kg	2.6	0.66	1	8081A	10/12/08 1:09	javogel	Q36092
Endrin	BRL	µg/kg	2.6	0.77	1	8081A	10/12/08 1:09	javogel	Q36092
Endrin Aldehyde	BRL	µg/kg	2.6	0.72	1	8081A	10/12/08 1:09	javogel	Q36092
Endrin Ketone	BRL	µg/kg	2.6	0.51	1	8081A	10/12/08 1:09	javogel	Q36092
g-BHC	BRL	µg/kg	2.6	0.30	1	8081A	10/12/08 1:09	javogel	Q36092
g-Chlordane	BRL	µg/kg	2.6	0.42	1	8081A	10/12/08 1:09	javogel	Q36092
Heptachlor	BRL	µg/kg	2.6	0.60	1	8081A	10/12/08 1:09	javogel	Q36092
Heptachlor Epoxide	BRL	µg/kg	2.6	0.47	1	8081A	10/12/08 1:09	javogel	Q36092
Toxaphene	BRL	µg/kg	64	6.5	1	8081A	10/12/08 1:09	javogel	Q36092

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Page 7 of 20



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: 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
						<b>Surrogate</b>	<b>% Recovery</b>	<b>Control Limits</b>	
						Tetrachloro-m-xylene (TCMX)	136	40 - 162	
						Decachlorobiphenyl (DCB)	114	26 - 204	

**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*

*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



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: 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
<b>Percent Solids Determination</b>									
Percent Solids	83.1	%			1	SM2540 G	10/13/08 10:45	dsullivan	
<b>Organochlorine Pesticides by Gas Chromatography</b>									
4,4'-DDD	BRL	µg/kg	2.4	0.73	1	8081A	10/12/08 1:52	jbvogel	Q36092
4,4'-DDE	BRL	µg/kg	2.4	0.51	1	8081A	10/12/08 1:52	jbvogel	Q36092
4,4'-DDT	BRL	µg/kg	2.4	0.87	1	8081A	10/12/08 1:52	jbvogel	Q36092
4,4'-Methoxychlor	BRL	µg/kg	4.8	1.6	1	8081A	10/12/08 1:52	jbvogel	Q36092
a-BHC	BRL	µg/kg	2.4	0.22	1	8081A	10/12/08 1:52	jbvogel	Q36092
a-Chlordane	BRL	µg/kg	2.4	0.42	1	8081A	10/12/08 1:52	jbvogel	Q36092
Aldrin	BRL	µg/kg	2.4	0.48	1	8081A	10/12/08 1:52	jbvogel	Q36092
b-BHC	BRL	µg/kg	2.4	0.61	1	8081A	10/12/08 1:52	jbvogel	Q36092
Chlordane	BRL	µg/kg	60	5.7	1	8081A	10/12/08 1:52	jbvogel	Q36092
d-BHC	BRL	µg/kg	2.4	0.34	1	8081A	10/12/08 1:52	jbvogel	Q36092
Dieldrin	BRL	µg/kg	1.2	0.50	1	8081A	10/12/08 1:52	jbvogel	Q36092
Endosulfan I	BRL	µg/kg	2.4	0.43	1	8081A	10/12/08 1:52	jbvogel	Q36092
Endosulfan II	BRL	µg/kg	2.4	0.54	1	8081A	10/12/08 1:52	jbvogel	Q36092
Endosulfan Sulfate	BRL	µg/kg	2.4	0.62	1	8081A	10/12/08 1:52	jbvogel	Q36092
Endrin	BRL	µg/kg	2.4	0.72	1	8081A	10/12/08 1:52	jbvogel	Q36092
Endrin Aldehyde	BRL	µg/kg	2.4	0.67	1	8081A	10/12/08 1:52	jbvogel	Q36092
Endrin Ketone	BRL	µg/kg	2.4	0.48	1	8081A	10/12/08 1:52	jbvogel	Q36092
g-BHC	BRL	µg/kg	2.4	0.28	1	8081A	10/12/08 1:52	jbvogel	Q36092
g-Chlordane	BRL	µg/kg	2.4	0.39	1	8081A	10/12/08 1:52	jbvogel	Q36092
Heptachlor	BRL	µg/kg	2.4	0.57	1	8081A	10/12/08 1:52	jbvogel	Q36092
Heptachlor Epoxide	BRL	µg/kg	2.4	0.44	1	8081A	10/12/08 1:52	jbvogel	Q36092
Toxaphene	BRL	µg/kg	60	6.1	1	8081A	10/12/08 1:52	jbvogel	Q36092

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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: 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	jbarrette P22766
				<b>Surrogate</b>		<b>% Recovery</b>		<b>Control Limits</b>	
				Tetrachloro-m-xylene (TCMX)		115		40 - 162	
				Decachlorobiphenyl (DCB)		102		26 - 204	

**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

**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



NC Certification No. 402  
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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: 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
<b>Percent Solids Determination</b>									
Percent Solids	77.6	%			1	SM2540 G	10/10/08 14:30	dsullivan	
<b>Organochlorine Pesticides by Gas Chromatography</b>									
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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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: 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	jbarrette P22766
						<b>Surrogate</b>	<b>% Recovery</b>	<b>Control Limits</b>	
						Tetrachloro-m-xylene (TCMX)	128	40 - 162	
						Decachlorobiphenyl (DCB)	101	26 - 204	

**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



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
<b>Organochlorine Pesticides by GC/ECD</b>									
4,4'-DDD	BRL	µg/L	0.050	0.014	1	8081A	10/11/08 11:40	ivogel	Q36227
4,4'-DDE	BRL	µg/L	0.050	0.0086	1	8081A	10/11/08 11:40	ivogel	Q36227
4,4'-DDT	BRL	µg/L	0.050	0.014	1	8081A	10/11/08 11:40	ivogel	Q36227
4,4'-Methoxychlor	BRL	µg/L	0.050	0.017	1	8081A	10/11/08 11:40	ivogel	Q36227
a-BHC	BRL	µg/L	0.050	0.0075	1	8081A	10/11/08 11:40	ivogel	Q36227
a-Chlordane	0.66	µg/L	0.050	0.0071	1	8081A	10/11/08 11:40	ivogel	Q36227
Aldrin	BRL	µg/L	0.050	0.015	1	8081A	10/11/08 11:40	ivogel	Q36227
b-BHC	BRL	µg/L	0.050	0.012	1	8081A	10/11/08 11:40	ivogel	Q36227
Chlordane	7.6	µg/L	0.50	0.14	1	8081A	10/11/08 11:40	ivogel	Q36227
d-BHC	BRL	µg/L	0.050	0.0077	1	8081A	10/11/08 11:40	ivogel	Q36227
Dieldrin	0.24	µg/L	0.050	0.0084	1	8081A	10/11/08 11:40	ivogel	Q36227
Endosulfan I	BRL	µg/L	0.050	0.0076	1	8081A	10/11/08 11:40	ivogel	Q36227
Endosulfan II	BRL	µg/L	0.050	0.0071	1	8081A	10/11/08 11:40	ivogel	Q36227
Endosulfan Sulfate	BRL	µg/L	0.050	0.0086	1	8081A	10/11/08 11:40	ivogel	Q36227
Endrin	BRL	µg/L	0.050	0.0082	1	8081A	10/11/08 11:40	ivogel	Q36227
Endrin Aldehyde	BRL	µg/L	0.050	0.016	1	8081A	10/11/08 11:40	ivogel	Q36227
Endrin Ketone	BRL	µg/L	0.050	0.0094	1	8081A	10/11/08 11:40	ivogel	Q36227
g-BHC	BRL	µg/L	0.050	0.0083	1	8081A	10/11/08 11:40	ivogel	Q36227
g-Chlordane	0.91	µg/L	0.050	0.0089	1	8081A	10/11/08 11:40	ivogel	Q36227
Heptachlor	BRL	µg/L	0.050	0.016	1	8081A	10/11/08 11:40	ivogel	Q36227
Heptachlor Epoxide	0.56	µg/L	0.050	0.0088	1	8081A	10/11/08 11:40	ivogel	Q36227
Toxaphene	BRL	µg/L	0.50	0.15	1	8081A	10/11/08 11:40	ivogel	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: 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
						<b>Surrogate</b>	<b>% Recovery</b>		<b>Control Limits</b>
						Tetrachloro-m-xylene (TCMX)	120		40 - 134
						Decachlorobiphenyl (DCB)	88		13 - 186

**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

**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
<b>Organochlorine Pesticides by GC/ECD</b>									
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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NC Certification No. 402  
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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: 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
						<b>Surrogate</b>	<b>% Recovery</b>		<b>Control Limits</b>
						Tetrachloro-m-xylene (TCMX)	120		40 - 134
						Decachlorobiphenyl (DCB)	56		13 - 186

**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

**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



NC Certification No. 402  
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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: 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
<b>Organochlorine Pesticides by GC/ECD</b>									
4,4'-DDD	BRL	µg/L	0.050	0.014	1	8081A	10/11/08 13:06	jbvogel	Q36227
4,4'-DDE	BRL	µg/L	0.050	0.0086	1	8081A	10/11/08 13:06	jbvogel	Q36227
4,4'-DDT	BRL	µg/L	0.050	0.014	1	8081A	10/11/08 13:06	jbvogel	Q36227
4,4'-Methoxychlor	BRL	µg/L	0.050	0.017	1	8081A	10/11/08 13:06	jbvogel	Q36227
a-BHC	BRL	µg/L	0.050	0.0075	1	8081A	10/11/08 13:06	jbvogel	Q36227
a-Chlordane	1.6	µg/L	0.050	0.0071	1	8081A	10/11/08 13:06	jbvogel	Q36227
Aldrin	BRL	µg/L	0.050	0.015	1	8081A	10/11/08 13:06	jbvogel	Q36227
b-BHC	BRL	µg/L	0.050	0.012	1	8081A	10/11/08 13:06	jbvogel	Q36227
Chlordane	16	µg/L	2.5	0.72	5	8081A	10/16/08 13:18	jbvogel	Q36227
d-BHC	BRL	µg/L	0.050	0.0077	1	8081A	10/11/08 13:06	jbvogel	Q36227
Dieldrin	0.31	µg/L	0.050	0.0084	1	8081A	10/11/08 13:06	jbvogel	Q36227
Endosulfan I	BRL	µg/L	0.050	0.0076	1	8081A	10/11/08 13:06	jbvogel	Q36227
Endosulfan II	BRL	µg/L	0.050	0.0071	1	8081A	10/11/08 13:06	jbvogel	Q36227
Endosulfan Sulfate	BRL	µg/L	0.050	0.0086	1	8081A	10/11/08 13:06	jbvogel	Q36227
Endrin	BRL	µg/L	0.050	0.0082	1	8081A	10/11/08 13:06	jbvogel	Q36227
Endrin Aldehyde	BRL	µg/L	0.050	0.016	1	8081A	10/11/08 13:06	jbvogel	Q36227
Endrin Ketone	BRL	µg/L	0.050	0.0094	1	8081A	10/11/08 13:06	jbvogel	Q36227
g-BHC	BRL	µg/L	0.050	0.0083	1	8081A	10/11/08 13:06	jbvogel	Q36227
g-Chlordane	2.4	µg/L	0.050	0.0089	1	8081A	10/11/08 13:06	jbvogel	Q36227
Heptachlor	BRL	µg/L	0.050	0.016	1	8081A	10/11/08 13:06	jbvogel	Q36227
Heptachlor Epoxide	0.93	µg/L	0.050	0.0088	1	8081A	10/11/08 13:06	jbvogel	Q36227
Toxaphene	BRL	µg/L	0.50	0.15	1	8081A	10/11/08 13:06	jbvogel	Q36227

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NC Certification No. 402  
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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: 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
				<b>Surrogate</b>		<b>% Recovery</b>		<b>Control Limits</b>	
				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



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
<b>Organochlorine Pesticides by GC/ECD</b>									
4,4'-DDD	BRL	µg/L	0.050	0.014	1	8081A	10/11/08 13:48	javogel	Q36227
4,4'-DDE	BRL	µg/L	0.050	0.0086	1	8081A	10/11/08 13:48	javogel	Q36227
4,4'-DDT	BRL	µg/L	0.050	0.014	1	8081A	10/11/08 13:48	javogel	Q36227
4,4'-Methoxychlor	BRL	µg/L	0.050	0.017	1	8081A	10/11/08 13:48	javogel	Q36227
a-BHC	BRL	µg/L	0.050	0.0075	1	8081A	10/11/08 13:48	javogel	Q36227
a-Chlordane	1.6	µg/L	0.050	0.0071	1	8081A	10/11/08 13:48	javogel	Q36227
Aldrin	BRL	µg/L	0.050	0.015	1	8081A	10/11/08 13:48	javogel	Q36227
b-BHC	BRL	µg/L	0.050	0.012	1	8081A	10/11/08 13:48	javogel	Q36227
Chlordane	17	µg/L	2.5	0.72	5	8081A	10/16/08 15:18	javogel	Q36227
d-BHC	BRL	µg/L	0.050	0.0077	1	8081A	10/11/08 13:48	javogel	Q36227
Dieldrin	0.31	µg/L	0.050	0.0084	1	8081A	10/11/08 13:48	javogel	Q36227
Endosulfan I	BRL	µg/L	0.050	0.0076	1	8081A	10/11/08 13:48	javogel	Q36227
Endosulfan II	BRL	µg/L	0.050	0.0071	1	8081A	10/11/08 13:48	javogel	Q36227
Endosulfan Sulfate	BRL	µg/L	0.050	0.0086	1	8081A	10/11/08 13:48	javogel	Q36227
Endrin	BRL	µg/L	0.050	0.0082	1	8081A	10/11/08 13:48	javogel	Q36227
Endrin Aldehyde	BRL	µg/L	0.050	0.016	1	8081A	10/11/08 13:48	javogel	Q36227
Endrin Ketone	BRL	µg/L	0.050	0.0094	1	8081A	10/11/08 13:48	javogel	Q36227
g-BHC	BRL	µg/L	0.050	0.0083	1	8081A	10/11/08 13:48	javogel	Q36227
g-Chlordane	2.4	µg/L	0.050	0.0089	1	8081A	10/11/08 13:48	javogel	Q36227
Heptachlor	BRL	µg/L	0.050	0.016	1	8081A	10/11/08 13:48	javogel	Q36227
Heptachlor Epoxide	0.95	µg/L	0.050	0.0088	1	8081A	10/11/08 13:48	javogel	Q36227
Toxaphene	BRL	µg/L	0.50	0.15	1	8081A	10/11/08 13:48	javogel	Q36227

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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
						<b>Surrogate</b>	<b>% Recovery</b>		<b>Control Limits</b>
						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



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

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

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

Matrix Spike							QC Batch ID
Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %		
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					QC Batch ID
	Result	RL	Control Limit	Units	
Arsenic	-0.001	0.01	<0.005	mg/L	Q36089
Chromium	0.0009	0.005	<0.0025	mg/L	Q36089

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

Matrix Spike							QC Batch ID
Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %		
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

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 7041 Old Wake Forest Rd.  
 Suite 103  
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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	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Sample 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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449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543

Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409



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

# 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

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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

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 7041 Old Wake Forest Rd.  
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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	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Sample 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



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

# Level II QC Report

10/21/2008

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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)

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



# CHAIN OF CUSTODY RECORD

LAB USE ONLY			
	YES	NO	N/A
Samples INTACT upon arrival?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Received ON WET ICE? Temp <u>0.9</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROPER PRESERVATIVES indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Received WITHIN HOLDING TIMES?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CUSTODY SEALS INTACT?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VOLATILES rec'd W/OUT HEADSPACE?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
PROPER CONTAINERS used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Full Service Analytical & Environmental Solutions  
 449 Springbrook Road • P.O. Box 240543 • Charlotte, NC 28224-0543  
 Phone: 704/529-8364 • Fax: 704/525-0409

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  Excel  Other \_\_\_\_\_  
 Site Location Name: USCG SWMU 33  
 Site Location Physical Address: \_\_\_\_\_

PAGE 1 OF 2 QUOTE # TO ENSURE PROPER BILLING: \_\_\_\_\_  
 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)

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

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER			PRESERVATIVES	ANALYSES REQUESTED								REMARKS	PRISM LAB ID NO.	
				*TYPE SEE BELOW	NO.	SIZE		807	808	809	810	811	812	813	814			815
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
33BUR-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) <u>[Signature]</u>	Received By: (Signature) <u>[Signature]</u>	Date	Military/Hours
Relinquished By: (Signature) _____	Received By: (Signature) _____	Date	
Relinquished By: (Signature) _____	Received For Prism Laboratories By: <u>[Signature]</u>	Date	435
Method of Shipment: <input checked="" type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> Hand-delivered <input type="checkbox"/> Prism Field Service <input type="checkbox"/> Other _____		COC Group No. <u>G1008219</u>	

Additional Comments:

Site Arrival Time: \_\_\_\_\_  
 Site Departure Time: \_\_\_\_\_  
 Field Tech Fee: \_\_\_\_\_  
 Mileage: \_\_\_\_\_

**PRISM USE ONLY**

SEE REVERSE FOR TERMS & CONDITIONS

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

ORIGINAL

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  Excel  Other \_\_\_\_\_  
Site Location Name: USCG SWMU 33  
Site Location Physical Address: \_\_\_\_\_

# CHAIN OF CUSTODY RECORD

PAGE 4 OF 7 QUOTE # TO ENSURE PROPER BILLING: \_\_\_\_\_

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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Received ON WET ICE? Temp <u>0.9</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROPER PRESERVATIVES indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Received WITHIN HOLDING TIMES?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CUSTODY SEALS INTACT?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
VOLATILES rec'd W/OUT HEADSPACE?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
PROPER CONTAINERS used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## 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			PRESERVATIVES	ANALYSES REQUESTED				REMARKS	PRISM LAB ID NO.	
				*TYPE SEE BELOW	NO.	SIZE		8081	PESTICIDES	As, Cr, Hg	6010			
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: \_\_\_\_\_

**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
<u>[Signature]</u>			
Method of Shipment: <input checked="" type="checkbox"/> Fed Ex <input type="checkbox"/> UPS <input type="checkbox"/> Hand-delivered <input checked="" type="checkbox"/> Prism Field Service <input type="checkbox"/> Other _____	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.	COC Group No. <u>935</u>	

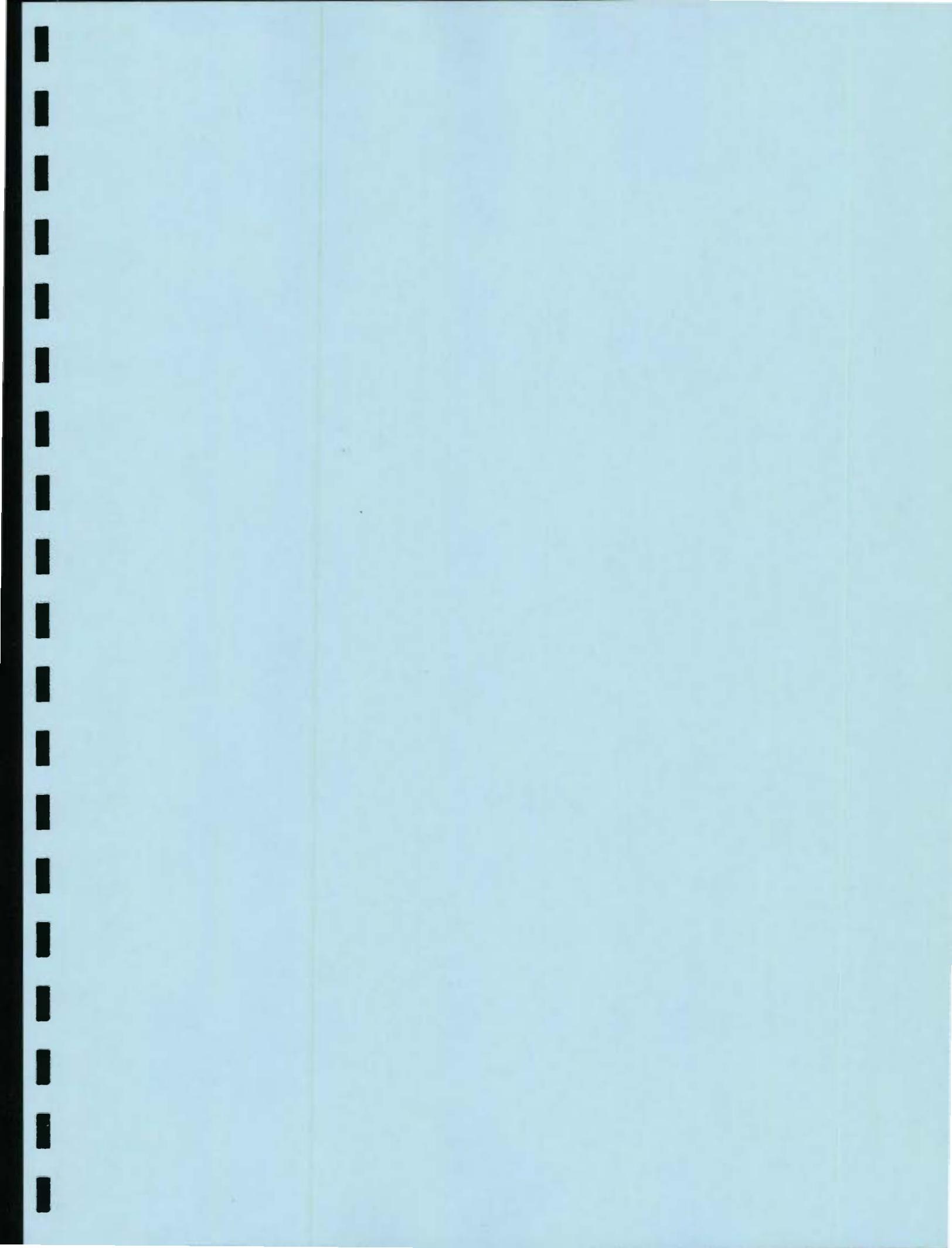
Additional Comments: \_\_\_\_\_  
Site Arrival Time: \_\_\_\_\_  
Site Departure Time: \_\_\_\_\_  
Field Tech Fee: \_\_\_\_\_  
Mileage: \_\_\_\_\_

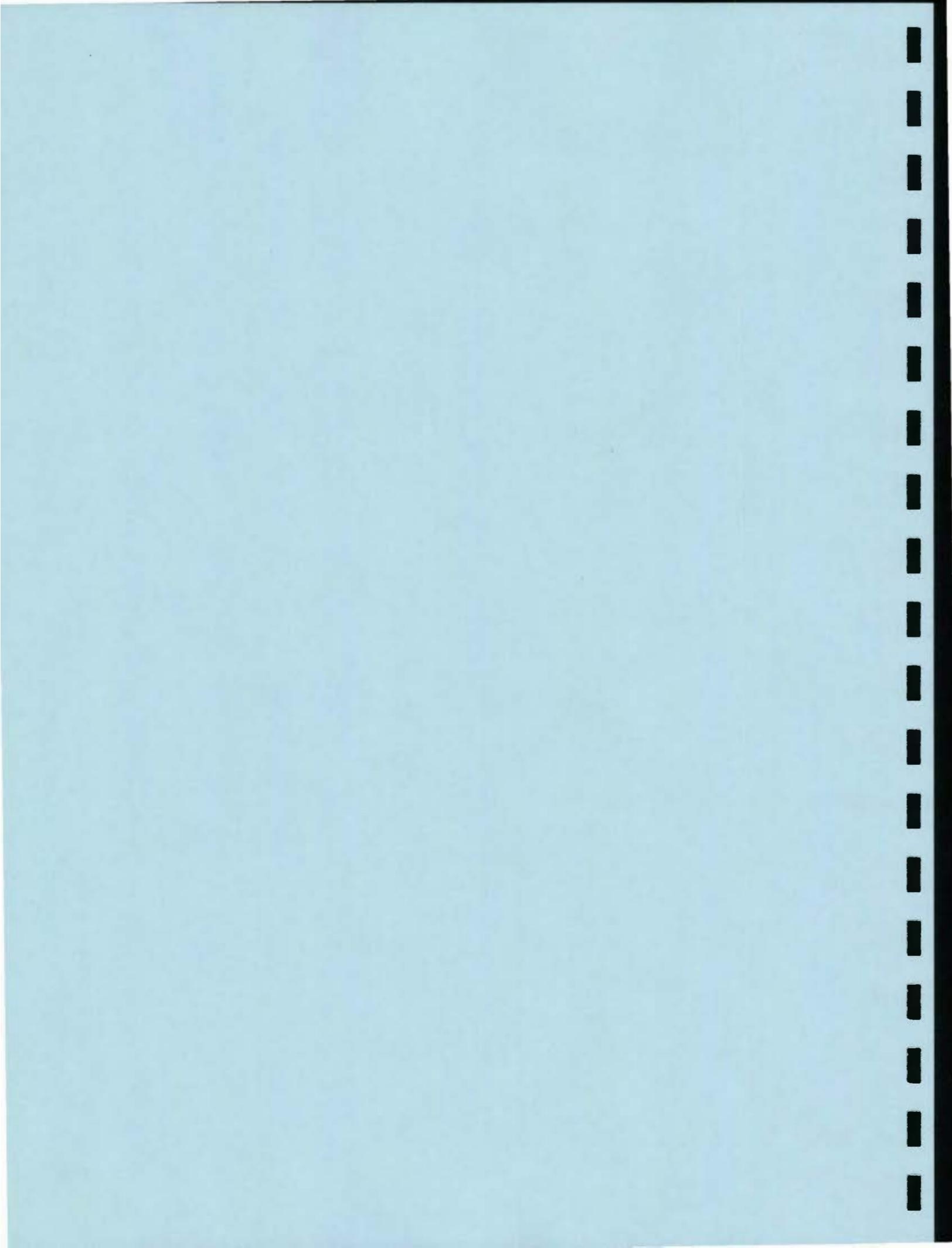
## PRISM USE ONLY

SEE REVERSE FOR TERMS & CONDITIONS

NPDES:	UST:	GROUNDWATER:	DRINKING WATER:	SOLID WASTE:	RCRA:	CERCLA	LANDFILL	OTHER:
<input type="checkbox"/> NC <input type="checkbox"/> SC								









## Case Narrative

**Date:** 10/21/08  
**Company:** ENSR C & E, Inc  
**Contact:** MICHAEL JORDAN  
**Address:** 7041 Old Wake Forest Rd.  
Suite 103  
Raleigh, NC 27616

**Client Project ID:** USCG Support Ctr. (SWMU-33)  
**Prism COC Group No:** G1008354  
**Collection Date(s):** 10/08/08  
**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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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-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
<b>Organochlorine Pesticides by GC/ECD</b>									
4,4'-DDD	BRL	µg/L	0.050	0.014	1	8081A	10/16/08 20:22	javogel	Q36221
4,4'-DDE	BRL	µg/L	0.050	0.0086	1	8081A	10/16/08 20:22	javogel	Q36221
4,4'-DDT	BRL	µg/L	0.050	0.014	1	8081A	10/16/08 20:22	javogel	Q36221
4,4'-Methoxychlor	BRL	µg/L	0.050	0.017	1	8081A	10/16/08 20:22	javogel	Q36221
a-BHC	BRL	µg/L	0.050	0.0075	1	8081A	10/16/08 20:22	javogel	Q36221
a-Chlordane	BRL	µg/L	0.050	0.0071	1	8081A	10/16/08 20:22	javogel	Q36221
Aldrin	BRL	µg/L	0.050	0.015	1	8081A	10/16/08 20:22	javogel	Q36221
b-BHC	BRL	µg/L	0.050	0.012	1	8081A	10/16/08 20:22	javogel	Q36221
Chlordane	BRL	µg/L	0.50	0.14	1	8081A	10/16/08 20:22	javogel	Q36221
d-BHC	BRL	µg/L	0.050	0.0077	1	8081A	10/16/08 20:22	javogel	Q36221
Dieldrin	BRL	µg/L	0.050	0.0084	1	8081A	10/16/08 20:22	javogel	Q36221
Endosulfan I	BRL	µg/L	0.050	0.0076	1	8081A	10/16/08 20:22	javogel	Q36221
Endosulfan II	BRL	µg/L	0.050	0.0071	1	8081A	10/16/08 20:22	javogel	Q36221
Endosulfan Sulfate	BRL	µg/L	0.050	0.0086	1	8081A	10/16/08 20:22	javogel	Q36221
Endrin	BRL	µg/L	0.050	0.0082	1	8081A	10/16/08 20:22	javogel	Q36221
Endrin Aldehyde	BRL	µg/L	0.050	0.016	1	8081A	10/16/08 20:22	javogel	Q36221
Endrin Ketone	BRL	µg/L	0.050	0.0094	1	8081A	10/16/08 20:22	javogel	Q36221
g-BHC	BRL	µg/L	0.050	0.0083	1	8081A	10/16/08 20:22	javogel	Q36221
g-Chlordane	BRL	µg/L	0.050	0.0089	1	8081A	10/16/08 20:22	javogel	Q36221
Heptachlor	BRL	µg/L	0.050	0.016	1	8081A	10/16/08 20:22	javogel	Q36221
Heptachlor Epoxide	0.16	µg/L	0.050	0.0088	1	8081A	10/16/08 20:22	javogel	Q36221
Toxaphene	BRL	µg/L	0.50	0.15	1	8081A	10/16/08 20:22	javogel	Q36221

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

**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

**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



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
<b><u>Organochlorine Pesticides by GC/ECD</u></b>									
4,4'-DDD	BRL	µg/L	0.050	0.014	1	8081A	10/16/08 21:47	lvogel	Q36221
4,4'-DDE	BRL	µg/L	0.050	0.0086	1	8081A	10/16/08 21:47	lvogel	Q36221
4,4'-DDT	BRL	µg/L	0.050	0.014	1	8081A	10/16/08 21:47	lvogel	Q36221
4,4'-Methoxychlor	BRL	µg/L	0.050	0.017	1	8081A	10/16/08 21:47	lvogel	Q36221
a-BHC	BRL	µg/L	0.050	0.0075	1	8081A	10/16/08 21:47	lvogel	Q36221
a-Chlordane	BRL	µg/L	0.050	0.0071	1	8081A	10/16/08 21:47	lvogel	Q36221
Aldrin	BRL	µg/L	0.050	0.015	1	8081A	10/16/08 21:47	lvogel	Q36221
b-BHC	BRL	µg/L	0.050	0.012	1	8081A	10/16/08 21:47	lvogel	Q36221
Chlordane	BRL	µg/L	0.50	0.14	1	8081A	10/16/08 21:47	lvogel	Q36221
d-BHC	BRL	µg/L	0.050	0.0077	1	8081A	10/16/08 21:47	lvogel	Q36221
Dieldrin	BRL	µg/L	0.050	0.0084	1	8081A	10/16/08 21:47	lvogel	Q36221
Endosulfan I	BRL	µg/L	0.050	0.0076	1	8081A	10/16/08 21:47	lvogel	Q36221
Endosulfan II	BRL	µg/L	0.050	0.0071	1	8081A	10/16/08 21:47	lvogel	Q36221
Endosulfan Sulfate	BRL	µg/L	0.050	0.0086	1	8081A	10/16/08 21:47	lvogel	Q36221
Endrin	BRL	µg/L	0.050	0.0082	1	8081A	10/16/08 21:47	lvogel	Q36221
Endrin Aldehyde	BRL	µg/L	0.050	0.016	1	8081A	10/16/08 21:47	lvogel	Q36221
Endrin Ketone	BRL	µg/L	0.050	0.0094	1	8081A	10/16/08 21:47	lvogel	Q36221
g-BHC	BRL	µg/L	0.050	0.0083	1	8081A	10/16/08 21:47	lvogel	Q36221
g-Chlordane	BRL	µg/L	0.050	0.0089	1	8081A	10/16/08 21:47	lvogel	Q36221
Heptachlor	BRL	µg/L	0.050	0.016	1	8081A	10/16/08 21:47	lvogel	Q36221
Heptachlor Epoxide	BRL	µg/L	0.050	0.0088	1	8081A	10/16/08 21:47	lvogel	Q36221
Toxaphene	BRL	µg/L	0.50	0.15	1	8081A	10/16/08 21:47	lvogel	Q36221

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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
<b>Organochlorine Pesticides by GC/ECD</b>									
4,4'-DDD	BRL	µg/L	0.050	0.014	1	8081A	10/16/08 23:13	lvogel	Q36221
4,4'-DDE	BRL	µg/L	0.050	0.0086	1	8081A	10/16/08 23:13	lvogel	Q36221
4,4'-DDT	BRL	µg/L	0.050	0.014	1	8081A	10/16/08 23:13	lvogel	Q36221
4,4'-Methoxychlor	BRL	µg/L	0.050	0.017	1	8081A	10/16/08 23:13	lvogel	Q36221
a-BHC	BRL	µg/L	0.050	0.0075	1	8081A	10/16/08 23:13	lvogel	Q36221
a-Chlordane	BRL	µg/L	0.050	0.0071	1	8081A	10/16/08 23:13	lvogel	Q36221
Aldrin	BRL	µg/L	0.050	0.015	1	8081A	10/16/08 23:13	lvogel	Q36221
b-BHC	BRL	µg/L	0.050	0.012	1	8081A	10/16/08 23:13	lvogel	Q36221
Chlordane	BRL	µg/L	0.50	0.14	1	8081A	10/16/08 23:13	lvogel	Q36221
d-BHC	BRL	µg/L	0.050	0.0077	1	8081A	10/16/08 23:13	lvogel	Q36221
Dieldrin	BRL	µg/L	0.050	0.0084	1	8081A	10/16/08 23:13	lvogel	Q36221
Endosulfan I	BRL	µg/L	0.050	0.0076	1	8081A	10/16/08 23:13	lvogel	Q36221
Endosulfan II	BRL	µg/L	0.050	0.0071	1	8081A	10/16/08 23:13	lvogel	Q36221
Endosulfan Sulfate	BRL	µg/L	0.050	0.0086	1	8081A	10/16/08 23:13	lvogel	Q36221
Endrin	BRL	µg/L	0.050	0.0082	1	8081A	10/16/08 23:13	lvogel	Q36221
Endrin Aldehyde	BRL	µg/L	0.050	0.016	1	8081A	10/16/08 23:13	lvogel	Q36221
Endrin Ketone	BRL	µg/L	0.050	0.0094	1	8081A	10/16/08 23:13	lvogel	Q36221
g-BHC	BRL	µg/L	0.050	0.0083	1	8081A	10/16/08 23:13	lvogel	Q36221
g-Chlordane	BRL	µg/L	0.050	0.0089	1	8081A	10/16/08 23:13	lvogel	Q36221
Heptachlor	BRL	µg/L	0.050	0.016	1	8081A	10/16/08 23:13	lvogel	Q36221
Heptachlor Epoxide	BRL	µg/L	0.050	0.0088	1	8081A	10/16/08 23:13	lvogel	Q36221
Toxaphene	BRL	µg/L	0.50	0.15	1	8081A	10/16/08 23:13	lvogel	Q36221

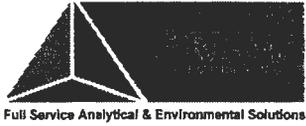
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Page 5 of 6





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

## Metals by ICP, method 6010B

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

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

Matrix Spike					Recovery %	Recovery Ranges %	QC Batch ID
Sample ID:	Result	Spike Amount	Units				
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					Recovery %	Recovery Ranges %	RPD %	RPD Range %	QC Batch ID
Sample ID:	Result	Spike Amount	Units						
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					QC Batch ID
	Result	RL	Control Limit	Units	
Mercury	-0.00011	0.0002	<0.0001	mg/L	Q36111

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

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

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

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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	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Sample 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



NC Certification No. 402  
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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



Full Service Analytical & Environmental Solutions

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

Client Company Name: ENSR/Aecom

Report To/Contact Name: M. Jordan

Reporting Address: 7041 Old Wake Forest Rd.  
Raleigh NC 27616

Phone: 719-872-6600 Fax (Yes) (No)

Email (Yes) (No) Email Address: Mike Jordan@Aecom.com

EDD Type: PDF  Excel  Other

Site Location Name: USCG

Site Location Physical Address: Elizabeth City, NC

# CHAIN OF CUSTODY RECORD

PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING: \_\_\_\_\_

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  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?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Received ON WET ICE? Temp: <u>3.0</u>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
PROPER PRESERVATIVES indicated?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Received WITHIN HOLDING TIMES?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CUSTODY SEALS INTACT?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
VOLATILES rec'd W/OUT HEADSPACE?	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
PROPER CONTAINERS used?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

TO BE FILLED IN BY CLIENT/SAMPLING PERSONNEL

Certification: NELAC  USACE  FL  NC

SC  OTHER  N/A

Water Chlorinated: YES  NO

Sample Iced Upon Collection: YES  NO

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER			PRESERVATIVES	ANALYSES REQUESTED				REMARKS	PRISM LAB ID NO.	
				*TYPE SEE BELOW	NO.	SIZE		0081	6010	85/4, Hg				
33MW-05	10/8/08	1105	Water	P Amber	1/2	500ml TL	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 Babineu 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
<u>[Signature]</u>	<u>Alex Harris</u>	10-9-8	1045
<u>Alex Harris</u>	<u>David Morris</u>	10-9-08	1250
<u>David Morris</u>	<u>[Signature]</u>	10/9/08	1510

Method of Shipment:  Fed Ex  UPS  Hand-delivered  Prism Field Service  Other

COC Group No. G1008354

Additional Comments:

## PRISM USE ONLY

Site Arrival Time:
Site Departure Time:
Field Tech Fee:
Mileage:

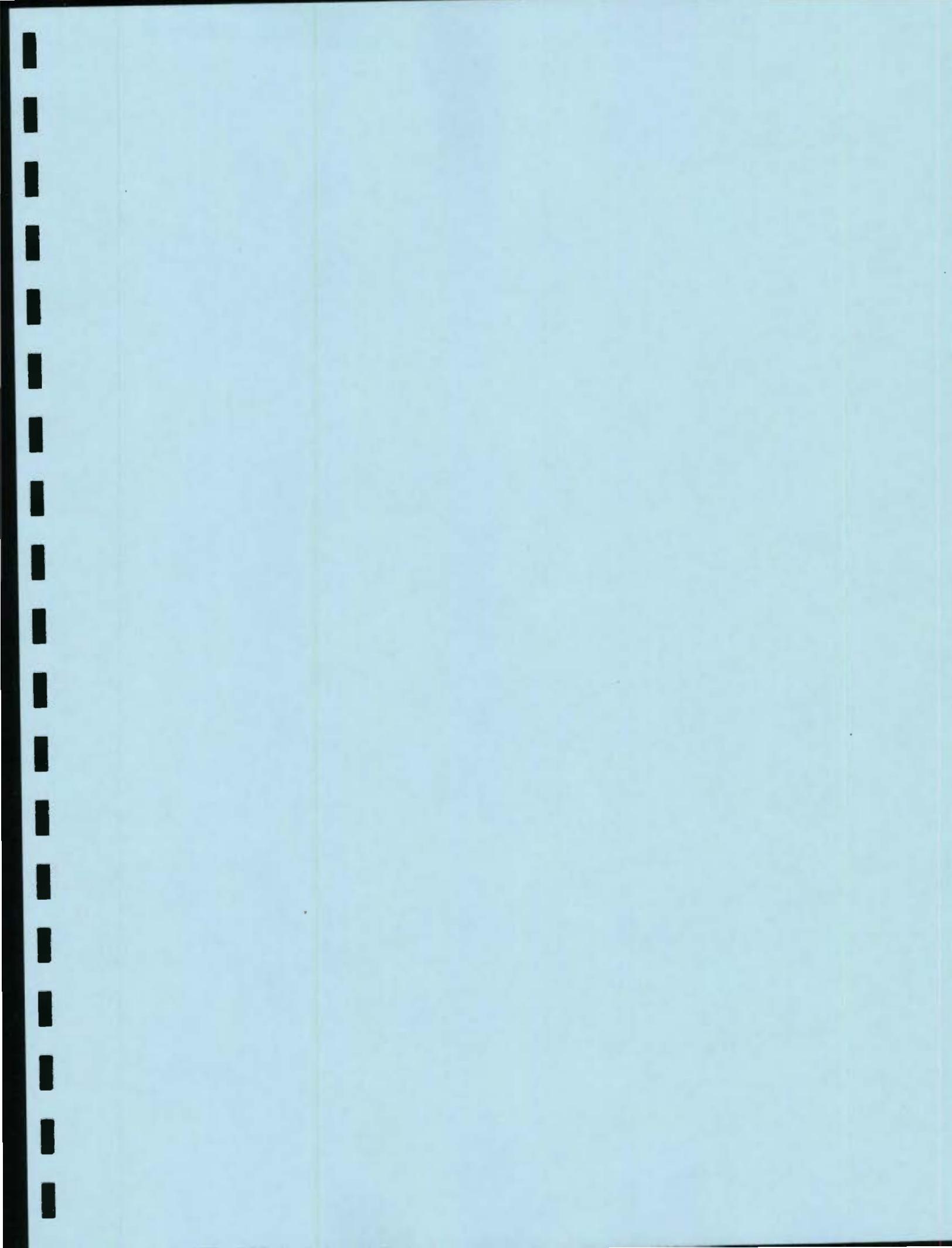
SEE REVERSE FOR TERMS & CONDITIONS

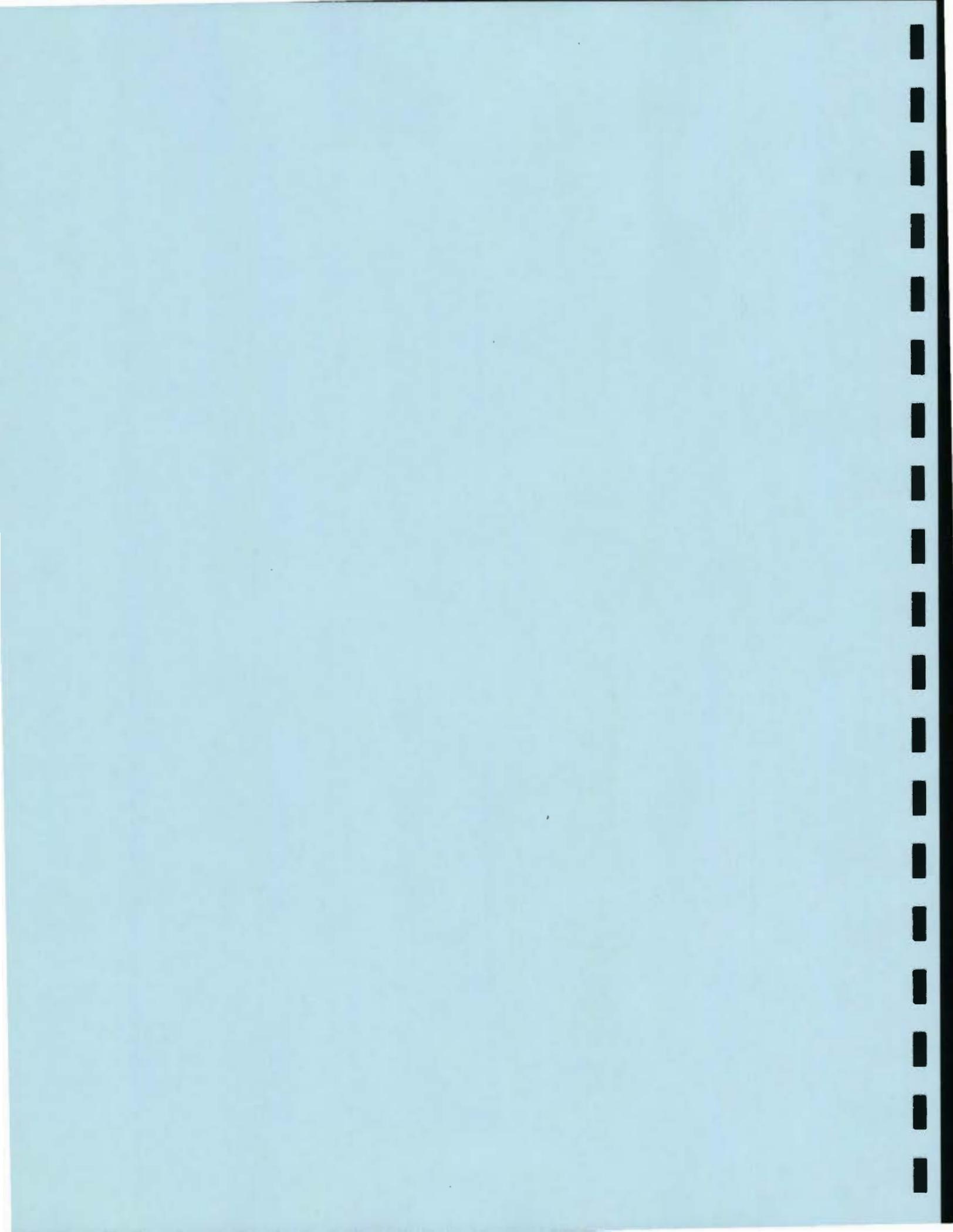
NPDES:	UST:	GROUNDWATER:	DRINKING WATER:	SOLID WASTE:	RCRA:	CERCLA:	LANDFILL:	OTHER:
<input type="checkbox"/> NC <input type="checkbox"/> SC	<input type="checkbox"/> NC <input type="checkbox"/> SC	<input checked="" type="checkbox"/> NC <input type="checkbox"/> SC	<input type="checkbox"/> NC <input type="checkbox"/> SC					

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

ORIGINAL







## Memorandum

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

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

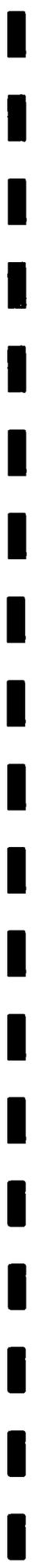
Sample data were reviewed for the following parameters:

- 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 <sup>1</sup>	Units	Reason Codes <sup>2</sup>
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

<sup>1</sup>: 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.

<sup>2</sup>: 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).



### About AECOM Environment

Evolving to better serve global clients, AECOM has formed AECOM Environment—a new global business line that utilizes the environmental management resources of ENSR, Earth Tech, STS and Metcalf & Eddy. With over 4200 staff worldwide in 20 countries, AECOM Environment is one of five new globally integrated business lines of AECOM (AECOM Water, AECOM Transportation, AECOM Design, AECOM Energy and Power). As AECOM Environment, we can offer clients broader and deeper environmental health and safety services with greater technical expertise across greater geographies—closer to sites and facilities. Plus, we can deliver more value by leveraging the full resources of AECOM's worldwide staff of 41,000 people in 450 offices. Our commitment to the success of your projects and your organization is our top priority, as we harness the global capabilities of AECOM.

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