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MCRD PARRIS ISLAND  
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SOLID WASTE MANAGEMENT UNIT ASSESSMENT REPORT ADDENDUM SEDIMENT  
SAMPLING AND ANALYSIS DATA SUMMARY FOR OLD WASTEWATER TREATMENT  
PLANT MCRD PARRIS ISLAND SC

5/1/2003  
TECHLAW

**SWMU ASSESSMENT REPORT (SAR) ADDENDUM  
SEDIMENT SAMPLING AND ANALYSIS DATA SUMMARY  
OLD WASTE WATER TREATMENT PLANT  
MCRD PARRIS ISLAND**

The field sampling team mobilized to MCRD Parris Island, South Carolina on April 3, 2003 to collect sediment samples from the Old WasteWater Treatment Plant (OWWTP) Site. See Figure 1, attached, for the general site location. The sediment sampling and analyses was performed in general accordance with the Letter work Plan (EPA, 2003) prepared for this scope of work. Deviations to the letter work plan include changes to the OWWTP sediment sampling locations as determined by the MCRD Parris Island Partnering Team and the method of the grain size analysis. Grain size analysis was performed by a Wet Sieve Gravimetric technique and not by the 1986 PSEP method as specified in the Letter Work Plan. The following paragraphs provide a brief summary of the sediment sampling activities, analyses and results at the OWWTP site.

**Objectives**

The objective of the sediment sampling at the OWWTP is to determine if there have been any adverse impacts to the marsh as result of past operational discharges. Laboratory test results of marsh sediment samples will be used to determine if further investigation at this unit is required.

**Background**

The OWWTP was taken out of service in the 1940's when the current sewage treatment plant was built and is the location of the old wastewater treatment tank (OWWTT). During operation, discharge was directly adjacent to the salt marsh, however, all influent and effluent piping in the tank has been plugged. The buildings and facilities draining to the tank are thought to have included an armory, dry cleaner and photo lab. The waste oil drums discovered intact in the north chamber were tested and determined to be non-hazardous. In February 2002 samples of standing liquid and sludge/sediment were collected from inside the concrete vault of the OWWTT and were submitted for Appendix IX analyses. Liquid and sludge/sediment results detected metal and PAH contaminants at concentrations greater than USEPA Region 9 Preliminary Remediation Goals (PRGs) (General Engineering Laboratories, February 2002)

**Field Sampling Activities**

Three samples were collected from the Old WasteWater Treatment Plant (OWWTP) location. The first sample designated SAR-SD-01-01 was collected approximately 17-ft from the concrete junction box, at the base of the slope and into the marsh along the general trend of the old clay discharge pipe. The second sample designated SAR-SD-02-01 is located along the trend of the discharge pipe approximately 80.5-ft from the first sample location. The third sample was collected at what visually appeared to be the terminus of the discharge pipe approximately 161-ft from the first sample location. The sample locations are depicted in the Site Sample Map presented as Figure 2, attached.

Sediment samples were collected at low tide utilizing a hand-held, box dredge. Water depth was negligible at each location at the time of sampling. Additionally, plant material was not encountered at any sample location.

### **Sediment Analysis and Results**

Sediments collected from the OWWTP area were analyzed for the complete list of TAL constituents (inorganics) plus mercury and cyanide, TCL organic compounds, pesticides and PCBs. A Sediment Sampling Summary is presented in Table 1, attached. Analytical test results indicate that sample SAR-SD-01-01 detected Phenanthrene, Fluoranthene, Pyrene, Benzo(a)Anthracene, Benzo-a-Pyrene, Chrysene (plus Total PAHs), DDE, DDE, (plus Total DDT Residues), copper, lead and mercury above applicable sediment ESVs. Sample SAR-SD-02-01 detected DDE, DDE, (plus Total DDT Residues), arsenic, copper, lead and zinc above applicable sediment ESVs. Sample SAR-SD-03-01 that was collected the greatest distance from the shoreline and the OWWTP site measured below all applicable ESVs. The only exception is arsenic which measured concentrations over two times the arsenic ESV for sediment. A Sediment Results Summary is presented in Table 2, attached.

### **Conclusions**

Based on the concentrations of PAHs, pesticides and metal compounds detected in marsh sediments in excess of EPA Region 4 Ecological Screening values (ESVs) for sediment and as discussed during the August, 2003 MCRD Partnering Team meeting, further investigation at this site is warranted.

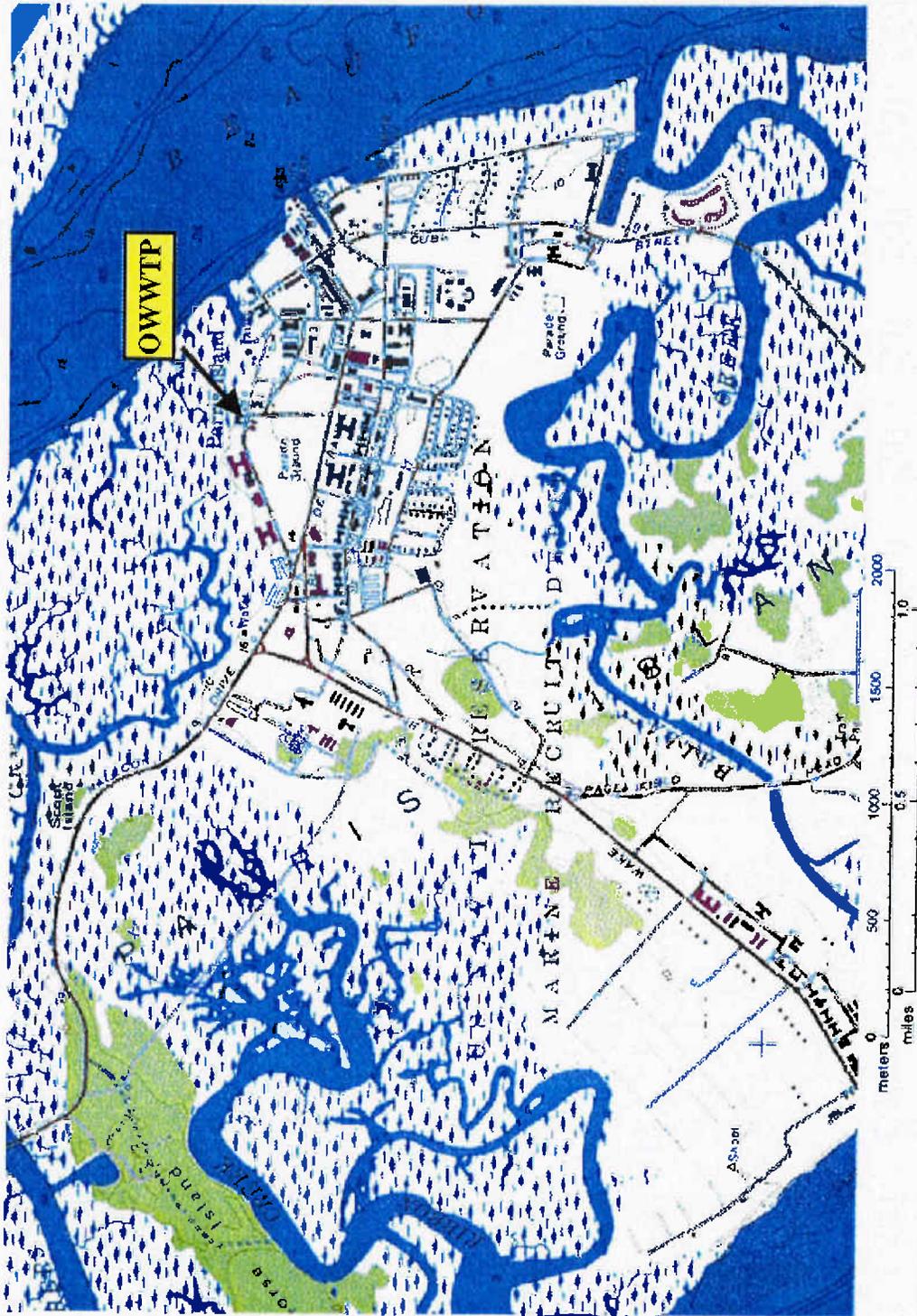
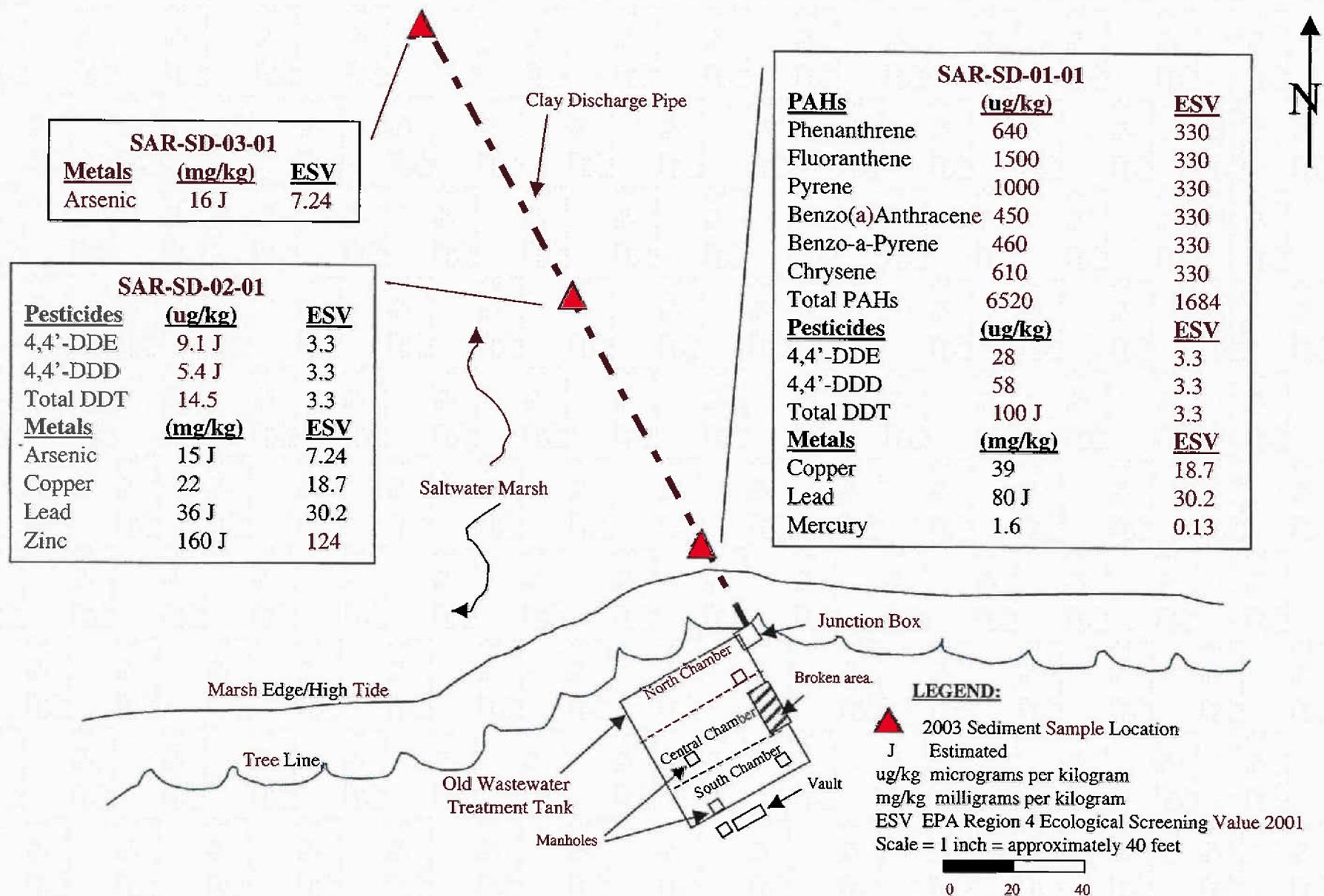


Figure 1. General Vicinity Map



**FIGURE 2. Old Wastewater Treatment Plant (OWWTP) Sediment Sample Locations (ESV Exceedances Only)**

**TABLE 1**  
**OLD WASTE WATER TREATMENT PLANT (OWWTP)**  
**SEDIMENT SAMPLING SUMMARY**

Sample Location	Sample Designation	Sample Depth	Sample Analysis				
			TCL	TAL <sup>1</sup>	Pesticides	PCBs	Other <sup>2</sup>
SAR-SD-01	SAR-SD-01-01	0 - 0.5'	X	X	X	X	X
SAR-SD-02	SAR-SD-02-01	0 - 0.5'	X	X	X	X	X
SAR-SD-03	SAR-SD-03-01	0 - 0.5'	X	X	X	X	X

Notes:

(1) TAL inorganics including mercury and cyanide.

(2) Conventional Sediment variables including TOC, grain size and moisture content.

**TABLE 2**  
**SEDIMENT RESULTS SUMMARY**  
**COMPARISON TO EPA REGION 4 ECOLOGICAL SCREENING VALUES (ESVs) FOR SEDIMENT**

Parameter	EPA Region 4 Sediment ESV	OWWTP Sediment Sample Results		
		SAR-SD-01-01	SAR-SD-02-01	SAR-SD-03-01
<b>ORGANICS (ug/kg)</b>				
Phenanthrene	330		170	37 J
Fluoranthene	330		280	96 J
Pyrene	330		230	80 J
Benzo(a)Anthracene	330		80 J	37 J
Benzo-a-Pyrene	330		93 J	60 J
Chrysene	330		140	40 J
Total PAHs*	1684		1613	862
<b>PESTICIDES (ug/kg)</b>				
4,4'-DDE	3.3			ND
4,4'-DDD	3.3			ND
Total DDT Residues	3.3			ND
<b>METALS (mg/kg)</b>				
Antimony	12	ND	ND	ND
Arsenic	7.24	1.1 J		
Copper	18.7			15
Lead	30.2			21 J
Mercury	0.13		ND	ND
Zinc	124	86 J		83 J
<b>PARTICLE SIZE DATA</b>				
8 mm % (> sand in size)		0.82	0.47	0.15
Sand %		53.44	6.48	10.28
Silt %		3.77	15.62	16.15
Clay %		1.18	5.26	4.32
% Moisture**		40.79	72.17	69.10
<b>TOTAL ORGANIC CARBON (TOC) (mg/kg)</b>				
		35,000	72,000	33,000

**Notes:**

Shaded cells indicate sediment ESV exceedance.

NA = Not Analyzed

ND = Not Detected

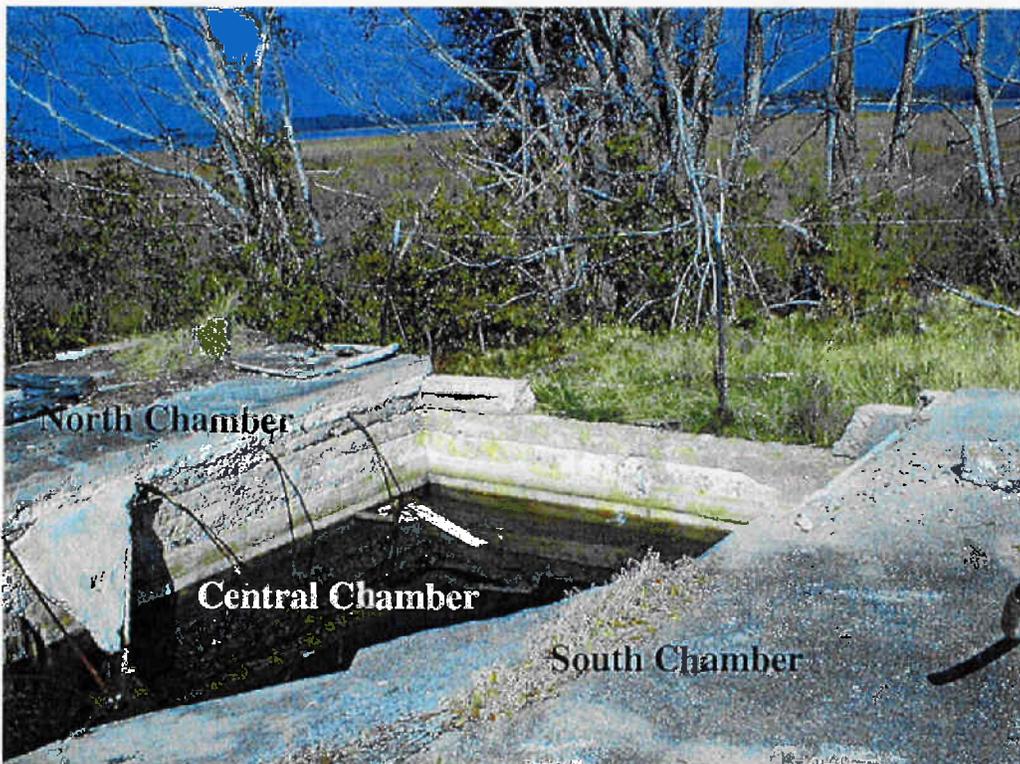
J - Identification of analyte is acceptable; reported value is an estimate

\* = 1/2 detection limit concentration for non detect PAHs included in Total PAHs

\*\* = Moisture results as reported by the EPA Contract Geotechnical Laboratory



**Photo 1.** Top of Old Wastewater Treatment Tank in Area of Breached Top. View to Northwest



**Photo 2.** Breach in Top of Old Wastewater Treatment Tank with Standing Water. View to Northeast. Note three chambers.



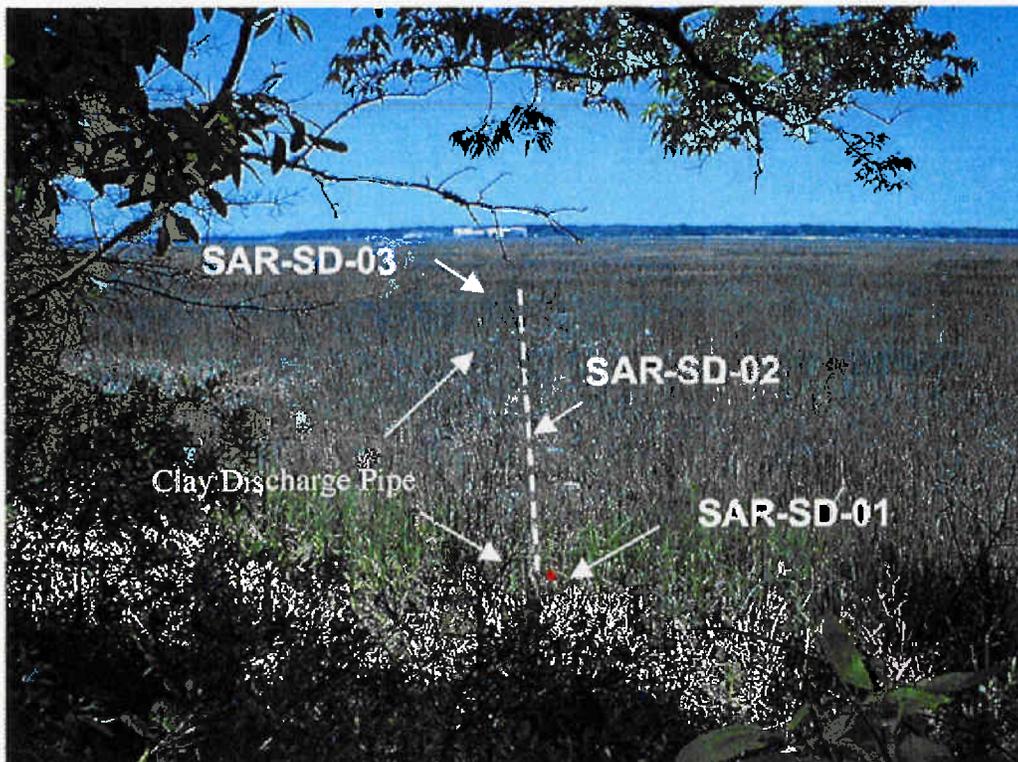
**Photo 3.** View to the west of OWWT and associated Junction Box.



**Photo 4 .** View of OWWT Junction Box and Clay Discharge Pipe.



**Photo 5.** View of Box Dredge Sampler at Location SAR-SD-02.



**Photo 6.** View to the northwest with sample locations and piping trace shown.