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SEDIMENT SAMPLING AND ANALYSIS SUMMARY REPORT FOR SITE 3 CAUSEWAY  
LANDFILL SEDIMENT AREA 4 MCRD PARRIS ISLAND SC

5/1/2003  
TECHLAW

## **SEDIMENT SAMPLING AND ANALYSIS SUMMARY REPORT SITE 3, SEDIMENT AREA 4, MCRD PARRIS ISLAND**

The field sampling team mobilized to Site 3, Area 4 MCRD Parris Island, South Carolina on April 3, 2003 to collect sediment samples from marsh side of causeway. 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. However, 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 Site 3, Sediment Area 4.

### **Objectives**

The objectives of the sediment sampling at Sediment Area 4 were as follows. Depending on the results of the additional sampling and testing, the data will either serve to provide 1) adequate baseline data for pursuing monitored natural recovery of sediments at the Site 3/SWMU 3 Causeway Landfill or 2) demonstrate that no further action is required to provide adequate protection for ecological receptors.

### **Background**

From August 2000 to June 2001, an interim remedial action was implemented at the Site 3/SWMU 3-Causeway Landfill, which covered and stabilized waste materials within the causeway and covered the most contaminated sediments. Additional adjacent, but less contaminated sediments, were also covered during this interim action (CCI, 2002). Results of the 2001 sediment sampling conducted at the Site/SWMU 3-Causeway Landfill indicated that residual ecological risks for site COPCs remain following the Post-Interim Construction remedial action. Concentrations of the metals of concern which include mercury, lead and arsenic and the pesticide DDD, were in excess of ecological screening values in several locations, particularly at Sediment Area 4 (Hot Spot 4), located on the pond side of the causeway (TiNUS, 2002).

### **Field Sampling Activities**

Three (3) samples were collected within tidal rivulets located in the marsh on the pond side of Site 3, Sediment Area 4. The first sample designated PAI-03-SD-61-01 was co-located with sample PAI-03-SD-59. The second sample designated PAI-03-SD-62-01 was collected at a location approximately 47.8-ft due east of the first sample location. The third sample designated PAI-03-SD-63-01 was located approximately North 25-degrees East and 59-ft from the first sample location. The sediment sample locations are shown in Figure 2, attached.

Sediment samples were collected at low tide utilizing a hand-held, box dredge. Water depth at the time of sampling ranged from 4-6-inches at each location. A layer of plant material was encountered at each location and averaged approximately 6-inches in thickness.

## **Sediment Analysis and Results**

Sediment samples were submitted for analyses to an analytical laboratory currently under contract to USEPA. Sediment samples collected from Site 3, Sediment Area 4 will be analyzed for the metals and pesticides of concern and include mercury, lead, arsenic and the DDX series pesticides, respectively. In addition to analytical analyses, sediment samples will also be analyzed for conventional variables including total organic carbon (TOC), grain size and moisture content. Sediment Sampling Summary is presented in Table 1, attached.

Analytical test results indicate that samples PAI-03-SD-61-01 and PAI-03-SD-62-01 were in excess of EPA Region 4 Sediment Ecological Screening Values (ESVs) for the pesticides DDE, DDD and Total DDT residues. Sample PAI-03-SD-63-01, which is located approximately 59-ft northeast of the rip-rap bank, measured below sediment ESVs for DDE, DDD and Total DDT residues. Mercury, lead and arsenic analysis of the three sediment samples indicates no exceedances above applicable sediment ESVs. A Sediment Results Summary is presented in Table 2, attached.

## **Conclusions**

Based on the concentrations of DDE and DDD and total organic carbon (TOC) measured in marsh sediments at the site, sediment long term monitoring (LTM) is not necessary. As agreed by the MCRD Partnering Team, during the August 2003 meeting, the final ROD for Site 3 will specify long term groundwater monitoring plus land use controls (LUC).

**TABLE 1**  
**SITE 3, SEDIMENT AREA 4**  
**SEDIMENT SAMPLING SUMMARY**

Sample Location	Sample Designation	Sample Depth	Sample Analysis		
			Pesticides	Hg, Pb, As	Other <sup>1</sup>
PAI-03-SD-61	PAI-03-SD-61-01	0 - 0.5'	X <sup>2</sup>	X	X
PAI-03-SD-62	PAI-03-SD-62-01	0 - 0.5'	X <sup>2</sup>	X	X
PAI-03-SD-63	PAI-03-SD-63-01	0 - 0.5'	X <sup>2</sup>	X	X

Notes:

- (1) Conventional Sediment variables including TOC, grain size and moisture content.
- (3) DDX series only.

**TABLE 2  
SITE 3, SEDIMENT AREA 4  
SEDIMENT RESULTS SUMMARY**

Parameter	EPA Region 4 Sediment ESV	Sediment Results		
		PAI-03-SD-61-01	PAI-03-SD-62-01	PAI-03-SD-63-01
<b>PESTICIDES (ug/kg)</b>				
4,4'-DDE	3.3	5.2 J	2.8 J	2.5 J
4,4'-DDD	3.3	5.7 J	4.9 J	ND
Total DDT Residues	3.3	11 J	7.7 J	2.5 J
<b>METALS (mg/kg)</b>				
Arsenic	7.24	5.3 J	5.3 J	6.4 J
Lead	30.2	13 J	18 J	22 J
Mercury	0.13	ND	ND	ND
<b>PARTICLE SIZE DATA</b>				
8 mm % (> sand in size)		0.32	0.25	0.01
Sand %		42.62	14.11	41.21
Silt %		14.16	26.87	16.59
Clay %		5.62	10.96	7.65
% Moisture*		37.28	47.80	34.53
<b>TOTAL ORGANIC CARBON (TOC) (mg/kg)</b>				
		6700	11,000	15,000

**Notes:**

Shaded cells indicate sediment ESV exceedance

ND = Not Detected

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

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



**Figure 2. Site 3, Area 4 Sediment Results (ESV Exceedances Only)**

