DATA REPORT

2005 PRE-REMEDIAL DESIGN SEDIMENT SAMPLING AND ANALYSIS

DENNY WAY COMBINED SEWER OVERFLOW

Prepared for

King County Department of Natural Resources and Parks

821 Second Avenue

Seattle, Washington 98104

Prepared by

Anchor Environmental, L.L.C.

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and

King County Department of Natural Resources and

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Table of Contents

1 INTRODUCTION 1

2 EVENT SUMMARY 3
2.1 Sampling Schedule and Platform 3
2.2 Station Positioning 3
2.3 Station and Sample Identification 3

3 DEVIATIONS FROM SAMPLING AND ANALYSIS PLAN 5
3.1 Sampling Location Deviations 5
3.2 Laboratory Analysis Deviations 5

4 RESULTS 6
4.1 Dredge Material – 0 to 4 foot Sediment Depth 6
4.2 Z-layer – 4 to 5 foot Sediment Depth 7
4.3 Underlying Sediment – 5 to 10 foot Sediment Depth 7
4.3.1 DW101, DW102, and DW103 7
4.3.2 DW105 8
4.4 TCLP and DRET Results on Dredge Material Composite– 0 to 4 foot Sediment Depth.. 9

5 DATA QUALITY ASSURANCE 10
5.1 Quality Assurance/Quality Control 10
5.2 Laboratory Report 10

6 REFERENCES 11

List of Tables

Table 1 Denny Way Outfall Station Locations (NAD83)

Table 2 Sample Depth, Matrix, and Usage

Table 3 Sediment Core Analytical Results – Dry Weight Values

Table 4 Sediment Core Analytical Results – SMS Screening

List of Figures

Figure 1 Site Map

Figure 2 Sample Locations

List of Appendices

Appendix A Anchor Environmental LLC. 2005. Sampling and Analysis Plan Addendum. Denny Way Combined Sewer Overflow Outfall Sediment Characterization.

	Prepared for King County Department of Natural Resources and Parks. July 2005.
Appendix B	Anchor Environmental L.L.C. Sediment Coring Field Logs and Notes
Appendix C	King County Water and Land Resources Division Environmental Laboratory Denny Way Sediment Remediation Core Samples QA1 Data Report
Appendix D	Toxicity Characteristic Leaching Procedure (TCLP) and Dredge Elutriate Test (DRET) Results and QA/QC Data

1 INTRODUCTION

In 1997, a pre-construction sediment characterization study of the Denny Way combined sewer overflow (CSO) area was conducted to address the requirements of a Department of Natural Resources (DNR) lease land use authorization and to evaluate the nature and extent of sediment contamination in the site area. In addition, characterization was conducted to begin to address source control and sediment cleanup issues associated with the listing of the site on the Washington Department of Ecology (Ecology) Sediment Management Standards (SMS) Sediment Site List. Based on the results of the 1997 study (Black & Veatch 1997), preliminary sediment management areas were identified. In 2005, King County completed construction of two outfalls to Elliott Bay in Seattle, Washington, as part of ongoing source control improvements to the Denny Way CSO system (Figure 1).

Because of the potential for the new outfall construction to affect Puget Sound Chinook salmon, consultation with the National Marine Fisheries Service (NMFS) was required under Section 7 of the Endangered Species Act (ESA). King County completed a biological assessment for the project (CH2M Hill 1999), and a Biological Opinion (BO) was issued by NMFS (2000) that required pre- and post-construction monitoring. The pre-construction monitoring study was conducted in 2001 by King County (2001).

Based on these evaluations, as-built plans, post-construction bathymetric survey data, and additional relevant information on Elliott Bay sediments and oceanography, Anchor Environmental, L.L.C. (Anchor) developed an integrated work plan and sampling and analysis plan (SAP; Anchor 2004) to address the ongoing monitoring requirements of the BO and to generate sediment characterization data relevant to a sediment remedial investigation/ feasibility study (RI/FS). Because the BO monitoring provides a nearly complete evaluation of the Denny Way CSO site surface sediments, these data comprise the majority of the surface sediment characterization needs for the RI/FS. The work plan suggested additional surface and subsurface sampling in Remediation Areas A and B (Figure 1) to be able to efficiently complete the RI/FS characterization. In May 2004, the additional surface samples were collected; however, the subsurface coring was delayed. These additional data, along with the BO monitoring results, are presented in the Post-Construction Sediment Monitoring report (King County 2005).

In 2005, Anchor described the additional sediment coring program in a Sampling and Analysis Plan Addendum (SAPA; Anchor 2005; Appendix A). In order to fulfill data gaps, the additional sampling and testing included collecting sediment core samples for SMS chemical characterization within the prospective Remediation Area A and B dredge prism (Figure 1). Representative sediment collected from this area was also tested using the Toxicity Characteristic Leaching Procedure (TCLP) for metals to determine the sediment's acceptability for disposal at an upland landfill, dredge elutriate test (DRET) to estimate potential water column chemical concentrations possible during dredging, and grain size (particle size distribution). In addition, Z-layer samples (the new surface exposed by prospective dredging) were tested for the SMS analytes. This data report presents the results of the work outlined in the SAPA (Anchor 2005).

2 EVENT SUMMARY

The sampling and analysis program, including the addendum, was developed with consideration of site-specific project and environmental factors. The conceptual dredge plan required removal of a minimum of 3 feet and an average of 4 feet from the areas inshore of the existing sediment cap where there is no armor protection for the new Denny Way outfalls (Figure 1). Previous site characterization data had identified two locations inshore of the existing cap that required remediation (Remediation Areas A and B), which are located northwest of the outfalls. This section summarizes the sample collection, processing, and handling information detailed in the SAPA (Anchor 2005). Deviations from the SAPA are described below in Section 3.

2.1 Sampling Schedule and Platform

Sampling occurred on July 21, 2005. Collection of sediment cores was conducted from the *R/V Nancy Anne,* operated by Mr. Bill Jaworski of Marine Sampling Systems (MSS).

2.2 Station Positioning

Horizontal positioning was determined by the onboard differential global positioning system (DGPS) based on target coordinates. Measured station positions were converted to Washington State Plane Coordinates, North Zone (North American Datum [NAD] 83/91), to the nearest foot. The accuracy of measured and recorded horizontal coordinates was within 1 meter. Target coordinates and actual station coordinates recorded during the sampling event are shown in Table 1.

Water depth at each boring station was measured using a fathometer or lead line and converted to mean lower low water (MLLW) datum by adding the tidal elevation. Tidal elevations were based on tide predictions made by onboard computer software.

2.3 Station and Sample Identification

The core and composite sample identification numbers (IDs) for the sediment characterization in each of the areas are listed in Table 2 and the core IDs are shown on Figure 2. Four cores were collected from the site; three (DW101, DW102, and DW105) in Remediation Area A and one (DW103) in Remediation Area B.

The top 4 feet of each of the cores was combined into a single sample (total of four samples) and the 4- to 5-foot interval (Z-layer) was collected for analysis. The four composite samples were tested for TCLP metals to determine their suitability for disposal at an upland Subtitle D landfill. A composite of the four composites (resulting in one sample labeled as DW104) was also tested for DRET to measure potential water quality impacts at the point of dredging. The discrete 1-foot samples were tested for SMS analytes to establish the bottom extent of contamination and characterize the underlying sediments that may be left in place following dredging. Core logs and field notes are provided in Appendix B.

3 DEVIATIONS FROM SAMPLING AND ANALYSIS PLAN

In the field and laboratory, circumstances and individual sample conditions necessitated certain deviations from the SAP (and SAPA) be made, as described below.

3.1 Sampling Location Deviations

Actual sample location/sample field coordinates varied from those prescribed in the SAPA. The DW101, DW102, DW103, and DW105 prescribed and actual sample locations (NAD83) are shown in Table 1.

3.2 Laboratory Analysis Deviations

Total organic carbon analysis method detection limits (MDLs) were raised for all samples due to laboratory sample dilution. Additionally, the MDL for the silt and clay portion of the grain size measurement was raised to 0.5 percent during analysis compared to the SAP indicated MDL of 0.1 percent. The MDL deviations are further discussed in the King County Environmental Laboratory (KCEL) quality assurance level one (QA1) report (Appendix C), and did not affect data useability.

Samples were analyzed for mercury in accordance of U.S. Environmental Protection Agency (EPA) Method 245.5. This differs from the SAP, which indicated that EPA Method 7471 be used; however, these are considered equivalent methods. Some metals parameter MDLs were also changed from those indicated in the SAP. This occurred predominantly in response to the percent solids being less than 50 percent. These deviations from the SAP are further discussed in the KCEL QA1 report (Appendix C), and did not affect data useability.

The quality control acceptance limits for the semivolatile organic compound (SVOC), pesticide, and polychlorinated biphenyl (PCB) parameters varied between what the SAP prescribed and what was routinely used by the lab for sediment testing. For an assortment of samples, organics MDLs varied from those outlined in the SAP. These MDL alterations were predominantly due to necessitated dilutions. Specifically, for SVOC analyses, all samples were diluted 10 times except L36276-3; and for PCB analysis, all samples were diluted 10 times. These deviations are further discussed in the KCEL QA1 report (Appendix C), and again did not affect data useability.

4 RESULTS

Sediment samples were tested for bulk chemistry of SMS analytes, which included metals, PCBs, pesticides, low molecular weight polynuclear aromatic hydrocarbons (LPAHs), high molecular weight PAHs (HPAHs), chlorinated hydrocarbons, phthalates, phenols, and miscellaneous extractable organics. Dredge prism area sediment samples exceeding SMS chemical criteria are discussed below with the three vertical depth categories (0 to 4 foot, Z-layer, and 5 to 10 foot) being addressed separately. The complete suite of sediment sample analytical results, including grain size, is shown in Table 3. The SMS screening is presented in Table 4. The full DRET and TCLP results are presented in Appendix D.

4.1 Dredge Material – 0 to 4 foot Sediment Depth

One composite sample from the 0 to 4 foot level and one field replicate were collected to characterize prospective dredge material at the Denny Way CSO site. The 0 to 4 foot parent and replicate sample SMS exceedances were as follows:

- **Metals**: The parent and replicate sample mercury concentrations exceeded the SMS cleanup screening level (CSL) chemical criterion and the parent sample silver concentration exceeded the CSL.
- **PCBs**: The parent sample exceeded the SMS sediment quality standard (SQS) chemical criterion but not the CSL; however, the replicate sample exceeded the CSL.
- **LPAHs**: The parent sample 2-methylnaphthalene concentration exceeded the SQS chemical criterion but not the CSL.
- **HPAHs**: The parent and replicate sample fluoranthene concentrations exceeded the SQS chemical criterion but not the CSL.
- **Chlorinated Hydrocarbons**: The parent and replicate sample concentrations exceeded the CSL chemical criterion.
- **Phthalates**: Parent and replicate sample butylbenzylphthalate concentrations exceeded the SQS chemical criterion but not the CSL, and parent and replicate sample bis(2-ethylhexyl)phthalate concentrations exceeded the CSL.

Concentrations of phenols and miscellaneous extractable organic chemicals were all below SQS chemical criteria.

4.2 Z-layer – 4 to 5 foot Sediment Depth

One sample per individual core Z-layer (4 to 5 foot layer) was submitted to the laboratory in order to characterize the projected (post-dredging) sediment surface.

The Z-layer SMS exceedances were as follows:

- **Metals**: The DW101 cadmium concentration exceeded the CSL chemical criterion; the DW101, DW102, and DW105 mercury concentrations exceeded the CSL; and the DW101 silver concentration exceeded the CSL.
- **Total PCBs**: All four sample concentrations exceeded the SQS chemical criterion but not the CSL.
- **LPAHs**: The DW102 acenaphthene and fluorene concentrations exceeded the CSL chemical criteria.
- **HPAHs**: The DW102 fluoranthene and total PAHs concentrations exceeded the SQS chemical criteria but not their respective CSLs.
- **Phthalates**: The DW102 and DW103 butylbenzylphthalate concentrations exceeded the SQS chemical criterion but not the CSL; and the DW101, DW102, and DW105 bis(2-ethylhexyl)phthalate concentrations exceeded the CSL.

Concentrations of phenols, chlorinated hydrocarbons, and miscellaneous extractable organic chemicals were all below SQS chemical criteria.

4.3 Underlying Sediment – 5 to 10 foot Sediment Depth

Discrete samples were taken from 1-foot intervals (excluding the Z-layer discussed above) of the four sediment cores. The DW101, DW102, and DW103 cores were sectioned at the 5 to 7 foot depth interval. The DW105 core was sectioned at the 5 to 10 foot sediment depth interval. These sample sections were collected and tested to better characterize the underlying sediment. Results are summarized in the sections below.

4.3.1 DW101, DW102, and DW103

The DW101, DW102, and DW103 (5 to 7 foot) SMS exceedances were as follows:

- **Metals**: The DW101 (5 to 7 foot) and DW103 (5 to 7 foot) mercury concentrations exceeded the CSL chemical criterion; the DW102 (5 to 6 foot) mercury concentration exceeded the SQS but not the CSL; and the DW103 (5 to 6 foot) silver concentration exceeded the CSL.

- **Total PCBs:** The DW102 (5 to 7 foot) samples exceeded the CSL chemical criterion and the DW103 (5 to 7 foot) samples exceeded the SQS.
- **LPAHs**: The DW103 (5 to 7 foot) sample naphthalene, phenanthrene, and 2-methylnaphthalene concentrations exceeded the SQS chemical criteria but not the CSL; the DW102 (5 to 7 foot) and DW103 (5 to 7 foot) acenaphthene and fluorene concentrations exceeded the SQS but not the CSL
- **HPAHs**: The DW102 (5 to 7 foot) fluoranthene and DW102 (6 to 7 foot) benzo(g,h,i)perylene concentrations exceeded the SQS chemical criterion but not the CSL; concentration exceeded the SQS but not the CSL.
- **Chlorinated Hydrocarbons**: The DW102 (5 to 7 foot) 1,4-dichlorobenzene concentrations exceeded the SQS chemical criterion but not the CSL.
- **Phthalates**: The DW101 (6 to 7 foot), DW102 (5 to 7 foot) and DW103 (6 to 7 foot) butylbenzylphthalate concentrations exceeded the SQS chemical criterion but not the CSL; and the DW101 (5 to 6 foot), DW102 (5 to 7 foot) and DW103 (5 to 7 foot) bis(2-thylhexyl)phthalate concentrations exceeded the CSL.

Concentrations of phenols and miscellaneous extractable organic chemicals were all below SQS chemical criteria.

4.3.2 DW105

The DW105 (5 to 10 foot) SMS exceedances were as follows:

- **Metals**: The 6 to 7 foot and 9 to 10 foot samples had cadmium concentrations that exceeded the SQS chemical criterion but not the CSL; however, the 5 to 6 foot sample cadmium concentration did exceed the CSL. The 5 to 6 foot sample copper concentration exceeded the CSL. The 5 to 6 foot sample lead concentration exceeded the CSL, while the 6 to 7 foot sample lead concentration exceeded the SQS but not the CSL. All the 5 to 10 foot samples had mercury concentrations that exceeded the CSL. The 5 to 8 foot samples and the 9 to 10 foot sample silver concentrations exceeded the CSL. The 5 to 7 foot samples zinc concentrations exceeded the SQS but not the CSL.
- **Total PCBs**: The 5 to 8 foot samples exceeded the CSL chemical criterion, and the 8 to 10 foot samples exceeded the SQS but not the CSL.

- **LPAHs**: The 5 to 8 foot samples had naphthalene concentrations that exceeded the SQS chemical criterion but not the CSL. The 5 to 7 foot samples had acenaphthene, fluorine, and phenanthrene concentrations that exceeded the SQS but not the CSL. The 5 to 8 foot samples had 2-methylnaphthalene concentrations that exceeded the CSL, while the 9 to 10 foot sample concentration exceeded the SQS but not the CSL. The 5 to 7 foot samples had total LPAH concentrations that exceeded the SQS but not the CSL.
- **Chlorinated Hydrocarbons**: The 5 to 7 foot samples had 1,4-dichlorobenzene concentration that exceeded the CSL chemical criterion, while the 7 to 8 foot and 9 to 10 foot samples exceeded the SQS but not the CSL. The 6 to 8 foot samples had 1,2-dichlorobenzene concentrations that exceeded the CSL.
- **Phthalates**: The 5 to 6 foot sample butylbenzylphthalate concentration exceeded the SQS chemical criterion but not the CSL. All the 5 to 10 foot samples had bis(2-ethylhexyl)phthalate concentrations that exceeded the CSL.
- **Miscellaneous Extractable Organics**: The 5 to 7 foot samples had dibenzofuran concentrations that exceeded the SQS chemical criterion but not the CSL.

Concentrations of phenols and HPAHs were all below SQS chemical criteria.

4.4 TCLP and DRET Results on Dredge Material Composite– 0 to 4 foot Sediment Depth

TCLP and DRET laboratory forms and data reports are provided in Appendix D. TCLP analysis included ICP metals (Method 1211/200.7) and total mercury (EPA 1211/245.2). Barium, lead, nickel, and zinc were detected. The concentrations measured in the tested representative composite sample were below EPA standards for hazardous waste (40CFR 261.24) and the material was found suitable for upland disposal. DRET analysis included total mercury (EPA 1211/245.2) and SVOCs (EPA 3520C/8270C). Mercury, 1,4-dichlorobenzene, acenaphthene, anthracene, benzo(a)anthracene, benzo(k)fluoroanthene, bis (2-ethylhexyl)phthalate, chrysene, coprostanol, fluoranthene, phenanthrene, and pyrene were detected.

5 DATA QUALITY ASSURANCE

5.1 Quality Assurance/Quality Control

Laboratory analysis quality assurance and quality control (QA/QC) followed the QA/QC protocol directed in the SAP. QA/QC was performed and evaluated internally by KCEL for the sediment core samples. The laboratory's QA1 report is included in this report as Appendix C.

5.2 Laboratory Report

The KCEL prepared a detailed laboratory report documenting all activities associated with the sample analyses. The report includes:

- **Project Narrative:** A detailed report describing the samples received, analyses performed, and corrective actions undertaken (Ecology SMS QA1 report).
- **Chain-of-Custody Documentation:** Laboratory policy requires that chain-of-custody documentation be available for all samples received. The chain-of-custody documented basic sample demographics such as client and project names, sample identification, analyses requested, and special instructions.
- **Data Summary Form:** A tabular listing of concentrations and/or detection limits for all target analytes. The data report also lists other pertinent information such as amount of sample analyzed, dilution factors, sample processing dates, extract cleanups, and surrogate recoveries.
- **QA Summary:** Including results of all quality control analyses, specifically recovery information. Laboratory control samples are reported with each batch. Additional quality control analysis may include laboratory replicates, matrix spikes, and standard reference materials.

6 REFERENCES

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TABLES

Table 1
Denny Way Outfall Station Locations (NAD83)

Lab Sample #	Station Name	Prescribed Northing	Field Northing	Prescribed Easting	Field Easting
L36276-1	DW101-CDC	229368	229374	1263519	1263513
L36276-2	DW101-CDD	229368	229374	1263519	1263513
L36276-3	DW101-CDE	229368	229374	1263519	1263513
L36276-4	DW102-CDC	229285	229282	1263688	1263682
L36276-5	DW102-CDD	229285	229282	1263688	1263682
L36276-6	DW103-CDE	229285	229282	1263688	1263682
L36276-7	DW103-CDC	229352	229325	1263685	1263685
L36276-8	DW103-CDD	229352	229325	1263685	1263685
L36276-9	DW103-CDE	229352	229325	1263685	1263685
L36276-10	DW104-CCB composite of DW101, 102 and 103	NA	NA	NA	NA
L36276-11	DW105-CDC	229327	229326	1263612	1263608
L36276-12	DW105-CDD	229327	229326	1263612	1263608
L36276-13	DW105-CDE	229327	229326	1263612	1263608
L36276-14	DW105-CDF	229327	229326	1263612	1263608
L36276-15	DW105-CDG	229327	229326	1263612	1263608
L36276-16	DW105-CDH	229327	229326	1263612	1263608
L36276-16	DW104-CSB field replicate of DW104-CCB	NA	NA	NA	NA

All coordinates are within +/- 1 meter accuracy limits, as defined in the SAP.

Table 2
Sample Depth, Matrix, and Usage

Lab Sample #	Locator	Sample Location	Sediment Core Depth (from surface)	Sample Usage
L36276-1	DW101-CDC	Core Sample	4 to 5 ft	Chemistry only
L36276-2	DW101-CDD	Core Sample	5 to 6 ft	Chemistry only
L36276-3	DW101-CDE	Core Sample	6 to 7 ft	Chemistry only
L36276-4	DW102-CDC	Core Sample	4 to 5 ft	Chemistry only
L36276-5	DW102-CDD	Core Sample	5 to 6 ft	Chemistry only
L36276-6	DW103-CDE	Core Sample	6 to 7 ft	Chemistry only
L36276-7	DW103-CDC	Core Sample	4 to 5 ft	Chemistry only
L36276-8	DW103-CDD	Core Sample	5 to 6 ft	Chemistry only
L36276-9	DW103-CDE	Core Sample	6 to 7 ft	Chemistry only
L36276-10	DW104-CCB	Core Sample	Composite of 101, 102 and 103 (0 to 4 ft)	Chemistry , DRET, TCLP
L36276-11	DW105-CDC	Core Sample	4 to 5 ft	Chemistry only
L36276-12	DW105-CDD	Core Sample	5 to 6 ft	Chemistry only
L36276-13	DW105-CDE	Core Sample	6 to 7 ft	Chemistry only
L36276-14	DW105-CDF	Core Sample	7 to 8 ft	Chemistry only
L36276-15	DW105-CDG	Core Sample	8 to 9 ft	Chemistry only
L36276-16	DW105-CDH	Core Sample	9 to 10 ft	Chemistry only
L36276-16	DW104-CSB	Core Sample (field replicate)	Composite of 101, 102 and 103 (0 to 4 ft)	Chemistry only

Table 3
Sediment Core Analytical Results – Dry Weight Values

Location ID			DW101	DW101	DW101	DW102	DW102	DW102	DW103	DW103	DW103	DW104	DW104	DW105	DW105	DW105	DW105	DW105	DW105
Sample ID			DW101-CDC	DW101-CDD	DW101-CDE	DW102-CDC	DW102-CDD	DW102-CDE	DW103-CDC	DW103-CDD	DW103-CDE	DW104-CCB	DW104-CSB	DW105-CDC	DW105-CDD	DW105-CDE	DW105-CDF	DW105-CDG	DW105-CDH
Sample Date			7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005
Depth Interval	DW-AET	DW-AET	4-5 ft	5-6 ft	6-7 ft	4-5 ft	5-6 ft	6-7 ft	4-5 ft	5-6 ft	6-7 ft	0-4 ft	0-4 ft	4-5 ft	5-6 ft	6-7 ft	7-8 ft	8-9 ft	9-10 ft
Sample Type	SQS	CSL	N	N	N	N	N	N	N	N	N	N	FR	N	N	N	N	N	N
Conventionals (%)																			
Total Organic Carbon	--	--	3.35	5.31	5.65	1.31	0.638	0.394	1.74	4.55	1.92	1.78	1.57	1.70	3.47	4.05	2.52	3.86	5.91
Total solids	--	--	49.9	42.9	38.2	82.4	85.8	82.5	75.9	65.1	76.7	77	75.2	68.6	65.8	62.7	64.6	45.9	38.9
Grain Size (%)																			
Gravel	--	--	0.4 J	1.7 J	2.4 J	5 J	9.6 J	17.9 J	10.4 J	7.4 J	25.2 J	12.2 J	17.6 J	10.9 J	3.2 J	2 J	0.4 J	0.8 J	1.1 J
Sand	--	--	51.3	46.6	37.1	88.1	85	76.9	74.6	48.3	44.3	74.1	67.2	51.9	43.5	34.3	23.1	21	32.3
Silt	--	--	29.9	39.5	42.5	4.9	2.5	2.4	8.6	30.1	23.2	8.4	7.4	26.4	32.5	40.4	46.8	51.9	45.8
Clay	--	--	15.9 J	14 J	14.6 J	3.1 J	1.2 J	1.2 J	2 J	5.4 J	5.6 J	6.5 J	3.1 J	9.9 J	14.7 J	17.8 J	22.6 J	19 J	13.1 J
Fines	--	--	45.9	53.5	57.1	8	3.7	3.6	10.6	35.5	28.8	14.9	10.5	36.3	47.2	58.2	69.5	70.8	58.9
Metals (mg/kg)																			
Aluminum	--	--	12585	12051	12120	9041	8590	7564	9051	11060	13690	8286	9468	13324	13511	14051	17647	12941	17686
Antimony	--	--	15 UJ	17.5 UJ	19.6 UJ	9.1 UJ	8.74 UJ	9.09 UJ	9.88 UJ	11.5 UJ	9.77 UJ	9.74 UJ	9.96 UJ	10.9 UJ	5.17 J	7.02 J	4.18 J	16.3 UJ	19.3 UJ
Arsenic	57	93	7.41 J	9.79 J	18.8 J	3.4 J	14.6 UJ	15.2 UJ	3.43 J	5.68 J	5.22 J	3.51 J	3.59 J	4.66 J	6.99 J	7.81 J	6.35 J	8.28 J	17.7 J
Beryllium	--	--	0.2 J	0.198 J	0.215 J	0.133 J	0.128 J	0.115 J	0.158 J	0.215 J	0.196 J	0.143 J	0.146 J	0.219 J	0.213 J	0.223 J	0.263 J	0.211 J	0.257 J
Cadmium	5.1	6.7	6.87 * #	2.42	0.942 J	1.95	1.11	0.788 J	0.343 J	1.33	1.15	2.26	1.64	0.7 J	6.31 *	5.3 *	2.83	0.915 J	5.99 *
Chromium	260	270	49.5	43.8	42.1	36.3	26.1	33	25	41.8	35.3	52.7	74.5	36	69	65.4	58.2	41.8	91
Copper	390	530	90 J	89.5 J	130 J	63.6 J	49.1 J	43.3 J	26.7 J	64.7 J	78 J	131 J	242 J	52.5 J	669 J * #	198 J	82.4 J	44.4 J	156 J
Iron	--	--	20240	19184	21335	16262	15152	13576	13702	18894	20339	15065	16622	19971	23860	25040	28019	19412	28535
Lead	450	530	196	141	204	226	177	97	55.5	175	125	196	199	96.8	667 * #	515 *	175	151	378
Manganese	--	--	255	228	245	176	155	160	179	184	224	169	190	255	295	300	328	217	319
Mercury	0.41	0.59	1.49 J * #	1.19 J * #	5.03 J * #	0.742 J * #	0.467 J *	0.295 J	0.116 J	1 J * #	0.768 J * #	0.796 J * #	1.65 J * #	1.09 J * #	5.23 J * #	24.6 J * #	2.48 J * #	0.702 J * #	3.7 J * #
Nickel	--	--	51.7	50.6	58.6	41.5	29.1	34.1	29.2	44.5	40.4	43.9	106	40.2	71.3	63.2	58.8	46.2	68.9
Selenium	--	--	25.1 U	29.1 U	32.7 U	15.2 U	14.6 U	15.2 U	16.5 U	19.2 U	16.3 U	16.2 U	16.6 U	18.2 U	19 U	19.9 U	19.3 U	27.2 U	32.1 U
Silver	6.1	6.1	9.26 J * #	2.33 J	2.02 J	5.98 J	3.22 J	2.41 J	0.843 J	11.7 J * #	5.76 J	6.53 J * #	5.17 J	3.18 J	16.1 J * #	24.2 J * #	6.92 J * #	3.2 J	26.7 J * #
Thallium	--	--	100 U	117 U	131 U	60.7 U	58.3 U	60.6 U	65.9 U	76.8 U	65.1 U	64.9 U	66.4 U	72.9 U	76 U	79.6 U	77.4 U	109 U	129 U
Zinc	410	960	325	303	164	140	111	96	85.1	194	138	195	181	130	663 *	491 *	226	329	409
PCBs (µg/kg)																			
Aroclor 1016	--	--	232 U	240 U	283 U	299 U	148 U	119 U	170 U	926 U	601 U	368 U	395 U	348 U	1460 U	1882 U	579 U	146 U	815 U
Aroclor 1221	--	--	100 U	117 U	131 U	60.7 U	58.3 U	60.6 U	65.9 U	76.8 U	65.2 U	64.9 U	66.5 U	72.9 U	76 U	79.7 U	77.4 U	109 U	129 U
Aroclor 1232	--	--	549 U	592 U	618 U	657 U	336 U	272 U	460 U	1644 U	1356 U	823 U	918 U	774 U	3176 U	4163 U	1252 U	344 U	1871 U
Aroclor 1242	--	--	505 U	506 U	631 U	640 U	420 U	278 U	386 U	1659 U	936 U	870 U	965 U	622 U	2371 U	2982 U	1200 U	379 U	1370 U
Aroclor 1248	--	--	185 J	173 J	193 J	234 J	181 J	104 J	123 J	624 J	347 J	327 J	354 J	227 J	1226 J	1523 J	475 J	94.3 J	584 J
Aroclor 1254	--	--	371	219	184	303	258	156	105	641	407	588	640	313	2082	2648	751	163	982
Aroclor 1260	--	--	198	104	125	123	79.4	63.5	39.4	286	233	190	223	125	676	1169	477	253	362
Total PCBs (SMS)	130	1000	754 *	496 *	502 *	660 *	518 *	324 *	267 *	1551 * #	987 *	1105 * #	1217 * #	665 *	3984 * #	5340 * #	1703 * #	510 *	1928 * #
Pesticides (µg/kg)																			
4,4'-DDD	--	--	16.9	28.4	7.3	29	15.3	11.3	67.5	104	40.3	53.8	47.3	32.9	113 J	195 J	70.6	10.7	184
4,4'-DDE	--	--	4.01 U	4.66 U	5.24 U	9.95	2.48	2.3 J	3.31	16.3	9.24	9.61	9.15	5.7	81 J	116 J	22.4	4.14 J	22
4,4'-DDT	--	--	6.29 J	3.03 J	3.4 J	6.54 J	4.46 J	2.79 J	4.27 J	14.9 J	8.53 J	13 J	12.2 J	5.35 J	31.3 J	45 J	19.3 J	3.7 J	15.5 J
Total DDT (SMS)	--	--	23.2	31.4	10.7	45.5	22.2	16.4	75.1	135	58.1	76.4	68.6	44	225	356	112	18.5	222
Aldrin	--	--	4.01 U	4.66 U	5.24 U	2.43 U	2.33 U	2.42 U	2.64 U	3.07 U	2.61 U	2.6 U	2.66 U	2.92 U	3.04 U	3.19 U	3.1 U	4.36 U	5.14 U
alpha-BHC	--	--	2 U	2.33 U	10.2 J	1.21 U	1.17 U	1.21 U	1.32 U	1.54 U	1.3 U	1.3 U	1.33 U	1.46 U	1.52 U	1.59 U	1.55 U	7.36 J	2.57 U
beta-BHC	--	--	2 U	2.33 U	2.62 U	1.21 U	1.17 U	1.21 U	1.32 U	1.54 U	1.3 U	1.3 U	1.33 U	1.46 U	1.52 U	1.59 U	1.55 U	2.18 U	2.57 U
delta-BHC	--	--	2 U	2.33 U	2.62 U	1.21 U	1.17 U	1.21 U	1.32 U	1.54 U	1.3 U	1.3 U	1.33 U	1.46 U	1.52 U	1.59 U	1.55 U	2.18 U	2.57 U
gamma-BHC (Lindane)	--	--	2 U	2.33 U	2.62 U	1.21 U	1.17 U	1.21 U	1.32 U	1.54 U	1.3 U	1.3 U	1.33 U	1.46 U	1.52 U	1.59 U	1.55 U	2.18 U	2.57 U
alpha-Chlordane	--	--	2 U	2.33 U	2.62 U	3.26	2.24	2.4	2.48	4.99	2.57	6.91	6.57	2.06	8.84 J	17.5 J	6.28	2.18 U	7.76
gamma-Chlordane	--	--	2 U	2.33 U	2.62 U	1.21 U	1.17 U	1.21 U	1.32 U	1.54 U	1.3 U	1.3 U	1.33 U	1.46 U	1.52 U	1.59 U	1.55 U	2.18 U	2.57 U
Total chlordane (SMS)	--	--	2 U	2.33 U	2.62 U	3.26	2.24	2.4	2.48	4.99	2.57	6.91	6.57	2.06	8.84	17.5	6.28	2.18 U	7.76
Dieldrin	--	--	4.01 U	4.66 U	5.24 U	2.43 U	2.33 U	2.42 U	2.64 U	3.07 U	2.61 U	2.6 U	2.66 U	2.92 U	3.04 U	3.19 U	3.1 U	4.36 U	5.14 U
Endosulfan I	--	--	4.01 U	4.66 U	5.24 U	2.43 U	2.33 U	2.42 U	2.64 U	3.07 U	2.61 U	2.6 U	2.66 U	2.92 U	3.04 U	3.19 U	3.1 U	4.36 U	5.14 U
Endosulfan II	--	--	4.01 U	4.66 U	5.24 U	2.43 U	2.33 U	2.42 U	2.64 U	3.07 U	2.61 U	2.6 U	2.66 U	2.92 U	3.04 U	3.19 U	3.1 U	4.36 U	5.14 U
Endosulfan Sulfate	--	--	4.01 U	4.66 U	5.24 U	2.43 U	2.33 U	2.42 U	2.64 U	3.07 U	2.61 U	2.6 U	2.66 U	2.92 U	3.04 U	3.19 U	3.1 U	4.36 U	5.14 U
Endrin	--	--	4.01 U	4.66 U	5.24 U	2.43 U	2.33 U	2.42 U	2.64 U	3.07 U	5.79	7.34	2.66 U	3.66	3.04 U	3.19 U	3.1 U	6.34	10.4
Endrin aldehyde	--	--	8.02 UJ	9.32 UJ	10.5 UJ	4.85 UJ	4.66 UJ	4.85 UJ	5.27 UJ	6.14 UJ	5.22 UJ	5.19 UJ	5.32 UJ	5.83 UJ	6.08 UJ	6.38 UJ	6.19 UJ	8.71 UJ	10.3 UJ
Heptachlor	--	--	2 U	2.33 U	2.62 U	1.21 U	1.17 U	1.21 U	1.32 U	1.54 U	1.3 U	1.3 U	1.33 U	1.46 U	1.52 U	1.59 U	1.55 U	2.18 U	2.57 U
Heptachlor Epoxide	--	--	2 U	2.33 U	2.62 U	1.21 U	1.17 U	1.21 U	1.32 U	1.54 U	1.3 U	1.3 U	1.33 U	1.46 U	1.52 U	1.59 U	1.55 U	2.18 U	2.57 U
Methoxychlor	--	--	20 UJ	23.3 UJ	26.2 UJ	12.1 UJ	11.7 U	12.1 U	13.2 U	15.4 U	13 U	13 U	13.3 U	14.6 U	15.2 U	15.9 U	15.5 U	21.8 U	25.7 U
Toxaphene	--	--	40.1 U	46.6 U	52.4 U	24.3 U	23.3 U	24.2 U	26.4 U	30.7 U	26.1 U	26 U	26.6 U	29.2 U	30.4 U	31.9 U	31 U	43.6 U	51.4 U
LPAH (µg/kg)																			

Table 3
Sediment Core Analytical Results – Dry Weight Values

Location ID			DW101	DW101	DW101	DW102	DW102	DW102	DW103	DW103	DW103	DW104	DW104	DW105	DW105	DW105	DW105	DW105	DW105
Sample ID			DW101-CDC	DW101-CDD	DW101-CDE	DW102-CDC	DW102-CDD	DW102-CDE	DW103-CDC	DW103-CDD	DW103-CDE	DW104-CCB	DW104-CSB	DW105-CDC	DW105-CDD	DW105-CDE	DW105-CDF	DW105-CDG	DW105-CDH
Sample Date			7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005
Depth Interval	DW-AET	DW-AET	4-5 ft	5-6 ft	6-7 ft	4-5 ft	5-6 ft	6-7 ft	4-5 ft	5-6 ft	6-7 ft	0-4 ft	0-4 ft	4-5 ft	5-6 ft	6-7 ft	7-8 ft	8-9 ft	9-10 ft
Sample Type	SQS	CSL	N	N	N	N	N	N	N	N	N	N	FR	N	N	N	N	N	N
Naphthalene	2100	2400	1020	347	272	94.5	62.1 U	64.6 U	55.3 J	4593 * #	2034	881	648	242	4605 * #	5502 * #	2957 * #	495	3316 * #
Acenaphthylene	1300	1300	107 U	124 U	59.4	64.7 U	62.1 U	64.6 U	70.2 U	81.9 U	69.5 U	42.9 J	70.9 U	77.7 U	81 U	85 U	82.5 U	116 U	137 U
Acenaphthene	500	730	90.2 J	282	227	1047 * #	206	179	63.2 J	2058 * #	686 *	206	213	77.7 U	1657 * #	1470 * #	82.5 U	69.7 J	137 U
Fluorene	540	1000	197	385	236	1211 * #	190	130	80	2181 * #	760 *	303	330	156	2128 * #	2536 * #	354	136	342
Phenanthrene	1500	5400	613	1592 *	937	510	217	240	423	5929 * #	1982 *	1066	940	500	5182 *	8070 * #	864	370	954
Anthracene	960	4400	110	266	189	1917 *	337	270	134	1152 *	514	551	1383 *	131	938	1324 *	136	82.8 J	242
2-Methylnaphthalene	670	1400	1080 *	266	190	75.4	62.1 U	64.6 U	35.6 J	1935 * #	894 *	830 *	594	325	5912 * #	7081 * #	3839 * #	586	2699 * #
Total LPAH (SMS)	5200	13000	2030	2872	1920	4780	950	819	756	15913 * #	5976 *	3050	3514	1029	14510 * #	18902 * #	4311	1154	4854
HPAH (µg/kg)																			
Fluoranthene	1700	2500	806	1366	1524	5752 * #	1515	1194	775	4455 * #	1708 *	4117 * #	4947 * #	746	2979 * #	4577 * #	712	468	1139
Pyrene	2600	3300	768	1112	1387	3835 * #	1094	939	934	3963 * #	1617	4156 * #	4082 * #	666	2295	3333 * #	681	499	1093
Benzo(a)anthracene	1300	1600	299 J	221 J	534 J	1007 J	312 J	278 J	303 J	1527 J *	495 J	1039 J	1035 J	262 J	843 J	710 J	316 J	197 J	519 J
Chrysene	1400	2800	363	247	437	933	308	288	344	1441 *	528	1138	1178	313	745	781	353	233	555
Benzo(b)fluoranthene	--	--	228 J	135 J	395 J	534 J	177 J	198 J	273 J	1066 J	321 J	565 J	710 J	213 J	383 J	373 J	180 J	141 J	404 J
Benzo(k)fluoranthene	--	--	208 J	132 J	382 J	505 J	167 J	183 J	260 J	1092 J	327 J	706 J	680 J	235 J	331 J	341 J	197 J	157 J	398 J
Benzofluoranthenes (total)	3200	3600	436	267	777	1039	344	381	533	2158	648	1271	1390	448	714	714	377	298	802
Benzo(a)pyrene	1600	3000	305 J	177 J	563 J	556 J	226 J	217 J	350 J	1479 J	441 J	743 J	747 J	312 J	307 J	380 J	268 J	229 J	532 J
Indeno(1,2,3-cd)pyrene	600	690	145 J	103 J	380 J	242 J	107 J	114 J	178 J	747 J * #	213 J	325 J	335 J	150 J	202 J	228 J	136 J	113 J	290 J
Dibenzo(a,h)anthracene	230	540	107 U	124 U	14 U	67.1	39.6 J	41.2 J	51.4 J	203	79.5	92.1	81.9	49.6 J	60.8 J	86.3	44.9 J	116 U	103 J
Benzo(g,h,i)perylene	670	720	174 J	121 J	474 J	262 J	113 J	127 J	213 J	836 J * #	243 J	358 J	347 J	179 J	242 J	212 J	161 J	132 J	298 J
Total HPAH (SMS)	12000	17000	3296	3614	6076	13693 *	4059	3579	3681	16809 *	5972	13239 *	14143 *	3126	8388	11021	3049	2169	5331
Chlorinated Hydrocarbons (µg/kg)																			
1,3-Dichlorobenzene	--	--	10.7 U	12.4 U	1.4 U	6.47 U	6.21 U	6.46 U	7.02 U	8.19 U	6.95 U	6.92 U	7.09 U	7.77 U	8.1 U	8.5 U	8.25 U	11.6 U	13.7 U
1,4-Dichlorobenzene	110	120	90	64.3	45.8	72.6	41.7	32	7.02 U	34.4	26.7	323 * #	266 * #	51.6	828 * #	781 * #	203 * #	36.6	398 * #
1,2-Dichlorobenzene	35	50	10.7 U	12.4 U	1.4 U	6.47 U	6.21 U	6.46 U	7.02 U	8.19 U	6.95 U	6.92 U	7.09 U	7.77 U	8.1 U	193 * #	62.8 * #	11.6 U	71.2 * #
1,2,4-Trichlorobenzene	31	51	10.7 U	12.4 U	1.4 U	6.47 U	6.21 U	6.46 U	7.02 U	8.19 U	6.95 U	6.92 U	7.09 U	7.77 U	8.1 U	8.5 U	8.25 U	11.6 U	13.7 U
Hexachlorobenzene	22	70	21.4 U	24.9 U	2.8 U	13 U	12.5 U	13 U	14.1 U	16.4 U	14 U	13.9 U	14.2 U	15.6 U	16.3 U	17.1 U	16.6 U	23.3 U	27.5 U
Phthalates (µg/kg)																			
Dimethylphthalate	71	160	214 U	249 U	28 U	130 U	125 U	130 U	141 U	164 U	140 U	139 U	142 U	156 U	163 U	171 U	166 U	233 U	275 U
Diethylphthalate	200	1200	214 U	249 U	28 U	130 U	125 U	130 U	141 U	164 U	140 U	139 U	142 U	156 U	163 U	171 U	166 U	233 U	275 U
Di-n-butylphthalate	1400	5100	214 U	249 U	28 U	121 J	125 U	130 U	141 U	164 U	87.4 J	156	94.4 J	156 U	179	183	92.9 J	233 U	185 J
Butylbenzylphthalate	63	900	214 U	249 U	372 *	233 *	88.6 J *	73.9 J *	87 J *	171 *	196 *	432 *	165 *	156 U	530 *	171 U	166 U	233 U	195 J *
bis(2-Ethylhexyl)phthalate	1300	1900	4008 J * #	8765 J * #	2024 J * #	2609 J * #	900 J	1173 J	401 J	3886 J * #	3781 J * #	13636 J * #	3617 J * #	1851 J *	13602 J * #	15391 J * #	7709 J * #	2636 J * #	6632 J * #
Di-n-octylphthalate	6200	--	214 U	249 U	28 U	130 U	125 U	130 U	141 U	164 U	140 U	139 U	142 U	156 U	163 U	171 U	166 U	233 U	275 U
Phenols (µg/kg)																			
Phenol	420	1200	214 U	249 U	28 U	130 U	125 U	130 U	141 U	164 U	140 U	139 U	142 U	156 U	163 U	171 U	166 U	233 U	275 U
2-Methylphenol	63	72	214 U	249 U	28 U	130 U	125 U	130 U	141 U	164 U	140 U	139 U	142 U	156 U	163 U	171 U	166 U	233 U	275 U
4-Methylphenol	670	1800	214 U	249 U	28 U	130 U	125 U	130 U	141 U	164 U	140 U	139 U	142 U	156 U	163 U	171 U	166 U	233 U	275 U
2,4-Dimethylphenol	29	72	107 U	124 U	14 U	64.7 U	62.1 U	64.6 U	70.2 U	81.9 U	69.5 U	69.2 U	70.9 U	77.7 U	81 U	85 U	82.5 U	116 U	137 U
Pentachlorophenol	360	690	535 U	622 U	69.9 U	324 U	311 U	324 U	352 U	410 U	348 U	347 U	355 U	389 U	406 U	426 U	413 U	582 U	686 U
Misc Extractables (µg/kg)																			
Benzyl alcohol	57	73	214 U	249 U	28 U	130 U	125 U	130 U	141 U	164 U	140 U	139 U	142 U	156 U	163 U	171 U	166 U	233 U	275 U
Benzoic acid	650	650	535 U	622 U	69.9 U	324 U	311 U	324 U	352 U	410 U	348 U	347 U	355 U	389 U	406 U	426 U	413 U	582 U	686 U
Dibenzofuran	540	700	107 U	157	130	136	50.1 J	32.7 J	42.2 J	1307 * #	386	127	93.9	70 J	1350 * #	1340 * #	82.5 U	116 U	137 U
Hexachlorobutadiene	11	120	53.5 U	62.2 U	6.99 U	32.4 U	31.1 U	32.4 U	35.2 U	41 U	34.8 U	34.7 U	35.5 U	38.9 U	40.6 U	42.6 U	41.3 U	58.2 U	68.6 U
n-Nitrosodiphenylamine	28	40	214 U	249 U	28 U	130 U	125 U	130 U	141 U	164 U	140 U	139 U	142 U	156 U	163 U	171 U	166 U	233 U	275 U

Notes:

Bold: Detected.

* Exceeds SQS-AET dry wt criteria.

Exceeds CSL-AET dry wt criteria.

Italics: TOC <0.5% or >3%.

Shaded: Exceeds TOC applicable criteria.

Table 4
Sediment Core Analytical Results – SMS Screening

Location ID			DW101	DW101	DW101	DW102	DW102	DW102	DW103	DW103	DW103	DW104	DW104	DW105	DW105	DW105	DW105	DW105	DW105
Sample ID			DW101-CDC	DW101-CDD	DW101-CDE	DW102-CDC	DW102-CDD	DW102-CDE	DW103-CDC	DW103-CDD	DW103-CDE	DW104-CCB	DW104-CSB	DW105-CDC	DW105-CDD	DW105-CDE	DW105-CDF	DW105-CDG	DW105-CDH
Sample Date			7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005
Depth Interval	SMS	SMS	4-5 ft	5-6 ft	6-7 ft	4-5 ft	5-6 ft	6-7 ft	4-5 ft	5-6 ft	6-7 ft	0-4 ft	0-4 ft	4-5 ft	5-6 ft	6-7 ft	7-8 ft	8-9 ft	9-10 ft
Sample Type	SQS	CSL	N	N	N	N	N	N	N	N	N	N	FR	N	N	N	N	N	N
Conventionals (%)																			
Total Organic Carbon	--	--	3.35	5.31	5.65	1.31	0.638	0.394	1.74	4.55	1.92	1.78	1.57	1.70	3.47	4.05	2.52	3.86	5.91
Total solids	--	--	49.9	42.9	38.2	82.4	85.8	82.5	75.9	65.1	76.7	77	75.2	68.6	65.8	62.7	64.6	45.9	38.9
Grain Size (%)																			
Gravel	--	--	0.4 J	1.7 J	2.4 J	5 J	9.6 J	17.9 J	10.4 J	7.4 J	25.2 J	12.2 J	17.6 J	10.9 J	3.2 J	2 J	0.4 J	0.8 J	1.1 J
Sand	--	--	51.3	46.6	37.1	88.1	85	76.9	74.6	48.3	44.3	74.1	67.2	51.9	43.5	34.3	23.1	21	32.3
Silt	--	--	29.9	39.5	42.5	4.9	2.5	2.4	8.6	30.1	23.2	8.4	7.4	26.4	32.5	40.4	46.8	51.9	45.8
Clay	--	--	15.9 J	14 J	14.6 J	3.1 J	1.2 J	1.2 J	2 J	5.4 J	5.6 J	6.5 J	3.1 J	9.9 J	14.7 J	17.8 J	22.6 J	19 J	13.1 J
Fines	--	--	45.9	53.5	57.1	8	3.7	3.6	10.6	35.5	28.8	14.9	10.5	36.3	47.2	58.2	69.5	70.8	58.9
Metals (mg/kg)																			
Aluminum	--	--	12585	12051	12120	9041	8590	7564	9051	11060	13690	8286	9468	13324	13511	14051	17647	12941	17686
Antimony	--	--	15 UJ	17.5 UJ	19.6 UJ	9.1 UJ	8.74 UJ	9.09 UJ	9.88 UJ	11.5 UJ	9.77 UJ	9.74 UJ	9.96 UJ	10.9 UJ	5.17 J	7.02 J	4.18 J	16.3 UJ	19.3 UJ
Arsenic	57	93	7.41 J	9.79 J	18.8 J	3.4 J	14.6 UJ	15.2 UJ	3.43 J	5.68 J	5.22 J	3.51 J	3.59 J	4.66 J	6.99 J	7.81 J	6.35 J	8.28 J	17.7 J
Beryllium	--	--	0.2 J	0.198 J	0.215 J	0.133 J	0.128 J	0.115 J	0.158 J	0.215 J	0.196 J	0.143 J	0.146 J	0.219 J	0.213 J	0.223 J	0.263 J	0.211 J	0.257 J
Cadmium	5.1	6.7	6.87 * #	2.42	0.942 J	1.95	1.11	0.788 J	0.343 J	1.33	1.15	2.26	1.64	0.7 J	6.31 *	5.3 *	2.83	0.915 J	5.99 *
Chromium	260	270	49.5	43.8	42.1	36.3	26.1	33	25	41.8	35.3	52.7	74.5	36	69	65.4	58.2	41.8	91
Copper	390	530	90 J	89.5 J	130 J	63.6 J	49.1 J	43.3 J	26.7 J	64.7 J	78 J	131 J	242 J	52.5 J	669 J * #	198 J	82.4 J	44.4 J	156 J
Iron	--	--	20240	19184	21335	16262	15152	13576	13702	18894	20339	15065	16622	19971	23860	25040	28019	19412	28535
Lead	450	530	196	141	204	226	177	97	55.5	175	125	196	199	96.8	667 * #	515 *	175	151	378
Manganese	--	--	255	228	245	176	155	160	179	184	224	169	190	255	295	300	328	217	319
Mercury	0.41	0.59	1.49 J * #	1.19 J * #	5.03 J * #	0.742 J * #	0.467 J *	0.295 J	0.116 J	1 J * #	0.768 J * #	0.796 J * #	1.65 J * #	1.09 J * #	5.23 J * #	24.6 J * #	2.48 J * #	0.702 J * #	3.7 J * #
Nickel	--	--	51.7	50.6	58.6	41.5	29.1	34.1	29.2	44.5	40.4	43.9	106	40.2	71.3	63.2	58.8	46.2	68.9
Selenium	--	--	25.1 U	29.1 U	32.7 U	15.2 U	14.6 U	15.2 U	16.5 U	19.2 U	16.3 U	16.2 U	16.6 U	18.2 U	19 U	19.9 U	19.3 U	27.2 U	32.1 U
Silver	6.1	6.1	9.26 J * #	2.33 J	2.02 J	5.98 J	3.22 J	2.41 J	0.843 J	11.7 J * #	5.76 J	6.53 J * #	5.17 J	3.18 J	16.1 J * #	24.2 J * #	6.92 J * #	3.2 J	26.7 J * #
Thallium	--	--	100 U	117 U	131 U	60.7 U	58.3 U	60.6 U	65.9 U	76.8 U	65.1 U	64.9 U	66.4 U	72.9 U	76 U	79.6 U	77.4 U	109 U	129 U
Zinc	410	960	325	303	164	140	111	96	85.1	194	138	195	181	130	663 *	491 *	226	329	409
PCBs (mg/kg-OC)																			
Total PCBs (SMS)	12	65	22.5 *	9.34	8.88	50.4 *	81.2 * #	82.2 * #	15.3 *	34.1 *	51.4 *	62.1 *	77.5 * #	39.1 *	115 * #	132 * #	67.6 * #	13.2 *	32.6 *
LPAH (mg/kg-OC)																			
Naphthalene	99	170	30.4	6.53	4.81	7.21	9.73 U	16.4 U	3.18 J	101 *	106 *	49.5	41.3	14.2	133 *	136 *	117 *	12.8	56.1
Acenaphthylene	66	66	3.19 U	2.34 U	1.05	4.94 U	9.73 U	16.4 U	4.03 U	1.8 U	3.62 U	2.41 J	4.52 U	4.57 U	2.33 U	2.1 U	3.27 U	3.01 U	2.32 U
Acenaphthene	16	57	2.69 J	5.31	4.02	79.9 * #	32.3 *	45.4 *	3.63 J	45.2 *	35.7 *	11.6	13.6	4.57 U	47.8 *	36.3 *	3.27 U	1.81 J	2.32 U
Fluorene	23	79	5.88	7.25	4.18	92.4 * #	29.8 *	33 *	4.6	47.9 *	39.6 *	17	21	9.18	61.3 *	62.6 *	14	3.52	5.79
Phenanthrene	100	480	18.3	30	16.6	38.9	34	60.9	24.3	130 *	103 *	59.9	59.9	29.4	149 *	199 *	34.3	9.59	16.1
Anthracene	220	1200	3.28	5.01	3.35	146	52.8	68.5	7.7	25.3	26.8	31	88.1	7.71	27	32.7	5.4	2.15 J	4.09
2-Methylnaphthalene	38	64	32.2	5.01	3.36	5.76	9.73 U	16.4 U	2.05 J	42.5 *	46.6 *	46.6 *	37.8	19.1	170 * #	175 * #	152 * #	15.2	45.7 *
Total LPAH (SMS)	370	780	60.6	54.1	34	365	149	208	43.4	350	311	171	224	60.5	418 *	467 *	171	29.9	82.1
HPAH (mg/kg-OC)																			
Fluoranthene	160	1200	24.1	25.7	27	439 *	237 *	303 *	44.5	97.9	89	231 *	315 *	43.9	85.9	113	28.3	12.1	19.3
Pyrene	1000	1400	22.9	20.9	24.5	293	171	238	53.7	87.1	84.2	233	260	39.2	66.1	82.3	27	12.9	18.5
Benzo(a)anthracene	110	270	8.93 J	4.16 J	9.45 J	76.9 J	48.9 J	70.6 J	17.4 J	33.6 J	25.8 J	58.4 J	65.9 J	15.4 J	24.3 J	17.5 J	12.5 J	5.1 J	8.78 J
Chrysene	110	460	10.8	4.65	7.73	71.2	48.3	73.1	19.8	31.7	27.5	63.9	75	18.4	21.5	19.3	14	6.04	9.39
Benzo(a)pyrene	99	210	9.1 J	3.33 J	9.96 J	42.4 J	35.4 J	55.1 J	20.1 J	32.5 J	23 J	41.7 J	47.6 J	18.4 J	8.85 J	9.38 J	10.6 J	5.93 J	9 J
Indeno(1,2,3-cd)pyrene	34	88	4.33 J	1.94 J	6.73 J	18.5 J	16.8 J	28.9 J	10.2 J	16.4 J	11.1 J	18.3 J	21.3 J	8.82 J	5.82 J	5.63 J	5.4 J	2.93 J	4.91 J
Dibenzo(a,h)anthracene	12	33	3.19 U	2.34 U	0.248 U	5.12	6.21 J	10.5 J	2.95 J	4.46	4.14	5.17	5.22	2.92 J	1.75 J	2.13	1.78 J	3.01 U	1.74 J
Benzo(g,h,i)perylene	31	78	5.19 J	2.28 J	8.39 J	20 J	17.7 J	32.2 J *	12.2 J	18.4 J	12.7 J	20.1 J	22.1 J	10.5 J	6.97 J	5.23 J	6.39 J	3.42 J	5.04 J
Total HPAH (SMS)	960	5300	98.4	68.1	108	1045 *	636	908	212	369	311	744	901	184	242	272	121	56.2	90.2
Chlorinated Hydrocarbons (mg/kg-OC)																			
1,4-Dichlorobenzene	3.1	9	2.69	1.21	0.811	5.54 *	6.54 *	8.12 *	0.403 U	0.756	1.39	18.1 * #	16.9 * #	3.04	23.9 * #	19.3 * #	8.06 *	0.948	6.73 *
1,2-Dichlorobenzene	2.3	2.3	0.319 U	0.234 U	0.0248 U	0.494 U	0.973 U	1.64 U	0.403 U	0.18 U	0.362 U	0.389 U	0.452 U	0.457 U	0.233 U	4.77 * #	2.49 * #	0.301 U	1.2
1,2,4-Trichlorobenzene	0.81	1.8	0.319 U	0.234 U	0.0248 U	0.494 U	0.973 U	1.64 U	0.403 U	0.18 U	0.362 U	0.389 U	0.452 U	0.457 U	0.233 U	0.21 U	0.327 U	0.301 U	0.232 U
Hexachlorobenzene	0.38	2.3	0.639 U	0.469 U	0.0496 U	0.992 U	1.96 U	3.3 U	0.81 U	0.36 U	0.729 U	0.781 U	0.904 U	0.918 U	0.47 U	0.422 U	0.659 U	0.604 U	0.465 U

Table 4
Sediment Core Analytical Results – SMS Screening

Location ID			DW101	DW101	DW101	DW102	DW102	DW102	DW103	DW103	DW103	DW104	DW104	DW105	DW105	DW105	DW105	DW105	DW105
Sample ID			DW101-CDC	DW101-CDD	DW101-CDE	DW102-CDC	DW102-CDD	DW102-CDE	DW103-CDC	DW103-CDD	DW103-CDE	DW104-CCB	DW104-CSB	DW105-CDC	DW105-CDD	DW105-CDE	DW105-CDF	DW105-CDG	DW105-CDH
Sample Date			7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005	7/21/2005
Depth Interval	SMS	SMS	4-5 ft	5-6 ft	6-7 ft	4-5 ft	5-6 ft	6-7 ft	4-5 ft	5-6 ft	6-7 ft	0-4 ft	0-4 ft	4-5 ft	5-6 ft	6-7 ft	7-8 ft	8-9 ft	9-10 ft
Sample Type	SQS	CSL	N	N	N	N	N	N	N	N	N	N	FR	N	N	N	N	N	N
Phthalates (mg/kg-OC)																			
Dimethylphthalate	53	53	*6.39 U*	*4.69 U*	*0.496 U*	9.92 U	19.6 U	*33 U*	8.1 U	*3.6 U*	7.29 U	7.81 U	9.04 U	9.18 U	*4.7 U*	*4.22 U*	6.59 U	*6.04 U*	*4.65 U*
Diethylphthalate	61	110	*6.39 U*	*4.69 U*	*0.496 U*	9.92 U	19.6 U	*33 U*	8.1 U	*3.6 U*	7.29 U	7.81 U	9.04 U	9.18 U	*4.7 U*	*4.22 U*	6.59 U	*6.04 U*	*4.65 U*
Di-n-butylphthalate	220	1700	*6.39 U*	*4.69 U*	*0.496 U*	**9.24 J**	19.6 U	*33 U*	8.1 U	*3.6 U*	**4.55 J**	**8.76**	**6.01 J**	9.18 U	***5.16***	***4.52***	**3.69 J**	*6.04 U*	***3.13 J***
Butylbenzylphthalate	4.9	64	*6.39 U*	*4.69 U*	***6.58 ****	**17.8 ***	**13.9 J ***	***18.8 J ****	**5 J ***	***3.76***	**10.2 ***	**24.3 ***	**10.5 ***	9.18 U	***15.3 ****	*4.22 U*	6.59 U	*6.04 U*	***3.3 J***
bis(2-Ethylhexyl)phthalate	47	78	***120 J * #***	***165 J * #***	***35.8 J***	**199 J * #**	**141 J * #**	***298 J * #***	**23 J**	***85.4 J * #***	**197 J * #**	**766 J * #**	**230 J * #**	**109 J * #**	***392 J * #***	***380 J * #***	**306 J * #**	***68.3 J ****	***112 J * #***
Di-n-octylphthalate	58	4500	*6.39 U*	*4.69 U*	*0.496 U*	9.92 U	19.6 U	*33 U*	8.1 U	*3.6 U*	7.29 U	7.81 U	9.04 U	9.18 U	*4.7 U*	*4.22 U*	6.59 U	*6.04 U*	*4.65 U*
Misc Extractables (mg/kg-OC)																			
Dibenzofuran	15	58	*3.19 U*	***2.96***	***2.3***	**10.4**	**7.85 J**	***8.3 J***	**2.43 J**	***28.7 ****	**20.1 ***	**7.13**	**5.98**	**4.12 J**	***38.9 ****	***33.1 ****	3.27 U	*3.01 U*	*2.32 U*
Hexachlorobutadiene	3.9	6.2	*1.6 U*	*1.17 U*	*0.124 U*	2.47 U	4.87 U	*8.22 U*	2.02 U	*0.901 U*	1.81 U	1.95 U	2.26 U	2.29 U	*1.17 U*	*1.05 U*	1.64 U	*1.51 U*	*1.16 U*
n-Nitrosodiphenylamine	11	11	*6.39 U*	*4.69 U*	*0.496 U*	9.92 U	19.6 U	*33 U*	8.1 U	*3.6 U*	7.29 U	7.81 U	9.04 U	9.18 U	*4.7 U*	*4.22 U*	6.59 U	*6.04 U*	*4.65 U*
Phenols (µg/kg)																			
Phenol	420	1200	*214 U*	*249 U*	*28 U*	130 U	125 U	*130 U*	141 U	*164 U*	140 U	139 U	142 U	156 U	*163 U*	*171 U*	166 U	*233 U*	*275 U*
2-Methylphenol	63	72	*214 U*	*249 U*	*28 U*	130 U	125 U	*130 U*	141 U	*164 U*	140 U	139 U	142 U	156 U	*163 U*	*171 U*	166 U	*233 U*	*275 U*
4-Methylphenol	670	1800	*214 U*	*249 U*	*28 U*	130 U	125 U	*130 U*	141 U	*164 U*	140 U	139 U	142 U	156 U	*163 U*	*171 U*	166 U	*233 U*	*275 U*
2,4-Dimethylphenol	29	72	*107 U*	*124 U*	*14 U*	64.7 U	62.1 U	*64.6 U*	70.2 U	*81.9 U*	69.5 U	69.2 U	70.9 U	77.7 U	*81 U*	*85 U*	82.5 U	*116 U*	*137 U*
Pentachlorophenol	360	690	*535 U*	*622 U*	*69.9 U*	324 U	311 U	*324 U*	352 U	*410 U*	348 U	347 U	355 U	389 U	*406 U*	*426 U*	413 U	*582 U*	*686 U*
Misc Extractables (µg/kg)																			
Benzyl alcohol	57	73	*214 U*	*249 U*	*28 U*	130 U	125 U	*130 U*	141 U	*164 U*	140 U	139 U	142 U	156 U	*163 U*	*171 U*	166 U	*233 U*	*275 U*
Benzoic acid	650	650	*535 U*	*622 U*	*69.9 U*	324 U	311 U	*324 U*	352 U	*410 U*	348 U	347 U	355 U	389 U	*406 U*	*426 U*	413 U	*582 U*	*686 U*
Dibenzofuran	540	700	*107 U*	***157***	***130***	**136**	**50.1 J**	***32.7 J***	**42.2 J**	***1307 * #***	**386**	**127**	**93.9**	**70 J**	***1350 * #***	***1340 * #***	82.5 U	*116 U*	*137 U*
Hexachlorobutadiene	11	120	*53.5 U*	*62.2 U*	*6.99 U*	32.4 U	31.1 U	*32.4 U*	35.2 U	*41 U*	34.8 U	34.7 U	35.5 U	38.9 U	*40.6 U*	*42.6 U*	41.3 U	*58.2 U*	*68.6 U*
n-Nitrosodiphenylamine	28	40	*214 U*	*249 U*	*28 U*	130 U	125 U	*130 U*	141 U	*164 U*	140 U	139 U	142 U	156 U	*163 U*	*171 U*	166 U	*233 U*	*275 U*

Notes:
Bold: Detected.
* Exceeds SQS-AET dry wt criteria.
# Exceeds CSL-AET dry wt criteria.
Italics: TOC <0.5% or >3%.
Shaded: Exceeds TOC applicable criteria.

FIGURES

Riprap

Sand Veneer

Boulders and Cobbles

Sediment Cap

Approximate Dredge Boundary

Notes:
1. Figure prepared from drawing provided by Black & Veatch Corporation entitled "Habitat Restoration Plan", dated November 1999.
2. Horizontal datum: SP NAD 83 WA N

0 150
Scale in Feet

Jul 13, 2005 10:50am cdavidson K:\Jobs\020067-KING_CO_SED_MANAG\02006701\02006701-23.dwg FIG 1

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 1
Site Map
Denny Way CSO

Station	Northing	Easting
DW101	229367.78	1263518.78
DW102	229284.71	1263688.25
DW103	229351.74	1263684.67
DW105	229326.80	1263612.08

Washington State Plane Coordinates North Zone
NAD 83/91

DW101 Sample Location and Number
Riprap
Sand Veneer
Boulders and Cobbles
Sediment Cap
Approximate Dredge Boundary

Notes:
1. Figure prepared from drawing provided by Black & Veatch Corporation entitled "Habitat Restoration Plan", dated November 1999.
2. Horizontal datum: SP NAD 83 WA N

0 150
Scale in Feet

Jul 19, 2005 2:59pm cdavidson K:\Jobs\020067-KING_CO_SED_MANAG\02006701\02006701-23.dwg FIG 2

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 2
Sample Locations
Denny Way CSO