Dakota Creek Industries
Shipyard Facility

Sediment Sampling Data Report

Appendix E
Sampling and Analysis Data Report

FINAL

SAMPLING AND ANALYSIS DATA REPORT

SUPPLEMENTAL SEDIMENT CHARACTERIZATION
DAKOTA CREEK INDUSTRIES SHIPYARD FACILITY/PIER 1 REDEVELOPMENT AREA
ANACORTES, WASHINGTON

Prepared for

Seattle District

U.S. Army Corps of Engineers

4735 E. Marginal Way South

Seattle, Washington 98124

On Behalf of

Kimberly Clark Corporation

Port of Anacortes

Prepared by

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October 2004

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1 INTRODUCTION

Anchor Environmental, L.L.C. (Anchor) was retained by Kimberly Clark Corporation (K-C) to conduct a supplemental evaluation of subsurface materials at the Dakota Creek Industries (DCI)/Pier 1 areas in Anacortes, Washington. This work was conducted in response to a request from the Dredged Material Management Office (DMMO) for confirmatory characterization of the proposed dredge material from the DCI Shipyard Facility and Port of Anacortes Pier 1 redevelopment project sites (Stirling 2003).

Previous DMMO-approved dredge material characterization studies were completed at each of the subject sites, and open water suitability determinations issued based on the study results. However, further confirmatory characterization was required by the DMMO to address potential concerns associated with historical outfall discharges to the area raised after issuance of the suitability determinations. Specifically, the DMMO was concerned about the potential for historical outfall discharges from the former Scott Paper Mill to have released polychlorinated dibenzodioxins and polychlorinated dibenzofurans (dioxins) to the proposed dredge prism sediments.

The Sampling and Analysis Data Report will be used by the DMMO to determine if dioxin is a concern for unconfined, open water disposal of proposed dredged material from the Pier 1 and DCI sites. This report specifically addresses collection and analysis of additional core samples from the dredged material management units (DMMUs) that have already been established at the DCI and Pier 1 project area (Hart Crowser 2000a and b, respectively). This report also evaluates the data relative to established Puget Sound Dredged Disposal Analysis (PSDDA) criteria.

1.1 Project Background

The general history and existing conditions of the DCI and Pier 1 areas proposed for dredging were previously described in detail by Landau Associates (2003) and Hart Crowser (2000a and b). Numerous sediment surface and core samples were collected in the project area between 1985 and 2002. The initial dredge material characterization studies for the proposed DCI and Pier 1 projects were completed in June of 2000. Suitability determinations based on these characterization studies were issued in April of 2001.

1.2 Project Specifics

To address DMMO concerns associated with the potential for historical pulp mill-related discharges at the site (Stirling 2003), four core samples were collected from the 1-to-3-foot layer within the established DCI and Pier 1 DMMUs and analyzed for dioxin. The stations were located to sample historically-deposited material present at the 1-to-3-foot interval. Selection of specific sampling locations and depths, as approved by the DMMO, was based on a review of core log observations available from previous Hart Crowser (2000a and b) dredge material characterization studies, conservatively focusing on areas of finer-gained sediment deposits.

1.3 Reference Sample Selection

In addition to the samples collected at the project site, two reference samples were collected from Fidalgo Bay and Padilla Bay and analyzed to characterize regional background sediment dioxin chemical concentrations. The reference sediment samples were collected from 0 to 15 cm below mudline to characterize the dioxin concentration within the biologically mixed surface layer. The sediment reference samples locations correspond to locations previously sampled by National Oceanic and Atmospheric Administration (NOAA) (1999) for general chemical and biological determinations (excluding dioxin analyses), and also with locations previously sampled by the Washington State Department of Ecology (Ecology) (2000) for dioxin determinations in regional crab tissue.

The remainder of this document addresses the components for a supplemental characterization SAR including:

- Section 2 – Overview of Project Investigation Components
- Section 3 – Field Activities
- Section 4 – Chemical and Conventional Analysis Results
- Section 5 – Conclusions

Field sampling was performed in accordance with the sampling and analysis plan (SAP; Anchor 2004), DMMO comments on the SAP (Stirling 2004) and additional comments from Ecology (Gries 2004). All sample handling and analyses followed the most recent Puget Sound Estuary Program (PSEP) protocols (PSEP 1986 as updated in 1989, 1991, 1995, and

1997). Chemical analyses followed PSDDA protocols as modified by a Dredged Material Management Program (DMMP) Issue Paper (Hoffman 2003).

1.4 Summary of Results

As presented in more detail in subsequent sections of this Sampling and Analysis Data Report, dioxin concentrations in the DCI and Pier 1 DMMUs were below both the DMMP criterion for 2,3,7,8-TCDD (5 ng/kg) and the calculated DMMP 2,3,7,8-TCDD Toxicity Equivalent Concentration (TEC) (15 ng/kg) (PSDDA 2000). Consistent with interpretation guidelines presented in the SAP, the previously issued open water disposal suitability determination was confirmed for all DMMUs.

2 OVERVIEW OF PROJECT INVESTIGATION COMPONENTS

Sediment sampling and characterization efforts were conducted July 13, 2004 and July 15, 2004. This section outlines the primary investigation elements which included core and grab sampling and core sample processing. Sampling and analysis procedures for all investigation elements were performed in accordance with the SAP (Anchor 2004), DMMO comments on the SAP (Stirling 2004), and additional comments from Ecology (Gries 2004).

The Port of Anacortes has proposed to dredge approximately 241,000 cubic yards (cy) of sediment from the two DMMUs at the DCI site and approximately 32,000 cy from the two DMMUs at the adjacent Pier 1 site. Of the 241,000 cy of sediment proposed for dredging at the DCI site, approximately 230,000 cy did not exceed PSDDA Screening Levels (SLs) and subsequently were determined to be suitable for open water disposal whereas, approximately 16,000 cy (surficial material located within DMMU 1) will require disposal at an appropriate upland facility. All of the 32,000 cy characterized at Pier 1 did not exceed SLs and was determined to be suitable for open water disposal. Dioxin was not previously identified as a potential contaminant of concern in the initial sediment characterization studies, and subsequently, was not analyzed.

Following general screening-level PSDDA characterization procedures, five sediment cores, each approximately 5 feet long, were collected from DMMUs DCI 1 (two cores), DCI 2 (one core), P1 (one core), and P2 (one core). For each core, a sample from the 1-to-3-foot interval was targeted. For DMMU DCI 1, samples DCI 1A and DCI 1B were composited into a single sample. Reference grab samples were collected from Fidalgo Bay and from Padilla Bay near Hat Island. Reference samples were collected from 0 to 15 cm below the mudline.

3 FIELD ACTIVITIES

3.1 Sample Collection

Field sampling and handling were conducted in accordance with the Work Plan/SAP (Anchor 2004). Field activities were performed during the period of July 13, 2004 and July 15, 2004, under the direction of Mr. Shawn Hinz of Anchor and Mr. Bill Jaworski of Marine Sampling Systems (MSS). MSS provided the sampling vessel R/V Nancy Anne, all sample collection equipment, and on-board positioning system, with sampling support provided by MSS and Anchor staff.

A total of five PSDDA cores approximately 5 feet in length, were collected (Anchor 2004). Sample location positions were determined with a differential global positioning system and are accurate to within 3 meters. Table 1 lists station identifiers, coordinates for all sample locations, mudline elevations, and core lengths, where applicable. Figure 1 depicts the confirmed locations of cores collected at the Site.

Table 1
Station Identification and Geographic Coordinates (NAD 83)

Sample ID	Date Sampled	Sample Location (NAD 83, Decimal Degrees)		Sampling Depth (ft)	Mudline Elevation (ft MLLW)	Bottom of Core Sample Elevation (ft MLLW)
		Latitude	Longitude			
AN-DCI-1A	13-Jul-04	-122.609568	48.521789	-18.7	-20.1	-23.1
AN-DCI-1B	13-Jul-04	-122.610258	48.521539	-6.8	-7.8	-10.8
AN-DCI-2	13-Jul-04	-122.609468	48.521149	-4.9	-2.4	-5.4
AN-P1-1	13-Jul-04	-122.612868	48.522179	-34.7	-33.1	-36.1
AN-P1-2	13-Jul-04	-122.610968	48.522179	-33.3	-33.4	-36.4
AN-REF-1	13-Jul-04	-122.580218	48.506069	-10.6	-9.5	(0 to 15 cm interval)
AN-REF-2	13-Jul-04	-122.536118	48.528359	-13.5	-5.4	(0 to 15 cm interval)

3.2 Sample Processing

Core tubes collected for the supplemental characterization were capped and stored aboard the sampling vessel on ice. After the cores were collected, they were transferred to personnel on shore who split the cores, removed the sample material from each core, homogenized the sediment sample, transferred the sample material to sample containers,

and packed the containers in coolers for subsequent delivery to the analytical laboratory. Table 2 shows the compositing scheme for these cores.

Table 2
Compositing Scheme for Core Samples

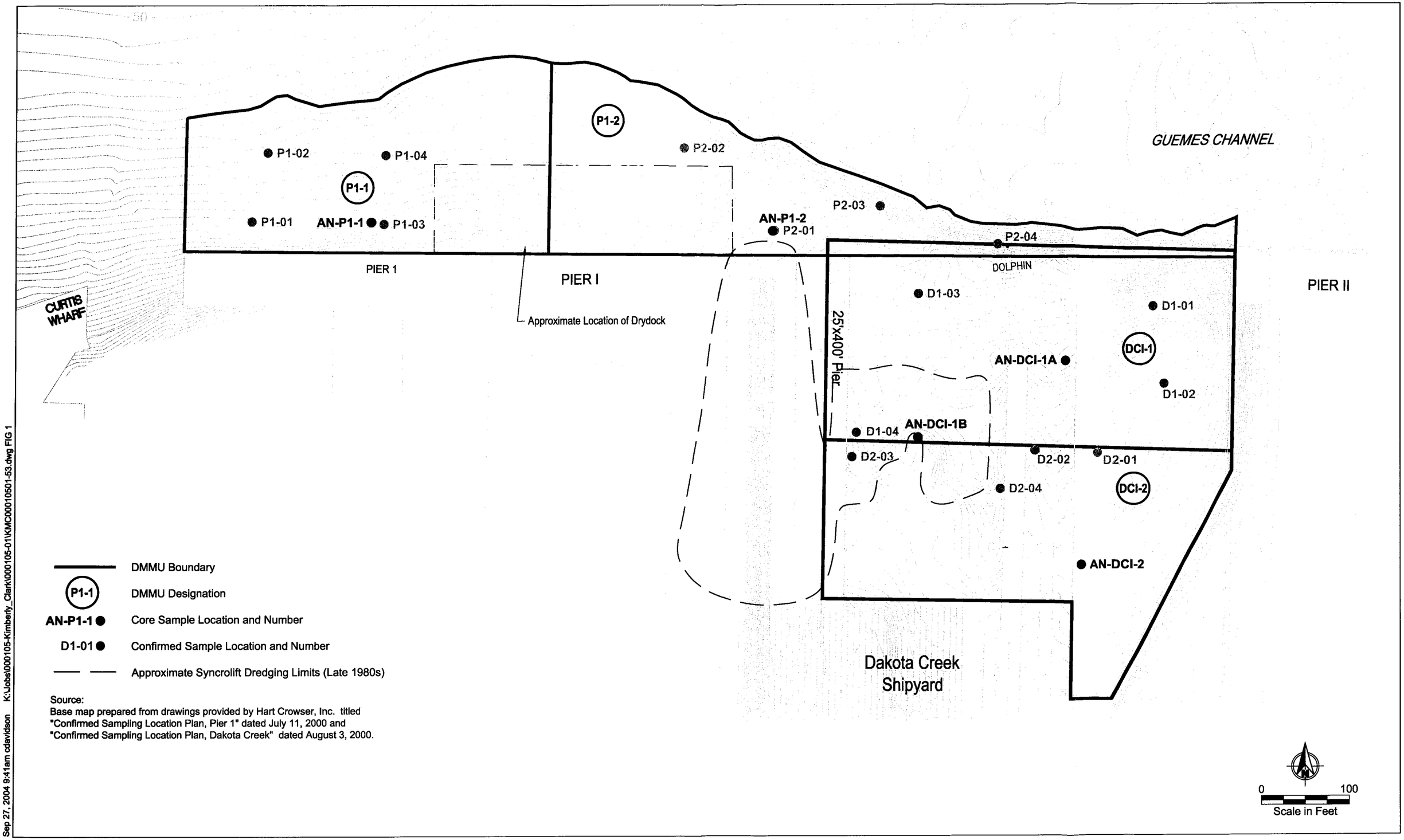
Individual Sample ID	Composite Sample ID	Analysis
AN-DCI-1A	AN-DCI-1	Dioxins, TOC, Grain Size, Total Solids
AN-DCI-1B		
AN-DCI-2	AN-DCI-2	
AN-P1-1	AN-P1-1	
AN-P1-1	AN-P1-1	

3.3 Deviations from the SAP

Deviations from the SAP included the following:

- Samples were taken from the 1-to-3-foot interval in accordance with direction provided by the DMMO and Gries (2004).
- A second core sample (AN-DCI-1B) was added in DMMU DCI-1 at a location deemed most likely to accumulate fine-grained sediment and that has not previously dredged per comments by Gries (2004).
- The sample from core AN-P1-1 was from the 2-to-3-foot interval because the material from 1-to-2-foot interval was primarily gravel and there was not enough sediment to extract a sample.
- Dr. Dennis Hanzlick replaced Mr. Ryan Barth as Field Coordinator.

There were no other deviations from the approved SAP (Anchor 2004) either during sample collection or processing.



Source:
Base map prepared from drawings provided by Hart Crowser, Inc. titled "Confirmed Sampling Location Plan, Pier 1" dated July 11, 2000 and "Confirmed Sampling Location Plan, Dakota Creek" dated August 3, 2000.

Sep 27, 2004 9:41am cdavidson K:\Jobs\000105-Kimberly_Clark\000105-01\KMC000105O1-53.dwg FIG 1

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 1
Actual Sample Location Map
Kimberly-Clark Anacortes, DCI

4 CHEMICAL AND CONVENTIONAL ANALYSIS RESULTS

Columbia Analytical Services (CAS), an Ecology-certified laboratory located in Kelso, Washington, conducted the chemical testing. Chemical and physical testing adhered to the most recent PSEP quality assurance/quality control (QA/QC) procedures (PSEP 1997) and PSEP analysis protocols. All analyses conformed to procedures described in the approved SAP (Anchor 2004).

4.1 Quality Control/Quality Assurance

The overall data QA/QC program for the supplemental evaluation followed procedures previously detail in Anchor (2004). Measures taken to ensure data quality employed current Environmental Protection Agency (EPA) and Ecology protocols. Specific actions are described below.

4.1.1 Laboratory QA/QC

For sediment tests, one of the samples submitted for chemical analysis was analyzed as a laboratory matrix spike/matrix spike duplicate (MS/MSD). Additional quality control included method blanks, method blank spikes, surrogate compound analysis, and standard reference material analysis.

4.1.2 Chain of Custody

Chain-of-custody forms and seals were used to track sample custody and document the proper handling and integrity of the samples. All containerized sediment samples were shipped to the analytical laboratory after preparation.

4.1.3 Data Validation

Data validation reports are provided in Appendix A, which verified the accuracy and precision of chemical determinations performed during this investigation.

4.2 PSDDA Characterization

Following general screening-level PSDDA characterization procedures (PSDDA 2000), four sediment samples were collected from sediment DMMUs DCI-1, DCI-2, P1-1, and P1-2 according the procedures outlined above. Each of the four samples was tested for

dioxins/furans using method 1613B, grain size, and total organic carbon (TOC) using PSEP methods, and total solids using method EPA 160.3. Validated chemical determinations are summarized in Table 3.

Table 3
Analytical Results for DCI/Pier 1 Sediment Core Samples

Sample ID Sample Date Depth		AN-DCI-1 7/15/2004 1-3 ft	AN-DCI-2 7/15/2004 1-3 ft	AN-P1-1 7/15/2004 2-3 ft	AN-P1-2 7/15/2004 1-3 ft	AN-REF-1-01-SD 7/13/2004 0-15 cm	AN-REF-2-01-SD 7/13/2004 0-15 cm
Conventionals							
Total solids	%	60	60.4	87.2	78.2	58	70.6
Total organic carbon	%	2.24	4.25	0.27	0.64	1.17	0.74
Grain Size							
Gravel	%	14.1	1.71	7.84	3.96	0.02	0.04
Sand, Very Course	%	4.35	2.21	3.26	3.25	0.36	0.41
Sand, Course	%	3.97	3.95	4.14	3.9	0.47	4.37
Sand, Medium	%	5.22	11.2	6.85	6.82	0.74	19.5
Sand, Fine	%	14.7	36	7.54	10.2	16.9	24.8
Sand, Very Fine	%	14.6	26	7.08	3.38	33	5.57
Silt	%	26.6	14.5	33.8	35	34.6	30
Clay	%	13	4.4	24.6	31.9	10.8	6.23
Dioxins							
1,2,3,4,6,7,8-HpCDD	ng/kg	55.574	25.002	2.5 U	2.5 U	2.742 J	6.001
1,2,3,4,6,7,8-HpCDF	ng/kg	5.652	5.104	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3,4,7,8,9-HpCDF	ng/kg	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3,4,7,8-HxCDD	ng/kg	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3,4,7,8-HxCDF	ng/kg	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3,6,7,8-HxCDD	ng/kg	1.76 J	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3,6,7,8-HxCDF	ng/kg	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3,7,8,9-HxCDD	ng/kg	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3,7,8,9-HxCDF	ng/kg	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3,7,8-PeCDD	ng/kg	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
1,2,3,7,8-PeCDF	ng/kg	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2,3,4,6,7,8-HxCDF	ng/kg	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2,3,4,7,8-PeCDF	ng/kg	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	2.5 U
2,3,7,8-TCDD	ng/kg	1 U	1 U	1 U	1 U	1 U	1 U
2,3,7,8-TCDF	ng/kg	1 U	1 UC	1 U	1 U	1 U	1 U
OCDD	ng/kg	589.61 B	206.812 B	10.782 BJ	9.1 BJ	16.972 J	47.747 B
OCDF	ng/kg	10.785 J	18.241	5 U	5 U	5 U	5 U
Total HpCDD	ng/kg	187.883	74.169	1.144	2.5 U	2.742	13.324
Total HpCDF	ng/kg	17.656	15.014	2.5 U	2.5 U	2.5 U	2.5 U
Total HxCDD	ng/kg	14.483	4.915	2.5 U	2.5 U	1.218	2.5 U
Total HxCDF	ng/kg	8.325	6.699	2.5 U	2.5 U	2.5 U	2.5 U
Total PeCDD	ng/kg	2.5 U	3.567	2.5 U	2.5 U	2.5 U	2.5 U
Total PeCDF	ng/kg	0.737	4.561	2.5 U	2.5 U	2.5 U	2.5 U
Total TCDD	ng/kg	1 U	5	1 U	1 U	1 U	1 U
Total TCDF	ng/kg	1 U	1.084	1 U	1 U	1 U	1 U
Dioxin TEQ	ng/kg	1.39	0.635	0.0108	0.0091	0.0444	0.108

5 CONCLUSIONS

The data were evaluated based on the tiered approach presented in the SAP (Anchor 2004) and per comments by Stirling (2004) and Gries (2004). Briefly, bulk sediment results were initially compared to the DMMP criterion for 2,3,7,8-TCDD (5 ng/g) and the calculated DMMP 2,3,7,8-TCDD Toxicity Equivalent Concentration (TEC) (15 ng/kg) (PSDDA 2000). As discussed in the SAP, if neither screening criterion is exceeded in an individual DMMU, the previously issued open water disposal suitability determination for that DMMU will be confirmed. If either screening level is exceeded, results for that DMMU will be further assessed under the Tier 2 program outlined below.

Neither the 2,3,7,8-TCDD nor the DMMP TEC was exceeded in any sample. Therefore, the previously issued open water disposal suitability determination was confirmed for all DMMUs.

6 REFERENCES

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APPENDIX A

DATA VALIDATION REPORTS

DATA VALIDATION REVIEW REPORT

KIMBERLY CLARK – DAKOTA CREEK INDUSTRIES, INC

August 2004

This report summarizes the review of analytical results for four sediment samples collected on July 13, 2004, at the Dakota Creek Industries site in Anacortes, Washington. Samples were collected by Anchor Environmental, Inc. and submitted to Columbia Analytical Services, Inc. (CAS) in Kelso, Washington. The dioxin analyses were subcontracted to the CAS Houston laboratory. Samples were analyzed for total solids by EPA method 160.3 modified for soils, total organic carbon by PSEP methodology, grainsize by PSEP methodology and Dioxins by EPA method 1613B. CAS sample data group number K2405272 and E2400667 were reviewed.

Sample ID	Location	Lab ID	Matrix	Analysis Requested
AN-DCI-2	DCI-1	K2405272-001 /E2400667-1	Sediment	TOC, total solids, dioxins, grain size
AN-P1-1	P1-1	K2405272-002 /E2400667-2	Sediment	TOC, total solids, dioxins, grain size
AN-DCI-1	DCI-1	K2405272-003 /E2400667-3	Sediment	TOC, total solids, dioxins, grain size
AN-P1-2	P1-2	K2405272-004 /E2400667-4	Sediment	TOC, total solids, dioxins, grain size

Data Validation and Qualifications

The following comments refer to the laboratory's performance in meeting the quality assurance/quality control (QA/QC) guidelines outlined in the data quality objective section of the Quality Assurance Project Plan (QAPP). Laboratory results were reviewed following USEPA guidelines (USEPA, 1994, 1999). Unless noted in this report, laboratory results for the samples listed above were within QC criteria.

Laboratory Data Package and Field Documentation

Field documentation was checked for completeness and accuracy. The samples were received in good condition and were consistent with the accompanying chain of custody.

Holding Times and Sample Preservation

The samples were received by the laboratory within the specified cooler temperatures of $4^{\circ}C \pm 2$ $^{\circ}C$. Samples analyses were conducted within holding times. No discrepancies were noted at the time of sample receipt.

Laboratory Method Blanks

Laboratory method blanks were analyzed at the required frequencies. OCDD was detected in the method blank associated with the dioxin analysis. Since both samples contained greater than five times the method blank concentration no further action was taken.

Field Quality Control

Field Duplicates

No field duplicates were submitted for this sample group.

Matrix Spike (MS) and Matrix Duplicate

A matrix spike (MS) sample and a matrix duplicate (MD), were analyzed at the required frequency. The MS and MD percent recoveries (%R and RPD) were within the laboratory control limits; no data were qualified based on these recoveries.

Laboratory Control Sample (LCS) and LCS Duplicate (LCSD)

Laboratory control samples were analyzed at the required frequencies. Both LCS percent recoveries were within laboratory control limits. No data were qualified based on these recoveries.

Method Reporting Limits

Sample results were reported using the laboratories method reporting limits. Reporting limits were acceptable. Analytes 1,2,3,6,7,8-HxCDD and OCDF for sample AN-DCI-1 had the ion abundance ratios outside the QC limit, the analytes have been qualified with a "J" to indicate the reported value is estimated. 2,3,7,8-TCDF for sample AN-DCI-2 had the labeled standard recovery below the QC control limit. Since the signal to noise ratio was greater than ten to one, no further action was taken.

Overall Assessment

The data are judged to be acceptable for their intended use as qualified.

Precision, Accuracy, and Completeness

Precision: All precision goals were met.

Accuracy: All accuracy goals were met.

Completeness: Completeness was 100 percent, all data are useable as qualified.

Susan Snyder, Data Reviewer Date

REFERENCES

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APPENDIX B

CHAIN OF CUSTODY FORMS

Columbia Analytical Services INC.
An Employee-Owned Company

CHAIN OF CUSTODY

Sediment and Tissue Chemistry

1317 South 13th Ave. • Kelso, WA 98626 • (360) 577-7222 • FAX (360) 636-1068

SR#: ________ PAGE 1 OF 1 COC # ________

PROJECT NAME: Kimberly Clark / [illegible] CL Industries
PROJECT NUMBER: [illegible]-CL [illegible]
PROJECT MANAGER: Dan [illegible]
COMPANY/ADDRESS: [illegible] 3rd Ave Ste 300, Seattle, WA 98107
PHONE # 206.287.9130 FAX # 206.287.9131
SAMPLER'S SIGNATURE: Katherine D'[illegible]

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	☐ Total Volatile Solids	TOC ☐ (ASTM D4129M) ☒ Total Solids	Grain size ☒ PSEP ☐ ASTM D422 ☒ PSEP	Sulfide ☐ Total (9030M) ☐ AVS	Ammonia ☐ Total (350.1m)	Metals (list below) ☐ Plumb ☐ Pore water	Pesticides (8081-L)	PCBs (8082-L) ☐ Aroclors ☐ Congeners	Semivolatiles ☐ GC/MS SIM (PAH) ☐ 8270-L	Organotins ☐ Bulk ☐ Pore Water ☐ TBT only	Volitiles (8260)	Dioxins ☐ 1613 ☒ 8290	TPH ☐ GRO ☐ DRO ☐ RRO	☐ Lipids	Tissue Sample Preparations (Instructions below)				REMARKS
AN-DCT-2	7/15/04	16:15		SE	3	X	X	X									X							
AN-FI-1	7/15/04	17:30		SE	3	X	X	X									X							
AN-DCT-1	7/15/04	15:[illegible]5		SE	3	X	X	X									X							
AN-FI-2	7/15/04	16:30		SE	3	X	X	X									X							

REPORT REQUIREMENTS

X I. Routine Report: Method Blank, Surrogate, as required
___ II. Report Dup., MS, MSD as required
X III. Data Validation Report (includes all raw data)
___ IV. CLP Deliverable Report
X V. EDD

INVOICE INFORMATION

P.O. # ________
Bill To: ________

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.
___ 5 Day
X Standard (10-15 working days)
___ Provide FAX Results
________ Requested Report Date

Circle which metals are to be analyzed:

SMS Metals: As Cd Cr Cu Pb Hg Ag Zn
CA Metals: Ag As Cd Cr Cu Hg Ni Pb Se Zn
SEM Metals: Cd Cu Pb Hg Ni Zn

SPECIAL INSTRUCTIONS/COMMENTS:
TOC, TS, Grain Size, Dioxins
ATTN: Abbie Spielman

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature: [illegible] Date/Time: 7/16/04 9:30	Signature ___ Date/Time ___	Signature ___ Date/Time ___	Signature ___ Date/Time ___
Printed Name: [illegible] Firm: Anch. Env.	Printed Name ___ Firm ___	Printed Name ___ Firm ___	Printed Name ___ Firm ___

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SR#: ______

PAGE 1 OF ______ COC # ______

PROJECT NAME: EC - PAKIMA CREEK INDUSTRIES

PROJECT NUMBER: 000105-01 BA 5

PROJECT MANAGER: DAN HENNESSY

COMPANY/ADDRESS: 1423 3rd Ave Ste 300, Seattle, WA 98107

PHONE #: 206 287.9130 FAX #: 206.287.9131

SAMPLER'S SIGNATURE:

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	☐ Total Volatile Solids, ☒ Total Solids	TOC ☐ (ASTM D4129M) ☒ PSEP	Grain size ☒ PSEP ☐ ASTM D422	Sulfide ☐ Total (9030M) ☐ PSEP	☐ AVS ☐ SEM (metals list below) ☐ Water Soluble	Ammonia ☐ Total (350.1m) ☐ Plumb ☐ Pore water	Metals (list below)	Pesticides (8081-L)	PCBs ☐ Aroclors (8082-L) ☐ Congeners	Semivolatiles ☐ GC/MS SIM (PAH) ☐ 8270-L	Organotins ☐ Bulk ☐ Pore Water ☐ TBT only	Volitiles (8260)	(Dioxins) ☐ 1613 ☐ 8290	TPH ☐ GRO ☐ DRO ☐ RRO	☐ Lipids	Tissue Sample Preparations (Instructions below)			REMARKS
AN-REF-[illegible]-01-30	7/11/01	16:0[illegible]		SE	3	X	X	X										X						
AN-[illegible]-01-[illegible]	7/11/01	16:36		SE	3	X	X	X										X						

REPORT REQUIREMENTS

X I. Routine Report: Method Blank, Surrogate, as required

___ II. Report Dup., MS, MSD as required

___ III. Data Validation Report (includes all raw data)

___ IV. CLP Deliverable Report

X V. EDD

INVOICE INFORMATION

P.O. # ______

Bill To: ______

TURNAROUND REQUIREMENTS

___ 24 hr. ___ 48 hr.

___ 5 Day

___ Standard (10-15 working days)

___ Provide FAX Results

______ Requested Report Date

Circle which metals are to be analyzed:

SMS Metals: As Cd Cr Cu Pb Hg Ag Zn

CA Metals: Ag As Cd Cr Cu Hg Ni Pb Se Zn

SEM Metals: Cd Cu Pb Hg Ni Zn

SPECIAL INSTRUCTIONS/COMMENTS:

TOC, TS, Dioxins, Grain Size

RELINQUISHED BY:		RECEIVED BY:		RELINQUISHED BY:		RECEIVED BY:	
Signature [illegible]	Date/Time 7/11/01 [illegible]	Signature	Date/Time	Signature	Date/Time	Signature	Date/Time
Printed Name	Firm	Printed Name	Firm	Printed Name	Firm	Printed Name	Firm

Sample Description

Classification of soils in this report is based on visual field and laboratory observations which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field nor laboratory testing unless presented herein. Visual–manual classification methods of ASTM D 2488 were used as an identification guide.

Soil descriptions consist of the following:
Density/consistency, moisture, color, minor constituents, MAJOR CONSTITUENT, additional remarks.

Density/Consistency

Soil density/consistency in borings is related primarily to the Standard Penetration Resistance.
Soil density/consistency in test pits is estimated based on visual observation and is presented parenthetically on the test pit logs.

SAND or GRAVEL Density	Standard Penetration Resistance (N) in Blows/Foot	SILT or CLAY Consistency	Standard Penetration Resistance (N) in Blows/Foot	Approximate Shear Strength in TSF
Very loose	0 – 4	Very soft	0 – 2	<0.125
Loose	4 – 10	Soft	2 – 4	0.125 – 0.25
Medium dense	10 – 30	Medium stiff	4 – 8	0.25 – 0.5
Dense	30 – 50	Stiff	8 – 15	0.5 – 1.0
Very dense	>50	Very stiff	15 – 30	1.0 – 2.0
		Hard	>30	>2.0

Moisture

Dry	Little perceptible moisture
Damp	Some perceptible moisture, probably below optimum
Moist	Probably near optimum moisture content
Wet	Much perceptible moisture, probably above optimum

Minor Constituents

	Estimated Percentage
Not identified in description	0 – 5
Slightly (clayey, silty, etc.)	5 – 12
Clayey, silty, sandy, gravelly	12 – 30
Very (clayey, silty, etc.)	30 – 50

Legends

Sampling Test Symbols

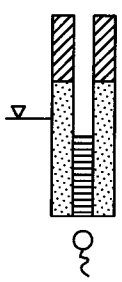
BORING SAMPLES

- Split Spoon
- Shelby Tube
- Cuttings
- Core Run
- * No Sample Recovery
- P Tube Pushed, Not Driven

TEST PIT SAMPLES

- Grab (Jar)
- Bag
- Shelby Tube

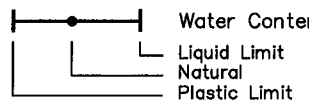
Groundwater Observations



- Surface Seal
- Groundwater Level on Date (ATD) At Time of Drilling
- Observation Well Tip or Slotted Section
- Groundwater Seepage (Test Pits)

Test Symbols

NS	No Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen
TCD	Triaxial Consolidated Drained
QU	Unconfined Compression
DS	Direct Shear
K	Permeability
PP	Pocket Penetrometer Approximate Compressive Strength in TSF
TV	Torvane Approximate Shear Strength in TSF
CBR	California Bearing Ratio
MD	Moisture Density Relationship
AL	Atterberg Limits
PID	Photoionization Detector Reading
CA	Chemical Analysis
DT	*In Situ* Density Test



ANCHOR ENVIRONMENTAL, L.L.C.

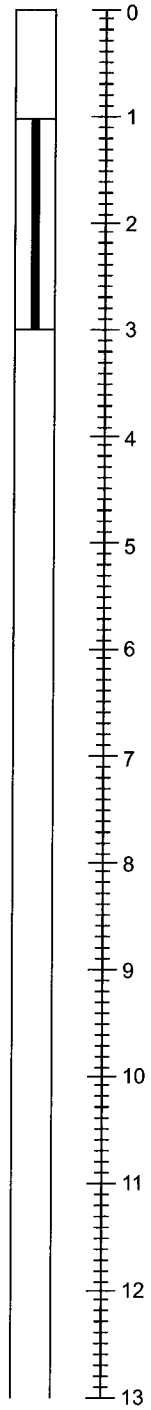
Figure C-1
Key to Exploration Logs
Kimberly Clark / Dakota Creek Industries
Anacortes, Washington

Sediment Core Log AN-DCI-1A

Drive Length in Feet: 13
Recovery in Feet: 12.4
Percent Recovery: 95%

Mudline Elevation in Feet: -20.1

Sediment Description	Sample No.
(Loose), wet, olive, clayey SILT. Slight hydrogen sulfide-like odor when core was opened.	
(Loose), wet, gray-brown SILT with 80% wood waste.	
(Medium), moist, brown-gray clayey SILT with 30% larger wood fragments eaten by worms at 1.2'.	
(Medium), damp, gray, sandy SILT with some small wood debris (10 to 20%).	A
(Medium), damp, dark gray, sandy SILT with shell fragments. (Native)	
Bottom of Sediment Core at 5.2 Feet. Completed 7/15/04	



Note: See Sheet A-1 for explanation of descriptions and symbols.

9/24/04 cvd K:\Jobs\000105-Kimberly Clark\LOGS\KC-Dakota Creek Logs.cdr

ANCHOR ENVIRONMENTAL, L.L.C.

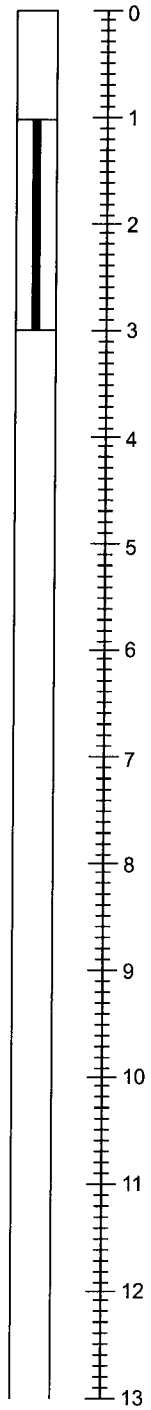
Figure C-2
Sediment Core Log AN-DCI-1A
Kimberly Clark / Dakota Creek Industries
Anacortes, Washington

Sediment Core Log AN-DCI-1B

Drive Length in Feet: 5.66
Recovery in Feet: 4.5
Percent Recovery: 97%

Mudline Elevation in Feet: -7.8

Sediment Description	Sample No.
(Very soft), wet, dark gray, clayey SILT with some sand from 1.0 to 1.3'.	
(Soft), wet, dark gray, clayey sandy SILT with shell fragments.	
(Soft), moist, dark gray, silty, sandy CLAY with shell fragments.	A
(Hard), dry, gray, gravelly CLAY.	
(Hard), dry, brown with gray lenses, gravelly CLAY with large 3" gravel from 1.7 to 2.0'.	
(Hard), dry, brown, gravelly CLAY.	
Bottom of Sediment Core at 4.6 Feet. Completed 7/15/04	



Note: See Sheet A-1 for explanation of descriptions and symbols.

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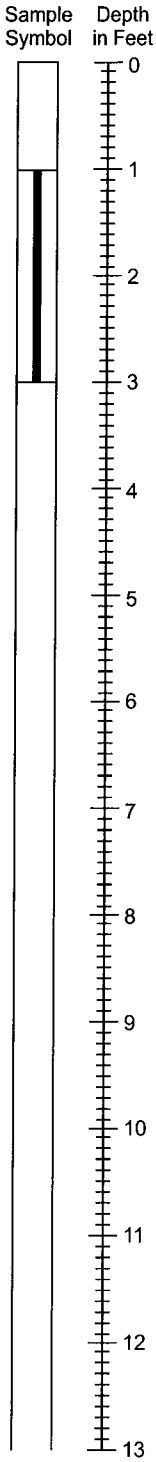
ANCHOR ENVIRONMENTAL, L.L.C.

Figure C-3
Sediment Core Log AN-DCI-1B
Kimberly Clark / Dakota Creek Industries
Anacortes, Washington

Sediment Core Log AN-DCI-2

Drive Length in Feet: 6.6
Recovery in Feet: 5.0
Percent Recovery: 78%

Sediment Description	Sample No.
Mudline Elevation in Feet: -2.4	
(Loose), wet, brown-gray, silty SAND with shell fragments and fine gravel. Strong hydrogen sulfide-like odor.	A
(Loose), wet, brown-red, silty SAND with wood fragments and shell fragments	
(Loose), wet, brown, silty SAND with sawdust fragments.	
(Loose), wet, brown, fine-medium SAND.	
(Loose), wet, brown, silty SAND with sawdust fragments.	
(Loose), wet, brown, silty SAND with large shell fragments and medium gravel.	
(Loose), wet, brown-gray, silty SAND.	
Bottom of Sediment Core at 4.8 Feet. Completed 7/15/04	



Note: See Sheet A-1 for explanation of descriptions and symbols.

9/24/04 cvd K:\Jobs\000105-Kimberly Clark\LOGS\KC-Dakota Creek Logs.cdr

ANCHOR ENVIRONMENTAL, L.L.C.

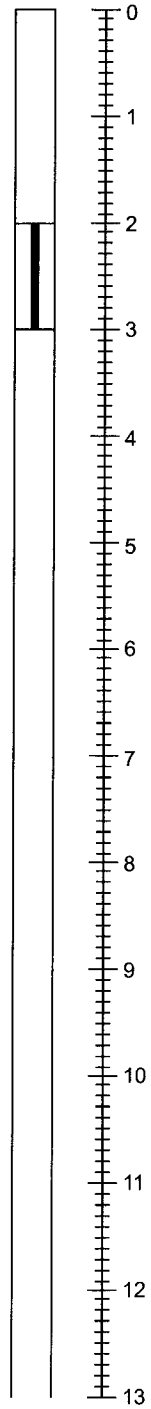
Figure C-4
Sediment Core Log AN-DCI-2
Kimberly Clark / Dakota Creek Industries
Anacortes, Washington

Sediment Core Log AN-P1-1

Drive Length in Feet: 6.0
Recovery in Feet: 4.4
Percent Recovery: 73%

Mudline Elevation in Feet: -33.1

Sediment Description	Sample No.
(Loose), wet, brown-gray, fine to medium SAND with shell fragments.	
(Loose), wet, brown-gray, medium, sandy GRAVEL with shell fragments.	
(Medium stiff), moist, brown-gray CLAY..	A
(Medium stiff), moist, brown-gray CLAY with shell fragments and sand.	
(Medium stiff), moist, brown-gray CLAY.	
Bottom of Sediment Core at 4.4 Feet. Completed 7/15/04	



Note: See Sheet A-1 for explanation of descriptions and symbols.

9/24/04 cvd K:\Jobs\000105-Kimberly Clark\LOGS\KC-Dakota Creek Logs.cdr

ANCHOR ENVIRONMENTAL, L.L.C.

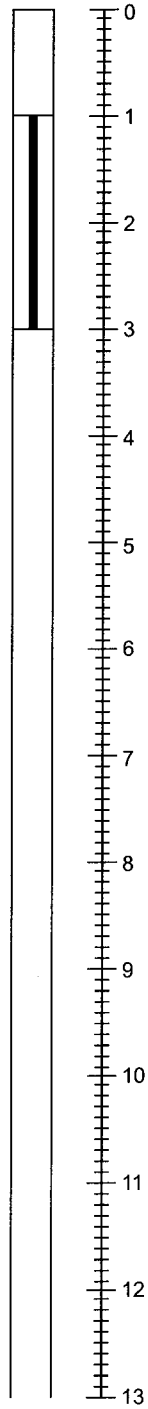
Figure C-5
Sediment Core Log AN-P1-1
Kimberly Clark / Dakota Creek Industries
Anacortes, Washington

Sediment Core Log AN-P1-2

Drive Length in Feet: 6.0
Recovery in Feet: 5.7
Percent Recovery: 95%

Mudline Elevation in Feet: -33.4

Sediment Description	Sample No.
0 to 1' no remarks.	
(Very stiff), moist, gray-brown, sandy clayey SILT with coarse sand scattered.	
(Very stiff), moist, gray-brown CLAY with shell fragments.	A
(Stiff), moist, gray-brown, sandy, silty CLAY.	
(Very stiff), moist, gray-brown CLAY with small gravel and scattered large gravel.	
Sand lens.	
(Very stiff), moist, gray-brown CLAY with small gravel and scattered large gravel.	
Bottom of Sediment Core at 5.7 Feet. Completed 7/15/04	



Note: See Sheet A-1 for explanation of descriptions and symbols.

9/24/04 cvd K:\Jobs\000105-Kimberly_Clark\LOGS\KC-Dakota Creek Logs.cdr

ANCHOR ENVIRONMENTAL, L.L.C.

Figure C-6
Sediment Core Log AN-P1-2
Kimberly Clark / Dakota Creek Industries
Anacortes, Washington

ANCHOR ENVIRONMENTAL, L.L.C.

Sediment Core Collection Form

Station ID: AN-DCI-1A **Date:** 15 July 2004

Project Name: KIMBERLY-CLARK/ DAKOTA CREEK INDUSTRIES **Project Number:** 000105-01-5

Coordinates:
Lat/Northing 48° 31.3071' N Long/Easting: -122° 36.5740' W

Vertical Datum (MLLW) MLW Other:

Depth Measurement Sounder Leadline 18.7 ft

Project Depth _____ **Overdredge** _____

	Attempt 1	Attempt 2	Attempt 3
Time:	10:15		
(A) Measured Water Depth	18.7 ft		
(B) Tide Height	-1.4		
(C) Mudline Elevation	-20.1 ft		
(-A+B = C include sign of tide height as reported)			
Estimated Penetration	13		
Description of Core Drive	1 ft freefall easy 1-3 mod → easy 3-6 6-7 mod hard 7-13 med.		
Refusal Encountered?	No		
Total Core Length	12.4		

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine
Sediment Odor	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogeneous			

Comments:

Recorded by: K. D'Orazio

ANCHOR ENVIRONMENTAL, L.L.C.

Sediment Core Collection Form

Station ID: AN-DCI-1B **Date:** 15 July 2004

Project Name: KC/Dakota Ck Industri **Project Number:** 000105-01-5.

Coordinates:
(Lat)/Northing 48° ~~31~~ .2922 N (Long)/Easting: -122° 36.6153 W

Vertical Datum (MLLW) MLW Other:

Depth Measurement Sounder (Leadline) ~~7.7~~ 6.8 7.1-8.3

Project Depth _____ **Overdredge** _____

	Attempt 1	Attempt 2	Attempt 3
Time:	11:0~~2~~3		
(A) Measured Water Depth	~~7.7~~ 6.8		
(B) Tide Height	-1.0		
(C) Mudline Elevation	-7.8		
(-A+B = C include sign of tide height as reported)			
Estimated Penetration	4.66 ft		
Description of Core Drive	hit debris? no hard clay & glacial till pull-out was easy		
Refusal Encountered?	YES - after ~~4.7~~ ft		
Total Core Length	~~3.5 firm~~ 4.5 top ft soup, rest firm		

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine
Sediment Odor	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogeneous			

Comments:

Recorded by: K. D'Orazio

ANCHOR ENVIRONMENTAL, L.L.C.

Sediment Core Collection Form

Station ID: AN-DC1-2 **Date:** 15 July 2004

Project Name: KC/Dakota Ck. Industries **Project Number:** 000105-01-5

Coordinates: (Lat/Northing) 48° 31.2692 N (Long/Easting) -122° 36.5683 W

Vertical Datum (MLLW) MLW Other:

Depth Measurement Sounder (Leadline) 4.9 ft

Project Depth _____ **Overdredge** _____

	Attempt 1	Attempt 2	Attempt 3
Time:	13:53		
(A) Measured Water Depth	4.9		
(B) Tide Height	+2.5		
(C) Mudline Elevation	-2.4		
(-A+B = C include sign of tide height as reported)			
Estimated Penetration	6.6		
Description of Core Drive	0~2 easy. 2-6.5 hard to very hard		
Refusal Encountered?	YES		
Total Core Length	5.0 ft		

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine
Sediment Odor	None, slight, mod; strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogeneous			

Comments:

Recorded by: K. Posyniak

ANCHOR ENVIRONMENTAL, L.L.C.

Sediment Core Collection Form

Station ID: AN-P1-1 **Date:** 15 July 2004

Project Name: KC/Dakota Ck. Industries **Project Number:** 000105-01-5

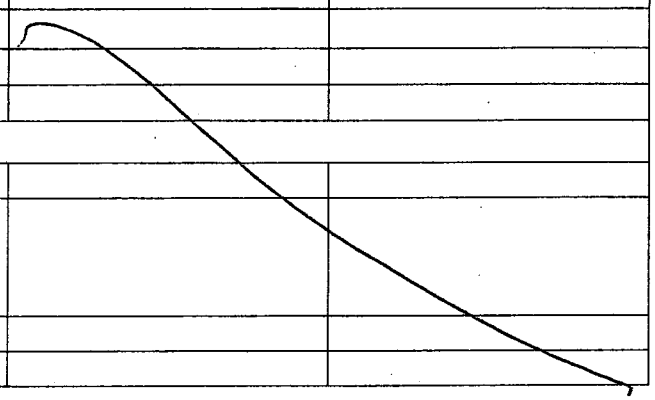
Coordinates:
Lat/Northing 48° 31.3310 N Long/Easting: -122° 36.7723 W

Vertical Datum (MLLW) MLW Other:

Depth Measurement Sounder (Leadline) 34.9

Project Depth _____ **Overdredge** _____

	Attempt 1	Attempt 2	Attempt 3
Time:	13:20		
(A) Measured Water Depth	34.9		
(B) Tide Height	+1.6		
(C) Mudline Elevation	-33.31		
(-A+B = C include sign of tide height as reported)			
Estimated Penetration	6 ft		
Description of Core Drive	0-3.5 easy-mod 3.5-6 difficult		
Refusal Encountered?	Yes.		
Total Core Length	4.4'		



Core Characteristics

Sediment Type	cobble, gravel, sand C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine
Sediment Odor	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogeneous			

Comments:

Recorded by: K. D'Orazio

WSP
project schedu
ask Sue
Tom Wang

ANCHOR ENVIRONMENTAL, L.L.C.

Sediment Core Collection Form

Station ID: AN-P1-2 **Date:** 15 July 2004

Project Name: KC/Dakota Ck. Industries **Project Number:** 000105-01-5

Coordinates:
(Lat)/Northing 48° 31.3308' N (Long)/Easting: -122° 36.6582' W

Vertical Datum (MLLW) MLW Other:

Depth Measurement Sounder (Leadline) 33.3 ft

Project Depth _____ **Overdredge** _____

	Attempt 1	Attempt 2	Attempt 3
Time:	11:56		
(A) Measured Water Depth	33.3		
(B) Tide Height	-0.1		
(C) Mudline Elevation	-33.4 ft		
(-A+B = C include sign of tide height as reported)			
Estimated Penetration	6 ft		
Description of Core Drive	0-4 mud-hard 4-6 VERY Hard!!		
Refusal Encountered?	yes		
Total Core Length	5.7		

Core Characteristics

Sediment Type	cobble, gravel, sand C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter	cobble, gravel, sand C M F, silt clay, organic matter
Sediment Color	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine	gray, black, brown brown surface, olivine
Sediment Odor	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic	None, slight, mod, strong H_2S, petroleum, septic
Any Layering Homogeneous			

Comments:

Recorded by: K. D'Orazio

ANCHOR ENVIRONMENTAL, L.L.C.

Surface Sediment Field Sample Record

Collection Date: 13 July 2004
Shipping Date:

Project Name: KC-~~ESHIT~~ Dakota Ck. **Project No:** 000105-01-4 **Station ID:** AN-REF-2

Sampling Crew: S. Hine, K. D'Orazio
Sampling Vessel: RV Nancy Anne
Sampling Method: power grab
Subcontractor(s): MSS - D. Dickinson Floyd Snyder McCarthy - T. Lamanna
Station Coordinates: (N) (Lat) 48° 31.7017' N
(W) (Long) 122° 32.1674' W
Weather: sunny, light breezy
Datum: (NAD 83) / WGS 84 Zone:

Sample Number: AN-REF-2-01
Analysis: Metals / BNAs / VOCs / PCBs / Pest / Herb / TBTs / (Diox-Furans)
(TS) / (Grain Size) / (TOC) / (TVS) / Ammonia / Sulfides
(Circle Appropriate Analyses)

Field Test Results
Salinity: ______ ppt
Ammonia: ______ mg/L
Grain Size: ml Coarse: ______ ml Fines: ______
Comments:

Grab Number: 1 Water Depth: 13'6" Penetration/Sampled Depth: 27/15 Time: 16:36
Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:		Comments:
cobble SM	D.O.	(none)	H2S	<1% woodchips
gravel	(gray) dk olive	slight	Petroleum	
(sand) C M (F) silty sand	black	moderate	other:	
(silt) clay	brown	strong		
organic matter	brown surface	overwhelming		

Grab Number: ______ Water Depth: ______ Penetration/Sampled Depth: ______ Time: ______
Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:		Comments:
cobble	D.O.	none	H2S	
gravel	gray	slight	Petroleum	
sand C M F	black	moderate	other:	
silt clay	brown	strong		
organic matter	brown surface	overwhelming		

Grab Number: ______ Water Depth: ______ Penetration/Sampled Depth: ______ Time: ______
Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:		Comments:
cobble	D.O.	none	H2S	
gravel	gray	slight	Petroleum	
sand C M F	black	moderate	other:	
silt clay	brown	strong		
organic matter	brown surface	overwhelming		

Grab Number: ______ Water Depth: ______ Penetration/Sampled Depth: ______ Time: ______
Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:		Comments:
cobble	D.O.	none	H2S	
gravel	gray	slight	Petroleum	
sand C M F	black	moderate	other:	
silt clay	brown	strong		
organic matter	brown surface	overwhelming		

Recorded by: K. D'Orazio

ANCHOR ENVIRONMENTAL, L.L.C.

Surface Sediment Field Sample Record

Shipping Date: Collection Date: 15 July 04

Project Name: Dakota Ck Industries **Project No:** 000105-01-5 **Station ID:** AN-REF01

Sampling Crew: S. Hinz, K. D'Orazio, D. Dickinson

Sampling Vessel: RV Nancy Anne Sampling Method: power grab

Subcontractor(s): MSS

Station Coordinates: (N)/Lat 48° 30.3640' N Weather: overcast light wind. partly sunny

(W)/Long 122° 34.8133' W

Datum: (NAD 83)/ WGS 84 Zone: ~~11~~ PDT

Sample Number: AN-REF1-01-SD

Analysis: Metals / BNAs / VOCs / PCBs / Pest / Herb / TBTs / Diox-Furans

(TS) / ~~Grain Size~~ / TOC / TVS / Ammonia / Sulfides

(Circle Appropriate Analyses)

Field Test Results

~~Salinity:~~ ppt

Ammonia: mg/L

Grain Size: ml Coarse: ml Fines:

Comments: DIGITAL PICTURE #1 of crab KMD.

10.6 FT

Grab Number: 1 Water Depth: ~~16~~ 62 ft Penetration/Sampled Depth: ~~0-15~~ KMD Time: 1200

Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle) 22/15

Sediment Type:	Sediment Color: dk. gray	Sediment Odor: none		Comments:
cobble	D.O. J J	(none)	H2S	root structure
gravel	(gray)	slight	Petroleum	eelgrass
sand C (M) F sandy silt	black 1-22	moderate	other:	decorator crab
silt clay	brown	strong		
organic matter	(brown surface) 0-1	overwhelming		

Grab Number: Water Depth: Penetration/Sampled Depth: Time:

Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:		Comments:
cobble	D.O.	none	H2S	
gravel	gray	slight	Petroleum	
sand C M F	black	moderate	other:	
silt clay	brown	strong		
organic matter	brown surface	overwhelming		

Grab Number: Water Depth: Penetration/Sampled Depth: Time:

Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:		Comments:
cobble	D.O.	none	H2S	
gravel	gray	slight	Petroleum	
sand C M F	black	moderate	other: KMD	
silt clay	brown	strong		
organic matter	brown surface	overwhelming		

Grab Number: Water Depth: Penetration/Sampled Depth: Time:

Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:		Comments:
cobble	D.O.	none	H2S	
gravel	gray	slight	Petroleum	
sand C M F	black	moderate	other:	
silt clay	brown	strong		
organic matter	brown surface	overwhelming		

Recorded by: _____