DATA SUMMARY REPORT
YEAR 1 EVENT 2 LONG-TERM PILOT CAP MONITORING

REMOVAL ACTION
NW NATURAL "GASCO" SITE

Prepared for Submittal to

U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue
Seattle, Washington 98101

Prepared by

Anchor Environmental, L.L.C.
6650 SW Redwood Lane, Suite 110
Portland, Oregon 97224

On behalf of

NW Natural
220 NW Second Avenue
Portland, Oregon 97209

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µg	microgram
Anchor	Anchor Environmental, L.L.C.
ARI	Analytical Resources, Inc.
AWQC	Ambient Water Quality Criteria
BTEX	benzene, toluene, ethylbenzene, and xylene
CAS	Columbia Analytical Services, Inc.
CCC	criterion continuous concentration
COC	chain-of-custody
DOC	dissolved organic carbon
EAF	exposure adjustment factor
EPA	U.S. Environmental Protection Agency
ESB	Equilibrium Partitioning Benchmark
EST	Environmental Sampling Technologies
FCV	Functional Criteria Values
GC/MS	gas chromatograph/mass spectrometer
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
LDC	Laboratory Data Consultants, Inc.
MARP	Monitoring and Reporting Plan
MD	matrix duplicate
MDL	method detection limit
MRL	method reporting limit
MS/MSD	matrix spike and matrix spike duplicate
NELAP	National Environmental Laboratory Accreditation Program
ng	nanogram
NRWQC	National Recommended Water Quality Criteria
OPR	Ongoing Precision Recovery
Order	Administrative Order on Consent
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
PEC	Probable Effects Concentration
PRC	performance reference compounds
PRG	Preliminary Remediation Goal

QA/QC	Quality Assurance/Quality Control
RAOs	Removal Action Objectives
RAPP	Removal Action Project Plan
RPD	relative percent difference
SCV	Sediment Concentration Value
Site	NW Natural "Gasco" Site
SLV	Screening Level Value
SOP	Standard Operating Procedure
SOW	Statement of Work
SPMD	semipermeable membrane device
SVOC	semivolatile organic compound
TOC	total organic carbon
TPH	total petroleum hydrocarbons
TPH-Dx	total petroleum hydrocarbons – diesel range
TPH-Gx	total petroleum hydrocarbons – gas range
TSS	total suspended solids
VOC	volatile organic compound

1 INTRODUCTION

NW Natural entered into an Administrative Order on Consent (Order) with the U.S. Environmental Protection Agency (EPA) on April 28, 2004 to perform a time-critical removal action at the "Gasco" site (Site; EPA 2004a; Figure 1). The Order requires that NW Natural perform a number of actions associated with removing a tar body (as defined in the Order) from the riverbank and nearshore sediment adjacent to the Site. The extent of the tar body was defined during the design characterization sampling (Figure 2). In accordance with the EPA-approved *Final Removal Action Project Plan* (RAPP; Anchor 2005), removal of the tar body was initiated in August 2005 and was completed in late October 2005.

Pending future implementation of a site-wide remedy, long-term monitoring of the tar body removal is being conducted in accordance with the EPA-approved *Monitoring and Reporting Plan* (MARP; Anchor 2006a). The MARP describes post-removal monitoring objectives and provides an overview of the monitoring approach, design of the monitoring program (e.g., sampling strategy, station locations and replication, field sampling methods, and laboratory methods), data analysis and interpretation, reporting requirements, post-removal site control, contingency response, and adaptive management. The objectives of the long-term monitoring within the removal action area are two-fold: 1) to monitor the performance of the remedy with respect to the removal action objectives (RAOs) identified in Section II of the Statement of Work (SOW) attached to the Order; and 2) to evaluate the performance of the engineered pilot cap as a method to minimize chemical movement from underlying sediments. The removal action was an interim action, and the monitoring information gathered pursuant to the MARP is not intended to monitor a permanent remedy.

In accordance with the reporting requirements identified in the MARP (Anchor 2006a), the remainder of this data summary report provides the Year 1 Event 2 monitoring results. As requested by EPA, this data summary report includes a summary of the monitoring conducted and methods used, tabulated results, data validation reports, and sampling location maps.

2 SUMMARY OF MONITORING ACTIVITIES AND ANALYSES

This section summarizes the Year 1 Event 2 sampling activities. Monitoring related to meeting the RAOs of the SOW versus evaluation of the pilot cap are noted in the heading of each subsection below. The results of sampling activities are described in Section 3.

2.1 Visual Inspection (RAO-Specific)

Visual monitoring has been conducted since completion of the removal action remedy to identify any areas of sheen or product release per the RAOs in the project SOW. Following submittal of the *Annual Data Evaluation Monitoring Report – Year 0 Long-Term Pilot Cap Monitoring* (Anchor 2007), visual monitoring was conducted on January 17, February 12, and March 27, 2008. Monitoring was conducted either from the water side, the top of the bank, the beach, and/or the adjacent pipeline structure to ensure visual coverage of the removal action area.

Results of the visual surveys are discussed in Section 3.1.

2.2 Bathymetric Survey (RAO-Specific)

A bathymetry survey was performed during the Year 1 Event 2 monitoring activities on October 29, 2007 within the entire area previously bounded by the outer area containment system to monitor changes in mudline elevation and assess changes in cap and fringe cover thickness.

The bathymetry survey results are discussed in Section 3.2.

2.3 Product Seepage Monitoring (RAO-Specific)

Per the RAOs in the project SOW, product seepage monitoring was performed during the Year 1 Event 2 monitoring through the collection of sediment cores, both within and just channelward of the pilot cap area (Figure 3). Identical to the methods used during Year 0 monitoring, sediment cores were collected using the MudMole™ impact core (mobilized as described in Appendix A of the *Year 0 Event 1 Data Summary Report* [Anchor 2006b]).

In accordance with the MARP (Anchor 2006a), from November 5 through 8, 2007, sediment cores were collected from nine stations within the pilot cap (i.e., PCM-02 to PCM-06, PCM-

08 to PCM-10, and PCM-21; Figure 3). The cores were logged, observed for any signs of product, and, pending sufficient cap thickness (i.e., greater than 0.6 feet), subsampled for bulk chemical analyses to monitor temporal and spatial changes in sediment concentrations within the pilot cap. The chemical analyses included total solids; total organic carbon (TOC); grain size; cyanide; polycyclic aromatic hydrocarbons (PAHs); benzene, toluene, ethylbenzene, and xylene (BTEX); total metals (i.e., arsenic, chromium, copper, nickel, lead, and zinc); pesticides; and polychlorinated biphenyls (PCBs).

Logging was intended to determine the extent of mixing within the pilot cap (at both the underlying sediment/cap and cap/mudline interfaces) and document whether seepage of non-aqueous phase liquid (e.g., mobile phase tar oil and tar) is observable. The core samples from the pilot cap area were horizontally and vertically co-located with the porewater and near-bottom surface water samples (discussed in Sections 2.5 and 2.6; Figure 3) to facilitate direct comparison of the various sampled media within the pilot cap area.

To the extent possible given the accuracy of the positioning equipment, the Year 1 Event 2 core stations were approximately co-located (slightly offset by the diver in accordance with the MARP protocols [Anchor 2006a]) with the Year 1 Event 1 core stations. Similar to Year 1 Event 1, station PCM-18 was relocated to PCM-21 approximately 15 feet southwest of station PCM-18 due to the presence of gravel at this station.

Sediment cores were also collected on November 8, 2007 from two stations (i.e., PCM-11 and PCM-12) just channelward of the pilot cap area. These cores were collected through the fringe cap to visibly monitor potential seepage of non-aqueous phase liquid (e.g., mobile phase tar oil and tar) in the bathymetric "low spot" created by the dredging activities (Figure 3). No samples were collected for chemical analyses from these channelward cores.

The pilot cap sediment analytical results are summarized in Section 3.3.

2.4 Recent Depositional Sediment Sampling (Site-Specific)

As identified during the Year 0 and Year 1 Event 1 monitoring activities, a depositional layer of surface sediment was identified that overlaid the pilot cap armor layer and fringe cover outside of the pilot cap area. This layer showed a consistent thickness of approximately 5

inches across the pilot cap area (Table 1). Although not required by the MARP (Anchor 2006a), NW Natural decided to sample these sediments to determine the chemical characteristics of the river-wide sediment loading to the pilot cap area and perimeter fringe cover area. This material was sampled at three co-located pilot cap monitoring stations (i.e., PCM-02, PCM-06, and PCM-09), forming a diagonal transect across the pilot cap area on November 5, 2007, and at two stations around the perimeter of the pilot cap area (i.e., PCM-14 and PCM-15) on November 7 and November 6, respectively (Figure 3). Because the primary objective for collection of these samples was to help identify the river-wide loading, the samples were analyzed for the full list of Portland Harbor Superfund Site contaminants of interest (Integral 2004).

The depositional surface sediment results are provided in Section 3.4.

2.5 Porewater Migration Sampling (Pilot Cap-Specific)

Migration of chemicals via porewater advection and/or diffusion through the pilot cap was monitored through the collection of porewater samples at six stations (i.e., PCM-02 to PCM-04, PCM-06, PCM-08, PCM-09, and PCM-21) within the pilot cap (Figure 3). The porewater stations were co-located with the pilot cap core stations (see above). A single porewater sample was collected at each station using the piezometer extraction method defined in the MARP (Anchor 2006a), from November 5 to 8, 2007. The piezometer porewater samples were analyzed for TOC, dissolved organic carbon (DOC); the dissolved forms of total, free and amenable cyanide; PAHs; and, BTEX. As per the MARP (Anchor 2006a), DOC, forms of cyanide, and PAHs were laboratory-filtered, so the results are in dissolved concentrations. The BTEX samples were not field- or laboratory-filtered.

2.6 Near-Bottom Surface Water Sampling (Pilot Cap-Specific)

The surface water quality directly overlying the cap and at one ambient station downstream and three ambient stations upstream of the removal action area were monitored through the collection of discrete and time-integrated near-bottom surface water samples (i.e., using semipermeable membrane devices [SPMDs]). Nine near-bottom surface water samples were collected within the pilot cap area co-located with the core and porewater stations (i.e., PCM-02 to PCM-06, PCM-08 to PCM-10, and PCM-21). In addition, discrete samples were collected from three upstream (i.e., PCM-13, PCM-19, and PCM-20) and one downstream

(i.e., PCM-01) stations, and SPMD samples were collected at stations PCM-13 and PCM-01. The sampling locations are shown on Figure 3.

The discrete samples were collected on November 9, 2007, in accordance with the MARP (Anchor 2006a) protocols on the day following completion of the coring and porewater collection activities. The discrete samples were collected first thing in the morning prior to any monitoring activities to prevent the potential disturbance of the mudline and increase the suspended solids in the water column. The discrete samples were analyzed for TOC; DOC; total suspended solids (TSS); total, free, and amenable cyanide; PAHs; and, BTEX. The DOC, forms of cyanide, and PAHs were laboratory-filtered so the results are in dissolved concentrations. The BTEX samples were not field- or laboratory-filtered.

The SPMD carriages were deployed following collection of the discrete near-bottom water samples on November 9, 2007. The carriages were maintained in the river for a period of 32 days and retrieved on December 11, 2007. The SPMD distillates were analyzed for PAHs as well as performance reference compounds (PRCs) (i.e., each bag spiked with 10 micrograms [μg] of phenanthrene-d10 and pyrene-d10). Following the procedures identified in Attachment A of the MARP (Anchor 2006a), the laboratory concentrations (concentration/SPMD) were converted to a water concentration using each of the recovered deuterated PAHs (i.e., each station has two calculated water concentrations) and a water temperature of 10 degrees Celsius.

The discrete and time-integrated near-bottom surface water sampling results are discussed in Section 3.6.

2.7 Chemical Analysis

Columbia Analytical Services, Inc. (CAS), a National Environmental Laboratory Accreditation Program (NELAP) -certified laboratory located in Kelso, Washington, conducted all bulk sediment and water chemical analyses except the dioxins/furans and PCB congeners analysis, which were conducted by Analytical Perspectives located in Wilmington, North Carolina. The SPMD samples were shipped to Environmental Sampling Technologies (EST) located in St. Joseph, Missouri for extraction of the distillates. EST shipped the distillates directly to Analytical Resources, Inc. (ARI) located in Tukwila,

Washington for PAH analysis. Chemical testing adhered to the procedures defined in the MARP (Anchor 2006a).

2.8 Quality Assurance/Quality Control (QA/QC)

2.8.1 Field QA/QC

Field quality assurance/quality control (QA/QC) samples were used to evaluate the efficiency of field decontamination procedures. Trip blanks accompanied samples submitted to the laboratory on November 5 to 9, 2007. One rinsate blank each was submitted in conjunction with sediment core sampling, porewater sampling, and depositional sediment sampling. In addition, one field blank, consisting of analysis of the laboratory-provided deionized water used for the rinsate blanks, was submitted and analyzed. The field blank was labeled PCM-BRB-071108, rather than PCM-BFB-071108.

2.8.2 Laboratory QA/QC

For organic analyses, a matrix spike and matrix spike duplicate (MS/MSD) was analyzed with each analytical method. Exceptions are discussed below. For the inorganic analyses, a MS and a matrix duplicate (MD) was analyzed with each analytical method with the exception of the total solids, TSS, and grain size analyses. A duplicate analysis was performed and a relative percent difference (RPD) was used to evaluate control for these three parameters. Additional quality control included method blanks, surrogate compound analysis, and laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) analysis.

The following organic analyses deviated from the QA/QC samples listed above: total petroleum hydrocarbons – gas range (TPH-Gx), TPH – diesel range (TPH-Dx), dioxin/furan, SPMD, and PCB congener analyses did not have an associated MS/MSD analysis. For the TPH-Gx and TPH-Dx analyses, a lab duplicate was performed instead of an MS/MSD. The SPMD analysis utilized two solvent blank spikes and two Day 0 blanks (spiked with 10 μg/SPMD). The PCB congener and dioxin/furan analyses utilized Ongoing Precision Recovery (OPR) samples to verify that the analysis was in compliance.

2.8.3 Chain-of-Custody

Chain-of-custody (COC) forms and seals were used to track sample custody and document the proper handling and integrity of all field samples. All sediment and porewater samples were provided to the analytical courier for subsequent transport to the laboratory. All samples were packed in chilled coolers. Copies of the COC forms for all sampling media are provided in Appendix E.

2.9 Data Validation

All data submitted in this report were validated by Laboratory Data Consultants, Inc. (LDC) of Carlsbad, California. The data validation was performed under EPA guidelines, as described in the MARP (Anchor 2006a). The analyses were validated using the following documents, as applicable to each method:

- *Contract Laboratory Program National Functional Guidelines for Organic Data Review* (EPA 1999)
- *Contract Laboratory Program National Functional Guidelines for Inorganic Data Review* (EPA 2004b)
- *National Functional Guidelines for Chlorinated Dibenzo-p-Dioxins (CDDs) and Chlorinated Dibenzofurans (CDFs) Data Review* (EPA 2005)
- *EPA SW 846, Third Edition, Test Methods for Evaluating Solid Waste, update 1, July 1992; update IIA, August 1993; update II, September 1994; update IIB, January 1995; update III, December 1996; update IIIA, April 1998; IIIB, November 2004; Update IV, February 2007* (EPA 2007)

3 MONITORING RESULTS

3.1 Visual Inspection

The visual monitoring forms are provided in Appendix A. No areas of sheen or product release were identified during any of the visual inspections. No erosion of the armor material near the upper portion of the organoclay mat was identified as compared to the Year 0 monitoring reported conditions.

3.2 Bathymetry Survey

The results of the bathymetry survey are provided in Figure 4. The isopach surface comparing the elevation differences identified between the post-cap placement (conducted in October 2005) and the Year 1 Event 2 surveys is provided in Figure 5. This isopach surface continues to document that the pilot cap area is, in general, a stable depositional environment and has withstood erosive forces during the high winter flows. Consistent with the Year 1 Event 1 survey (Anchor 2007), a small area within the protected (i.e., no dredging) area just upstream from the channelward pipeline support continues to show elevations below the as-built capping elevations. The lower elevations are in the same general footprint and depths as the Year 0 Event 3 survey, indicating no significant additional erosion in this area. As discussed in previous monitoring reports, it is anticipated that this feature is due to slope failure into the dredged area just upstream. Note that the accuracy of the bathymetry survey is estimated to be plus or minus 0.5 feet.

3.3 Product Seepage Monitoring

The sampling collection information is provided in Table 1 and the core logs and core collection forms are provided in Appendix B and C, respectively. The pilot cap sediment chemistry results obtained from stations PCM-02 to PCM-10 and PCM-21 are provided in Table 2. No seepage of non-aqueous phase liquid (e.g., mobile phase tar oil and tar) was observable in any of the pilot cap cores (Appendix B).

No seepage of non-aqueous phase liquid (e.g., mobile phase tar oil and tar) was observable in either of the two cores (i.e., stations PCM-11 and PCM-12) collected from the hydraulic "low spot" created by the dredging just channelward of the dredge footprint (Appendix B).

3.4 Recent Depositional Sediment Sampling

The depositional surface sediment collection forms are provided in Appendix D and the analytical results are provided in Table 3.

3.5 Porewater Migration Sampling

The pilot cap porewater analytical results obtained using the piezometer sampling device are provided in Table 4.

3.6 Near-Bottom Surface Water

The discrete near-bottom surface water analytical results obtained using a grab sampler are provided in Table 5.

The time-integrated near-bottom surface water concentrations were calculated using SPMD devices. The SPMD distillate laboratory concentrations (reported as nanograms [ng] per sample lipid bag) were input into the calculator spreadsheet (see Attachment A of the MARP [Anchor 2006a]) using the calculated exposure adjustment factors (EAFs) for the various PRCs (i.e., pyrene-d10 and phenanthrene-d10) spiked into the SPMD lipid bags and a river water temperature of 10 degrees Celsius. The calculated PAH concentrations are provided using both the phenathrene (Table 6a) and pyrene (Table 6b) EAFs. It is important to note that the calculator spreadsheet defaults to no detectable naphthalene concentration at a temperature of 10 degrees Celsius regardless of the distillate laboratory concentrations.

3.7 Quality Assurance/Quality Control

The overall data QA/QC results for the Year 1 Event 2 monitoring effort are described below. In summary, data quality objectives were generally met, with some exceptions. Due to a labeling discrepancy, sample PCM-03SC-071106 was analyzed outside of holding times for all analyses. This resulted in estimated values for all applicable analyses. Due to severe problems with the surrogate and/or LCS/LCSD percent recoveries, semivolatile organic compound (SVOC) data were rejected in some depositional sediment samples. Note that NW Natural elected to conduct these depositional sediment analyses, which are not required by the MARP. The sampling event overall objectives were judged to be met.

3.7.1 Field QA/QC

The field QA/QC analytical results are provided in Table 7.

3.7.2 Laboratory QA/QC

Data qualifiers assigned as a result of the data validation and their definitions are shown on each of the respective analytical results tables (i.e., Table 2 to Table 7).

3.7.3 Data Validation

Data validation reports are provided in Appendix F. The data validation reports verified the analytical accuracy and precision of the chemical analyses performed during this monitoring effort. The Year 1 Event 2 monitoring data may have been qualified as estimated for a particular analysis based on method or technical criterion as stated in the functional guidelines (EPA 2004b, 2004c, 2005). It should be noted that qualification as an estimate indicates that the analyte was positively identified and that the associated numerical value is the approximate concentration of the analyte in the sample. Consequently, these data qualifications are not expected to alter the data quality objectives defined in the MARP (Anchor 2006a).

A brief description of the data usability for each of the media monitored is provided in Sections 3.7.3.1 through 3.7.3.6.

3.7.3.1 Sediment Core Results

3.7.3.2 Depositional Sediment Results

A total of five depositional sediment samples were collected on November 5 to 7, 2007. All chemical analyses were analyzed by CAS (Kelso) and reported under the lab report IDs K0710375, K0710416, and K0710470. There were no problems encountered with TPH-Dx and residual range organics, total solids, or grain size analyses. Remaining analyses contained QA/QC-related issues pertaining to method or technical criteria. Associated sample results were qualified as estimated based on these findings. All data were deemed useable as qualified with the following exceptions: samples PCM-02DS-071105, PCM-06DS-071105, PCM-09DS-071105, and PCM-14DS-071107 had severe problems with the SVOC LCS/LCSD percent recoveries and resulted in rejected data for compounds aniline, 2-methylphenol, 4-methylphenol, and 2,4-dimethylphenol. Sample PCM-15DS-071106 had severe SVOC surrogate and LCS percent recovery issues but was re-extracted by the laboratory (beyond holding time). Between the two analyses, there was usable (non-rejected) data for all SVOC target compounds. Hexavalent chromium was rejected in samples PCM-02DS-071105, PCM-06DS-071105, and PCM-09DS-071105 due to significantly missed holding times. Sulfide was rejected in sample PCM-14DS-071107 due to a significantly missed holding time.

3.7.3.3 Porewater and Discrete Surface Water Results

Seven porewater samples and 13 surface water samples were collected from November 5 to 8, 2007. The samples were submitted to CAS (Kelso) and reported under the lab report IDs K0710375, K0710416, K0710470, and K0710558. There were no problems encountered with the volatile organic compounds (VOC), total cyanide, free cyanide, sulfide, DOC, TOC, and TSS analyses. There was an issue with the amenable cyanide analysis, which is described in the following paragraph. The remaining analyses contained a few QA/QC related issues pertaining to method or technical criteria. Associated samples were qualified as estimates based on the findings. All data were deemed useable as qualified. No data were rejected for these samples.

CAS's standard operating procedure (SOP) at the time of this sampling event was to calculate amenable cyanide in both an unchlorinated and chlorinated aliquot of the

sample, then subtract the amount of cyanide detected in the chlorinated aliquot from the amount of cyanide detected in the unchlorinated aliquot. If no total cyanide was detected, the laboratory did not proceed with the analysis of the chlorinated aliquot because any subtraction from zero would yield negative values, which would in turn be reported as non-detect. Because the laboratory did not analyze the chlorinated aliquot and therefore did not follow their SOP, all non-detect amenable cyanide results for the discrete surface water samples have been qualified with "UJ." This issue only affected selected near-bottom surface water samples, given the porewater samples showed detections of total cyanide for all samples, and therefore the laboratory analyzed the chlorinated aliquots and calculated the amenable cyanide concentrations. CAS has recently revised their SOP to reflect the procedure followed for these analyses.

3.7.3.4 Time-Integrated Near-Bottom Surface Water Results

Eleven SPMDs were deployed on November 9, 2007 and retrieved on December 12, 2007. The samples underwent dialysis on January 14, 2008. Processed distillate samples and associated QA/QC samples were sent to ARI (Tukwila), for analysis. Samples were analyzed using a gas chromatograph/mass spectrometer (GC/MS) in selective ion mode with internal standards for quantification. Samples showed moderate to heavy fouling on their exteriors. The continuing calibration for pyrene was outside the method criterion. All results for pyrene have been qualified as estimated with the "J" flag. The initial analysis of sample PCM-01TSW-071211 had low internal standard response for d-12-perylene. The sample was reanalyzed at a 100-times dilution with acceptable internal standard response. Most analytes were diluted out in the 100-times dilution, so only pyrene was reported from this analytical run. The remaining PAHs were reported from the original analysis of 10-times dilution and qualified as estimated in order to perform the calculations. All data were deemed useable as qualified. No data were rejected for these samples.

3.7.3.5 Field QA/QC Analytical Results

Analysis of the pilot cap bulk sediment rinsate blank (i.e., sample PCM-SCRB-071108) resulted in the detection of m,p-xylenes, 2-methylnaphthalene, phenanthrene, aldrin, TPH-Gx, TPH-Dx, chromium, copper, and iron below the

method reporting limit (MRL) but above the method detection limit (MDL). Toluene, naphthalene, lead, and zinc were detected above the MRL.

Analysis of the porewater rinsate blank (i.e., sample PCM-PWRB-071108) resulted in the detection of m,p-xylene, acenaphthene, fluorene, benzo(a)anthracene, chrysene, and iron below the MRL but above the MDL. Toluene, naphthalene, 2-methylnaphthalene, phenanthrene, fluoranthene, and pyrene were detected above the MRL.

Analysis of the depositional rinsate blank (i.e., sample PCM-DRB-071108) resulted in the detection of m,p-xylene, 2-methylnaphthalene, phenanthrene, and chromium below the MRL but above the MDL. Toluene, naphthalene, lead, and zinc were detected above the MRL.

Analysis of the field blank (i.e., sample PCM-BRB-071108) resulted in the detection of m,p-xylene, naphthalene, heptachlor, TPH-Gx, TPH-Dx, residual range organics, and chromium below the MRL but above the MDL. Toluene, 2-methylnaphthalene, lead, and zinc were detected above the MRL.

Four trip blanks were analyzed in association with each day of sample collection. No VOCs were detected in these analyses.

None of the pilot cap sediment core samples, depositional sediment, pilot cap porewater samples, or near-bottom surface water samples were qualified based on the rinsate or field blank analytical results.

3.7.3.6 Reporting Limits

As shown in Table 8, the target laboratory MRLs for all of the pilot cap sediment core samples were achieved except for VOCs and PCBs, which had some samples with elevated MRLs due to matrix interference and/or sample volume and percent moisture effects. Several target MRLs were not achieved for surface depositional sediment samples. SVOC and pesticides analyses of several samples required dilutions due to elevated levels of target compounds, which raised the MRLs. The

VOCs, chlorophenols, chlorophenoxy herbicides, butyltins, and PCB analyses showed matrix interference problems that resulted in raised MRLs for some samples. The chromatograms indicate the presence of non-target background components, which prevented adequate resolution of the target compounds at the reporting limit. The mercury MRL was raised due to method blank contamination. Also, hexavalent chromium and sulfides had higher MRLs than the limits listed in the MARP (Anchor 2006a).

Laboratory reporting limits for the porewater and surface water analyses were met for all analytes except total, amenable, and free cyanide. The MDL, however, met the target reporting limit.

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TABLES

Table 1
Sample Collection Information – Year 1 Event 2 Long-Term Monitoring

	Proposed (NAD 83)		Actual (NAD 83)		Depositional Surface Sediment			Sediment Core					Pilot Cap Porewater (Piezometer)			Discrete Near-Bottom Surface Water		Time-Integrated Near-Bottom Surface Water	
Station	Latitude	Longitude	Latitude	Longitude	Date	Time	Depositional Layer (in)	Date	Time	Water Depth (ft)	Core Recovery (%)	Cap Thickness (ft)	Date	Time	Sampling Midpoint (ft)	Date	Time	Depolyment Date	Retrieval Date
PCM-01	45.5815213	-122.7611330	45.5816167	-122.7610856	--	--	--	--	--	--	--	--	--	--	--	11/9/2007	8:40	11/9/2007	12/11/2007
PCM-02	45.5801345	-122.7583817	45.5801296	-122.7583681	11/5/2007	11:00	4.8	11/7/2007	8:12	28	71	1.2	11/7/2007	10:00	0.6	11/9/2007	10:00	11/9/2007	12/11/2007
PCM-03	45.5800443	-122.7584068	45.5800504	-122.7583873	--	--	--	11/6/2007	8:43	18	75	1.4	11/6/2007	10:10	1.0	11/9/2007	10:05	11/9/2007	12/11/2007
PCM-04	45.5799599	-122.7584167	45.5799693	-122.7583936	--	--	--	11/7/2007	12:37	9	73	0.7	11/7/2007	14:15	0.35	11/9/2007	10:10	11/9/2007	12/11/2007
PCM-05	45.5801330	-122.7582274	45.5801232	-122.7582133	--	--	--	11/7/2007	10:35	34	77	0.5	NA	NA	NSC[e]	11/9/2007	10:15	11/9/2007	12/11/2007
PCM-06	45.5800349	-122.7582066	45.5800453	-122.7582282	11/5/2007	11:20	4.8	11/6/2007	10:55	25	69	1.9	11/6/2007	13:00	0.9	11/9/2007	10:20	11/9/2007	12/11/2007
PCM-21[a]	45.5798940	-122.7582338	45.5798793	-122.7582168	--	--	--	11/6/2007	13:39	9	71	1.0	11/6/2007	15:15	0.5	11/9/2007	10:25	11/9/2007	12/11/2007
PCM-08	45.5800056	-122.7580492	45.5800069	-122.7580286	--	--	--	11/8/2007	8:02	31	90	1.4	11/8/2007	10:00	0.9	11/9/2007	10:35	11/9/2007	12/11/2007
PCM-09	45.5798946	-122.7581036	45.5798754	-122.7580850	11/5/2007	11:40	4.8	11/5/2007	12:43	12	79	1.7	11/5/2007	13:30	0.9	11/9/2007	10:55	11/9/2007	12/11/2007
PCM-10	45.5798427	-122.7582100	45.5798452	-122.7581781	--	--	--	11/5/2007	14:39	8	75	0.5	NA	NA	NSC[e]	11/9/2007	11:05	11/9/2007	12/11/2007
PCM-11[b]	45.5801444	-122.7580801	45.5801463	-122.7580660	--	--	--	11/8/2007	11:39	40	67	NA	--	--	--	--	--	--	--
PCM-12[b]	45.5800973	-122.7579348	45.5800914	-122.7579288	--	--	--	11/8/2007	10:42	39	72	NA	--	--	--	--	--	--	--
PCM-13	45.5789664	-122.7548505	45.5789664	-122.7548505	--	--	--	--	--	--	--	--	--	--	--	11/9/2007	9:25	11/9/2007	12/11/2007
PCM-14[c]	45.5804451	-122.7578888	45.5804451	-122.7578888	11/7/2007	14:45	1[f]	--	--	--	--	--	--	--	--	--	--	--	--
PCM-15[c]	45.5802183	-122.7572758	45.5802183	-122.7572758	11/6/2007	16:45	2	--	--	--	--	--	--	--	--	--	--	--	--
PCM-19[d]	45.5787667	-122.7548054	45.5787667	-122.7548054	--	--	--	--	--	--	--	--	--	--	--	11/9/2007	9:10	11/9/2007	--
PCM-20[d]	45.5791756	-122.7549144	45.5791756	-122.7549144	--	--	--	--	--	--	--	--	--	--	--	11/9/2007	9:15	11/9/2007	--

Notes:

a This station was offset approximately 15 feet southwest from station PCM-18 sampled during Year 0 Event 3 and sampled during Year 1 Event 1. Gravel placed at the target station location as part of the Phase 2 offshore drilling actitivies precluded sampling at the target station. This station was targeted during the Year 1 Event 2 monitoring.

b Cores were collected only for visual observations of the presence of tar product, no chemical analyses were performed.

c Additional depositional sediment sampling station collected during the Year 1 Event 2 sampling to better evaluate depositional sediment concentrations surrounding the pilot cap area.

d Additional ambient sampling station collected during the Year 1 Event 2 sampling to better evaluate upriver ambient surface water concentrations.

e No sample collected due to insufficient cap thickness.

f No archive volume collected due to insufficient volume

NA Not applicable.

NSC No sample collected.

Table 2
Pilot Cap Sediment Analytical Results – Year 1 Event 2 Long-Term Monitoring

Location ID Sample ID Sample Date	ODEQ (2001) Bioaccumulative Level II Screening Level Values (SLV)	MacDonald et al. (2000) Consensus Based Toxicity Probable Effects Concentrations (PEC)	PCM-02 PCM-02SC-071107 11/7/07	PCM-03 PCM-03SC-071106 11/6/07	PCM-04 PCM-04SC-071107 11/7/07	PCM-05 PCM-05SC-071107 11/7/07	PCM-06 PCM-06SC-071106 11/6/07	PCM-08 PCM-08SC-071108 11/8/07	PCM-09 PCM-09SC-071105 11/5/07	PCM-10 PCM-10SC-071105 11/5/07	PCM-21 PCM-21SC-071106 11/6/07
Metals (mg/kg)											
Aluminum	--	--	**--**	**4020 J**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
Antimony	10	64	**--**	0.06 U	**--**	**--**	**--**	**--**	**--**	**--**	**--**
Arsenic	4	33	**0.8**	**0.8**	**0.9**	**0.8**	**0.5**	**0.6**	**0.8**	**0.7**	**1.1**
Cadmium	0.003	4.98	**--**	**0.045**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
Chromium	4200	111	**5.46**	**7.9**	**10.2**	**19.4**	**6.63**	**7.79 J**	**5.99**	**8.11**	**6.94**
Copper	10	149	**7.35**	**6.6**	**14.4**	**10.4**	**15.5**	**17.9 J**	**12.4**	**15.7**	**15.4**
Iron	--	--	**11400**	**10000 J**	**21100**	**17000**	**20600 J**	**23900**	**14000**	**27900**	**20000 J**
Lead	128	128	**1.34**	**1.74**	**3.85**	**1.97**	**2.02**	**2.3**	**1.56 J**	**2.28 J**	**2.88**
Nickel	316	48.6	**6.14**	**8.1**	**9.9**	**7.89**	**8.97**	**10.8**	**8.7 J**	**11.3 J**	**11.3**
Silver	--	5	**--**	**0.054**	**--**	**--**	**--**	**--**	**--**	**--**	**--**
Zinc	3	459	**19.3**	**23.4**	**26.6**	**22.2**	**24.3**	**28**	**22 J**	**24.4 J**	**27.1**
PCBs (µg/kg)											
Aroclor 1016	420	530	10 U	11 U	10 U	9.9 U	10 U	9.9 U	10 U	10 U	10 U
Aroclor 1221	--	--	20 U	21 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Aroclor 1232	--	--	10 U	11 U	10 U	9.9 U	10 U	9.9 U	10 U	10 U	10 U
Aroclor 1242	2		10 U	11 U	10 U	9.9 U	10 U	9.9 U	10 U	10 U	10 U
Aroclor 1248	4	1500	10 U	11 U	10 U	9.9 U	10 U	9.9 U	10 U	10 U	10 U
Aroclor 1254	10	300	10 U	17 U	10 U	9.9 U	10 U	9.9 U	10 U	10 U	10 U
Aroclor 1260	--	200	10 U	11 U	10 U	9.9 U	10 U	9.9 U	10 U	10 U	10 U
Aroclor 1262	--	676	10 U	11 U	10 U	9.9 U	10 U	9.9 U	10 U	10 U	10 U
Aroclor 1268	--	--	10 U	11 U	10 U	9.9 U	10 U	9.9 U	10 U	10 U	10 U
Total PCB	--	--	20 U	21 U	20 U	20 U	20 U	20 U	20 U	20 U	20 U
Pesticides (µg/kg)											
4,4'-DDD	0.3	28	**0.5 J**	0.81 UJ	**0.68 J**	**1.6**	**0.8 J**	**0.43 J**	1 U	1 U	**1.4**
4,4'-DDE	0.3	31.3	1 U	0.81 UJ	1 U	0.99 U	1 UJ	0.99 U	1 U	1 U	1 UJ
4,4'-DDT	0.3	62.9	1 U	0.81 UJ	1 U	0.99 U	**0.32 J**	0.99 U	1 U	1 U	1 U
Total DDT	0.3	--	**0.5**	0.81 UJ	**0.68**	**1.6**	**1.12**	**0.43**	1 U	1 U	**1.4**
Aldrin	--	40	1 U	1.5 UJ	1.6 U	1.5 U	1 UJ	1.8 U	**1.1**	1 U	**4.4 J**
alpha-BHC	--	--	1 U	0.81 UJ	1 U	0.99 U	1 U	0.99 U	1 U	1 U	1 U
alpha-Chlordane	--	--	1 U	0.81 UJ	1 U	0.99 U	1 U	0.99 U	1 U	1 U	1 U
gamma-Chlordane	--	--	1 U	0.81 UJ	1 U	0.99 U	1 UJ	0.99 U	1 U	1 U	1 UJ
Total Chlordane	--	--	1 U	0.81 UJ	1 U	0.99 U	1 U	0.99 U	1 U	1 U	1 U
beta-BHC	--	--	1 U	0.85 UJ	1 U	0.99 U	1 U	0.99 U	1 U	1 U	1 U
delta-BHC	--	--	1 U	**0.43 J**	1 U	0.99 U	1 U	0.99 U	1 U	1 U	1 U
Dieldrin	--	61.8	1 U	0.81 UJ	1 U	0.99 U	1 UJ	0.99 U	1 U	1 U	1 UJ
Endosulfan I	--	--	1 U	0.81 UJ	1.1 U	0.99 U	1 U	0.99 U	1 U	1 U	1 U
Endosulfan II	--	--	1 U	0.81 UJ	1 U	0.99 U	1 U	0.99 U	1 U	1 U	1 U
Endosulfan sulfate	--	--	1 U	**0.44 J**	1 U	0.99 U	1 U	0.99 U	1 U	1 U	1 U
Endrin	--	207	1 U	0.81 UJ	1 U	0.99 U	1 U	0.99 U	1 U	1 U	1 U
Endrin aldehyde	--	--	1 U	0.81 UJ	1 U	0.99 U	**0.13 J**	0.99 U	1 U	1 U	1 U
Endrin ketone	--	--	1 U	**0.17 J**	1 U	0.99 U	1 U	0.99 U	1 U	1 U	1 U
gamma-BHC (Lindane)	--	4.99	1 U	2.1 UJ	1.1 U	0.99 U	1 U	0.99 U	1 U	1 U	1 U
Heptachlor	--	10	1 U	0.81 UJ	1 U	0.99 U	1 U	0.99 U	1 U	1 U	1 U

Table 2
Pilot Cap Sediment Analytical Results – Year 1 Event 2 Long-Term Monitoring

Location ID Sample ID Sample Date	ODEQ (2001) Bioaccumulative Level II Screening Level Values (SLV)	MacDonald et al. (2000) Consensus Based Toxicity Probable Effects Concentrations (PEC)	PCM-02 PCM-02SC-071107 11/7/07	PCM-03 PCM-03SC-071106 11/6/07	PCM-04 PCM-04SC-071107 11/7/07	PCM-05 PCM-05SC-071107 11/7/07	PCM-06 PCM-06SC-071106 11/6/07	PCM-08 PCM-08SC-071108 11/8/07	PCM-09 PCM-09SC-071105 11/5/07	PCM-10 PCM-10SC-071105 11/5/07	PCM-21 PCM-21SC-071106 11/6/07
Heptachlor epoxide	--	16	1 U	0.81 UJ	**0.54 J**	0.99 U	1 U	0.99 U	**0.52 J**	**0.16 J**	1 U
Methoxychlor	--	--	1 UJ	0.81 UJ	1 UJ	0.99 UJ	1 U	0.99 UJ	**0.32 J**	1 U	1 U
Toxaphene	--	--	50 U	41 UJ	60 U	50 U	50 UJ	52 U	50 U	50 U	50 UJ
PAHs (µg/kg)											
2-Methylnaphthalene	--	200	**94**	**16 J**	**630**	**330**	**87**	**210**	**83**	**3.4 J**	**100**
Acenaphthene	--	300	**550**	**380 J**	**2300**	**1200**	**690**	**2500**	**1400**	**140**	**7300**
Acenaphthylene	--	200	**42**	**210 J**	**460**	**150**	**120**	**190**	**250**	**39**	**400**
Anthracene	--	845	**380**	**680 J**	**1600**	**1300**	**990**	**2300**	**1200**	**160**	**6000**
Benzo(a)anthracene	--	1050	**360**	**660 J**	**1600**	**1100**	**730**	**1700**	**1000**	**200**	**4000**
Benzo(a)pyrene	--	1450	**500**	**960 J**	**2200**	**1500**	**1000**	**2400**	**1400**	**280**	**5000**
Benzo(b)fluoranthene	--	--	**430**	**810 J**	**2000**	**1300**	**930**	**2100**	**1200**	**260**	**4500**
Benzo(g,h,i)perylene	--	300	**410**	**780 J**	**1800**	**1200**	**890**	**2000**	**1100**	**270**	**4500**
Benzo(k)fluoranthene	--	13000	**150**	**290 J**	**610**	**400**	**350**	**670**	**500**	**120**	**2000**
Total Benzofluoranthenes	--	--	**580**	**1100 J**	**2610**	**1700**	**1280**	**2770**	**1700**	**380**	**6500**
Chrysene	--	1290	**430**	**810 J**	**2000**	**1500**	**1100**	**2300**	**1400**	**270**	**4800**
Dibenzo(a,h)anthracene	--	1300	**39**	**63 J**	**170**	**110**	**77**	**190**	**120**	**27**	**420**
Dibenzofuran	--	--	**29**	**--**	**170**	**100**	**--**	**--**	**91**	**11**	**--**
Fluoranthene	--	2230	**1400**	**2800 J**	**6500**	**4100**	**3300**	**7400**	**4500**	**850**	**18000**
Fluorene	--	536	**250**	**240 J**	**1200**	**740**	**450**	**970**	**630**	**10**	**2800**
Indeno(1,2,3-cd)pyrene	--	100	**360**	**720 J**	**1600**	**1100**	**820**	**1800**	**1100**	**230**	**4000**
Naphthalene	--	561	**310**	**100 J**	**2400**	**1100**	**330**	**630**	**940**	**59**	**470**
Phenanthrene	--	1170	**2000**	**2600 J**	**9500**	**5800**	**4200**	**10000**	**6400**	**230**	**25000**
Pyrene	--	1520	**1600**	**3200 J**	**7500**	**5200**	**4000**	**8800**	**5200**	**970**	**23000**
Total HPAH	--	--	**5680**	**11100 J**	**26000**	**17500**	**13200**	**29400**	**17500**	**3480**	**70200**
Total LPAH	--	--	**3530**	**4210 J**	**17500**	**10300**	**6780**	**16600**	**10800**	**638**	**42000**
Total PAH		676	**9210**	**15300 J**	**43400**	**27800**	**20000**	**45900**	**28300**	**4110**	**112000**
Total Petroleum Hydrocarbons (mg/kg)											
Diesel Range	--	--	**11 J**	**430**	**140**	**81**	**56**	**140**	**74**	**19**	**350**
Gasoline Range	--	--	6 U	11 U	6.2 U	6 U	5.7 U	6.1 U	5.8 U	5.8 U	6 U
Residual Range	--	--	**9.9 J**	**330**	**130**	**85 J**	**60 J**	**120 J**	**64 J**	**23 J**	**270**
Volatile Organics (µg/kg)											
Benzene	--	--	1.1 U	**2.3 J**	**8.8**	**6.5**	1.2 U	1.5 U	1.4 U	1.1 U	1.2 U
Ethylbenzene	--	--	1.1 U	2.6 U	**4.6**	**0.77 J**	1.2 U	1.5 U	1.4 U	1.1 U	1.2 U
Toluene	--	--	1.1 U	2.6 U	**0.84 J**	**0.62 J**	1.2 U	1.5 U	1.4 U	1.1 U	1.2 U
m,p-Xylene	--	--	1.1 U	**0.54 J**	**5.3**	**1 J**	1.2 U	**0.23 J**	**0.25 J**	1.1 U	1.2 U
o-Xylene	--	--	1.1 U	**0.46 J**	**7.9**	1.5 U	1.2 U	1.5 U	**0.34 J**	1.1 U	1.2 U
Total Xylene	--	--	1.1 U	**1 J**	**13.2**	**1**	1.2 U	**0.23**	**0.59 J**	1.1 U	1.2 U
Conventionals (%)											
Total organic carbon	--	--	**0.06 J**	**1.48 J**	**0.17 J**	**0.08 J**	**0.12 J**	**0.32 J**	**0.12 J**	**0.11 J**	**0.51 J**
Total solids	--	--	**82.9**	**47.3**	**80.2**	**82.3**	**87.3**	**80**	**84.9**	**85.8**	**83.9**
Conventionals (mg/kg)											
Cyanide	--	--	**0.13**	**0.65**	**0.22**	**0.1 J**	0.11 U	**0.23**	**0.1 J**	**0.09 J**	**0.11**
Grain Size (%)											
Fines	--	--	**0.6**	**0.55**	**3.31**	**1.31**	**2.46**	**3.39**	**0.95**	**3.45**	**1.53**

Table 2
Pilot Cap Sediment Analytical Results – Year 1 Event 2 Long-Term Monitoring

Location ID Sample ID Sample Date	ODEQ (2001) Bioaccumulative Level II Screening Level Values (SLV)	MacDonald et al. (2000) Consensus Based Toxicity Probable Effects Concentrations (PEC)	PCM-02 PCM-02SC-071107 11/7/07	PCM-03 PCM-03SC-071106 11/6/07	PCM-04 PCM-04SC-071107 11/7/07	PCM-05 PCM-05SC-071107 11/7/07	PCM-06 PCM-06SC-071106 11/6/07	PCM-08 PCM-08SC-071108 11/8/07	PCM-09 PCM-09SC-071105 11/5/07	PCM-10 PCM-10SC-071105 11/5/07	PCM-21 PCM-21SC-071106 11/6/07
Gravel	--	--	**6.54**	**12**	**29.2**	**16**	**29.4**	**32.4**	**19.8**	**24.8**	**26.1**
Sand, Very Coarse	--	--	**14**	**10.3**	**16.8**	**11.4**	**16.1**	**16**	**17.8**	**15.4**	**16**
Sand, Coarse	--	--	**26.6**	**21.3**	**18.2**	**21**	**20**	**20.9**	**22.7**	**22.9**	**20.4**
Sand, Medium	--	--	**32.9**	**33.9**	**17.8**	**27.8**	**16.2**	**15.3**	**21**	**17.1**	**19.4**
Sand, Fine	--	--	**12.1**	**15.4**	**8.65**	**13.5**	**6.64**	**6.16**	**8.35**	**5.84**	**8.69**
Sand, Very Fine	--	--	**0.71**	**0.78**	**1.44**	**1.12**	**1.24**	**1.49**	**0.81**	**1.18**	**1.77**
Silt	--	--	**0.51**	**0.45**	**2.4**	**0.99**	**1.72**	**2.44**	**0.76**	**2.38**	**1.15**
Clay	--	--	**0.09**	**0.1**	**0.91**	**0.32**	**0.74**	**0.95**	**0.19**	**1.07**	**0.38**

Notes

Detections are bold.

U The analyte was analyzed for, but not detected above the sample reporting limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ The analyte was not detected at the estimated detection limit.

Non-detected concentration above one or more toxicity or Bioaccumulative Level II SLVs.

Detected concentration greater than Oregon Department of Environmetnal Quality (ODEQ) Level II SLVs.

Detected concentration greater than MacDonald PECs.

Table 3
Depositional Surface Sediment Analytical Results – Year 1 Event 2 Long-Term Monitoring

Location ID Sample ID Sample Date Depth Interval	ODEQ (2001) Bioaccumulative Level II Screening Level Values (SLV)	MacDonald et al. (2000) Consensus Based Toxicity Probable Effects Concentration (PEC)	PCM-02 PCM-02DS-071105 11/5/07 4.8 in	PCM-06 PCM-06DS-071105 11/5/07 4.8 in	PCM-09 PCM-09DS-071105 11/5/07 4.8 in	PCM-14 PCM-14DS-071107 11/7/07 0.8 in	PCM-15 PCM-15DS-071106 11/6/07 2 in	PCM-15 PCM-15DS-071106RE 11/6/07 2 in
Conventionals (mg/kg)								
Ammonia	--	--	**75.7**	**116**	**62.8**	**23.2 J**	**28**	**--**
Sulfide	--	--	1.2 UJ	**2.3 J**	1.2 UJ	R	1 U	**--**
Conventionals (pct)	--	--	**--**	**--**	**--**	**--**	**--**	**--**
Total organic carbon	--	--	**2.56 J**	**2.3 J**	**2.25 J**	**0.46 J**	**1.29 J**	**--**
Total solids	--	--	**42.5**	**43.4**	**45.5**	**57**	**50.4**	**--**
Dioxin/Furans (pg/g)	--	--	**--**	**--**	**--**	**--**	**--**	**--**
2,3,7,8-TCDD	--	--	**0.332 J**	0.58 U	**0.289 J**	0.0478 U	0.112 U	--
1,2,3,7,8-PeCDD	--	--	**0.9 J**	**0.826 J**	**0.741 J**	**0.285 J**	1.08 U	--
1,2,3,4,7,8-HxCDD	--	--	**1.56 J**	**1.17 J**	**1.02 J**	**0.492 J**	**0.765 J**	--
1,2,3,6,7,8-HxCDD	--	--	**8.21**	**5.29**	**4.62**	**2.52**	**3.41**	--
1,2,3,7,8,9-HxCDD	--	--	**3.38 J**	**2.5 J**	**2.23 J**	**1.22 J**	**1.76 J**	--
1,2,3,4,6,7,8-HpCDD	--	--	**296**	**133**	**121**	**56.5**	**72.2**	--
OCDD	--	--	**2520**	**1240**	**1120**	**504**	**647**	--
2,3,7,8-TCDF	--	--	**21.6**	**14.6**	**12.3**	**7.89**	**9.44**	--
1,2,3,7,8-PeCDF	--	--	**20.7**	**19.6**	**11.2**	**19.6**	**15.7**	--
2,3,4,7,8-PeCDF	--	--	**11.6**	**10.3**	**6.3**	**8.59**	**7.53**	--
1,2,3,4,7,8-HxCDF	--	--	**37.2**	**41.5**	**37**	**29**	**25.4**	--
1,2,3,6,7,8-HxCDF	--	--	**7.78**	**9.89**	**9.66**	**6.86**	**5.89**	--
1,2,3,7,8,9-HxCDF	--	--	**4.12**	**4.23**	**3.38**	**2.89**	**2.83**	--
2,3,4,6,7,8-HxCDF	--	--	**3.2 J**	**3.23**	**2.73 J**	**2.29**	**2.37**	--
1,2,3,4,6,7,8-HpCDF	--	--	**40.2**	**31.8**	**39.7**	**16.2**	**21.1**	--
1,2,3,4,7,8,9-HpCDF	--	--	**8.01**	**7.61**	**9.52**	**3.17**	**4.74**	--
OCDF	--	--	**144**	**96**	**100**	**38**	**54.6**	--
Total TCDD	--	--	**7.46**	**6.47**	**5.73**	**3.42**	**3.84**	--
Total PeCDD	--	--	**9.95**	**6.78**	**5.88**	**3.46**	**2.45**	--
Total HxCDD	--	--	**83.2**	**36.6**	**41.3**	**21.4**	**26.9**	--
Total HpCDD	--	--	**692**	**307**	**278**	**123**	**154**	--
Total TCDF	--	--	**67.6**	**49.5**	**41.5**	**20.9**	**26.5**	--
Total PeCDF	--	--	**64.1**	**60.6**	**43.3**	**48.6**	**41.3**	--
Total HxCDF	--	--	**93.1**	**91.7**	**84.8**	**57.2**	**54.7**	--
Total HpCDF	--	--	**135**	**96.1**	**106**	**42.1**	**57.3**	--
Grain Size (pct)	--	--	**--**	**--**	**--**	**--**	**--**	**--**
Clay	--	--	**1.2**	**2.22**	**1.56**	**1.41**	**1.21**	**--**
Fines	--	--	**1.2**	**2.22**	**1.56**	**1.41**	**1.21**	**--**
Gravel	--	--	**0.52**	**0.98**	**0.52**	**0.27**	**2**	**--**
Sand, Coarse	--	--	**1.01**	**1.2**	**2.22**	**8.52**	**6.39**	**--**
Sand, Fine	--	--	**9.63**	**7.73**	**7.95**	**6.2**	**8.65**	**--**
Sand, Medium	--	--	**3.01**	**2.22**	**6.7**	**35.6**	**17.9**	**--**
Sand, Very Coarse	--	--	**0.87**	**0.62**	**0.87**	**3**	**2.27**	**--**
Sand, Very Fine	--	--	**25**	**47.6**	**46.2**	**3.07**	**3.58**	**--**
Silt, Coarse	--	--	**11**	**9.54**	**9.32**	**7.76**	**10.3**	**--**
Silt, Fine	--	--	**4.1**	**4.42**	**3.99**	**3.09**	**3.82**	**--**
Silt, Medium	--	--	**7.41**	**8.66**	**7.96**	**4.95**	**5.92**	**--**

Table 3
Depositional Surface Sediment Analytical Results – Year 1 Event 2 Long-Term Monitoring

Location ID Sample ID Sample Date Depth Interval	ODEQ (2001) Bioaccumulative Level II Screening Level Values (SLV)	MacDonald et al. (2000) Consensus Based Toxicity Probable Effects Concentration (PEC)	PCM-02 PCM-02DS-071105 11/5/07 4.8 in	PCM-06 PCM-06DS-071105 11/5/07 4.8 in	PCM-09 PCM-09DS-071105 11/5/07 4.8 in	PCM-14 PCM-14DS-071107 11/7/07 0.8 in	PCM-15 PCM-15DS-071106 11/6/07 2 in	PCM-15 PCM-15DS-071106RE 11/6/07 2 in
Silt, Very Fine	--	--	**4.3**	**3.95**	**4.29**	**2.68**	**3.65**	--
Metals (mg/kg)	--	--	--	--	--	--	--	--
Aluminum	--	--	**29500**	**25100**	**23900**	**13600**	**20600 J**	--
Antimony	10	64	**0.12**	**0.12**	**0.11**	**0.08**	**0.07**	--
Arsenic	4	33	**4.1**	**3.2**	**3.1**	**2.4**	**2.7**	--
Cadmium	0.003	4.98	**0.193**	**0.194**	**0.186**	**0.104**	**0.134**	--
Chromium	4200	111	**37.3**	**33.5**	**32.4**	**19**	**28.3**	--
Chromium VI	--	--	R	R	R	**0.14 J**	**0.18 J**	--
Copper	10	149	**42.6**	**39.2**	**37.2**	**20.6**	**27.6**	--
Iron	--	--	**41500**	**36700**	**35200**	**24600**	**28500 J**	--
Lead	128	128	**16.9 J**	**11.8 J**	**12.6 J**	**7.48**	**8.53**	--
Mercury	--	1.06	**0.065**	0.054 U	0.049 U	0.054 U	0.031 U	--
Nickel	316	48.6	**28.5**	**26.3**	**22.6**	**15.1**	**18.4**	--
Selenium	0.1	5	**0.13**	**0.15**	**0.13**	**0.1**	**0.16**	--
Silver	--	5	**0.19**	**0.196**	**0.178**	**0.122**	**0.162**	--
Zinc	3	459	**120**	**105**	**100**	**61.9**	**75.1**	--
Metals Organic (µg/kg)	--	--	--	--	--	--	--	--
Di-n-Butyltin	--	--	**1.2 J**	**1.5 J**	**1.7 J**	**1.7 J**	**2 J**	--
Monobutyltin	--	--	2.3 U	**0.64 J**	**0.81 J**	**0.74 J**	**0.77 J**	--
Tetrabutyltin	--	--	2.3 U	2.3 U	2.2 U	1.8 U	2 U	--
Tri-n-Butyltin	190	--	**2 J**	**2.6**	**2.1 J**	**3.7**	**2.7**	--
PCBs (µg/kg)	--	--	--	--	--	--	--	--
Aroclor 1016	420	530	12 U	12 U	11 U	9.9 U	9.9 U	--
Aroclor 1221	--	--	24 U	29 U	22 U	21 U	20 U	--
Aroclor 1232	--	--	12 U	15 U	11 U	9.9 U	9.9 U	--
Aroclor 1242	2	--	12 U	12 U	11 U	9.9 U	9.9 U	--
Aroclor 1248	4	1500	12 U	12 U	11 U	9.9 U	9.9 U	--
Aroclor 1254	10	300	53 U	27 U	29 U	23 U	17 U	--
Aroclor 1260	--	200	12 U	12 U	11 U	9.9 U	9.9 U	--
Aroclor 1262	--	--	12 U	12 U	11 U	9.9 U	9.9 U	--
Aroclor 1268	--	--	12 U	12 U	11 U	9.9 U	9.9 U	--
Total PCB	--	676	53 U	29 U	29 U	23 U	20 U	--
PCB Congeners (pg/g)								
PCB-001	--	--	**18.4**	**8.43**	**7.46**	**17.5**	**5.17**	--
PCB-002	--	--	**16.7**	**10**	**8.3**	**5.14**	**5.66**	--
PCB-003	--	--	**22**	**10.6**	**9.69**	**7.22**	**5.83**	--
PCB-004	--	--	**47.5**	**32.2**	**28.7**	**24.4**	**17.4**	--
PCB-005	--	--	0.568 U	**0.91**	**0.813**	**0.535**	**0.415**	--
PCB-006	--	--	**16.9**	**12.8**	**11.5**	**7.31**	**6.19**	--
PCB-007	--	--	**2.71**	**2.1**	**1.76**	**1.32**	**0.921**	--
PCB-015	--	--	**111**	**74.6**	**65.6**	**39.4**	**41.7**	--
PCB-008	--	--	**76.5**	**48.6**	**46.7**	**31.4**	**26.1**	--
PCB-009	--	--	**5.49**	**4.09**	**3.82**	**2.44**	**2.15**	--
PCB-010	--	--	**1.82**	**1.13**	**1.07**	**0.749**	**0.655**	--
PCB-011	--	--	**198**	**148**	**168**	**88**	**114**	--

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PCB-012/013	--	--	**11**	**8.38**	**7.3**	**4.55**	**4.14**	--
PCB-014	--	--	0.516 U	**0.271**	0.173 U	**0.198**	0.195 U	--
PCB-016	--	--	**111**	**58.1**	**54.6**	**29.7**	**26.2**	--
PCB-017	--	--	**110**	**65.9**	**55.6**	**34.3**	**34.9**	--
PCB-018/030	--	--	**254**	**140**	**126**	**72.3**	**62.9**	--
PCB-019	--	--	**56**	**42.2**	**35.2**	**21.3**	**24.9**	--
PCB-020/028	--	--	**465**	**285**	**240**	**137**	**134**	--
PCB-021/033	--	--	**156**	**89.9**	**80.4**	**43.2**	**42.9**	--
PCB-022	--	--	**131**	**77.4**	**66.9**	**36**	**35.3**	--
PCB-023	--	--	0.379 U	**0.296**	**0.254**	0.112 U	0.137 U	--
PCB-024	--	--	0.224 U	**1**	**1.36**	**0.952**	**0.584**	--
PCB-025	--	--	**31.3**	**27.3**	**19.3**	**11.1**	**11.8**	--
PCB-026/029	--	--	**66.5**	**46.6**	**36.9**	**19.7**	**20.4**	--
PCB-027	--	--	**22.3**	**15**	**12.9**	**7.54**	**8.48**	--
PCB-031	--	--	**347**	**195**	**166**	**89.2**	**87.1**	--
PCB-032	--	--	0.209 U	**44.7**	**39.5**	**22.8**	**21.2**	--
PCB-034	--	--	**2.59**	**2.14**	**1.64**	**0.885**	**0.924**	--
PCB-035	--	--	**9.54**	**7.01**	**6.24**	**3.37**	**3.68**	--
PCB-036	--	--	**1.11**	**1.16**	**1**	**0.514**	**0.47**	--
PCB-037	--	--	**167**	**108**	**93.8**	**53.5**	**58.6**	--
PCB-038	--	--	**0.856**	**0.819**	**0.538**	**0.342**	**0.3**	--
PCB-039	--	--	**3.37**	0.222 U	**2.13**	**1.27**	**1.27**	--
PCB-040/071	--	--	**304**	**193**	**152**	**83.2**	**83.9**	--
PCB-041	--	--	**53.5**	**31**	**23.9**	**12.8**	**13.5**	--
PCB-042	--	--	**188**	**124**	**98.1**	**54.7**	**53.6**	--
PCB-043	--	--	**28.7**	**17.9**	**13.6**	**7.7**	**7.03**	--
PCB-044/047/065	--	--	**697**	**526**	**374**	**218**	**242**	--
PCB-045	--	--	**85.4**	**46**	**37.2**	**18.9**	**16.4**	--
PCB-046	--	--	**36.3**	**22.2**	**17.8**	**9.96**	**8.86**	--
PCB-048	--	--	**112**	**68.4**	**52.5**	**29.5**	**27.5**	--
PCB-049/069	--	--	**400**	**312**	**223**	**129**	**143**	--
PCB-050/053	--	--	**104**	**78.1**	**59.8**	**35.4**	**40.5**	--
PCB-051	--	--	**40.4**	**41.1**	**33.3**	**22.2**	**33.8**	--
PCB-052	--	--	**796**	**684**	**419**	**230**	**259**	--
PCB-054	--	--	**9.42**	**8.54**	**6.46**	**4.24**	**8.12**	--
PCB-055	--	--	**5.52**	**4.27**	**3.55**	**2.01**	**1.89**	--
PCB-056	--	--	**296**	**200**	**150**	**86.9**	**87.9**	--
PCB-057	--	--	**2.75**	0.585 U	**1.75**	**0.866**	**0.975**	--
PCB-058	--	--	**1.99**	0.676 U	**1.54**	0.331 U	**0.976**	--
PCB-059/062/075	--	--	**50.1**	**33.4**	**26.7**	**15.2**	**14.9**	--
PCB-060	--	--	**122**	**69.1**	**54.1**	**30.7**	**29.6**	--
PCB-061/070/074/076	--	--	**1070**	**817**	**556**	**309**	**341**	--
PCB-063	--	--	**20.8**	**14.8**	**10.6**	**6.08**	**6.61**	--
PCB-064	--	--	**242**	**163**	**119**	**65.5**	**64.5**	--
PCB-066	--	--	**617**	**447**	**336**	**192**	**209**	--

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PCB-067	--	--	**16.9**	**12.3**	**9.8**	**6.48**	**5.99**	--
PCB-068	--	--	**5.93**	**5.12**	**3.97**	**2.7**	**2.76**	--
PCB-072	--	--	**7.74**	**6.7**	**5.69**	**3.18**	**3.64**	--
PCB-073	--	--	0.277 U	**2.03**	**1.77**	**1.04**	**1.49**	--
PCB-077	--	--	**74.8**	**52.3**	**44.6**	**25.8**	**28.6**	--
PCB-078	--	--	0.924 U	0.67 U	0.64 U	0.329 U	0.434 U	--
PCB-079	--	--	**7.43**	**8.3**	**5.77**	**3.18**	**3.56**	--
PCB-080	--	--	0.808 U	0.586 U	0.56 U	0.287 U	0.379 U	--
PCB-081	--	--	**2.82**	**1.65**	**1.79**	**0.998**	**1.06**	--
PCB-082	--	--	**113**	**117**	**65.9**	**34.8**	**44**	--
PCB-083	--	--	**49.4**	**59.9**	**22.7**	**16.7**	**18.4**	--
PCB-084	--	--	**194**	**222**	**114**	**60.2**	**81.4**	--
PCB-085/116	--	--	**131**	**133**	**75.9**	**44.1**	**54.6**	--
PCB-086/087/097/108/119/125	--	--	**544**	**632**	**348**	**176**	**232**	--
PCB-088	--	--	0.648 U	0.375 U	0.376 U	0.252 U	0.399 U	--
PCB-089	--	--	**12.4**	**10.5**	**6.66**	**3.38**	**3.92**	--
PCB-090/101/113	--	--	**857**	**964**	**610**	**294**	**387**	--
PCB-091	--	--	**105**	**114**	**68.3**	**38.4**	**51.6**	--
PCB-092	--	--	**179**	**206**	**128**	**65**	**85.9**	--
PCB-093/100	--	--	**19.9**	**19.4**	**16.2**	**10.7**	**15.2**	--
PCB-094	--	--	**7.35**	**7.7**	**4.92**	**3.3**	**4.39**	--
PCB-095	--	--	**583**	**667**	**356**	**193**	**257**	--
PCB-096	--	--	**11.9**	**10.2**	**6.45**	**3.99**	**5.47**	--
PCB-098	--	--	**1.67**	**1.31**	**0.738**	0.227 U	0.359 U	--
PCB-099	--	--	**392**	**415**	**303**	**137**	**182**	--
PCB-102	--	--	**28.5**	**26.8**	**16.6**	**9.97**	**13**	--
PCB-103	--	--	**14.2**	**14**	**11.4**	**6.89**	**8.95**	--
PCB-104	--	--	**1.37**	**1.19**	**0.947**	**0.78**	**1.38**	--
PCB-105	--	--	**326**	**357**	**223**	**102**	**134**	--
PCB-106	--	--	0.476 U	0.276 U	0.276 U	**0.233**	**0.418**	--
PCB-107/124	--	--	**28**	**34.8**	**18.1**	**9.21**	**12.4**	--
PCB-109	--	--	**51.1**	**56.9**	**48.7**	**18.2**	**23.8**	--
PCB-110	--	--	**969**	**1080**	**609**	**321**	**416**	--
PCB-111	--	--	**0.916**	**0.979**	**3.89**	**0.492**	**0.56**	--
PCB-112	--	--	0.5 U	0.29 U	0.29 U	0.195 U	0.308 U	--
PCB-114	--	--	**18.6**	**22.2**	**16.4**	**6.01**	**7.86**	--
PCB-115	--	--	0.391 U	0.227 U	0.227 U	0.152 U	0.241 U	--
PCB-117	--	--	**14.5**	**24.9**	**12.3**	**5**	**5.71**	--
PCB-118	--	--	**773**	**894**	**498**	**267**	**342**	--
PCB-120	--	--	**5.3**	**4.71**	**15.4**	**2.24**	**2.71**	--
PCB-121	--	--	**0.922**	**0.775**	**1.05**	**0.464**	**0.671**	--
PCB-122	--	--	**9.94**	**11.1**	**6.03**	**3.41**	**4.38**	--
PCB-123	--	--	**15.5**	**15.5**	**8.3**	**4.61**	**6.31**	--
PCB-126	--	--	**3.87**	**3.18**	**3.6**	**1.79**	**2.32**	--
PCB-127	--	--	0.424 U	0.248 U	0.251 U	0.163 U	0.266 U	--

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PCB-128/166	--	--	**169**	**199**	**116**	**56.2**	**75.8**	--
PCB-129/138/163	--	--	**1330**	**1420**	**1150**	**498**	**664**	--
PCB-130	--	--	**77.1**	**89**	**111**	**29.2**	**40.6**	--
PCB-131	--	--	**10.8**	**14.6**	**7.15**	**3.72**	**5.56**	--
PCB-132	--	--	**366**	**396**	**260**	**136**	**179**	--
PCB-133	--	--	**23.8**	**24.2**	**121**	**10.4**	**13.8**	--
PCB-134	--	--	**74.9**	**81.2**	**55.6**	**27.9**	**37.6**	--
PCB-135/151	--	--	**505**	**467**	**517**	**194**	**242**	--
PCB-136	--	--	**211**	**196**	**129**	**76.2**	**97.9**	--
PCB-137	--	--	**32.3**	**39.9**	**31**	**12.3**	**16.9**	--
PCB-139/140	--	--	**18.2**	**22.3**	**83.5**	**7.23**	**9.63**	--
PCB-141	--	--	**237**	**237**	**170**	**87.7**	**113**	--
PCB-142	--	--	0.307 U	**1.23**	**0.833**	0.12 U	0.184 U	--
PCB-143	--	--	0.269 U	**3.23**	**1.45**	0.105 U	0.161 U	--
PCB-144	--	--	**68**	**64.7**	**45.5**	**24.6**	**30.2**	--
PCB-145	--	--	**0.51**	**0.479**	0.191 U	0.0756 U	**0.177**	--
PCB-146	--	--	**244**	**237**	**1020**	**96.5**	**126**	--
PCB-147/149	--	--	**1060**	**999**	**765**	**402**	**513**	--
PCB-148	--	--	**5.25**	**4.59**	**39.8**	**2.49**	**3.32**	--
PCB-150	--	--	**4.94**	**4.19**	**16.9**	**2.07**	**3.01**	--
PCB-152	--	--	**1.83**	**1.8**	**1.26**	**0.789**	**1.11**	--
PCB-153/168	--	--	**1170**	**1130**	**1310**	**452**	**580**	--
PCB-154	--	--	**27**	**24.1**	**207**	**11.7**	**16.1**	--
PCB-155	--	--	**0.408**	**0.496**	**1.62**	**0.319**	**0.352**	--
PCB-156/157	--	--	**121**	**160**	**121**	**44.6**	**62.9**	--
PCB-158	--	--	**118**	**138**	**101**	**42.8**	**57.8**	--
PCB-159	--	--	**16.9**	**15**	**41.6**	**6.69**	**8.28**	--
PCB-160	--	--	0.221 U	0.209 U	0.228 U	0.0865 U	0.132 U	--
PCB-161	--	--	0.193 U	0.182 U	0.199 U	0.0755 U	0.116 U	--
PCB-162	--	--	**3.19**	**4.89**	**4.63**	**1.27**	**1.5**	--
PCB-164	--	--	**83.2**	**91.5**	**70.8**	**32.2**	**41.5**	--
PCB-165	--	--	**1.55**	**1.09**	**2.85**	**0.737**	**0.877**	--
PCB-167	--	--	**45.5**	**54.8**	**48.2**	**17.1**	**22.3**	--
PCB-169	--	--	**3.37**	**4.21**	**16**	**1.76**	**2.4**	--
PCB-170	--	--	**334**	**318**	**1280**	**138**	**187**	--
PCB-171/173	--	--	**125**	**118**	**309**	**50.7**	**66.7**	--
PCB-172	--	--	**62.7**	**58.6**	**246**	**25.6**	**34**	--
PCB-174	--	--	**455**	**404**	**1110**	**184**	**238**	--
PCB-175	--	--	**19**	**17.5**	**44.1**	**7.04**	**9.94**	--
PCB-176	--	--	**46**	**38.8**	**88.4**	**19**	**22.4**	--
PCB-177	--	--	**276**	**248**	**950**	**111**	**142**	--
PCB-178	--	--	**85.8**	**71.3**	**297**	**37**	**44.3**	--
PCB-179	--	--	**207**	**172**	**415**	**87.8**	**104**	--
PCB-180/193	--	--	**822**	**744**	**3460**	**343**	**450**	--
PCB-181	--	--	**12.5**	**10.8**	**8.11**	**3.39**	**5.21**	--

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PCB-182	--	--	**2.76**	**2.65**	**38.3**	**1.18**	**1.38**	--
PCB-183	--	--	**215**	**186**	**599**	**88.4**	**114**	--
PCB-184	--	--	**0.684**	**0.812**	**3**	**0.325**	**0.402**	--
PCB-185	--	--	**34**	**35.6**	**81.2**	**14**	**17.3**	--
PCB-186	--	--	**0.606**	0.176 U	0.192 U	0.154 U	0.117 U	--
PCB-187	--	--	**584**	**510**	**2030**	**236**	**310**	--
PCB-188	--	--	**1.1**	**1.02**	**11.2**	**0.639**	**0.741**	--
PCB-189	--	--	**14.1**	**15**	**77.1**	**6.22**	**7.76**	--
PCB-190	--	--	**77.5**	**73.2**	**376**	**32**	**43.6**	--
PCB-191	--	--	**16.1**	**14.7**	**64.6**	**6.31**	**8.3**	--
PCB-192	--	--	0.825 U	0.898 U	1.07 U	0.482 U	0.626 U	--
PCB-194	--	--	**220**	**194**	**1670**	**90.9**	**122**	--
PCB-195	--	--	**88.3**	**83.9**	**652**	**38.3**	**50.8**	--
PCB-196	--	--	**94.8**	**82.7**	**649**	**39**	**47.9**	--
PCB-197	--	--	**8.86**	**7.53**	**50.8**	**3.44**	**4.61**	--
PCB-198/199	--	--	**311**	**251**	**1680**	**114**	**143**	--
PCB-200	--	--	**32.6**	**28.3**	**167**	**12.3**	**16.3**	--
PCB-201	--	--	**32.6**	**27.5**	**175**	**12.7**	**16.2**	--
PCB-202	--	--	**50.2**	**41.5**	**210**	**19.3**	**24.5**	--
PCB-203	--	--	**162**	**130**	**909**	**61.6**	**78.2**	--
PCB-204	--	--	0.382 U	0.405 U	0.539 U	0.32 U	0.343 U	--
PCB-205	--	--	**11**	**10.1**	**85.3**	**4.39**	**6.27**	--
PCB-206	--	--	**222**	**121**	**522**	**63**	**81.8**	--
PCB-207	--	--	**21**	**15.1**	**57**	**7.5**	**9.98**	--
PCB-208	--	--	**63.6**	**35.2**	**91.2**	**18.4**	**25.2**	--
PCB-209	--	--	**204**	**142**	**599**	**73.9**	**104**	--
Dichlorobiphenyls (total)	--	--	**471**	**333**	**335**	**200**	**213**	--
Heptachlorobiphenyls (total)	--	--	**3390**	**3040**	**11500**	**1390**	**1810**	--
Hexachlorobiphenyls (total)	--	--	**6020**	**6120**	**6550**	**2280**	**2970**	--
Monochlorobiphenyl (total)	--	--	**57.1**	**29.1**	**25.4**	**29.9**	**16.7**	--
Nonachlorobiphenyl (total)	--	--	**307**	**171**	**670**	**88.9**	**117**	--
Octachlorobiphenyl (total)	--	--	**1010**	**857**	**6250**	**396**	**510**	--
Pentachlorobiphenyl (total)	--	--	**5460**	**6130**	**3620**	**1840**	**2410**	--
Tetrachlorobiphenyls (total)	--	--	**5400**	**3990**	**2840**	**1610**	**1740**	--
Trichlorobiphenyls (total)	--	--	**1930**	**1210**	**1040**	**585**	**576**	--
Pesticides (µg/kg)	--	--	--	--	--	--	--	--
2,2-Dichloropropionic acid	--	--	120 U	120 U	110 U	88 U	99 U	--
2,4,5-T	--	--	120 U	120 U	110 U	88 U	99 U	--
2,4,5-TP (Silvex)	--	--	120 U	120 U	110 U	88 U	99 U	--
2,4-D	--	--	120 UJ	120 UJ	110 UJ	**22 J**	99 UJ	--
2,4-DB	--	--	120 U	150 U	110 U	88 U	99 U	--
2,4'-DDD	--	--	19 U	19 U	**3.1 J**	**4 J**	**3.8 J**	--
2,4'-DDE	--	--	5.9 U	5.8 U	1.1 U	0.99 U	0.99 UJ	--
2,4'-DDT	--	--	**11 J**	5.8 UJ	**3.6 J**	**2.9**	**1.4 J**	--
4,4'-DDD	0.3	28	**25**	**12**	**12**	**6.6**	**8**	--

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4,4'-DDE	0.3	31.3	**5.4 J**	**5.8**	**3.8**	**2.6**	**2.7 J**	--
4,4'-DDT	0.3	62.9	**20**	**15**	**36**	**3.7**	**1.4**	--
Aldrin	--	40	7 U	9.5 U	1.6 U	0.99 U	0.99 UJ	--
alpha-BHC	--	--	5.9 U	5.8 U	1.1 U	0.99 U	0.99 U	--
alpha-Chlordane	--	--	5.9 U	5.8 U	1.1 U	0.99 U	0.99 U	--
beta-BHC	--	--	12 U	5.8 U	1.1 U	0.99 U	0.99 U	--
cis-Nonachlor	--	--	**4.2 J**	5.8 UJ	**1.6 J**	0.99 U	0.99 UJ	--
delta-BHC	--	--	5.9 U	5.8 U	1.1 U	0.99 U	0.99 U	--
Dicamba	--	--	120 U	120 U	110 U	88 U	99 U	--
Dichloroprop	--	--	120 U	120 U	110 U	88 U	99 U	--
Dieldrin	--	61.8	5.9 U	5.8 U	1.1 U	0.99 U	0.99 UJ	--
Dinoseb	--	--	120 U	120 U	110 U	88 U	99 U	--
Endosulfan I	--	--	5.9 U	5.8 U	1.1 U	0.99 U	0.99 U	--
Endosulfan II	--	--	5.9 U	5.8 U	1.1 U	0.99 U	0.99 U	--
Endosulfan sulfate	--	--	5.9 U	5.8 U	1.1 U	0.99 U	0.99 U	--
Endrin	--	207	5.9 U	5.8 U	1.1 U	2.6 U	0.99 U	--
Endrin aldehyde	--	--	5.9 U	5.8 U	1.1 U	0.99 U	0.99 U	--
Endrin ketone	--	--	5.9 U	5.8 U	1.1 U	0.99 U	0.99 U	--
gamma-BHC (Lindane)	--	4.99	5.9 U	9.6 U	2.5 U	0.99 U	0.99 U	--
gamma-Chlordane	--	--	5.9 U	5.8 U	1.1 U	**0.45 J**	0.99 UJ	--
Heptachlor	--	10	**3.6 J**	**4.7 J**	1.1 U	0.99 U	0.99 U	--
Heptachlor epoxide	--	16	**3.2 J**	5.8 U	1.1 U	0.99 U	0.99 U	--
Hexachlorobutadiene	--	600	5.9 U	5.8 U	1.1 U	0.99 U	0.99 U	--
Hexachloroethane	--	--	5.9 UJ	5.8 UJ	**0.74 J**	**0.38 J**	**0.83 J**	--
MCPA	--	--	24000 U	23000 U	22000 U	18000 U	20000 U	--
MCPP	--	--	24000 U	23000 U	22000 U	18000 U	20000 U	--
Methoxychlor	--	--	9.4 UJ	17 UJ	1.1 UJ	0.99 UJ	0.99 U	--
Mirex	--	--	5.9 UJ	5.8 UJ	1.1 UJ	0.99 U	0.99 UJ	--
Oxychlordane	--	--	5.9 U	6.8 U	1.1 U	0.99 U	0.99 U	--
Total Chlordane	--	17.6	5.9 U	5.8 U	1.1 U	**0.45**	0.99 U	--
Total DDT	0.3	--	**61.4**	**32.8**	**58.5**	**19.8**	**17.3**	--
Toxaphene	--	--	400 U	380 U	97 U	50 U	50 UJ	--
trans-Nonachlor	--	--	5.9 UJ	5.8 UJ	1.1 UJ	0.99 U	0.99 UJ	--
SVOC (µg/kg)	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	--	9200	240 UJ	57 UJ	110 UJ	44 UJ	50 UJ	R
1,2-Dichlorobenzene	--	1700	240 UJ	57 UJ	110 UJ	44 UJ	50 UJ	R
1,3-Dichlorobenzene	--	300	240 UJ	57 UJ	110 UJ	44 UJ	50 UJ	R
1,4-Dichlorobenzene	--	300	240 UJ	57 UJ	110 UJ	44 UJ	50 UJ	R
2,3,4,5-Tetrachlorophenol	--	--	12 U	12 U	11 U	8.5 U	9.4 U	--
2,3,5,6-Tetrachlorophenol	--	--	**0.62 J**	**0.87 J**	11 U	8.5 U	9.4 U	--
2,4,5-Trichlorophenol	--	--	240 UJ	57 UJ	110 UJ	44 UJ	R	99 UJ
2,4,5-Trichlorophenol	--	--	12 U	12 U	11 U	8.5 U	9.4 U	--
2,4,6-Trichlorophenol	--	--	240 UJ	57 UJ	110 UJ	44 UJ	R	99 UJ
2,4,6-Trichlorophenol	--	--	**0.38 J**	12 U	11 U	**0.3 J**	9.4 U	--
2,4-Dichlorophenol	--	--	240 UJ	57 UJ	110 UJ	44 UJ	R	99 UJ

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2,4-Dimethylphenol	--	--	R	R	R	R	R	500 UJ
2,4-Dinitrophenol	--	--	4700 UJ	1200 UJ	2200 UJ	870 UJ	R	2000 UJ
2,4-Dinitrotoluene	--	--	240 UJ	57 U	110 U	44 U	50 U	R
2,6-Dinitrotoluene	--	--	240 U	57 U	110 U	44 U	50 U	R
2-Chloronaphthalene	--	--	240 UJ	57 UJ	110 UJ	44 UJ	50 UJ	R
2-Chlorophenol	--	--	240 UJ	57 UJ	110 UJ	44 UJ	R	99 UJ
2-Methylnaphthalene	--	200	**1800**	**830**	**120**	**78**	**15**	--
2-Methylphenol	--	--	R	R	R	R	R	99 UJ
2-Nitroaniline	--	--	470 U	120 U	220 U	87 U	99 U	R
2-Nitrophenol	--	--	240 UJ	57 UJ	110 UJ	44 UJ	R	99 UJ
3,3'-Dichlorobenzidine	--	--	2400 UJ	570 UJ	1100 UJ	440 UJ	500 UJ	R
3-Nitroaniline	--	--	470 UJ	120 UJ	220 UJ	87 UJ	99 UJ	R
4,6-Dinitro-2-methylphenol	--	--	2400 U	570 U	1100 U	440 U	R	990 UJ
4-Bromophenyl-phenylether	--	--	240 U	57 U	110 U	44 U	50 U	R
4-Chloro-3-methylphenol	--	--	240 UJ	57 UJ	110 UJ	44 UJ	R	99 UJ
4-Chloroaniline	--	--	240 UJ	57 UJ	110 UJ	44 UJ	50 UJ	R
4-Chlorophenyl-phenylether	--	--	240 UJ	57 UJ	110 UJ	44 UJ	50 UJ	R
4-Methylphenol	--	--	R	R	R	R	R	99 UJ
4-Nitroaniline	--	--	470 UJ	120 UJ	220 UJ	87 UJ	99 UJ	R
4-Nitrophenol	--	--	2400 U	570 U	1100 U	440 U	R	990 UJ
Acenaphthene	--	300	**7700**	**2100**	**600**	**220**	**98**	--
Acenaphthylene	--	200	**2100**	**430**	**490**	**66**	**28**	--
Aniline	--	--	R	R	R	R	R	200 UJ
Anthracene	--	845	**17000**	**2500**	**2000**	**200**	**190**	--
Azobenzene	--	--	240 UJ	57 UJ	110 UJ	44 UJ	50 UJ	R
Benzo(a)anthracene	--	1050	**19000**	**2700**	**3600**	**700**	**260**	--
Benzo(a)pyrene	--	1450	**29000**	**4300**	**5900**	**1100**	**430**	--
Benzo(b)fluoranthene	--	--	**24000**	**3700**	**5100**	**980**	**400**	--
Benzo(g,h,i)perylene	--	300	**27000**	**3900**	**5200**	**850**	**410**	--
Benzo(k)fluoranthene	--	13000	**8900**	**1700**	**2000**	**310**	**150**	--
Total Benzofluoranthenes	--	--	**32900**	**5400**	**7100**	**1290**	**550**	--
Benzyl alcohol	--	--	470 UJ	120 UJ	220 UJ	87 UJ	99 UJ	R
bis(2-Chloroethoxy)methane	--	--	240 UJ	57 UJ	110 UJ	44 UJ	50 UJ	R
bis(2-Chloroethyl)ether	--	--	240 UJ	57 UJ	110 UJ	44 UJ	50 UJ	R
bis(2-Chloroisopropyl)ether	--	--	240 UJ	57 UJ	110 UJ	44 UJ	50 UJ	R
bis(2-Ethylhexyl)phthalate	330	800	**220 J**	**82 J**	**160 J**	**53 J**	**81 J**	R
Butylbenzylphthalate	--	--	240 U	57 U	110 U	44 U	50 U	R
Carbazole	--	1600	**340**	**66**	**87 J**	**20 J**	**19 J**	R
Chrysene	--	1290	**24000**	**3800**	**4500**	**910**	**360**	--
Dibenzo(a,h)anthracene	--	1300	**2600**	**380**	**550**	**100**	**41**	--
Dibenzofuran	--	--	**480**	**150**	**45 J**	**15**	**33**	--
Diethylphthalate	--	600	240 U	57 U	110 U	44 U	50 U	R
Dimethylphthalate	--	--	240 U	57 U	110 U	44 U	50 U	R
Di-n-butylphthalate	--	100	470 U	120 U	220 U	87 U	99 U	R
Di-n-octylphthalate	--	--	240 U	57 U	110 U	44 U	50 U	R

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Fluoranthene	--	2230	**59000**	**9200**	**10000**	**1400**	**670**	--
Fluorene	--	536	**4700**	**1200**	**400**	**86**	**110**	--
Hexachlorobenzene	--	100	240 U	57 U	110 U	44 U	50 U	R
Hexachlorobutadiene	--	600	240 U	57 U	110 U	44 U	50 U	R
Hexachlorocyclopentadiene	--	400	1200 UJ	290 UJ	550 UJ	220 UJ	250 UJ	R
Hexachloroethane	--	--	240 UJ	57 UJ	110 UJ	44 UJ	50 UJ	R
Indeno(1,2,3-cd)pyrene	--	100	**24000**	**3500**	**4800**	**780**	**380**	--
Isophorone	--	--	240 UJ	57 UJ	110 UJ	44 UJ	50 UJ	R
Naphthalene	--	561	**10000**	**2400**	**670**	**350**	**110**	--
Nitrobenzene	--	--	240 UJ	57 UJ	110 UJ	44 UJ	50 UJ	R
n-Nitroso-di-n-propylamine	--	--	240 UJ	57 UJ	110 UJ	44 UJ	50 UJ	R
n-Nitroso-di-phenylamine	--	--	240 UJ	57 UJ	110 UJ	44 UJ	50 UJ	R
Pentachlorophenol	--	1000	2400 U	570 U	1100 U	440 UJ	R	990 UJ
Pentachlorophenol	--	1000	**3.4 J**	**12 J**	11 U	8.5 U	9.4 U	--
Phenanthrene	--	1170	**42000**	**8200**	**4800**	**630**	**460**	--
Phenol	--	50	710 UJ	180 UJ	330 UJ	140 UJ	R	300 UJ
Pyrene	--	1520	**70000**	**11000**	**12000**	**1700**	**750**	--
Total HPAH	--	--	**287000**	**44200**	**53600**	**8830**	**3850**	--
Total LPAH	--	--	**83500**	**16800**	**8960**	**1550**	**996**	--
Total PAH	--	676	**371000**	**61000**	**62600**	**10400**	**4850**	--
Total Petroleum Hydrocarbons (mg/kg)	--	--	**--**	**--**	**--**	**--**	**--**	--
Diesel Range	--	--	**4100**	**190**	**260**	**69**	**66**	--
Gasoline Range	--	--	**24**	12 U	11 U	8.8 U	9.9 U	--
Residual Range	--	--	**3700**	**730**	**840**	**240**	**340**	--
Volatile Organics (µg/kg)	--	--	**--**	**--**	**--**	**--**	**--**	--
1,1,1,2-Tetrachloroethane	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
1,1,1-Trichloroethane	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
1,1,2,2-Tetrachloroethane	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
1,1,2-Trichloroethane	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
1,1-Dichloroethane	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
1,1-Dichloroethene	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
1,2,3-Trichloropropane	--	--	7 U	5.6 U	5.2 U	4.1 U	5.4 U	--
1,2-Dibromoethane	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
1,2-Dichloroethane	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
1,2-Dichloropropane	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
1,4-Dichlorobenzene	--	300	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
2-Butanone (MEK)	--	--	14 UJ	12 UJ	11 UJ	8.2 UJ	11 UJ	--
2-Chloroethylvinylether	--	--	7 U	5.6 U	5.2 U	4.1 U	5.4 U	--
2-Hexanone	--	--	28 U	23 U	21 U	17 U	22 U	--
4-Methyl-2-pentanone (MIBK)	--	--	5.6 U	4.5 U	4.1 U	3.3 U	4.3 U	--
Acetone	--	--	56 UJ	45 UJ	41 UJ	33 UJ	43 UJ	--
Acrolein	--	--	14 UJ	15 UJ	13 UJ	11 UJ	14 UJ	--
Acrylonitrile	--	--	5.6 U	4.5 U	4.1 U	3.3 U	4.3 U	--
Benzene	--	--	**310**	2.3 U	2.1 U	1.7 U	**2.8**	--
Bromochloromethane	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--

Table 3
Depositional Surface Sediment Analytical Results – Year 1 Event 2 Long-Term Monitoring

Location ID Sample ID Sample Date Depth Interval	ODEQ (2001) Bioaccumulative Level II Screening Level Values (SLV)	MacDonald et al. (2000) Consensus Based Toxicity Probable Effects Concentration (PEC)	PCM-02 PCM-02DS-071105 11/5/07 4.8 in	PCM-06 PCM-06DS-071105 11/5/07 4.8 in	PCM-09 PCM-09DS-071105 11/5/07 4.8 in	PCM-14 PCM-14DS-071107 11/7/07 0.8 in	PCM-15 PCM-15DS-071106 11/6/07 2 in	PCM-15 PCM-15DS-071106RE 11/6/07 2 in
Bromodichloromethane	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
Bromoform	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
Bromomethane	--	--	14 U	12 U	11 U	8.2 U	11 U	--
Carbon disulfide	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
Carbon tetrachloride	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
Chlorobenzene	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
Chloroethane	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
Chloroform	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
Chloromethane	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
cis-1,3-Dichloropropene	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
Dibromochloromethane	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
Dibromomethane	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
Dichlorodifluoromethane	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
Ethylbenzene	--	--	**3.8**	2.3 U	2.1 U	1.7 U	2.2 U	--
Iodomethane	--	--	56 UJ	45 UJ	41 UJ	33 UJ	43 U	--
Isopropylbenzene	--	--	**5.1**	2.3 U	2.1 U	1.7 U	2.2 U	--
m,p-Xylene	--	--	**6**	2.3 U	2.1 U	1.7 U	2.2 U	--
Methylene chloride	--	--	14 U	12 U	11 U	8.2 U	11 U	--
Methyltert-butylether	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
o-Xylene	--	--	**20**	**0.6 J**	2.1 U	1.7 U	2.2 U	--
Styrene	--	--	**1.2 J**	2.3 U	2.1 U	1.7 U	2.2 U	--
Tetrachloroethene	--	500	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
Toluene	--	--	**1.9 J**	2.3 U	2.1 U	1.7 U	2.2 U	--
Total Xylene	--	--	**26**	**0.6**	2.1 U	1.7 U	2.2 U	--
trans-1,2-Dichloroethene	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
trans-1,3-Dichloropropene	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
trans-1,4-Dichloro-2-butene	--	--	7 U	5.6 U	5.2 U	4.1 U	5.4 U	--
Trichloroethene	--	2100	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
Trichlorofluoromethane	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--
Vinyl acetate	--	--	7 UJ	5.6 UJ	5.2 UJ	4.1 UJ	5.4 UJ	--
Vinyl chloride	--	--	2.8 U	2.3 U	2.1 U	1.7 U	2.2 U	--

Notes:

Detections are bold

U The analyte was analyzed for, but not detected above the sample reporting limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ The analyte was not detected above the sample reporting limit. However, the sample reporting limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R Data was rejected after validation

Non-detected concentration above one or more toxicity or Bioaccumulative Level II SLVs,

Detected concentration greater than ODEQ Level II SLVs.

Detected concentration greater than MacDonald PECs.

* This analyte coelutes and cannot be separated from 2,3,4,6-tetrachlorophenol.

Table 4
Piezometer Pilot Cap Porewater Analytical Results – Year 1 Event 2 Long-Term Monitoring

Location ID Sample ID Sample Date	EPA 2002 Final Chronic Values (FCVs) for Equilibrium Screening Benchmarks (ESBs)	PCM-02 PCM-02PW-071107 11/7/07	PCM-03 PCM-03PW-071106 11/6/07	PCM-04 PCM-04PW-071107 11/7/07	PCM-06 PCM-06PW-071106 11/6/07	PCM-08 PCM-08PW-071108 11/8/07	PCM-09 PCM-09PW-071105 11/5/07	PCM-21 PCM-21PW-071106 11/6/07
Conventionals (mg/L)								
Dissolved organic carbon	--	**6.4**	**7.5**	**7.4**	**6.3**	**7.6**	**4.3**	**8.3**
Sulfide	--	**0.027 J**	**0.24**	**0.19**	**0.17**	0.05 U	**0.038 J**	**0.03 J**
Total organic carbon	--	**7.4**	**9.9**	**9.4**	**6.9**	**8.7**	**5**	**9.2**
Cyanides (mg/L)								
Amenable Cyanide	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Cyanide (dissolved)	--	**0.04**	**0.03**	**0.19**	**0.03**	**0.07**	**0.03**	**0.03**
Cyanide	--	**0.04**	**0.04**	**0.14**	**0.03**	**0.07**	**0.04**	**0.02**
Free Cyanide		0.01 U	0.01 U	**0.006 J**	**0.008 J**	**0.009 J**	**0.007 J**	0.01 U
Metals (µg/L)								
Iron (dissolved)	--	**1340**	**54**	**1240**	31.5 U	**41**	33.1 U	**49**
Iron	--	**5970**	**5560**	**13100**	**6460**	**2750**	**2890**	**2500**
PAHs (µg/L)								
2-Methylnaphthalene	--	**56**	**45**	**6.4**	**8.5**	**5.4**	**11**	**0.6**
Acenaphthene	55.85	**370**	**100**	**49**	**110**	**180**	**190**	**270**
Acenaphthylene	306.5	**2**	**120**	**17**	**5.1**	**33**	**22**	**2.1**
Anthracene	20.73	**11**	**1.7**	**1.1**	**0.61**	**5.8**	**3.5**	**5.1**
Benzo(a)anthracene	2.227	**0.021 J**	**0.023 J**	**0.23**	**0.012 J**	**0.03**	**0.054**	**0.06**
Benzo(a)pyrene	0.9573	**0.0048 J**	**0.01 J**	**0.29**	**0.0071 J**	**0.012 J**	**0.035**	**0.023**
Benzo(b)fluoranthene	0.6774	0.022 U	**0.0094 J**	**0.25**	**0.0068 J**	**0.01 J**	**0.031**	**0.019 J**
Benzo(g,h,i)perylene	--	0.022 U	**0.0058 J**	**0.26**	**0.0057 J**	**0.0076 J**	**0.024**	**0.011 J**
Benzo(k)fluoranthene	0.6415	0.022 U	**0.0044 J**	**0.1**	0.023 U	**0.0039 J**	**0.01 J**	**0.0085 J**
Total Benzofluoranthenes	--	0.022 U	**0.0138 J**	**0.35**	**0.0068**	**0.0139 J**	**0.041**	**0.0275 J**
Chrysene	2.042	**0.012 J**	**0.014 J**	**0.47**	**0.0092 J**	**0.019 J**	**0.051**	**0.036**
Dibenzo(a,h)anthracene	0.2825	0.022 U	0.023 U	**0.036**	0.023 U	0.021 U	**0.0032 J**	0.02 U
Dibenzofuran	--	**6.5**		**2**			**6.4**	
Fluoranthene	7.109	**1.9**	**0.46**	**1.4**	**0.33**	**1.9**	**1.1**	**2.6**
Fluorene	39.3	**54**	**18**	**6.1**	**2.8**	**19**	**11**	**35**
Indeno(1,2,3-cd)pyrene	--	0.022 U	**0.0061 J**	**0.24**	**0.0048 J**	**0.0073 J**	**0.021**	**0.011 J**
Naphthalene	193.5	**2500**	**4800**	**510**	**570**	**1900**	**640**	**52**
Phenanthrene	19.13	**100**	**35**	**7.9**	**5.1**	**100**	**47**	**66**
Pyrene	10.11	**1.4**	**0.39**	**1.3**	**0.29**	**1.2**	**1.1**	**2.3**
Total HPAH	--	**3.34**	**0.923**	**4.58**	**0.666**	**3.19**	**2.43**	**5.07**
Total LPAH	--	**3040**	**5070**	**591**	**694**	**2240**	**913**	**430**
Total PAH	--	**3040**	**5080**	**596**	**694**	**2240**	**916**	**435**
Volatile Organics (µg/L)								
Benzene	--	**210**	**2600**	**650**	**540**	**400**	**94**	**0.48 J**
Ethylbenzene	--	**36**	**14**	**9.7**	**13**	**39**	**6.4**	**0.25 J**
Toluene	--	**5.1**	**6**	**14**	**6.7**	**6.4**	**1.2 J**	**0.39 J**
m,p-Xylene	--	**31**	**21**	**15**	**11**	**22**	**3.5**	**0.4 J**
o-Xylene	--	**17**	**17**	**17**	**18**	**34**	**5.5**	**0.5**
Total Xylene	--	**48**	**38**	**32**	**29**	**56**	**9**	**0.9**

Notes:

a Samples were laboratory filtered

Detections are bold

U The analyte was analyzed for, but not detected above the sample reporting limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

Detected concentration greater than EPA (2002) FCVs for ESBs.

Table 5
Discrete Near-Bottom Surface Water Analytical Results – Year 1 Event 2 Long-Term Monitoring

	Ecological			Human Health	PCM-01	PCM-02	PCM-03	PCM-04	PCM-05	PCM-06	PCM-08
					PCM-01DSW-071109	PCM-02DSW-071109	PCM-03DSW-071109	PCM-04DSW-071109	PCM-05DSW-071109	PCM-06DSW-071109	PCM-08DSW-071109
	ODEQ 2004 Chronic Ambient Water Quality Criteria (AWQC)	EPA 2004 National Recommended Water Quality Criteria (NRWQC) Criterion Continuous Concentration (CCC)	Oakridge Nat. Lab 1996 Tier II Sediment Concentration Values (SCV)	EPA 2004 Drinking Water Region 9 PRGs	11/9/07	11/9/07	11/9/07	11/9/07	11/9/07	11/9/07	11/9/07
Conventionals (mg/L)											
Dissolved organic carbon	--	--	--	--	**1.9**	**2**	**2**	**1.9**	**2**	**1.9**	**1.9**
Sulfide	--	--	--	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Total organic carbon	--	--	--	--	**1.9**	**2**	**1.9**	**1.9**	**1.9**	**1.9**	**1.9**
Total suspended solids	--	--	--	--	**6**	**7**	**6**	**5**	**7**	**7**	**7**
Cyanides (mg/L)											
Amenable Cyanide	--	--	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Cyanide	0.0052	--	--	0.73	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Free Cyanide	--	0.0052			0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Metals (µg/L)											
Iron	--	--	--	--	**450**	**414**	**434**	**397**	**368**	**414**	**388**
PAHs (µg/L)											
2-Methylnaphthalene	--	--	2.1	--	**0.004 J**	**0.0026 J**	**0.0039 J**	**0.027**	**0.0025 J**	**0.0061 J**	**0.0048 J**
Acenaphthene	520	--	--	370	**0.0062 J**	0.021 U	**0.0045 J**	**0.026**	0.02 U	**0.013 J**	**0.01 J**
Acenaphthylene	--	--	--	--	0.021 U	0.021 U	0.02 U	0.02 U	0.02 U	0.02 U	0.021 U
Anthracene	--	--	0.73	1800	0.021 U	0.021 U	0.02 U	**0.0071 J**	0.02 U	**0.0047 J**	0.021 U
Benzo(a)anthracene	--	--	0.027	0.092	0.021 U	0.021 U	0.02 U	**0.008 J**	0.02 U	0.02 U	**0.005 J**
Benzo(a)pyrene	--	--	0.014	0.0092	0.021 U	0.021 U	0.02 U	**0.0056 J**	0.02 U	0.02 U	0.021 U
Benzo(b)fluoranthene	--	--	--	0.092	0.021 U	0.021 U	0.02 U	**0.0067 J**	0.02 U	0.02 U	0.021 U
Benzo(g,h,i)perylene	--	--	--	--	0.021 U	0.021 U	0.02 U	**0.0079 J**	0.02 U	0.02 U	0.021 U
Benzo(k)fluoranthene	--	--	--	0.92	0.021 U	0.021 U	0.02 U	**0.0039 J**	0.02 U	0.02 U	0.021 U
Total Benzofluoranthenes	--	--	--	--	0.021 U	0.021 U	0.02 U	**0.0106 J**	0.02 U	0.02 U	0.021 U
Chrysene	--	--	--	9.2	0.021 U	0.021 U	0.02 U	**0.012 J**	0.02 U	0.02 U	0.021 U
Dibenzo(a,h)anthracene	--	--	--	0.0092	0.021 U	0.021 U	0.02 U	**0.0026 J**	0.02 U	0.02 U	0.021 U
Fluoranthene	--	--	--	1500	**0.011 J**	**0.0076 J**	**0.0064 J**	**0.025**	**0.0063 J**	**0.0083 J**	**0.012 J**
Fluorene	--	--	3.9	240	0.021 U	0.021 U	0.02 U	**0.0094 J**	0.02 U	0.02 U	**0.0044 J**
Indeno(1,2,3-cd)pyrene	--	--	--	0.092	0.021 U	0.021 U	0.02 U	**0.0081 J**	0.02 U	0.02 U	0.021 U
Naphthalene	620		12	6.2	0.021 U	0.021 U	**0.025**	**0.2**	0.02 U	**0.11**	**0.052**
Phenanthrene	--	--	--	--	**0.0082 J**	0.021 U	**0.0057 J**	**0.029**	**0.0059 J**	**0.011 J**	**0.012 J**
Pyrene	--	--	--	180	**0.0092 J**	**0.0041 J**	**0.0046 J**	**0.023**	**0.0046 J**	**0.0067 J**	**0.0091 J**
Total HPAH	--	--	--	--	**0.0202**	**0.0117**	**0.011**	**0.103**	**0.0109**	**0.015**	**0.0261**
Total LPAH	--	--	--	--	**0.0144**	0.021 U	**0.0352**	**0.272**	**0.0059**	**0.139**	**0.0784**
Total PAH	0.014	--	0.14	--	**0.0346**	**0.0117**	**0.0462**	**0.374**	**0.0168**	**0.154**	**0.105**
Volatile Organics (µg/L)											
Benzene	--	--	130	0.35	0.5 U	0.5 U	0.5 U	**0.26 J**	0.5 U	0.5 U	0.5 U
Ethylbenzene	--	--	7.3	1300	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	--	--	9.8	720	**0.99**	**0.12 J**	**0.56**	**0.96**	**0.29 J**	0.5 U	0.5 U
m,p-Xylene	--	--	1.8	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
o-Xylene	--	--	13	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Total Xylene	--	--	--	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:

Detections are bold

a Napthalene was analyzed as a semivolatile compound (EPA Method 8270)

U The analyte was analyzed for, but not detected above the sample reporting limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ Non-detected value was determined theoretically and there was no analysis performed to confirm the non-detect.

Non-detected concentration above one or more ecological or human health screening level values.

Detected concentration above one or more ecological or human health screening level values.

Table 5
Discrete Near-Bottom Surface Water Analytical Results – Year 1 Event 2 Long-Term Monitoring

	Ecological			Human Health	PCM-01	PCM-09	PCM-10	PCM-13	PCM-19	PCM-20	PCM-21
					PCM-01DSW-071109	PCM-09DSW-071109	PCM-10DSW-071109	PCM-13DSW-071109	PCM-19DSW-071109	PCM-20DSW-071109	PCM-21DSW-071109
	ODEQ 2004 Chronic Ambient Water Quality Criteria (AWQC)	EPA 2004 National Recommended Water Quality Criteria (NRWQC) Criterion Continuous Concentration (CCC)	Oakridge Nat. Lab 1996 Tier II Sediment Concentration Values (SCV)	EPA 2004 Drinking Water Region 9 PRGs	11/9/07	11/9/07	11/9/07	11/9/07	11/9/07	11/9/07	11/9/07
Conventionals (mg/L)											
Dissolved organic carbon	--	--	--	--	**1.9**	**1.9**	**1.8**	**1.9**	**1.8**	**1.9**	**2**
Sulfide	--	--	--	--	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U	0.05 U
Total organic carbon	--	--	--	--	**1.9**	**1.9**	**1.9**	**2**	**1.9**	**1.9**	**1.9**
Total suspended solids	--	--	--	--	**6**	**6**	**7**	**7**	**6**	**8**	**6**
Cyanides (mg/L)											
Amenable Cyanide	--	--	--	--	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Cyanide	0.0052	--	--	0.73	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Free Cyanide	--	0.0052			0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U	0.01 U
Metals (µg/L)											
Iron	--	--	--	--	**450**	**403**	**437**	**445**	**423**	**372**	**396**
PAHs (µg/L)											
2-Methylnaphthalene	--	--	2.1	--	**0.004 J**	**0.0091 J**	**0.018 J**	0.02 U	**0.0043 J**	**0.0034 J**	**0.011 J**
Acenaphthene	520	--	--	370	**0.0062 J**	**0.02**	**0.051**	0.02 U	**0.0067 J**	0.021 U	**0.02 J**
Acenaphthylene	--	--	--	--	0.021 U	0.019 U	0.021 U	0.02 U	0.021 U	0.021 U	0.021 U
Anthracene	--	--	0.73	1800	0.021 U	**0.0077 J**	**0.016 J**	0.02 U	0.021 U	0.021 U	**0.0062 J**
Benzo(a)anthracene	--	--	0.027	0.092	0.021 U	**0.0067 J**	**0.029**	0.02 U	0.021 U	0.021 U	**0.0075 J**
Benzo(a)pyrene	--	--	0.014	0.0092	0.021 U	0.019 U	**0.031**	0.02 U	0.021 U	0.021 U	**0.0062 J**
Benzo(b)fluoranthene	--	--	--	0.092	0.021 U	**0.0042 J**	**0.033**	0.02 U	0.021 U	0.021 U	**0.0056 J**
Benzo(g,h,i)perylene	--	--	--	--	0.021 U	**0.0039 J**	**0.03**	0.02 U	0.021 U	0.021 U	**0.0041 J**
Benzo(k)fluoranthene	--	--	--	0.92	0.021 U	0.019 U	**0.016 J**	0.02 U	0.021 U	0.021 U	**0.0027 J**
Total Benzofluoranthenes	--	--	--	--	0.021 U	**0.0042**	**0.049**	0.02 U	0.021 U	0.021 U	**0.0083 J**
Chrysene	--	--	--	9.2	0.021 U	**0.012 J**	**0.035**	0.02 U	0.021 U	0.021 U	**0.0068 J**
Dibenzo(a,h)anthracene	--	--	--	0.0092	0.021 U	0.019 U	0.021 U	0.02 U	0.021 U	0.021 U	0.021 U
Fluoranthene	--	--	--	1500	**0.011 J**	**0.021**	**0.094**	0.02 U	0.021 U	0.021 U	**0.024**
Fluorene	--	--	3.9	240	0.021 U	**0.0065 J**	**0.015 J**	0.02 U	0.021 U	0.021 U	**0.008 J**
Indeno(1,2,3-cd)pyrene	--	--	--	0.092	0.021 U	0.019 U	**0.022**	0.02 U	0.021 U	0.021 U	**0.0047 J**
Naphthalene	620		12	6.2	0.021 U	**0.11**	**0.11**	0.02 U	**0.023**	0.021 U	**0.11**
Phenanthrene	--	--	--	--	**0.0082 J**	**0.019**	**0.055**	0.02 U	**0.013 J**	0.021 U	**0.024**
Pyrene	--	--	--	180	**0.0092 J**	**0.019 J**	**0.097**	0.02 U	0.021 U	0.021 U	**0.021**
Total HPAH	--	--	--	--	**0.0202**	**0.0668**	**0.387**	0.02 U	0.021 U	0.021 U	**0.0826**
Total LPAH	--	--	--	--	**0.0144**	**0.163**	**0.247**	0.02 U	**0.0427**	0.021 U	**0.168**
Total PAH	0.014	--	0.14	--	**0.0346**	**0.23**	**0.634**	0.02 U	**0.0427**	0.021 U	**0.251**
Volatile Organics (µg/L)											
Benzene	--	--	130	0.35	0.5 U	**0.17 J**	**0.34 J**	**0.16 J**	0.5 U	0.5 U	**0.16 J**
Ethylbenzene	--	--	7.3	1300	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	--	--	9.8	720	**0.99**	**0.14 J**	**0.23 J**	**0.28 J**	**0.29 J**	**0.18 J**	**0.19 J**
m,p-Xylene	--	--	1.8	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
o-Xylene	--	--	13	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Total Xylene	--	--	--	--	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U

Notes:

Detections are bold

a Napthalene was analyzed as a semivolatile compound (EPA Method 8270)

U The analyte was analyzed for, but not detected above the sample reporting limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

UJ Non-detected value was determined theoretically and there was no analysis performed to confirm the non-detect.

Non-detected concentration above one or more ecological or human health screening level values.

Detected concentration above one or more ecological or human health screening level values.

Table 6a
Time-Integrated Near-Bottom Surface Water Laboratory Analytical and Calculated Results Using Phenanthrene EAF – Year 1 Event 2 Long-Term Monitoring

Sample Location	Ecological			Human Health	Year 1 Event 2	PCM-01[a]	PCM-01[a]	PCM-02	PCM-02	PCM-03
Sample ID	ODEQ 2004 Chronic Ambient Water Quality	EPA 2004 National Recommended Water Quality Criteria (NRWQC) Criterion Continous Concentration (CCC)	Oakridge Nat. Lab 1996 Tier II Sediment Concentration Values (SCV)	EPA 2004 Drinking Water Region 9 PRGs	QA/QC	PCM-01TSW-071211	PCM-01TSW-071211	PCM-02TSW-071211	PCM-02TSW-071211	PCM-03TSW-071211
Date					Laboratory Data Blank Corrected	12/11/2007 Laboratory Data Blank Corrected	12/11/2007 Calculated Concentration	12/11/2007 Laboratory Data Blank Corrected	12/11/2007 Calculated Concentration	12/11/2007 Laboratory Data Blank Corrected
Data Format										
Units					ng/sample[b]	ng/sample	µg/L	ng/sample	µg/L	ng/sample
Acenaphthene	520	--	--	370	**6.1**	**72.0**	0.0012	**200.0**	0.0021	**180.0**
Acenaphthylene	--	--	--	--	0.0	0.0	0.0000	**12.0**	0.0001	**13.0**
Anthracene	--	--	0.73	1800	0.0	**76.0**	0.0012	**280.0**	0.0026	**330.0**
Benzo(a)anthracene	--	--	0.027	0.092	0.0	**83.0**	0.0011	**240.0**	0.0019	**320.0**
Benzo(a)pyrene	--	--	0.014	0.0092	0.0	**12.0**	0.0000	**41.0**	0.0000	**43.0**
Benzo(b)fluoranthene	--	--	--	0.092	0.0	**11.0**	0.0002	**31.0**	0.0003	**63.0**
Benzo(g,h,i)perylene	--	--	--	--	0.0	0.0	0.0000	0.0	0.0000	0.0
Benzo(k)fluoranthene	--	--	--	0.92	0.0	**11.0**	0.0002	**31.0**	0.0003	**16.0**
Total Benzofluoranthes	--	--	--	--	NA	**22.0**	0.0003	**62.0**	0.0005	**79.0**
Chrysene	--	--	--	9.2	0.0	**96.0**	0.0011	**250.0**	0.0018	**320.0**
Dibenz(a,h)anthracene	--	--	--	0.0092	0.0	0.0	0.00000	0.0	0.0000	0.0
Fluoranthene	--	--	--	1500	**27.0**	**620.0**	0.0067	**990.0**	0.0065	**1700.0**
Fluorene	--	--	3.9	240	**14.0**	**63.0**	0.0010	**93.0**	0.0009	**110.0**
Indeno(1,2,3-cd)pyrene	--	--	--	0.092	0.0	0.0	0.0000	0.0	0.0000	0.0
Naphthalene	620	--	12	6.2	**84.0**	0.0	NM	**46.0**		**26.0**
Phenanthrene	--	--	--	--	**93.0**	**341.0**	0.0041	**621.0**	0.0045	**761.0**
Pyrene	--	--	--	180	**14.0**	**474.0**	0.0043	**874.0**	0.0048	**1284.0**
Total PAHs	--	--	--	--	NA	NA	0.0212	NA	0.0262	NA

Notes:

Laboratory detections shown in bold.

NA Not analyzed.

NM Not measurable. USGS water concentration calculator (2003) assumes no measurable partitioning of napthalene at 10 degrees celcius.

a PCM-01 is the downstream ambient station and PCM-13 is the upstream ambient station.

b All laboratory blank corrected data were normalized to account for the day zero blank sample PAH concentration.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

Table 6a
Time-Integrated Near-Bottom Surface Water Laboratory Analytical and Calculated Results Using Phenanthrene EAF – Year 1 Event 2 Long-Term Monitoring

Sample Location	Ecological			Human Health	PCM-03	PCM-04	PCM-04	PCM-05	PCM-05	PCM-06
Sample ID					PCM-03TSW-071211	PCM-04TSW-071211	PCM-04TSW-071211	PCM-05TSW-071211	PCM-05TSW-071211	PCM-06TSW-071211
Date					12/11/2007	12/11/2007	12/11/2007	12/11/2007	12/11/2007	12/11/2007
Data Format	ODEQ 2004 Chronic Ambient Water Quality	EPA 2004 National Recommended Water Quality Criteria (NRWQC) Criterion Continous Concentration (CCC)	Oakridge Nat. Lab 1996 Tier II Sediment Concentration Values (SCV)	EPA 2004 Drinking Water Region 9 PRGs	Calculated Concentration	Laboratory Data Blank Corrected	Calculated Concentration	Laboratory Data Blank Corrected	Calculated Concentration	Laboratory Data Blank Corrected
Units					µg/L	ng/sample	µg/L	ng/sample	µg/L	ng/sample
Acenaphthene	520	--	--	370	0.0020	**210.0**	0.0030	**200.0**	0.0026	**170.0**
Acenaphthylene	--	--	--	--	0.0002	**17.0**	0.0003	0.0	0.0000	**11.0**
Anthracene	--	--	0.73	1800	0.0032	**640.0**	0.0081	**360.0**	0.0042	**320.0**
Benzo(a)anthracene	--	--	0.027	0.092	0.0026	**540.0**	0.0057	**400.0**	0.0039	**240.0**
Benzo(a)pyrene	--	--	0.014	0.0092	0.0004	**63.0**	0.0007	**45.0**	0.0005	**28.0**
Benzo(b)fluoranthene	--	--	--	0.092	0.0006	**89.0**	0.0011	**57.0**	0.0006	**42.0**
Benzo(g,h,i)perylene	--	--	--	--	0.0000	**13.0**	0.0003	0.0	0.0000	0.0
Benzo(k)fluoranthene	--	--	--	0.92	0.0001	**24.0**	0.0003	**21.0**	0.0002	**11.0**
Total Benzofluoranthes	--	--	--	--	0.0007	**113.0**	0.0013	**78.0**	0.0008	**53.0**
Chrysene	--	--	--	9.2	0.0024	**500.0**	0.0048	**380.0**	0.0033	**250.0**
Dibenz(a,h)anthracene	--	--	--	0.0092	0.00000	0.0	0.00000	0.0	0.00000	0.0
Fluoranthene	--	--	--	1500	0.0116	**2400.0**	0.0213	**1400.0**	0.0115	**910.0**
Fluorene	--	--	3.9	240	0.0011	**120.0**	0.0015	**78.0**	0.0009	**86.0**
Indeno(1,2,3-cd)pyrene	--	--	--	0.092	0.00000	0.0	0.00000	0.0	0.00000	0.0
Naphthalene	620	--	12	6.2		**4.0**		**156.0**		**36.0**
Phenanthrene	--	--	--	--	0.0057	**921.0**	0.0090	**511.0**	0.0046	**501.0**
Pyrene	--	--	--	180	0.0074	**1884.0**	0.0141	**1084.0**	0.0075	**794.0**
Total PAHs	--	--	--	--	0.0380	NA	0.0713	NA	0.0407	NA

Notes:

Laboratory detections shown in bold.

NA Not analyzed.

NM Not measurable. USGS water concentration calculator (2003) assumes no measurable partitioning of napthalene at 10 degrees celcius.

a PCM-01 is the downstream ambient station and PCM-13 is the upstream ambient station.

b All laboratory blank corrected data were normalized to account for the day zero blank sample PAH concentration.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

Table 6a
Time-Integrated Near-Bottom Surface Water Laboratory Analytical and Calculated Results Using Phenanthrene EAF – Year 1 Event 2 Long-Term Monitoring

Sample Location	Ecological			Human Health	PCM-06	PCM-21	PCM-21	PCM-08	PCM-08	PCM-09
Sample ID	ODEQ 2004 Chronic Ambient Water Quality	EPA 2004 National Recommended Water Quality Criteria (NRWQC) Criterion Continous Concentration (CCC)	Oakridge Nat. Lab 1996 Tier II Sediment Concentration Values (SCV)	EPA 2004 Drinking Water Region 9 PRGs	PCM-06TSW-071211	PCM-21SW-071211	PCM-21SW-071211	PCM-08TSW-071211	PCM-08TSW-071211	PCM-09TSW-071211
Date					12/11/2007	12/11/2007	12/11/2007	12/11/2007	12/11/2007	12/11/2007
Data Format					Calculated Concentration	Laboratory Data Blank Corrected	Calculated Concentration	Laboratory Data Blank Corrected	Calculated Concentration	Laboratory Data Blank Corrected
Units					µg/L	ng/sample	µg/L	ng/sample	µg/L	ng/sample
Acenaphthene	520	--	--	370	0.0017	**180.0**	0.0022	**230.0**	0.0020	**180.0**
Acenaphthylene	--	--	--	--	0.0001	**19.0**	0.0003	**15.0**	0.0002	**17.0**
Anthracene	--	--	0.73	1800	0.0029	**740.0**	0.0081	**590.0**	0.0046	**560.0**
Benzo(a)anthracene	--	--	0.027	0.092	0.0018	**650.0**	0.0060	**360.0**	0.0023	**400.0**
Benzo(a)pyrene	--	--	0.014	0.0092	0.0002	**160.0**	0.0015	**55.0**	0.0004	**80.0**
Benzo(b)fluoranthene	--	--	--	0.092	0.0004	**200.0**	0.0021	**71.0**	0.0005	**100.0**
Benzo(g,h,i)perylene	--	--	--	--	0.0000	**63.0**	0.0011	**19.0**	0.0002	**29.0**
Benzo(k)fluoranthene	--	--	--	0.92	0.0001	**58.0**	0.0006	**24.0**	0.0002	**31.0**
Total Benzofluoranthes	--	--	--	--	0.0004	**258.0**	0.0026	**95.0**	0.0007	**131.0**
Chrysene	--	--	--	9.2	0.0017	**750.0**	0.0062	**380.0**	0.0022	**450.0**
Dibenz(a,h)anthracene	--	--	--	0.0092	0.0000	0.0	0.0000	0.0	0.0000	0.0
Fluoranthene	--	--	--	1500	0.0057	**2200.0**	0.0169	**1500.0**	0.0081	**1600.0**
Fluorene	--	--	3.9	240	0.0008	**100.0**	0.0011	**120.0**	0.0009	**96.0**
Indeno(1,2,3-cd)pyrene	--	--	--	0.092	0.0000	**44.0**	0.0004	**11.0**	0.0001	**17.0**
Naphthalene	620	--	12	6.2		**106.0**		**166.0**		**136.0**
Phenanthrene	--	--	--	--	0.0035	**771.0**	0.0065	**731.0**	0.0044	**611.0**
Pyrene	--	--	--	180	0.0042	**1584.0**	0.0102	**1084.0**	0.0050	**1184.0**
Total PAHs	--	--	--	--	0.0234	NA	0.0657	NA	0.0318	NA

Notes:

Laboratory detections shown in bold.

NA Not analyzed.

NM Not measurable. USGS water concentration calculator (2003) assumes no measurable partitioning of napthalene at 10 degrees celcius.

a PCM-01 is the downstream ambient station and PCM-13 is the upstream ambient station.

b All laboratory blank corrected data were normalized to account for the day zero blank sample PAH concentration.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

Table 6a
Time-Integrated Near-Bottom Surface Water Laboratory Analytical and Calculated Results Using Phenanthrene EAF – Year 1 Event 2 Long-Term Monitoring

Sample Location	Ecological			Human Health	PCM-09	PCM-10	PCM-10	PCM-13[a]	PCM-13[a]
Sample ID					PCM-09TSW-071211	PCM-10TSW-071211	PCM-10TSW-071211	PCM-13TSW-071211	PCM-13TSW-071211
Date					12/11/2007	12/11/2007	12/11/2007	12/11/2007	12/11/2007
Data Format	ODEQ 2004 Chronic Ambient Water Quality	EPA 2004 National Recommended Water Quality Criteria (NRWQC) Criterion Continous Concentration (CCC)	Oakridge Nat. Lab 1996 Tier II Sediment Concentration Values (SCV)	EPA 2004 Drinking Water Region 9 PRGs	Calculated Concentration	Laboratory Data Blank Corrected	Calculated Concentration	Laboratory Data Blank Corrected	Calculated Concentration
Units					µg/L	ng/sample	µg/L	ng/sample	µg/L
Acenaphthene	520	--	--	370	0.0023	**200.0**	0.0029	**65.0**	0.0008
Acenaphthylene	--	--	--	--	0.0003	**20.0**	0.0003	**13.0**	0.0002
Anthracene	--	--	0.73	1800	0.0064	**750.0**	0.0098	**350.0**	0.0039
Benzo(a)anthracene	--	--	0.027	0.092	0.0038	**320.0**	0.0035	**110.0**	0.0010
Benzo(a)pyrene	--	--	0.014	0.0092	0.0008	**68.0**	0.0008	**12.0**	0.0001
Benzo(b)fluoranthene	--	--	--	0.092	0.0011	**84.0**	0.0010	**18.0**	0.0002
Benzo(g,h,i)perylene	--	--	--	--	0.0005	**28.0**	0.0006	0.0	0.0000
Benzo(k)fluoranthene	--	--	--	0.92	0.0003	**28.0**	0.0003	0.0	0.0000
Total Benzofluoranthes	--	--	--	--	0.0014	**112.0**	0.0014	**18.0**	0.0002
Chrysene	--	--	--	9.2	0.0039	**370.0**	0.0036	**140.0**	0.0012
Dibenz(a,h)anthracene	--	--	--	0.0092	0.0000	0.0	0.0000	0.0	0.0000
Fluoranthene	--	--	--	1500	0.0127	**1600.0**	0.0146	**430.0**	0.0033
Fluorene	--	--	3.9	240	0.0011	**110.0**	0.0014	**60.0**	0.0007
Indeno(1,2,3-cd)pyrene	--	--	--	0.092	0.0002	**17.0**	0.0002	**0.0**	0.0000
Naphthalene	620	--	12	6.2		**116.0**		**76.0**	NM
Phenanthrene	--	--	--	--	0.0054	**861.0**	0.0087	**311.0**	0.0027
Pyrene	--	--	--	180	0.0079	**1184.0**	0.0091	**394.0**	0.0026
Total PAHs	--	--	--	--	0.0480	NA	0.0584	NA	0.0168

Notes:

Laboratory detections shown in bold.

NA Not analyzed.

NM Not measurable. USGS water concentration calculator (2003) assumes no measurable partitioning of napthalene at 10 degrees celcius.

a PCM-01 is the downstream ambient station and PCM-13 is the upstream ambient station.

b All laboratory blank corrected data were normalized to account for the day zero blank sample PAH concentration.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

Table 6b
Time-Integrated Near-Bottom Surface Water Laboratory Analytical and Calculated Results Using Pyrene EAF – Year 1 Event 2 Long-Term Monitoring

Sample Location	Ecological			Human Health	Year 1 Event 2	PCM-01[a]	PCM-01[a]	PCM-02	PCM-02	PCM-03
Sample ID					QA/QC	PCM-01TSW-071211	PCM-01TSW-071211	PCM-02TSW-071211	PCM-02TSW-071211	PCM-03TSW-071211
Date						12/11/2007	12/11/2007	12/11/2007	12/11/2007	12/11/2007
Data Format	ODEQ 2004 Chronic Ambient Water Quality Criteria (AWQC)	EPA 2004 National Recommended Water Quality Criteria (NRWQC) Criterion Continous Concentration (CCC)	Oakridge Nat. Lab 1996 Tier II Sediment Concentration Values (SCV)	EPA 2004 Drinking Water Region 9 PRGs	Laboratory Data Blank Corrected	Laboratory Data Blank Corrected	Calculated Concentration	Laboratory Data Blank Corrected	Calculated Concentration	Laboratory Data Blank Corrected
Units					ng/sample[b]	ng/sample	µg/L	ng/sample	µg/L	ng/sample
Acenaphthene	520	--	--	370	**6.1**	**72.0**	0.0034	**200.0**	0.002963	**180.0**
Acenaphthylene	--	--	--	--	0.0	0.0	0.0000	**12.0**	0.000209	**13.0**
Anthracene	--	--	0.73	1800	0.0	**76.0**	0.0033	**280.0**	0.003733	**330.0**
Benzo(a)anthracene	--	--	0.027	0.092	0.0	**83.0**	0.0030	**240.0**	0.002667	**320.0**
Benzo(a)pyrene	--	--	0.014	0.0092	0.0	**12.0**	0.0000	**41.0**	0.000469	**43.0**
Benzo(b)fluoranthene	--	--	--	0.092	0.0	**11.0**	0.0004	**31.0**	0.000388	**63.0**
Benzo(g,h,i)perylene	--	--	--	--	0.0	0.0	0.0000	0.0	0.000000	0.0
Benzo(k)fluoranthene	--	--	--	0.92	0.0	**11.0**	0.0004	**31.0**	0.000365	**16.0**
Total Benzofluoranthes	--	--	--	--	NA	**22.0**	0.0009	**62.0**	0.000752	**79.0**
Chrysene	--	--	--	9.2	0.0	**96.0**	0.0031	**250.0**	0.002500	**320.0**
Dibenz(a,h)anthracene	--	--	--	0.0092	0.0	0.0	0.0000	0.0	0.000000	0.0
Fluoranthene	--	--	--	1500	**27.0**	**620.0**	0.0185	**990.0**	0.009209	**1700.0**
Fluorene	--	--	3.9	240	**14.0**	**63.0**	0.0027	**93.0**	0.001240	**110.0**
Indeno(1,2,3-cd)pyrene	--	--	--	0.092	0.0	0.0	0.0000	0.0	0.000000	0.0
Naphthalene	620	--	12	6.2	**84.0**	0.0	NM	**46.0**	NM	**26.0**
Phenanthrene	--	--	--	--	**93.0**	**341.0**	0.0112	**621.0**	0.006369	**761.0**
Pyrene	--	--	--	180	**14.0**	**474.0**	0.0120	**874.0**	0.006855	**1284.0**
Total PAHs	--	--	--	--	NA	NA	0.0589	NA	0.037718	NA

Notes:

Laboratory detections shown in bold.

NA Not analyzed.

NM Not measurable. USGS water concentration calculator (2003) assumes no measurable partitioning of napthalene at 10 degrees celcius.

a PCM-13 is the upstream ambient station.

b All laboratory blank corrected data were normalized to account for the day zero blank sample PAH

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

Table 6b
Time-Integrated Near-Bottom Surface Water Laboratory Analytical and Calculated Results Using Pyrene EAF – Year 1 Event 2 Long-Term Monitoring

Sample Location	Ecological			Human Health	PCM-03	PCM-04	PCM-04	PCM-05	PCM-05	PCM-06
Sample ID					PCM-03TSW-071211	PCM-04TSW-071211	PCM-04TSW-071211	PCM-05TSW-071211	PCM-05TSW-071211	PCM-06TSW-071211
Date					12/11/2007	12/11/2007	12/11/2007	12/11/2007	12/11/2007	12/11/2007
Data Format					Calculated Concentration	Laboratory Data Blank Corrected	Calculated Concentration	Laboratory Data Blank Corrected	Calculated Concentration	Laboratory Data Blank Corrected
Units	ODEQ 2004 Chronic Ambient Water Quality Criteria (AWQC)	EPA 2004 National Recommended Water Quality Criteria (NRWQC) Criterion Continous Concentration (CCC)	Oakridge Nat. Lab 1996 Tier II Sediment Concentration Values (SCV)	EPA 2004 Drinking Water Region 9 PRGs	µg/L	ng/sample	µg/L	ng/sample	µg/L	ng/sample
Acenaphthene	520	--	--	370	0.0033	**210.0**	0.0016	**200.0**	0.0014	**170.0**
Acenaphthylene	--	--	--	--	0.0003	**17.0**	0.00015	0.0	0.0000	**11.0**
Anthracene	--	--	0.73	1800	0.0055	**640.0**	0.00430	**360.0**	0.0023	**320.0**
Benzo(a)anthracene	--	--	0.027	0.092	0.0044	**540.0**	0.0030	**400.0**	0.0021	**240.0**
Benzo(a)pyrene	--	--	0.014	0.0092	0.00061	**63.0**	0.00036	**45.0**	0.0002	**28.0**
Benzo(b)fluoranthene	--	--	--	0.092	0.0010	**89.0**	0.00056	**57.0**	0.0003	**42.0**
Benzo(g,h,i)perylene	--	--	--	--	0.00000	**13.0**	0.00014	0.0	0.0000	0.0
Benzo(k)fluoranthene	--	--	--	0.92	0.00023	**24.0**	0.00014	**21.0**	0.0001	**11.0**
Total Benzofluoranthes	--	--	--	--	0.0012	**113.0**	0.0007	**78.0**	0.0005	**53.0**
Chrysene	--	--	--	9.2	0.0040	**500.0**	0.0025	**380.0**	0.0018	**250.0**
Dibenz(a,h)anthracene	--	--	--	0.0092	0.00000	0.0	0.00000	0.0	0.0000	0.0
Fluoranthene	--	--	--	1500	0.0196	**2400.0**	0.0113	**1400.0**	0.0061	**910.0**
Fluorene	--	--	3.9	240	0.0018	**120.0**	0.0008	**78.0**	0.0005	**86.0**
Indeno(1,2,3-cd)pyrene	--	--	--	0.092	0.00000	0.0	0.00000	0.0	0.0000	0.0
Naphthalene	620	--	12	6.2	NM	**4.0**	NM	**156.0**	NM	**36.0**
Phenanthrene	--	--	--	--	0.0097	**921.0**	0.0048	**511.0**	0.0025	**501.0**
Pyrene	--	--	--	180	0.0125	**1884.0**	0.0074	**1084.0**	0.0040	**794.0**
Total PAHs	--	--	--	--	0.0640	NA	0.0377	NA	0.0218	NA

Notes:

Laboratory detections shown in bold.

NA Not analyzed.

NM Not measurable. USGS water concentration calculator (2003) assumes no measurable partitioning of napthalene at 10 degrees celcius.

a PCM-13 is the upstream ambient station.

b All laboratory blank corrected data were normalized to account for the day zero blank sample PAH

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

Table 6b
Time-Integrated Near-Bottom Surface Water Laboratory Analytical and Calculated Results Using Pyrene EAF – Year 1 Event 2 Long-Term Monitoring

Sample Location	Ecological			Human Health	PCM-06	PCM-21	PCM-21	PCM-08	PCM-08	PCM-09
Sample ID					PCM-06TSW-071211	PCM-21SW-071211	PCM-21SW-071211	PCM-08TSW-071211	PCM-08TSW-071211	PCM-09TSW-071211
Date					12/11/2007	12/11/2007	12/11/2007	12/11/2007	12/11/2007	12/11/2007
Data Format					Calculated Concentration	Laboratory Data Blank Corrected	Calculated Concentration	Laboratory Data Blank Corrected	Calculated Concentration	Laboratory Data Blank Corrected
Units	ODEQ 2004 Chronic Ambient Water Quality Criteria (AWQC)	EPA 2004 National Recommended Water Quality Criteria (NRWQC) Criterion Continous Concentration (CCC)	Oakridge Nat. Lab 1996 Tier II Sediment Concentration Values (SCV)	EPA 2004 Drinking Water Region 9 PRGs	µg/L	ng/sample	µg/L	ng/sample	µg/L	ng/sample
Acenaphthene	520	--	--	370	**0.0013**	**180.0**	0.0005	**230.0**	0.0011	**180.0**
Acenaphthylene	--	--	--	--	0.0001	**19.0**	0.0001	**15.0**	0.0001	**17.0**
Anthracene	--	--	0.73	1800	**0.0023**	**740.0**	0.0020	**590.0**	0.0026	**560.0**
Benzo(a)anthracene	--	--	0.027	0.092	**0.0014**	**650.0**	0.0014	**360.0**	0.0013	**400.0**
Benzo(a)pyrene	--	--	0.014	0.0092	**0.0002**	**160.0**	0.0004	**55.0**	0.0002	**80.0**
Benzo(b)fluoranthene	--	--	--	0.092	**0.0003**	**200.0**	0.0005	**71.0**	0.0003	**100.0**
Benzo(g,h,i)perylene	--	--	--	--	0.0000	**63.0**	0.0003	**19.0**	0.0001	**29.0**
Benzo(k)fluoranthene	--	--	--	0.92	**0.0001**	**58.0**	0.0001	**24.0**	0.0001	**31.0**
Total Benzofluoranthes	--	--	--	--	0.0004	**258.0**	0.0006	**95.0**	0.0004	**131.0**
Chrysene	--	--	--	9.2	**0.0013**	**750.0**	0.0015	**380.0**	0.0012	**450.0**
Dibenz(a,h)anthracene	--	--	--	0.0092	0.0000	0.0	0.0000	0.0	0.0000	0.0
Fluoranthene	--	--	--	1500	**0.0045**	**2200.0**	0.0041	**1500.0**	0.0046	**1600.0**
Fluorene	--	--	3.9	240	**0.0006**	**100.0**	0.0003	**120.0**	0.0005	**96.0**
Indeno(1,2,3-cd)pyrene	--	--	--	0.092	0.0000	**44.0**	0.0001	**11.0**	0.0000	**17.0**
Naphthalene	620	--	12	6.2	NM	**106.0**	NM	**166.0**	NM	**136.0**
Phenanthrene	--	--	--	--	**0.0028**	**771.0**	0.0016	**731.0**	0.0025	**611.0**
Pyrene	--	--	--	180	**0.0033**	**1584.0**	0.0025	**1084.0**	0.0028	**1184.0**
Total PAHs	--	--	--	--	0.0186	NA	0.0160	NA	0.0178	NA

Notes:

Laboratory detections shown in bold.

NA Not analyzed.

NM Not measurable. USGS water concentration calculator (2003) assumes no measurable partitioning of napthalene at 10 degrees celcius.

a PCM-13 is the upstream ambient station.

b All laboratory blank corrected data were normalized to account for the day zero blank sample PAH

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

Table 6b
Time-Integrated Near-Bottom Surface Water Laboratory Analytical and Calculated Results Using Pyrene EAF – Year 1 Event 2 Long-Term Monitoring

Sample Location	Ecological			Human Health	PCM-09	PCM-10	PCM-10	PCM-13[a]	PCM-13[a]
Sample ID					PCM-09TSW-071211	PCM-10TSW-071211	PCM-10TSW-071211	PCM-13TSW-071211	PCM-13TSW-071211
Date					12/11/2007	12/11/2007	12/11/2007	12/11/2007	12/11/2007
Data Format	ODEQ 2004 Chronic Ambient Water Quality Criteria (AWQC)	EPA 2004 National Recommended Water Quality Criteria (NRWQC) Criterion Continous Concentration (CCC)	Oakridge Nat. Lab 1996 Tier II Sediment Concentration Values (SCV)	EPA 2004 Drinking Water Region 9 PRGs	Calculated Concentration	Laboratory Data Blank Corrected	Calculated Concentration	Laboratory Data Blank Corrected	Calculated Concentration
Units					µg/L	ng/sample	µg/L	ng/sample	µg/L
Acenaphthene	520	--	--	370	0.0006	**200.0**	0.0010	**65.0**	**0.0000**
Acenaphthylene	--	--	--	--	0.0001	**20.0**	0.0001	**13.0**	0.0000
Anthracene	--	--	0.73	1800	0.0016	**750.0**	0.0034	**350.0**	0.0002
Benzo(a)anthracene	--	--	0.027	0.092	**0.0009**	**320.0**	0.0012	**110.0**	**0.0000**
Benzo(a)pyrene	--	--	0.014	0.0092	0.0002	**68.0**	0.0003	**12.0**	0.0000
Benzo(b)fluoranthene	--	--	--	0.092	0.0003	**84.0**	0.0004	**18.0**	0.0000
Benzo(g,h,i)perylene	--	--	--	--	0.0001	**28.0**	0.0002	0.0	0.0000
Benzo(k)fluoranthene	--	--	--	0.92	0.0001	**28.0**	0.0001	0.0	0.0000
Total Benzofluoranthes	--	--	--	--	0.0003	**112.0**	0.0005	**18.0**	0.0000
Chrysene	--	--	--	9.2	**0.0009**	**370.0**	0.0008	**140.0**	**0.0001**
Dibenz(a,h)anthracene	--	--	--	0.0092	0.0000	0.0	0.0000	0.0	0.0000
Fluoranthene	--	--	--	1500	**0.0031**	**1600.0**	0.0050	**430.0**	**0.0002**
Fluorene	--	--	3.9	240	0.0003	**110.0**	0.0005	**60.0**	**0.0000**
Indeno(1,2,3-cd)pyrene	--	--	--	0.092	0.0000	**17.0**	0.0001	**0.0**	0.0000
Naphthalene	620	--	12	6.2	NM	**116.0**	NM	**76.0**	NM
Phenanthrene	--	--	--	--	**0.0013**	**861.0**	0.0030	**311.0**	**0.0001**
Pyrene	--	--	--	180	**0.0019**	**1184.0**	0.0031	**394.0**	**0.0001**
Total PAHs	--	--	--	--	0.0117	NA	0.0195	NA	0.0008

Notes:

Laboratory detections shown in bold.

NA Not analyzed.

NM Not measurable. USGS water concentration calculator (2003) assumes no measurable partitioning of napthalene at 10 degrees celcius.

a PCM-13 is the upstream ambient station.

b All laboratory blank corrected data were normalized to account for the day zero blank sample PAH

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

Table 7
Quality Assurance/Quality Control Analytical Results – Year 1 Event 2 Long-Term Monitoring

Sample ID Sample Date Sample Type	PCM-BRB-071108 11/8/07 Rinsate Field Blank	PCM-DRB-071108 11/8/07 Discrete Near-Bottom Surface Water Rinsate Blank	PCM-PWRB-071108 11/8/07 Piezometer Pilot Cap Porewater Rinsate Blank	PCM-SCRB-071108 11/8/07 Pilot Cap Core Rinsate Blank	PCM-TB-071105 11/5/07 Trip Blank	PCMTB-071106 11/6/07 Trip Blank	PCM-TB-071107 11/7/07 Trip Blank	PCM-TB-071108 11/8/07 Trip Blank
Cyanides (mg/L)								
Amenable Cyanide	0.01 U	0.01 U	0.01 U	0.01 U	--	--	--	--
Cyanide	0.01 U	0.01 U	0.01 U	0.01 U	--	--	--	--
Free Cyanide	0.01 U	0.01 U	0.01 U	0.01 U	--	--	--	--
Metals (µg/L)								
Arsenic	0.5 U	0.5 U	--	0.5 U	--	--	--	--
Chromium	**0.14**	**0.08**	--	**0.12**	--	--	--	--
Copper	0.1 U	0.1 U	--	**0.04**	--	--	--	--
Iron	20 U	20 U	**8**	**4.8**	--	--	--	--
Lead	**0.02**	**0.061**		**0.032**	--	--	--	--
Nickel	0.2 U	0.2 U	--	0.2 U	--	--	--	--
Zinc	**0.7**	**1.8**	--	**1.2**	--	--	--	--
PCBs (µg/L)								
Aroclor 1016	0.2 U	--	--	0.21 U	--	--	--	--
Aroclor 1221	0.39 U	--	--	0.42 U	--	--	--	--
Aroclor 1232	0.2 U	--	--	0.21 U	--	--	--	--
Aroclor 1242	0.2 U	--	--	0.21 U	--	--	--	--
Aroclor 1248	0.2 U	--	--	0.21 U	--	--	--	--
Aroclor 1254	0.2 U	--	--	0.21 U	--	--	--	--
Aroclor 1260	0.2 U	--	--	0.21 U	--	--	--	--
Total PCB	0.39 U	--	--	0.42 U	--	--	--	--
Pesticides (µg/L)								
4,4'-DDD	0.0097 U	--	--	0.011 U	--	--	--	--
4,4'-DDE	0.0097 U	--	--	0.011 U	--	--	--	--
4,4'-DDT	0.0097 U	--	--	0.011 U	--	--	--	--
Aldrin	0.0097 U	--	--	**0.0005 J**	--	--	--	--
alpha-BHC	0.0097 U	--	--	0.011 U	--	--	--	--
alpha-Chlordane	0.0097 U	--	--	0.011 U	--	--	--	--
beta-BHC	0.0097 U	--	--	0.011 U	--	--	--	--
delta-BHC	0.0097 U	--	--	0.011 U	--	--	--	--
Dieldrin	0.0097 U	--	--	0.011 U	--	--	--	--
Endosulfan I	0.0097 U	--	--	0.011 U	--	--	--	--
Endosulfan II	0.0097 U	--	--	0.011 U	--	--	--	--
Endosulfan sulfate	0.0097 U	--	--	0.011 U	--	--	--	--
Endrin	0.0097 U	--	--	0.011 U	--	--	--	--
Endrin aldehyde	0.0097 U	--	--	0.011 U	--	--	--	--
Endrin ketone	0.0097 U	--	--	0.011 U	--	--	--	--
gamma-BHC (Lindane)	0.0097 U	--	--	0.011 U	--	--	--	--
gamma-Chlordane	0.0097 U	--	--	0.011 U	--	--	--	--
Heptachlor	**0.00062 J**	--	--	0.011 U	--	--	--	--
Heptachlor epoxide	0.0097 U	--	--	0.011 U	--	--	--	--
Methoxychlor	0.0097 U	--	--	0.011 U	--	--	--	--
Total Chlordane	0.0097 U	--	--	0.011 U	--	--	--	--
Total DDT	0.0097 U	--	--	0.011 U	--	--	--	--
Toxaphene	0.49 U	--	--	0.53 U	--	--	--	--
PAHs (µg/L)								
2-Methylnaphthalene	**0.017 J**	**0.018 J**	**0.021**	**0.019 J**	--	--	--	--

Table 7
Quality Assurance/Quality Control Analytical Results – Year 1 Event 2 Long-Term Monitoring

Sample ID	PCM-BRB-071108	PCM-DRB-071108	PCM-PWRB-071108	PCM-SCRB-071108	PCM-TB-071105	PCMTB-071106	PCM-TB-071107	PCM-TB-071108
Sample Date	11/8/07	11/8/07	11/8/07	11/8/07	11/5/07	11/6/07	11/7/07	11/8/07
		Discrete	Piezometer					
		Near-Bottom	Pilot Cap					
		Surface Water	Porewater	Pilot Cap Core				
Sample Type	Rinsate Field Blank	Rinsate Blank	Rinsate Blank	Rinsate Blank	Trip Blank	Trip Blank	Trip Blank	Trip Blank
Acenaphthene	0.019 U	0.021 U	**0.0097 J**	0.02 U	--	--	--	--
Acenaphthylene	0.019 U	0.021 U	0.02 U	0.02 U	--	--	--	--
Anthracene	0.019 U	0.021 U	0.02 U	0.02 U	--	--	--	--
Benzo(a)anthracene	0.019 U	0.021 U	**0.0039 J**	0.02 U	--	--	--	--
Benzo(a)pyrene	0.019 U	0.021 U	0.02 U	0.02 U	--	--	--	--
Benzo(b)fluoranthene	0.019 U	0.021 U	0.02 U	0.02 U	--	--	--	--
Benzo(g,h,i)perylene	0.019 U	0.021 U	0.02 U	0.02 U	--	--	--	--
Benzo(k)fluoranthene	0.019 U	0.021 U	0.02 U	0.02 U	--	--	--	--
Total Benzofluoranthenes	0.019 U	0.021 U	0.02 U	0.02 U	--	--	--	--
Chrysene	0.019 U	0.021 U	**0.0053 J**	0.02 U	--	--	--	--
Dibenzo(a,h)anthracene	0.019 U	0.021 U	0.02 U	0.02 U	--	--	--	--
Fluoranthene	0.019 U	0.021 U	**0.039**	0.02 U	--	--	--	--
Fluorene	0.019 U	0.021 U	**0.0046 J**	0.02 U	--	--	--	--
Indeno(1,2,3-cd)pyrene	0.019 U	0.021 U	0.02 U	0.02 U	--	--	--	--
Naphthalene	**0.063**	**0.07**	**0.11**	**0.081**	--	--	--	--
Phenanthrene	0.019 U	**0.0057 J**	**0.045**	**0.0064 J**	--	--	--	--
Pyrene	0.019 U	0.021 U	**0.021**	0.02 U	--	--	--	--
Total HPAH	0.019 U	0.021 U	**0.0692**	0.02 U	--	--	--	--
Total LPAH	**0.063**	**0.0757**	**0.169**	**0.0874**	--	--	--	--
Total PAH	**0.063**	**0.0757**	**0.239**	**0.0874**	--	--	--	--
Total Petroleum Hydrocarbons (µg/L)								
Diesel Range	**15 J**	--	--	**21 J**	--	--	--	--
Gasoline Range	**15 J**	--	--	**17 J**	--	--	--	--
Residual Range	**19 J**	--	--	**23 J**	--	--	--	--
Volatile Organics (µg/L)								
Benzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Ethylbenzene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Toluene	**0.66**	**0.73**	**0.74**	**0.63**	0.5 U	0.5 U	0.5 U	0.5 U
m,p-Xylene	**0.35 J**	**0.32 J**	**0.27 J**	**0.28 J**	0.5 U	0.5 U	0.5 U	0.5 U
o-Xylene	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Total Xylene	**0.35 J**	**0.32 J**	**0.27 J**	**0.28 J**	0.5 U	0.5 U	0.5 U	0.5 U

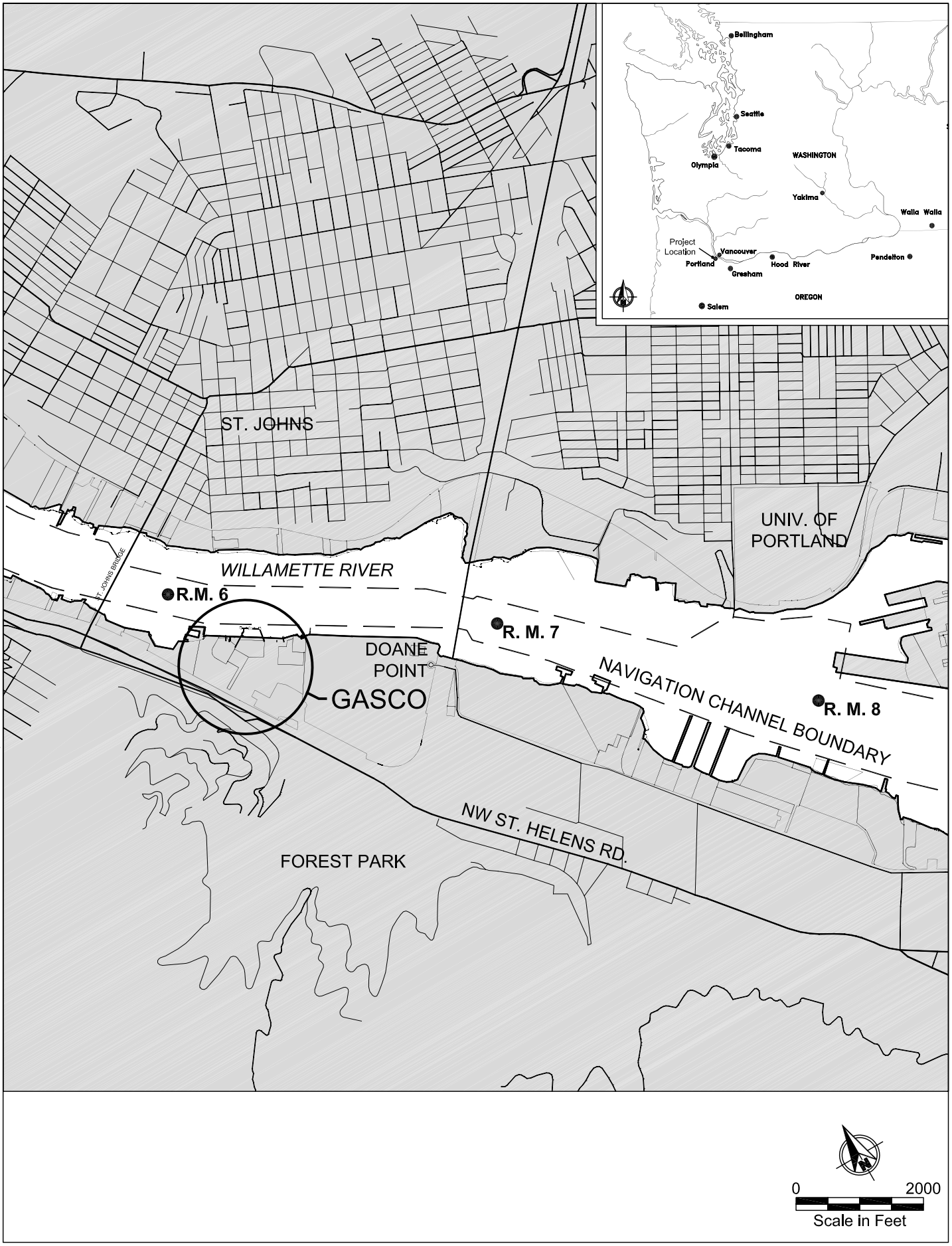
Notes

Detections are bold

U The analyte was analyzed for, but not detected above the sample reporting limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

FIGURES



Oct 03, 2005 10:07am dholmer K:\Jobs\000029-GASCO\00002902\00002902-01.dwg FIG 1

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 1
Vicinity Map
NW Natural "Gasco" Site

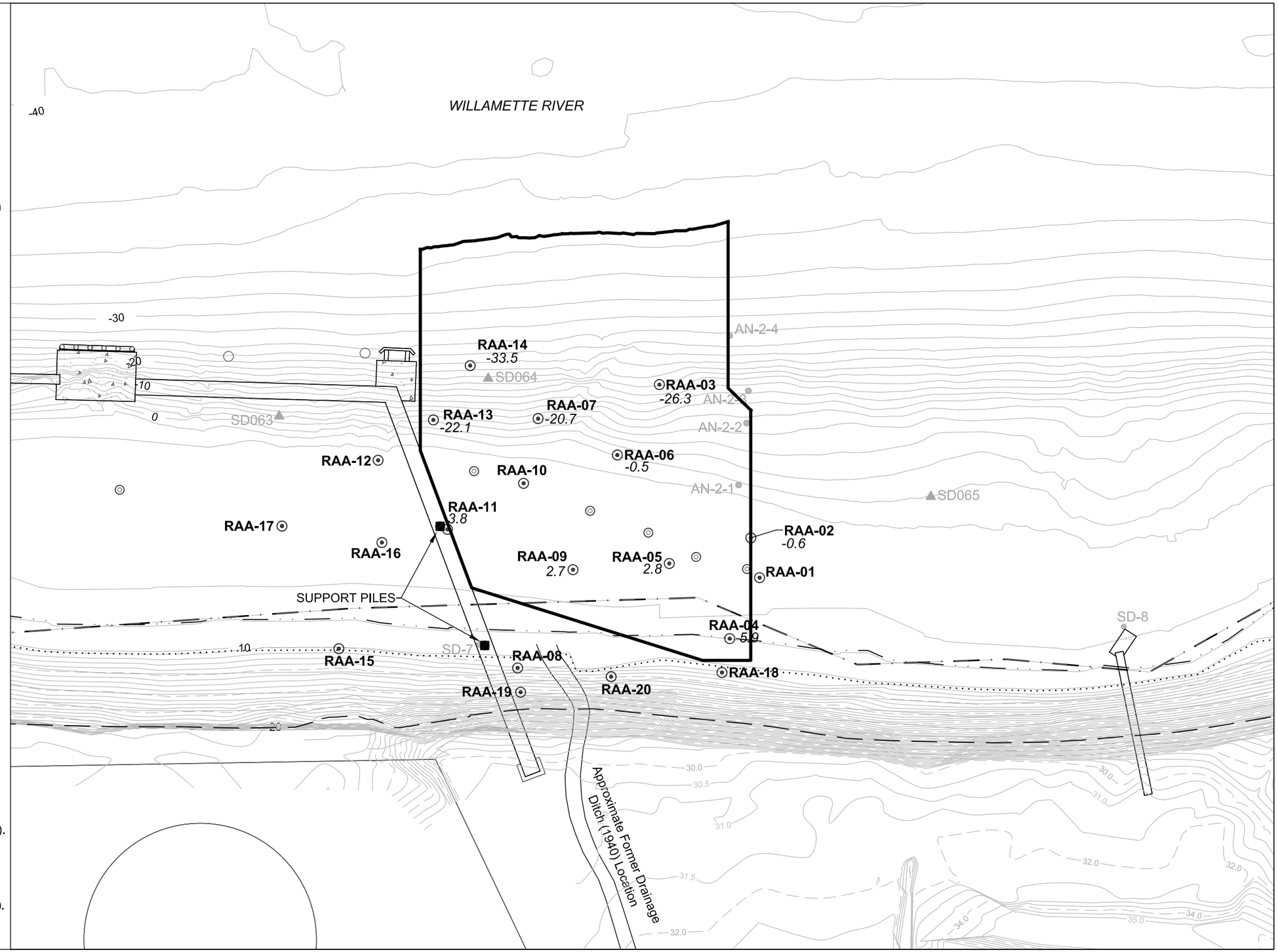
Legend:

- Lateral Extents of Suface Tar Body in Removal Action Area
- RAA-01 Design Characterization Sediment Core Location (Anchor 2004)
- -33.5 Bottom Elevation of Surface Tar Body in Removal Action Area (ft NAVD 88)
- Pile Location (surveyed August 2004)
- AN-2-1 Previous Sediment Core Location (Anchor 2002)
- SD063 Previous Sediment Core Location (Weston 1998)
- SD-7 Previous Sediment Core Location (HAI 1996)
- Support Pile Locations (to be protected during dredging)
- Property Line
- OHW = 20.41 ft NAVD 88
- OLW = 7.91 ft NAVD 88
- 50% River Stage Elevation = 10.23 ft NAVD 88

0 50
Scale in Feet

Notes:

1. Bathymetric contours provided by the Lower Willamette Group as part of the Portland Harbor Superfund Site study (2003).
2. Upland topography directed by Anchor Environmental as part of upland investigation (2002).
3. Horizontal Datum: Oregon State Plane North NAD 83 (ft).
4. Vertical Datum: NAVD 88 (ft).
5. Former Drainage Ditch location from Phase 1 Remedial Investigation Summary Report (HAI 1998).



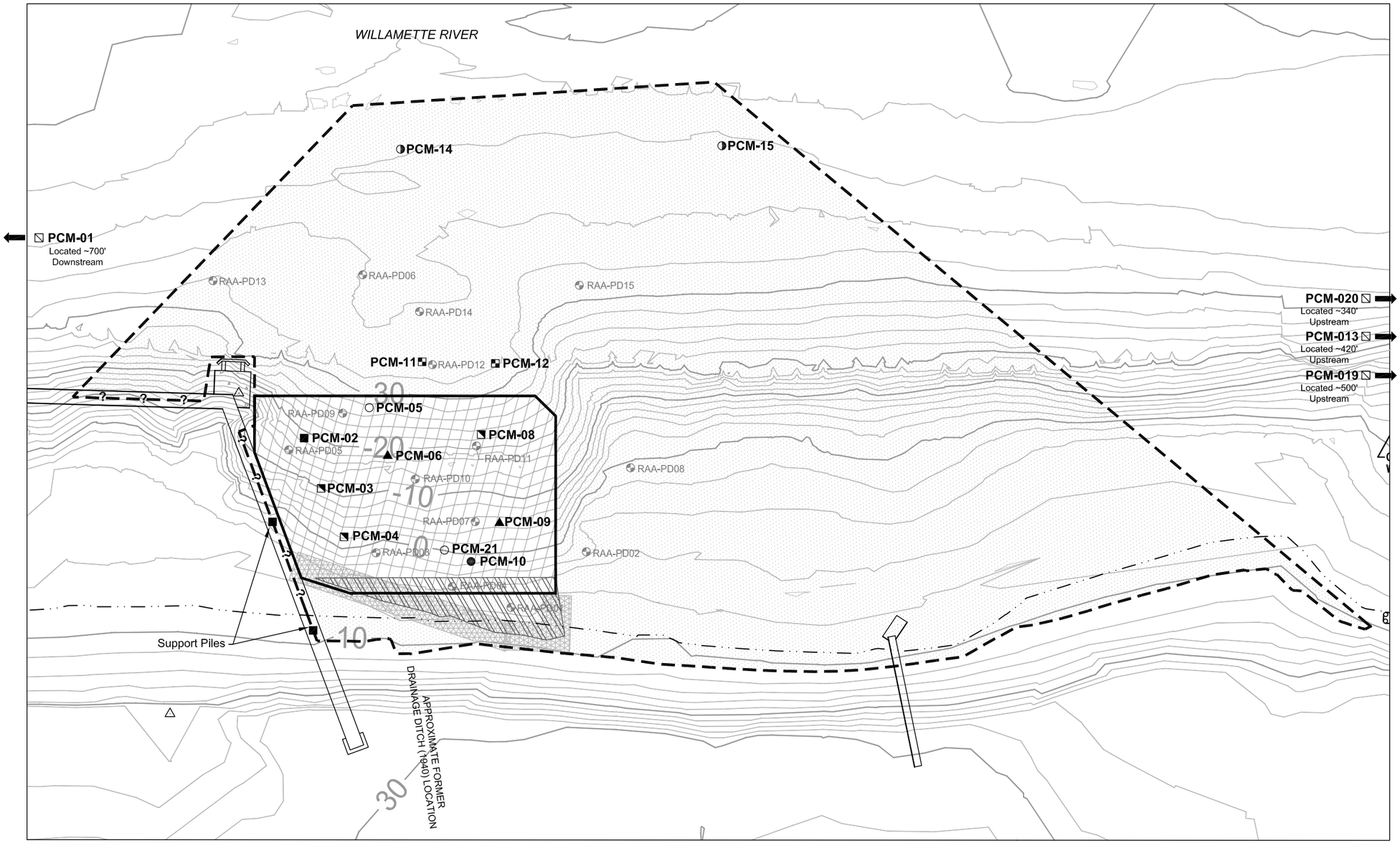
Aug 17, 2006 12:53pm hlevasseur K:\Jobs\000029-GASCO\0000290\0000290\0000290-62.dwg FIG 2

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 2
Former Pre-Removal Lateral and Vertical Extents of Surface Tar Body
NW Natural "Gasco" Site

Legend

- Support Pile Location
- Extent and Elevation of 18 in Thick Cap
- Extent and Elevation of 6 in Thick Cover
- Reactive Organo-Clay Mat (RCM) Location
- Lateral Extents of Surf Zone Armoring d50 = 3 inches
- PCM-06 ▲ Co-located Core, Porewater, Near-Bottom Surface Water & Depositional Surface Sediment Sample
- PCM-02 ■ Co-Located Core, Near-Bottom Surface Water & Depositional Surface Sediment Sample
- PCM-03 ◥ Co-Located Core, Porewater & Near-Bottom Surface Water Sample
- PCM-21 ○ Co-Located Core & Near-Bottom Surface Water Sample
- PCM-10 ● Near-Bottom Surface Water Sample
- PCM-01 ◹ Background Near- Bottom Surface Water Sample
- PCM-11 ⊞ Seepage Monitoring Core
- PCM-14 ◑ Depositional Surface Sediment Sample
- RAA-PD13 Post-Dredge Surface Sediment Sample (October 2005)



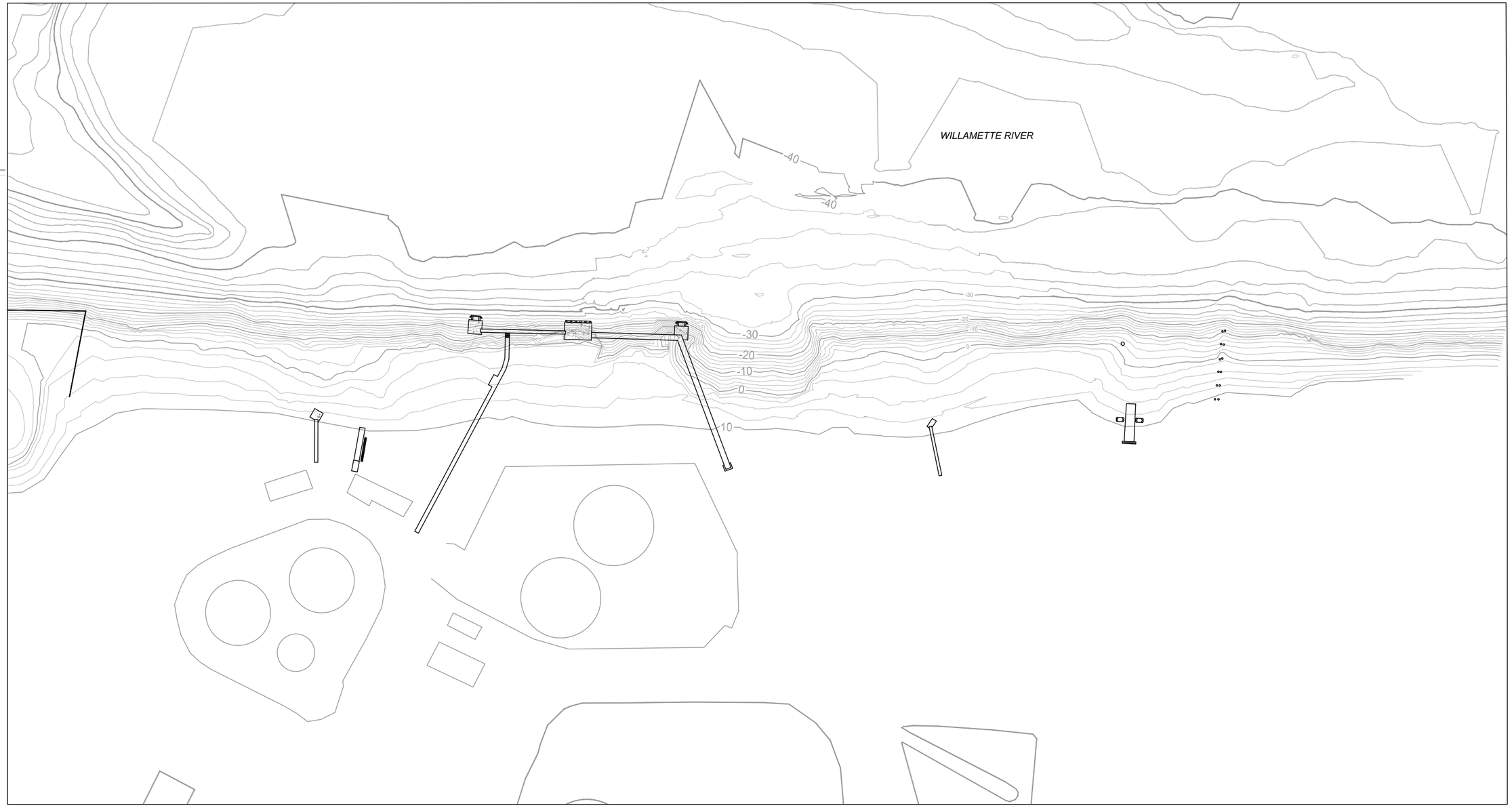
Notes

1. Post-cap bathymetric contours produced from survey provide by Blue Water Engineering dated August 2007.
2. Upland topography directed by Anchor Environmental as part of upland investigation (2002).
3. Horizontal Datum: Oregon State Plane North NAD 83 (International Feet).
4. Vertical Datum: NAVD 88 (ft).
5. Former Drainage Ditch location from Phase 1 Remedial Investigation Summary Report (HAI 1998).

Mar 25, 2008 8:54am herriksen K:\Jobs\000029-GASCO\00002902\00002902-196.dwg FIG 3

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 3
Actual Year 1 Event 2 Monitoring Station Locations
NW Natural "Gasco" Site



Notes
1. Bathymetric contours updated with survey provided by Blue Water Engineering dated October 2007.
2. Vertical Datum: NAVD 88.

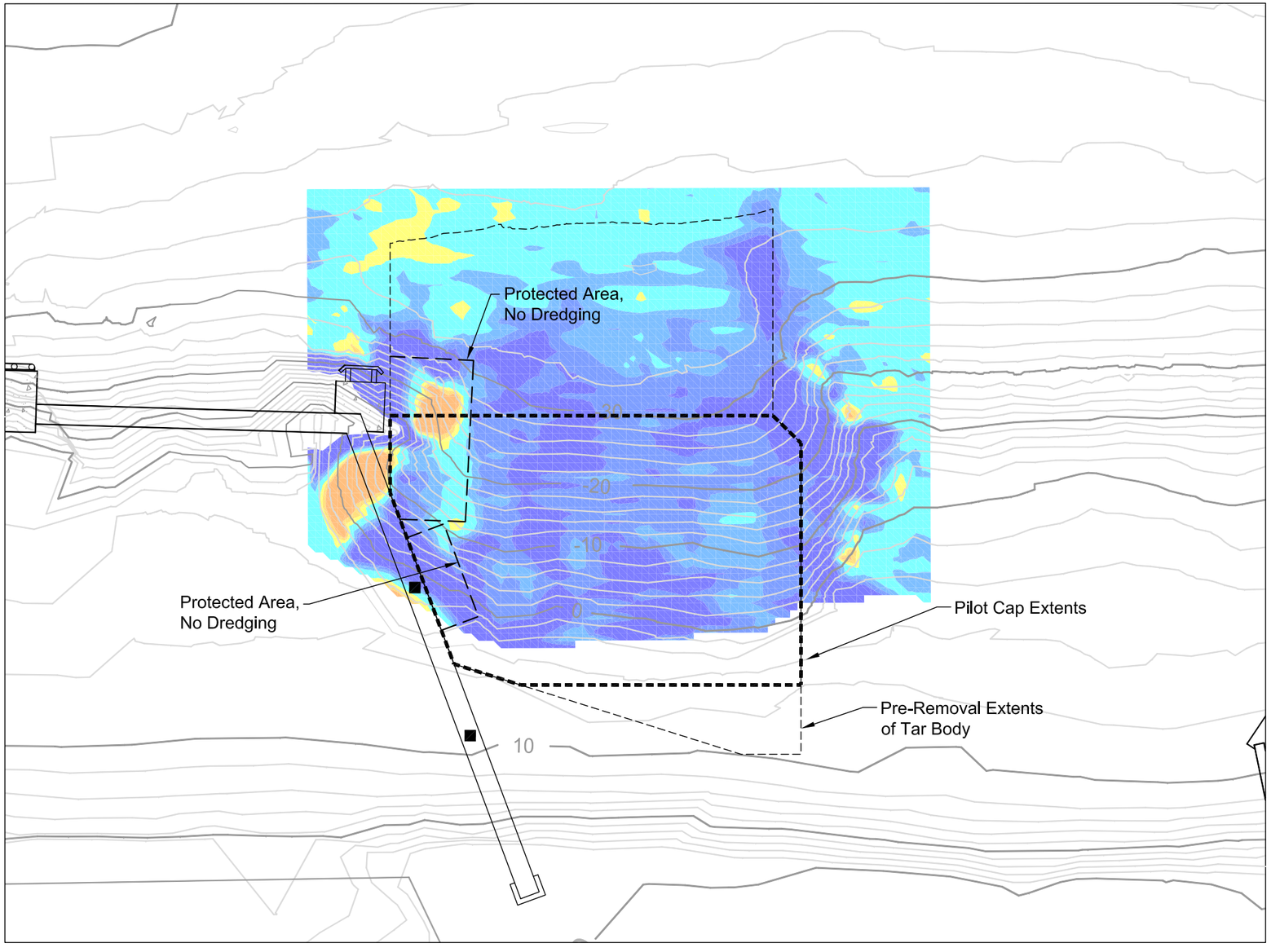
Topographic and Bathymetric Contours (2' Interval)

0 150
Scale in Feet

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 4
Year 1 Event 2 Bathymetry
NW Natural "Gasco" Site

Mar 25, 2008 2:00pm dholmer K:\Jobs\000029-GASCO\0000290\0000290\0000290\02-195.dwg FIG 4



Topographic and Bathymetric Contours (2' Interval)

Color	Range Beg.	Range End
	<-2.00	-1.50
	-1.50	-1.00
	-1.00	-0.50
	-0.50	0.50
	0.50	1.00
	1.00	1.50
	1.50	>2.00

0 50
Scale in Feet

Notes:
1. Post-construction bathymetric contours produced from surveys provided by Blue Water Engineering dated October 2005 and October 2007.
2. Upland topography directed by Anchor Environmental as part of upland investigation (2002).
3. Horizontal Datum: Oregon State Plane North NAD 83 (International Feet).
4. Vertical Datum: NAVD 88 (Feet).

Mar 25, 2008 1:48pm dholmer K:\Jobs\000029-GASCO\00002902\00002902-194.dwg FIG 5

ANCHOR ENVIRONMENTAL, L.L.C.

Figure 5
Isopach Comparing Post-Cap October 2005 and October 2007 Bathymetry Surveys
NW Natural "Gasco" Site

APPENDIX A

VISUAL MONITORING COLLECTION FORMS

Visual Observations Log Form

Date	January 17, 2008		
Location:	NW Natural "Gasco" Site		
Project Name:	NW Natural – Gasco	**Project Number:**	000029-02
Monitoring Period:	Year 1—January 2008		
Time Observations Started:	January 17, 2008 @ 1330	**Time Observation Concluded:**	January 17, 2008 @ 1600
Weather Conditions:	Overcast, 40-45 degrees F, moderate wind from the east, occasional light precipitation		
Wave Action Observations:	Very light wind-generated riffle and occasional larger waves generated by boats and/or barges (0.5-1.0 feet in height)		
Photographs Taken:	(Yes) No		

Tidal Conditions: River level conditions (1/17/08) ranged from 8.83 to 10.15 ft City of Portland Datum

Observations of Erosion/Deposition: No erosion/deposition was evident along the shoreline.
The water levels were shoreward of the pilot cap extents for the duration of the observation period (Photo 1).

Observations of Longterm Controls (i.e., oil booms, organo-clay mat, etc.) The oil boom typically in place across the face of the Site from Fuel and Marine Marketing (FAMM) to a wooden dolphin at the upstream edge of the Site was in place during the observation period (Photos 1, 2, and 3).
No portions of the organoclay mat were exposed or visible due to the high river level conditions.

Other Comments:
No sheen or exposed tar body was observed in the vicinity of the cap area (Photo 2). Occasional wood debris observed moving through cap area on the river surface.

Recorded by: **Timothy Stone**

Photo 1—*overview of cap area (1/17/08)*

Photo 2—*close-up view of cap area (1/17/08)*

Photo 3—*cap area and shoreline condition upriver of cap area (1/17/08)*

Visual Observations Log Form

Date	February 12, 2008		
Location:	NW Natural "Gasco" Site		
Project Name:	NW Natural – Gasco	**Project Number:**	000029-02 BG17 T1
Monitoring Period:	Monthly(Year 1)—February 2008		
Time Observations Started:	February 12, 2008 @ 1430	**Time Observation Concluded:**	February 12, 2008 @ 1700
Weather Conditions:	Overcast, 40-45 degrees F, light wind from the northwest, occasional light precipitation		
Wave Action Observations:	Very light wind-generated riffle and occasional larger waves generated by boats and/or barges (0.0-1.0 feet in height)		
Photographs Taken:	(Yes) No		

Tidal Conditions:

River level elevation (2/12/08) ranged from 7.21 to 9.32 ft City of Portland Datum

Observations of Erosion/Deposition:

No erosion/deposition was evident along the shoreline.
The water levels were just shoreward of the pilot cap extents for the duration of the observation period (Photo 1).

Observations of Longterm Controls (i.e., oil booms, organo-clay mat, etc.)

The oil boom typically in place across the face of the Site from Fuel and Marine Marketing (FAMM) to a wooden dolphin at the upstream edge of the Site was in use to surround a fuel vessel offloading at the FAMM dock during the inspection.

Multiple small sections of the organoclay mat material were visible just below the water surface within approximately 3-5 feet of the water's edge. (Photo 2 and Photo 3)

Other Comments:
No sheen or exposed tar body was observed in the vicinity of the cap area. Photo 4 shows the water surface immediately downstream of the cap area.

Recorded by: **Timothy Stone**

Photo 1—*overview of cap area (2/12/08)*

Photo 2—*close-up view of cap area with remnants of organoclay mat material exposed (2/12/08)*

Photo 3— *close-up view of cap area with remnants of organoclay mat material exposed (2/12/08)*

Photo 4—*conditions immediately downstream of cap area (2/12/08)*

APPENDIX B

SEDIMENT CORE LOGS

Visual Classification of Undisturbed Sample

ANCHOR ENVIRONMENTAL, L.L.C.

Job Gasco Pilot Cap Long-Term Monitoring Year 1 Event	Date 11/7/07
Job No. 000029-02 BG 12 T17.4	Sample Pushed By Geomatrix
Exploration No. PCM-02	Sample Logged By R. Baith
Sample No. PCM-02SC-071107	Type of Sample ☐ Shelby ☐ Piston Core ☒ Mud Mole
Depth of Sample 10.3 ft	Diameter of Sample (inches) 4" Square
Sampled Length (feet; from log) 1.2 ft	Sample Quality Good ☒ Fair ☐ Poor ☐
Sample Recovery (feet) 7.3 ft	Average % Compaction = 70.8

DEPTH ( )	Sample Interval	Sample Analytes	ODOR	SHEEN	COLOR	Theoretical Depth (ft)	Actual Depth (ft)	Classification and Remarks
		Metals, Pest, PCB, PAH, Cn, TPH, TOC, TS, VOC, Grainsize					1	Dark grey, moist, medium cap sand, strong odor, no sheen
1.2							1.2	grey-brown f. sandy silt w/ dense clay lenses and 1 inch minus wood debris. moderate odor, no sheen
							1.9	
2							2	
								dark grey, moist f. sand w/ silt pockets throughout. mod. odor and sheen. Some tarballs.
3							3	
4							4	
							4.6	grey-brown sl. sandy clayey silt sl. odor
							4.9	
5							5	grey-brown silty sand sl. odor. grades to sandy silt
							5.6	brown sandy ~~silt~~ clayey silt sl. odor.
6							6	
							6.3	dark grey fine sand slight odor
7							7	
							7.3	END OF CORE

Visual Classification of Undisturbed Sample

ANCHOR ENVIRONMENTAL, L.L.C.

Job Gasco Pilot Cap Long-Term Monitoring Year/Event	Date 11/6/07
Job No. 000029-02 BG 12 T17.4	Sample Pushed By Geomatrix
Exploration No. PCM-03	Sample Logged By R. Barth
Sample No. PCM-04SC-071106	Type of Sample ☐ Shelby ☐ Piston Core ☒ MudMole
Depth of Sample 10.1 ft	Diameter of Sample (inches) 4" Square
Sampled Length (feet; from log) 1.4 ft	Sample Quality Good ☒ Fair ☐ Poor ☐
Sample Recovery (feet) 7.6 ft	Average % Compaction = 75.2 %

DEPTH ( )	Sample Interval	Sample Analytes	ODOR	SHEEN	COLOR	Theoretical Depth (ft) Actual Core Sections	Classification and Remarks
1		Metals, Pest PCB, PAH, CN TPH, TOC, TS, VOC, Grainsize				1	Moist, brown medium cap sand, moderate mothball odor
1.4						1.4	Moist, grey fine cap sand (fringe) sheen & tarball, strong mothball odor
2						2	brown sandy clayey silt sheen and 2cm tar ball
3						3	
4						3.9 4	grey-brown silty fine sand no odor, silt pockets (<2cm)
5						4.9 5	grey-brown silty fine sand
6						6	grey-brown sl. sand clayey silt no odor/sheen
7						6.9 7	grey-brown silty fine sand
						7.6	End of core

Visual Classification of Undisturbed Sample

ANCHOR ENVIRONMENTAL, L.L.C.

Job Gasco Pilot Cap Long-Term Monitoring Year 1 Event	Date 4/7/07
Job No. 000029-02 BG 12 T17.4	Sample Pushed By Geomatrix
Exploration No. PCM-04	Sample Logged By R. Barth
Sample No. PCM-04SC-071107	Type of Sample ☐ Shelby ☐ Piston Core ☒ MudMole
Depth of Sample ~~0.7 ft~~ 10.1 ft	Diameter of Sample (inches) 4" Square
Sampled Length (feet; from log) 0.7 ft	Sample Quality Good ☒ Fair ☐ Poor ☐
Sample Recovery (feet) 7.4	Average % Compaction = 73.3 %

DEPTH ( )	Sample Interval	Sample Analytes	ODOR	SHEEN	COLOR	Theoretical Depth (ft) Actual Core Sections	Classification and Remarks
0.7		TS, TOC, ICP, PEST, PCB, Metals, PAH, SVOC				0.7	grey, ~~sl. silty sand, strong~~ brown cap sand, strong odor (rotten egg)
1						1	grey sl. silty, sand, strong odor moist, sheen
						1.2	grades to silty, clayey sand mod. odor
						1.6	grey, silty sand, sheen, strong odor
2						2	
						2.5	grey-brown, sl. f. sandy clayey silt, no odor/sheen
3						3	
4						4	
5						5	
6						6	grades to
						6.6	~~brown~~ silty sand, dense, no odor
						7	
						7.4	

Visual Classification of Undisturbed Sample

ANCHOR ENVIRONMENTAL

Job Gasco Pilot Cap Long-Term Monitoring Year/Event	Date 11/7/07
Job No. 000029-02 BG 12 T17.4	Sample Pushed By Geomatrix
Exploration No. PCM-05	Sample Logged By R. Baith
Sample No. PCM-05SC-071107	Type of Sample ☐ Shelby ☐ Piston Core ☒ MudMole
Depth of Sample 8.4 ft.	Diameter of Sample (inches) 4" Square
Sampled Length (feet; from log) 0.5 ft	Sample Quality Good ☒ Fair ☐ Poor ☐
Sample Recovery (feet) 6.5 ft	Average % Compaction = 77.4 %

DEPTH ( )	Sample Interval	Sample Analytes	ODOR	SHEEN	COLOR	Theoretical Depth (ft)	Actual Depth (ft)	Classification and Remarks
	X	Metals, Dioxins, PAH, Cu, TPH, TOC, TS, VOC, Grainsize						
0.5							0.5	grey-brown, moist, fine sand, mod. to strong odor, no sheen.
								45° angle interface w/ above cap sand layer olive brown sl. sandy silt, mod. odor
1							1	grey-brown, moist, fine sand w/ heavy sheen, mod. odor, some tar present
							1.9	
2							2	gr. brown sl sandy clayey silt v. sl. odor
							2.5	grey fine sand, some sheen, no odor
3							3	
							3.4	brown sandy clayey silt, sl. odor
							3.7	
4							4	grey-brown sl. silty sand sl. odor
								grades to fine sand
5							5	
							5.3	brown sandy, clayey, silt no odor
							5.4	
6							6	gr. brown f. sand, no odor
							6.5	END OF CORE
7							7	

Visual Classification of Undisturbed Sample

ANCHOR ENVIRONMENTAL, L.L.C.

Job Gasco Pilot Cap Long-Term Monitoring Year/Event	Date 11/6/07
Job No. 000029-02 BG 12 T17.4	Sample Pushed By Geomatrix
Exploration No. PCM-06	Sample Logged By R. Barth
Sample No. PCM-06SC-071106	Type of Sample ☐ Shelby ☐ Piston Core ☒ MudMole
Depth of Sample 10.1 ft	Diameter of Sample (inches) 4" Square
Sampled Length (feet; from log) 1.9 ft	Sample Quality Good ☐ Fair ☒ Poor ☐
Sample Recovery (feet) 7.0 ft	Average % Compaction = 69.3 %

DEPTH ( )	Sample Interval	Sample Analytes	ODOR	SHEEN	COLOR	Theoretical Depth (ft) Actual Core Sections	Classification and Remarks
1		Metals, Pest, PCB PAH, Cn TPH, TOC TS, VOC, Grainsize				1	grey-brown, medium to fine cap sand material. Moderate mothball odor, sl. sheen, moist.
1.9 2						1.9 2	~~Core tube bent at this interval~~
						2.5	
3						3	grey silty fine sand moderate odor, some sheen, small tar blebs, pockets of silt
						3.6	
4						4	→ SAME, sl. odor (mothball)
5						5 5.2	brown clayey silt
						5.6	grey-brown sl. silty fine sand, no odor/sheen
6						6	
						7	end of core

Visual Classification of Undisturbed Sample

ANCHOR ENVIRONMENTAL, L.L.C.

Job Gasco Pilot Cap Long-Term Monitoring Year/Event	Date 11/6/07
Job No. 000029-02 BB 12 T17.4	Sample Pushed By Geomatrix
Exploration No. PCM-21	Sample Logged By R. Barth
Sample No. PCM-21SC-071106	Type of Sample ☐ Shelby ☐ Piston Core ☒ MudMole
Depth of Sample 10.1 ft	Diameter of Sample (inches) 4" Square
Sampled Length (feet; from log) 1.0 ft	Sample Quality Good ☒ Fair ☐ Poor ☐
Sample Recovery (feet) 7.2	Average % Compaction = 71.3 %

DEPTH ( )	Sample Interval	Sample Analytes	ODOR	SHEEN	COLOR	Theoretical Depth (Ft) Actual Core Sections	Classification and Remarks
	X	Metals, Pest, PCB PAH, Cn TPH, TOC TS, VOC Grainsize					grey-brown medium cap sand, moderate mothball odor, no sheen
1						1	grey-brown silty sand, moderate odor, sheen, and tar blebs
2						2	
						2.6	brown sandy silt no odor, sheen
3						3	
4						4	
						4.6	grey-brown sl. silty fine sand
5						5	
						5.6	grey-brown sandy silt
6						6	
						6.2	grey-brown silty sand
7						7	
						7.2	end of core

Visual Classification of Undisturbed Sample

ANCHOR ENVIRONMENTAL, L.L.C.

Job Gasco Pilot Cap Long-Term Monitoring Year 1 Event	Date 11/8/07
Job No. 000029-02 BG 12 T17.4	Sample Pushed By Geomatrix
Exploration No. PCM-08	Sample Logged By R. Barth
Sample No. PCM-08SC-071108	Type of Sample ☐ Shelby ☐ Piston Core ☒ MudMole
Depth of Sample 10.1 ft	Diameter of Sample (inches) 4" Square
Sampled Length (feet; from log) 1.4 ft	Sample Quality Good ☒ Fair ☐ Poor ☐
Sample Recovery (feet) 9.0 ft	Average % Compaction = 90 %

DEPTH (ft)	Sample Interval	Sample Analytes	ODOR	SHEEN	COLOR	Theoretical Depth (ft)	Actual Depth (ft)	Core Sections	Classification and Remarks
		TS, TOC, Metals, CN, PAH, VOC, Fe, TPH					0.5		wet/moist, fine grey sand, mod. odor, no sheen,
1							1		wet, brown, coarse/med cap sand, spotty sheen, mod. odor,
MPH							1.6		
2							2		wet, grey, f/m sand, no sheen/odor
3							3		
							3.2		wet, fine sand, grey, no sheen/odor
4							4		
							4.2		same
5							5		silty clay, brown, moist, no sheen/odor
							5.8		
6							6		
7							7		fine grey sand, moist/wet, no sheen/odor
8							8		silty clay, moist, brown, no sheen/odor
									same
9							9		Bottom of Core

Visual Classification of Undisturbed Sample

ANCHOR ENVIRONMENTAL, L.L.C.

Job Gasco Pilot Cap Long-Term Monitoring Year 1 Event	Date 11/5/07
Job No. 000029-02 BG 12 T17.4	Sample Pushed By Geomatrix
Exploration No. PCM-09	Sample Logged By R. Barth
Sample No. PCM-09SC-071105	Type of Sample ☐ Shelby ☐ Piston Core ☒ MudMole
Depth of Sample 10.1 ft	Diameter of Sample (inches) 4" Square
Sampled Length (feet; from log) 1.7 ft	Sample Quality Good ☒ Fair ☐ Poor ☐
Sample Recovery (feet) 8.0 ft	Average % Compaction = 79%

DEPTH ( )	Sample Interval	Sample Analytes	ODOR	SHEEN	COLOR	Theoretical Depth (ft) Actual Core Sections	Classification and Remarks
		Metals, Pest, PCB, PAH, CN, TPH, TOC, TS, VOC, Grainsize					moist, f. sand, grey, fringe cover, minor mothball odor, no sheen
1						1	moist, brn, cap sand, strong moth ball odor, no sheen,
1.7						1.8	
2						2	brown sl. sandy clayey silt, no odor, ~~sheen of f. grey sand, sheen, mod odor~~ no sheen, moist
3						3	grades to less moist, ↑ clay fraction
4						4	
5						5	
						5.7	
6						6	brown, moist, silty sand, no odor/ Sheen
						6.6	moist, brown, sl. clayey silt,
7						7	
						7.4	Same
8						8	Bottom Core

Visual Classification of Undisturbed Sample

ANCHOR ENVIRONMENTAL, L.L.C.

Job Gasco Pilot Cap Long-Term Monitoring Year 1 Event 2	Date 11/5/07
Job No. 000029-02 BG 12 T17.4	Sample Pushed By Geomatrix
Exploration No. PCM-10	Sample Logged By R. Barth
Sample No. PCM-10SC-071105	Type of Sample ☐ Shelby ☐ Piston Core ☒ MudMole
Depth of Sample 10.1 ft	Diameter of Sample (inches) 4" Square
Sampled Length (feet; from log) 0.5 ft	Sample Quality Good ☒ Fair ☐ Poor ☐
Sample Recovery (feet) 7.6 ft	Average % Compaction = 75%

DEPTH (ft)	Sample Interval	Sample Analytes	ODOR	SHEEN	COLOR	Theoretical Depth (ft) Actual Core Sections	Classification and Remarks
0.5	☒	TS, TOC, CN, PCBs, PCBs, Metals, PAH SVOC				0.6 ft	moist, cap sand (M/C), strong mothball odor, no sheen, brown
1							moist, sandy silt, brown, no sheen/odor
1.6						1.6 ft 1.8 ft	tar ball, 3" Ø, heavy sheen, odor, sand, grey, black
2							same, less moist,
						2.4 ft	silty sand, heavy sheen/odor, grey
						2.7 ft	moist, brown, sandy silt, no sheen/odor,
3						3	
4						4	
5						5	
							moist, fine sand, grey, no odor/sheen
6						6	
							same
7						7	
							Bottom of Core
8						8	
9							

Visual Classification of Undisturbed Sample

ANCHOR ENVIRONMENTAL, L.L.C.

Job Gasco Pilot Cap Long-Term Monitoring Year/Event/	Date 11/8/08
Job No. 000029-02 BG 12 T17.4	Sample Pushed By Geomatrix
Exploration No. PCM-11	Sample Logged By R. Barth
Sample No. ~~PCM-11SC-071108~~	Type of Sample ☐ Shelby ☐ Piston Core ☒ MudMole
Depth of Sample 8.5 ft (Refusal Reached)	Diameter of Sample (inches) 4" Square
Sampled Length (feet; from log) 0 (Visual Only Core)	Sample Quality Good ☒ Fair ☐ Poor ☐
Sample Recovery (feet) 5.7 ft	Average % Compaction = 0.7 %

DEPTH (ft)	Sample Interval	Sample Analytes	ODOR	SHEEN	COLOR	Theoretical Depth (ft)	Actual Core Sections	Classification and Remarks
								wet, soft, brown, depositional silt, mod. mothball odor, spots of sheen
							0.7	
1							1	moist, fine/med. sand, grey, mod/heavy sheen, mod. odor
							1.7	
2							2	grades to sl. finer sand that is more brown, sheen decreases, mod odor
3							3	
							3.2	moist, brown, clayey silt, no odor/sheen
4							4	same, sl. odor
							4.5	
5							5	same but sl. finer, sl. woody odor
							5.3	
							5.5	same
							5.7	same
6							6	Bottom of Core
7							7	
8							8	
9							9	

NO SAMPLE
VISUAL CORE
NO PRODUCT OBSERVED

Visual Classification of Undisturbed Sample

ANCHOR ENVIRONMENTAL, L.L.C.

Job Gasco Pilot Cap Long-Term Monitoring Year 1 Event	Date 11/8/07
Job No. 000029-02 BG 12 T17.4	Sample Pushed By Geomatrix
Exploration No. PCM-12	Sample Logged By R. Barth
Sample No. ~~PCM-BG-07-1108~~	Type of Sample ☐ Shelby ☐ Piston Core ☒ MudMole
Depth of Sample 10.1	Diameter of Sample (inches) 4" Square
Sampled Length (feet; from log) Ø (Visual Only)	Sample Quality Good ☐ Fair ☐ Poor ☐
Sample Recovery (feet) 7.3ft	Average % Compaction = 72 %

DEPTH (ft)	Sample Interval	Sample Analytes	ODOR	SHEEN	COLOR	Theoretical Depth (ft) Actual Core Sections	Classification and Remarks
						0.3	wet, brown, soft depositional silt, spots of sheen, mod. mothball odor
							wet, fine, grey/brn sand, mod. mothball odor, spots sheen
1						1	wet/moist, grey brown sand, fine/med course, mod. organic odor
2						2	moist, brown, sandy silt, sl. odor, no sheen
							same
3						3	silty clay
						3.4	brown, ~~clayey sandy silt~~, no odor/sheen
4						4	same
						4.4	brown, silty clay, moist, no odor/sheen
							wet/moist, fine sand, brown, no odor/sheen (finer than above intervals)
5						5	
						5.3	same
						5.6	
6						6	same
						6.4	same
7						7	olive, moist, sandy silt, no sheen/odor
						7.3	Bottom Core
8						8	
9						9	

NO SAMPLE

VISUAL ONLY

No sign of product !!

APPENDIX C

SEDIMENT CORE COLLECTION FORMS

Geomatrix Consultants, Inc. MudMole Bore Log

Place Field ID Label Here

Collection Information

Date: 11-7-07

Project: GRS co Recorder: GSM

Station Name: PCM-02

Tube Length (ft): 10.5

Water Depth (ft): 27.6 Time: 0812

Est. Tide Height (ft) _____ (MLLW)

Est. Mudline: _____ (MLLW)

Position Information

Coordinate Datum: _____

Northing 45 / 34 / 48.4 6642

Easting 122 / 45 / 30.12509

On Deck Top of Sediment 2.6

Comments: _____

Penetration Tape Reading	Recovery Tape Reading	Comments
8.4	8.8	
6.3	7.0	
5.0	5.9	
4.1	5.0	slowing down
1.9	3.4	
0.7	2.8	
0.2	2.5	

MCS Environmental, Inc.
6505 - 216th St SW, Suite 100
Mountlake Terrace, WA 98043
(425) 697-4340

Mudmole™ Bore Log

Project: Gasco Year 1 Event 2 Cap Monitoring **Station:** PCM-02

Project No: 000029-02 BG10 T4 **Position:** NAD83

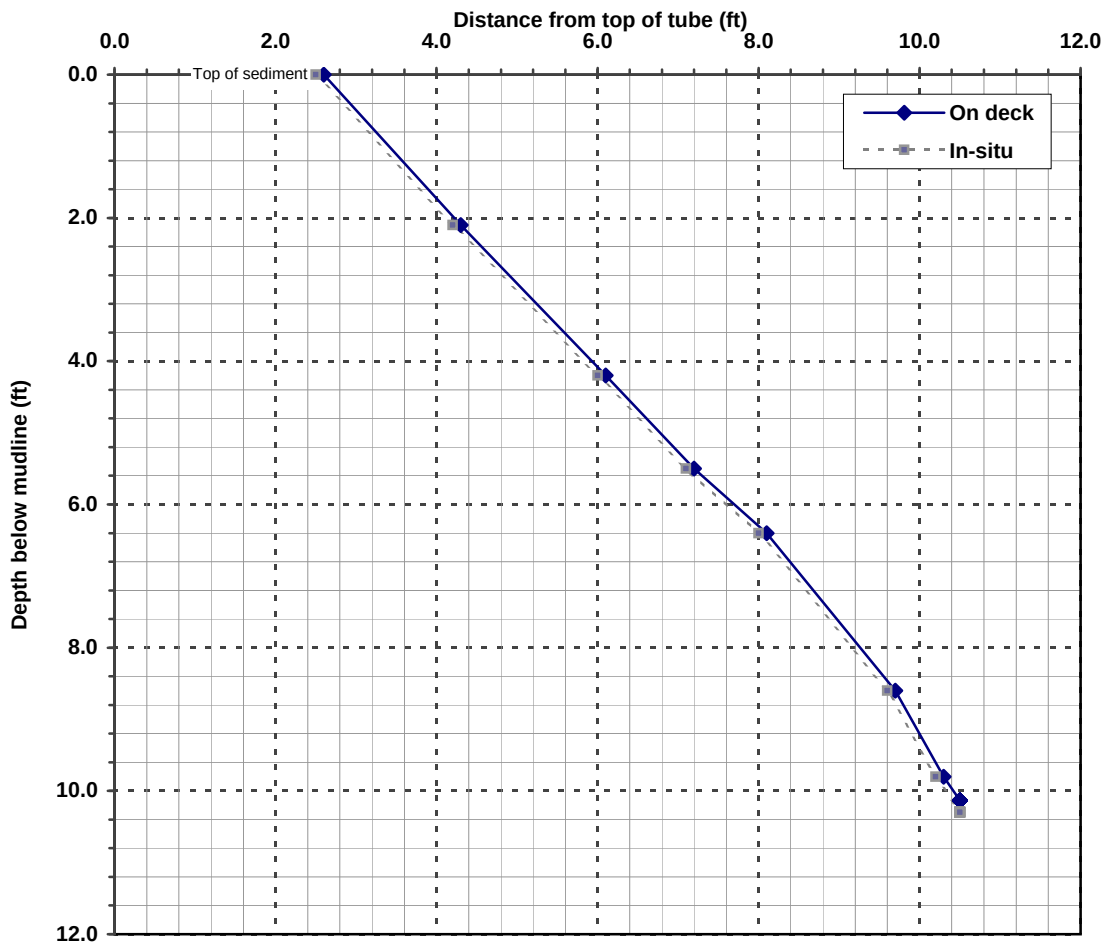
Collected by: GSM 45 34 48.46642

Date: 11/7/2007 **Time:** 8:12 122 45 30.12509

Water depth: 27.6 ft **Mudline:** -19.0 ft NAVD88 (approximated from bathymetry)

Place Field ID Label Here

Weather/Comments: N/A



Penetration 10.3 ft/ On deck recovery 7.9 ft = 77% Recovery

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-2.1	1.7	81%
2.1-4.2	1.8	86%
4.2-5.5	1.1	85%
5.5-6.4	0.9	100%
6.4-8.6	1.6	73%
8.6-9.8	0.6	50%
9.8-10.3	0.3	60%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	2.6
1	3.41
2	4.22
3	5.07
4	5.93
5	6.78
6	7.70
7	8.54
8	9.26
9	9.90
10	10.42
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Geomatrix Consultants, Inc.
3500 188th Street SW, Suite 600
Lynnwood, WA 98037

(425) 921-4000
fax (425) 921-4040

Geomatrix Consultants, Inc. MudMole Bore Log

Place Field ID Label Here

Collection Information

Date: 11-6-07

Project: Gasco Recorder: GSM

Station Name: PCM-03

Tube Length (ft): 10.3

Water Depth (ft): 18.2 Time: 0843

Est. Tide Height (ft) _____ (MLLW)

Est. Mudline: _____ (MLLW)

Position Information

Coordinate Datum: _____

Northing 45 34 48.18143

Easting 122 45 30.19420

On Deck Top of Sediment 2.8

Comments: _____

Penetration Tape Reading	Recovery Tape Reading	Comments
7.7	8.2	
5.7	6.8	
4.0	5.1	
2.7	4.3	
0.2	2.6	

MCS Environmental, Inc.
6505 - 216th St SW, Suite 100
Mountlake Terrace, WA 98043
(425) 697-4340

Mudmole™ Bore Log

Project: Gasco Year 1 Event 2 Cap Monitoring **Station:** PCM-03

Project No: 000029-02 BG10 T4 **Position:** NAD83

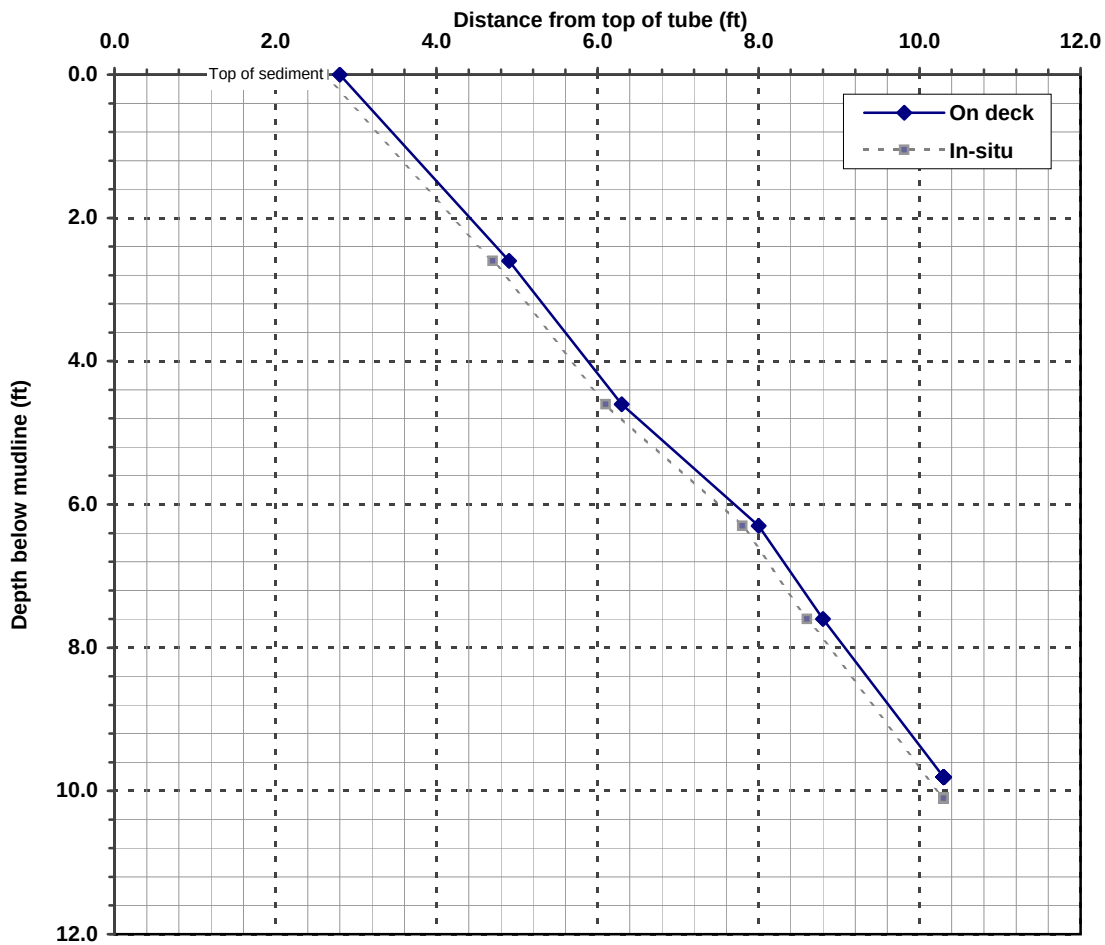
Collected by: GSM 45 34 48.18143

Date: 11/6/2007 **Time:** 8:43 122 45 30.19420

Water depth: 18.2 ft **Mudline:** -9.0 ft NAVD88 (approximated from bathymetry)

Place Field ID Label Here

Weather/Comments: N/A



Penetration 10.1 ft/ On deck recovery 7.5 ft = 74% Recovery

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-2.6	2.1	81%
2.6-4.6	1.4	70%
4.6-6.3	1.7	100%
6.3-7.6	0.8	62%
7.6-10.1	1.7	68%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	2.8
1	3.61
2	4.42
3	5.18
4	5.88
5	6.70
6	7.70
7	8.43
8	9.07
9	9.75
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

Geomatrix Consultants, Inc.
3500 188th Street SW, Suite 600
Lynnwood, WA 98037

(425) 921-4000
fax (425) 921-4040

Geomatrix Consultants, Inc. MudMole Bore Log

Place Field ID Label Here

Collection Information

Date: 11-7-07

Project: GASCO Recorder: GSM

Station Name: PCM-04

Tube Length (ft): 10.3

Water Depth (ft): 9.4 Time: 1237

Est. Tide Height (ft) _____ (MLLW)

Est. Mudline: _____ (MLLW)

Position Information

Coordinate Datum: _____

Northing 45 37 47.88942

Easting 122 45 30.21676

On Deck Top of Sediment 2-9

Comments: _____

Penetration Tape Reading	Recovery Tape Reading	Comments
8.1	8.9	
5.8	7.0	
3.7	5.2	
2.1	4.0	
0.8	3.1	
0.2	2.7	

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Mudmole™ Bore Log

Project: Gasco Year 1 Event 2 Cap Monitoring **Station:** PCM-04

Project No: 000029-02 BG10 T4 **Position:** NAD83

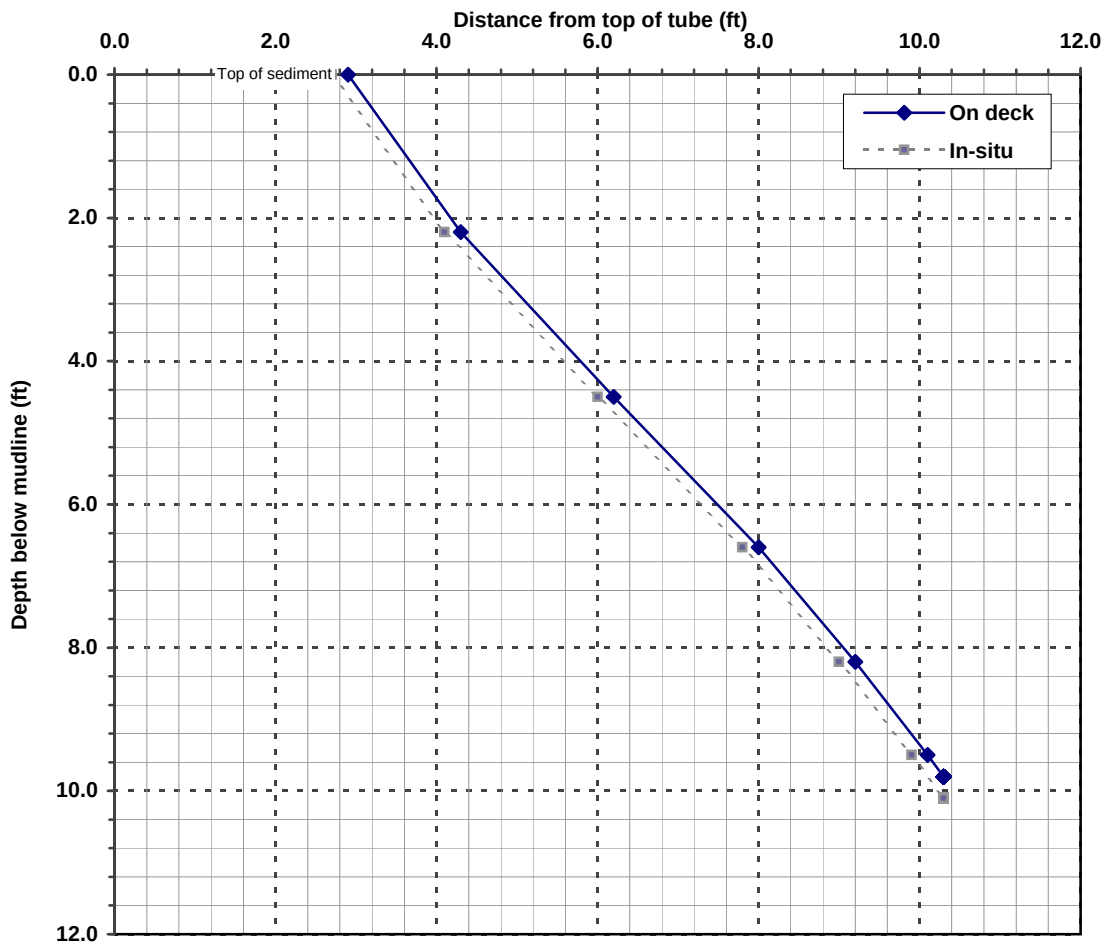
Collected by: GSM 45 37 47.88942

Date: 11/7/2007 **Time:** 12:37 122 45 30.21676

Water depth: 9.4 ft **Mudline:** 2.0 ft NAVD88 (approximated from bathymetry)

Place Field ID Label Here

Weather/Comments: N/A



Penetration 10.1 ft/ On deck recovery 7.4 ft = 73% Recovery

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-2.2	1.4	64%
2.2-4.5	1.9	83%
4.5-6.6	1.8	86%
6.6-8.2	1.2	75%
8.2-9.5	0.9	69%
9.5-10.1	0.4	67%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	2.9
1	3.54
2	4.17
3	4.96
4	5.79
5	6.63
6	7.49
7	8.30
8	9.05
9	9.75
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

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Place Field ID Label Here

Collection Information

Date: 11-7-07

Project: Gasco Recorder: GSM

Station Name: PCM 05

Tube Length (ft): 10.3

Water Depth (ft): 33.5 Time: 1035

Est. Tide Height (ft) _____ (MLLW)

Est. Mudline: _____ (MLLW)

Position Information

Coordinate Datum: _____

Northing 45 34 48.44367

Easting 122 45 29.5 6781

~~29.5~~

On Deck Top of Sediment 3.6

Comments: _____

Penetration Tape Reading	Recovery Tape Reading		Comments
8.1	8.4		
6.0	6.7		
4.1	5.1		
2.9	4.1		slow
1.9	3.4		refusal (very slow)
		10.3	
		1.9	
		8.4	

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Project: Gasco Year 1 Event 2 Cap Monitoring **Station:** PCM-06

Project No: 000029-02 BG10 T4 **Position:** NAD83

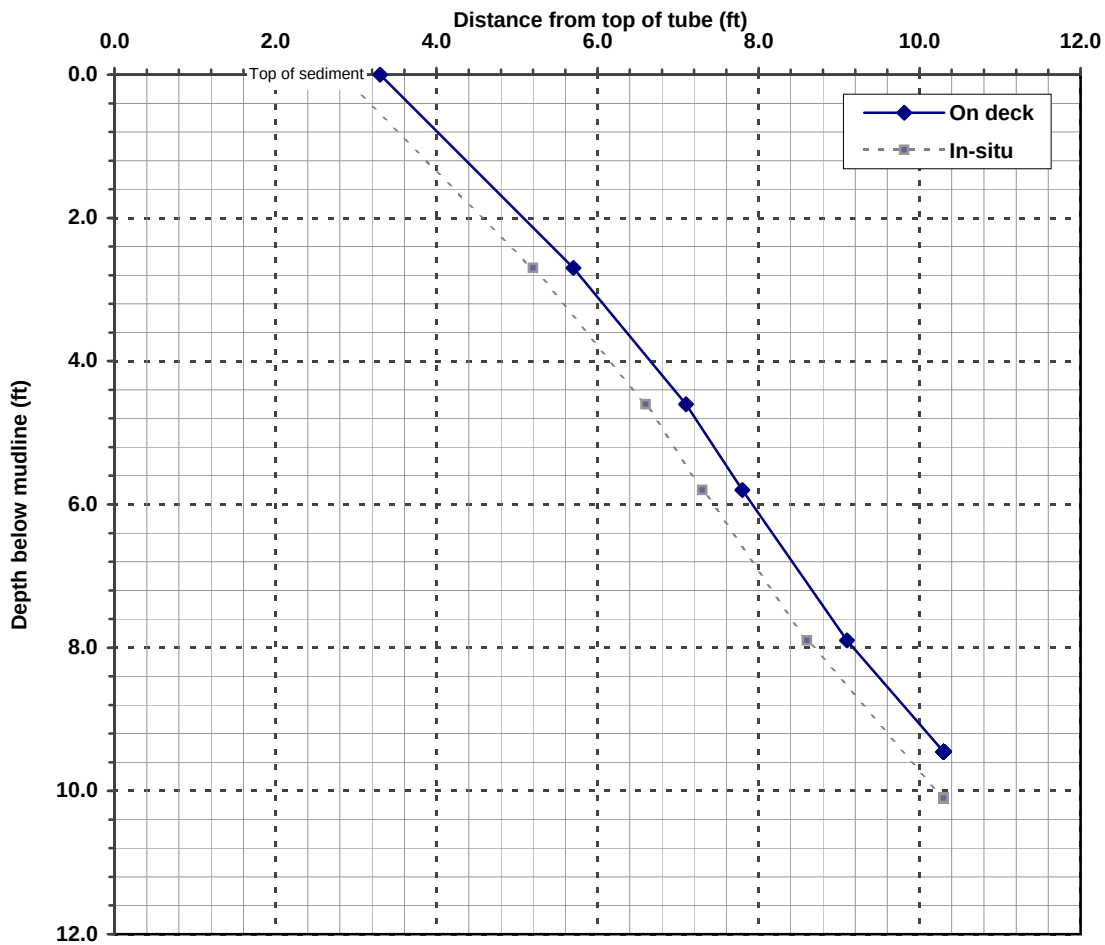
Collected by: GSM 45 34 48.16291

Date: 11/6/2007 **Time:** 10:55 122 45 29.62143

Water depth: 24.8 ft **Mudline:** -16.0 ft NAVD88 (approximated from bathymetry)

Place Field ID Label Here

Weather/Comments: N/A



Penetration 10.1 ft/ On deck recovery 7 ft = 69% Recovery

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-2.7	2.4	89%
2.7-4.6	1.4	74%
4.6-5.8	0.7	58%
5.8-7.9	1.3	62%
7.9-10.1	1.7	77%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	3.3
1	4.19
2	5.08
3	5.92
4	6.66
5	7.33
6	7.92
7	8.54
8	9.18
9	9.95
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

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Place Field ID Label Here

Collection Information

Date: 11-6-07

Project: Gasco Recorder: GSM

Station Name: PCM 06

Tube Length (ft): 10.3

Water Depth (ft): 24.8 Time: 1055

Est. Tide Height (ft) _____ (MLLW)

Est. Mudline: _____ (MLLW)

Position Information

Coordinate Datum: _____

Northing 45 34 48.16291

Easting 122 45 29.62143

On Deck Top of Sediment 3-3

Comments: _____

Penetration Tape Reading	Recovery Tape Reading		Comments
7.6	7.9		
5.7	6.5		
4.5	5.8		
2.4	4.5		
0.2	2.8		
		10.3	

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Mudmole™ Bore Log

Project: Gasco Year 1 Event 2 Cap Monitoring **Station:** PCM-06

Project No: 000029-02 BG10 T4 **Position:** NAD83

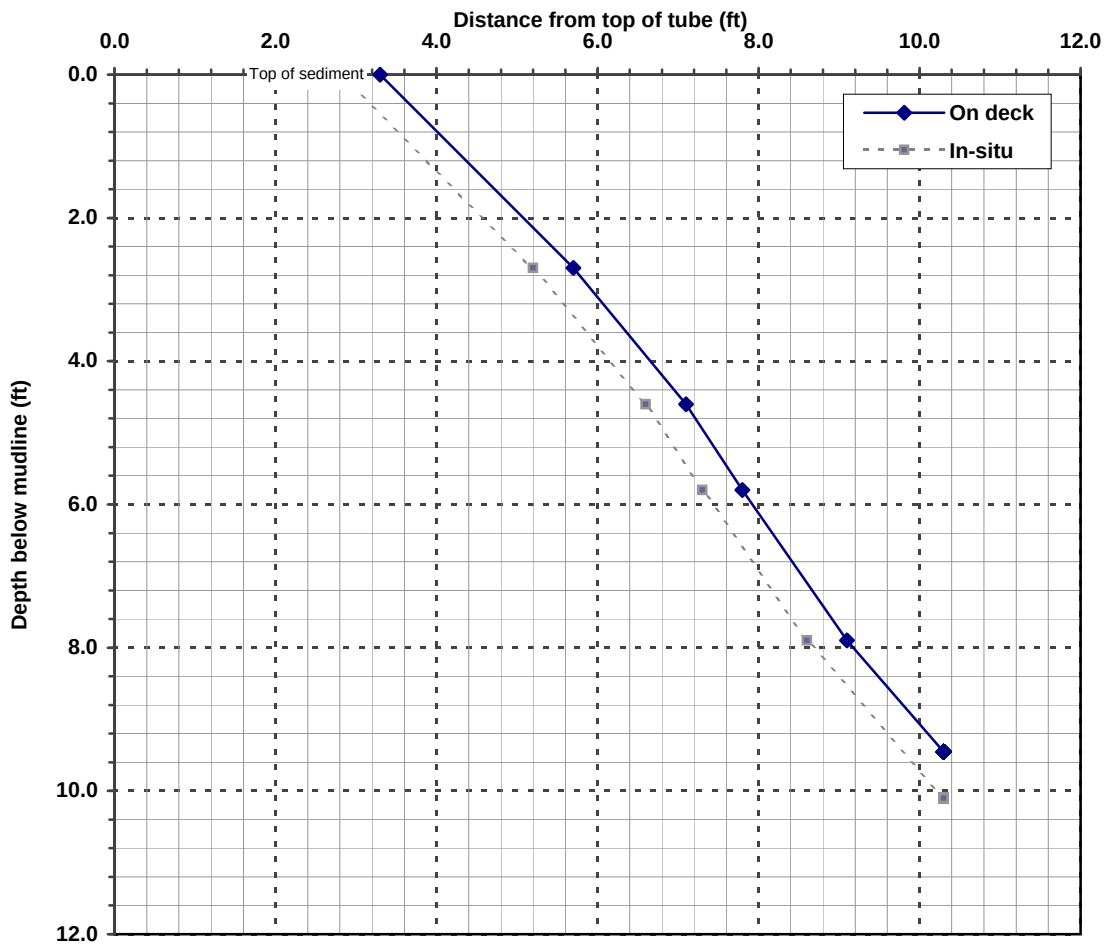
Collected by: GSM 45 34 48.16291

Date: 11/6/2007 **Time:** 10:55 122 45 29.62143

Water depth: 24.8 ft **Mudline:** -16.0 ft NAVD88 (approximated from bathymetry)

Place Field ID Label Here

Weather/Comments: N/A



Penetration 10.1 ft/ On deck recovery 7 ft = 69% Recovery

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-2.7	2.4	89%
2.7-4.6	1.4	74%
4.6-5.8	0.7	58%
5.8-7.9	1.3	62%
7.9-10.1	1.7	77%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	3.3
1	4.19
2	5.08
3	5.92
4	6.66
5	7.33
6	7.92
7	8.54
8	9.18
9	9.95
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

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Place Field ID Label Here

Collection Information

Date: 11-6-07

Project: GASCO Recorder: GSM

Station Name: PCM-21

Tube Length (ft): 10.3

Water Depth (ft): 9.4 Time: 1339

Est. Tide Height (ft) _____ (MLLW)

Est. Mudline: _____ (MLLW)

Position Information

Coordinate Datum: _____

Northing 45 34 47 .56557

Easting 122 45 29 .58030

On Deck Top of Sediment 3.2

Comments: _____

Penetration Tape Reading	Recovery Tape Reading	Comments
8.4	8.8	
6.3	7.2	
4.6	5.7	
3.2	4.9	
2.6	4.2	
0.2	3.0	

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Project: Gasco Year 1 Event 2 Cap Monitoring **Station:** PCM-21

Project No: 000029-02 BG10 T4 **Position:** NAD83

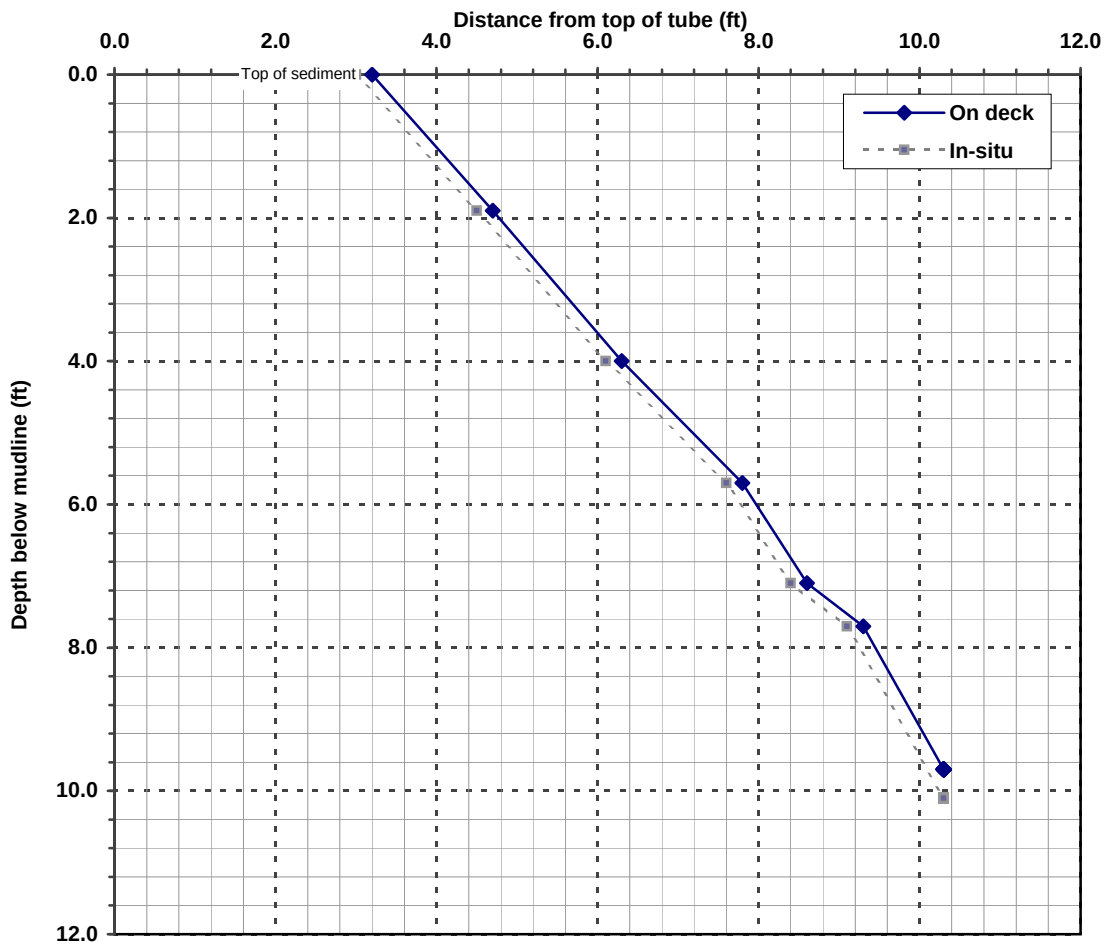
Collected by: GSM 45 34 47.56557

Date: 11/6/2007 **Time:** 13:39 122 45 29.58030

Water depth: 9.4 ft **Mudline:** 6.0 ft NAVD88 (approximated from bathymetry)

Place Field ID Label Here

Weather/Comments: N/A



Penetration 10.1 ft/ On deck recovery 7.1 ft = 70% Recovery

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-1.9	1.5	79%
1.9-4	1.6	76%
4-5.7	1.5	88%
5.7-7.1	0.8	57%
7.1-7.7	0.7	117%
7.7-10.1	1.2	50%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	3.2
1	3.99
2	4.78
3	5.54
4	6.30
5	7.18
6	7.97
7	8.54
8	9.45
9	9.95
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

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Place Field ID Label Here

Collection Information

Date: 11-8-07

Project: GASCO Recorder: GSM

Station Name: PCM 08

Tube Length (ft): 10.3

Water Depth (ft): 31.4 Time: 0802

Est. Tide Height (ft) _____ (MLLW)

Est. Mudline: _____ (MLLW)

Position Information

Coordinate Datum: _____

Northing 45 34 48.02494

Easting 122 45 28.90303

On Deck Top of Sediment 1.2

Comments: _____

Penetration Tape Reading	Recovery Tape Reading	Comments
8.2	8.6	
5.3	5.7	
3.7	3.8	
1.9	2.4	
0.2	0.7	

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Project: Gasco Year 1 Event 2 Cap Monitoring **Station:** PCM-08

Project No: 000029-02 BG10 T4 **Position:** NAD83

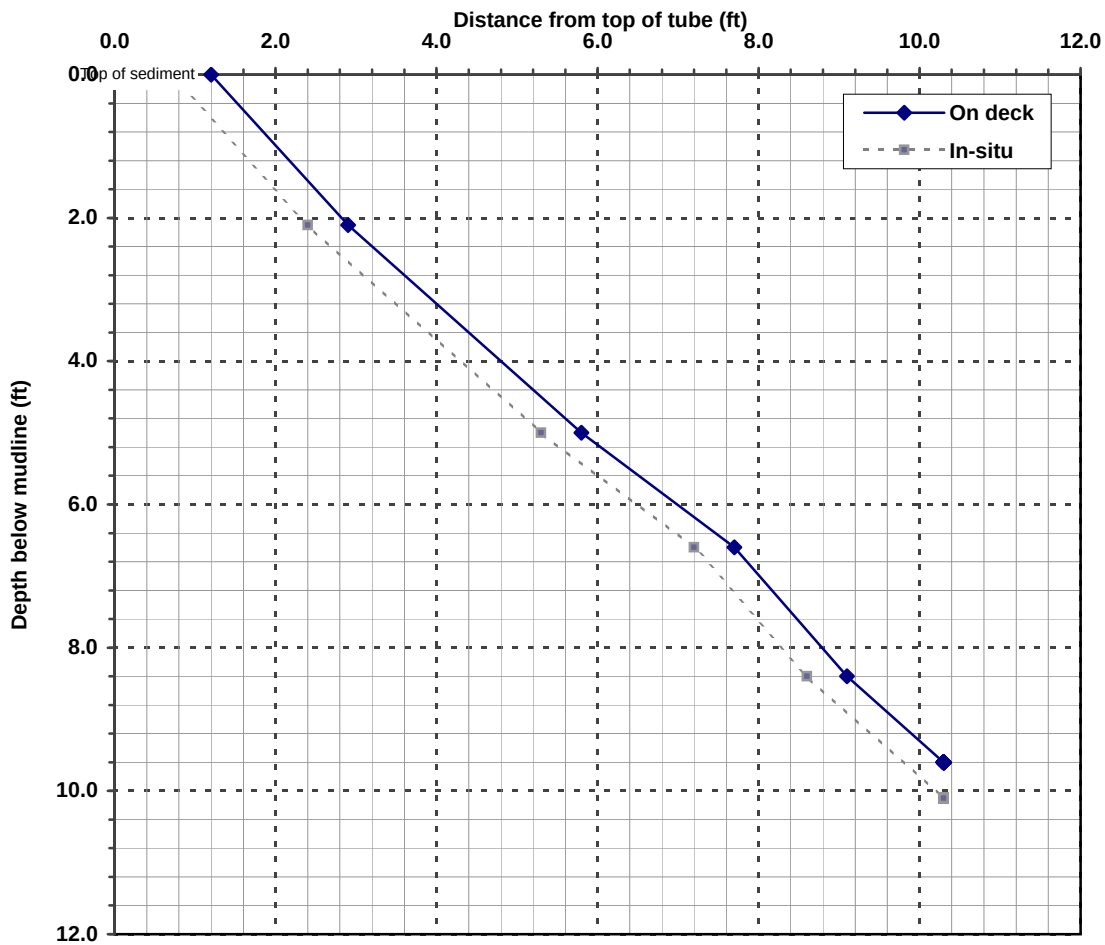
Collected by: GSM 45 34 48.02494

Date: 11/8/2007 **Time:** 8:02 122 45 28.90303

Water depth: 31.4 ft **Mudline:** -21.0 ft NAVD88 (approximated from bathymetry)

Place Field ID Label Here

Weather/Comments: N/A



Penetration 10.1 ft/ On deck recovery 9.1 ft = 90% Recovery

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-2.1	1.7	81%
2.1-5	2.9	100%
5-6.6	1.9	119%
6.6-8.4	1.4	78%
8.4-10.1	1.7	100%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	1.2
1	2.01
2	2.82
3	3.80
4	4.80
5	5.80
6	6.99
7	8.01
8	8.79
9	9.70
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

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Collection Information

Place Field ID Label Here

Date: 11-5-07

Project: Gasco Recorder: GSM

Station Name: PCM-09

Tube Length (ft): 10.3

Water Depth (ft): 11.7 Time: 1243

Est. Tide Height (ft) _____ (MLLW)

Est. Mudline: _____ (MLLW)

Position Information

Coordinate Datum: _____

Northing 45 39 47.55141

Easting 122 45 29.10590

On Deck Top of Sediment 2.0

Comments: _____

Penetration Tape Reading	Recovery Tape Reading	Comments
10.4	9.9	
8.2	8.6	
6.3	6.6	
4.3	4.9	
3.0	3.6	
2.6	2.7	
0.2	1.6	

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Project: Gasco Year 1 Event 2 Cap Monitoring **Station:** PCM-09

Project No: 000029-02 BG10 T4 **Position:** NAD83

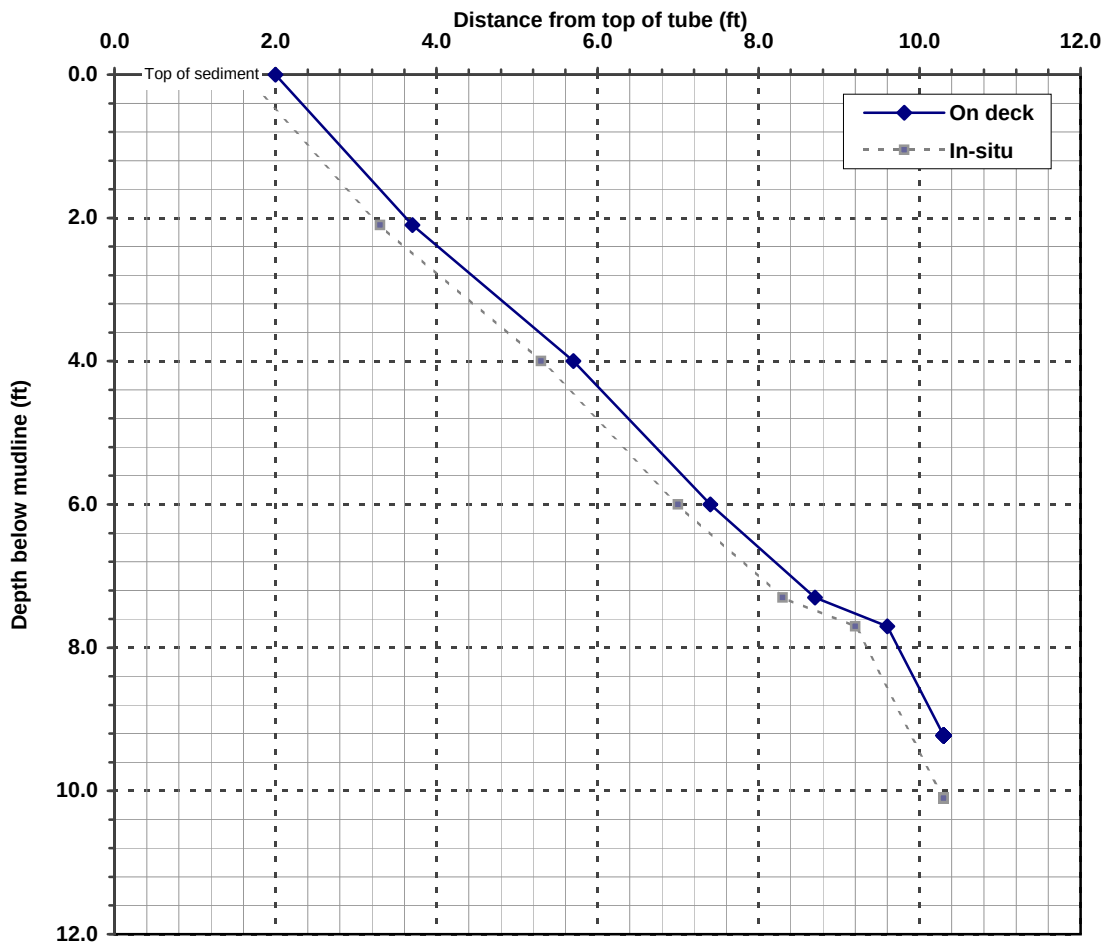
Collected by: GSM 45 34 47.55141

Date: 11/5/2007 **Time:** 12:43 122 45 29.10590

Water depth: 11.7 ft **Mudline:** -3.0 ft NAVD88 (approximated from bathymetry)

Place Field ID Label Here

Weather/Comments: N/A



Penetration 10.1 ft/ On deck recovery 8.3 ft = 82% Recovery

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-2.1	1.7	81%
2.1-4	2	105%
4-6	1.7	85%
6-7.3	1.3	100%
7.3-7.7	0.9	225%
7.7-10.1	1.1	46%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	2
1	2.81
2	3.62
3	4.65
4	5.70
5	6.55
6	7.40
7	8.40
8	9.74
9	10.20
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

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Place Field ID Label Here

Collection Information

Date: 11-5-07

Project: Gasco Recorder: GSM

Station Name: RCM-10

Tube Length (ft): 10.3

Water Depth (ft): 7.5 Time: 1439

Est. Tide Height (ft) _____ (MLLW)

Est. Mudline: _____ (MLLW)

Position Information

Coordinate Datum: _____

Northing 45 34 47.44267

Easting 122 45 29.44096

On Deck Top of Sediment 2.8

Comments: _____

Penetration Tape Reading	Recovery Tape Reading	Comments
8.2	8.4	
6.2	7.2	
4.3	5-6	
3.3	4.5	
2.1	3.8	
1.0	3.0	
0.2	2.3	

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borelog paper.xls

Mudmole™ Bore Log

Project: Gasco Year 1 Event 2 Cap Monitoring **Station:** PCM-10

Project No: 000029-02 BG10 T4 **Position:** NAD83

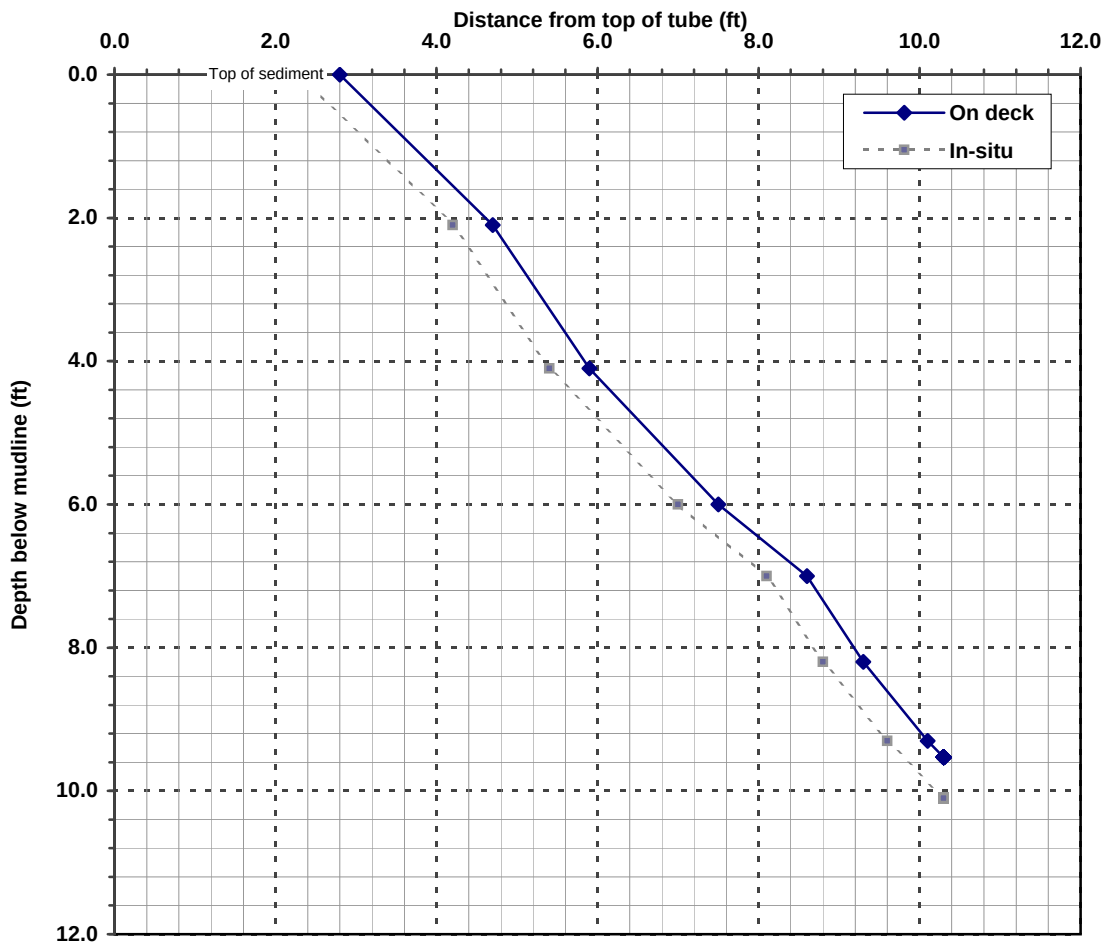
Collected by: GSM 45 34 47.44267

Date: 11/5/2007 **Time:** 14:39 122 45 29.44096

Water depth: 7.6 ft **Mudline:** 5.0 ft NAVD88 (approximated from bathymetry)

Place Field ID Label Here

Weather/Comments: N/A



Penetration 10.1 ft/ On deck recovery 7.5 ft = 74% Recovery

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-2.1	1.9	90%
2.1-4.1	1.2	60%
4.1-6	1.6	84%
6-7	1.1	110%
7-8.2	0.7	58%
8.2-9.3	0.8	73%
9.3-10.1	0.7	87%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	2.8
1	3.70
2	4.61
3	5.24
4	5.84
5	6.66
6	7.50
7	8.60
8	9.18
9	9.88
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

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Place Field ID Label Here

Collection Information

Date: 11-8-07

Project: Gasco Recorder: GSM

Station Name: BCM-11

Tube Length (ft): 10.5

Water Depth (ft): 39.8 Time: 1139

Est. Tide Height (ft) _____ (MLLW)

Est. Mudline: _____ (MLLW)

Position Information

Coordinate Datum: _____

Northing 45 34 48.52671

Easting 122 45 29.03742

On Deck Top of Sediment 4.6

Comments: _____

Penetration Tape Reading	Recovery Tape Reading	Comments
8.0	8.2	
7.2	7.3	
5.1	6.1	
3.0	4.8	
2.2	~~4.4~~ 4.5	
2.0	4.5	refusal

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Mudmole™ Bore Log

Project: Gasco Year 1 Event 2 Cap Monitoring **Station:** PCM-11

Project No: 000029-02 BG10 T4 **Position:** NAD83

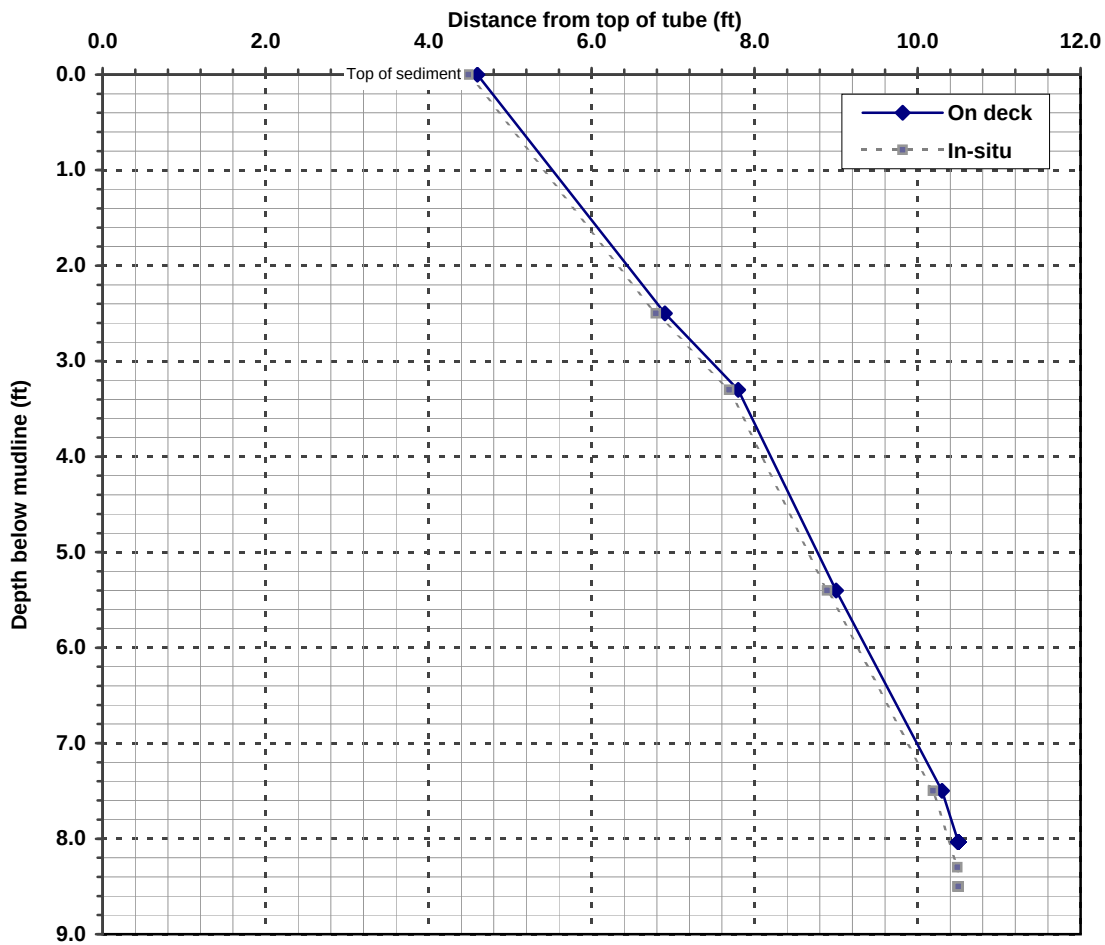
Collected by: GSM 45 34 48.52671

Date: 11/8/2007 **Time:** 11:39 122 45 29.03742

Water depth: 38.1 ft **Mudline:** -33.0 ft NAVD88 (approximated from bathymetry)

Place Field ID Label Here

Weather/Comments: N/A



Penetration 8.5 ft/ On deck recovery 5.9 ft = 69% Recovery

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-2.5	2.3	92%
2.5-3.3	0.9	113%
3.3-5.4	1.2	57%
5.4-7.5	1.3	62%
7.5-8.3	0.3	37%
8.3-8.5	0.01	5%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	4.6
1	5.52
2	6.44
3	7.46
4	8.20
5	8.77
6	9.37
7	9.99
8	10.49
9	No sample
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

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Collection Information

Place Field ID Label Here

Date: 11-8-07

Project: Gasco Recorder: GSM

Station Name: PCM - 12

Tube Length (ft): 10.3

Water Depth (ft): 39.0 Time: 1042

Est. Tide Height (ft) _____ (MLLW)

Est. Mudline: _____ (MLLW)

Position Information

Coordinate Datum: _____

Northing 45 34 48.32897

Easting 122 45 28.54347

On Deck Top of Sediment 3.5

Comments: _____

Penetration Tape Reading	Recovery Tape Reading	Comments
7.9	8.5	
5.6	~~5.~~ 7.0	
4.2	6.3	
3.0	5.3	
1.4	4.0	
0.2	3.1	

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Mudmole™ Bore Log

Project: Gasco Year 1 Event 2 Cap Monitoring **Station:** PCM-12

Project No: 000029-02 BG10 T4 **Position:** NAD83

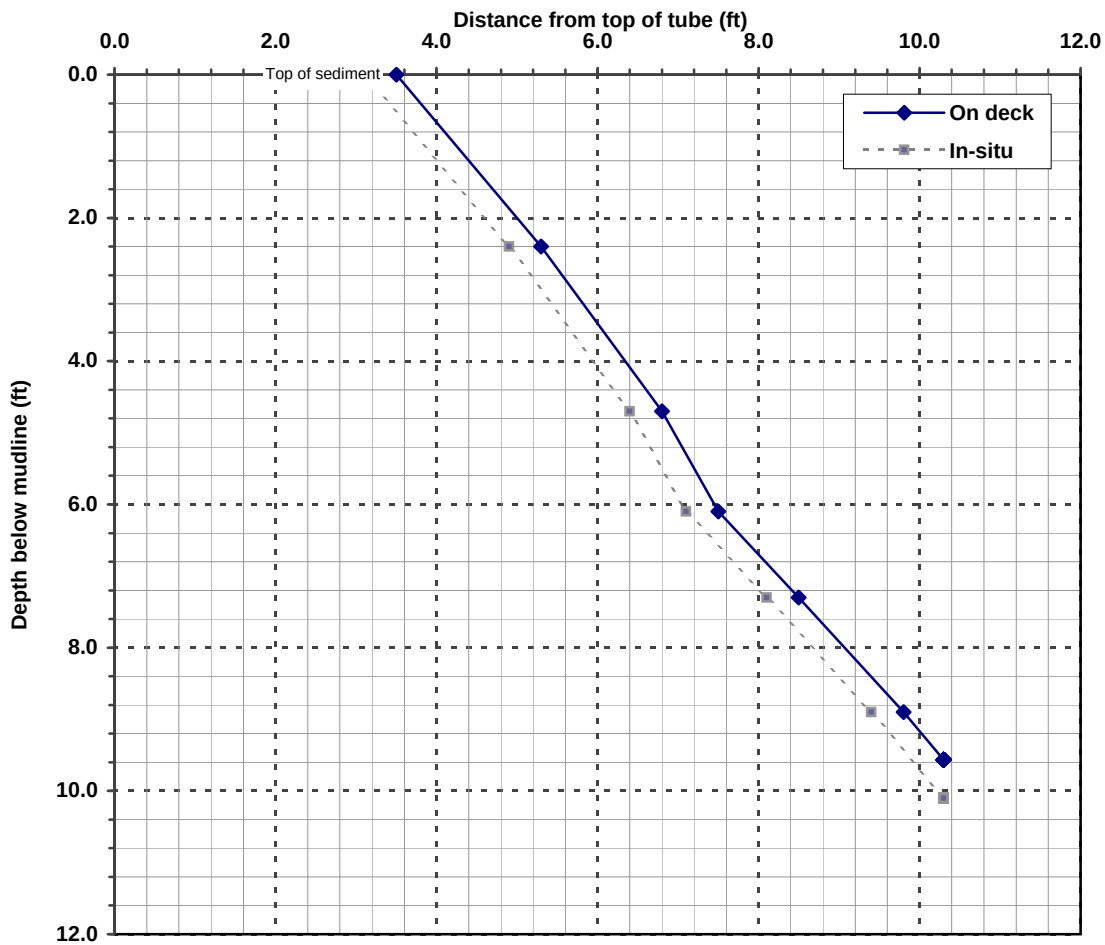
Collected by: GSM 45 34 48.32897

Date: 11/8/2007 **Time:** 10:42 122 45 28.54347

Water depth: 39.0 ft **Mudline:** -33.0 ft NAVD88 (approximated from bathymetry)

Place Field ID Label Here

Weather/Comments: N/A



Penetration 10.1 ft/ On deck recovery 6.8 ft = 67% Recovery

Penetration interval (ft)	Interval recovery (ft)	Percent recovery
0-2.4	1.8	75%
2.4-4.7	1.5	65%
4.7-6.1	0.7	50%
6.1-7.3	1	83%
7.3-8.9	1.3	81%
8.9-10.1	0.9	75%

Depth below mudline (ft)	Distance from top of tube (ft)
Mudline	3.5
1	4.25
2	5.00
3	5.69
4	6.34
5	6.95
6	7.45
7	8.25
8	9.07
9	9.88
10	No sample
11	No sample
12	No sample
13	No sample
14	No sample
15	No sample
16	No sample
17	No sample
18	No sample
19	No sample
20	No sample

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APPENDIX D

DEPOSITIONAL SURFACE SEDIMENT COLLECTION FORMS

Collection Date: 11/5/07
Shipping Date: 11/6/07

ANCHOR ENVIRONMENTAL, L.L.C.

Surface Sediment Field Sample Record

Project Name: Gasco Pilot Cap Monitoring Year 1 Event 2 Project No: 000029-02 Station ID: PCM-02

Sampling Crew: Anchor & RSS
Sampling Vessel: RSS Skiff
Sampling Method: Duwe Slide Sampler
Subcontractor(s): RSS
Station Coordinates: N / Lat. ~2ft off station to avoid
E / W / Long. previous hole
Weather: Sunny, no breeze
Datum: NAD 83 / WGS 84 Zone:

Sample Number:
Analysis: Metals / BNAs / VOCs / PCBs / Pest / Herb / TBTs / Diox-Furans
TS / Grain Size / TOC / TVS / Ammonia / Sulfides
(Circle Appropriate Analyses)
Full Portland Harbor List (No archive)

Field Test Results
Salinity: ppt
Ammonia: mg/L
Grain Size: ml Coarse: ml Fines:
Comments: Good grab. Full penetration & recovery.

Grab Number: 1 Water Depth: 23 ft Penetration/Sampled Depth: 12cm/10cm Time: 1120
Bioassay (Chemistry) (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:		Comments:
cobble	D.O.	none	H2S	Scattered manor sheen upon mixing.
gravel	gray	(slight) Hydrocarbon	Petroleum	
sand C M F	black olive	moderate	other:	
silt clay	brown	strong		
organic matter	(brown surface) ~1mm	overwhelming		

Armor layer felt below dep. sed; scattered wood fibers/chunk (5%) throughout. Few worms on surface

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: Ryan Burt

Collection Date: 11/5/07
Shipping Date: 11/6/07

ANCHOR ENVIRONMENTAL, L.L.C.

Surface Sediment Field Sample Record

Project Name: Gasco Pilot Cap Monitoring Year 1 Event 2 **Project No:** 000029-02 **Station ID:** PCM-06

Sampling Crew: Anchor & RSS
Sampling Vessel: RSS Skiff
Sampling Method: Duwe Slide Sampler
Subcontractor(s): RSS
Station Coordinates: N / Lat. slightly offset (~2ft) from
E / W / Long. previous hole
Weather: Sunny, no breeze.
Datum: NAD 83 / WGS 84 Zone:

Sample Number: PCM-06DS-071105
Analysis: Metals / BNAs / VOCs / PCBs / Pest / Herb / TBTs / Diox-Furans
TS / Grain Size / TOC / TVS / Ammonia / Sulfides
(Circle Appropriate Analyses)
Full Portland Harbor List (No archive)

Field Test Results
Salinity: ppt
Ammonia: mg/L
Grain Size: ml Coarse: ml Fines:
Comments: Good grab. Full penetration & recovery.

Grab Number: 1 Water Depth: 22ft Penetration/Sampled Depth: 12cm / 10cm Time: 1140
Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

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

Scattered wood chunks throughout (5%); armor felt below grab.

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: Ryan Batt

Collection Date: 11/5/07
Shipping Date: 11/6/07

ANCHOR ENVIRONMENTAL, L.L.C.

Surface Sediment Field Sample Record

Project Name: Gasco Pilot Cap Monitoring Year 1 Event 2 Project No: 000029-02 Station ID: PCM-09

Sampling Crew: Anchor & RSS
Sampling Vessel: RSS Skiff
Sampling Method: Dwer Slide Sampler
Subcontractor(s): RSS
Station Coordinates: N / Lat. ~5ft off station (upslope) to avoid sampling prev. hole
E / W / Long.
Weather: Sunny, No wind
Datum: NAD 83 / WGS 84 Zone:

Sample Number: PCM-09DS-071105
Analysis: Metals / BNAs / VOCs / PCBs / Pest / Herb / TBTs / Diox-Furans
TS / Grain Size / TOC / TVS / Ammonia / Sulfides
(Circle Appropriate Analyses)
Full Portland Harbor List (No archive)

Field Test Results
Salinity: ppt
Ammonia: mg/L
Grain Size: ml Coarse: ml Fines:
Comments: Dwer moved ~5ft upslope from previous excavation hole (barely visible). Good grab, full recovery.

Grab Number: 1 Water Depth: 11.5 Penetration/Sampled Depth: 12 cm/10cm Time: 1100
Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

Sediment Type:	Sediment Color:	Sediment Odor:		Comments:
cobble	D.O.	none	H2S	few sheen spots upon homogenization
gravel	gray	slight	Petroleum	
sand C M F	black dwr	moderate	other:	
silt clay	brown	strong		
organic matter	brown surface ~1mm	overwhelming		

cap armor felt below grab. Some minor chunks of wood debris (5%) throughout. Worms throughout.

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: Ryan Burt

Collection Date: 11/7/07
Shipping Date: 11/8/07

ANCHOR ENVIRONMENTAL, L.L.C.

Surface Sediment Field Sample Record

Project Name: Gasco Pilot Cap Monitoring Year 1 Event! Project No: 000029-02 Station ID: PCM-14

Sampling Crew: Anchor & RSS
Sampling Vessel: RSS Skiff
Sampling Method: Dwier Slide Sampler
Subcontractor(s): RSS
Station Coordinates: N / Lat.
E / W / Long.
Weather: Sunny, calm
Datum: NAD 83 / WGS 84 Zone:

Sample Number: PCM-14DS-071107
Analysis: Metals / BNAs / VOCs / PCBs / Pest / Herb / TBTs / Diox-Furans
TS / Grain Size / TOC / TVS / Ammonia / Sulfides
(Circle Appropriate Analyses)
Full Portland Harbor List.

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

Comments: Good grabs. Full penetration and recovery. Four grabs required to achieve sample volume requirements.

Grab Number: 1 Water Depth: 45 ft Penetration/Sampled Depth: 10 cm/2 cm Time: 1445
Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

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

Grab Number: 2 Water Depth: 45 ft Penetration/Sampled Depth: 10 cm/2.5 cm Time: 1445
Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

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

Grab Number: 3 Water Depth: 45 ft Penetration/Sampled Depth: ~~[illegible]~~ 10 cm/2.5 cm Time: 1500
Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

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

Grab Number: 4 Water Depth: 45 ft Penetration/Sampled Depth: 10 cm/2.5 cm Time: 1500
Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

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

Recorded by: Ryan Burt

Collection Date: 11/6/07
Shipping Date: 11/7/07

ANCHOR ENVIRONMENTAL, L.L.C.

Surface Sediment Field Sample Record

Project Name: Gasco Pilot Cap Monitoring Year 1 Event 1 Project No: 000029-02 Station ID: PCM-15

Sampling Crew: Anchor & RSS
Sampling Vessel: RSS Skiff
Sampling Method: Duren Slide Sampler
Subcontractor(s): RSS
Station Coordinates: N / Lat. 45.5802183
E / W / Long. -122.7572758
Weather: Sunny, calm
Datum: NAD 83 / WGS 84 Zone:

Sample Number: PCM-15DS-071106
Full Portland Harbor list.
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: Good grab. Full penetration & recovery.

Grab Number: 1 Water Depth: 46 ft 45 Penetration/Sampled Depth: 12in/5cm Time: 1645
Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

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

Comments: slight sheens upon mixing

Grab Number: 2 Water Depth: 46 ft 45 Penetration/Sampled Depth: 12cm/7cm Time: 1645
Bioassay / Chemistry (circle) AVS/SEM; Total Sulfides; VOC Sample (circle)

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

Comments:

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

Sediment Type:	Sediment Color:	Sediment Odor:	
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	

Comments:

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

Sediment Type:	Sediment Color:	Sediment Odor:	
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	

Comments:

Recorded by: Ryan Burt

APPENDIX E

CHAIN-OF-CUSTODY FORMS

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SR#: _____

PAGE _____ OF _____ COC # _____

PROJECT NAME: Gasco Long-Term Pilot Cap Monitoring Year 1 Event 2
PROJECT NUMBER: 002029-02 B612 T17.4
PROJECT MANAGER: Ryan Barth
COMPANY/ADDRESS: Anchor Environmental, 1423 3rd Ave Suite 300
CITY/STATE/ZIP: Seattle, WA 98101
E-MAIL ADDRESS: rbarth@anchorenv.com
PHONE #: (206) 287-9130 FAX#: (206) 287-9131
SAMPLER'S SIGNATURE: Ryan Barth

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625☐ 8270☐ 8270LL☐	Volatile Organics 624☐ 8260☐ 8021☐ BTEX☐	Hydrocarbons (*see below) Gas☐ Diesel☐ Oil☐ ☐ Fuel Fingerprint (FIQ) ☐ NW-HCID Screen	Oil & Grease/TRPH 1664 HEM☐ 1664 SGT☐	PCB's Aroclors☐ Congeners☐	Pesticides/Herbicides 608☐ 8081A☐ 8141A☐ 8151A☐	Chlorophenolics - 8151M Tri☐ Tetra☐ PCP☐	PAHS 8310☐ SIM☐	Metals: Total or Dissolved (See list below)	Cyanide☐ Hex-Chrom☐	pH, Cond, Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS (circle) NH_3-N, COD, Total-P, TKN, TOC, DOC (circle) NO_2+NO_3	TOX 9020☐ AOX 1650☐ 506☐	Dioxins/Furans				REMARKS
PCM-02DS-071105	11/5/07	1100		SED															X					
PCM-06DS-071105	↓	1120		↓															↓					
PCM-09DS-071105	↓	1140		↓															↓					
PCM-15DS-071106	11/6/07	1645		↓															↓					
PCM-14DS-071106				↓															↓					

REPORT REQUIREMENTS

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

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: _____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

RELINQUISHED BY:		RECEIVED BY:		RELINQUISHED BY:		RECEIVED BY:	
Ryan Barth	11/8/07 0710	[signature]	11/8/07 7:10				
Signature	Date/Time	Signature	Date/Time	Signature	Date/Time	Signature	Date/Time
Ryan Barth	Anchor	[signature]	GAS				
Printed Name	Firm	Printed Name	Firm	Printed Name	Firm	Printed Name	Firm

RCOC #1 06/03

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SR#: _____

PAGE _____ OF _____ COC # _____

PROJECT NAME
PROJECT NUMBER
PROJECT MANAGER
COMPANY/ADDRESS
CITY/STATE/ZIP
E-MAIL ADDRESS
PHONE # FAX#
SAMPLER'S SIGNATURE

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625 ☐ 8270 ☐ 8270LL ☐	Volatile Organics 624 ☐ 8260 ☐ 8021 ☐ BTEX ☐	Hydrocarbons (*see below) Gas ☐ Diesel ☐ Oil ☐	☐ Fuel Fingerprint (FIO) ☐ NW-HCID Screen	Oil & Grease/TRPH 1664 HEM ☐ 1664 SGT ☐	PCB's Aroclors ☐ Congeners ☐	Pesticides/Herbicides 608 ☐ 8081A ☐ 8141A ☐ 8151A ☐	Chlorophenolics - 8151M Tri ☐ Tetra ☐ PCP ☐	PAHS 8310 ☐ SIM ☐	Metals, Total or Dissolved (See list below)	Cyanide ☐ Hex-Chrom ☐	pH, Cond, Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS (circle)	NH_3-N, COD, Total-P, TKN, TOC, DOC (circle) NO_2+NO_3	TOX 9020 ☐ AOX 1650 ☐ 506 ☐	[illegible]	[illegible]	[illegible]	[illegible]	REMARKS
[illegible]	[illegible]	[illegible]		SD	2			X		X		X	X	X	X	X	X							X		
[illegible]	[illegible]	[illegible]		LQ	10			X							X										X	
[illegible]	[illegible]	[illegible]		SD	3			X		X		X	X		X	X	X							X		
[illegible]	[illegible]	[illegible]		SD	2																X					
[illegible]	[illegible]	[illegible]		SD	2																X					
[illegible]	[illegible]	[illegible]		SD	2																X					
[illegible]	[illegible]	[illegible]		[illegible]	2			X																		

REPORT REQUIREMENTS

___ 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
X Standard (10-15 working days)
___ Provide FAX Results

_____ Requested Report Date

Circle which metals are to be analyzed:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER: _____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS: [illegible]

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature / Date/Time	Signature / Date/Time	Signature / Date/Time	Signature / Date/Time
Printed Name / Firm	Printed Name / Firm	Printed Name / Firm	Printed Name / Firm

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PAGE 1 OF 1 COC # _____

PROJECT NAME: [illegible]
PROJECT NUMBER: [illegible]
PROJECT MANAGER: [illegible]
COMPANY/ADDRESS: [illegible]
CITY/STATE/ZIP: [illegible]
E-MAIL ADDRESS: [illegible]
PHONE #: [illegible] FAX#: [illegible]
SAMPLER'S SIGNATURE: [illegible]

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625 ☐ 8270 ☐ 8270LL ☐	Volatile Organics 624 ☐ 8260 ☐	Hydrocarbons (*see below) Gas ☐ Diesel ☐ Oil ☐ 8021 ☐ BTEX ☐	☐ Fuel Fingerprint (FIQ) ☐ NW-HCID Screen	Oil & Grease/TRPH 1664 HEM ☐ 1664 SGT ☐	PCB's Aroclors ☐ Congeners ☐	Pesticides/Herbicides 608 ☐ 8081A ☐ 8141A ☐ 8151A ☐	Chlorophenolics - 8151M Tri ☐ Tetra ☐ PCP ☐	PAHS 8310 ☐ SIM ☐	Metals: Total or Dissolved (See list below)	Cyanide ☐	pH, Cond., Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS (circle)	NH_3-N, COD, Total-P, TKN, TOC, DOC (circle) NO_2+NO_3	TOX 9020 ☐ AOX 1650 ☐ 506 ☐	[illegible]	[illegible]	[illegible]	[illegible]	REMARKS
[illegible]	[illegible]	0950		SED				X	X			X	X		X		X						X		X	
[illegible]	[illegible]	1015		H2O				X							X	X								X		
[illegible]	[illegible]	1130		SED				X	X			X	X		X		X						X		X	
[illegible]	[illegible]	1300		H2O				X							X	X								X		
[illegible]	[illegible]	1445		SED				X	X			X	X		X		X						X		X	
[illegible]	[illegible]	1515		H2O				X							X	X								X		
[illegible]	[illegible]	1900		H2O				X																		
[illegible]	[illegible]	1045		SED																	X					

REPORT REQUIREMENTS

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

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER:_____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

[illegible]

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

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PROJECT NAME
PROJECT NUMBER
PROJECT MANAGER
COMPANY/ADDRESS
CITY/STATE/ZIP
E-MAIL ADDRESS
PHONE # FAX#
SAMPLER'S SIGNATURE

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625 ☐ 8270 ☐ 8270LL ☐	Volatile Organics 624 ☐ 8260 ☐ 8021 ☐ BTEX ☐	Hydrocarbons (* see below) Gas ☐ Diesel ☐ Oil ☐ ☐ Fuel Fingerprint (FIQ) ☐ NW-HCID Screen	Oil & Grease/TRPH 1664 HEM ☐ 1664 SGT ☐	PCB's Aroclors ☐ Congeners ☐	Pesticides/Herbicides 608 ☐ 8081A ☐ 8141A ☐ 8151A ☐	Chlorophenolics - 8151M Tri ☐ Tetra ☐ PCP ☐	PAHS 8310 ☐ SIM ☐	Metals, Total or Dissolved (See list below)	Cyanide ☐ Hex-Chrom ☐	pH, Cond., Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS (circle)	NH_3-N, COD, Total-P, TKN, TOC, DOC (circle) NO_2+NO_3	TOX 9020 ☐ AOX 1650 ☐ 506 ☐					REMARKS

REPORT REQUIREMENTS

___ 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
___ 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:

Total Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

Dissolved Metals: Al As Sb Ba Be B Ca Cd Co Cr Cu Fe Pb Mg Mn Mo Ni K Ag Na Se Sr Tl Sn V Zn Hg

*INDICATE STATE HYDROCARBON PROCEDURE: AK CA WI NORTHWEST OTHER:_____ (CIRCLE ONE)

SPECIAL INSTRUCTIONS/COMMENTS:

RELINQUISHED BY:	RECEIVED BY:	RELINQUISHED BY:	RECEIVED BY:
Signature / Date/Time	Signature / Date/Time	Signature / Date/Time	Signature / Date/Time
Printed Name / Firm	Printed Name / Firm	Printed Name / Firm	Printed Name / Firm

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CHAIN OF CUSTODY

SR#: _____

PAGE _____ OF _____ COC # _____

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PROJECT NAME
PROJECT NUMBER
PROJECT MANAGER
COMPANY/ADDRESS
CITY/STATE/ZIP
E-MAIL ADDRESS
PHONE # | FAX#
SAMPLER'S SIGNATURE

SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS	Semivolatile Organics by GC/MS 625 ☐ 8270 ☐ 8270LL ☐	Volatile Organics 624 ☐ 8260 ☐ 8021 ☐ BTEX ☐	Hydrocarbons (*see below) Gas ☐ Diesel ☐ Oil ☐	Fuel Fingerprint (FIQ) NW-HCID Screen	Oil & Grease/TRPH 1664 HEM ☐ 1664 SGT ☐	PCB's Aroclors ☐ Congeners ☐	Pesticides/Herbicides 608 ☐ 8081A ☐ 8141A ☐ 8151A ☐	Chlorophenolics Tri ☐ Tetra ☐ 8151M PCP ☐	PAHS 8310 ☐ SIM ☐	Metals, Total or Dissolved (See list below)	Cyanide ☐ Hex-Chrom ☐	pH, Cond., Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS (circle)	NH_3-N, COD, Total-P, TKN, TOC, DOC (circle) NO_2+NO_3	TOX 9020 ☐ AOX 1650 ☐ 506 ☐					REMARKS

REPORT REQUIREMENTS

___ 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
___ 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

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SAMPLE I.D.	DATE	TIME	LAB I.D.	MATRIX	NUMBER OF CONTAINERS		Semivolatile Organics by GC/MS 625 ☐ 8270 ☐ 8270LL ☐	Volatile Organics 624 ☐ 8260 ☐ 8021 ☐ BTEX ☐	Hydrocarbons (*see below) Gas ☐ Diesel ☐ Oil ☐	Fuel Fingerprint (FIQ) NW-HCID Screen	Oil & Grease/TRPH 1664 HEM ☐ 1664 SGT ☐	PCB's Aroclors ☐ Congeners ☐	Pesticides/Herbicides 608 ☐ 8081A ☐ 8141A ☐ 8151A ☐	Chlorophenolics - 8151M Tri ☐ Tetra ☐ PCP ☐	PAHS 8310 ☐ SIM ☐	Metals, Total or Dissolved (See list below)	Cyanide ☐ Hex-Chrom ☐	pH, Cond, Cl, SO_4, PO_4, F, NO_2, NO_3, BOD, TSS, TDS (circle)	NH_3-N, COD, Total-P, TKN, TOC, DOC (circle) NO_2+NO_3	TOX 9020 ☐ AOX 1650 ☐ 506 ☐					REMARKS

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APPENDIX F

DATA VALIDATION REPORT
(ON CD)