LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

Anchor Environmental, LLC
1423 3rd Avenue, Suite 300
Seattle, WA 98101-2226
ATTN: Ms. Joy Dunay

December 31, 2007

SUBJECT: NW Natural Gasco Site, Data Validation

Dear Ms. Dunay,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on December 13, 2007. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 17976:

SDG #	Fraction
P8604	Polychlorinated Biphenyls, Dioxins/Dibenzofurns

The data validation was performed under EPA Level III guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999
- USEPA, Contract Laboratory Program National Functional Guidelines for Polychlorinated Dioxins/Diobenzofurans Data Review, September 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

Please feel free to contact us if you have any questions.

Sincerely,

Stella S. Cuenco
Project Manager/Senior Chemist

Attachment 1

844 Pages-EX EDD LDC #17976 (Anchor Environmental-Seattle WA / NW Natural - Gasco Pilot Cap Monitoring Year 1)

LDC	SDG#	DATE REC'D	(3) DATE DUE	Dioxins (1613B)		PCBs (1668A)																															
Matrix: Water/Sediment				W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	P8604	12/13/07	01/07/08	0	5	0	5																														
Total	T/SC			0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Shaded cells indicate Level IV validation (all other cells are Level III validation). These sample counts do not include MS, MSD, or DUP's.

NW Natural Gasco Site
Data Validation Reports
LDC# 17976

PCBs

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 5, 2007
LDC Report Date:	December 26, 2007
Matrix:	Sediment
Parameters:	Polychlorinated Biphenyls
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	P8604

Sample Identification

PCM-02DS-071105
PCM-06DS-071105
PCM-09DS-071105
PCM-15DS-071106
PCM-14DS-071107

Introduction

This data review covers 5 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 1668A for Polychlorinated Biphenyls as Congeners.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of multicomponent compounds was performed for the primary (quantitation) column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated biphenyl contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
MB-5392	11/12/07	PCB-105	0.294 pg/g	All samples in SDG P8604
		PCB-118	0.623 pg/g	
		Total Dichlorobiphenyls	7.78 pg/g	
		Total Monochlorobiphenyls	0.907 pg/g	
		Total Trichlorobiphenyls	2.68 pg/g	
		Total Tetrachlorobiphenyls	3.93 pg/g	
		Total Pentachlorobiphenyls	3.11 pg/g	
		Total Hexachlorobiphenyls	1.36 pg/g	
		Total Heptachlorobiphenyls	0.397 pg/g	
		Total Octachlorobiphenyls	0.188 pg/g	
		Total Decachlorobiphenyls	0.244 pg/g	

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and Reported CRQLs

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Polychlorinated Biphenyls - Data Qualification Summary - SDG P8604

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG P8604

No Sample Data Qualified in this SDG

Sample ID: PCM-02DS-071105 Method HR-PCB

Client Data		Sample Data		Laboratory Data			
Name	Anchor Environmental, LLC	Matrix:	Solid	Project No.	P8604	Date Received:	09 Nov 07
Project ID	000029-02 BG 12 T17.4	Weight/Volume:	7.24 g	Sample ID:	P8604_5392_PCB_001-RJ2	Date Extracted	12 Nov 07
Date Collected.	05 Nov 07	% Solids	39.9 %	QC Batch No..	5392	Date Analyzed:	21 Nov 07

Analyte	Conc.	DL	EMPC	Qualifier	Standard	Recovery
	pg/g	pg/g	pg/g			%
PCB-77 33'44'-TeCB	74.8				ES PCB-1	88.5
PCB-81 344 5-TeCB	2.82				ES PCB-3	91.6
PCB-105 233'44'-PeCB	326				ES PCB-4	89.3
PCB-114 2344'5-PeCB	18 6				ES PCB-15	110
PCB-118 23'44'5-PeCB	773				ES PCB-19	103
PCB-123 2'344'5-PeCB	15.5				ES PCB-37	105
PCB-126 33'44'5-PeCB	3.87				ES PCB-54	85.3
PCB-156/157 233'44'5/233'44'5'	121				ES PCB-77	99 4
PCB-167 23'44'55'-HxCB	45.5				ES PCB-81	98.1
PCB-169 33'44'55'-HxCB	3.37				ES PCB-104	94.2
PCB-189 233'44'55'-HpCB	14.1				ES PCB-105	108
					ES PCB-114	102
TEQs (WHO M/H)					ES PCB-118	106
					ES PCB-123	107
ND = 0	0.536		0 536		ES PCB-126	105
ND = 0.5 x DL	0.536		0 536		ES PCB-153	104
					ES PCB-155	97
Totals					ES PCB-156/157	112
					ES PCB-167	108
Mono-CBs	57 1				ES PCB-169	111
Di-CBs	471				ES PCB-170	124
Tri-CBs	1,930				ES PCB-180	121
Tetra-CBs	5,400				ES PCB-188	120
Penta-CBs	5,460		5,460		ES PCB-189	92 2
Hexa-CBs	6,020		6,020		ES PCB-202	114
Hepta-CBs	3,390		3,390		ES PCB-205	87.5
Octa-CBs	1,010				ES PCB-206	87.1
Nona-CBs	307				ES PCB-208	88.2
PCB-209 DeCB	204				ES PCB-209	81.9
					CS PCB-28	101
					CS PCB-111	107
					CS PCB-178	122

ANALYTICAL PERSPECTIVES

2714 Exchange Drive T 910 794-1613
Wilmington F: 910 794-3919
North Carolina 28405 info@ultratrace.com
USA www.ultratrace.com

1/27/07

Reviewer DCW
Date 09Dec07

Sample ID: PCM-06DS-071105

Method HR-PCB

Client Data		Sample Data		Laboratory Data			
Name	Anchor Environmental, LLC	Matrix:	Solid	Project No.:	P8604	Date Received:	09 Nov 07
Project ID	000029-02 BG 12 T17.4	Weight/Volume:	8.22 g	Sample ID:	P8604_5392_PCB_002-RJ2	Date Extracted:	12 Nov 07
Date Collected	05 Nov 07	% Solids	40.7 %	QC Batch No.:	5392	Date Analyzed:	21 Nov 07

Analyte	Conc.	DL	EMPC	Qualifier	Standard	Recovery
	pg/g	pg/g	pg/g			%
PCB-77 33'44'-TeCB	52.3				ES PCB-1	104
PCB-81 344'5-TeCB	EMPC		1.65		ES PCB-3	106
PCB-105 233'44'-PeCB	357				ES PCB-4	111
PCB-114 2344'5-PeCB	22.2				ES PCB-15	103
PCB-118 23'44'5-PeCB	894				ES PCB-19	98.3
PCB-123 2'344'5-PeCB	15.5				ES PCB-37	92.9
PCB-126 33'44'5-PeCB	EMPC		3.18		ES PCB-54	92.6
PCB-156/157 233'44'5/233'44'5'	160				ES PCB-77	88.6
PCB-167 23'44'55'-HxCB	54.8				ES PCB-81	88.4
PCB-169 33'44'55'-HxCB	4.21				ES PCB-104	92.5
PCB-189 233'44'55'-HpCB	15				ES PCB-105	97.1
					ES PCB-114	91.9
TEQs (WHO M/H)					ES PCB-118	97.6
					ES PCB-123	96.1
ND = 0	0.177		0.495		ES PCB-126	92.8
ND = 0.5 x DL	0.227		0.495		ES PCB-153	103
					ES PCB-155	101
Totals					ES PCB-156/157	110
					ES PCB-167	107
Mono-CBs	29.1				ES PCB-169	112
Di-CBs	333				ES PCB-170	134
Tri-CBs	1,210				ES PCB-180	127
Tetra-CBs	3,980		3,990		ES PCB-188	122
Penta-CBs	6,120		6,130		ES PCB-189	88.2
Hexa-CBs	6,120		6,120		ES PCB-202	110
Hepta-CBs	3,040				ES PCB-205	85.5
Octa-CBs	857				ES PCB-206	85.2
Nona-CBs	171				ES PCB-208	88.2
PCB-209 DeCB	142				ES PCB-209	78.4
					CS PCB-28	86.6
					CS PCB-111	96.2
					CS PCB-178	110

00

ANALYTICAL PERSPECTIVES

2714 Exchange Drive
Wilmington
North Carolina 28405
USA

T: 910 794-1613
F: 910 794-3919
info@ultratrace.com
www.ultratrace.com

11/29/07

Reviewer
Date 11/29/07

Sample ID: PCM-09DS-071105

Method HR-PCB

Client Data		Sample Data		Laboratory Data			
Name	Anchor Environmental, LLC	Matrix:	Solid	Project No.:	P8604	Date Received:	09 Nov 07
Project ID	000029-02 BG 12 T17.4	Weight/Volume:	8.45 g	Sample ID:	P8604_5392_PCB_003-RJ2	Date Extracted:	12 Nov 07
Date Collected:	05 Nov 07	% Solids	43.7 %	QC Batch No.:	5392	Date Analyzed:	21 Nov 07

Analyte	Conc.	DL	EMPC	Qualifier	Standard	Recovery
	pg/g	pg/g	pg/g			%
PCB-77 33'44'-TeCB	44.6				ES PCB-1	102
PCB-81 344'5-TeCB	1.79				ES PCB-3	105
PCB-105 233'44'-PeCB	223				ES PCB-4	108
PCB-114 2344'5-PeCB	16.4				ES PCB-15	102
PCB-118 23'44'5-PeCB	498				ES PCB-19	97.9
PCB-123 2'344'5-PeCB	8.3				ES PCB-37	95.1
PCB-126 33'44'5-PeCB	EMPC		3.6		ES PCB-54	96.2
PCB-156/157 233'44'5/233'44'5'	121				ES PCB-77	86.3
PCB-167 23'44'55'-HxCB	48.2				ES PCB-81	86.8
PCB-169 33'44'55'-HxCB	16				ES PCB-104	98.9
PCB-189 233'44'55'-HpCB	77.1				ES PCB-105	98.3
					ES PCB-114	93
TEQs (WHO M/H)					ES PCB-118	99.2
					ES PCB-123	97.8
ND = 0	0.514		0.874		ES PCB-126	92.4
ND = 0.5 x DL	0.581		0.874		ES PCB-153	100
					ES PCB-155	101
Totals					ES PCB-156/157	111
					ES PCB-167	105
Mono-CBs	25.4				ES PCB-169	114
Di-CBs	335				ES PCB-170	120
Tri-CBs	1,040		1,040		ES PCB-180	118
Tetra-CBs	2,840		2,840		ES PCB-188	115
Penta-CBs	3,610		3,620		ES PCB-189	85.1
Hexa-CBs	6,550		6,550		ES PCB-202	107
Hepta-CBs	11,500				ES PCB-205	83.5
Octa-CBs	6,250				ES PCB-206	82.3
Nona-CBs	670				ES PCB-208	84.8
PCB-209 DeCB	599				ES PCB-209	81.7
					CS PCB-28	91.6
					CS PCB-111	98.9
					CS PCB-178	109

ANALYTICAL PERSPECTIVES

2714 Exchange Drive
Wilmington
North Carolina 28405
USA

T: 910 794-1613
F: 910 794-3919
info@ultratrace.com
www.ultratrace.com

Reviewer
Date 11/22/07

Sample ID: PCM-15DS-071106

Method HR-PCB

Client Data		Sample Data		Laboratory Data			
Name	Anchor Environmental, LLC	Matrix:	Solid	Project No.:	P8604	Date Received:	09 Nov 07
Project ID	000029-02 BG 12 T17 4	Weight/Volume:	10.88 g	Sample ID:	P8604_5392_PCB_004-RJ2	Date Extracted:	12 Nov 07
Date Collected:	06 Nov 07	% Solids	49.8 %	QC Batch No.:	5392	Date Analyzed:	21 Nov 07

Analyte	Conc.	DL	EMPC	Qualifier
	pg/g	pg/g	pg/g	
PCB-77 33'44'-TeCB	28.6			
PCB-81 344'5-TeCB	1.06			
PCB-105 233'44'-PeCB	134			
PCB-114 2344'5-PeCB	7.86			
PCB-118 23'44'5-PeCB	342			
PCB-123 2'344'5-PeCB	6.31			
PCB-126 33'44'5-PeCB	2.32			
PCB-156/157 233'44'5/233'44'5'	62.9			
PCB-167 23'44'55'-HxCB	22.3			
PCB-169 33'44'55'-HxCB	2.4			
PCB-189 233'44'55'-HpCB	7.76			
TEQs (WHO M/H)				
ND = 0	0.325		0.325	
ND = 0.5 x DL	0.325		0.325	
Totals				
Mono-CBs	16.7			
Di-CBs	213			
Tri-CBs	575		576	
Tetra-CBs	1,740		1,740	
Penta-CBs	2,410			
Hexa-CBs	2,970			
Hepta-CBs	1,810		1,810	
Octa-CBs	510			
Nona-CBs	117			
PCB-209 DeCB	104			

Standard	Recovery
	%
ES PCB-1	106
ES PCB-3	108
ES PCB-4	120
ES PCB-15	113
ES PCB-19	106
ES PCB-37	103
ES PCB-54	103
ES PCB-77	100
ES PCB-81	99.7
ES PCB-104	102
ES PCB-105	105
ES PCB-114	101
ES PCB-118	105
ES PCB-123	105
ES PCB-126	98
ES PCB-153	104
ES PCB-155	103
ES PCB-156/157	114
ES PCB-167	115
ES PCB-169	116
ES PCB-170	122
ES PCB-180	121
ES PCB-188	121
ES PCB-189	92.2
ES PCB-202	116
ES PCB-205	89
ES PCB-206	88.4
ES PCB-208	91.1
ES PCB-209	80.1
CS PCB-28	89.7
CS PCB-111	99.2
CS PCB-178	109

ANALYTICAL PERSPECTIVES

2714 Exchange Drive
Wilmington
North Carolina 28405
USA

T: 910 794-1613
F: 910 794-3919
info@ultratrace.com
www.ultratrace.com

11/29/07

Reviewer
Date 29Nov07

Sample ID: PCM-14DS-071107

Method HR-PCB

Client Data		Sample Data		Laboratory Data			
Name:	Anchor Environmental, LLC	Matrix:	Solid	Project No.:	P8604	Date Received:	09 Nov 07
Project ID	000029-02 BG 12 T17.4	Weight/Volume:	13.65 g	Sample ID:	P8604_5392_PCB_005-RJ2	Date Extracted:	12 Nov 07
Date Collected	07 Nov 07	% Solids	57.2 %	QC Batch No.:	5392	Date Analyzed:	21 Nov 07

Analyte	Conc.	DL	EMPC	Qualifier	Standard	Recovery
	pg/g	pg/g	pg/g			%
PCB-77 33'44'-TeCB	25.8				ES PCB-1	108
PCB-81 344'5-TeCB	0.998				ES PCB-3	114
PCB-105 233'44'-PeCB	102				ES PCB-4	128
PCB-114 2344'5-PeCB	6.01				ES PCB-15	118
PCB-118 23'44'5-PeCB	267				ES PCB-19	111
PCB-123 2'344'5-PeCB	4.61				ES PCB-37	98.6
PCB-126 33'44'5-PeCB	1.79				ES PCB-54	107
PCB-156/157 233'44'5/233'44'5'	44.6				ES PCB-77	93
PCB-167 23'44'5'-HxCB	17.1				ES PCB-81	93.2
PCB-169 33'44'5'-HxCB	1.76				ES PCB-104	102
PCB-189 233'44'5'-HpCB	6.22				ES PCB-105	107
					ES PCB-114	99.9
TEQs (WHO M/H)					ES PCB-118	104
					ES PCB-123	104
ND = 0	0.248		0.248		ES PCB-126	96.5
ND = 0.5 x DL	0.248		0.248		ES PCB-153	105
					ES PCB-155	104
Totals					ES PCB-156/157	116
					ES PCB-167	112
Mono-CBs	29.9				ES PCB-169	113
Di-CBs	200				ES PCB-170	128
Tri-CBs	585				ES PCB-180	124
Tetra-CBs	1,610				ES PCB-188	112
Penta-CBs	1,840		1,840		ES PCB-189	88.9
Hexa-CBs	2,280				ES PCB-202	116
Hepta-CBs	1,390		1,390		ES PCB-205	90.3
Octa-CBs	396				ES PCB-206	85.1
Nona-CBs	88.9				ES PCB-208	89.3
PCB-209 DeCB	73.9				ES PCB-209	75.5
					CS PCB-28	92.9
					CS PCB-111	101
					CS PCB-178	110

ANALYTICAL PERSPECTIVES

2714 Exchange Drive
Wilmington
North Carolina 28405
USA

T: 910 794-1613
F: 910 794-3919
info@ultratrace.com
www.ultratrace.com

11/28/07

Reviewer
Date

LDC #: 17976A3

SDG #: P8604

Laboratory: Analytical Perspectives

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 12/20/07

Page: 1 of 1

Reviewer: 9

2nd Reviewer: W

METHOD: HRGC/HRMS Polychlorinated Biphenyl Congeners (EPA Method 1668A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/5/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration ~~CCV~~ --	A	
V.	Blanks	SW	
VI.	Matrix spike/Matrix spike duplicates	N	client spiked
VII.	Laboratory control samples	A	LCS
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	A	
X.	Target compound identifications	N	
XI.	Compound quantitation and CRQLs	N	
XII.	System performance	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:

1	PCM-02DS-071105 lead	11	MB1_5392	21		31	
2	PCM-06DS-071105	12		22		32	
3	PCM-09DS-071105	13		23		33	
4	PCM-15DS-071106	14		24		34	
5	PCM-14DS-071107	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 17976A3
SDG #: D8604

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: CY
2nd Reviewer: CC

METHOD: HRGC/HRMS Polychlorinated Biphenyls (EPA Method 1668)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction was performed?
Y N N/A Was method blank contamination less < CRQL for all target compounds?

Blank extraction date: 11/12/07 **Blank analysis date:** 11/21/07 **Associated samples:** All (>5x)

Conc. units: pg/g

Compound	Blank ID	Sample Identification								
MB	MB-5392									
PCB 105	0.294									
118	0.623									
Total Di-CBs	7.78									
Mono-CBs	0.907									
Tri-CBs	2.68									
Tetra-CBs	3.93									
Penta-CBs	3.11									
Hexa-CBs	1.36									
Hepta-CBs	0.397									
Octa-CBs	0.188*									
DeCB	0.244									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

* EMPC

NW Natural Gasco Site
Data Validation Reports
LDC# 17976

Dioxins/Dibenzofurans

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 5, 2007
LDC Report Date:	December 26, 2007
Matrix:	Sediment
Parameters:	Dioxins/Dibenzofurans
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	P8604

Sample Identification

PCM-02DS-071105
PCM-06DS-071105
PCM-09DS-071105
PCM-15DS-071106
PCM-14DS-071107

Introduction

This data review covers 5 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 1613B for Polychlorinated Dioxins/Dibenzofurans.

This review follows USEPA Contract Laboratory Program National Functional Guidelines for Polychlorinated Dioxins/Dibenzofurans Data Review (September 2005) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. HRGC/HRMS Instrument Performance Check

Instrument performance was checked at the required daily frequency.

Retention time windows were established for all homologues. The chromatographic resolution between 2,3,7,8-TCDD and peaks representing any other unlabeled TCDD isomer was less than or equal to 25%.

III. Initial Calibration

A five point initial calibration was performed as required by the method.

Percent relative standard deviations (%RSD) were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

IV. Routine Calibration (Continuing)

Routine calibration was performed at the required frequencies.

All of the routine calibration percent differences (%D) between the initial calibration RRF and the routine calibration RRF were less than or equal to 20.0% for unlabeled compounds and less than or equal to 30.0% for labeled compounds.

The ion abundance ratios for all PCDDs and PCDFs were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated dioxin/dibenzofuran contaminants were found in the method blanks.

VI. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Regional Quality Assurance and Quality Control

Not applicable.

IX. Internal Standards

All internal standard recoveries were within QC limits.

X. Target Compound Identifications

Raw data were not reviewed for this SDG.

XI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XII. System Performance

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

Data flags have been summarized at the end of the report if data has been qualified.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Dioxins/Dibenzofurans - Data Qualification Summary - SDG P8604

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Dioxins/Dibenzofurans - Laboratory Blank Data Qualification Summary - SDG P8604

No Sample Data Qualified in this SDG

Sample ID: PCM-02DS-071105

Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Anchor Environmental, LLC	Matrix:	Solids	Project No.:	P8604	Date Received:	9-Nov-07
Project ID	000029-02 BG 12 T17.4	Weight/Volume:	7.24 g	Sample ID:	P8604_5392_001	Date Extracted:	12-Nov-07
Date Collected:	5-Nov-07	% Solids:	39.9 %	QC Batch No.:	5392	Date Analyzed:	18-Nov-07
		Split:	-	Dilution:	-	Time Analyzed:	6:41:16

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2,3,7,8-TCDD	0.332	[Ra=0.846]		J	13C-2,3,7,8-TCDD	90.6	
1,2,3,7,8-PeCDD	0.9			J	13C-1,2,3,7,8-PeCDD	81.7	
1,2,3,4,7,8-HxCDD	1.56			J	13C-1,2,3,4,7,8-HxCDD	82.1	
1,2,3,6,7,8-HxCDD	8.21				13C-1,2,3,6,7,8-HxCDD	82	
1,2,3,7,8,9-HxCDD	3.38			J	13C-1,2,3,7,8,9-HxCDD	76.7	
1,2,3,4,6,7,8-HpCDD	296				13C-1,2,3,4,6,7,8-HpCDD	65.8	
OCDD	2,520				13C-OCDD	62	
2,3,7,8-TCDF	21.6				13C-2,3,7,8-TCDF	87.5	
1,2,3,7,8-PeCDF	20.7				13C-1,2,3,7,8-PeCDF	86.6	
2,3,4,7,8-PeCDF	11.6				13C-2,3,4,7,8-PeCDF	88.7	
1,2,3,4,7,8-HxCDF	37.2				13C-1,2,3,4,7,8-HxCDF	78.6	
1,2,3,6,7,8-HxCDF	7.78				13C-1,2,3,6,7,8-HxCDF	84.7	
2,3,4,6,7,8-HxCDF	3.2			J	13C-2,3,4,6,7,8-HxCDF	85.9	
1,2,3,7,8,9-HxCDF	4.12				13C-1,2,3,7,8,9-HxCDF	74.3	
1,2,3,4,6,7,8-HpCDF	40.2				13C-1,2,3,4,6,7,8-HpCDF	67.4	
1,2,3,4,7,8,9-HpCDF	8.01				13C-1,2,3,4,7,8,9-HpCDF	64.2	
OCDF	144				13C-OCDF	56	
Totals						**CS Recoveries**	
TCDDs	6.97		7.46		37Cl-2,3,7,8-TCDD	89.5	
PeCDDs	7.86		9.95		13C-1,2,3,4,7-PeCDD	108	
HxCDDs	83.2				13C-1,2,3,4,6-PeCDF	108	
HpCDDs	692				13C-1,2,3,4,6,9-HxCDF	108	
					13C-1,2,3,4,6,8,9-HpCDF	94.8	
TCDFs	64.2		67.6				
PeCDFs	53.6		64.1			**AS Recoveries**	
HxCDFs	93.1				13C-1,3,6,8-TCDD	101	
HpCDFs	135				13C-1,3,6,8-TCDF	105	
Total PCDD/Fs	**3,810**		**3,820**				
ITEF TEQs							
TEQ: ND=0	22.4		22.4				
TEQ: ND=DL/2	22.4		22.4				
TEQ: ND=DL	22.4		22.4				

ANALYTICAL PERSPECTIVES

2714 Exchange Drive
Wilmington, NC 28405
USA

Tel: +1 910 794-1613; Toll-Free 866 846-8290
Fax: +1 910 794-3919

info@ultratrace.com
www.ultratrace.com

Checkcode: 3459

AP 2006 Rev. 0

11/27/07

Reviewer .....

Date 27 Nov 07

Sample ID: PCM-06DS-071105

Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Anchor Environmental, LLC	Matrix:	Solids	Project No.:	P8604	Date Received:	9-Nov-07
Project ID:	000029-02 BG 12 T17.4	Weight/Volume:	8.22 g	Sample ID:	P8604_5392_002	Date Extracted:	12-Nov-07
Date Collected:	5-Nov-07	% Solids:	40.7 %	QC Batch No.:	5392	Date Analyzed:	18-Nov-07
		Split:	-	Dilution:	-	Time Analyzed:	7:32:03

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2,3,7,8-TCDD	ND	0.58			13C-2,3,7,8-TCDD	98.8	
1,2,3,7,8-PeCDD	0.826			J	13C-1,2,3,7,8-PeCDD	87.3	
1,2,3,4,7,8-HxCDD	1.17			J	13C-1,2,3,4,7,8-HxCDD	91.7	
1,2,3,6,7,8-HxCDD	5.29				13C-1,2,3,6,7,8-HxCDD	92.8	
1,2,3,7,8,9-HxCDD	2.5			J	13C-1,2,3,7,8,9-HxCDD	86.9	
1,2,3,4,6,7,8-HpCDD	133				13C-1,2,3,4,6,7,8-HpCDD	77.3	
OCDD	1,240				13C-OCDD	71.9	
2,3,7,8-TCDF	14.6				13C-2,3,7,8-TCDF	91.9	
1,2,3,7,8-PeCDF	19.6				13C-1,2,3,7,8-PeCDF	65.9	
2,3,4,7,8-PeCDF	10.3				13C-2,3,4,7,8-PeCDF	69.5	
1,2,3,4,7,8-HxCDF	41.5				13C-1,2,3,4,7,8-HxCDF	89.1	
1,2,3,6,7,8-HxCDF	9.89				13C-1,2,3,6,7,8-HxCDF	59.3	
2,3,4,6,7,8-HxCDF	3.23				13C-2,3,4,6,7,8-HxCDF	90.7	
1,2,3,7,8,9-HxCDF	4.23				13C-1,2,3,7,8,9-HxCDF	89.1	
1,2,3,4,6,7,8-HpCDF	31.8				13C-1,2,3,4,6,7,8-HpCDF	77.3	
1,2,3,4,7,8,9-HpCDF	7.61				13C-1,2,3,4,7,8,9-HpCDF	75.2	
OCDF	96				13C-OCDF	68.1	
Totals						**CS Recoveries**	
TCDDs	6.01		6.47		37Cl-2,3,7,8-TCDD	97.2	
PeCDDs	4.3		6.78		13C-1,2,3,4,7-PeCDD	89.3	
HxCDDs	36.6				13C-1,2,3,4,6-PeCDF	92	
HpCDDs	307				13C-1,2,3,4,6,9-HxCDF	112	
					13C-1,2,3,4,6,8,9-HpCDF	99.3	
TCDFs	47.7		49.5				
PeCDFs	60.6					**AS Recoveries**	
HxCDFs	91.7				13C-1,3,6,8-TCDD	100	
HpCDFs	96.1				13C-1,3,6,8-TCDF	98.3	
Total PCDD/Fs	**1,990**		**1,990**				
ITEF TEQs							
TEQ: ND=0	17.8		17.8				
TEQ: ND=DL/2	18.1		18.1				
TEQ: ND=DL	18.4		18.4				

ANALYTICAL PERSPECTIVES

2714 Exchange Drive
Wilmington, NC 28405
USA

Tel: +1 910 794-1613; Toll-Free 866 846-8290
Fax: +1 910 794-3919

info@ultratrace.com
www.ultratrace.com

Checkcode: 3632

AP 2006 Rev. 6

Reviewer .....

Date 27 Nov 07

Sample ID: PCM-09DS-071105

Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Anchor Environmental, LLC	Matrix:	Solids	Project No.:	P8604	Date Received:	9-Nov-07
Project ID:	000029-02 BG 12 T17.4	Weight/Volume:	8.45 g	Sample ID:	P8604_5392_003	Date Extracted:	12-Nov-07
Date Collected:	5-Nov-07	% Solids:	n/a	QC Batch No.:	5392	Date Analyzed:	18-Nov-07
		Split:	-	Dilution:	-	Time Analyzed:	8:22:44

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2,3,7,8-TCDD	EMPC	[Ra=1.08]	0.289	J	13C-2,3,7,8-TCDD	93.1	
1,2,3,7,8-PeCDD	0.741			J	13C-1,2,3,7,8-PeCDD	87.2	
1,2,3,4,7,8-HxCDD	1.02			J	13C-1,2,3,4,7,8-HxCDD	88.3	
1,2,3,6,7,8-HxCDD	4.62				13C-1,2,3,6,7,8-HxCDD	90.7	
1,2,3,7,8,9-HxCDD	2.23			J	13C-1,2,3,7,8,9-HxCDD	86	
1,2,3,4,6,7,8-HpCDD	121				13C-1,2,3,4,6,7,8-HpCDD	75.6	
OCDD	1,120				13C-OCDD	74.3	
2,3,7,8-TCDF	12.3				13C-2,3,7,8-TCDF	87	
1,2,3,7,8-PeCDF	11.2				13C-1,2,3,7,8-PeCDF	87.5	
2,3,4,7,8-PeCDF	6.3				13C-2,3,4,7,8-PeCDF	95	
1,2,3,4,7,8-HxCDF	37				13C-1,2,3,4,7,8-HxCDF	88.4	
1,2,3,6,7,8-HxCDF	9.66				13C-1,2,3,6,7,8-HxCDF	97.2	
2,3,4,6,7,8-HxCDF	2.73			J	13C-2,3,4,6,7,8-HxCDF	99.9	
1,2,3,7,8,9-HxCDF	3.38				13C-1,2,3,7,8,9-HxCDF	83.9	
1,2,3,4,6,7,8-HpCDF	39.7				13C-1,2,3,4,6,7,8-HpCDF	75.3	
1,2,3,4,7,8,9-HpCDF	9.52				13C-1,2,3,4,7,8,9-HpCDF	76.3	
OCDF	100				13C-OCDF	68	
Totals						**CS Recoveries**	
TCDDs	5.44		5.73		37Cl-2,3,7,8-TCDD	93.3	
PeCDDs	3.25		5.88		13C-1,2,3,4,7-PeCDD	114	
HxCDDs	40.3		41.3		13C-1,2,3,4,6-PeCDF	110	
HpCDDs	278				13C-1,2,3,4,6,9-HxCDF	118	
					13C-1,2,3,4,6,8,9-HpCDF	103	
TCDFs	40.1		41.5				
PeCDFs	43.3					**AS Recoveries**	
HxCDFs	84.4		84.8		13C-1,3,6,8-TCDD	101	
HpCDFs	106				13C-1,3,6,8-TCDF	99.2	
Total PCDD/Fs	**1,820**		**1,830**				
ITEF TEQs							
TEQ: ND=0	14.3		14.6				
TEQ: ND=DL/2	14.3		14.6				
TEQ: ND=DL	14.3		14.6				

ANALYTICAL PERSPECTIVES

2714 Exchange Drive
Wilmington, NC 28405
USA

Tel: +1 910 794-1613; Toll-Free 866 846-8290
Fax: +1 910 794-3919

info@ultratrace.com
www.ultratrace.com

Checkcode: 5202

AP 2006 Rev. 0

12/22/07

Reviewer

Date 10 Dec 07

Sample ID: PCM-15DS-071106

Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Anchor Environmental, LLC	Matrix:	Solids	Project No.:	P8604	Date Received:	9-Nov-07
Project ID:	000029-02 BG 12 T17.4	Weight/Volume:	10.88 g	Sample ID:	P8604_5392_004	Date Extracted:	12-Nov-07
Date Collected:	6-Nov-07	% Solids:	49.8 %	QC Batch No.:	5392	Date Analyzed:	18-Nov-07
		Split:	-	Dilution:	-	Time Analyzed:	9:13:32

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2,3,7,8-TCDD	ND	0.112			13C-2,3,7,8-TCDD	96.2	
1,2,3,7,8-PeCDD	ND	1.08			13C-1,2,3,7,8-PeCDD	87.5	
1,2,3,4,7,8-HxCDD	0.765			J	13C-1,2,3,4,7,8-HxCDD	93.6	
1,2,3,6,7,8-HxCDD	3.41				13C-1,2,3,6,7,8-HxCDD	93.7	
1,2,3,7,8,9-HxCDD	1.76			J	13C-1,2,3,7,8,9-HxCDD	88.7	
1,2,3,4,6,7,8-HpCDD	72.2				13C-1,2,3,4,6,7,8-HpCDD	87.6	
OCDD	647				13C-OCDD	91	
2,3,7,8-TCDF	9.44				13C-2,3,7,8-TCDF	93.7	
1,2,3,7,8-PeCDF	15.7				13C-1,2,3,7,8-PeCDF	95.8	
2,3,4,7,8-PeCDF	7.53				13C-2,3,4,7,8-PeCDF	99.6	
1,2,3,4,7,8-HxCDF	25.4				13C-1,2,3,4,7,8-HxCDF	91.3	
1,2,3,6,7,8-HxCDF	5.89				13C-1,2,3,6,7,8-HxCDF	110	
2,3,4,6,7,8-HxCDF	2.37				13C-2,3,4,6,7,8-HxCDF	103	
1,2,3,7,8,9-HxCDF	2.83				13C-1,2,3,7,8,9-HxCDF	93.7	
1,2,3,4,6,7,8-HpCDF	21.1				13C-1,2,3,4,6,7,8-HpCDF	87	
1,2,3,4,7,8,9-HpCDF	4.74				13C-1,2,3,4,7,8,9-HpCDF	88.8	
OCDF	54.6				13C-OCDF	89	
Totals						**CS Recoveries**	
TCDDs	0.681		3.84		37Cl-2,3,7,8-TCDD	89.2	
PeCDDs	1.97		2.45		13C-1,2,3,4,7-PeCDD	107	
HxCDDs	26.5		26.9		13C-1,2,3,4,6-PeCDF	106	
HpCDDs	154				13C-1,2,3,4,6,9-HxCDF	112	
					13C-1,2,3,4,6,8,9-HpCDF	102	
TCDFs	24.8		26.5				
PeCDFs	41.3					**AS Recoveries**	
HxCDFs	54.7				13C-1,3,6,8-TCDD	107	
HpCDFs	57.3				13C-1,3,6,8-TCDF	104	
Total PCDD/Fs	1,060		1,070				
ITEF TEQs							
TEQ: ND=0	11.4		11.4				
TEQ: ND=DL/2	11.7		11.7				
TEQ: ND=DL	12.1		12.1				

ANALYTICAL PERSPECTIVES

2714 Exchange Drive
Wilmington, NC 28405
USA

Tel: +1 910 794-1613; Toll-Free 866 846-8290
Fax: +1 910 794-3919

info@ultratrace.com
www.ultratrace.com

Checkcode: 4073

AP 2006 Rev. 6

12/27/07

Reviewer .....

Date 27 Nov 07

Sample ID: PCM-14DS-071107

Method 1613

Client Data		Sample Data		Laboratory Data			
Name:	Anchor Environmental, LLC	Matrix:	Solids	Project No.:	P8604	Date Received:	9-Nov-07
Project ID:	000029-02 BG 12 T17.4	Weight/Volume:	13.65 g	Sample ID:	P8604_5392_005	Date Extracted:	12-Nov-07
Date Collected:	7-Nov-07	% Solids:	57.2 %	QC Batch No.:	5392	Date Analyzed:	18-Nov-07
		Split:	-	Dilution:	-	Time Analyzed:	10:04:14

Analyte	Conc. (pg/g)	DL (pg/g)	EMPC (pg/g)	Qualifiers	Standard	ES Recoveries	Qualifiers
2,3,7,8 TCDD	ND	0.0478			13C-2,3,7,8-TCDD	94.4	
1,2,3,7,8-PeCDD	EMPC		0.285	J	13C-1,2,3,7,8-PeCDD	86.3	
1,2,3,4,7,8-HxCDD	0.492			J	13C-1,2,3,4,7,8-HxCDD	96.1	
1,2,3,6,7,8-HxCDD	2.52				13C-1,2,3,6,7,8-HxCDD	96	
1,2,3,7,8,9-HxCDD	1.22			J	13C-1,2,3,7,8,9-HxCDD	90.2	
1,2,3,4,6,7,8-HpCDD	56.5				13C-1,2,3,4,6,7,8-HpCDD	85.1	
OCDD	504				13C-OCDD	88.2	
2,3,7,8-TCDF	7.89				13C-2,3,7,8-TCDF	88.8	
1,2,3,7,8-PeCDF	19.6				13C-1,2,3,7,8-PeCDF	89.5	
2,3,4,7,8-PeCDF	8.59				13C-2,3,4,7,8-PeCDF	94.5	
1,2,3,4,7,8-HxCDF	29				13C-1,2,3,4,7,8-HxCDF	94.9	
1,2,3,6,7,8-HxCDF	6.86				13C-1,2,3,6,7,8-HxCDF	110	
2,3,4,6,7,8-HxCDF	2.29				13C-2,3,4,6,7,8-HxCDF	107	
1,2,3,7,8,9-HxCDF	2.89				13C-1,2,3,7,8,9-HxCDF	95.8	
1,2,3,4,6,7,8-HpCDF	16.2				13C-1,2,3,4,6,7,8-HpCDF	85.7	
1,2,3,4,7,8,9-HpCDF	3.17				13C-1,2,3,4,7,8,9-HpCDF	87.8	
OCDF	38				13C-OCDF	85.1	
Totals						**CS Recoveries**	
TCDDs	2.85		3.42		37Cl-2,3,7,8-TCDD	91.6	
PeCDDs	2.96		3.46		13C-1,2,3,4,7-PeCDD	104	
HxCDDs	21.4				13C-1,2,3,4,6-PeCDF	104	
HpCDDs	123				13C-1,2,3,4,6,9-HxCDF	119	
					13C-1,2,3,4,6,8,9-HpCDF	106	
TCDFs	19.7		20.9				
PeCDFs	47.8		48.6			**AS Recoveries**	
HxCDFs	57.2				13C-1,3,6,8-TCDD	103	
HpCDFs	42.1				13C-1,3,6,8-TCDF	100	
Total PCDD/Fs	**859**		**862**				
ITEF TEQs							
TEQ: ND=0	11.9		12				
TEQ: ND=DL/2	11.9		12.1				
TEQ: ND=DL	11.9		12.1				

ANALYTICAL PERSPECTIVES

Tel: +1 910 794-1613; Toll-Free 866 846-8290
Fax: +1 910 794-3919

2714 Exchange Drive
Wilmington, NC 28405
USA
info@ultratrace.com
www.ultratrace.com

Checkcode: 1417

AP 2006 Rev 6

11/27/07

Reviewer .....

Date 27 Nov 07

LDC #: 17976A21 **VALIDATION COMPLETENESS WORKSHEET** Date: 12/20/07
SDG #: P8604 Level III Page: 1 of 1
Laboratory: Analytical Perspectives Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: HRGC/HRMS Dioxins/Dibenzofurans (EPA Method 1613B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/5/07
II.	HRGC/HRMS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Routine calibration/~~RCV~~	A	
V.	Blanks	A	
VI.	Matrix spike/Matrix spike duplicates	N	client specified
VII.	Laboratory control samples	A	OPR
VIII.	Regional quality assurance and quality control	N	
IX.	Internal standards	A	
X.	Target compound identifications	N	
XI.	Compound quantitation and CRQLs	N	
XII.	System performance	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	PCM-02DS-071105	11	#0.5392 MB01	21		31	
2	PCM-06DS-071105	12		22		32	
3	PCM-09DS-071105	13		23		33	
4	PCM-15DS-071106	14		24		34	
5	PCM-14DS-071107	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

Anchor Environmental, LLC
1423 3rd Avenue, Suite 300
Seattle, WA 98101-2226
ATTN: Ms. Joy Dunay

January 21, 2008

SUBJECT: NW Natural Gasco Pilot Cap Monitoring Year 1, Data Validation

Dear Ms. Dunay,

Enclosed are the final validation reports for the fractions listed below. This SDG was received on January 4, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 18053:

SDG #	Fraction
K0710416	Volatiles, Semivolatiles, Polynuclear Aromatic Hydrocarbons, Chlorinated Pesticides, Polychlorinated Biphenyls, Metals, Herbicides, Wet Chemistry, Gasoline Range Organics, Diesel Range Organics & Residual Range Organics, Butyltins, Chlorinated Phenols

The data validation was performed under EPA Level III guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004
- 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

Please feel free to contact us if you have any questions.

Sincerely,

Stella Cuenco

Stella S. Cuenco
Project Manager/Senior Chemist

5,923 Pages-EX

LDC #18053 (Anchor Environmental-Seattle WA / NW Natural - Gasco Pilot Cap Monitoring Year 1)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (8260B)		BTEX (8260B)		SVOA (8270C)		PAHs (8270C -SIM)		Pest. (8081A)		PCBs (8082)		Metals (SW846)		Fe (6010B)		Diss. Fe (6010B)		Herbs. (8151A)		Chlor. Phenols (8151M)		Butyl -tins (Krone)		GRO (NWTPH -Gx)		DRO RRO (Dx)							
Matrix:	Water/Sediment			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K0710416	01/04/08	01/25/08	0	1	4	3	0	1	3	4	0	4	0	5	0	4	3	0	3	0	0	1	0	1	0	1	0	4	0	4						
Total	T/SC			0	1	4	3	0	1	3	4	0	4	0	5	0	4	3	0	3	0	0	1	0	1	0	1	0	4	0	4	0	0	0	0	0	0

5,923 Pages-EX

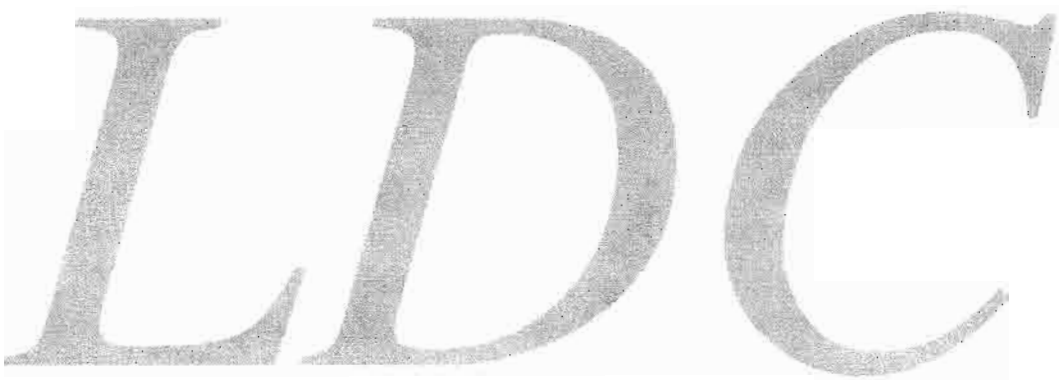
LDC #18053 (Anchor Environmental-Seattle WA / NW Natural - Gasco Pilot Cap Monitoring Year 1)

LDC	SDG#	DATE REC'D	(3) DATE DUE	NH_3-N (350.1 Plumb)		T.CN- (335.4 /4500)		Diss. CN- (4500)		Free CN- (D4282)		Amen. CN- (4500)		Cr(VI) (7196A)		ORP (D1498 -76)		pH (9045C)		Part. Size (PSEP)		S= (9030M /4500)		DOC (5310C)		TOC (PSEP 5310C)		Total Solids (160.3)									
Matrix:	Water/Sediment			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K0710416	01/04/08	01/25/08	0	1	3	4	3	0	3	0	3	0	0	1	1	0	1	0	0	4	3	1	3	0	3	4	0	5								
Total	T/SC			0	1	3	4	3	0	3	0	3	0	0	1	1	0	1	0	0	4	3	1	3	0	3	4	0	5	0	0	0	0	0	0	0	0

Shaded cells indicate Level IV validation (all other cells are Level III validation). These sample counts do not include MS, MSD, or DUP's.

NW Natural Gasco Site
Data Validation Reports
LDC# 18053

Volatiles



Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NW Natural Gasco Site

Collection Date: November 6, 2007

LDC Report Date: January 16, 2008

Matrix: Sediment/Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): K0710416

Sample Identification

PCM-03SC-071106
PCM-03PW-071106
PCM-06SC-071106
PCM-06PW-071106
PCM-21SC-071106
PCM-21PW-071106
PCM-TB-071106
PCM-15DS-071106

Introduction

This data review covers 4 sediment samples and 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all volatile target compounds and system performance check compounds (SPCCs) were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/7/07	Acrolein Vinyl acetate 2-Butanone	0.0259 (≥0.05) 0.0415 (≥0.05) 0.0203 (≥0.05)	PCM-15DS-071106 KWG0712458-5	J (all detects) UJ (all non-detects)	A

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/13/07	Iodomethane	26	PCM-15DS-071106 KWG0712458-5	J (all detects) UJ (all non-detects)	A

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/7/07	Vinyl acetate Acetone	37 26	PCM-15DS-071106 KWG0712458-5	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

All of the continuing calibration RRF values were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/13/07	Acrolein Vinyl acetate 2-Butanone	0.0260 (≥0.05) 0.0444 (≥0.05) 0.0218 (≥0.05)	PCM-15DS-071106 KWG0712458-5	J (all detects) UJ (all non-detects)	A

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polynuclear aromatic hydrocarbon contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Analysis Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
KWG0712458-5	11/13/07	Methylene chloride Acetone Iodomethane 1,4-Dichlorobenzene	1.8 ug/Kg 4.3 ug/Kg 9.2 ug/Kg 0.18 ug/Kg	PCM-15DS-071106

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
PCM-15DS-071106	Methylene chloride Acetone	3.4 ug/Kg 147 ug/Kg	11U ug/Kg 43U ug/Kg

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to calibration %D and RRF problems, data were qualified as estimated in one sample.

Due to method blank contamination problems, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

Sample PCM-TB-071106 was identified as a trip blank. No volatile contaminants were found in this blank.

NW Natural Gasco Site
Volatiles - Data Qualification Summary - SDG K0710416

SDG	Sample	Compound	Flag	A or P	Reason
K0710416	PCM-15DS-071106	Acrolein Vinyl acetate 2-Butanone	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
K0710416	PCM-15DS-071106	Iodomethane	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
K0710416	PCM-15DS-071106	Vinyl acetate Acetone	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
K0710416	PCM-15DS-071106	Acrolein Vinyl acetate 2-Butanone	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)

NW Natural Gasco Site
Volatiles - Laboratory Blank Data Qualification Summary - SDG K0710416

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
K0710416	PCM-15DS-071106	Methylene chloride Acetone	11U ug/Kg 43U ug/Kg	A

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Volatile Organic Compounds

Sample Name:	PCM-03SC-071106	**Units:**	ug/Kg
Lab Code:	K0710416-001	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**2.3**	J	2.6	0.21	1	11/12/07	11/12/07	KWG0712399	
Toluene	ND	U	2.6	0.34	1	11/12/07	11/12/07	KWG0712399	
Ethylbenzene	ND	U	2.6	0.17	1	11/12/07	11/12/07	KWG0712399	
m,p-Xylenes	**0.54**	J	2.6	0.39	1	11/12/07	11/12/07	KWG0712399	
o-Xylene	**0.46**	J	2.6	0.15	1	11/12/07	11/12/07	KWG0712399	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	91	69-115	11/12/07	Acceptable
Toluene-d8	96	64-128	11/12/07	Acceptable
4-Bromofluorobenzene	96	54-129	11/12/07	Acceptable

Comments: SL 01/4/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Pore water	**Date Received:**	11/07/2007

Volatile Organics by GC/MS

Sample Name:	PCM-03PW-071106	**Units:**	ug/L
Lab Code:	K0710416-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**2600**	D	50	14	100	11/20/07	11/20/07	KWG0712818	
Toluene	**6.0**	D	5.0	1.1	10	11/17/07	11/17/07	KWG0712703	
Ethylbenzene	**14**	D	5.0	1.3	10	11/17/07	11/17/07	KWG0712703	
m,p-Xylenes	**21**	D	5.0	2.2	10	11/17/07	11/17/07	KWG0712703	
o-Xylene	**17**	D	5.0	1.1	10	11/17/07	11/17/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	91	87-120	11/17/07	Acceptable
Dibromofluoromethane	87	82-125	11/17/07	Acceptable
4-Bromofluorobenzene	90	73-118	11/17/07	Acceptable

Comments: 11/14/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Volatile Organic Compounds

Sample Name:	PCM-06SC-071106	**Units:**	ug/Kg
Lab Code:	K0710416-003	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	1.2	0.090	1	11/12/07	11/12/07	KWG0712399	
Toluene	ND	U	1.2	0.15	1	11/12/07	11/12/07	KWG0712399	
Ethylbenzene	ND	U	1.2	0.074	1	11/12/07	11/12/07	KWG0712399	
m,p-Xylenes	ND	U	1.2	0.17	1	11/12/07	11/12/07	KWG0712399	
o-Xylene	ND	U	1.2	0.065	1	11/12/07	11/12/07	KWG0712399	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	90	69-115	11/12/07	Acceptable
Toluene-d8	96	64-128	11/12/07	Acceptable
4-Bromofluorobenzene	93	54-129	11/12/07	Acceptable

Comments: SL 011408

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Pore water	**Date Received:**	11/07/2007

Volatile Organics by GC/MS

Sample Name:	PCM-06PW-071106	**Units:**	ug/L
Lab Code:	K0710416-004	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**540**	D	10	2.8	20	11/15/07	11/15/07	KWG0712577	
Toluene	**6.7**	D	1.0	0.22	2	11/15/07	11/15/07	KWG0712577	
Ethylbenzene	**13**	D	1.0	0.26	2	11/15/07	11/15/07	KWG0712577	
m,p-Xylenes	**11**	D	1.0	0.44	2	11/15/07	11/15/07	KWG0712577	
o-Xylene	**18**	D	1.0	0.21	2	11/15/07	11/15/07	KWG0712577	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	89	87-120	11/15/07	Acceptable
Dibromofluoromethane	89	82-125	11/15/07	Acceptable
4-Bromofluorobenzene	91	73-118	11/15/07	Acceptable

Comments: SC 1/14/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Volatile Organic Compounds

Sample Name:	PCM-21SC-071106	**Units:**	ug/Kg
Lab Code:	K0710416-005	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	1.2	0.091	1	11/12/07	11/12/07	KWG0712399	
Toluene	ND	U	1.2	0.15	1	11/12/07	11/12/07	KWG0712399	
Ethylbenzene	ND	U	1.2	0.075	1	11/12/07	11/12/07	KWG0712399	
m,p-Xylenes	ND	U	1.2	0.18	1	11/12/07	11/12/07	KWG0712399	
o-Xylene	ND	U	1.2	0.066	1	11/12/07	11/12/07	KWG0712399	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	90	69-115	11/12/07	Acceptable
Toluene-d8	95	64-128	11/12/07	Acceptable
4-Bromofluorobenzene	91	54-129	11/12/07	Acceptable

Comments: SC 01/4/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Pore water	**Date Received:**	11/07/2007

Volatile Organics by GC/MS

Sample Name:	PCM-21PW-071106	**Units:**	ug/L
Lab Code:	K0710416-006	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**0.48**	J	0.50	0.14	1	11/15/07	11/15/07	KWG0712577	
Toluene	**0.39**	J	0.50	0.11	1	11/15/07	11/15/07	KWG0712577	
Ethylbenzene	**0.25**	J	0.50	0.13	1	11/15/07	11/15/07	KWG0712577	
m,p-Xylenes	**0.40**	J	0.50	0.22	1	11/15/07	11/15/07	KWG0712577	
o-Xylene	**0.50**		0.50	0.11	1	11/15/07	11/15/07	KWG0712577	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	98	87-120	11/15/07	Acceptable
Dibromofluoromethane	92	82-125	11/15/07	Acceptable
4-Bromofluorobenzene	89	73-118	11/15/07	Acceptable

Comments: SC 11/4/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Pore water	**Date Received:**	11/07/2007

Volatile Organics by GC/MS

Sample Name:	PCMTB-071106	**Units:**	ug/L
Lab Code:	K0710416-007	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	11/15/07	11/15/07	KWG0712577	
Toluene	ND	U	0.50	0.11	1	11/15/07	11/15/07	KWG0712577	
Ethylbenzene	ND	U	0.50	0.13	1	11/15/07	11/15/07	KWG0712577	
m,p-Xylenes	ND	U	0.50	0.22	1	11/15/07	11/15/07	KWG0712577	
o-Xylene	ND	U	0.50	0.11	1	11/15/07	11/15/07	KWG0712577	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	99	87-120	11/15/07	Acceptable
Dibromofluoromethane	91	82-125	11/15/07	Acceptable
4-Bromofluorobenzene	87	73-118	11/15/07	Acceptable

Comments: 8Col1408

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Volatile Organic Compounds

Sample Name:	PCM-15DS-071106	**Units:**	ug/Kg
Lab Code:	K0710416-008	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q		MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Acrolein	ND	U	UJ5	14	3.7	1	11/13/07	11/13/07	KWG0712458	
Iodomethane (Methyl Iodide)	ND	U	↓	43	0.76	1	11/13/07	11/13/07	KWG0712458	
Methyl tert-Butyl Ether	ND	U		2.2	0.14	1	11/13/07	11/13/07	KWG0712458	
Acrylonitrile	ND	U		4.3	0.99	1	11/13/07	11/13/07	KWG0712458	
Vinyl Acetate	ND	U	UJ5	5.4	2.1	1	11/13/07	11/13/07	KWG0712458	
1,2-Dichloropropane	ND	U		2.2	0.21	1	11/13/07	11/13/07	KWG0712458	
Dibromomethane	ND	U		2.2	0.33	1	11/13/07	11/13/07	KWG0712458	
2-Chloroethyl Vinyl Ether	ND	U		5.4	0.67	1	11/13/07	11/13/07	KWG0712458	
1,2-Dibromoethane (EDB)	ND	U		2.2	0.20	1	11/13/07	11/13/07	KWG0712458	
1,1,1,2-Tetrachloroethane	ND	U		2.2	0.17	1	11/13/07	11/13/07	KWG0712458	
trans-1,4-Dichloro-2-butene	ND	U		5.4	0.88	1	11/13/07	11/13/07	KWG0712458	
1,2,3-Trichloropropane	ND	U		5.4	0.63	1	11/13/07	11/13/07	KWG0712458	
Dichlorodifluoromethane	ND	U		2.2	0.15	1	11/13/07	11/13/07	KWG0712458	
Chloromethane	ND	U		2.2	0.24	1	11/13/07	11/13/07	KWG0712458	
Vinyl Chloride	ND	U		2.2	0.21	1	11/13/07	11/13/07	KWG0712458	
Bromomethane	ND	U		11	1.1	1	11/13/07	11/13/07	KWG0712458	
Chloroethane	ND	U		2.2	0.52	1	11/13/07	11/13/07	KWG0712458	
Trichlorofluoromethane	ND	U		2.2	0.24	1	11/13/07	11/13/07	KWG0712458	
Acetone	14	J	43UJ	43 5,7	3.9	1	11/13/07	11/13/07	KWG0712458	
1,1-Dichloroethene	ND	U		2.2	0.13	1	11/13/07	11/13/07	KWG0712458	
Carbon Disulfide	ND	U		2.2	0.13	1	11/13/07	11/13/07	KWG0712458	
Methylene Chloride	3.4	J	11U7	11	0.31	1	11/13/07	11/13/07	KWG0712458	
trans-1,2-Dichloroethene	ND	U		2.2	0.19	1	11/13/07	11/13/07	KWG0712458	
1,1-Dichloroethane	ND	U		2.2	0.15	1	11/13/07	11/13/07	KWG0712458	
2-Butanone (MEK)	ND	U	UJ5	11	2.4	1	11/13/07	11/13/07	KWG0712458	
Chloroform	ND	U		2.2	0.14	1	11/13/07	11/13/07	KWG0712458	
1,1,1-Trichloroethane (TCA)	ND	U		2.2	0.15	1	11/13/07	11/13/07	KWG0712458	
Carbon Tetrachloride	ND	U		2.2	0.16	1	11/13/07	11/13/07	KWG0712458	
1,2-Dichloroethane (EDC)	ND	U		2.2	0.13	1	11/13/07	11/13/07	KWG0712458	
Benzene	2.8			2.2	0.17	1	11/13/07	11/13/07	KWG0712458	
Trichloroethene (TCE)	ND	U		2.2	0.16	1	11/13/07	11/13/07	KWG0712458	
Bromodichloromethane	ND	U		2.2	0.24	1	11/13/07	11/13/07	KWG0712458	
2-Hexanone	ND	U		22	1.3	1	11/13/07	11/13/07	KWG0712458	

Comments: 11/14/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Volatile Organic Compounds

Sample Name:	PCM-15DS-071106	**Units:**	ug/Kg
Lab Code:	K0710416-008	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
cis-1,3-Dichloropropene	ND	U	2.2	0.13	1	11/13/07	11/13/07	KWG0712458	
Toluene	ND	U	2.2	0.28	1	11/13/07	11/13/07	KWG0712458	
trans-1,3-Dichloropropene	ND	U	2.2	0.20	1	11/13/07	11/13/07	KWG0712458	
1,1,2-Trichloroethane	ND	U	2.2	0.24	1	11/13/07	11/13/07	KWG0712458	
4-Methyl-2-pentanone (MIBK)	ND	U	4.3	0.48	1	11/13/07	11/13/07	KWG0712458	
Bromochloromethane	ND	U	2.2	0.39	1	11/13/07	11/13/07	KWG0712458	
Tetrachloroethene (PCE)	ND	U	2.2	0.17	1	11/13/07	11/13/07	KWG0712458	
Dibromochloromethane	ND	U	2.2	0.21	1	11/13/07	11/13/07	KWG0712458	
Chlorobenzene	ND	U	2.2	0.11	1	11/13/07	11/13/07	KWG0712458	
Ethylbenzene	ND	U	2.2	0.14	1	11/13/07	11/13/07	KWG0712458	
m,p-Xylenes	ND	U	2.2	0.33	1	11/13/07	11/13/07	KWG0712458	
o-Xylene	ND	U	2.2	0.13	1	11/13/07	11/13/07	KWG0712458	
Styrene	ND	U	2.2	0.15	1	11/13/07	11/13/07	KWG0712458	
Bromoform	ND	U	2.2	0.41	1	11/13/07	11/13/07	KWG0712458	
Isopropylbenzene	ND	U	2.2	0.11	1	11/13/07	11/13/07	KWG0712458	
1,1,2,2-Tetrachloroethane	ND	U	2.2	0.24	1	11/13/07	11/13/07	KWG0712458	
1,4-Dichlorobenzene	ND	U	2.2	0.22	1	11/13/07	11/13/07	KWG0712458	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	89	69-115	11/13/07	Acceptable
Toluene-d8	93	64-128	11/13/07	Acceptable
4-Bromofluorobenzene	84	54-129	11/13/07	Acceptable

Comments: K3140e

LDC #: 18053A1 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/10/08
SDG #: K0710416 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: D
2nd Reviewer: M

METHOD: GC/MS Volatiles (~~BTEX~~)(EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/6/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	
IV.	Continuing calibration	A	
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	N	client specified
VIII.	Laboratory control samples	A	LCS/LCSD
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	ND	TB = 7

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:
sediment + water

1 5	PCM-03SC-071106	11 1	KWG0712577-4	21 x		31	
2 3	PCM-03PW-071106 W (4 = D)	12 2	KWG0712624-4	22 x		32	
3 5	PCM-06SC-071106	13 3	KWG0712703-4	23 x		33	
4 1	PCM-06PW-071106 W	14 4	KWG0712818-3	24 x		34	
5 5	PCM-21SC-071106	15 5	KWG0712399-5	25 x		35	
6 1	PCM-21PW-071106 W	16 6	KWG0712458-5	26 x		36	
7 1	PCMTB-071106 W	17		27		37	
8 6	PCM-15DS-071106	18		28		38	
9		19		29		39	
10		20		30		40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform*	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene*	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform**	EE. Ethylbenzene**	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN.
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane**	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

* = System performance check compounds (SPCC) for RRF ; ** = Calibration check compounds (CCC) for %RSD.

LDC #: 18053A1
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

- (Y) N N/A — Did the laboratory perform a 5 point calibration prior to sample analysis?
- (Y) N N/A — Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
- Y (N) N/A — Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?________
- (Y) N N/A — Did the initial calibration meet the acceptance criteria?
- Y (N) N/A — Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/7/07	CAL6779	FFFF		0.0259	KWG0712458-5, 8	J/UJ/A
			HH		0.0415	↓	↓
			M		0.0203		

LDC #: 18053A /
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: KT
2nd Reviewer: M

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
Y N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y N N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/7/07	CAL6779-ICV	HH	37		KWG0712458-5,	J | UJ/A
			F	26		8	↓
	11/13/07	1113F004	FFFF		0.0260	↓	J/UJ/A
			HH		0.0444		↓
			M		0.0218		
			Iodomethane	26		↓	↓

LDC #: 18053A1
SDG #: fee cover

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank associated with every sample in this SDG?
Y N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 11/13/07
Conc. units: ug/kg
Associated Samples: 8

Compound	Blank ID	Sample Identification								
[illegible]	KWG0712458-5	8								
Methylene chloride	1.8	3.4 /11U								
Acetone	4.3	14 /43U								
Iodomethane	9.2	—								
HHH	0.18	—								
CRQL										

Blank analysis date:
Conc. units:
Associated Samples:

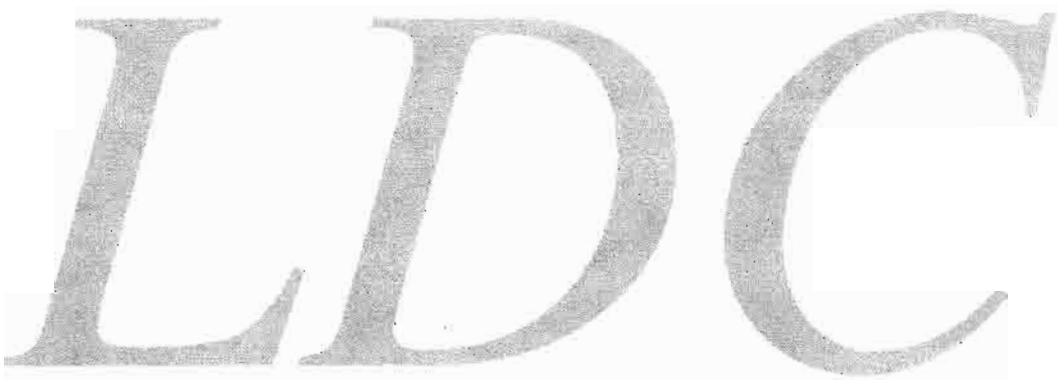
Compound	Blank ID	Sample Identification								
[illegible]										
Methylene chloride										
Acetone										
CRQL										

All results were qualified using the criteria stated below except those circled.

Note: Common contaminants such as Methylene chloride, Acetone, 2-Butanone, Carbon disulfide and TICs that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

NW Natural Gasco Site
Data Validation Reports
LDC# 18053

Semivolatiles



Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 6, 2007
LDC Report Date:	January 11, 2008
Matrix:	Sediment
Parameters:	Semivolatiles
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710416

Sample Identification

PCM-15DS-071106
PCM-15DS-071106RE

Introduction

This data review covers 2 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
PCM-15DS-071106RE	All TCL compounds	35	14	J (all detects) UJ (all non-detects)	A

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where %RSD was greater than 15.0%, the laboratory used a calibration curve to evaluate the compound. All coefficients of determination (r^2) were greater than or equal to 0.990 .

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all semivolatile target compounds and system performance check compounds (SPCCs) were greater than or equal to 0.05 as required.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration RRF values were greater than or equal to 0.05 .

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits with the following exceptions:

Sample	Surrogate	%R (Limits)	Compound	Flag	A or P
PCM-15DS-071106	2-Fluorophenol Phenol-d5 2,4,6-Tribromophenol	0 (10-86) 0 (17-101) 2 (21-110)	All acid compounds	J (all detects) R (all non-detects)	P

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
KWG0712491-3/4 (PCM-15DS-071106 KWG0712491-5)	Aniline 2-Methylphenol 4-Methylphenol 2,4-Dimethylphenol	2 (50-150) 12 (50-150) 11 (50-150) 5 (50-150)	3 (50-150) 9 (50-150) 8 (50-150) 4 (50-150)	- - - -	J (all detects) R (all non-detects)	P
KWG0713374-3/4 (PCM-15DS-071106RE KWG0713374-5)	Aniline Benzyl alcohol 2,4-Dimethylphenol Benzoic acid	31 (50-150) - 49 (50-150) 10 (50-150)	25 (50-150) 45 (50-150) 42 (50-150) 12 (50-150)	- - - -	J (all detects) UJ (all non-detects)	P

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
KWG0712491-3/4 (PCM-15DS-071106 KWG0712491-5)	Bis(2-chloroethyl) ether	-	43 (50-150)	-	J (all detects) UJ (all non-detects)	P
	Phenol	-	42 (50-150)	-		
	2-Chlorophenol	48 (50-150)	38 (50-150)	-		
	1,3-Dichlorobenzene	49 (50-150)	39 (50-150)	-		
	1,4-Dichlorobenzene	-	41 (50-150)	-		
	1,2-Dichlorobenzene	49 (50-150)	40 (50-150)	-		
	Benzyl alcohol	45 (50-150)	36 (50-150)	-		
	Bis(2-chloroisopropyl)ether	-	43 (50-150)	-		
	Hexachloroethane	-	39 (50-150)	-		
	N-Nitroso-di-n-propylamine	44 (50-150)	37 (50-150)	-		
	Nitrobenzene	-	42 (50-150)	-		
	Isophorone	-	48 (50-150)	-		
	2-Nitrophenol	-	44 (50-150)	-		
	Bis(2-chloroethoxy)methane	-	45 (50-150)	-		
	2,4-Dichlorophenol	47 (50-150)	41 (50-150)	-		
	Benzoic acid	14 (50-150)	10 (50-150)	-		
	1,2,4-Trichlorobenzene	-	47 (50-150)	-		
	4-Chloroaniline	17 (50-150)	19 (50-150)	-		
	4-Chloro-3-methylphenol	43 (50-150)	35 (50-150)	-		
	Hexachlorocyclopentadiene	-	42 (50-150)	-		
	2,4,6-Trichlorophenol	43 (50-150)	36 (50-150)	-		
	2,4,5-Trichlorophenol	-	45 (50-150)	-		
	2-Chloronaphthalene	-	44 (50-150)	-		
	3-Nitroaniline	46 (50-150)	42 (50-150)	-		
	2,4-Dinitrophenol	39 (50-150)	36 (50-150)	-		
	4-Chlorophenyl-phenyl ether	-	48 (50-150)	-		
	4-Nitroaniline	-	46 (50-150)	-		
	N-Nitrosodiphenylamine	40 (50-150)	35 (50-150)	-		
	Azobenzene	-	47 (50-150)	-		
	Pentachlorophenol	-	46 (50-150)	-		
	3,3'-Dichlorobenzidine	25 (50-150)	18 (50-150)	-		

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

The analysis was conducted within all specifications of the method.

Due to severe problems with the surrogate and LCS/LCSD %Rs, data were rejected in one sample.

Due to extraction holding time and LCS/LCSD %R problems, data were qualified as estimated in one sample.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were rejected as follows:

Sample	Compound	Flag	A or P
PCM-15DS-071106	All acid compounds and Aniline	R	A
PCM-15DS-071106RE	All base/neutral compounds except Aniline	R	A

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Semivolatiles - Data Qualification Summary - SDG K0710416

SDG	Sample	Compound	Flag	A or P	Reason
K0710416	PCM-15DS-071106RE	All TCL compounds	J (all detects) UJ (all non-detects)	A	Technical holding times
K0710416	PCM-15DS-071106	Phenol 2-Chlorophenol 2-Methylphenol 4-Methylphenol 2-Nitrophenol 2,4-Dimethylphenol 2,4-Dichlorophenol 4-Chloro-3-methylphenol 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2,4-Dinitrophenol 4-Nitrophenol 4,6-Dinitro-2-methylphenol Pentachlorophenol Benzoic acid	J (all detects) R (all non-detects)	A	Surrogate spikes (%R)
K0710416	PCM-15DS-071106	Bis(2-chloroethyl) ether Phenol 2-Chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Benzyl alcohol Bis(2-chloroisopropyl)ether Hexachloroethane N-Nitroso-di-n-propylamine Nitrobenzene Isophorone 2-Nitrophenol Bis(2-chloroethoxy)methane 2,4-Dichlorophenol Benzoic acid 1,2,4-Trichlorobenzene 4-Chloroaniline 4-Chloro-3-methylphenol Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 3-Nitroaniline 2,4-Dinitrophenol 4-Chlorophenyl-phenyl ether 4-Nitroaniline N-Nitrosodiphenylamine Azobenzene Pentachlorophenol 3,3'-Dichlorobenzidine	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)
K0710416	PCM-15DS-071106	Aniline 2-Methylphenol 4-Methylphenol 2,4-Dimethylphenol	J (all detects) R (all non-detects)	P	Laboratory control samples (%R)
K0710416	PCM-15DS-071106RE	Aniline Benzyl alcohol 2,4-Dimethylphenol Benzoic acid	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)

SDG	Sample	Compound	Flag	A or P	Reason
K0710416	PCM-15DS-071106	Phenol	R	A	Overall assessment of data
		2-Chlorophenol	R		
		2-Methylphenol	R		
		4-Methylphenol	R		
		2-Nitrophenol	R		
		2,4-Dimethylphenol	R		
		2,4-Dichlorophenol	R		
		4-Chloro-3-methylphenol	R		
		2,4,6-Trichlorophenol	R		
		2,4,5-Trichlorophenol	R		
		2,4-Dinitrophenol	R		
		4-Nitrophenol	R		
		4,6-Dinitro-2-methylphenol	R		
		Pentachlorophenol	R		
		Benzoic acid	R		
		Aniline	R		
K0710416	PCM-15DS-071106RE	Bis(2-chloroethyl) ether	R	A	Overall assessment of data
		1,3-Dichlorobenzene	R		
		1,4-Dichlorobenzene	R		
		1,2-Dichlorobenzene	R		
		Bis(2-chloroisopropyl)ether	R		
		N-Nitroso-di-n-propylamine	R		
		Hexachloroethane	R		
		Nitrobenzene	R		
		Isophorone	R		
		Bis(2-chloroethoxy)methane	R		
		1,2,4-Trichlorobenzene	R		
		4-Chloroaniline	R		
		Hexachlorobutadiene	R		
		Hexachlorocyclopentadiene	R		
		2-Chloronaphthalene	R		
		2-Nitroaniline	R		
		Dimethylphthalate	R		
		2,6-Dinitrotoluene	R		
		3-Nitroaniline	R		
		2,4-Dinitrotoluene	R		
		Diethylphthalate	R		
		4-Chlorophenylphenyl ether	R		
		4-Nitroaniline	R		
		N-Nitrosodiphenylamine	R		
		4-Bromophenyphenyl ether	R		
		Hexachlorobenzene	R		
		Di-n-butylphthalate	R		
		Butylbenzylphthalate	R		
		3,3'-Dichlorobenzidine	R		
		Bis(2-ethyhexyl)phthalate	R		
		Di-n-octylphthalate	R		
		Benzyl alcohol	R		
		Azobenzene	R		
		Carbazole	R		

NW Natural Gasco Site
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG K0710416

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	PCM-15DS-071106	**Units:**	ug/Kg
Lab Code:	K0710416-008	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Bis(2-chloroethyl) Ether	ND	U UJ10	50	9.5	5	11/15/07	12/05/07	KWG0712491	
Phenol	ND	U R1B	150 22	10	5	11/15/07	12/05/07	KWG0712491	
Aniline	ND	U R1B	99 22	7.5	5	11/15/07	12/05/07	KWG0712491	*
2-Chlorophenol	ND	U R1B	50 22	10	5	11/15/07	12/05/07	KWG0712491	
1,3-Dichlorobenzene	ND	U UJ10	50	15	5	11/15/07	12/05/07	KWG0712491	
1,4-Dichlorobenzene	ND	U	50	15	5	11/15/07	12/05/07	KWG0712491	
1,2-Dichlorobenzene	ND	U	50	15	5	11/15/07	12/05/07	KWG0712491	
Benzyl Alcohol	ND	U	99	11	5	11/15/07	12/05/07	KWG0712491	
Bis(2-chloroisopropyl) Ether	ND	U	50	13	5	11/15/07	12/05/07	KWG0712491	
2-Methylphenol	ND	U R1B,3B	50 22	7.5	5	11/15/07	12/05/07	KWG0712491	*
Hexachloroethane	ND	U UJ10	50	16	5	11/15/07	12/05/07	KWG0712491	
N-Nitrosodi-n-propylamine	ND	U	50	12	5	11/15/07	12/05/07	KWG0712491	
4-Methylphenol†	ND	U R1B,3B	50 22	7.5	5	11/15/07	12/05/07	KWG0712491	*
Nitrobenzene	ND	U UJ10	50	11	5	11/15/07	12/05/07	KWG0712491	
Isophorone	ND	U	50	5.0	5	11/15/07	12/05/07	KWG0712491	
2-Nitrophenol	ND	U R1B	50 22	7.5	5	11/15/07	12/05/07	KWG0712491	
2,4-Dimethylphenol	ND	U R1B,3B	250 22	28	5	11/15/07	12/05/07	KWG0712491	*
Bis(2-chloroethoxy)methane	ND	U UJ10	50	7.5	5	11/15/07	12/05/07	KWG0712491	
2,4-Dichlorophenol	ND	U R1B 22	50	5.0	5	11/15/07	12/05/07	KWG0712491	
Benzoic Acid	ND	U	990	480	5	11/15/07	12/05/07	KWG0712491	
1,2,4-Trichlorobenzene	ND	U UJ10	50	13	5	11/15/07	12/05/07	KWG0712491	
4-Chloroaniline	ND	U	50	9.5	5	11/15/07	12/05/07	KWG0712491	
Hexachlorobutadiene	ND	U	50	13	5	11/15/07	12/05/07	KWG0712491	
4-Chloro-3-methylphenol	ND	U R1B 22	50	7.0	5	11/15/07	12/05/07	KWG0712491	
Hexachlorocyclopentadiene	ND	U UJ10	250	150	5	11/15/07	12/05/07	KWG0712491	
2,4,6-Trichlorophenol	ND	U R1B 22	50	7.0	5	11/15/07	12/05/07	KWG0712491	
2,4,5-Trichlorophenol	ND	U	50	7.5	5	11/15/07	12/05/07	KWG0712491	
2-Chloronaphthalene	ND	U UJ10	50	8.0	5	11/15/07	12/05/07	KWG0712491	
2-Nitroaniline	ND	U	99	16	5	11/15/07	12/05/07	KWG0712491	
Dimethyl Phthalate	ND	U	50	5.0	5	11/15/07	12/05/07	KWG0712491	
2,6-Dinitrotoluene	ND	U	50	10	5	11/15/07	12/05/07	KWG0712491	
3-Nitroaniline	ND	U UJ10	99	13	5	11/15/07	12/05/07	KWG0712491	
2,4-Dinitrophenol	ND	U R1B 22	990	85	5	11/15/07	12/05/07	KWG0712491	

Comments: SC 01/4/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	PCM-15DS-071106	**Units:**	ug/Kg
Lab Code:	K0710416-008	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
4-Nitrophenol	ND	U RB 22	500	90	5	11/15/07	12/05/07	KWG0712491	
2,4-Dinitrotoluene	ND	U	50	7.5	5	11/15/07	12/05/07	KWG0712491	
4-Chlorophenyl Phenyl Ether	ND	U UJ 10	50	7.0	5	11/15/07	12/05/07	KWG0712491	
Diethyl Phthalate	ND	U	50	6.5	5	11/15/07	12/05/07	KWG0712491	
4-Nitroaniline	ND	U UJ 10	99	9.0	5	11/15/07	12/05/07	KWG0712491	
2-Methyl-4,6-dinitrophenol	ND	U RB 22	500	7.0	5	11/15/07	12/05/07	KWG0712491	
N-Nitrosodiphenylamine	ND	U UJ 10	50	8.0	5	11/15/07	12/05/07	KWG0712491	
Azobenzene†	ND	U ↓	50	5.5	5	11/15/07	12/05/07	KWG0712491	
4-Bromophenyl Phenyl Ether	ND	U	50	8.0	5	11/15/07	12/05/07	KWG0712491	
Hexachlorobenzene	ND	U	50	6.0	5	11/15/07	12/05/07	KWG0712491	
Pentachlorophenol	ND	U RB 22	500	100	5	11/15/07	12/05/07	KWG0712491	
Carbazole	19	JD	50	6.5	5	11/15/07	12/05/07	KWG0712491	
Di-n-butyl Phthalate	ND	U	99	40	5	11/15/07	12/05/07	KWG0712491	
Butyl Benzyl Phthalate	ND	U	50	16	5	11/15/07	12/05/07	KWG0712491	
3,3'-Dichlorobenzidine	ND	U UJ 10	500	19	5	11/15/07	12/05/07	KWG0712491	
Bis(2-ethylhexyl) Phthalate	81	JD	500	35	5	11/15/07	12/05/07	KWG0712491	
Di-n-octyl Phthalate	ND	U	50	8.5	5	11/15/07	12/05/07	KWG0712491	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	0	10-86	12/05/07	Outside Control Limits
Phenol-d6	0	17-101	12/05/07	Outside Control Limits
Nitrobenzene-d5	46	10-108	12/05/07	Acceptable
2-Fluorobiphenyl	43	10-108	12/05/07	Acceptable
2,4,6-Tribromophenol	2	21-110	12/05/07	Outside Control Limits
Terphenyl-d14	70	26-122	12/05/07	Acceptable

† Analyte Comments

4-Methylphenol	This analyte cannot be separated from 3-Methylphenol.
Azobenzene	1,2-Diphenylhydrazine is reported as Azobenzene.

Comments: SW1408

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	PCM-15DS-071106	**Units:**	ug/Kg
Lab Code:	K0710416-008	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
4-Nitrophenol	ND	U UJ1	990	180	10	12/11/07	12/17/07	KWG0713374	*
2,4-Dinitrotoluene	ND	U R22	99	15	10	12/11/07	12/17/07	KWG0713374	*
4-Chlorophenyl Phenyl Ether	ND	U	99	14	10	12/11/07	12/17/07	KWG0713374	*
Diethyl Phthalate	ND	U	99	13	10	12/11/07	12/17/07	KWG0713374	*
4-Nitroaniline	ND	U	200	18	10	12/11/07	12/17/07	KWG0713374	*
2-Methyl-4,6-dinitrophenol	ND	U UJ1	990	14	10	12/11/07	12/17/07	KWG0713374	*
N-Nitrosodiphenylamine	ND	U R22	99	16	10	12/11/07	12/17/07	KWG0713374	*
Azobenzene†	ND	U	99	11	10	12/11/07	12/17/07	KWG0713374	*
4-Bromophenyl Phenyl Ether	ND	U	99	16	10	12/11/07	12/17/07	KWG0713374	*
Hexachlorobenzene	ND	U	99	12	10	12/11/07	12/17/07	KWG0713374	*
Pentachlorophenol	ND	U UJ1	990	200	10	12/11/07	12/17/07	KWG0713374	*
Carbazole	**24**	JD R22	99	13	10	12/11/07	12/17/07	KWG0713374	*
Di-n-butyl Phthalate	ND	U	200	79	10	12/11/07	12/17/07	KWG0713374	*
Butyl Benzyl Phthalate	ND	U	99	32	10	12/11/07	12/17/07	KWG0713374	*
3,3'-Dichlorobenzidine	ND	U	990	37	10	12/11/07	12/17/07	KWG0713374	*
Bis(2-ethylhexyl) Phthalate	**160**	JD	990	70	10	12/11/07	12/17/07	KWG0713374	*
Di-n-octyl Phthalate	ND	U	200	17	10	12/11/07	12/17/07	KWG0713374	*

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	56	10-86	12/17/07	Acceptable
Phenol-d6	60	17-101	12/17/07	Acceptable
Nitrobenzene-d5	60	10-108	12/17/07	Acceptable
2-Fluorobiphenyl	67	10-108	12/17/07	Acceptable
2,4,6-Tribromophenol	93	21-110	12/17/07	Acceptable
Terphenyl-d14	93	26-122	12/17/07	Acceptable

† **Analyte Comments**

4-Methylphenol	This analyte cannot be separated from 3-Methylphenol.
Azobenzene	1,2-Diphenylhydrazine is reported as Azobenzene.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	PCM-15DS-071106	**Units:**	ug/Kg
Lab Code:	K0710416-008	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Bis(2-chloroethyl) Ether	ND	U R22	99	19	10	12/11/07	12/17/07	KWG0713374	*
Phenol	ND	U UJ1	300	20	10	12/11/07	12/17/07	KWG0713374	*
Aniline	ND	U UJ10,1	200	15	10	12/11/07	12/17/07	KWG0713374	*
2-Chlorophenol	ND	U UJ1	99	20	10	12/11/07	12/17/07	KWG0713374	*
1,3-Dichlorobenzene	ND	U R22	99	30	10	12/11/07	12/17/07	KWG0713374	*
1,4-Dichlorobenzene	ND	U	99	29	10	12/11/07	12/17/07	KWG0713374	*
1,2-Dichlorobenzene	ND	U	99	29	10	12/11/07	12/17/07	KWG0713374	*
Benzyl Alcohol	ND	U ~~UJ10~~	200 R22	21	10	12/11/07	12/17/07	KWG0713374	*
Bis(2-chloroisopropyl) Ether	ND	U R22	99	26	10	12/11/07	12/17/07	KWG0713374	*
2-Methylphenol	ND	U UJ1	99	15	10	12/11/07	12/17/07	KWG0713374	*
Hexachloroethane	ND	U R22	99	31	10	12/11/07	12/17/07	KWG0713374	*
N-Nitrosodi-n-propylamine	ND	U	99	24	10	12/11/07	12/17/07	KWG0713374	*
4-Methylphenol†	ND	U UJ1	99	15	10	12/11/07	12/17/07	KWG0713374	*
Nitrobenzene	ND	U R22	99	22	10	12/11/07	12/17/07	KWG0713374	*
Isophorone	ND	U	99	10	10	12/11/07	12/17/07	KWG0713374	*
2-Nitrophenol	ND	U UJ1	99	15	10	12/11/07	12/17/07	KWG0713374	*
2,4-Dimethylphenol	ND	U UJ10,1	500	55	10	12/11/07	12/17/07	KWG0713374	*
Bis(2-chloroethoxy)methane	ND	U R22	99	15	10	12/11/07	12/17/07	KWG0713374	*
2,4-Dichlorophenol	ND	U UJ1	99	10	10	12/11/07	12/17/07	KWG0713374	*
Benzoic Acid	ND	U UJ10,1	2000	960	10	12/11/07	12/17/07	KWG0713374	*
1,2,4-Trichlorobenzene	ND	U R22	99	26	10	12/11/07	12/17/07	KWG0713374	*
4-Chloroaniline	ND	U	99	19	10	12/11/07	12/17/07	KWG0713374	*
Hexachlorobutadiene	ND	U	99	25	10	12/11/07	12/17/07	KWG0713374	*
4-Chloro-3-methylphenol	ND	U UJ1	99	14	10	12/11/07	12/17/07	KWG0713374	*
Hexachlorocyclopentadiene	ND	U R22	500	290	10	12/11/07	12/17/07	KWG0713374	*
2,4,6-Trichlorophenol	ND	U UJ1	99	14	10	12/11/07	12/17/07	KWG0713374	*
2,4,5-Trichlorophenol	ND	U	99	15	10	12/11/07	12/17/07	KWG0713374	*
2-Chloronaphthalene	ND	U R22	99	16	10	12/11/07	12/17/07	KWG0713374	*
2-Nitroaniline	ND	U	200	32	10	12/11/07	12/17/07	KWG0713374	*
Dimethyl Phthalate	ND	U	99	10	10	12/11/07	12/17/07	KWG0713374	*
2,6-Dinitrotoluene	ND	U	99	20	10	12/11/07	12/17/07	KWG0713374	*
3-Nitroaniline	ND	U	200	25	10	12/11/07	12/17/07	KWG0713374	*
2,4-Dinitrophenol	ND	U UJ1	2000	170	10	12/11/07	12/17/07	KWG0713374	*

Comments: 11/14/08

LDC #: 18053A2a **VALIDATION COMPLETENESS WORKSHEET** Date: 1/9/08
SDG #: K0710416 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 11/6/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	% RSD, r^2 ≥ 0.990
IV.	Continuing calibration	A	ICV ≤ 25
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	N	client specified
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:

~~Soil~~ Sediment

1	PCM-15DS-071106	11	KW G0712491-5	21		31	
2	PCM-15DS-071106RE	12	KW G0713374-5	22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270C) ACIDS

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. Azobenzene
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes:* = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

LDC #: 18053A2a
SDG #: file copy

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: [illegible]
2nd Reviewer: [illegible]

All circled dates have exceeded the technical holding times.
(Y) N N/A Were all cooler temperatures within validation criteria?

METHOD : GC/MS BNA (EPA SW 846 Method 8270)

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
2	SOIL		11/6/07	12/11/07	12/17/07	35	J/UJ/A

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 40 days.
Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 1805 STAN
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		1 (5X)	2FP	0 (10-86)	J/R/A All AADS + PPP
			PHL	0 (17-101)	↓ ↓
			TBP	2 (21-110)	↓ ↓
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* QC limits are advisory	QC Limits (Soil)	QC Limits (Water)		QC Limits (Soil)	QC Limits (Water)
S1 (NBZ) = Nitrobenzene-d5	23-120	35-114	S5 (2FP) = 2-Fluorophenol	25-121	21-100
S2 (FBP) = 2-Fluorobiphenyl	30-115	43-116	S6 (TBP) = 2,4,6-Tribromophenol	19-122	10-123
S3 (TPH) = Terphenyl-d14	18-137	33-141	S7 (2CP) = 2-Chlorophenol-d4	20-130*	33-110*
S4 (PHL) = Phenol-d5	24-113	10-94	S8 (DCB) = 1,2-Dichlorobenzene-d4	20-130*	16-110*

SUR.2S

LDC #: 18053A2a
SDG #: fee cover

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?
Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KWG0712491-3/4	see attached	( )	( )	( )	KWG0712491-5, 1	see attached
				( )	( )	( )		
				( )	( )	( )	- - -	-
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		KWG0713374-3/4	NNN	31 (50-150)	25 (50-150)	( )	KWG0713374-5, 2	J/UJ/P
			QQQ	( )	45 (↓)	( )		
			O	49 (↓)	42 (↓)	( )		
			PPP	10 (↓)	12 (↓)	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Anchor Environmental
Project: Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4
Sample Matrix: Sediment

Service Request: K0710416
Date Extracted: 11/15/2007
Date Analyzed: 12/05/2007

limit(All) = 50-150

Lab Control Spike/Duplicate Lab Control Spike Summary
Semi-Volatile Organic Compounds by GC/MS

Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0712491

Analyte Name	Lab Control Sample KWG0712491-3 Lab Control Spike Result	Expected	%Rec		Duplicate Lab Control Sample KWG0712491-4 Duplicate Lab Control Spike Result	Expected	%Rec	%Rec Limits	RPD	RPD Limit
Bis(2-chloroethyl) Ether	127	250	51		107	250	43 B	10-115	16	40 J/UJ/P
Phenol	130	250	52		105	250	42 A	23-104	21	40
Aniline	5.55	250	2	*	6.85	250	3 *NNN	10-79	21	40 J/R/P
2-Chlorophenol	120	250	48		96.0	250	38 C	22-97	22	40 J/UJ/P
1,3-Dichlorobenzene	123	250	49		98.4	250	39 D	15-88	22	40
1,4-Dichlorobenzene	125	250	50		101	250	41 E	16-89	21	40
1,2-Dichlorobenzene	122	250	49		99.0	250	40 F	18-91	21	40
Benzyl Alcohol	113	250	45		89.2	250	36 QQQ	23-101	23	40
Bis(2-chloroisopropyl) Ether	131	250	52		109	250	43 MMM	20-95	18	40
2-Methylphenol	30.1	250	12	*	23.7	250	9 *G	23-93	24	40 J/R/P
Hexachloroethane	126	250	51		98.6	250	39 K	17-89	25	40 J/UJ/P
N-Nitrosodi-n-propylamine	111	250	44		91.6	250	37 J	27-99	19	40
4-Methylphenol	27.1	250	11	*	20.7	250	8 *I	24-94	27	40 J/R/P
Nitrobenzene	127	250	51		105	250	42 L	24-98	19	40 J/UJ/P
Isophorone	136	250	54		119	250	48 M	23-103	13	40
2-Nitrophenol	132	250	53		110	250	44 N	25-101	18	40
2,4-Dimethylphenol	12.9	250	5	*	8.91	250	4 *O	10-83	36	40 J/R/P
Bis(2-chloroethoxy)methane	139	250	56		113	250	45 P	26-101	21	40 J/UJ/P
2,4-Dichlorophenol	118	250	47		101	250	41 Q	27-98	15	40
Benzoic Acid	105	750	14		77.2	750	10 PPP	10-53	30	40
1,2,4-Trichlorobenzene	141	250	56		117	250	47 R	20-95	19	40
4-Chloroaniline	43.2	250	17		46.8	250	19 T	10-87	8	40
Hexachlorobutadiene	156	250	62		125	250	50	18-96	22	40
4-Chloro-3-methylphenol	107	250	43		87.9	250	35 V	30-101	20	40 J/UJ/P
Hexachlorocyclopentadiene	126	250	50		106	250	42 X	10-99	18	40
2,4,6-Trichlorophenol	108	250	43		91.0	250	36 Y	30-98	17	40
2,4,5-Trichlorophenol	127	250	51		112	250	45 Z	30-100	12	40
2-Chloronaphthalene	125	250	50		110	250	44 AA	28-101	12	40
2-Nitroaniline	141	250	56		136	250	54	33-105	4	40
Dimethyl Phthalate	150	250	60		135	250	54	33-107	11	40
2,6-Dinitrotoluene	147	250	59		146	250	58	33-108	1	40
3-Nitroaniline	115	250	46		104	250	42 FF	27-100	10	40 J/UJ/P
2,4-Dinitrophenol	97.0	250	39		89.4	250	36 HH	10-102	8	40
4-Nitrophenol	183	250	73		162	250	65	31-118	12	40
2,4-Dinitrotoluene	151	250	61		143	250	57	37-111	6	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Extracted:**	11/15/2007
Sample Matrix:	Sediment	**Date Analyzed:**	12/05/2007

Lab Control Spike/Duplicate Lab Control Spike Summary
Semi-Volatile Organic Compounds by GC/MS

Extraction Method:	EPA 3541	**Units:**	ug/Kg
Analysis Method:	8270C	**Basis:**	Dry
		Level:	Low
		Extraction Lot:	KWG0712491

	Lab Control Sample KWG0712491-3 Lab Control Spike			Duplicate Lab Control Sample KWG0712491-4 Duplicate Lab Control Spike					
Analyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
4-Chlorophenyl Phenyl Ether	133	250	53	119	250	48 MM	31-100	11 J|MJ|P	40
Diethyl Phthalate	152	250	61	142	250	57	35-107	6	40
4-Nitroaniline	126	250	50	116	250	46 ΘΘ	30-107	8 J|MJ|P	40
2-Methyl-4,6-dinitrophenol	142	250	57	124	250	50	17-111	14	40
N-Nitrosodiphenylamine	101	250	40	88.2	250	35 QQ	30-102	14 J|MJ|P	40
Azobenzene	124	250	50	118	250	47 TTT	29-105	5 ↓	40
4-Bromophenyl Phenyl Ether	139	250	56	129	250	52	35-101	8	40
Hexachlorobenzene	157	250	63	145	250	58	35-103	8	40
Pentachlorophenol	136	250	54	116	250	46 TT	29-97	16 J|MJ|P	40
Carbazole	165	250	66	156	250	62	38-110	5	40
Di-n-butyl Phthalate	184	250	74	172	250	69	37-118	7	40
Butyl Benzyl Phthalate	187	250	75	173	250	69	36-123	7	40
3,3'-Dichlorobenzidine	62.6	250	25	44.6	250	18 BBB	10-83	34 J|MJ|P	40
Bis(2-ethylhexyl) Phthalate	186	250	74	167	250	67	34-133	10	40
Di-n-octyl Phthalate	189	250	76	176	250	70	34-125	7	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

LDC #: 7803 SAPA
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Overall Assessment of Data

Page: 1 of 1
Reviewer: FZ
2nd Reviewer: R

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

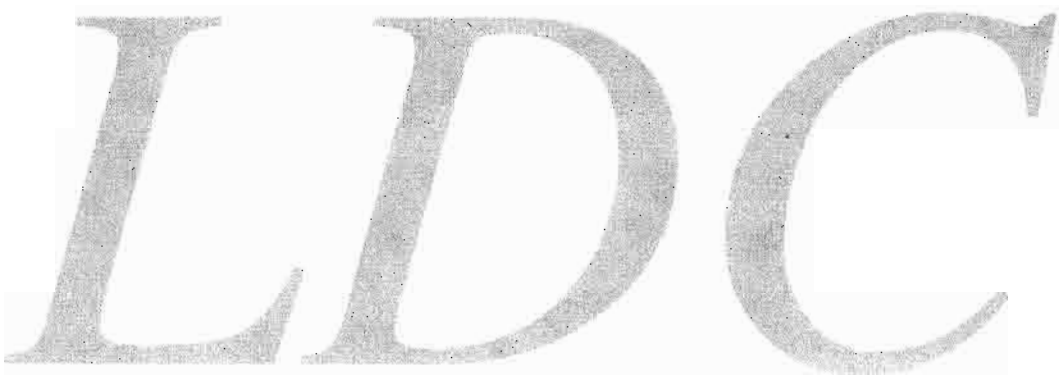
#	Date	Sample ID	Finding	Associated Samples	Qualifications
	Aniline +	All Acids + PPP	low surrogate, 1	1	R/A
		All except above	outside H.T.	2	R/A

Comments:

OVR.2S

NW Natural Gasco Site
Data Validation Reports
LDC# 18053

Polynuclear Aromatic Hydrocarbons



Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 6, 2007
LDC Report Date:	January 11, 2008
Matrix:	Sediment/Water
Parameters:	Polynuclear Aromatic Hydrocarbons
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710416

Sample Identification

PCM-03PW-071106
PCM-06SC-071106
PCM-06PW-071106
PCM-21SC-071106
PCM-21PW-071106
PCM-15DS-071106
PCM-03SC-071106
PCM-06SC-071106MS
PCM-06SC-071106MSD
PCM-03SC-071106MS
PCM-03SC-071106MSD

Introduction

This data review covers 8 sediment samples and 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per a modification of EPA SW 846 Method 8270C using Selected Ion Monitoring (SIM) for Polynuclear Aromatic Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
PCM-03SC-071106 PCM-03SC-071106MS PCM-03SC-071106MSD	All TCL compounds	28	14	J (all detects) UJ (all non-detects)	P

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals. All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

Average relative response factors (RRF) for all target compounds were within validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% .

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration RRF values were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polynuclear aromatic hydrocarbon contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
KWG0712238-4	11/8/07	Naphthalene	0.028 ug/L	All water samples in SDG K0710416
KWG0712490-5	11/15/07	Naphthalene	0.43 ug/Kg	PCM-06SC-071106 PCM-21SC-071106 PCM-15DS-071106
KWG0713163-5	12/4/07	Naphthalene	1.1 ug/Kg	PCM-03SC-071106

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
PCM-03SC-071106MS/MSD (PCM-03SC-071106)	Naphthalene Anthracene Indeno(1,2,3-cd)pyrene	181 (50-140) 46 (50-140) 45 (50-140)	- 36 (50-140) 46 (50-140)	66 (≤40) - -	J (all detects) UJ (all non-detects)	A

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to extraction holding time and MS/MSD %R and RPD problems, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG K0710416

SDG	Sample	Compound	Flag	A or P	Reason
K0710416	PCM-03SC-071106	All TCL compounds	J (all detects) UJ (all non-detects)	P	Technical holding times
K0710416	PCM-03SC-071106	Naphthalene	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)(RPD)
K0710416	PCM-03SC-071106	Anthracene Indeno(1,2,3-cd)pyrene	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)

NW Natural Gasco Site
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG K0710416

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Pore water	**Date Received:**	11/07/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-03PW-071106	**Units:**	ug/L
Lab Code:	K0710416-002	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**4800**	D	12	1.7	500	11/08/07	12/09/07	KWG0712238	
2-Methylnaphthalene	**45**	D	0.23	0.026	10	11/08/07	12/09/07	KWG0712238	
Acenaphthylene	**120**	D	12	2.0	500	11/08/07	12/09/07	KWG0712238	
Acenaphthene	**100**	D	0.23	0.050	10	11/08/07	12/09/07	KWG0712238	
Fluorene	**18**	D	0.23	0.043	10	11/08/07	12/09/07	KWG0712238	
Phenanthrene	**35**	D	0.23	0.057	10	11/08/07	12/09/07	KWG0712238	
Anthracene	**1.7**		0.023	0.0041	1	11/08/07	11/29/07	KWG0712238	
Fluoranthene	**0.46**		0.023	0.0050	1	11/08/07	11/29/07	KWG0712238	
Pyrene	**0.39**		0.023	0.0040	1	11/08/07	11/29/07	KWG0712238	
Benz(a)anthracene	**0.023**	J	0.023	0.0030	1	11/08/07	11/29/07	KWG0712238	
Chrysene	**0.014**	J	0.023	0.0039	1	11/08/07	11/29/07	KWG0712238	
Benzo(b)fluoranthene	**0.0094**	J	0.023	0.0026	1	11/08/07	11/29/07	KWG0712238	
Benzo(k)fluoranthene	**0.0044**	J	0.023	0.0029	1	11/08/07	11/29/07	KWG0712238	
Benzo(a)pyrene	**0.010**	J	0.023	0.0049	1	11/08/07	11/29/07	KWG0712238	
Indeno(1,2,3-cd)pyrene	**0.0061**	J	0.023	0.0030	1	11/08/07	11/29/07	KWG0712238	
Dibenz(a,h)anthracene	ND	U	0.023	0.0029	1	11/08/07	11/29/07	KWG0712238	
Benzo(g,h,i)perylene	**0.0058**	J	0.023	0.0033	1	11/08/07	11/29/07	KWG0712238	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	71	26-131	11/29/07	Acceptable
Fluoranthene-d10	79	28-150	11/29/07	Acceptable
Terphenyl-d14	79	32-157	11/29/07	Acceptable

Comments: SR 11408

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-06SC-071106	**Units:**	ug/Kg
Lab Code:	K0710416-003	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**330**		4.5	0.37	1	11/15/07	12/06/07	KWG0712490	
2-Methylnaphthalene	**87**		4.5	0.39	1	11/15/07	12/06/07	KWG0712490	
Acenaphthylene	**120**		4.5	0.24	1	11/15/07	12/06/07	KWG0712490	
Acenaphthene	**690**		4.5	0.23	1	11/15/07	12/06/07	KWG0712490	
Fluorene	**450**		4.5	0.50	1	11/15/07	12/06/07	KWG0712490	
Phenanthrene	**4200**	D	45	7.5	10	11/15/07	12/11/07	KWG0712490	
Anthracene	**990**		4.5	0.47	1	11/15/07	12/06/07	KWG0712490	
Fluoranthene	**3300**	D	45	6.1	10	11/15/07	12/11/07	KWG0712490	
Pyrene	**4000**	D	45	3.7	10	11/15/07	12/11/07	KWG0712490	
Benz(a)anthracene	**730**		4.5	0.48	1	11/15/07	12/06/07	KWG0712490	
Chrysene	**1100**		4.5	0.25	1	11/15/07	12/06/07	KWG0712490	
Benzo(b)fluoranthene	**930**		4.5	0.25	1	11/15/07	12/06/07	KWG0712490	
Benzo(k)fluoranthene	**350**		4.5	0.15	1	11/15/07	12/06/07	KWG0712490	
Benzo(a)pyrene	**1000**		4.5	0.14	1	11/15/07	12/06/07	KWG0712490	
Indeno(1,2,3-cd)pyrene	**820**		4.5	0.16	1	11/15/07	12/06/07	KWG0712490	
Dibenz(a,h)anthracene	**77**		4.5	0.28	1	11/15/07	12/06/07	KWG0712490	
Benzo(g,h,i)perylene	**890**		4.5	0.64	1	11/15/07	12/06/07	KWG0712490	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	83	10-123	12/06/07	Acceptable
Fluoranthene-d10	76	10-136	12/06/07	Acceptable
Terphenyl-d14	84	32-123	12/06/07	Acceptable

Comments: R 1/14/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Pore water	**Date Received:**	11/07/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-06PW-071106	**Units:**	ug/L
Lab Code:	K0710416-004	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**570**	D	12	1.7	500	11/08/07	12/09/07	KWG0712238	
2-Methylnaphthalene	**8.5**	D	0.23	0.026	10	11/08/07	12/09/07	KWG0712238	
Acenaphthylene	**5.1**		0.023	0.0038	1	11/08/07	11/29/07	KWG0712238	
Acenaphthene	**110**	D	12	2.5	500	11/08/07	12/09/07	KWG0712238	
Fluorene	**2.8**		0.023	0.0043	1	11/08/07	11/29/07	KWG0712238	
Phenanthrene	**5.1**		0.023	0.0056	1	11/08/07	11/29/07	KWG0712238	
Anthracene	**0.61**		0.023	0.0040	1	11/08/07	11/29/07	KWG0712238	
Fluoranthene	**0.33**		0.023	0.0049	1	11/08/07	11/29/07	KWG0712238	
Pyrene	**0.29**		0.023	0.0039	1	11/08/07	11/29/07	KWG0712238	
Benz(a)anthracene	**0.012**	J	0.023	0.0029	1	11/08/07	11/29/07	KWG0712238	
Chrysene	**0.0092**	J	0.023	0.0038	1	11/08/07	11/29/07	KWG0712238	
Benzo(b)fluoranthene	**0.0068**	J	0.023	0.0026	1	11/08/07	11/29/07	KWG0712238	
Benzo(k)fluoranthene	ND	U	0.023	0.0028	1	11/08/07	11/29/07	KWG0712238	
Benzo(a)pyrene	**0.0071**	J	0.023	0.0048	1	11/08/07	11/29/07	KWG0712238	
Indeno(1,2,3-cd)pyrene	**0.0048**	J	0.023	0.0029	1	11/08/07	11/29/07	KWG0712238	
Dibenz(a,h)anthracene	ND	U	0.023	0.0028	1	11/08/07	11/29/07	KWG0712238	
Benzo(g,h,i)perylene	**0.0057**	J	0.023	0.0033	1	11/08/07	11/29/07	KWG0712238	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	75	26-131	11/29/07	Acceptable
Fluoranthene-d10	79	28-150	11/29/07	Acceptable
Terphenyl-d14	80	32-157	11/29/07	Acceptable

Comments: 8/01/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-21SC-071106	**Units:**	ug/Kg
Lab Code:	K0710416-005	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**470**	D	46	3.7	10	11/15/07	12/06/07	KWG0712490	
2-Methylnaphthalene	**100**	D	46	3.9	10	11/15/07	12/06/07	KWG0712490	
Acenaphthylene	**400**	D	46	2.4	10	11/15/07	12/06/07	KWG0712490	
Acenaphthene	**7300**	D	46	2.3	10	11/15/07	12/06/07	KWG0712490	
Fluorene	**2800**	D	46	5.0	10	11/15/07	12/06/07	KWG0712490	
Phenanthrene	**25000**	D	230	38	50	11/15/07	12/11/07	KWG0712490	
Anthracene	**6000**	D	46	4.7	10	11/15/07	12/06/07	KWG0712490	
Fluoranthene	**18000**	D	46	6.1	10	11/15/07	12/06/07	KWG0712490	
Pyrene	**23000**	D	230	19	50	11/15/07	12/11/07	KWG0712490	
Benz(a)anthracene	**4000**	D	46	4.8	10	11/15/07	12/06/07	KWG0712490	
Chrysene	**4800**	D	46	2.5	10	11/15/07	12/06/07	KWG0712490	
Benzo(b)fluoranthene	**4500**	D	46	2.5	10	11/15/07	12/06/07	KWG0712490	
Benzo(k)fluoranthene	**2000**	D	46	1.5	10	11/15/07	12/06/07	KWG0712490	
Benzo(a)pyrene	**5000**	D	46	1.4	10	11/15/07	12/06/07	KWG0712490	
Indeno(1,2,3-cd)pyrene	**4000**	D	46	1.6	10	11/15/07	12/06/07	KWG0712490	
Dibenz(a,h)anthracene	**420**	D	46	2.8	10	11/15/07	12/06/07	KWG0712490	
Benzo(g,h,i)perylene	**4500**	D	46	6.4	10	11/15/07	12/06/07	KWG0712490	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	86	10-123	12/06/07	Acceptable
Fluoranthene-d10	81	10-136	12/06/07	Acceptable
Terphenyl-d14	86	32-123	12/06/07	Acceptable

Comments: 90114-08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Pore water	**Date Received:**	11/07/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-21PW-071106	**Units:**	ug/L
Lab Code:	K0710416-006	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**52**	D	0.40	0.060	20	11/08/07	12/09/07	KWG0712238	
2-Methylnaphthalene	**0.60**		0.020	0.0023	1	11/08/07	11/29/07	KWG0712238	
Acenaphthylene	**2.1**		0.020	0.0034	1	11/08/07	11/29/07	KWG0712238	
Acenaphthene	**270**	D	2.0	0.44	100	11/08/07	12/10/07	KWG0712238	
Fluorene	**35**	D	0.40	0.076	20	11/08/07	12/09/07	KWG0712238	
Phenanthrene	**66**	D	0.40	0.10	20	11/08/07	12/09/07	KWG0712238	
Anthracene	**5.1**		0.020	0.0036	1	11/08/07	11/29/07	KWG0712238	
Fluoranthene	**2.6**		0.020	0.0044	1	11/08/07	11/29/07	KWG0712238	
Pyrene	**2.3**		0.020	0.0035	1	11/08/07	11/29/07	KWG0712238	
Benz(a)anthracene	**0.060**		0.020	0.0026	1	11/08/07	11/29/07	KWG0712238	
Chrysene	**0.036**		0.020	0.0034	1	11/08/07	11/29/07	KWG0712238	
Benzo(b)fluoranthene	**0.019**	J	0.020	0.0023	1	11/08/07	11/29/07	KWG0712238	
Benzo(k)fluoranthene	**0.0085**	J	0.020	0.0025	1	11/08/07	11/29/07	KWG0712238	
Benzo(a)pyrene	**0.023**		0.020	0.0043	1	11/08/07	11/29/07	KWG0712238	
Indeno(1,2,3-cd)pyrene	**0.011**	J	0.020	0.0026	1	11/08/07	11/29/07	KWG0712238	
Dibenz(a,h)anthracene	ND	U	0.020	0.0025	1	11/08/07	11/29/07	KWG0712238	
Benzo(g,h,i)perylene	**0.011**	J	0.020	0.0029	1	11/08/07	11/29/07	KWG0712238	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	79	26-131	11/29/07	Acceptable
Fluoranthene-d10	79	28-150	11/29/07	Acceptable
Terphenyl-d14	82	32-157	11/29/07	Acceptable

Comments: SC 011408

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	Service Request:	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	Date Collected:	11/06/2007
Sample Matrix:	Sediment	Date Received:	11/07/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-15DS-071106	Units:	ug/Kg
Lab Code:	K0710416-008	Basis:	Dry
Extraction Method:	EPA 3541	Level:	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	110		4.6	0.37	1	11/15/07	12/06/07	KWG0712490	
2-Methylnaphthalene	15		4.6	0.39	1	11/15/07	12/06/07	KWG0712490	
Acenaphthylene	28		4.6	0.24	1	11/15/07	12/06/07	KWG0712490	
Acenaphthene	98		4.6	0.23	1	11/15/07	12/06/07	KWG0712490	
Fluorene	110		4.6	0.50	1	11/15/07	12/06/07	KWG0712490	
Dibenzofuran	33		4.6	0.59	1	11/15/07	12/06/07	KWG0712490	
Phenanthrene	460		4.6	0.75	1	11/15/07	12/06/07	KWG0712490	
Anthracene	190		4.6	0.47	1	11/15/07	12/06/07	KWG0712490	
Fluoranthene	670		4.6	0.61	1	11/15/07	12/06/07	KWG0712490	
Pyrene	750		4.6	0.37	1	11/15/07	12/06/07	KWG0712490	
Benzo(b)fluoranthene	400		4.6	0.25	1	11/15/07	12/06/07	KWG0712490	
Benzo(k)fluoranthene	150		4.6	0.15	1	11/15/07	12/06/07	KWG0712490	
Benz(a)anthracene	260		4.6	0.48	1	11/15/07	12/06/07	KWG0712490	
Chrysene	360		4.6	0.25	1	11/15/07	12/06/07	KWG0712490	
Benzo(a)pyrene	430		4.6	0.14	1	11/15/07	12/06/07	KWG0712490	
Indeno(1,2,3-cd)pyrene	380		4.6	0.16	1	11/15/07	12/06/07	KWG0712490	
Dibenz(a,h)anthracene	41		4.6	0.28	1	11/15/07	12/06/07	KWG0712490	
Benzo(g,h,i)perylene	410		4.6	0.64	1	11/15/07	12/06/07	KWG0712490	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	67	10-123	12/06/07	Acceptable
Fluoranthene-d10	69	10-136	12/06/07	Acceptable
Terphenyl-d14	70	32-123	12/06/07	Acceptable

Comments: 1/14/08

000-5

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-03SC-071106	**Units:**	ug/Kg
Lab Code:	K0710416-009	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	100	J8,9,1	3.0	0.37	1	12/04/07	12/13/07	KWG0713163	*
2-Methylnaphthalene	16	J1	3.0	0.39	1	12/04/07	12/13/07	KWG0713163	*
Acenaphthylene	210		3.0	0.24	1	12/04/07	12/13/07	KWG0713163	*
Acenaphthene	380		3.0	0.23	1	12/04/07	12/13/07	KWG0713163	*
Fluorene	240		3.0	0.50	1	12/04/07	12/13/07	KWG0713163	*
Phenanthrene	2600	D	30	7.5	10	12/04/07	12/13/07	KWG0713163	*
Anthracene	680	J8,1	3.0	0.47	1	12/04/07	12/13/07	KWG0713163	*
Fluoranthene	2800	D J1	30	6.1	10	12/04/07	12/13/07	KWG0713163	*
Pyrene	3200	D	30	3.7	10	12/04/07	12/13/07	KWG0713163	*
Benz(a)anthracene	660		3.0	0.48	1	12/04/07	12/13/07	KWG0713163	*
Chrysene	810		3.0	0.25	1	12/04/07	12/13/07	KWG0713163	*
Benzo(b)fluoranthene	810		3.0	0.25	1	12/04/07	12/13/07	KWG0713163	*
Benzo(k)fluoranthene	290		3.0	0.15	1	12/04/07	12/13/07	KWG0713163	*
Benzo(a)pyrene	960		3.0	0.14	1	12/04/07	12/13/07	KWG0713163	*
Indeno(1,2,3-cd)pyrene	720	J8,1	3.0	0.16	1	12/04/07	12/13/07	KWG0713163	*
Dibenz(a,h)anthracene	63	J1	3.0	0.28	1	12/04/07	12/13/07	KWG0713163	*
Benzo(g,h,i)perylene	780		3.0	0.64	1	12/04/07	12/13/07	KWG0713163	*

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	79	10-123	12/13/07	Acceptable
Fluoranthene-d10	85	10-136	12/13/07	Acceptable
Terphenyl-d14	81	32-123	12/13/07	Acceptable

Comments: 1/11/08

LDC #: 18053A2b **VALIDATION COMPLETENESS WORKSHEET** Date: 1/10/08
SDG #: K0710416 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS ~~Polynuclear Aromatic Hydrocarbons~~ SVOA (EPA SW 846 Method 8270C-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 11/6/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	ICV ≤ 25
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS LD
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: Sediment + water

1	PCM-03PW-071106 (11/29, 12/9) W	11	PCM-03SC-071106MSD	21	KWG0712238-4	31	
2	PCM-06SC-071106 (12/06, 12/11)	12		22	KWG0712490-5		
3	PCM-06PW-071106 (11/29, 12/9) W	13		23	KWG0713163-3	33	
4	PCM-21SC-071106	14		24		34	
5	PCM-21PW-071106 W	15		25		35	
6	PCM-15DS-071106	16		26		36	
7	PCM-03SC-071106 x2 MT	17		27		37	
8	PCM-06SC-071106MS	18		28		38	
9	PCM-06SC-071106MSD	19		29		39	
10	PCM-03SC-071106MS	20		30		40	

All PAH 8270-SIM except #7 PAH + Dibenzofuran 8270-SIM

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes:* = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

LDC #: 18053A2D
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

All circled dates have exceeded the technical holding times.
Y N N/A Were all cooler temperatures within validation criteria?

METHOD : GC/MS BNA (EPA SW 846 Method 8270)

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
7, 10, 11	SOIL		11/6/07	12/4/07	12/13/07	28	J/W/R
							P

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 40 days.
Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 18053A26
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 2
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 11/8/07 **Blank analysis date:** 11/29/07
Conc. units: ug/L Associated Samples: All water 7SX

Compound	Blank ID	Sample Identification								
	KWG0712338-4									
S	0.028									

Blank extraction date: 11/15/07 **Blank analysis date:** 12/6/07
Conc. units: ug/kg Associated Samples: 2, 4, 6 >5X

Compound	Blank ID	Sample Identification								
	KWG0712490-5									
S	0.43									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18053A2b
SDG #: All cores

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 12/4/07 **Blank analysis date:** 12/13/07
Conc. units: ug/kg Associated Samples: 7 7SX

Compound	Blank ID	Sample Identification								
	KWG07	3163-5								
S	1.1									

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18053A2b
SDG #: per cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

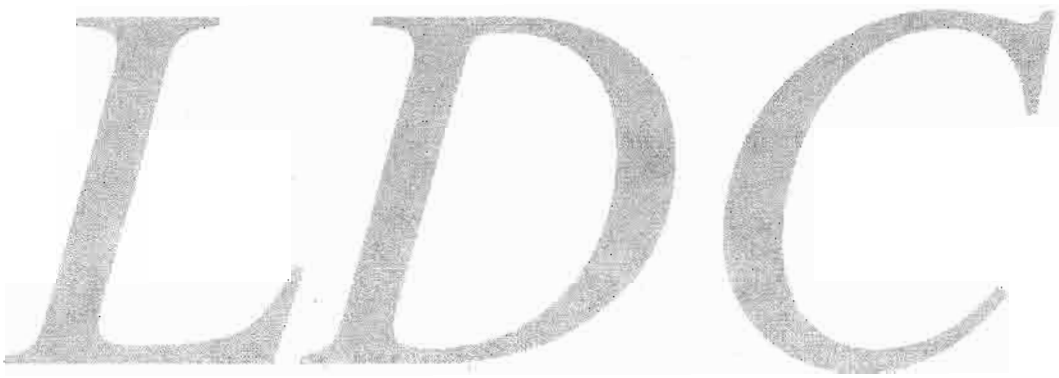
Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		8+9	UU	33 (50-140)	0 (50-140)	( )	2	NO QUAL
			YY	( )	0 (↓)	( )	↓	parent 7 4X spike Amt
			ZZ	0 (↓)	0 (↓)	( )	↓	
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
		10+11	S	181 (50-140)	( )	66 (40)	7	J/UJ/A
			UU	0 (50-140)	0 (50-140)	( )		no qual parent 7 4X spike Amt
			VV	46 (↓)	36 (↓)	( )		J/UJ/A
			YY	0 (↓)	0 (↓)	( )		no qual parent 7 4X spike Amt
			ZZ	0 (↓)	0 (↓)	( )		↓
			JJJ	45 (↓)	46 (↓)	( )	↓	J/UJ/A
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

NW Natural Gasco Site
Data Validation Reports
LDC# 18053

Chlorinated Pesticides



Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 6, 2007
LDC Report Date:	January 11, 2008
Matrix:	Sediment
Parameters:	Chlorinated Pesticides
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710416

Sample Identification

PCM-06SC-071106
PCM-21SC-071106
PCM-15DS-071106
PCM-03SC-071106
PCM-06SC-071106MS
PCM-06SC-071106MSD
PCM-15DS-071106MS
PCM-15DS-071106MSD
PCM-03SC-071106MS

Introduction

This data review covers 9 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8081A for Chlorinated Pesticides.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (In Days) From Sample Collection Until Extraction	Flag	A or P
PCM-03SC-071106 PCM-03SC-071106MS	All TCL compounds	28	14	J (all detects) UJ (all non-detects)	P

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of single and multicomponent compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for selected compounds.

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination (r^2) was greater than or equal to 0.990 .

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
12/17/07	1217F004-008	DB-XLB	cis-Nonachlor	15.4	KWG0712505-13	J (all detects) UJ (all non-detects)	A
12/18/07	1217F025-029	DB-XLB	Aldrin gamma-Chlordane Dieldrin 4,4'-DDE Toxaphene	16 16 16 18 16	PCM-06SC-071106 PCM-21SC-071106 PCM-15DS-071106 PCM-06SC-071106MS PCM-06SC-071106MSD PCM-15DS-071106MS PCM-15DS-071106MSD	J (all detects) UJ (all non-detects)	A

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
12/18/07	1217F025-029	DB-XLB	2,4'-DDE cis-Nonachlor 2,4'-DDD trans-Nonachlor 2,4'-DDT Mirex Hexachloroethane	16 19 17 17 16 17 15.4	PCM-15DS-071106 PCM-15DS-071106MS PCM-15DS-071106MSD	J (all detects) UJ (all non-detects)	A
12/18/07	1217F025C-029C	DB-35MS	4,4'-DDE	16	PCM-06SC-071106 PCM-21SC-071106 PCM-15DS-071106 PCM-06SC-071106MS PCM-06SC-071106MSD PCM-15DS-071106MS PCM-15DS-071106MSD	J (all detects) UJ (all non-detects)	A
12/18/07	1217F025C-029C	DB-35MS	2,4'-DDE 2,4'-DDD	17 15.4	PCM-15DS-071106 PCM-15DS-071106MS PCM-15DS-071106MSD	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
12/20/07	1219F030/31	DB-XLB	Endrin 4,4'-DDD 4,4'-DDT Methoxychlor	16 16 19 17	PCM-03SC-071106 PCM-03SC-071106MS KWG0713166-7	J (all detects) UJ (all non-detects)	A
12/20/07	1219F030/31	DB-MS	Methoxychlor	17	PCM-03SC-071106 PCM-03SC-071106MS KWG0713166-7	J (all detects) UJ (all non-detects)	A

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

The individual 4,4'-DDT and Endrin breakdowns (%BD) were less than or equal to 15.0%.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
KWG0712505-13	11/15/07	Endosulfan sulfate	0.13 ug/Kg	PCM-06SC-071106 PCM-21SC-071106 PCM-15DS-071106
KWG0713166-7	12/4/07	4,4'-DDT	0.091 ug/Kg	PCM-03SC-071106

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
PCM-21SC-071106	Endosulfan sulfate	0.36 ug/Kg	1.0U ug/Kg

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

The laboratory has indicated that there were no matrix spike duplicate (MSD) analyses specified for sample PCM-03SC-071106, and therefore matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and Reported CRQLs

The sample results for detected compounds from the two columns were within 40% relative percent difference (RPD) with the following exceptions:

Sample	Compound	RPD	Flag	A or P
PCM-06SC-071106	4 4'-DDT	51	J (all detects)	A
PCM-21SC-071106	Aldrin	84	J (all detects)	A
PCM-15DS-071106	Hexachlorcethane	89	J (all detects)	A
PCM-03SC-071106	Endosulfan sulfate Endrin ketone	71 46	J (all detects) J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to extraction holding time, calibration %D and compound quantitation RPD problems, data were qualified as estimated in several samples.

Due to method blank contamination problems, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Chlorinated Pesticides - Data Qualification Summary - SDG K0710416

SDG	Sample	Compound	Flag	A or P	Reason
K0710416	PCM-03SC-071106	All TCL compounds	J (all detects) UJ (all non-detects)	P	Technical holding times
K0710416	PCM-06SC-071106 PCM-21SC-071106 PCM-15DS-071106	Aldrin gamma-Chlordane Dieldrin 4,4'-DDE Toxaphene	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
K0710416	PCM-15DS-071106	2,4'-DDE cis-Nonachlor 2,4'-DDD trans-Nonachlor 2,4'-DDT Mirex Hexachloroethane	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
K0710416	PCM-03SC-071106	Endrin 4,4'-DDD 4,4'-DDT Methoxychlor	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
K0710416	PCM-06SC-071106	4,4'-DDT	J (all detects)	A	Compound quantitation and CRQLs (RPD)
K0710416	PCM-21SC-071106	Aldrin	J (all detects)	A	Compound quantitation and CRQLs (RPD)
K0710416	PCM-15DS-071106	Hexachloroethane	J (all detects)	A	Compound quantitation and CRQLs (RPD)
K0710416	PCM-03SC-071106	Endosulfan sulfate Endrin ketone	J (all detects) J (all detects)	A	Compound quantitation and CRQLs (RPD)

NW Natural Gasco Site
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG K0710416

SDG	Sample	Compound	Modified Final Concentration	A or P
K0710416	PCM-21SC-071106	Endosulfan sulfate	1.0U ug/Kg	A

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Organochlorine Pesticides

Sample Name:	PCM-06SC-071106	**Units:**	ug/Kg
Lab Code:	K0710416-003	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8081A		

Analyte Name	Result	Q		MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U		1.0	0.26	1	11/15/07	12/18/07	KWG0712505	
beta-BHC	ND	U		1.0	0.30	1	11/15/07	12/18/07	KWG0712505	
gamma-BHC (Lindane)	ND	Ui		1.0	0.85	1	11/15/07	12/18/07	KWG0712505	
delta-BHC	ND	Ui		1.0	0.12	1	11/15/07	12/18/07	KWG0712505	
Heptachlor	ND	U		1.0	0.080	1	11/15/07	12/18/07	KWG0712505	
Aldrin	ND	Ui	UJS	1.0	0.91	1	11/15/07	12/18/07	KWG0712505	
Heptachlor Epoxide	ND	U		1.0	0.13	1	11/15/07	12/18/07	KWG0712505	
gamma-Chlordane†	ND	U	UJS	1.0	0.064	1	11/15/07	12/18/07	KWG0712505	
Endosulfan I	ND	U		1.0	0.17	1	11/15/07	12/18/07	KWG0712505	
alpha-Chlordane	ND	U		1.0	0.23	1	11/15/07	12/18/07	KWG0712505	
Dieldrin	ND	U	UJS	1.0	0.29	1	11/15/07	12/18/07	KWG0712505	
4,4'-DDE	ND	Ui	↓	1.0	0.14	1	11/15/07	12/18/07	KWG0712505	
Endrin	ND	U		1.0	0.20	1	11/15/07	12/18/07	KWG0712505	
Endosulfan II	ND	U		1.0	0.19	1	11/15/07	12/18/07	KWG0712505	
4,4'-DDD	**0.80**	J		1.0	0.12	1	11/15/07	12/18/07	KWG0712505	*
Endrin Aldehyde	**0.13**	J		1.0	0.053	1	11/15/07	12/18/07	KWG0712505	*
Endosulfan Sulfate	ND	Ui		1.0	0.79	1	11/15/07	12/18/07	KWG0712505	
4,4'-DDT	**0.32**	JP	J12	1.0	0.064	1	11/15/07	12/18/07	KWG0712505	
Endrin Ketone	ND	U		1.0	0.082	1	11/15/07	12/18/07	KWG0712505	
Methoxychlor	ND	U		1.0	0.10	1	11/15/07	12/18/07	KWG0712505	
Toxaphene	ND	Ui	UJS	50	28	1	11/15/07	12/18/07	KWG0712505	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	87	32-138	12/18/07	Acceptable
Decachlorobiphenyl	85	23-162	12/18/07	Acceptable

† **Analyte Comments**

gamma-Chlordane	For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: 12/14/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Organochlorine Pesticides

Sample Name:	PCM-21SC-071106	**Units:**	ug/Kg
Lab Code:	K0710416-005	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8081A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	Ui	1.0	0.42	1	11/15/07	12/18/07	KWG0712505	
beta-BHC	ND	Ui	1.0	1.0	1	11/15/07	12/18/07	KWG0712505	
gamma-BHC (Lindane)	ND	Ui	1.0	1.0	1	11/15/07	12/18/07	KWG0712505	
delta-BHC	ND	Ui	1.0	0.63	1	11/15/07	12/18/07	KWG0712505	
Heptachlor	ND	Ui	1.0	0.45	1	11/15/07	12/18/07	KWG0712505	
Aldrin	**4.4**	P J5 [2]	1.0	0.15	1	11/15/07	12/18/07	KWG0712505	*
Heptachlor Epoxide	ND	Ui	1.0	1.0	1	11/15/07	12/18/07	KWG0712505	
gamma-Chlordane†	ND	Ui UJ5	1.0	1.0	1	11/15/07	12/18/07	KWG0712505	
Endosulfan I	ND	Ui	1.0	1.0	1	11/15/07	12/18/07	KWG0712505	
alpha-Chlordane	ND	Ui	1.0	1.0	1	11/15/07	12/18/07	KWG0712505	
Dieldrin	ND	U UJ5	1.0	0.29	1	11/15/07	12/18/07	KWG0712505	
4,4'-DDE	ND	Ui ↓	1.0	1.0	1	11/15/07	12/18/07	KWG0712505	
Endrin	ND	U	1.0	0.20	1	11/15/07	12/18/07	KWG0712505	
Endosulfan II	ND	U	1.0	0.19	1	11/15/07	12/18/07	KWG0712505	
4,4'-DDD	**1.4**		1.0	0.12	1	11/15/07	12/18/07	KWG0712505	*
Endrin Aldehyde	ND	Ui	1.0	0.38	1	11/15/07	12/18/07	KWG0712505	
Endosulfan Sulfate	**0.36**	J 1,UU7	1.0	0.079	1	11/15/07	12/18/07	KWG0712505	
4,4'-DDT	ND	Ui	1.0	0.79	1	11/15/07	12/18/07	KWG0712505	
Endrin Ketone	ND	U	1.0	0.082	1	11/15/07	12/18/07	KWG0712505	
Methoxychlor	ND	U	1.0	0.10	1	11/15/07	12/18/07	KWG0712505	
Toxaphene	ND	Ui UJ5	50	39	1	11/15/07	12/18/07	KWG0712505	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	82	32-138	12/18/07	Acceptable
Decachlorobiphenyl	84	23-162	12/18/07	Acceptable

† **Analyte Comments**

gamma-Chlordane	For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: SE 01/4/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Organochlorine Pesticides

Sample Name:	PCM-15DS-071106	**Units:**	ug/Kg
Lab Code:	K0710416-008	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8081A		

Analyte Name	Result	Q		MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U		0.99	0.26	1	11/15/07	12/18/07	KWG0712505	
Hexachlorobenzene	**0.87**	J		0.99	0.079	1	11/15/07	12/18/07	KWG0712505	
beta-BHC	ND	Ui		0.99	0.74	1	11/15/07	12/18/07	KWG0712505	
gamma-BHC (Lindane)	ND	U		0.99	0.15	1	11/15/07	12/18/07	KWG0712505	
delta-BHC	ND	U		0.99	0.055	1	11/15/07	12/18/07	KWG0712505	
Heptachlor	ND	Ui		0.99	0.99	1	11/15/07	12/18/07	KWG0712505	
Aldrin	ND	Ui	UJ5	0.99	0.35	1	11/15/07	12/18/07	KWG0712505	
Heptachlor Epoxide	ND	U		0.99	0.13	1	11/15/07	12/18/07	KWG0712505	
gamma-Chlordane†	ND	Ui	UJ5	0.99	0.99	1	11/15/07	12/18/07	KWG0712505	
Endosulfan I	ND	U		0.99	0.17	1	11/15/07	12/18/07	KWG0712505	
alpha-Chlordane	ND	U		0.99	0.23	1	11/15/07	12/18/07	KWG0712505	
Dieldrin	ND	U	UJ5	0.99	0.29	1	11/15/07	12/18/07	KWG0712505	
4,4'-DDE	**2.7**		J5	0.99	0.10	1	11/15/07	12/18/07	KWG0712505	*
Endrin	ND	U		0.99	0.20	1	11/15/07	12/18/07	KWG0712505	
Endosulfan II	ND	U		0.99	0.19	1	11/15/07	12/18/07	KWG0712505	
4,4'-DDD	**8.0**			0.99	0.12	1	11/15/07	12/18/07	KWG0712505	*
Endrin Aldehyde	ND	U		0.99	0.053	1	11/15/07	12/18/07	KWG0712505	
Endosulfan Sulfate	ND	Ui		0.99	0.99	1	11/15/07	12/18/07	KWG0712505	
4,4'-DDT	**1.4**			0.99	0.064	1	11/15/07	12/18/07	KWG0712505	
Endrin Ketone	ND	Ui		0.99	0.21	1	11/15/07	12/18/07	KWG0712505	
Methoxychlor	ND	U		0.99	0.10	1	11/15/07	12/18/07	KWG0712505	
Toxaphene	ND	Ui	UJ5	50	50	1	11/15/07	12/18/07	KWG0712505	
Oxychlordane	ND	U		0.99	0.058	1	11/15/07	12/18/07	KWG0712505	
2,4'-DDE	ND	U	UJ5	0.99	0.23	1	11/15/07	12/18/07	KWG0712505	
cis-Nonachlor	ND	Ui	↓	0.99	0.99	1	11/15/07	12/18/07	KWG0712505	
2,4'-DDD	**3.8**		J5	0.99	0.21	1	11/15/07	12/18/07	KWG0712505	*
trans-Nonachlor	ND	Ui	UJ5	0.99	0.60	1	11/15/07	12/18/07	KWG0712505	
2,4'-DDT	**1.4**		J5	0.99	0.14	1	11/15/07	12/18/07	KWG0712505	
Mirex	ND	U	UJ5	0.99	0.063	1	11/15/07	12/18/07	KWG0712505	
Hexachloroethane	**0.83**	JP	J5,12	0.99	0.15	1	11/15/07	12/18/07	KWG0712505	*
Hexachlorobutadiene	ND	Ui		0.99	0.39	1	11/15/07	12/18/07	KWG0712505	

* See Case Narrative

Comments: SL 01/4/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Organochlorine Pesticides

Sample Name:	PCM-15DS-071106	**Units:**	ug/Kg
Lab Code:	K0710416-008	**Basis:**	Dry

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	92	32-138	12/18/07	Acceptable
Decachlorobiphenyl	81	23-162	12/18/07	Acceptable

† Analyte Comments

gamma-Chlordane	For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: 12/11/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Organochlorine Pesticides

Sample Name:	PCM-03SC-071106	**Units:**	ug/Kg
Lab Code:	K0710416-009	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8081A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U UJ	0.81	0.26	1	12/04/07	12/20/07	KWG0713166	*
beta-BHC	ND	Ui	0.85	0.85	1	12/04/07	12/20/07	KWG0713166	*
gamma-BHC (Lindane)	ND	Ui	2.1	2.1	1	12/04/07	12/20/07	KWG0713166	*
delta-BHC	**0.43**	J J	0.81	0.055	1	12/04/07	12/20/07	KWG0713166	*
Heptachlor	ND	Ui UJ	0.81	0.79	1	12/04/07	12/20/07	KWG0713166	*
Aldrin	ND	Ui	1.5	1.5	1	12/04/07	12/20/07	KWG0713166	*
Heptachlor Epoxide	ND	Ui	0.81	0.49	1	12/04/07	12/20/07	KWG0713166	*
gamma-Chlordane†	ND	U	0.81	0.064	1	12/04/07	12/20/07	KWG0713166	*
Endosulfan I	ND	Ui	0.81	0.47	1	12/04/07	12/20/07	KWG0713166	*
alpha-Chlordane	ND	Ui	0.81	0.38	1	12/04/07	12/20/07	KWG0713166	*
Dieldrin	ND	U	0.81	0.29	1	12/04/07	12/20/07	KWG0713166	*
4,4'-DDE	ND	Ui	0.81	0.81	1	12/04/07	12/20/07	KWG0713166	*
Endrin	ND	U UJS	0.81	0.20	1	12/04/07	12/20/07	KWG0713166	*
Endosulfan II	ND	U UJ	0.81	0.19	1	12/04/07	12/20/07	KWG0713166	*
4,4'-DDD	ND	Ui UJS	0.81	0.61	1	12/04/07	12/20/07	KWG0713166	*
Endrin Aldehyde	ND	Ui UJ	0.81	0.81	1	12/04/07	12/20/07	KWG0713166	*
Endosulfan Sulfate	**0.44**	JP J12	0.81	0.079	1	12/04/07	12/20/07	KWG0713166	*
4,4'-DDT	ND	U UJS	0.81	0.064	1	12/04/07	12/20/07	KWG0713166	*
Endrin Ketone	**0.17**	JP J12	0.81	0.082	1	12/04/07	12/20/07	KWG0713166	*
Methoxychlor	ND	Ui UJS	0.81	0.38	1	12/04/07	12/20/07	KWG0713166	*
Toxaphene	ND	Ui UJ	41	34	1	12/04/07	12/20/07	KWG0713166	*

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	90	32-138	12/20/07	Acceptable
Decachlorobiphenyl	71	23-162	12/20/07	Acceptable

† Analyte Comments

gamma-Chlordane	For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: SL 01/4/08

LDC #: 18053A3a
SDG #: K0710416
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/9/08
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 11/6/07
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	A	%RSD, $r^2 \geq 0.990$
IV.	Continuing calibration/ICV	SW	ICV ≤ 15
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	#4 no MSD
VIII.	Laboratory control samples	A	LCS/D
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: soil Sediment

+ 1	PCM-06SC-071106.	11	KWG0712505-13	21		31	
+ 2	PCM-21SC-071106.	12	2 KWG0713166-7	22		32	
+ 3	PCM-15DS-071106.	13		23		33	
4 2	PCM-03SC-071106x	14		24		34	
5	PCM-06SC-071106MS	15		25		35	
6	PCM-06SC-071106MSD	16		26		36	
7	PCM-15DS-071106MS	17		27		37	
8	PCM-15DS-071106MSD	18		28		38	
9	PCM-03SC-071106MS	19		29		39	
~~10~~	~~PCM-03SC-071106MSD~~ F7	20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE.	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes:_____

DC #: 180531A3a
DG #: per cover

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

(1) circled dates have exceeded the technical holding times.
Y / N N/A Were all cooler temperatures within validation criteria?

METHOD: ~~GC~~ HPLC

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
4, 9	SOIL		11/6/07	12/4/07	12/20/07	28	J/UJ/P

TECHNICAL HOLDING TIME CRITERIA

VOLATILES:
- Water unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.
- Water preserved: Both within 14 days of sample collection.
- Soils: Both within 14 days of sample collection.

EXTRACTABLES:
- Water: Extracted within 7 days, analyzed within 40 days.
- Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 18053A3a
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: [illegible]

METHOD: ___ GC ___ HPLC

2nd Reviewer: [illegible]

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
What type of continuing calibration calculation was performed? ___%D or ___RPD

Y N N/A Were continuing calibration standards analyzed at the required frequencies?
Y N N/A Did the continuing calibration standards meet the %D / RPD validation criteria of ≤15.0%?
Level IV Only
Y N N/A Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Detector/ Column	Compound	%D / RPD (Limit ≤ 15.0)	RT (limit)	Associated Samples	Qualifications
	12/17/07	1217F004-008	DB-XLB	cis-nonachlor	15.4	( )	KWG0712505-13	J/UJ/A
						( )		
						( )		
						( )		
	12/18/07	1217F025-029	DB-XLB	F	16	( )	1, 2, ~~5,6~~ 5, 6	J/UJ/A
				T	16	( )		
				I	16	( )		
				J	18	( )	~~5,6~~	
				U	16	( )		
						( )		
				F	16	( )	3, 7, 8	
				T	16	( )		
				I	16	( )		
				J	18	( )		
				U	16	( )		
				2,4'-DDE	16	( )		
				cis-nonachlor	19	( )		
				2,4'-DDD	17	( )		
				trans-nonachlor	17	( )		
				2,4'-DDT	16	( )		
				Mirex	17	( )		
				Hexachloroethane	15.4	( )		

LDC #: 18053A3a
SDG #: All cond

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: PT

METHOD: ~~GC~~ HPLC

2nd Reviewer: AC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
What type of continuing calibration calculation was performed? ___%D or __RPD

Y (N) N/A Were continuing calibration standards analyzed at the required frequencies?
Y (N) N/A Did the continuing calibration standards meet the %D / RPD validation criteria of ≤15.0%?

Level IV Only
Y N (N/A) Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Detector/ Column	Compound	%D / RPD (Limit ≤ 15.0)	RT (limit)	Associated Samples	Qualifications
	12/18/07	1217F025L-029C	DB-35MS	J	16	( )	1, 2, 5, 6	J / UJ / A
						( )		
				J	16	( )	3, 7, 8	J / UJ / A
				2,4'-DDE	17	( )	↓	↓
				2,4-DDD	15.4	( )		
						( )		
						( )		
						( )		
						( )		
	12/20/07	1219F030/31	DB-XLB	K	16	( )	KWG0713166-7,	J / UJ / A
				M	16	( )	4, 9	
				~~O~~	19	( )	↓	↓
				P	17	( )		
			DB-35MS	P	17	( )	↓	↓
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

LDC #: 18053A3a
SDG #: pre cover

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: A
2nd Reviewer: A

METHOD: GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a given method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
Y N N/A Was a method blank performed with each extraction batch?
Y N N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Level IV/D Only

Y N N/A (Gasoline and aromatics only)Was a method blank analyzed with each 24 hour batch?
Y N N/A Was a method blank analyzed for each analytical / extraction batch of ≤20 samples?

Blank extraction date: 11/15/07 **Blank analysis date:** 12/17/07 **Associated samples:** 1 → 3
Conc. units: ug/kg

Compound	Blank ID	Sample Identification						
	KWG0712505-13	2						
N	0.13		0.36/1.0U					

Blank extraction date: 12/4/07 **Blank analysis date:** 12/20/07 **Associated samples:** 4 (ND)
Conc. units: ug/kg

Compound	Blank ID	Sample Identification						
	↑							
	KWG0713166-7							
Θ	0.091							

ALL CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 18053A3a
SDG #: Per cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: __ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

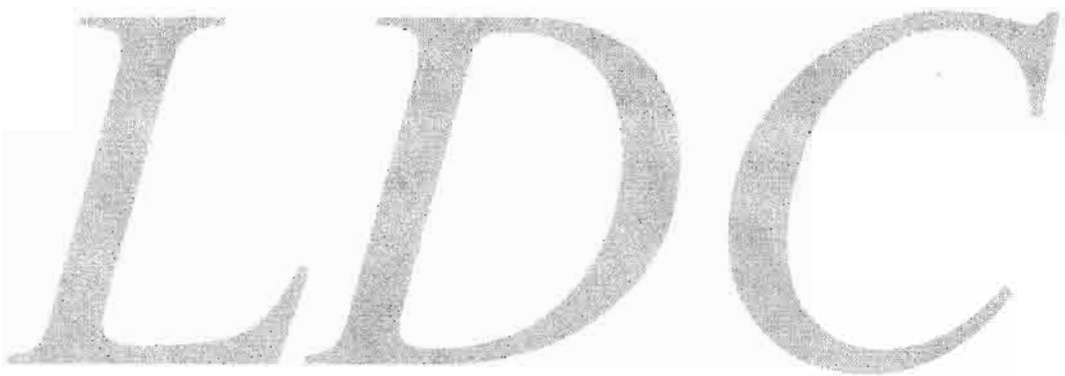
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	% RPD Bet 2 column Finding ≤40	Associated Samples	Qualifications
	O	51	1	J/A det
	F	84	2	J/A det
	Hexachloroethane	89	3	J/A det
	N	71	4	J/A det
	Q	46	↓	↓

Comments: See sample calculation verification worksheet for recalculations

NW Natural Gasco Site
Data Validation Reports
LDC# 18053

Polychlorinated Biphenyls



Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NW Natural Gasco Site

Collection Date: November 6, 2007

LDC Report Date: January 15, 2008

Matrix: Sediment

Parameters: Polychlorinated Biphenyls

Validation Level: EPA Level III

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): K0710416

Sample Identification

PCM-03SC-071106(01)
PCM-06SC-071106
PCM-21SC-071106
PCM-15DS-071106
PCM-03SC-071106(09)
PCM-03SC-071106(09)MS

Introduction

This data review covers 6 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8082 for Polychlorinated Biphenyls.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
PCM-03SC-071106(09)	All TCL compounds	28	14	J (all detects) UJ (all non-detects)	P

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of multicomponent compounds was performed for the primary (quantitation) column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated biphenyl contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

The laboratory has indicated that there were no matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and Reported CRQLs

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to extraction holding time problems, results were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Polychlorinated Biphenyls - Data Qualification Summary - SDG K0710416

SDG	Sample	Compound	Flag	A or P	Reason
K0710416	PCM-03SC-071106(09)	All TCL compounds	J (all detects) UJ (all non-detects)	P	Technical holding times

NW Natural Gasco Site
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG K0710416

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Polychlorinated Biphenyls (PCBs)

Sample Name:	PCM-03SC-071106	**Units:**	ug/Kg
Lab Code:	K0710416-001	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8082		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	11	6.0	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1221	ND	U	21	1.8	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1232	ND	Ui	11	4.2	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1242	ND	Ui	11	2.4	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1248	ND	Ui	11	2.6	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1254	ND	Ui	17	17	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1260	ND	Ui	11	4.6	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1262	ND	Ui	11	3.9	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1268	ND	U	11	1.8	1	11/15/07	12/13/07	KWG0712506	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	72	33-141	12/13/07	Acceptable

Comments: SC1148

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Polychlorinated Biphenyls (PCBs)

Sample Name:	PCM-06SC-071106	**Units:**	ug/Kg
Lab Code:	K0710416-003	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8082		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1221	ND	U	20	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1232	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1242	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1248	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1254	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1260	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1262	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1268	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	78	33-141	12/13/07	Acceptable

Comments: 12/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Polychlorinated Biphenyls (PCBs)

Sample Name:	PCM-21SC-071106	**Units:**	ug/Kg
Lab Code:	K0710416-005	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8082		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	10	4.1	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1221	ND	Ui	20	19	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1232	ND	Ui	10	5.8	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1242	ND	Ui	10	5.6	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1248	ND	Ui	10	3.1	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1254	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1260	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1262	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1268	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	80	33-141	12/13/07	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Polychlorinated Biphenyls (PCBs)

Sample Name:	PCM-15DS-071106	**Units:**	ug/Kg
Lab Code:	K0710416-008	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8082		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	9.9	3.8	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1221	ND	Ui	20	16	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1232	ND	Ui	9.9	9.9	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1242	ND	Ui	9.9	2.6	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1248	ND	Ui	9.9	2.5	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1254	ND	Ui	17	17	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1260	ND	Ui	9.9	6.5	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1262	ND	Ui	9.9	4.0	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1268	ND	U	9.9	1.7	1	11/15/07	12/13/07	KWG0712506	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	79	33-141	12/13/07	Acceptable

Comments: 11/4/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Polychlorinated Biphenyls (PCBs)

Sample Name:	PCM-03SC-071106	**Units:**	ug/Kg
Lab Code:	K0710416-009	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8082		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	8.1	1.7	1	12/04/07	12/26/07	KWG0713167	*
Aroclor 1221	ND	Ui	17	17	1	12/04/07	12/26/07	KWG0713167	*
Aroclor 1232	ND	U	8.1	1.7	1	12/04/07	12/26/07	KWG0713167	*
Aroclor 1242	ND	U	8.1	1.7	1	12/04/07	12/26/07	KWG0713167	*
Aroclor 1248	ND	U	8.1	1.7	1	12/04/07	12/26/07	KWG0713167	*
Aroclor 1254	ND	U	8.1	1.7	1	12/04/07	12/26/07	KWG0713167	*
Aroclor 1260	ND	U	8.1	1.7	1	12/04/07	12/26/07	KWG0713167	*
Aroclor 1262	ND	U	8.1	1.7	1	12/04/07	12/26/07	KWG0713167	*
Aroclor 1268	ND	U	8.1	1.7	1	12/04/07	12/26/07	KWG0713167	*

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	71	33-141	12/26/07	Acceptable

Comments:

LDC #: 18053A3b
SDG #: K0710416
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/10/08
Page: 1 of 1
Reviewer:
2nd Reviewer:

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 11/6/07
II.	GC/ECD Instrument Performance Check	NA	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	ICV ≤ 15
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A ~~N~~	~~client specified~~ #5 NO MSD
VIII.	Laboratory control samples	A	LCS/D
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: soil sediment

1	PCM-03SC-071106 (01)	11	KWG0712506-4	21		31	
2	PCM-06SC-071106	12	KWG0713167-4	22		32	
3	PCM-21SC-071106	13		23		33	
4	PCM-15DS-071106	14		24		34	
5	PCM-03SC-071106 (09)	15		25		35	
6	PCM-03SC-071106 (09) MS	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

DC #: 18653A36
DG #: see cover

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: FT
2nd Reviewer: [illegible]

All circled dates have exceeded the technical holding times.
(Y) N N/A Were all cooler temperatures within validation criteria?

METHOD: GC HPLC

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
5	soil	no	11/6/07	12/4/07	12/26/07	28	J/UJ/P

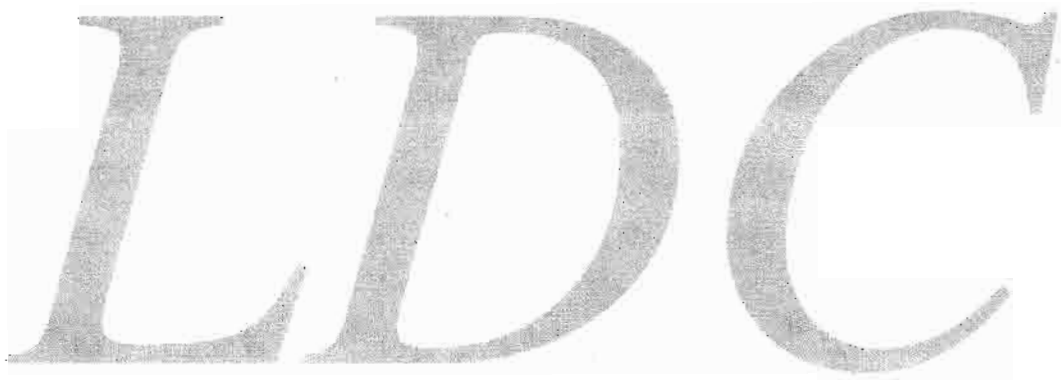
TECHNICAL HOLDING TIME CRITERIA

VOLATILES:
- Water unpreserved: Aromatic within 7 days, non-aromatic within 14 days of sample collection.
- Water preserved: Both within 14 days of sample collection.
- Soils: Both within 14 days of sample collection.

EXTRACTABLES:
- Water: Extracted within 7 days, analyzed within 40 days.
- Soil: Extracted within 14 days, analyzed within 40 days.

NW Natural Gasco Site
Data Validation Reports
LDC# 18053

Metals



Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NW Natural Gasco Site

Collection Date: November 6, 2007

LDC Report Date: January 8, 2008

Matrix: Sediment/Water

Parameters: Metals

Validation Level: EPA Level III

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): K0710416

Sample Identification

PCM-03PW-071106
PCM-06SC-071106
PCM-06PW-071106
PCM-21SC-071106
PCM-21PW-071106
PCM-15DS-071106
PCM-03SC-071106
PCM-03PW-071106F
PCM-06PW-071106F
PCM-21PW-071106F
PCM-03PW-071106MS
PCM-03PW-071106DUP
PCM-06SC-071106MS
PCM-06SC-071106DUP
PCM-15DS-071106MS
PCM-15DS-071106DUP
PCM-03SC-071106MS
PCM-03SC-071106DUP

Sample IDs ending in "F" were analyzed for dissolved metals

Introduction

This data review covers 10 sediment samples and 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B, 6020, and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Cadmium, Chromium, Copper, Iron, Lead, Mercury, Nickel, Selenium, Silver, and Zinc.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chromium Copper Zinc	0.06 mg/Kg 0.06 mg/Kg 0.23 mg/Kg	PCM-06SC-071106 PCM-21SC-071106
PB (prep blank)	Iron Lead	1.1 mg/Kg 0.05 mg/Kg	All sediment samples in SDG K0710416
ICB/CCB	Mercury	0.120 ug/L	PCM-15DS-071106
ICB/CCB	Iron	7.0 ug/L	All samples in SDG K0710416

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
PCM-15DS-071106	Mercury	0.031 mg/Kg	0.031 mg/Kg
PCM-06PW-071106F	Iron	31.5 ug/L	31.5U ug/L

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

V. Matrix Spike Analysis

Matrix spike (MS) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
PCM-03SC-071106DUP (PCM-15DS-071106 PCM-03SC-071106)	Aluminum	31 (<20)	-	J (all detects) UJ (all non-detects)	A
PCM-03SC-071106DUP (All sediment samples in SDG K0710416)	Iron	24 (≤20)	-	J (all detects) UJ (all non-detects)	A

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Internal Standards (ICP-MS)

ICP-MS was not utilized in this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to Duplicate RPD problems, data were qualified as estimated in several samples.

Due to calibration and method blank contamination problems, data were qualified as not detected in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Metals - Data Qualification Summary - SDG K0710416

SDG	Sample	Analyte	Flag	A or P	Reason
K0710416	PCM-15DS-071106 PCM-03SC-071106	Aluminum	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (RPD)
K0710416	PCM-06SC-071106 PCM-21SC-071106 PCM-15DS-071106 PCM-03SC-071106	Iron	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (RPD)

NW Natural Gasco Site
Metals - Laboratory Blank Data Qualification Summary - SDG K0710416

SDG	Sample	Analyte	Modified Final Concentration	A or P
K0710416	PCM-15DS-071106	Mercury	0.031 mg/Kg	A
K0710416	PCM-06PW-071106F	Iron	31.5U ug/L	A

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710416
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/06/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/07/07
Matrix:	SEDIMENT	Units:	MG/KG
		Basis:	Dry

Sample Name: PCM-06SC-071106 Lab Code: K0710416-003

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.6	0.1	5	12/20/07	12/21/07	0.5	B	
Chromium	6020	0.22	0.04	5	12/20/07	12/21/07	6.63		
Copper	6020	0.11	0.02	5	12/20/07	12/21/07	15.5		
Iron	6010B	4.5	0.7	2	11/30/07	12/11/07	20600		J9
Lead	6020	0.06	0.02	5	12/20/07	12/21/07	2.02		
Nickel	6020	0.22	0.04	5	12/20/07	12/21/07	8.97		
Zinc	6020	0.56	0.10	5	12/20/07	12/21/07	24.3		

% Solids: 87.3

12/14/08

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710416
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/06/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/07/07
Matrix:	SEDIMENT	Units:	MG/KG
		Basis:	Dry

Sample Name: PCM-21SC-071106 Lab Code: K0710416-005

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q	
Arsenic	6020	0.6	0.1	5	12/20/07	12/21/07	1.1			
Chromium	6020	0.24	0.05	5	12/20/07	12/21/07	6.94			
Copper	6020	0.12	0.02	5	12/20/07	12/21/07	15.4			
Iron	6010B	4.8	0.7	2	11/30/07	12/11/07	20000			J9
Lead	6020	0.06	0.02	5	12/20/07	12/21/07	2.88			
Nickel	6020	0.24	0.05	5	12/20/07	12/21/07	11.3			
Zinc	6020	0.60	0.11	5	12/20/07	12/21/07	27.1			

% Solids: 83.9

Comments:

METALS

-I-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710416
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/06/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/07/07
Matrix:	SEDIMENT	Units:	MG/KG
		Basis:	Dry

Sample Name: PCM-15DS-071106 Lab Code: K0710416-008

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q	
Aluminum	6010B	11.0	7.7	2	11/30/07	12/11/07	20600		*	J9
Antimony	6020	0.05	0.02	5	11/30/07	12/18/07	0.07			
Arsenic	6020	0.5	0.1	5	12/20/07	12/21/07	2.7			
Cadmium	6020	0.022	0.009	5	12/20/07	12/21/07	0.134			
Chromium	6010B	2.2	0.3	2	11/30/07	12/11/07	28.3			
Copper	6010B	2.2	0.8	2	11/30/07	12/11/07	27.6			
Iron	6010B	4.4	0.7	2	11/30/07	12/11/07	28500			J9
Lead	6020	0.05	0.02	5	12/20/07	12/21/07	8.53			
Mercury	7471A	0.019	0.002	1	11/19/07	11/21/07	0.031			U7
Nickel	6010B	4.4	0.4	2	11/30/07	12/11/07	18.4			
Selenium	7742	0.11	0.02	2	11/30/07	12/15/07	0.16			
Silver	6020	0.022	0.009	5	11/30/07	12/15/07	0.162			
Zinc	6010B	2.2	0.9	2	11/30/07	12/11/07	75.1			

% Solids: 50.4

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710416
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/06/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/07/07
Matrix:	SEDIMENT	Units:	MG/KG
		Basis:	Dry

Sample Name: PCM-03SC-071106 Lab Code: K0710416-009

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q	
Aluminum	6010B	11.7	8.2	2	11/30/07	12/11/07	4020		*	J9
Antimony	6020	0.06	0.02	5	11/30/07	12/18/07	0.02	U		
Arsenic	6020	0.6	0.1	5	12/20/07	12/21/07	0.8			
Cadmium	6020	0.023	0.009	5	12/20/07	12/21/07	0.045			
Chromium	6010B	2.3	0.4	2	11/30/07	12/11/07	7.9			
Copper	6010B	2.3	0.8	2	11/30/07	12/11/07	6.6			
Iron	6010B	4.7	0.7	2	11/30/07	12/11/07	10000			J9
Lead	6020	0.06	0.02	5	12/20/07	12/21/07	1.74			
Nickel	6010B	4.7	0.5	2	11/30/07	12/11/07	8.1			
Silver	6020	0.023	0.009	5	11/30/07	12/15/07	0.054			
Zinc	6010B	2.3	0.9	2	11/30/07	12/11/07	23.4			

% Solids: 83.0

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710416
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/06/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/07/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-03PW-071106 Lab Code: K0710416-002

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	12/3/07	12/11/07	5560		

% Solids: 0.0

Comments:

12/14/08

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710416
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/06/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/07/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-03PW-071106 Lab Code: K0710416-002 DISS

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	12/3/07	12/11/07	54.0		

12/11/07

% Solids: 0.0

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710416
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/06/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/07/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-06PW-071106 Lab Code: K0710416-004

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	12/3/07	12/11/07	6460		

7 of 408

% Solids: 0.0

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710416
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/06/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/07/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-06PW-071106 Lab Code: K0710416-004 DISS

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q	
Iron	6010B	20.0	3.0	1	12/3/07	12/11/07	31.5			U7

12/11/08

% Solids: 0.0

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710416
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/06/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/07/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-21PW-071106 Lab Code: K0710416-006

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	12/3/07	12/11/07	2500		

12/14/08

% Solids: 0.0

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710416
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/06/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/07/07
Matrix:	WATER	Units:	pG/L
		Basis:	NA

Sample Name: PCM-21PW-071106 Lab Code: K0710416-006 DISS

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	12/3/07	12/11/07	49.0		

SL 11/08

% Solids: 0.0

Comments:

LDC #: 18053A4

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 1/7/08

SDG #: K0710416

Page: 1 of 1

Laboratory: Columbia Analytical Services

Reviewer: AA

2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6010B/6020) ~~7471A~~ 7000 ✓

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/6/07
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	A	MS/Dup
VI.	Duplicate Sample Analysis	SW	
VII.	Laboratory Control Samples (LCS)	A	LCS
VIII.	Internal Standard (ICP-MS)	N	Not Reviewed for Level III
IX.	Furnace Atomic Absorption QC	A	
X.	ICP Serial Dilution	A SW	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:

Sediment - water

1	PCM-03PW-071106	W	11	PCM-03PW-071106MS	W	21		11	
2	PCM-06SC-071106	S	12	PCM-03PW-071106DUP	↓	22		12	
3	PCM-06PW-071106	W	13	PCM-06SC-071106MS	S	23		13	
4	PCM-21SC-071106	S	14	PCM-06SC-071106DUP		24		14	
5	PCM-21PW-071106	W	15	PCM-15DS-071106MS		25		15	
6	PCM-15DS-071106	S	16	PCM-15DS-071106DUP		26		16	
7	PCM-03SC-071106	↓	17	PCM-03SC-071106MS		27		17	
8	PCM-03PW-071106F	W	18	PCM-03SC-071106DUP	↓	28		18	
9	PCM-06PW-071106F	↓	19	MB		29		19	
10	PCM-21PW-071106F	↓	20			30		20	

Notes: Samples appended with "F" were analyzed for dissolved metals

LDC #: 18053A4
SDG #: K0710416

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: AA
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
2, 4	Sed	Al, Sb, (As), Ba, Be, Cd, Ca, (Cr), Co, (Cu, Fe, Pb), Mg, Mn, Hg, (Ni), K, Se, Ag, Na, Tl, V, (Zn), Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
6	Sed	(Al, Sb, As), Ba, Be, (Cd), Ca, (Cr), Co, (Cu, Fe, Pb), Mg, Mn, (Hg, Ni), K, (Se, Ag), Na, Tl, V, (Zn), Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
7	Sed	(Al, Sb, As), Ba, Be, (Cd), Ca, (Cr), Co, (Cu, Fe, Pb), Mg, Mn, Hg, (Ni), K, Se, (Ag), Na, Tl, V, (Zn), Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
1, 3, 5,	W	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, (Fe), Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
8 - 10		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
QC sample 11 - 12	W	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, (Fe), Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
13 - 14	Sed	Al, Sb, (As), Ba, Be, (Cd), Ca, (Cr), Co, (Cu), Fe, (Pb), Mg, Mn, Hg, (Ni), K, Se, Ag, Na, Tl, V, (Zn), Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
15 - 16	Sed	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, (Hg), Ni, K, (Se), Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
17 - 18	Sed	(Al, Sb), As, Ba, Be, Cd, Ca, (Cr), Co, (Cu, Fe), Pb, Mg, Mn, (Hg), (Ni), K, (Se), (Ag), Na, Tl, V, (Zn), Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
Analysis Method		
ICP		(Al), Sb, As, Ba, Be, Cd, Ca, (Cr), Co, (Cu), (Fe), Pb, Mg, Mn, Hg, (Ni), K, Se, Ag, Na, Tl, V, (Zn), Mo, B, Si, CN, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
ICP-MS		Al, (Sb), (As), Ba, Be, (Cd), Ca, (Cr), Co, (Cu), Fe, (Pb), Mg, Mn, Hg, (Ni), K, Se, (Ag), Na, Tl, V, (Zn), Mo, B, Si, CN, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, (Se), Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___

Comments: (Mercury by CVAA if performed)

LDC #: 18053A4
SDG #: K5710416
METHOD: Trace Metals (EPA SW 846 Method 6010/7000)
Sample Concentration units, unless otherwise noted: mg/kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: 100 X 2/1g
Associated Samples:

Hg: 6
Cr, Cu, Zn: 2, 4
Fe, Pb: All out

Page: 1 of 2
Reviewer:
2nd Reviewer:

Analyte	Maximum PB[a] (mg/Kg)	Maximum PB[a] (ug/L)	Maximum ICB/CCB[a] (ug/L)	Blank Action Limit	Sample Identification: 6										
Al															Al
Sb															Sb
As															As
Ba															Ba
Be															Be
Cd															Cd
Ca															Ca
Cr	0.06			0.30											Cr
Co															Co
Cu	0.06			0.30											Cu
Fe	1.1		7.0	1.4											Fe
Pb	0.05			0.20											Pb
Mg															Mg
Mn															Mn
Hg			0.120	0.06 ~~0.006~~	0.031										Hg
Ni															Ni
K															K
Se															Se
Ag															Ag
Na															Na
Tl															Tl
V															V
Zn	0.23			1.15											Zn
B															B
Mo															Mo
Sr															Sr

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

BLNKSMP.4S2

LDC #: 18053A4
SDG #: K6710416

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer: CA
2nd Reviewer: [illegible]

METHOD: Trace Metals (EPA SW 846 Method 6010/7000) Soil preparation factor applied: _____
Sample Concentration units, unless otherwise noted: mg/L Associated Samples: All water [illegible]

Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Blank Action Limit	Sample Identification: 9										
Al															Al
Sb															Sb
As															As
Ba															Ba
Be															Be
Cd															Cd
Ca															Ca
Cr															Cr
Co															Co
Cu															Cu
Fe			7.0	35.0	31.5										Fe
Pb															Pb
Mg															Mg
Mn															Mn
Hg															Hg
Ni															Ni
K															K
Se															Se
Ag															Ag
Na															Na
Tl															Tl
V															V
Zn															Zn
B															B
Mo															Mo
Sr															Sr

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 18053A4
SDG #: K071091(6

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: AL
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y (N) N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤ 35% for soil samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

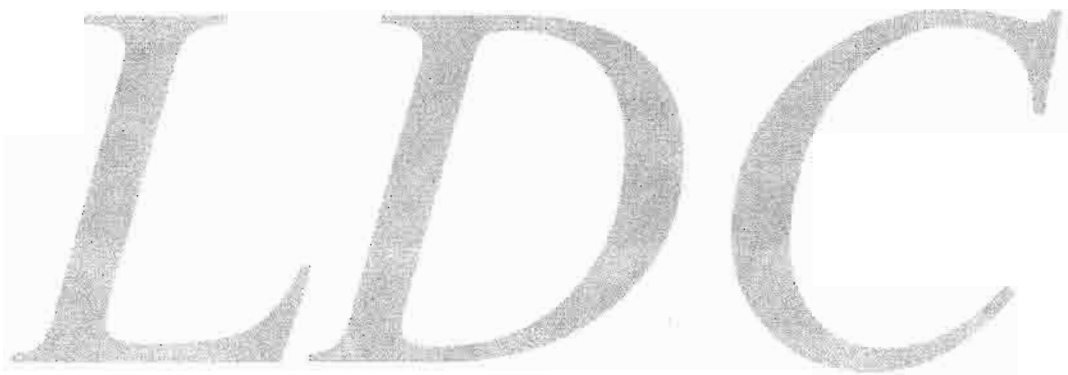
Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
	18	Sed	Al	31 (≤20)		2, 4, 6, 7	J / us / A
			Fe	24		↓	↓
			~~Ni~~	~~28~~		~~6, 7~~	
			Ag	51			

Comments: Ni, Ag. <5xRL + Difference < 2xRL.

NW Natural Gasco Site
Data Validation Reports
LDC# 18053

Herbicides



Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 6, 2007
LDC Report Date:	January 11, 2008
Matrix:	Sediment
Parameters:	Herbicides
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710416

Sample Identification

PCM-15DS-071106

Introduction

This data review covers one sediment sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8151A for Herbicides.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

b. Calibration Verification

Calibration verification was performed at the required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
11/7/07	1107R021-ICV	RTX-35	2,4-D	49	All samples in SDG K0710416	J (all detects) UJ (all non-detects)	A

III. Blanks

Method blanks were reviewed for each matrix as applicable. No herbicide contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/(Matrix Spike) Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to calibration %D problems, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Herbicides - Data Qualification Summary - SDG K0710416

SDG	Sample	Compound	Flag	A or P	Reason
K0710416	PCM-15DS-071106	2,4-D	J (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)

NW Natural Gasco Site
Herbicides - Laboratory Blank Data Qualification Summary - SDG K0710416

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Chlorinated Herbicides

Sample Name:	PCM-15DS-071106	**Units:**	ug/Kg
Lab Code:	K0710416-008	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dalapon	ND	U	99	62	1	11/19/07	12/13/07	KWG0712682	
Dicamba	ND	U	99	7.0	1	11/19/07	12/13/07	KWG0712682	
MCPP	ND	Ui	20000	4100	1	11/19/07	12/13/07	KWG0712682	
MCPA	ND	Ui	20000	1900	1	11/19/07	12/13/07	KWG0712682	
Dichlorprop	ND	U	99	6.0	1	11/19/07	12/13/07	KWG0712682	
2,4-D	ND	Ui UJS	99	14	1	11/19/07	12/13/07	KWG0712682	
2,4,5-TP (Silvex)	ND	U	99	7.2	1	11/19/07	12/13/07	KWG0712682	
2,4,5-T	ND	U	99	8.0	1	11/19/07	12/13/07	KWG0712682	
2,4-DB	ND	Ui	99	54	1	11/19/07	12/13/07	KWG0712682	
Dinoseb	ND	U	99	13	1	11/19/07	12/13/07	KWG0712682	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	75	18-153	12/13/07	Acceptable

Comments: SC 01408

LDC #: 18053A5 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/9/08
SDG #: K0710416 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Herbicides (EPA SW 846 Method 8151A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/6/07
IIa.	Initial calibration	A	%RSD, $r^2 \geq 0.990$
IIb.	Calibration verification/ICV	SW	ICV ≤ 15
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	client specified
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ~~Soil~~ Sediment

1	PCM-15DS-071106	11	KWG0712682-4	21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

VALIDATION FINDINGS WORKSHEET

METHOD: ___GC ___HPLC

8310	8330	8151	8141	8141(Con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotolune	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L. 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Tetrachlorvinphos	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Sulprofos	
O. Phenanthrene	O.		O. Chlorpyrifos		
P. Pyrene	P.		P. Fenthion		
Q.	Q		Q. Parathion-ethyl		
R.			R. Trichloronate		
S.			S. Merphos		
			T. Stirofos		
			U. Tokuthion		

Notes:_____

LDC #: 18053A5
SDG #: all cover

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: KT

METHOD: ✓ GC __ HPLC

2nd Reviewer: N

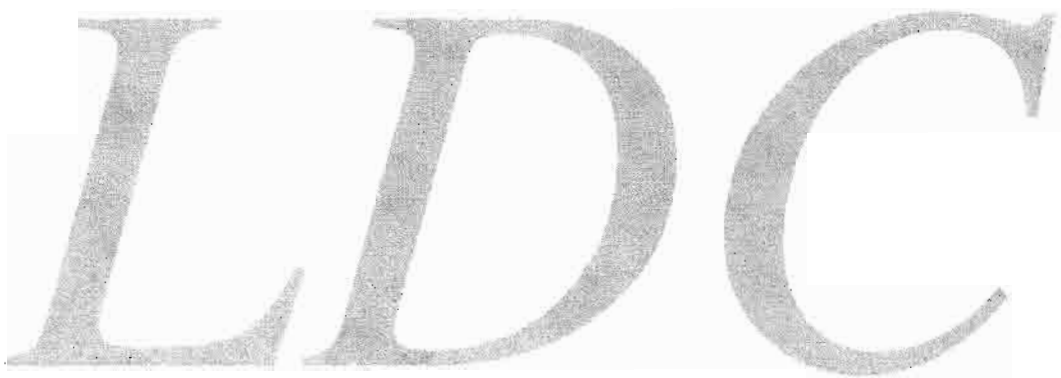
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
What type of continuing calibration calculation was performed? ___%D or ___RPD

Y N N/A Were continuing calibration standards analyzed at the required frequencies?
Y N N/A Did the continuing calibration standards meet the %D / RPD validation criteria of ≤15.0%?
Level IV Only
Y N N/A Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Detector/ Column	Compound	%D / RPD (Limit < 15.0)	RT (limit)	Associated Samples	Qualifications
	11/7/07	1107R021-10V	RTX-35	A	49	( )	All + Blank	J/W/A
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

NW Natural Gasco Site
Data Validation Reports
LDC# 18053

Wet Chemistry



Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 6, 2007
LDC Report Date:	January 16, 2008
Matrix:	Sediment/Water
Parameters:	Wet Chemistry
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710416

Sample Identification

PCM-03SC-071106(01)
PCM-03PW-071106
PCM-06SC-071106
PCM-06PW-071106
PCM-21SC-071106
PCM-21PW-071106
PCM-15DS-071106
PCM-03SC-071106(09)
PCM-03SC-071106(01)MS
PCM-03SC-071106(01)DUP
PCM-06PW-071106MS
PCM-06PW-071106DUP
PCM-21PW-071106MS
PCM-21PW-071106MSD
PCM-21PW-071106DUP
PCM-15DS-071106DUP
PCM-15DS-071106TRP
PCM-03SC-071106(09)MS
PCM-03SC-071106(09)DUP
PCM-03SC-071106(09)TRP

Introduction

This data review covers 12 soil samples and 8 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.3 for Total Solids, EPA Method 350.1 for Ammonia as Nitrogen, EPA SW 846 Method 7196A for Hexavalent Chromium, EPA SW 846 Method 9012A and Standard Method 4500-CN-C/E for Total Cyanide, EPA SW 846 Method 9030M and Standard Method 4500-S2-D for Sulfide, Standard Method 4500-CN/C/E for Dissolved Cyanide, Standard Method 4500-CN-G/E for Amenable to Chlorination Cyanide, Standard Method 5310C for Dissolved Organic Carbon, Standard Method 5310C and PSEP Method for Total Organic Carbon, PSEP Method for Particle Size, ASTM Method D1498-76 for ORP, and ASTM Method D4282-02 for Free Cyanide.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
PCM-03SC-071106(09)	Total cyanide	28 days	14 days	J (all detects) UJ (all non-detects)	P
PCM-06SC-071106 PCM-21SC-071106 PCM-15DS-071106 PCM-03SC-071106(09) PCM-03SC-071106(09)MS PCM-03SC-071106(09)DUP PCM-03SC-071106(09)TRP	Total organic carbon	34 days	14 days	J (all detects) R (all non-detects)	P
PCM-03SC-071106(09) PCM-03SC-071106(09)DUP PCM-03SC-071106(09)TRP	Total solids	27 days	14 days	J (all detects) UJ (all non-detects)	P

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration of each method were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
PB (prep blank)	Dissolved organic carbon Total organic carbon	0.04 mg/L 0.04 mg/L	All water samples in SDG K0710416
ICB/CCB	Dissolved organic carbon Total organic carbon	0.07 mg/L 0.07 mg/L	All water samples in SDG K0710416

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
PCM-21PW-071106MS/MSD (All water samples in SDG K0710416)	Amenable to chlorination cyanide	190 (55-135)	180 (55-135)	-	J (all detects)	A

V. Duplicates/Triplicates

Duplicate (DUP) and triplicate (TRP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VII. Sample Result Verification

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to analysis holding time problems, data were qualified as estimated in several samples.

No data were qualified due to MS/MSD %R problems. The associated sample results were not detected.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Wet Chemistry - Data Qualification Summary - SDG K0710416

SDG	Sample	Analyte	Flag	A or P	Reason
K0710416	PCM-03SC-071106(09)	Total cyanide Total solids	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Technical holding times
K0710416	PCM-06SC-071106 PCM-21SC-071106 PCM-15DS-071106 PCM-03SC-071106(09)	Total organic carbon	J (all detects) R (all non-detects)	P	Technical holding times
K0710416	PCM-03PW-071106 PCM-06PW-071106 PCM-21PW-071106	Amenable to chlorination cyanide	J (all detects)	A	Matrix spike/Matrix spike duplicates (%R)

NW Natural Gasco Site
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG K0710416

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Moni/000029-02 BG12 T17.4		
Sample Matrix:	Sediment		

Total Solids

Prep Method:	NONE	**Units:**	PERCENT
Analysis Method:	160.3M	**Basis:**	Wet
Test Notes:			

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
PCM-03SC-071106	K0710416-001	11/06/2007	11/07/2007	11/07/2007	47.3	
PCM-06SC-071106	K0710416-003	11/06/2007	11/07/2007	11/07/2007	87.3	
PCM-21SC-071106	K0710416-005	11/06/2007	11/07/2007	11/07/2007	83.9	
PCM-15DS-071106	K0710416-008	11/06/2007	11/07/2007	11/07/2007	50.4	

11/14/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Moni/000029-02 BG12 T17.4		
Sample Matrix:	Sediment		

Total Solids

Prep Method:	NONE	**Units:**	PERCENT
Analysis Method:	160.3M	**Basis:**	Wet
Test Notes:			

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
PCM-03SC-071106	K0710416-009	11/06/2007	11/07/2007	12/03/2007	83.0	J Y1

K011408

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710416
Project Name :	Gasco Long-Term Monitoring Year 1 Event 2	**Date Collected :**	11/06/07
Project Number :	000029-02 BG12 T17.4	**Date Received :**	11/07/07
Sample Matrix :	PORE WATER		

Cyanide, Free

Prep Method :	Method	Units :	ug/L
Analysis Method :	ASTM D4282-02	Basis :	NA
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-03PW-071106	K0710416-002	10	5	1	11/7/2007	11/07/07	ND	
PCM-06PW-071106	K0710416-004	10	5	1	11/7/2007	11/07/07	8	J
PCM-21PW-071106	K0710416-006	10	5	1	11/7/2007	11/07/07	ND	
Method Blank	K0710416-MB	10	5	1	11/7/2007	11/07/07	ND	

Col14/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Anchor Environmental
Project Name : Gasco Long-Term Monitoring Year 1 Event 2
Project Number : 000029-02 BG12 T17.4
Sample Matrix : SEDIMENT

Service Request : K0710416
Date Collected : 11/06/07
Date Received : 11/07/07

Cyanide, Total

Prep Method : Method
Analysis Method : 9012A
Test Notes :

Units : mg/Kg
Basis : Dry

Sample Name	Lab Code	MRL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-03SC-071106	K0710416-001	0.21	1	11/8/2007	11/08/07	0.65	
PCM-06SC-071106	K0710416-003	0.11	1	11/8/2007	11/08/07	ND	
PCM-21SC-071106	K0710416-005	0.11	1	11/8/2007	11/08/07	0.11	
PCM-03SC-071106	K0710416-009	0.11	1	12/4/2007	12/04/07	ND	VJ1 X
Method Blank	K0710416-MB	0.11	1	11/8/2007	11/08/07	ND	
Method Blank	K0710416-MB	0.11	1	12/4/2007	12/04/07	ND	

11/14/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710416
Project Name :	Gasco Long-Term Monitoring Year 1 Event 2	**Date Collected :**	11/06/07
Project Number :	000029-02 BG12 T17.4	**Date Received :**	11/07/07
Sample Matrix :	PORE WATER		

Cyanide, Total

Prep Method :	SM 4500-CN- C	Units :	mg/L
Analysis Method :	SM 4500-CN- E	Basis :	NA
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-03PW-071106	K0710416-002	0.01	0.003	1	11/9/2007	11/13/07	0.04	
PCM-06PW-071106	K0710416-004	0.01	0.003	1	11/9/2007	11/13/07	0.03	
PCM-21PW-071106	K0710416-006	0.01	0.003	1	11/9/2007	11/13/07	0.02	
Method Blank	K0710416-MB	0.01	0.003	1	11/9/2007	11/13/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

11408

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710416
Project Name :	Gasco Long-Term Monitoring Year 1 Event 2	**Date Collected :**	11/06/07
Project Number :	000029-02 BG12 T17.4	**Date Received :**	11/07/07
Sample Matrix :	PORE WATER		

Cyanide, Amenable to Chlorination

Prep Method :	SM 4500-CN-G	Units :	mg/L
Analysis Method :	SM 4500-CN- E	Basis :	NA
Test Notes :			

Sample Name	Lab Code	MRL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-03PW-071106	K0710416-002	0.01	1	11/14/2007	11/15/07	ND	
PCM-06PW-071106	K0710416-004	0.01	1	11/14/2007	11/15/07	ND	
PCM-21PW-071106	K0710416-006	0.01	1	11/14/2007	11/15/07	ND	
Method Blank	K0710416-MB	0.01	1	11/14/2007	11/15/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

11/14/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710416
Project Name :	Gasco Long-Term Monitoring Year 1 Event 2	**Date Collected :**	11/06/07
Project Number :	000029-02 BG12 T17.4	**Date Received :**	11/07/07
Sample Matrix :	PORE WATER		

Cyanide, Dissolved

Prep Method :	SM 4500-CN-C	Units :	mg/L
Analysis Method :	SM 4500-CN- E	Basis :	NA
Test Notes :			

Sample Name	Lab Code	MRL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-03PW-071106	K0710416-002	0.01	1	11/15/2007	11/15/07	0.03	
PCM-06PW-071106	K0710416-004	0.01	1	11/15/2007	11/15/07	0.03	
PCM-21PW-071106	K0710416-006	0.01	1	11/15/2007	11/15/07	0.03	
Method Blank	K0710416-MB	0.01	1	11/15/2007	11/15/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

C 011408

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710416
Project Name :	Gasco Long-Term Monitoring Year 3 Event 2	**Date Collected :**	11/06/07
Project Number :	000029-02 BG12 T17.4	**Date Received :**	11/07/07
Sample Matrix :	SEDIMENT		

Chromium, Hexavalent

Prep Method :	EPA 3060A	Units :	mg/Kg
Analysis Method :	7196A	Basis :	Dry
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-15DS-071106	K0710416-008	1.0	0.12	1	11/27/2007	11/28/07	0.18	J
Method Blank	K0710416-MB	1.0	0.12	1	11/27/2007	11/28/07	ND	

JC 01/14/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710416
Project Name :	Gasco Long-Term Monitoring Year 1 Event 2	**Date Collected :**	11/06/07
Project Number :	000029-02 BG12 T17.4	**Date Received :**	11/07/07
Sample Matrix :	SEDIMENT		

Ammonia as Nitrogen

Prep Method :	EPA Plumb 5-1981 KCl	Units :	mg/Kg
Analysis Method :	350.1M	Basis :	Dry
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-15DS-071106	K0710416-008	0.50	0.06	1	11/7/2007	11/19/07	28.0	
Method Blank	K0710416-MB	0.50	0.06	1	11/7/2007	11/19/07	ND	

M Modified for analysis of soil.

11/14/07

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Anchor Environmental
Project Name : Gasco Long-Term Monitoring Year 1 Event 2
Project Number : 000029-02 BG12 T17.4
Sample Matrix : PORE WATER

Service Request : K0710416
Date Collected : 11/06/07
Date Received : 11/07/07

Sulfide, Total

Analysis Method : SM 4500-S2- D
Test Notes :

Units : mg/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-03PW-071106	K0710416-002	0.05	0.004	1	11/08/07	0.24	
PCM-06PW-071106	K0710416-004	0.05	0.004	1	11/08/07	0.17	
PCM-21PW-071106	K0710416-006	0.05	0.004	1	11/08/07	0.03	J
Method Blank	K0710416-MB	0.05	0.004	1	11/08/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

11/14/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710416
Project Name :	Gasco Long-Term Monitoring Year 1 Event 2	**Date Collected :**	11/06/07
Project Number :	000029-02 BG12 T17.4	**Date Received :**	11/07/07
Sample Matrix :	SEDIMENT		

Sulfide, Total

Prep Method :	EPA 9030B Modified	Units :	mg/Kg
Analysis Method :	9030M	Basis :	Dry
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-15DS-071106	K0710416-008	1.0	0.4	1	11/8/2007	11/08/07	ND	
Method Blank	K0710416-MB	1.0	0.4	1	11/8/2007	11/08/07	ND	

K011408

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710416
Project Name :	Gasco Long-Term Monitoring Year 1 Event 2	**Date Collected :**	11/06/07
Project Number :	000029-02 BG12 T17.4	**Date Received :**	11/07/07
Sample Matrix :	PORE WATER		

Carbon, Dissolved Organic (DOC)

Analysis Method : SM 5310 C
Test Notes :

Units : mg/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-03PW-071106	K0710416-002	1.0	0.080	2	11/13/07	7.5	
PCM-06PW-071106	K0710416-004	0.5	0.04	1	11/13/07	6.3	
PCM-21PW-071106	K0710416-006	0.5	0.04	1	11/13/07	8.3	
Method Blank	K0710416-MB	0.5	0.04	1	11/13/07	0.04	J

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

11/14/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Anchor Environmental
Project Name : Gasco Long-Term Monitoring Year 1 Event 2
Project Number : 000029-02 BG12 T17.4
Sample Matrix : PORE WATER

Service Request : K0710416
Date Collected : 11/06/07
Date Received : 11/07/07

Carbon, Total Organic

Analysis Method : SM 5310 C
Test Notes :

Units : mg/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-03PW-071106	K0710416-002	1.0	0.080	2	11/13/07	9.9	
PCM-06PW-071106	K0710416-004	1.0	0.080	2	11/13/07	6.9	
PCM-21PW-071106	K0710416-006	1.0	0.080	2	11/13/07	9.2	
Method Blank	K0710416-MB	0.5	0.04	1	11/13/07	0.04	J

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Anchor Environmental
Project Name : Gasco Long-Term Monitoring Year 1 Event 2
Project Number : 000029-02 BG12 T17.4
Sample Matrix : SEDIMENT

Service Request : K0710416
Date Collected : 11/06/07
Date Received : 11/07/07

Carbon, Total Organic (TOC)

Prep Method : Method
Analysis Method : PSEP TOC
Test Notes :

Units : Percent
Basis : Dry

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-06SC-071106	K0710416-003	0.05	0.02	1	11/13/2007	12/10/07	0.12	J1
PCM-21SC-071106	K0710416-005	0.05	0.02	1	11/13/2007	12/10/07	0.51	
PCM-15DS-071106	K0710416-008	0.05	0.02	1	11/13/2007	12/10/07	1.29	
PCM-03SC-071106	K0710416-009	0.05	0.02	1	11/13/2007	12/10/07	1.48	
Method Blank	K0710416-MB	0.05	0.02	1	11/13/2007	12/10/07	ND	

SC 011408

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/6/2007
Sample Matrix:	Sediment	**Date Received:**	11/7/2007
		Date Analyzed:	11/30/2007

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: PCM-03SC-071106
Lab Code: K0710416-001

Sand Fraction:	Dry Weight (Grams)	77.4519
Sand Fraction:	Weight Recovered (Grams)	77.7369
Sand Fraction:	Percent Recovery	100

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel	<-1 Ø	9.9604	12.0
Sand, Very Coarse	-1 to 0 Ø	8.5486	10.3
Sand, Coarse	0 to 1 Ø	17.6592	21.3
Sand, Medium	1 to 2 Ø	28.1315	33.9
Sand, Fine	2 to 3 Ø	12.7681	15.4
Sand, Very Fine	3 to 4 Ø	0.6439	0.78
Silt	4 to 8 Ø	0.3750	0.45
Clay	> 8 Ø	0.0800	0.10
	Total	78.1667	94.2

SC 011408

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/6/2007
Sample Matrix:	Sediment	**Date Received:**	11/7/2007
		Date Analyzed:	11/30/2007

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: PCM-06SC-071106
Lab Code: K0710416-003

Sand Fraction: Dry Weight (Grams)	78.0309
Sand Fraction: Weight Recovered (Grams)	78.0165
Sand Fraction: Percent Recovery	100

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel	<-1 Ø	25.5637	29.4
Sand, Very Coarse	-1 to 0 Ø	13.9790	16.1
Sand, Coarse	0 to 1 Ø	17.4555	20.0
Sand, Medium	1 to 2 Ø	14.0937	16.2
Sand, Fine	2 to 3 Ø	5.7853	6.64
Sand, Very Fine	3 to 4 Ø	1.0840	1.24
Silt	4 to 8 Ø	1.4950	1.72
Clay	> 8 Ø	0.6450	0.74
	Total	80.1012	92.0

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/6/2007
Sample Matrix:	Sediment	**Date Received:**	11/7/2007
		Date Analyzed:	11/30/2007

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: PCM-21SC-071106
Lab Code: K0710416-005

Sand Fraction: Dry Weight (Grams)	77.2800
Sand Fraction: Weight Recovered (Grams)	77.3831
Sand Fraction: Percent Recovery	100

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel	<-1 Ø	21.8574	26.1
Sand, Very Coarse	-1 to 0 Ø	13.3915	16.0
Sand, Coarse	0 to 1 Ø	17.0632	20.4
Sand, Medium	1 to 2 Ø	16.2640	19.4
Sand, Fine	2 to 3 Ø	7.2820	8.69
Sand, Very Fine	3 to 4 Ø	1.4832	1.77
Silt	4 to 8 Ø	0.9650	1.15
Clay	> 8 Ø	0.3150	0.38
	Total	78.6213	93.8

SL 11/4/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/0	**Date Collected:**	11/6/2007
Sample Matrix:	Sediment	**Date Received:**	11/7/2007
		Date Analyzed:	11/30/2007

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: PCM-15DS-071106
Lab Code: K0710416-008

Sand Fraction: Dry Weight (Grams)	8.6334
Sand Fraction: Weight Recovered (Grams)	8.6812
Sand Fraction: Percent Recovery	101

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel	<-1 Ø	0.4144	2.00
Very Coarse Sand	-1 to 0 Ø	0.4697	2.27
Coarse Sand	0 to 1 Ø	1.3214	6.39
Medium Sand	1 to 2 Ø	3.7099	17.9
Fine Sand	2 to 3 Ø	1.7882	8.65
Very Fine Sand	3 to 4 Ø	0.7409	3.58
62.5 µm	4 to 5 Ø	3.5450	17.14
31.3 µm	5 to 6 Ø	2.1350	10.3
15.6 µm	6 to 7 Ø	1.2250	5.92
7.8 µm	7 to 8 Ø	0.7900	3.82
3.9 µm	8 to 9 Ø	0.5100	2.47
1.95 µm	9 to 10 Ø	0.2450	1.18
0.98 µm	> 10 Ø	0.2500	1.21
		17.1445	82.9

Approved By: _____ Date: 12/17/07

SE 011408

LDC #: 18053A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/7/08
SDG #: K0710416 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: AV
2nd Reviewer:

METHOD: Ammonia-N (EPA Method 350.1/~~Plumb 5 1981 KCl~~), Total Cyanide (EPA SW846 Method 9012A/SM4500-CN-C/E), Dissolved Cyanide (SM4500-CN/C/E), Free Cyanide (ASTM D4282-02), Amenable to Chlorine Cyanide (SM 4500-CN-G/E), Hexavalent Chromium (EPA SW846 Method 7196A), ORP (ASTM D1498-76), Particle Size (PSEP), ~~pH (EPA SW846 Method 9045C)~~, Sulfide (EPA SW846 Method 9030M/SM4500-S2-D), Total Solids (EPA Method 160.3), DOC (SM5310C), TOC (SM5310C/PSEP Method)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 11/6/07
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	SW	
IV	Matrix Spike/Matrix Spike Duplicates	SW	MS/MSD/Dup/TRP
V	Duplicates	A	
VI.	Laboratory control samples	A	LCS
VII.	Sample result verification	SW	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: Sed. + water

1	PCM-03SC-071106 (01) S	11	PCM-06PW-071106MS W	21	PB	31	
2	PCM-03PW-071106 W	12	PCM-06PW-071106DUP	22		32	
3	PCM-06SC-071106 S	13	PCM-21PW-071106MS	23		33	
4	PCM-06PW-071106 W	14	PCM-21PW-071106MSD	24		34	
5	PCM-21SC-071106 S	15	PCM-21PW-071106DUP	25		35	
6	PCM-21PW-071106 W	16	PCM-15DS-071106DUP S	26		36	
7	PCM-15DS-071106 S	17	PCM-15DS-071106TRP	27		37	
8	PCM-03SC-071106 (09)	18	PCM-03SC-071106MS (09)	28		38	
9	PCM-03SC-071106MS (01)	19	PCM-03SC-071106DUP	29		39	
10	PCM-03SC-071106DUP	20	PCM-03SC-071106TRP	30		40	

Notes:

LDC #: 18053A6
SDG #: K0710416

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: AA
2nd reviewer:

All circled methods are applicable to each sample.

Sample ID	Parameter
1	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK (CN) NH_3 TKN TOC CR^{6+} (Part. Sim) (Tot. Solid)
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
2, 4	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK (CN) NH_3 TKN (TOC) CR^{6+} (Doc) (Sulfide) ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
3, 5	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK (CN) NH_3 TKN (TOC) CR^{6+} (Part. Sim) (Tot. Solid)
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
6	~~(pH)~~ TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK (CN) NH_3 TKN (TOC) CR^{6+} (Doc) (Sulfide) ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
7	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN (TOC) CR^{6+} (Sulfide) (Part. Sim) (Tot. Solid)
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
8	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK (CN) NH_3 TKN (TOC) CR^{6+} (Tot. Solid) ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
QC sample 9 - 15	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK (CN) NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
16 - 17	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} (Part. Sim) ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
18, 20	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN (TOC) CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
19	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN (TOC) CR^{6+} (Tot. Solid) ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
20 ~~21~~	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}

Comments: _____

LDC #: 18053A6
SDG #: K0410416

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: AM
2nd reviewer:

All circled dates have exceeded the technical holding time.
(Y) N N/A Were all samples preserved as applicable to each method ?
(Y) N N/A Were all cooler temperatures within validation criteria?

Method:		9012A		PSEP	160.3		
Parameters:		Tot. CN		TOC	TS		
Technical holding time:		14 days		14 days	14 days		
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
8	11/6/07	(12/4/07)		(28 days)			J/UJ/P
3,5,7,8,~~14~~ 18,20	11/6/07			(12/10/07)	(34 days)		J/P/P
8,19,20	11/6/07			~~12/10/07~~	(2/03/08)	(87 days)	J/UJ/P

LDC #: 18033A6
SDG #: K0710416

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Inorganics, Method Sm Con

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were all samples associated with a given method blank?
(Y) N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: mg/L

Associated Samples: ~~2, 4, 6~~ All As (All >5x)

Analyte	Blank ID	Maximum ICB/CCB	Blank Action Limit	Sample Identification								
	PB											
DOC	0.04	0.07	0.55									
TOC	0.04	0.07	0.35									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 18053A6
SDG #: K0710416

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Inorganics, EPA Method Sm Conv

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y N N/A Were matrix spike percent recoveries (%R) within the control limits of ~~75-125~~ 55-135? If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

Y N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

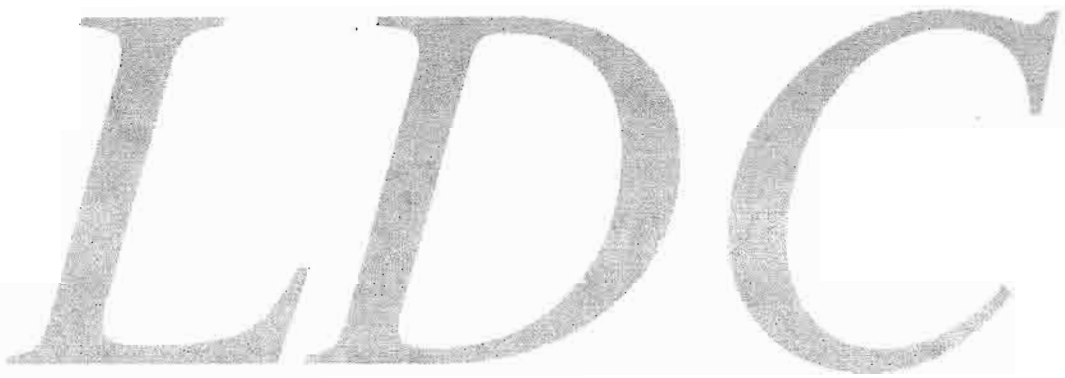
Y N N/A Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	13/14	W	CN, Amen. to Chlor.	190	180		All ~~2, 4, 6~~	J det / A

Comments:

NW Natural Gasco Site
Data Validation Reports
LDC# 18053

Gasoline Range Organics



Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 6, 2007
LDC Report Date:	January 11, 2008
Matrix:	Sediment
Parameters:	Gasoline Range Organics
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710416

Sample Identification

PCM-03SC-071106
PCM-06SC-071106
PCM-21SC-071106
PCM-15DS-071106

Introduction

This data review covers 4 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per NWTPH-Gx Method for Gasoline Range Organics.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No gasoline range organic contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Analysis Date	Compound	Concentration	Associated Samples
KWG0712424-3	11/13/07	Gasoline range organics	3.1 ug/L	All samples in SDG K0607031

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
PCM-03SC-071106	Gasoline range organics	6.7 mg/Kg	11U mg/Kg
PCM-06SC-071106	Gasoline range organics	1.6 mg/Kg	5.7U mg/Kg
PCM-21SC-071106	Gasoline range organics	2.8 mg/Kg	6.0U mg/Kg

Sample	Compound	Reported Concentration	Modified Final Concentration
PCM-15DS-071106	Gasoline range organics	3.9 mg/Kg	9.9U mg/Kg

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to method blank contamination problems, data were qualified as not detected in four samples.

The quality control criteria reviewed were met and are considered acceptable. Based upon the level III data validation all results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Gasoline Range Organics - Data Qualification Summary - SDG K0710416

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG K0710416

SDG	Sample	Compound	Modified Final Concentration	A or P
K0710416	PCM-03SC-071106	Gasoline range organics	11U mg/Kg	A
K0710416	PCM-06SC-071106	Gasoline range organics	5.7U mg/Kg	A
K0710416	PCM-21SC-071106	Gasoline range organics	6.0U mg/Kg	A
K0710416	PCM-15DS-071106	Gasoline range organics	9.9U mg/Kg	A

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Gasoline Range Organics

Sample Name:	PCM-03SC-071106	**Units:**	mg/Kg
Lab Code:	K0710416-001	**Basis:**	Dry
Extraction Method:	EPA 5035/5030B	**Level:**	Med
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q		MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	6.7	J	1147	11	1.3	1	11/13/07	11/14/07	KWG0712424	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	87	50-150	11/14/07	Acceptable

Comments: SC 11/29

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Gasoline Range Organics

Sample Name:	PCM-06SC-071106	**Units:**	mg/Kg
Lab Code:	K0710416-003	**Basis:**	Dry
Extraction Method:	EPA 5035/5030B	**Level:**	Med
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	1.6	J 5.747	5.7	0.68	1	11/13/07	11/14/07	KWG0712424	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	92	50-150	11/14/07	Acceptable

Comments: K011408

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Gasoline Range Organics

Sample Name:	PCM-21SC-071106	**Units:**	mg/Kg
Lab Code:	K0710416-005	**Basis:**	Dry
Extraction Method:	EPA 5035/5030B	**Level:**	Med
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	2.8	J 6.047	6.0	0.71	1	11/13/07	11/14/07	KWG0712424	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	93	50-150	11/14/07	Acceptable

Comments: 11.1408

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Gasoline Range Organics

Sample Name:	PCM-15DS-071106	**Units:**	mg/Kg
Lab Code:	K0710416-008	**Basis:**	Dry
Extraction Method:	EPA 5035/5030B	**Level:**	Med
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	3.9	J	9.9	9.9	1.2	1	11/13/07	11/14/07	KWG0712424	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	81	50-150	11/14/07	Acceptable

Comments: K0711408

LDC #: 18053A7 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/10/08
SDG #: K0710416 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: EJ
2nd Reviewer: AC

METHOD: Gasoline Range Organics (NWTPH-Gx)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/6/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	ICV ≤ 15
III.	Blanks	SW A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	~~not reported~~ client specified
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:
~~Soil~~ Sediment

1	PCM-03SC-071106 1	11	KWG0712424-3	21		31	
2	PCM-06SC-071106 3	12		22		32	
3	PCM-21SC-071106 5	13		23		33	
4	PCM-15DS-071106 8	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 18053A7
SDG #: per cover

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: FT
2nd Reviewer:

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a given method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
Y N N/A Was a method blank performed with each extraction batch?
Y N N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Level IV/D Only

Y N N/A (Gasoline and aromatics only)Was a method blank analyzed with each 24 hour batch?
Y N N/A Was a method blank analyzed for each analytical / extraction batch of ≤20 samples?

Blank extraction date: 11/13/07 **Blank analysis date:** 11/14/07 **Associated samples:** All

Conc. units: mg/kg

Compound	Blank ID	Sample Identification						
	KWG0712424-3	1	2	3	4			
GRO	3.1		6.7/11U	1.6/5.7U	2.8/6.0U	3.9/9.9U		

Blank extraction date: _____ **Blank analysis date:** _____ **Associated samples:** _____

Conc. units: _____

Compound	Blank ID	Sample Identification						

ALL CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

NW Natural Gasco Site
Data Validation Reports
LDC# 18053

Diesel Range Organics & Residual Range Organics

LDC

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 6, 2007
LDC Report Date:	January 11, 2008
Matrix:	Sediment
Parameters:	Diesel Range Organics & Residual Range Organics
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710416

Sample Identification

PCM-03SC-071106
PCM-06SC-071106
PCM-21SC-071106
PCM-15DS-071106

Introduction

This data review covers 4 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per NWTPH-Dx Method for Diesel Range Organics and Residual Range Organics.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No diesel range organic or residual range organic contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the level III data validation all results are considered valid and usable for all purposes.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Diesel Range Organics & Residual Range Organics - Data Qualification Summary - SDG K0710416

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Diesel Range Organics & Residual Range Organics - Laboratory Blank Data Qualification Summary - SDG K0710416

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Diesel and Residual Range Organics

Sample Name:	PCM-03SC-071106	**Units:**	mg/Kg
Lab Code:	K0710416-001	**Basis:**	Dry
Extraction Method:	EPA 3550B	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**430**	Z	22	2.6	1	11/08/07	11/14/07	KWG0712228	
Residual Range Organics (RRO)	**330**	Z	220	6.2	1	11/08/07	11/14/07	KWG0712228	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	113	50-150	11/14/07	Acceptable
n-Triacontane	130	50-150	11/14/07	Acceptable

Comments: 2/11/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Diesel and Residual Range Organics

Sample Name:	PCM-06SC-071106	**Units:**	mg/Kg
Lab Code:	K0710416-003	**Basis:**	Dry
Extraction Method:	EPA 3550B	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**56**	Z	12	1.4	1	11/08/07	11/14/07	KWG0712228	
Residual Range Organics (RRO)	**60**	J	120	3.4	1	11/08/07	11/14/07	KWG0712228	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	105	50-150	11/14/07	Acceptable
n-Triacontane	128	50-150	11/14/07	Acceptable

Comments: SR 11/4/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Diesel and Residual Range Organics

Sample Name:	PCM-21SC-071106	**Units:**	mg/Kg
Lab Code:	K0710416-005	**Basis:**	Dry
Extraction Method:	EPA 3550B	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**350**	Z	12	1.5	1	11/08/07	11/14/07	KWG0712228	
Residual Range Organics (RRO)	**270**	Z	120	3.5	1	11/08/07	11/14/07	KWG0712228	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	107	50-150	11/14/07	Acceptable
n-Triacontane	132	50-150	11/14/07	Acceptable

Comments: SC 01/14/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Diesel and Residual Range Organics

Sample Name:	PCM-15DS-071106	**Units:**	mg/Kg
Lab Code:	K0710416-008	**Basis:**	Dry
Extraction Method:	EPA 3550B	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	66	H	49	2.4	1	11/08/07	11/14/07	KWG0712228	
Residual Range Organics (RRO)	340	O	200	5.8	1	11/08/07	11/14/07	KWG0712228	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	100	50-150	11/14/07	Acceptable
n-Triacontane	99	50-150	11/14/07	Acceptable

Comments: SC 11/4/08

LDC #: 18053A8 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/10/08
SDG #: K0710416 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Diesel Range Organics & Residual Range Organics (NWTPH-Dx)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/6/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	ICV ≤ 15
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	client specified
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

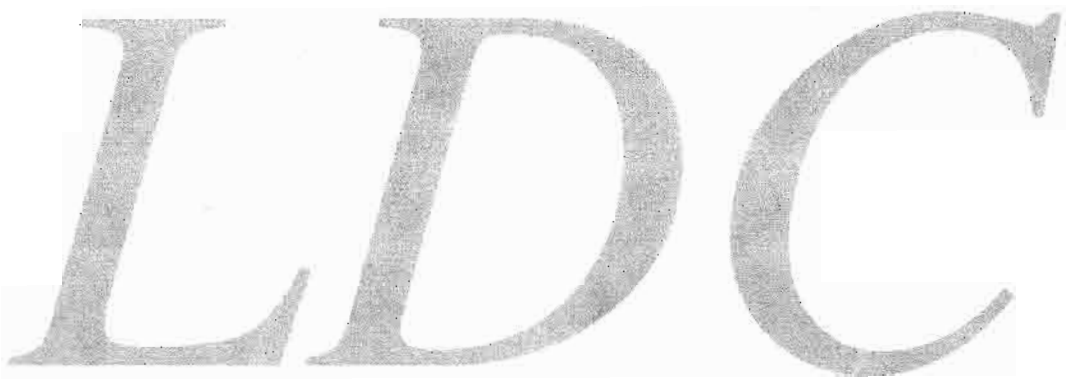
Validated Samples: SOIL Sediment

1	PCM-03SC-071106	11	KWG0712228-6	21		31	
2	PCM-06SC-071106	12		22		32	
3	PCM-21SC-071106	13		23		33	
4	PCM-15DS-071106	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

NW Natural Gasco Site
Data Validation Reports
LDC# 18053

Butyltins



Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 6, 2007
LDC Report Date:	January 11, 2008
Matrix:	Sediment
Parameters:	Butyltins
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710416

Sample Identification

PCM-15DS-071106
PCM-15DS-071106MS
PCM-15DS-071106MSD

Introduction

This data review covers 3 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per Krone Method for Butyltins.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and the confirmation column as required by this method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at the required frequencies.

The percent differences (%D) of continuing standard mixtures were within the 25.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No organotin contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
PCM-15DS-071106MS/MSD (PCM-15DS-071106)	n-Butyltin	9 (50-140)	12 (50-140)	-	J (all detects) UJ (all non-detects)	A

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

The sample results for detected compounds from the two columns were within 40% relative percent difference (RPD) with the following exceptions:

Sample	Compound	RPD	Flag	A or P
PCM-15DS-071106	n-Butyltin	50	J (all detects)	A

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to MS/MSD %R and compound quantitation RPD problems, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Butyltins - Data Qualification Summary - SDG K0710416

SDG	Sample	Compound	Flag	A or P	Reason
K0710416	PCM-15DS-071106	n-Butyltin	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)
K0710416	PCM-15DS-071106	n-Butyltin	J (all detects)	A	Compound quantitation and CRQLs (RPD)

NW Natural Gasco Site
Butyltins - Laboratory Blank Data Qualification Summary - SDG K0710416

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Butyltins (as cation)

Sample Name:	PCM-15DS-071106	**Units:**	ug/Kg
Lab Code:	K0710416-008	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	Krone		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.0	0.14	1	11/13/07	11/20/07	KWG0712329	
Tri-n-butyltin	**2.7**		2.0	0.12	1	11/13/07	11/20/07	KWG0712329	
Di-n-butyltin	**2.0**	J	2.0	0.056	1	11/13/07	11/20/07	KWG0712329	
n-Butyltin	**0.77**	JP	J8,12 2.0	0.060	1	11/13/07	11/20/07	KWG0712329	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	56	10-116	11/20/07	Acceptable

Comments: 8/14/8

LDC #: 18053A19 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/10/08
SDG #: K0710416 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Butyltins (Krone Method)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/6/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	%D/ICV ≤ 25
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	SW	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	SW	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples: Soil + Sediment

1	PCM-15DS-071106	11	KWG0712329-4	21		31	
2	PCM-15DS-071106MS	12		22		32	
3	PCM-15DS-071106MSD	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 18053A19
SDG #: see cover

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: PT
2nd Reviewer:

METHOD: X GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG?
Y N N/A Was an MS/MSD analyzed every 20 samples for each matrix or whenever a sample extraction was performed?
Y N N/A Were the MS/MSD percent recoveries (%R) and relative percent differences (RPD) within QC limits?

#	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
	2 + 3	n-Butyltin	9 (50-140)	12 (50-140)	( )	1	J | UJ / A
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		
			( )	( )	( )		

LDC #: 18053A19
SDG #: fee canyon

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: [illegible]
2nd Reviewer: _____

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?

Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?

#	Compound Name	% RPP Bet 2 column Finding	Associated Samples	Qualifications
	n-Butyltin	50	1	J/A dil

Comments: See sample calculation verification worksheet for recalculations

NW Natural Gasco Site
Data Validation Reports
LDC# 18053

Chlorinated Phenols

LDC

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 6, 2007
LDC Report Date:	January 11, 2008
Matrix:	Sediment
Parameters:	Chlorinated Phenols
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710416

Sample Identification

PCM-15DS-071106

Introduction

This data review covers one sediment sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8151M for Chlorinated Phenols.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

b. Calibration Verification

Calibration verification was performed at the required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated phenol contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/(Matrix Spike) Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the level III data validation all results are considered valid and usable for all purposes.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Chlorinated Phenols - Data Qualification Summary - SDG K0710416

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Chlorinated Phenols - Laboratory Blank Data Qualification Summary - SDG K0710416

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710416
Project:	Gasco Long-Term Monitoring Year 1 Event 2/000029-02 BG12 T17.4	**Date Collected:**	11/06/2007
Sample Matrix:	Sediment	**Date Received:**	11/07/2007

Chlorinated Phenols

Sample Name:	PCM-15DS-071106	**Units:**	ug/Kg
Lab Code:	K0710416-008	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
2,4,6-Trichlorophenol	ND	U	9.4	0.21	1	11/13/07	12/12/07	KWG0712416	
2,4,5-Trichlorophenol	ND	U	9.4	1.1	1	11/13/07	12/12/07	KWG0712416	
2,3,4,5-Tetrachlorophenol	ND	U	9.4	0.40	1	11/13/07	12/12/07	KWG0712416	
2,3,5,6-Tetrachlorophenol†	ND	U	9.4	0.32	1	11/13/07	12/12/07	KWG0712416	
Pentachlorophenol	ND	Ui	9.4	4.8	1	11/13/07	12/12/07	KWG0712416	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	88	21-128	12/12/07	Acceptable

† **Analyte Comments**

2,3,5,6-Tetrachlorophenol	This analyte cannot be separated from 2,3,4,6-Tetrachlorophenol.

Comments:

LDC #: 18053A33

SDG #: K0710416

Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 1/19/09

Page: 1 of 1

Reviewer: [illegible]

2nd Reviewer: [illegible]

METHOD: GC Phenols (EPA SW 846 Method 8151M)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/6/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	ICV ≤ 15
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	~~not~~ → client specified
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: ~~SOH~~ Sediment

1	PCM-15DS-071106	11	KWG0171241b-4	21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

Anchor Environmental, LLC
1423 3rd Avenue, Suite 300
Seattle, WA 98101-2226
ATTN: Ms. Joy Dunay

February 6, 2008

SUBJECT: NW Natural Gasco Pilot Cap Monitoring Year 1, Data Validation

Dear Ms. Dunay,

Enclosed are the final validation reports for the fractions listed below. These SDGs were received on January 16, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 18144:

SDG #	Fraction
K0710375, K0710558, K0710470	Volatiles, Semivolatiles, Polynuclear Aromatic Hydrocarbons, Chlorinated Pesticides, Polychlorinated Biphenyls, Metals, Herbicides, Wet Chemistry, Gasoline Range Organics, Diesel Range Organics & Residual Range Organics, Butyltins, Chlorinated Phenols

The data validation was performed under EPA Level III guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999
- USEPA, Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, October 2004
- 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

Please feel free to contact us if you have any questions.

Sincerely,

Stella S. Cuenco
Project Manager/Senior Chemist

EDD

Attachment 1

15,364 Pages-CD

LDC #18144 (Anchor Environmental-Seattle WA / NW Natural - Gasco Pilot Cap Monitoring Year 1)

LDC	SDG#	DATE REC'D	(3) DATE DUE	VOA (8260B)		BTEX (8260B)		SVOA (8270C)		PAHs (8270C -SIM)		Pest. (8081A)		PCBs (8082)		Metals (SW846)		Fe (6010B)		Diss. Fe (6010B)		Herbs. (8151A)		Chlor. Phenols (8151M)		Butyl -tins (Krone)		GRO (NWTPH -Gx)		DRO RRO (Dx)							
Matrix:	Water/Sediment			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K0710375	01/16/08	02/06/08	0	3	2	2	0	3	1	5	0	5	0	5	0	5	1	0	1	0	0	3	0	3	0	3	0	5	0	5						
B	K0710558	01/16/08	02/06/08	-	-	19	1	-	-	18	1	2	1	2	1	3	1	16	0	1	0	-	-	-	-	-	-	2	1	2	1						
C	K0710470	01/16/08	02/06/08	0	1	3	3	0	1	2	4	0	4	0	4	0	4	2	0	2	0	0	1	0	1	0	1	0	4	0	4						
Total	T/SC			0	4	24	6	0	4	21	10	2	10	2	10	3	10	19	0	4	0	0	4	0	4	0	4	2	10	2	10	0	0	0	0	0	165

LDC #18144 (Anchor Environmental-Seattle WA / NW Natural - Gasco Pilot Cap Monitoring Year 1)

LDC	SDG#	DATE REC'D	(3) DATE DUE	NH_3-N (350.1 Plumb)		T.CN- (9012A /4500)		Diss. CN- (4500)		Free CN- (D4282)		Amen. CN- (4500)		Cr(VI) (7196A)		Part. Size (PSEP)		S= (9030M /4500)		DOC (5310C)		TOC (PSEP 5310C)		Total Solids (160.3)		TSS (2540D)											
Matrix:	Water/Sediment			W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	K0710375	01/16/08	02/06/08	0	3	1	2	1	0	1	0	1	0	0	3	0	5	1	3	1	0	1	5	0	5	-	-										
B	K0710558	01/16/08	02/06/08	-	-	18	1	1	0	18	0	18	0	-	-	0	1	14	0	14	0	14	1	0	1	13	0										
C	K0710470	01/16/08	02/06/08	0	1	2	3	2	0	2	0	2	0	0	1	0	4	2	1	2	0	2	4	0	4	-	-										
Total	T/SC			0	4	21	6	4	0	21	0	21	0	0	4	0	10	17	4	17	0	17	10	0	10	13	0	0	0	0	0	0	0	0	0	0	179

Shaded cells indicate Level IV validation (all other cells are Level III validation). These sample counts do not include MS, MSD, or DUP's.

NW Natural Gasco Site
Data Validation Reports
LDC# 18144

Volatiles

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 5, 2007
LDC Report Date:	January 31, 2008
Matrix:	Sediment/Water
Parameters:	Volatiles
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710375

Sample Identification

PCM-09SC-071105
PCM-09PW-071105
PCM-10SC-071105
PCM-02DS-071105
PCM-06DS-071105
PCM-09DS-071105
PCM-TB-071105
PCM-10SC-071105MS
PCM-10SC-071105MSD

Introduction

This data review covers 7 sediment samples and 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all volatile target compounds and system performance check compounds (SPCCs) were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/7/07	Acrolein Vinyl acetate 2-Butanone	0.0259 (≥0.05) 0.0415 (≥0.05) 0.0203 (>0.05)	PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105 KWG0712399-5 KWG0712458-5	J (all detects) UJ (all non-detects)	A

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/12/07	Iodomethane Dichlorodifluoromethane	44 35	PCM-02DS-071105 PCM-06DS-071105 PCM-10SC-071105MS PCM-10SC-071105MSD KWG0712399-5	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/13/07	Iodomethane	26	PCM-09DS-071105 KWG0712458-5	J (all detects) UJ (all non-detects)	A

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/7/07	Vinyl acetate Acetone	37 26	PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105 KWG0712399-5 KWG0712458-5	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

All of the continuing calibration RRF values were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/12/07	Vinyl acetate 2-Butanone	0.0365 (≥0.05) 0.0184 (≥0.05)	PCM-02DS-071105 PCM-06DS-071105 PCM-10SC-071105MS PCM-10SC-071105MSD KWG0712399-5	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A
11/13/07	Acrolein	0.0260 (≥0.05)	PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105 KWG0712458-5	J (all detects) UJ (all non-detects)	A
11/13/07	Vinyl acetate 2-Butanone	0.0444 (≥0.05) 0.0218 (≥0.05)	PCM-09DS-071105 KWG0712458-5	J (all detects) UJ (all non-detects)	A

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polynuclear aromatic hydrocarbon contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Analysis Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
KWG0712399-5	11/12/07	Methylene chloride Acetone Iodomethane 1,4-Dichlorobenzene	1.0 ug/Kg 4.7 ug/Kg 12 ug/Kg 0.27 ug/Kg	PCM-02DS-071105 PCM-06DS-071105
KWG0712458-5	11/13/07	Methylene chloride Acetone Iodomethane 1,4-Dichlorobenzene	1.8 ug/Kg 4.3 ug/Kg 9.2 ug/Kg 0.18 ug/Kg	PCM-09DS-071105

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
PCM-02DS-071105	Methylene chloride Acetone Iodomethane 1,4-Dichlorobenzene	4.0 ug/Kg 19 ug/Kg 24 ug/Kg 1.1 ug/Kg	14U ug/Kg 56U ug/Kg 56U ug/Kg 2.8U ug/Kg
PCM-06DS-071105	Methylene chloride Acetone Iodomethane	4.0 ug/Kg 16 ug/Kg 21 ug/Kg	12U ug/Kg 45U ug/Kg 45U ug/Kg
PCM-09DS-071105	Methylene chloride Acetone Iodomethane	8.7 ug/Kg 10 ug/Kg 2.3 ug/Kg	11U ug/Kg 41U ug/Kg 41U ug/Kg

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to calibration RRF and %D problems, data were qualified as estimated in three samples.

Due to method blank contamination problems, data were qualified as not detected in three samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

Sample PCM-TB-071107 was identified as a trip blank. No volatile contaminants were found in this blank.

NW Natural Gasco Site
Volatiles - Data Qualification Summary - SDG K0710375

SDG	Sample	Compound	Flag	A or P	Reason
K0710375	PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105	Acrolein Vinyl acetate 2-Butanone	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
K0710375	PCM-02DS-071105 PCM-06DS-071105	Iodomethane Dichlorodifluoromethane	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
K0710375	PCM-09DS-071105	Iodomethane	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
K0710375	PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105	Vinyl acetate Acetone	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
K0710375	PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105	Vinyl acetate 2-Butanone Acrolein	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)

NW Natural Gasco Site
Volatiles - Laboratory Blank Data Qualification Summary - SDG K0710375

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
K0710375	PCM-02DS-071105	Methylene chloride Acetone Iodomethane 1,4-Dichlorobenzene	14U ug/Kg 56U ug/Kg 56U ug/Kg 2.8U ug/Kg	A
K0710375	PCM-06DS-071105	Methylene chloride Acetone Iodomethane	12U ug/Kg 45U ug/Kg 45U ug/Kg	A
K0710375	PCM-09DS-071105	Methylene chloride Acetone Iodomethane	11U ug/Kg 41U ug/Kg 41U ug/Kg	A

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612.T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Pore water	**Date Received:**	11/06/2007

Volatile Organics by GC/MS

Sample Name:	PCM-09PW-071105	**Units:**	ug/L
Lab Code:	K0710375-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	94	D	1.3	0.34	2.5	11/14/07	11/14/07	KWG0712484	
Toluene	1.2	JD	1.3	0.27	2.5	11/14/07	11/14/07	KWG0712484	
Ethylbenzene	6.4	D	1.3	0.33	2.5	11/14/07	11/14/07	KWG0712484	
m,p-Xylenes	3.5	D	1.3	0.55	2.5	11/14/07	11/14/07	KWG0712484	
o-Xylene	5.5	D	1.3	0.26	2.5	11/14/07	11/14/07	KWG0712484	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	112	87-120	11/14/07	Acceptable
Dibromofluoromethane	114	82-125	11/14/07	Acceptable
4-Bromofluorobenzene	99	73-118	11/14/07	Acceptable

Comments: K13108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Pore water	**Date Received:**	11/06/2007

Volatile Organics by GC/MS

Sample Name:	PCM-TB-071105	**Units:**	ug/L
Lab Code:	K0710375-007	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	11/14/07	11/14/07	KWG0712533	
Toluene	ND	U	0.50	0.11	1	11/14/07	11/14/07	KWG0712533	
Ethylbenzene	ND	U	0.50	0.13	1	11/14/07	11/14/07	KWG0712533	
m,p-Xylenes	ND	U	0.50	0.22	1	11/14/07	11/14/07	KWG0712533	
o-Xylene	ND	U	0.50	0.11	1	11/14/07	11/14/07	KWG0712533	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	93	87-120	11/14/07	Acceptable
Dibromofluoromethane	92	82-125	11/14/07	Acceptable
4-Bromofluorobenzene	86	73-118	11/14/07	Acceptable

Comments: 1/0/3/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Volatile Organic Compounds

Sample Name:	PCM-09SC-071105	**Units:**	ug/Kg
Lab Code:	K0710375-001	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	1.4	0.11	1	11/12/07	11/12/07	KWG0712399	
Toluene	ND	U	1.4	0.18	1	11/12/07	11/12/07	KWG0712399	
Ethylbenzene	ND	U	1.4	0.090	1	11/12/07	11/12/07	KWG0712399	
m,p-Xylenes	**0.25**	J	1.4	0.21	1	11/12/07	11/12/07	KWG0712399	
o-Xylene	**0.34**	J	1.4	0.079	1	11/12/07	11/12/07	KWG0712399	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	91	69-115	11/12/07	Acceptable
Toluene-d8	96	64-128	11/12/07	Acceptable
4-Bromofluorobenzene	94	54-129	11/12/07	Acceptable

Comments: RCD 3/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Volatile Organic Compounds

Sample Name:	PCM-10SC-071105	**Units:**	ug/Kg
Lab Code:	K0710375-003	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	1.1	0.086	1	11/12/07	11/12/07	KWG0712399	
Toluene	ND	U	1.1	0.15	1	11/12/07	11/12/07	KWG0712399	
Ethylbenzene	ND	U	1.1	0.071	1	11/12/07	11/12/07	KWG0712399	
m,p-Xylenes	ND	U	1.1	0.17	1	11/12/07	11/12/07	KWG0712399	
o-Xylene	ND	U	1.1	0.062	1	11/12/07	11/12/07	KWG0712399	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	93	69-115	11/12/07	Acceptable
Toluene-d8	97	64-128	11/12/07	Acceptable
4-Bromofluorobenzene	95	54-129	11/12/07	Acceptable

Comments: 12/31/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Volatile Organic Compounds

Sample Name:	PCM-02DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-004	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Acrolein	ND	U UJ5	14	3.8	1	11/13/07	11/13/07	KWG0712458	
Iodomethane (Methyl Iodide)	**24**	J J56	56 UJ	0.97 5,7	1	11/12/07	11/12/07	KWG0712399	*
Methyl tert-Butyl Ether	ND	U	2.8	0.18	1	11/12/07	11/12/07	KWG0712399	
Acrylonitrile	ND	U	5.6	1.3	1	11/12/07	11/12/07	KWG0712399	
Vinyl Acetate	ND	U UJ5	7.0	2.7	1	11/12/07	11/12/07	KWG0712399	
1,2-Dichloropropane	ND	U	2.8	0.26	1	11/12/07	11/12/07	KWG0712399	
Dibromomethane	ND	U	2.8	0.42	1	11/12/07	11/12/07	KWG0712399	
2-Chloroethyl Vinyl Ether	ND	U	7.0	0.86	1	11/12/07	11/12/07	KWG0712399	
1,2-Dibromoethane (EDB)	ND	U	2.8	0.26	1	11/12/07	11/12/07	KWG0712399	
1,1,1,2-Tetrachloroethane	ND	U	2.8	0.22	1	11/12/07	11/12/07	KWG0712399	
trans-1,4-Dichloro-2-butene	ND	U	7.0	1.2	1	11/12/07	11/12/07	KWG0712399	
1,2,3-Trichloropropane	ND	U	7.0	0.81	1	11/12/07	11/12/07	KWG0712399	
Dichlorodifluoromethane	ND	U UJ5	2.8	0.19	1	11/12/07	11/12/07	KWG0712399	
Chloromethane	ND	U	2.8	0.31	1	11/12/07	11/12/07	KWG0712399	
Vinyl Chloride	ND	U	2.8	0.26	1	11/12/07	11/12/07	KWG0712399	
Bromomethane	ND	U	14	1.5	1	11/12/07	11/12/07	KWG0712399	
Chloroethane	ND	U	2.8	0.67	1	11/12/07	11/12/07	KWG0712399	
Trichlorofluoromethane	ND	U	2.8	0.31	1	11/12/07	11/12/07	KWG0712399	
Acetone	**19**	J J56UJ	56 5,7	5.0	1	11/12/07	11/12/07	KWG0712399	
1,1-Dichloroethene	ND	U	2.8	0.16	1	11/12/07	11/12/07	KWG0712399	
Carbon Disulfide	ND	U	2.8	0.16	1	11/12/07	11/12/07	KWG0712399	
Methylene Chloride	**4.0**	J 14U7	14	0.39	1	11/12/07	11/12/07	KWG0712399	
trans-1,2-Dichloroethene	ND	U	2.8	0.24	1	11/12/07	11/12/07	KWG0712399	
1,1-Dichloroethane	ND	U	2.8	0.19	1	11/12/07	11/12/07	KWG0712399	
2-Butanone (MEK)	ND	U UJ5	14	3.1	1	11/12/07	11/12/07	KWG0712399	
Chloroform	ND	U	2.8	0.18	1	11/12/07	11/12/07	KWG0712399	
1,1,1-Trichloroethane (TCA)	ND	U	2.8	0.19	1	11/12/07	11/12/07	KWG0712399	
Carbon Tetrachloride	ND	U	2.8	0.20	1	11/12/07	11/12/07	KWG0712399	
1,2-Dichloroethane (EDC)	ND	U	2.8	0.16	1	11/12/07	11/12/07	KWG0712399	
Benzene	**310**		2.8	0.22	1	11/12/07	11/12/07	KWG0712399	
Trichloroethene (TCE)	ND	U	2.8	0.20	1	11/12/07	11/12/07	KWG0712399	
Bromodichloromethane	ND	U	2.8	0.31	1	11/12/07	11/12/07	KWG0712399	
2-Hexanone	ND	U	28	1.7	1	11/12/07	11/12/07	KWG0712399	

Comments: R20131108

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Volatile Organic Compounds

Sample Name:	PCM-02DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-004	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
cis-1,3-Dichloropropene	ND	U	2.8	0.16	1	11/12/07	11/12/07	KWG0712399	
Toluene	**1.9**	J	2.8	0.36	1	11/12/07	11/12/07	KWG0712399	
trans-1,3-Dichloropropene	ND	U	2.8	0.26	1	11/12/07	11/12/07	KWG0712399	
1,1,2-Trichloroethane	ND	U	2.8	0.31	1	11/12/07	11/12/07	KWG0712399	
4-Methyl-2-pentanone (MIBK)	ND	U	5.6	0.61	1	11/12/07	11/12/07	KWG0712399	
Bromochloromethane	ND	U	2.8	0.50	1	11/12/07	11/12/07	KWG0712399	
Tetrachloroethene (PCE)	ND	U	2.8	0.22	1	11/12/07	11/12/07	KWG0712399	
Dibromochloromethane	ND	U	2.8	0.27	1	11/12/07	11/12/07	KWG0712399	
Chlorobenzene	ND	U	2.8	0.15	1	11/12/07	11/12/07	KWG0712399	
Ethylbenzene	**3.8**		2.8	0.18	1	11/12/07	11/12/07	KWG0712399	
m,p-Xylenes	**6.0**		2.8	0.42	1	11/12/07	11/12/07	KWG0712399	
o-Xylene	**20**		2.8	0.16	1	11/12/07	11/12/07	KWG0712399	
Styrene	**1.2**	J	2.8	0.19	1	11/12/07	11/12/07	KWG0712399	
Bromoform	ND	U	2.8	0.53	1	11/12/07	11/12/07	KWG0712399	
Isopropylbenzene	**5.1**		2.8	0.14	1	11/12/07	11/12/07	KWG0712399	
1,1,2,2-Tetrachloroethane	ND	U	2.8	0.31	1	11/12/07	11/12/07	KWG0712399	
1,4-Dichlorobenzene	**1.1**	J 2.8U7	2.8	0.28	1	11/12/07	11/12/07	KWG0712399	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	92	69-115	11/12/07	Acceptable
Toluene-d8	93	64-128	11/12/07	Acceptable
4-Bromofluorobenzene	86	54-129	11/12/07	Acceptable

Comments: 12/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 TI7.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Volatile Organic Compounds

Sample Name:	PCM-06DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-005	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Iodomethane (Methyl Iodide)	21	J UJ 45	45 UJ	0.78 5,7	1	11/12/07	11/12/07	KWG0712399	*
Methyl tert-Butyl Ether	ND	U	2.3	0.15	1	11/12/07	11/12/07	KWG0712399	
Acrylonitrile	ND	U	4.5	1.1	1	11/12/07	11/12/07	KWG0712399	
Vinyl Acetate	ND	U UJ	5.6	2.2	1	11/12/07	11/12/07	KWG0712399	
1,2-Dichloropropane	ND	U	2.3	0.21	1	11/12/07	11/12/07	KWG0712399	
Dibromomethane	ND	U	2.3	0.34	1	11/12/07	11/12/07	KWG0712399	
2-Chloroethyl Vinyl Ether	ND	U	5.6	0.69	1	11/12/07	11/12/07	KWG0712399	
1,2-Dibromoethane (EDB)	ND	U	2.3	0.21	1	11/12/07	11/12/07	KWG0712399	
1,1,1,2-Tetrachloroethane	ND	U	2.3	0.17	1	11/12/07	11/12/07	KWG0712399	
trans-1,4-Dichloro-2-butene	ND	U	5.6	0.91	1	11/12/07	11/12/07	KWG0712399	
1,2,3-Trichloropropane	ND	U	5.6	0.65	1	11/12/07	11/12/07	KWG0712399	
Acrolein	ND	U UJ	15	3.9	1	11/13/07	11/13/07	KWG0712458	
Dichlorodifluoromethane	ND	U ↓	2.3	0.15	1	11/12/07	11/12/07	KWG0712399	
Chloromethane	ND	U	2.3	0.25	1	11/12/07	11/12/07	KWG0712399	
Vinyl Chloride	ND	U	2.3	0.21	1	11/12/07	11/12/07	KWG0712399	
Bromomethane	ND	U	12	1.2	1	11/12/07	11/12/07	KWG0712399	
Chloroethane	ND	U	2.3	0.54	1	11/12/07	11/12/07	KWG0712399	
Trichlorofluoromethane	ND	U	2.3	0.25	1	11/12/07	11/12/07	KWG0712399	
Acetone	16	J 45 UJ	45 5,7	4.0	1	11/12/07	11/12/07	KWG0712399	
1,1-Dichloroethene	ND	U	2.3	0.13	1	11/12/07	11/12/07	KWG0712399	
Carbon Disulfide	ND	U	2.3	0.13	1	11/12/07	11/12/07	KWG0712399	
Methylene Chloride	4.0	J 12 UJ	12	0.32	1	11/12/07	11/12/07	KWG0712399	
trans-1,2-Dichloroethene	ND	U	2.3	0.19	1	11/12/07	11/12/07	KWG0712399	
1,1-Dichloroethane	ND	U	2.3	0.16	1	11/12/07	11/12/07	KWG0712399	
2-Butanone (MEK)	ND	U UJ	12	2.5	1	11/12/07	11/12/07	KWG0712399	
Chloroform	ND	U	2.3	0.14	1	11/12/07	11/12/07	KWG0712399	
1,1,1-Trichloroethane (TCA)	ND	U	2.3	0.15	1	11/12/07	11/12/07	KWG0712399	
Carbon Tetrachloride	ND	U	2.3	0.16	1	11/12/07	11/12/07	KWG0712399	
1,2-Dichloroethane (EDC)	ND	U	2.3	0.13	1	11/12/07	11/12/07	KWG0712399	
Benzene	ND	U	2.3	0.18	1	11/12/07	11/12/07	KWG0712399	
Trichloroethene (TCE)	ND	U	2.3	0.16	1	11/12/07	11/12/07	KWG0712399	
Bromodichloromethane	ND	U	2.3	0.25	1	11/12/07	11/12/07	KWG0712399	
2-Hexanone	ND	U	23	1.4	1	11/12/07	11/12/07	KWG0712399	

Comments: R 1/3/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Volatile Organic Compounds

Sample Name:	PCM-06DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-005	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
cis-1,3-Dichloropropene	ND	U	2.3	0.13	1	11/12/07	11/12/07	KWG0712399	
Toluene	ND	U	2.3	0.29	1	11/12/07	11/12/07	KWG0712399	
trans-1,3-Dichloropropene	ND	U	2.3	0.21	1	11/12/07	11/12/07	KWG0712399	
1,1,2-Trichloroethane	ND	U	2.3	0.25	1	11/12/07	11/12/07	KWG0712399	
4-Methyl-2-pentanone (MIBK)	ND	U	4.5	0.49	1	11/12/07	11/12/07	KWG0712399	
Bromochloromethane	ND	U	2.3	0.40	1	11/12/07	11/12/07	KWG0712399	
Tetrachloroethene (PCE)	ND	U	2.3	0.17	1	11/12/07	11/12/07	KWG0712399	
Dibromochloromethane	ND	U	2.3	0.22	1	11/12/07	11/12/07	KWG0712399	
Chlorobenzene	ND	U	2.3	0.12	1	11/12/07	11/12/07	KWG0712399	
Ethylbenzene	ND	U	2.3	0.15	1	11/12/07	11/12/07	KWG0712399	
m,p-Xylenes	ND	U	2.3	0.34	1	11/12/07	11/12/07	KWG0712399	
o-Xylene	**0.60**	J	2.3	0.13	1	11/12/07	11/12/07	KWG0712399	
Styrene	ND	U	2.3	0.15	1	11/12/07	11/12/07	KWG0712399	
Bromoform	ND	U	2.3	0.43	1	11/12/07	11/12/07	KWG0712399	
Isopropylbenzene	ND	U	2.3	0.12	1	11/12/07	11/12/07	KWG0712399	
1,1,2,2-Tetrachloroethane	ND	U	2.3	0.25	1	11/12/07	11/12/07	KWG0712399	
1,4-Dichlorobenzene	ND	U	2.3	0.23	1	11/12/07	11/12/07	KWG0712399	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	90	69-115	11/12/07	Acceptable
Toluene-d8	93	64-128	11/12/07	Acceptable
4-Bromofluorobenzene	85	54-129	11/12/07	Acceptable

Comments: 12/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Volatile Organic Compounds

Sample Name:	PCM-09DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-006	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Acrolein	ND	U UJ5	13	3.5	1	11/13/07	11/13/07	KWG0712458	
Iodomethane (Methyl Iodide)	**2.3**	J J8 41	41 UJ	0.725,7	1	11/13/07	11/13/07	KWG0712458	
Methyl tert-Butyl Ether	ND	U	2.1	0.14	1	11/13/07	11/13/07	KWG0712458	
Acrylonitrile	ND	U	4.1	0.95	1	11/13/07	11/13/07	KWG0712458	
Vinyl Acetate	ND	U UJ5	5.2	2.0	1	11/13/07	11/13/07	KWG0712458	
1,2-Dichloropropane	ND	U	2.1	0.20	1	11/13/07	11/13/07	KWG0712458	
Dibromomethane	ND	U	2.1	0.31	1	11/13/07	11/13/07	KWG0712458	
2-Chloroethyl Vinyl Ether	ND	U	5.2	0.64	1	11/13/07	11/13/07	KWG0712458	
1,2-Dibromoethane (EDB)	ND	U	2.1	0.20	1	11/13/07	11/13/07	KWG0712458	
1,1,1,2-Tetrachloroethane	ND	U	2.1	0.16	1	11/13/07	11/13/07	KWG0712458	
trans-1,4-Dichloro-2-butene	ND	U	5.2	0.85	1	11/13/07	11/13/07	KWG0712458	
1,2,3-Trichloropropane	ND	U	5.2	0.60	1	11/13/07	11/13/07	KWG0712458	
Dichlorodifluoromethane	ND	U	2.1	0.14	1	11/13/07	11/13/07	KWG0712458	
Chloromethane	ND	U	2.1	0.23	1	11/13/07	11/13/07	KWG0712458	
Vinyl Chloride	ND	U	2.1	0.20	1	11/13/07	11/13/07	KWG0712458	
Bromomethane	ND	U	11	1.1	1	11/13/07	11/13/07	KWG0712458	
Chloroethane	ND	U	2.1	0.50	1	11/13/07	11/13/07	KWG0712458	
Trichlorofluoromethane	ND	U	2.1	0.23	1	11/13/07	11/13/07	KWG0712458	
Acetone	**10**	J 41 UJ	41 5,7	3.7	1	11/13/07	11/13/07	KWG0712458	
1,1-Dichloroethene	ND	U	2.1	0.12	1	11/13/07	11/13/07	KWG0712458	
Carbon Disulfide	ND	U	2.1	0.12	1	11/13/07	11/13/07	KWG0712458	
Methylene Chloride	**8.7**	J 11 UJ	11	0.29	1	11/13/07	11/13/07	KWG0712458	
trans-1,2-Dichloroethene	ND	U	2.1	0.18	1	11/13/07	11/13/07	KWG0712458	
1,1-Dichloroethane	ND	U	2.1	0.14	1	11/13/07	11/13/07	KWG0712458	
2-Butanone (MEK)	ND	U UJ5	11	2.3	1	11/13/07	11/13/07	KWG0712458	
Chloroform	ND	U	2.1	0.13	1	11/13/07	11/13/07	KWG0712458	
1,1,1-Trichloroethane (TCA)	ND	U	2.1	0.14	1	11/13/07	11/13/07	KWG0712458	
Carbon Tetrachloride	ND	U	2.1	0.15	1	11/13/07	11/13/07	KWG0712458	
1,2-Dichloroethane (EDC)	ND	U	2.1	0.12	1	11/13/07	11/13/07	KWG0712458	
Benzene	ND	U	2.1	0.17	1	11/13/07	11/13/07	KWG0712458	
Trichloroethene (TCE)	ND	U	2.1	0.15	1	11/13/07	11/13/07	KWG0712458	
Bromodichloromethane	ND	U	2.1	0.23	1	11/13/07	11/13/07	KWG0712458	
2-Hexanone	ND	U	21	1.3	1	11/13/07	11/13/07	KWG0712458	

Comments: R 01308

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Volatile Organic Compounds

Sample Name:	PCM-09DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-006	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
cis-1,3-Dichloropropene	ND	U	2.1	0.12	1	11/13/07	11/13/07	KWG0712458	
Toluene	ND	U	2.1	0.27	1	11/13/07	11/13/07	KWG0712458	
trans-1,3-Dichloropropene	ND	U	2.1	0.20	1	11/13/07	11/13/07	KWG0712458	
1,1,2-Trichloroethane	ND	U	2.1	0.23	1	11/13/07	11/13/07	KWG0712458	
4-Methyl-2-pentanone (MIBK)	ND	U	4.1	0.46	1	11/13/07	11/13/07	KWG0712458	
Bromochloromethane	ND	U	2.1	0.37	1	11/13/07	11/13/07	KWG0712458	
Tetrachloroethene (PCE)	ND	U	2.1	0.16	1	11/13/07	11/13/07	KWG0712458	
Dibromochloromethane	ND	U	2.1	0.20	1	11/13/07	11/13/07	KWG0712458	
Chlorobenzene	ND	U	2.1	0.11	1	11/13/07	11/13/07	KWG0712458	
Ethylbenzene	ND	U	2.1	0.14	1	11/13/07	11/13/07	KWG0712458	
m,p-Xylenes	ND	U	2.1	0.31	1	11/13/07	11/13/07	KWG0712458	
o-Xylene	ND	U	2.1	0.12	1	11/13/07	11/13/07	KWG0712458	
Styrene	ND	U	2.1	0.14	1	11/13/07	11/13/07	KWG0712458	
Bromoform	ND	U	2.1	0.39	1	11/13/07	11/13/07	KWG0712458	
Isopropylbenzene	ND	U	2.1	0.11	1	11/13/07	11/13/07	KWG0712458	
1,1,2,2-Tetrachloroethane	ND	U	2.1	0.23	1	11/13/07	11/13/07	KWG0712458	
1,4-Dichlorobenzene	ND	U	2.1	0.21	1	11/13/07	11/13/07	KWG0712458	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	95	69-115	11/13/07	Acceptable
Toluene-d8	92	64-128	11/13/07	Acceptable
4-Bromofluorobenzene	85	54-129	11/13/07	Acceptable

Comments: 12/3/08

LDC #: 18144A1 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/30/08
SDG #: K0710375 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: 9
2nd Reviewer: M

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/5/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	RSD, r^2
IV.	Continuing calibration ICV	SW	2570
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS 1-3
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	ND	TB = 7

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:

1	PCM-09SC-071105 Soil	11	KWG0712484-4	21		31	
2	PCM-09PW-071105 W	12	KWG0712533-4	22		32	
3	PCM-10SC-071105 Soil	13	KWG0712399-5	23		33	
4	PCM-02DS-071105	14	KWG0712458-5	24		34	
5	PCM-06DS-071105	15		25		35	
6	PCM-09DS-071105	16		26		36	
7	PCM-TB-071105 W	17		27		37	
8	PCM-10SC-071105MS Soil	18		28		38	
9	PCM-10SC-071105MSD	19		29		39	
10		20		30		40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform*	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene*	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform**	EE. Ethylbenzene**	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane**	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

* = System performance check compounds (SPCC) for RRF ; ** = Calibration check compounds (CCC) for %RSD.

LDC #: 18144A1
SDG #: K0710375

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: Q
2nd Reviewer: A

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(N) N N/A — Did the laboratory perform a 5 point calibration prior to sample analysis?
(Y) N N/A — Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
(N) N N/A — Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation? _____
(Y) N N/A — Did the initial calibration meet the acceptance criteria?
Y (N) N/A — Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/7/07	ICAL	FFFF		0.0259	4-6.	J/UH/A
			HH		0.0415	KWG0712399-5	
			M		0.0203	KWG0712458-5	

INICAL.1SB

LDC #: 18144A1
SDG #: KQ71037S

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: 9
2nd Reviewer: [signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8260)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(N) N N/A — Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?

(Y) N N/A — Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y (N) N/A — Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/7/07	110TF018 (ICV)	HH	37		4-6.	J/UJ/A
			F	26		KWG0712399-5	J
						KWG0712458-5	
	11/12/07	1112F004	~~FFFF~~	~~45~~			
			NNNN	44		4-5. 8-9	J/UJ/A
			VV	35		KWG0712399-5	J
			~~FFFF~~		~~0.0144~~		
			HH		0.0365		J/UJ/A
			M		0.0184		J
	11/13/07	1113F00L	NNNN	26		6. KWG0712458-5	J/UJ/A
			FFFF		0.0260	4-6	J
			HH		0.0444	6	
			M		0.0218	"	

CONCAL1S

LDC #: 18444A1
SDG #: K0710375

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: K

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank associated with every sample in this SDG?
Y N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 11/12/07
Conc. units: ug/kg
Associated Samples: 4-5

Compound	Blank ID	Sample Identification								
~~KWG0TP399-5~~		4	5							
Methylene chloride	1.0	4.0/4U	4.0/2.4							
Acetone	4.7	19/56U	16/45U							
~~Isomethane~~ NNNN	12	24/56U	21/45U							
HHH	0.27	1.1/5.8U								
CRQL										

Blank analysis date: 11/13/07
Conc. units: ug/kg
Associated Samples: 6

Compound	Blank ID	Sample Identification								
~~KWG0T12458-5~~		*	6							
Methylene chloride	1.8		8.7/1.4							
Acetone	4.3		10/41U							
~~Iodo~~ NNNN	9.2		2.3/41U							
HHH	0.18									
CRQL										

All results were qualified using the criteria stated below except those circled.

Note: Common contaminants such as Methylene chloride, Acetone, 2-Butanone, Carbon disulfide and TICs that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC Report# 18144B1

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NW Natural Gasco Site

Collection Date: November 8 through November 9, 2007

LDC Report Date: January 31, 2008

Matrix: Sediment/Water

Parameters: Volatiles

Validation Level: EPA Level III

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): K0710558

Sample Identification

PCM-13DSW-071109	PCM-01DSW-071109MS
PCM-01DSW-071109	PCM-01DSW-071109MSD
PCM-02DSW-071109	
PCM-03DSW-071109	
PCM-04DSW-071109	
PCM-05DSW-071109	
PCM-06DSW-071109	
PCM-21DSW-071109	
PCM-08DSW-071109	
PCM-09DSW-071109	
PCM-10DSW-071109	
PCM-08SC-071108	
PCM-08PW-071108	
PCM-TB-071108	
PCM-SCRB-071108	
PCM-PWRB-071108	
PCM-DRB-071108	
PCM-BRB-071108	
PCM-19DSW-071109	
PCM-20DSW-071109	

Introduction

This data review covers one sediment sample and 21 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles which are Benzene, Toluene, Ethylbenzene and Xylenes (BTEX).

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all volatile target compounds and system performance check compounds (SPCCs) were within method and validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration RRF values were within method and validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polynuclear aromatic hydrocarbon contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the level III data validation all results are considered valid and usable for all purposes.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

Sample PCM-TB-071108 was identified as a trip blank. No volatile contaminants were found in this blank.

Samples PCM-SCRB-071108, PCM-PWRB-071108, PCM-DRB-071108, and PCM-BRB-071108 were identified as rinsate blanks. No volatile contaminants were found in these blanks with the following exceptions:

Rinsate Blank ID	Compound	Concentration (ug/L)
PCM-SCRB-071108	Toluene m,p-Xylenes	0.63 0.28
PCM-PWRB-071108	Toluene m,p-Xylenes	0.74 0.27
PCM-DRB-071108	Toluene m,p-Xylenes	0.73 0.32
PCM-BRB-071108	Toluene m,p-Xylenes	0.66 0.35

NW Natural Gasco Site
Volatiles - Data Qualification Summary - SDG K0710558

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Volatiles - Laboratory Blank Data Qualification Summary - SDG K0710558

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Volatile Organics by GC/MS

Sample Name:	PCM-13DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-001	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**0.16**	J	0.50	0.14	1	11/17/07	11/17/07	KWG0712703	
Toluene	**0.28**	J	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	
Ethylbenzene	ND	U	0.50	0.13	1	11/17/07	11/17/07	KWG0712703	
m,p-Xylenes	ND	U	0.50	0.22	1	11/17/07	11/17/07	KWG0712703	
o-Xylene	ND	U	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	94	87-120	11/17/07	Acceptable
Dibromofluoromethane	94	82-125	11/17/07	Acceptable
4-Bromofluorobenzene	85	73-118	11/17/07	Acceptable

Comments: K0713108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Volatile Organics by GC/MS

Sample Name:	PCM-01DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	11/17/07	11/17/07	KWG0712703	
Toluene	**0.99**		0.50	0.11	1	11/17/07	11/17/07	KWG0712703	
Ethylbenzene	ND	U	0.50	0.13	1	11/17/07	11/17/07	KWG0712703	
m,p-Xylenes	ND	U	0.50	0.22	1	11/17/07	11/17/07	KWG0712703	
o-Xylene	ND	U	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	94	87-120	11/17/07	Acceptable
Dibromofluoromethane	94	82-125	11/17/07	Acceptable
4-Bromofluorobenzene	86	73-118	11/17/07	Acceptable

Comments: DC 1/3/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Volatile Organics by GC/MS

Sample Name:	PCM-02DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-003	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	11/17/07	11/17/07	KWG0712703	
Toluene	**0.12**	J	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	
Ethylbenzene	ND	U	0.50	0.13	1	11/17/07	11/17/07	KWG0712703	
m,p-Xylenes	ND	U	0.50	0.22	1	11/17/07	11/17/07	KWG0712703	
o-Xylene	ND	U	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	93	87-120	11/17/07	Acceptable
Dibromofluoromethane	93	82-125	11/17/07	Acceptable
4-Bromofluorobenzene	83	73-118	11/17/07	Acceptable

Comments: K013108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Volatile Organics by GC/MS

Sample Name:	PCM-03DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-004	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	11/17/07	11/17/07	KWG0712703	
Toluene	**0.56**		0.50	0.11	1	11/17/07	11/17/07	KWG0712703	
Ethylbenzene	ND	U	0.50	0.13	1	11/17/07	11/17/07	KWG0712703	
m,p-Xylenes	ND	U	0.50	0.22	1	11/17/07	11/17/07	KWG0712703	
o-Xylene	ND	U	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	94	87-120	11/17/07	Acceptable
Dibromofluoromethane	95	82-125	11/17/07	Acceptable
4-Bromofluorobenzene	85	73-118	11/17/07	Acceptable

Comments: 12/3108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Volatile Organics by GC/MS

Sample Name:	PCM-04DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-005	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**0.26**	**J**	0.50	0.14	1	11/17/07	11/17/07	KWG0712703	
Toluene	**0.96**		0.50	0.11	1	11/17/07	11/17/07	KWG0712703	
Ethylbenzene	ND	U	0.50	0.13	1	11/17/07	11/17/07	KWG0712703	
m,p-Xylenes	ND	U	0.50	0.22	1	11/17/07	11/17/07	KWG0712703	
o-Xylene	ND	U	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	99	87-120	11/17/07	Acceptable
Dibromofluoromethane	94	82-125	11/17/07	Acceptable
4-Bromofluorobenzene	85	73-118	11/17/07	Acceptable

Comments: RL 3108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Volatile Organics by GC/MS

Sample Name:	PCM-05DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-006	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	11/17/07	11/17/07	KWG0712703	
Toluene	0.29	J	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	
Ethylbenzene	ND	U	0.50	0.13	1	11/17/07	11/17/07	KWG0712703	
m,p-Xylenes	ND	U	0.50	0.22	1	11/17/07	11/17/07	KWG0712703	
o-Xylene	ND	U	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	94	87-120	11/17/07	Acceptable
Dibromofluoromethane	95	82-125	11/17/07	Acceptable
4-Bromofluorobenzene	85	73-118	11/17/07	Acceptable

Comments: 12/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Volatile Organics by GC/MS

Sample Name:	PCM-06DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-007	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	11/17/07	11/17/07	KWG0712703	
Toluene	ND	U	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	
Ethylbenzene	ND	U	0.50	0.13	1	11/17/07	11/17/07	KWG0712703	
m,p-Xylenes	ND	U	0.50	0.22	1	11/17/07	11/17/07	KWG0712703	
o-Xylene	ND	U	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	94	87-120	11/17/07	Acceptable
Dibromofluoromethane	94	82-125	11/17/07	Acceptable
4-Bromofluorobenzene	85	73-118	11/17/07	Acceptable

Comments: PC 12/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Volatile Organics by GC/MS

Sample Name:	PCM-21DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-008	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**0.16**	J	0.50	0.14	1	11/17/07	11/17/07	KWG0712703	
Toluene	**0.19**	J	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	
Ethylbenzene	ND	U	0.50	0.13	1	11/17/07	11/17/07	KWG0712703	
m,p-Xylenes	ND	U	0.50	0.22	1	11/17/07	11/17/07	KWG0712703	
o-Xylene	ND	U	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	98	87-120	11/17/07	Acceptable
Dibromofluoromethane	94	82-125	11/17/07	Acceptable
4-Bromofluorobenzene	86	73-118	11/17/07	Acceptable

Comments: DL 013108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Volatile Organics by GC/MS

Sample Name:	PCM-08DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-009	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	11/17/07	11/17/07	KWG0712703	
Toluene	ND	U	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	
Ethylbenzene	ND	U	0.50	0.13	1	11/17/07	11/17/07	KWG0712703	
m,p-Xylenes	ND	U	0.50	0.22	1	11/17/07	11/17/07	KWG0712703	
o-Xylene	ND	U	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	93	87-120	11/17/07	Acceptable
Dibromofluoromethane	94	82-125	11/17/07	Acceptable
4-Bromofluorobenzene	84	73-118	11/17/07	Acceptable

Comments: K0710558

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Volatile Organics by GC/MS

Sample Name:	PCM-09DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-010	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**0.17**	J	0.50	0.14	1	11/17/07	11/17/07	KWG0712703	
Toluene	**0.14**	J	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	
Ethylbenzene	ND	U	0.50	0.13	1	11/17/07	11/17/07	KWG0712703	
m,p-Xylenes	ND	U	0.50	0.22	1	11/17/07	11/17/07	KWG0712703	
o-Xylene	ND	U	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	95	87-120	11/17/07	Acceptable
Dibromofluoromethane	95	82-125	11/17/07	Acceptable
4-Bromofluorobenzene	83	73-118	11/17/07	Acceptable

Comments: 8013108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Volatile Organics by GC/MS

Sample Name:	PCM-10DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-011	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**0.34**	J	0.50	0.14	1	11/17/07	11/17/07	KWG0712703	
Toluene	**0.23**	J	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	
Ethylbenzene	ND	U	0.50	0.13	1	11/17/07	11/17/07	KWG0712703	
m,p-Xylenes	ND	U	0.50	0.22	1	11/17/07	11/17/07	KWG0712703	
o-Xylene	ND	U	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	94	87-120	11/17/07	Acceptable
Dibromofluoromethane	95	82-125	11/17/07	Acceptable
4-Bromofluorobenzene	85	73-118	11/17/07	Acceptable

Comments: SC 01310

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Sediment	**Date Received:**	11/09/2007

Volatile Organic Compounds

Sample Name:	PCM-08SC-071108	**Units:**	ug/Kg
Lab Code:	K0710558-012	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	1.5	0.12	1	11/14/07	11/14/07	KWG0712514	
Toluene	ND	U	1.5	0.19	1	11/14/07	11/14/07	KWG0712514	
Ethylbenzene	ND	U	1.5	0.092	1	11/14/07	11/14/07	KWG0712514	
m,p-Xylenes	**0.23**	J	1.5	0.22	1	11/14/07	11/14/07	KWG0712514	
o-Xylene	ND	U	1.5	0.081	1	11/14/07	11/14/07	KWG0712514	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	91	69-115	11/14/07	Acceptable
Toluene-d8	97	64-128	11/14/07	Acceptable
4-Bromofluorobenzene	95	54-129	11/14/07	Acceptable

Comments: 12/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Pore water	**Date Received:**	11/09/2007

Volatile Organics by GC/MS

Sample Name:	PCM-08PW-071108	**Units:**	ug/L
Lab Code:	K0710558-013	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**400**	D	5.0	1.4	10	11/17/07	11/17/07	KWG0712703	
Toluene	**6.4**	D	5.0	1.1	10	11/17/07	11/17/07	KWG0712703	
Ethylbenzene	**39**	D	5.0	1.3	10	11/17/07	11/17/07	KWG0712703	
m,p-Xylenes	**22**	D	5.0	2.2	10	11/17/07	11/17/07	KWG0712703	
o-Xylene	**34**	D	5.0	1.1	10	11/17/07	11/17/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	91	87-120	11/17/07	Acceptable
Dibromofluoromethane	94	82-125	11/17/07	Acceptable
4-Bromofluorobenzene	91	73-118	11/17/07	Acceptable

Comments: SL 12/10

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Volatile Organics by GC/MS

Sample Name:	PCM-TB-071108	**Units:**	ug/L
Lab Code:	K0710558-014	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	11/17/07	11/17/07	KWG0712703	
Toluene	ND	U	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	
Ethylbenzene	ND	U	0.50	0.13	1	11/17/07	11/17/07	KWG0712703	
m,p-Xylenes	ND	U	0.50	0.22	1	11/17/07	11/17/07	KWG0712703	
o-Xylene	ND	U	0.50	0.11	1	11/17/07	11/17/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	99	87-120	11/17/07	Acceptable
Dibromofluoromethane	93	82-125	11/17/07	Acceptable
4-Bromofluorobenzene	87	73-118	11/17/07	Acceptable

Comments: SL013108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Volatile Organics by GC/MS

Sample Name:	PCM-SCRB-071108	**Units:**	ug/L
Lab Code:	K0710558-015	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	11/18/07	11/18/07	KWG0712703	
Toluene	**0.63**		0.50	0.11	1	11/18/07	11/18/07	KWG0712703	
Ethylbenzene	ND	U	0.50	0.13	1	11/18/07	11/18/07	KWG0712703	
m,p-Xylenes	**0.28**	J	0.50	0.22	1	11/18/07	11/18/07	KWG0712703	
o-Xylene	ND	U	0.50	0.11	1	11/18/07	11/18/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	94	87-120	11/18/07	Acceptable
Dibromofluoromethane	94	82-125	11/18/07	Acceptable
4-Bromofluorobenzene	86	73-118	11/18/07	Acceptable

Comments: SL 43108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Volatile Organics by GC/MS

Sample Name:	PCM-PWRB-071108	**Units:**	ug/L
Lab Code:	K0710558-016	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	11/18/07	11/18/07	KWG0712703	
Toluene	**0.74**		0.50	0.11	1	11/18/07	11/18/07	KWG0712703	
Ethylbenzene	ND	U	0.50	0.13	1	11/18/07	11/18/07	KWG0712703	
m,p-Xylenes	**0.27**	J	0.50	0.22	1	11/18/07	11/18/07	KWG0712703	
o-Xylene	ND	U	0.50	0.11	1	11/18/07	11/18/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	95	87-120	11/18/07	Acceptable
Dibromofluoromethane	95	82-125	11/18/07	Acceptable
4-Bromofluorobenzene	85	73-118	11/18/07	Acceptable

Comments: 8/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Volatile Organics by GC/MS

Sample Name:	PCM-DRB-071108	**Units:**	ug/L
Lab Code:	K0710558-017	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	11/18/07	11/18/07	KWG0712703	
Toluene	**0.73**		0.50	0.11	1	11/18/07	11/18/07	KWG0712703	
Ethylbenzene	ND	U	0.50	0.13	1	11/18/07	11/18/07	KWG0712703	
m,p-Xylenes	**0.32**	J	0.50	0.22	1	11/18/07	11/18/07	KWG0712703	
o-Xylene	ND	U	0.50	0.11	1	11/18/07	11/18/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	92	87-120	11/18/07	Acceptable
Dibromofluoromethane	96	82-125	11/18/07	Acceptable
4-Bromofluorobenzene	84	73-118	11/18/07	Acceptable

Comments: DL 13108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Volatile Organics by GC/MS

Sample Name:	PCM-BRB-071108	**Units:**	ug/L
Lab Code:	K0710558-018	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	11/18/07	11/18/07	KWG0712703	
Toluene	**0.66**		0.50	0.11	1	11/18/07	11/18/07	KWG0712703	
Ethylbenzene	ND	U	0.50	0.13	1	11/18/07	11/18/07	KWG0712703	
m,p-Xylenes	**0.35**	J	0.50	0.22	1	11/18/07	11/18/07	KWG0712703	
o-Xylene	ND	U	0.50	0.11	1	11/18/07	11/18/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	93	87-120	11/18/07	Acceptable
Dibromofluoromethane	95	82-125	11/18/07	Acceptable
4-Bromofluorobenzene	84	73-118	11/18/07	Acceptable

Comments: 102108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Volatile Organics by GC/MS

Sample Name:	PCM-19DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-019	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	11/18/07	11/18/07	KWG0712703	
Toluene	**0.29**	J	0.50	0.11	1	11/18/07	11/18/07	KWG0712703	
Ethylbenzene	ND	U	0.50	0.13	1	11/18/07	11/18/07	KWG0712703	
m,p-Xylenes	ND	U	0.50	0.22	1	11/18/07	11/18/07	KWG0712703	
o-Xylene	ND	U	0.50	0.11	1	11/18/07	11/18/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	94	87-120	11/18/07	Acceptable
Dibromofluoromethane	96	82-125	11/18/07	Acceptable
4-Bromofluorobenzene	84	73-118	11/18/07	Acceptable

Comments: 11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Volatile Organics by GC/MS

Sample Name:	PCM-20DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-020	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	11/18/07	11/18/07	KWG0712703	
Toluene	**0.18**	J	0.50	0.11	1	11/18/07	11/18/07	KWG0712703	
Ethylbenzene	ND	U	0.50	0.13	1	11/18/07	11/18/07	KWG0712703	
m,p-Xylenes	ND	U	0.50	0.22	1	11/18/07	11/18/07	KWG0712703	
o-Xylene	ND	U	0.50	0.11	1	11/18/07	11/18/07	KWG0712703	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	100	87-120	11/18/07	Acceptable
Dibromofluoromethane	96	82-125	11/18/07	Acceptable
4-Bromofluorobenzene	86	73-118	11/18/07	Acceptable

Comments: N013108

LDC #: 18144B1 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/30/08
SDG #: K0710558 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Volatiles (BTEX)(EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/8 - 9/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration 1cv	A	
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	SW	TB=14*. RB=15.16.17.18.

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	PCM-13DSW-071109 W	11	PCM-10DSW-071109 W	21	PCM-01DSW-071109MS W	31	KWG0712703-4
2	PCM-01DSW-071109	12	PCM-08SC-071108 Sed	22	PCM-01DSW-071109MSD W	32	KWG0712514-5
3	PCM-02DSW-071109	13	PCM-08PW-071108 W	23		33	
4	PCM-03DSW-071109	14	PCM-TB-071108	24		34	
5	PCM-04DSW-071109	15	PCM-SCRB-071108	25		35	
6	PCM-05DSW-071109	16	PCM-PWRB-071108	26		36	
7	PCM-06DSW-071109	17	PCM-DRB-071108	27		37	
8	PCM-21DSW-071109	18	PCM-BRB-071108	28		38	
9	PCM-08DSW-071109	19	PCM-19DSW-071109	29		39	
10	PCM-09DSW-071109	20	PCM-20DSW-071109	30		40	

LDC #: 18144B1
SDG #: K0710558

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 6f1
Reviewer: 9
2nd reviewer: N

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Sample: 15 Field Blank / Trip Blank / Rinsate / Other ~~FB~~ (circle one)

Compound	Concentration Units (µg/L)
cc	0.63
RRR	0.28

Sample: 16 Field Blank / Trip Blank / Rinsate / Other RB (circle one)

Compound	Concentration Units (µg/L)
cc	0.74
RRR	0.27

Sample: 17 Field Blank / Trip Blank / Rinsate / Other RB (circle one)

Compound	Concentration Units (µg/L)
cc	0.73
RRR	0.32

LDC #: 18444B1
SDG #: 410558

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: Q
2nd reviewer: N

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Sample: 18 Field Blank / Trip Blank / Rinsate / Other RB (circle one)

Compound	Concentration Units (ug/L)
CC-	0.66
RRR	0.35

Sample: _____ Field Blank / Trip Blank / Rinsate / Other _____ (circle one)

Compound	Concentration Units ( )

Sample: _____ Field Blank / Trip Blank / Rinsate / Other _____ (circle one)

Compound	Concentration Units ( )

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 7, 2007
LDC Report Date:	January 31, 2008
Matrix:	Sediment/Water
Parameters:	Volatiles
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710470

Sample Identification

PCM-02SC-071107
PCM-02PW-071107
PCM-05SC-071107
PCM-04SC-071107
PCM-04PW-071107
PCM-14DS-071107
PCM-TB-071107
PCM-04SC-071107MS
PCM-04SC-071107MSD

Introduction

This data review covers 6 sediment samples and 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8260B for Volatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all volatile target compounds and system performance check compounds (SPCCs) were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/7/07	Acrolein Vinyl acetate 2-Butanone	0.0259 (≥0.05) 0.0415 (>0.05) 0.0203 (≥0.05)	PCM-14DS-071107 KWG0712458-5	J (all detects) UJ (all non-detects)	A

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/13/07	Iodomethane	26	PCM-14DS-071107 KWG0712458-5	J (all detects) UJ (all non-detects)	A

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
11/7/07	Vinyl acetate Acetone	37 26	PCM-14DS-071107 KWG0712458-5	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

All of the continuing calibration RRF values were within method and validation criteria with the following exceptions:

Date	Compound	RRF (Limits)	Associated Samples	Flag	A or P
11/13/07	Acrolein Vinyl acetate 2-Butanone	0.0260 (>0.05) 0.0444 (>0.05) 0.0218 (>0.05)	PCM-14DS-071107 KWG0712458-5	J (all detects) UJ (all non-detects)	A

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polynuclear aromatic hydrocarbon contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Analysis Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
KWG0712458-5	11/13/07	Methylene chloride Acetone Iodomethane 1,4-Dichlorobenzene	1.8 ug/Kg 4.3 ug/Kg 9.2 ug/Kg 0.18 ug/Kg	PCM-14DS-071107

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
PCM-14DS-071107	Methylene chloride	2.2 ug/Kg	8.2U ug/Kg
	Acetone	11 ug/Kg	33U ug/Kg
	Iodomethane	7.7 ug/Kg	33U ug/Kg
	1,4-Dichlorobenzene	0.46 ug/Kg	1.7U ug/Kg

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to calibration RRF and %D problems, data were qualified as estimated in one sample.

Due to method blank contamination problems, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

Sample PCM-TB-071107 was identified as a trip blank. No volatile contaminants were found in this blank.

NW Natural Gasco Site
Volatiles - Data Qualification Summary - SDG K0710470

SDG	Sample	Compound	Flag	A or P	Reason
K0710470	PCM-14DS-071107	Acrolein Vinyl acetate 2-Butanone	J (all detects) UJ (all non-detects)	A	Initial calibration (RRF)
K0710470	PCM-14DS-071107	Iodomethane	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
K0710470	PCM-14DS-071107	Vinyl acetate Acetone	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)
K0710470	PCM-14DS-071107	Acrolein Vinyl acetate 2-Butanone	J (all detects) UJ (all non-detects)	A	Continuing calibration (RRF)

NW Natural Gasco Site
Volatiles - Laboratory Blank Data Qualification Summary - SDG K0710470

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
K0710470	PCM-14DS-071107	Methylene chloride Acetone Iodomethane 1,4-Dichlorobenzene	8.2U ug/Kg 33U ug/Kg 33U ug/Kg 1.7U ug/Kg	A

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Volatile Organic Compounds

Sample Name:	PCM-02SC-071107	**Units:**	ug/Kg
Lab Code:	K0710470-001	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	1.1	0.096	1	11/13/07	11/13/07	KWG0712458	
Toluene	ND	U	1.1	0.16	1	11/13/07	11/13/07	KWG0712458	
Ethylbenzene	ND	U	1.1	0.079	1	11/13/07	11/13/07	KWG0712458	
m,p-Xylenes	ND	U	1.1	0.19	1	11/13/07	11/13/07	KWG0712458	
o-Xylene	ND	U	1.1	0.069	1	11/13/07	11/13/07	KWG0712458	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	89	69-115	11/13/07	Acceptable
Toluene-d8	96	64-128	11/13/07	Acceptable
4-Bromofluorobenzene	92	54-129	11/13/07	Acceptable

Comments: 11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Pore water	**Date Received:**	11/08/2007

Volatile Organics by GC/MS

Sample Name:	PCM-02PW-071107	**Units:**	ug/L
Lab Code:	K0710470-002	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**210**	D	5.0	1.4	10	11/16/07	11/16/07	KWG0712624	
Toluene	**5.1**	D	5.0	1.1	10	11/16/07	11/16/07	KWG0712624	
Ethylbenzene	**36**	D	5.0	1.3	10	11/16/07	11/16/07	KWG0712624	
m,p-Xylenes	**31**	D	5.0	2.2	10	11/16/07	11/16/07	KWG0712624	
o-Xylene	**17**	D	5.0	1.1	10	11/16/07	11/16/07	KWG0712624	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	95	87-120	11/16/07	Acceptable
Dibromofluoromethane	89	82-125	11/16/07	Acceptable
4-Bromofluorobenzene	92	73-118	11/16/07	Acceptable

Comments: 8/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Volatile Organic Compounds

Sample Name:	PCM-05SC-071107	**Units:**	ug/Kg
Lab Code:	K0710470-003	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**6.5**		1.5	0.12	1	11/14/07	11/14/07	KWG0712514	
Toluene	**0.62**	J	1.5	0.19	1	11/14/07	11/14/07	KWG0712514	
Ethylbenzene	**0.77**	J	1.5	0.092	1	11/14/07	11/14/07	KWG0712514	
m,p-Xylenes	**1.0**	J	1.5	0.22	1	11/14/07	11/14/07	KWG0712514	
o-Xylene	ND	U	1.5	0.080	1	11/14/07	11/14/07	KWG0712514	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	90	69-115	11/14/07	Acceptable
Toluene-d8	97	64-128	11/14/07	Acceptable
4-Bromofluorobenzene	96	54-129	11/14/07	Acceptable

Comments: K/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Volatile Organic Compounds

Sample Name:	PCM-04SC-071107	**Units:**	ug/Kg
Lab Code:	K0710470-004	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**8.8**		1.4	0.11	1	11/14/07	11/14/07	KWG0712514	
Toluene	**0.84**	J	1.4	0.19	1	11/14/07	11/14/07	KWG0712514	
Ethylbenzene	**4.6**		1.4	0.091	1	11/14/07	11/14/07	KWG0712514	
m,p-Xylenes	**5.3**		1.4	0.21	1	11/14/07	11/14/07	KWG0712514	
o-Xylene	**7.9**		1.4	0.080	1	11/14/07	11/14/07	KWG0712514	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	89	69-115	11/14/07	Acceptable
Toluene-d8	95	64-128	11/14/07	Acceptable
4-Bromofluorobenzene	90	54-129	11/14/07	Acceptable

Comments: K013108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Pore water	**Date Received:**	11/08/2007

Volatile Organics by GC/MS

Sample Name:	PCM-04PW-071107	**Units:**	ug/L
Lab Code:	K0710470-005	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	**650**	D	5.0	1.4	10	11/16/07	11/16/07	KWG0712624	
Toluene	**14**	D	2.5	0.54	5	11/16/07	11/16/07	KWG0712624	
Ethylbenzene	**9.7**	D	2.5	0.65	5	11/16/07	11/16/07	KWG0712624	
m,p-Xylenes	**15**	D	2.5	1.1	5	11/16/07	11/16/07	KWG0712624	
o-Xylene	17	D	2.5	0.51	5	11/16/07	11/16/07	KWG0712624	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	94	87-120	11/16/07	Acceptable
Dibromofluoromethane	85	82-125	11/16/07	Acceptable
4-Bromofluorobenzene	89	73-118	11/16/07	Acceptable

Comments: 8/13108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Volatile Organic Compounds

Sample Name:	PCM-14DS-071107	**Units:**	ug/Kg
Lab Code:	K0710470-006	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q		MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Acrolein	ND	U	UJ5	11	3.0	1	11/13/07	11/13/07	KWG0712458	
Iodomethane (Methyl Iodide)	7.7	J	33UJ	33 5,7	0.62	1	11/13/07	11/13/07	KWG0712458	
Methyl tert-Butyl Ether	ND	U		1.7	0.12	1	11/13/07	11/13/07	KWG0712458	
Acrylonitrile	ND	U		3.3	0.81	1	11/13/07	11/13/07	KWG0712458	
Vinyl Acetate	ND	U	UJ5	4.1	1.7	1	11/13/07	11/13/07	KWG0712458	
1,2-Dichloropropane	ND	U		1.7	0.17	1	11/13/07	11/13/07	KWG0712458	
Dibromomethane	ND	U		1.7	0.27	1	11/13/07	11/13/07	KWG0712458	
2-Chloroethyl Vinyl Ether	ND	U		4.1	0.55	1	11/13/07	11/13/07	KWG0712458	
1,2-Dibromoethane (EDB)	ND	U		1.7	0.17	1	11/13/07	11/13/07	KWG0712458	
1,1,1,2-Tetrachloroethane	ND	U		1.7	0.14	1	11/13/07	11/13/07	KWG0712458	
trans-1,4-Dichloro-2-butene	ND	U		4.1	0.72	1	11/13/07	11/13/07	KWG0712458	
1,2,3-Trichloropropane	ND	U		4.1	0.51	1	11/13/07	11/13/07	KWG0712458	
Dichlorodifluoromethane	ND	U		1.7	0.12	1	11/13/07	11/13/07	KWG0712458	
Chloromethane	ND	U		1.7	0.20	1	11/13/07	11/13/07	KWG0712458	
Vinyl Chloride	ND	U		1.7	0.17	1	11/13/07	11/13/07	KWG0712458	
Bromomethane	ND	U		8.2	0.90	1	11/13/07	11/13/07	KWG0712458	
Chloroethane	ND	U		1.7	0.43	1	11/13/07	11/13/07	KWG0712458	
Trichlorofluoromethane	ND	U		1.7	0.20	1	11/13/07	11/13/07	KWG0712458	
Acetone	11	J	33UJ	33 5,7	3.2	1	11/13/07	11/13/07	KWG0712458	
1,1-Dichloroethene	ND	U		1.7	0.10	1	11/13/07	11/13/07	KWG0712458	
Carbon Disulfide	ND	U		1.7	0.10	1	11/13/07	11/13/07	KWG0712458	
Methylene Chloride	2.2	J	8.2U7	8.2	0.25	1	11/13/07	11/13/07	KWG0712458	
trans-1,2-Dichloroethene	ND	U		1.7	0.15	1	11/13/07	11/13/07	KWG0712458	
1,1-Dichloroethane	ND	U		1.7	0.12	1	11/13/07	11/13/07	KWG0712458	
2-Butanone (MEK)	ND	U	UJ5	8.2	2.0	1	11/13/07	11/13/07	KWG0712458	
Chloroform	ND	U		1.7	0.12	1	11/13/07	11/13/07	KWG0712458	
1,1,1-Trichloroethane (TCA)	ND	U		1.7	0.12	1	11/13/07	11/13/07	KWG0712458	
Carbon Tetrachloride	ND	U		1.7	0.13	1	11/13/07	11/13/07	KWG0712458	
1,2-Dichloroethane (EDC)	ND	U		1.7	0.10	1	11/13/07	11/13/07	KWG0712458	
Benzene	ND	U		1.7	0.14	1	11/13/07	11/13/07	KWG0712458	
Trichloroethene (TCE)	ND	U		1.7	0.13	1	11/13/07	11/13/07	KWG0712458	
Bromodichloromethane	ND	U		1.7	0.20	1	11/13/07	11/13/07	KWG0712458	
2-Hexanone	ND	U		17	1.1	1	11/13/07	11/13/07	KWG0712458	

Comments: 1/21/3108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Volatile Organic Compounds

Sample Name:	PCM-14DS-071107	**Units:**	ug/Kg
Lab Code:	K0710470-006	**Basis:**	Dry
Extraction Method:	EPA 5030A	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q		MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
cis-1,3-Dichloropropene	ND	U		1.7	0.099	1	11/13/07	11/13/07	KWG0712458	
Toluene	ND	U		1.7	0.23	1	11/13/07	11/13/07	KWG0712458	
trans-1,3-Dichloropropene	ND	U		1.7	0.17	1	11/13/07	11/13/07	KWG0712458	
1,1,2-Trichloroethane	ND	U		1.7	0.20	1	11/13/07	11/13/07	KWG0712458	
4-Methyl-2-pentanone (MIBK)	ND	U		3.3	0.39	1	11/13/07	11/13/07	KWG0712458	
Bromochloromethane	ND	U		1.7	0.32	1	11/13/07	11/13/07	KWG0712458	
Tetrachloroethene (PCE)	ND	U		1.7	0.14	1	11/13/07	11/13/07	KWG0712458	
Dibromochloromethane	ND	U		1.7	0.17	1	11/13/07	11/13/07	KWG0712458	
Chlorobenzene	ND	U		1.7	0.090	1	11/13/07	11/13/07	KWG0712458	
Ethylbenzene	ND	U		1.7	0.12	1	11/13/07	11/13/07	KWG0712458	
m,p-Xylenes	ND	U		1.7	0.27	1	11/13/07	11/13/07	KWG0712458	
o-Xylene	ND	U		1.7	0.10	1	11/13/07	11/13/07	KWG0712458	
Styrene	ND	U		1.7	0.12	1	11/13/07	11/13/07	KWG0712458	
Bromoform	ND	U		1.7	0.34	1	11/13/07	11/13/07	KWG0712458	
Isopropylbenzene	ND	U		1.7	0.088	1	11/13/07	11/13/07	KWG0712458	
1,1,2,2-Tetrachloroethane	ND	U		1.7	0.20	1	11/13/07	11/13/07	KWG0712458	
1,4-Dichlorobenzene	0.46	J	1.747	1.7	0.18	1	11/13/07	11/13/07	KWG0712458	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Dibromofluoromethane	89	69-115	11/13/07	Acceptable
Toluene-d8	94	64-128	11/13/07	Acceptable
4-Bromofluorobenzene	85	54-129	11/13/07	Acceptable

Comments: 11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Pore water	**Date Received:**	11/08/2007

Volatile Organics by GC/MS

Sample Name:	PCM-TB-071107	**Units:**	ug/L
Lab Code:	K0710470-007	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	8260B		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Benzene	ND	U	0.50	0.14	1	11/16/07	11/16/07	KWG0712624	
Toluene	ND	U	0.50	0.11	1	11/16/07	11/16/07	KWG0712624	
Ethylbenzene	ND	U	0.50	0.13	1	11/16/07	11/16/07	KWG0712624	
m,p-Xylenes	ND	U	0.50	0.22	1	11/16/07	11/16/07	KWG0712624	
o-Xylene	ND	U	0.50	0.11	1	11/16/07	11/16/07	KWG0712624	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Toluene-d8	93	87-120	11/16/07	Acceptable
Dibromofluoromethane	92	82-125	11/16/07	Acceptable
4-Bromofluorobenzene	84	73-118	11/16/07	Acceptable

Comments: 12/13/08

LDC #: 18144C1 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/30/08
SDG #: K0710470 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: 9
2nd Reviewer: M

METHOD: GC/MS Volatiles (EPA SW 846 Method 8260B)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/7/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	SW	
IV.	Continuing calibration	SW	25%
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	ND	TB=7

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	PCM-02SC-071107 Sed	11	KNG0712624-4	21	~~KNG0712458~~	31	
2	PCM-02PW-071107 W	12	KNG0712458-5	22	KB	32	
3	PCM-05SC-071107 Sed	13	KNG0712514-5	23		33	
4	PCM-04SC-071107 ↓	14		24		34	
5	PCM-04PW-071107 W	15		25		35	
6	PCM-14DS-071107 Sed	16		26		36	
7	PCM-TB-071107 W	17		27		37	
8	PCM-04SC-071107MS Sed	18		28		38	
9	PCM-04SC-071107MSD ↓	19		29		39	
10		20		30		40	

TARGET COMPOUND WORKSHEET

METHOD: VOA (EPA SW 846 Method 8260B)

A. Chloromethane*	U. 1,1,2-Trichloroethane	OO. 2,2-Dichloropropane	III. n-Butylbenzene	CCCC.1-Chlorohexane
B. Bromomethane	V. Benzene	PP. Bromochloromethane	JJJ. 1,2-Dichlorobenzene	DDDD. Isopropyl alcohol
C. Vinyl choride**	W. trans-1,3-Dichloropropene	QQ. 1,1-Dichloropropene	KKK. 1,2,4-Trichlorobenzene	EEEE. Acetonitrile
D. Chloroethane	X. Bromoform*	RR. Dibromomethane	LLL. Hexachlorobutadiene	FFFF. Acrolein
E. Methylene chloride	Y. 4-Methyl-2-pentanone	SS. 1,3-Dichloropropane	MMM. Naphthalene	GGGG. Acrylonitrile
F. Acetone	Z. 2-Hexanone	TT. 1,2-Dibromoethane	NNN. 1,2,3-Trichlorobenzene	HHHH. 1,4-Dioxane
G. Carbon disulfide	AA. Tetrachloroethene	UU. 1,1,1,2-Tetrachloroethane	OOO. 1,3,5-Trichlorobenzene	IIII. Isobutyl alcohol
H. 1,1-Dichloroethene**	BB. 1,1,2,2-Tetrachloroethane*	VV. Isopropylbenzene	PPP. trans-1,2-Dichloroethene	JJJJ. Methacrylonitrile
I. 1,1-Dichloroethane*	CC. Toluene**	WW. Bromobenzene	QQQ. cis-1,2-Dichloroethene	KKKK. Propionitrile
J. 1,2-Dichloroethene, total	DD. Chlorobenzene*	XX. 1,2,3-Trichloropropane	RRR. m,p-Xylenes	LLLL. Ethyl ether
K. Chloroform**	EE. Ethylbenzene**	YY. n-Propylbenzene	SSS. o-Xylene	MMMM. Benzyl chloride
L. 1,2-Dichloroethane	FF. Styrene	ZZ. 2-Chlorotoluene	TTT 1,1,2-Trichloro-1,2,2-trifluoroethane	NNNN. Iodomethane
M. 2-Butanone	GG. Xylenes, total	AAA. 1,3,5-Trimethylbenzene	UUU. 1,2-Dichlorotetrafluoroethane	OOOO.
N. 1,1,1-Trichloroethane	HH. Vinyl acetate	BBB. 4-Chlorotoluene	VVV. 4-Ethyltoluene	PPPP.
O. Carbon tetrachloride	II. 2-Chloroethylvinyl ether	CCC. tert-Butylbenzene	WWW. Ethanol	QQQQ.
P. Bromodichloromethane	JJ. Dichlorodifluoromethane	DDD. 1,2,4-Trimethylbenzene	XXX. Di-isopropyl ether	RRRR.
Q. 1,2-Dichloropropane**	KK. Trichlorofluoromethane	EEE. sec-Butylbenzene	YYY. tert-Butanol	SSSS.
R. cis-1,3-Dichloropropene	LL. Methyl-tert-butyl ether	FFF. 1,3-Dichlorobenzene	ZZZ. tert-Butyl alcohol	TTTT.
S. Trichloroethene	MM. 1,2-Dibromo-3-chloropropane	GGG. p-Isopropyltoluene	AAAA. Ethyl tert-butyl ether	UUUU.
T. Dibromochloromethane	NN. Methyl ethyl ketone	HHH. 1,4-Dichlorobenzene	BBBB. tert-Amyl methyl ether	VVVV.

* = System performance check compounds (SPCC) for RRF ; ** = Calibration check compounds (CCC) for %RSD.

LDC #: 18144C1
SDG #: K0710470

VALIDATION FINDINGS WORKSHEET
Initial Calibration

Page: 1 of 1
Reviewer: [signature]
2nd Reviewer: [signature]

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Did the laboratory perform a 5 point calibration prior to sample analysis?
Y N N/A Were percent relative standard deviations (%RSD) and relative response factors (RRF) within method criteria for all CCC's and SPCC's?
Y N N/A Was a curve fit used for evaluation? If yes, what was the acceptance criteria used for evaluation?_____
Y N N/A Did the initial calibration meet the acceptance criteria?
Y N N/A Were all %RSDs and RRFs within the validation criteria of ≤30 %RSD and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %RSD (Limit: ≤30.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/7/07	ICAL	FFFF		0.0259	6-KWG0712/LCS-5	V/UJ/A
			HH		0.0415		
			M		0.0203		

INICAL1SB

LDC #: 18144C1
SDG #: K710470

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 4

METHOD: GC/MS VOA (EPA SW 846 Method 8260)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours for each instrument?
(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?
Y (N) N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	11/7/07	1107F018 (ICV)	HH	37		6. KNG0712458-5	J/UJ/A
			F	26			J
	11/13/07	1113F004	NNNN	26		6. KNG0712458-5	J/UJ/A
			FFFF		0.0260		J
			HH		0.0441		
			M		0.0218		

CONCAL1S

LDC #: 18144C1
SDG #: 0710470

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: a

METHOD: GC/MS VOA (EPA SW 846 Method 8260B)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank associated with every sample in this SDG?
Y N N/A Was a method blank analyzed at least once every 12 hours for each matrix and concentration?
Y N N/A Was there contamination in the method blanks? If yes, please see the qualifications below.

Blank analysis date: 11/13/07
Conc. units: ug/kg
Associated Samples: 6

Compound	Blank ID	Sample Identification							
ug/kg	071258-5	6							
Methylene chloride	1.8	2.2/8.4							
Acetone	4.3	11/33U							
NNNN	9.2	7.7/33U							
HHH	0.18	0.46/1.7U							
CRQL									

Blank analysis date:
Conc. units:
Associated Samples:

Compound	Blank ID	Sample Identification							
Methylene chloride									
Acetone									
CRQL									

All results were qualified using the criteria stated below except those circled.

Note: Common contaminants such as Methylene chloride, Acetone, 2-Butanone, Carbon disulfide and TICs that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

NW Natural Gasco Site
Data Validation Reports
LDC# 18144

Semivolatiles

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 5, 2007
LDC Report Date:	January 30, 2008
Matrix:	Sediment
Parameters:	Semivolatiles
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710375

Sample Identification

PCM-02DS-071105
PCM-06DS-071105
PCM-09DS-071105
PCM-02DS-071105MS
PCM-02DS-071105MSD

Introduction

This data review covers 5 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where %RSD was greater than 15.0%, the laboratory used a calibration curve to evaluate the compound. All coefficients of determination (r^2) were greater than or equal to 0.990 .

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all semivolatile target compounds and system performance check compounds (SPCCs) were greater than or equal to 0.05 as required.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration RRF values were greater than or equal to 0.05 .

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits. Since the samples were diluted out, no data were qualified.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Compound	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
PCM-02DS-071105MS/MSD (PCM-02DS-071105)	Phenol N-Nitroso-di-n-propylamine 2,4-Dinitrotoluene	- - -	- - -	49 (<40) 42 (≤40) 41 (≤40)	J (all detects) UJ (all non-detects)	A

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
KWG0712491-3/4 (All samples in SDG K0710375)	Aniline 2-Methylphenol 4-Methylphenol 2,4-Dimethylphenol	2 (50-140) 12 (50-140) 11 (50-140) 5 (50-140)	3 (50-140) 9 (50-140) 8 (50-140) 4 (50-140)	- - - -	J (all detects) R (all non-detects)	P

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
KWG0712491-3/4 (All samples in SDG K0710375)	Bis(2-chloroethyl) ether	-	43 (50-140)	-	J (all detects) UJ (all non-detects)	P
	Phenol	-	42 (50-140)	-		
	2-Chlorophenol	48 (50-140)	38 (50-140)	-		
	1,3-Dichlorobenzene	49 (50-140)	39 (50-140)	-		
	1,4-Dichlorobenzene	-	41 (50-140)	-		
	1,2-Dichlorobenzene	49 (50-140)	40 (50-140)	-		
	Benzyl alcohol	45 (50-140)	36 (50-140)	-		
	Bis(2-chloroisopropyl)ether	-	43 (50-140)	-		
	Hexachloroethane	-	39 (50-140)	-		
	N-Nitroso-di-n-propylamine	44 (50-140)	37 (50-140)	-		
	Nitrobenzene	-	42 (50-140)	-		
	Isophorone	-	48 (50-140)	-		
	2-Nitrophenol	-	44 (50-140)	-		
	Bis(2-chloroethoxy)methane	-	45 (50-140)	-		
	2,4-Dichlorophenol	47 (50-140)	41 (50-140)	-		
	Benzoic acid	14 (50-140)	10 (50-140)	-		
	1,2,4-Trichlorobenzene	-	47 (50-140)	-		
	4-Chloroaniline	14 (50-140)	19 (50-140)	-		
	4-Chloro-3-methylphenol	43 (50-140)	35 (50-140)	-		
	Hexachlorocyclopentadiene	-	42 (50-140)	-		
	2,4,6-Trichlorophenol	43 (50-140)	36 (50-140)	-		
	2,4,5-Trichlorophenol	-	45 (50-140)	-		
	2-Chloronaphthalene	-	44 (50-140)	-		
	3-Nitroaniline	46 (50-140)	42 (50-140)	-		
	2,4-Dinitrophenol	39 (50-140)	36 (50-140)	-		
	4-Chlorophenyl-phenyl ether	-	48 (50-140)	-		
	4-Nitroaniline	-	46 (50-140)	-		
	N-Nitrosodiphenylamine	40 (50-140)	35 (50-140)	-		
	Azobenzene	-	47 (50-140)	-		
	Pentachlorophenol	-	46 (50-140)	-		
	3,3'-Dichlorobenzidine	25 (50-140)	18 (50-140)	-		

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

The analysis was conducted within all specifications of the method.

Due to severe problems with the LCS/LCSD %Rs, data were rejected in three samples.

Due to MS/MSD RPD and LCS/LCSD %R problems, data were qualified as estimated in three samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Semivolatiles - Data Qualification Summary - SDG K0710375

SDG	Sample	Compound	Flag	A or P	Reason
K0710375	PCM-02DS-071105	Phenol N-Nitroso-di-n-propylamine 2,4-Dinitrotoluene	J (all detects) UJ (all non-detects)	A	Matrix spike/Matrix spike duplicates (RPD)
K0710375	PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105	Aniline 2-Methylphenol 4-Methylphenol 2,4-Dimethylphenol	J (all detects) R (all non-detects)	P	Laboratory control samples (%R)
K0710375	PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105	Bis(2-chloroethyl) ether Phenol 2-Chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Benzyl alcohol Bis(2-chloroisopropyl)ether Hexachloroethane N-Nitroso-di-n-propylamine Nitrobenzene Isophorone 2-Nitrophenol Bis(2-chloroethoxy)methane 2,4-Dichlorophenol Benzoic acid 1,2,4-Trichlorobenzene 4-Chloroaniline 4-Chloro-3-methylphenol Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 3-Nitroaniline 2,4-Dinitrophenol 4-Chlorophenyl-phenyl ether 4-Nitroaniline N-Nitrosodiphenylamine Azobenzene Pentachlorophenol 3,3'-Dichlorobenzidine	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)

NW Natural Gasco Site
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG K0710375

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	PCM-02DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-004	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Bis(2-chloroethyl) Ether	ND	U UJ 10	240	45	20	11/15/07	12/05/07	KWG0712491	
Phenol	ND	U ↓ 9,10	710	47	20	11/15/07	12/05/07	KWG0712491	
Aniline	ND	U R 10	470	36	20	11/15/07	12/05/07	KWG0712491	*
2-Chlorophenol	ND	U UJ	240	47	20	11/15/07	12/05/07	KWG0712491	
1,3-Dichlorobenzene	ND	U	240	71	20	11/15/07	12/05/07	KWG0712491	
1,4-Dichlorobenzene	ND	U	240	68	20	11/15/07	12/05/07	KWG0712491	
1,2-Dichlorobenzene	ND	U	240	68	20	11/15/07	12/05/07	KWG0712491	
Benzyl Alcohol	ND	U	470	50	20	11/15/07	12/05/07	KWG0712491	
Bis(2-chloroisopropyl) Ether	ND	U ↓	240	61	20	11/15/07	12/05/07	KWG0712491	
2-Methylphenol	ND	U R	240	36	20	11/15/07	12/05/07	KWG0712491	*
Hexachloroethane	ND	U UJ ↓	240	73	20	11/15/07	12/05/07	KWG0712491	
N-Nitrosodi-n-propylamine	ND	U ↓ 9,10	240	57	20	11/15/07	12/05/07	KWG0712491	
4-Methylphenol†	ND	U R 10	240	36	20	11/15/07	12/05/07	KWG0712491	*
Nitrobenzene	ND	U UJ	240	52	20	11/15/07	12/05/07	KWG0712491	
Isophorone	ND	U	240	24	20	11/15/07	12/05/07	KWG0712491	
2-Nitrophenol	ND	U ↓	240	36	20	11/15/07	12/05/07	KWG0712491	
2,4-Dimethylphenol	ND	U R	1200	130	20	11/15/07	12/05/07	KWG0712491	*
Bis(2-chloroethoxy)methane	ND	U UJ	240	36	20	11/15/07	12/05/07	KWG0712491	
2,4-Dichlorophenol	ND	U	240	24	20	11/15/07	12/05/07	KWG0712491	
Benzoic Acid	ND	U	4700	2300	20	11/15/07	12/05/07	KWG0712491	
1,2,4-Trichlorobenzene	ND	U	240	61	20	11/15/07	12/05/07	KWG0712491	
4-Chloroaniline	ND	U ↓ ↓	240	45	20	11/15/07	12/05/07	KWG0712491	
Hexachlorobutadiene	ND	U	240	59	20	11/15/07	12/05/07	KWG0712491	
4-Chloro-3-methylphenol	ND	U UJ 10	240	33	20	11/15/07	12/05/07	KWG0712491	
Hexachlorocyclopentadiene	ND	U	1200	680	20	11/15/07	12/05/07	KWG0712491	
2,4,6-Trichlorophenol	ND	U	240	33	20	11/15/07	12/05/07	KWG0712491	
2,4,5-Trichlorophenol	ND	U	240	36	20	11/15/07	12/05/07	KWG0712491	
2-Chloronaphthalene	ND	U ↓	240	38	20	11/15/07	12/05/07	KWG0712491	
2-Nitroaniline	ND	U	470	75	20	11/15/07	12/05/07	KWG0712491	
Dimethyl Phthalate	ND	U	240	24	20	11/15/07	12/05/07	KWG0712491	
2,6-Dinitrotoluene	ND	U	240	47	20	11/15/07	12/05/07	KWG0712491	
3-Nitroaniline	ND	U UJ 10	470	59	20	11/15/07	12/05/07	KWG0712491	
2,4-Dinitrophenol	ND	U ↓	4700	400	20	11/15/07	12/05/07	KWG0712491	

Comments: ✗ 2/3/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	PCM-02DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-004	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C		

Analyte Name	Result	Q		MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
4-Nitrophenol	ND	U		2400	430	20	11/15/07	12/05/07	KWG0712491	
2,4-Dinitrotoluene	ND	U	UJ9	240	36	20	11/15/07	12/05/07	KWG0712491	
4-Chlorophenyl Phenyl Ether	ND	U	UJ10	240	33	20	11/15/07	12/05/07	KWG0712491	
Diethyl Phthalate	ND	U		240	31	20	11/15/07	12/05/07	KWG0712491	
4-Nitroaniline	ND	U	UJ10	470	43	20	11/15/07	12/05/07	KWG0712491	
2-Methyl-4,6-dinitrophenol	ND	U		2400	33	20	11/15/07	12/05/07	KWG0712491	
N-Nitrosodiphenylamine	ND	U	UJ10	240	38	20	11/15/07	12/05/07	KWG0712491	
Azobenzene†	ND	U	↓	240	26	20	11/15/07	12/05/07	KWG0712491	
4-Bromophenyl Phenyl Ether	ND	U		240	38	20	11/15/07	12/05/07	KWG0712491	
Hexachlorobenzene	ND	U		240	29	20	11/15/07	12/05/07	KWG0712491	
Pentachlorophenol	ND	U	UJ10	2400	470	20	11/15/07	12/05/07	KWG0712491	
Carbazole	**340**	D		240	31	20	11/15/07	12/05/07	KWG0712491	
Di-n-butyl Phthalate	ND	U		470	190	20	11/15/07	12/05/07	KWG0712491	
Butyl Benzyl Phthalate	ND	U		240	75	20	11/15/07	12/05/07	KWG0712491	
3,3'-Dichlorobenzidine	ND	U	UJ10	2400	87	20	11/15/07	12/05/07	KWG0712491	
Bis(2-ethylhexyl) Phthalate	**220**	JD		2400	170	20	11/15/07	12/05/07	KWG0712491	
Di-n-octyl Phthalate	ND	U		240	40	20	11/15/07	12/05/07	KWG0712491	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	0	10-86	12/05/07	Outside Control Limits
Phenol-d6	0	17-101	12/05/07	Outside Control Limits
Nitrobenzene-d5	39	10-108	12/05/07	Acceptable
2-Fluorobiphenyl	52	10-108	12/05/07	Acceptable
2,4,6-Tribromophenol	0	21-110	12/05/07	Outside Control Limits
Terphenyl-d14	63	26-122	12/05/07	Acceptable

† Analyte Comments

4-Methylphenol	This analyte cannot be separated from 3-Methylphenol.
Azobenzene	1,2-Diphenylhydrazine is reported as Azobenzene.

Comments: 1/3/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	PCM-06DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-005	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Bis(2-chloroethyl) Ether	ND	U UJ	57	11	5	11/15/07	12/05/07	KWG0712491	
Phenol	ND	U ↓	180	12	5	11/15/07	12/05/07	KWG0712491	
Aniline	ND	U R	120	8.6	5	11/15/07	12/05/07	KWG0712491	*
2-Chlorophenol	ND	U UJ	57	12	5	11/15/07	12/05/07	KWG0712491	
1,3-Dichlorobenzene	ND	U	57	18	5	11/15/07	12/05/07	KWG0712491	
1,4-Dichlorobenzene	ND	U	57	17	5	11/15/07	12/05/07	KWG0712491	
1,2-Dichlorobenzene	ND	U	57	17	5	11/15/07	12/05/07	KWG0712491	
Benzyl Alcohol	ND	U	120	12	5	11/15/07	12/05/07	KWG0712491	
Bis(2-chloroisopropyl) Ether	ND	U	57	15	5	11/15/07	12/05/07	KWG0712491	
2-Methylphenol	ND	U R	57	8.6	5	11/15/07	12/05/07	KWG0712491	*
Hexachloroethane	ND	U UJ	57	18	5	11/15/07	12/05/07	KWG0712491	
N-Nitrosodi-n-propylamine	ND	U ↓	57	14	5	11/15/07	12/05/07	KWG0712491	
4-Methylphenol†	ND	U R	57	8.6	5	11/15/07	12/05/07	KWG0712491	*
Nitrobenzene	ND	U UJ	57	13	5	11/15/07	12/05/07	KWG0712491	
Isophorone	ND	U	57	5.7	5	11/15/07	12/05/07	KWG0712491	
2-Nitrophenol	ND	U ↓	57	8.6	5	11/15/07	12/05/07	KWG0712491	
2,4-Dimethylphenol	ND	U R	290	32	5	11/15/07	12/05/07	KWG0712491	*
Bis(2-chloroethoxy)methane	ND	U UJ	57	8.6	5	11/15/07	12/05/07	KWG0712491	
2,4-Dichlorophenol	ND	U	57	5.7	5	11/15/07	12/05/07	KWG0712491	
Benzoic Acid	ND	U	1200	550	5	11/15/07	12/05/07	KWG0712491	
1,2,4-Trichlorobenzene	ND	U	57	15	5	11/15/07	12/05/07	KWG0712491	
4-Chloroaniline	ND	U ↓ ↓	57	11	5	11/15/07	12/05/07	KWG0712491	
Hexachlorobutadiene	ND	U	57	15	5	11/15/07	12/05/07	KWG0712491	
4-Chloro-3-methylphenol	ND	U UJ10	57	8.0	5	11/15/07	12/05/07	KWG0712491	
Hexachlorocyclopentadiene	ND	U	290	170	5	11/15/07	12/05/07	KWG0712491	
2,4,6-Trichlorophenol	ND	U	57	8.0	5	11/15/07	12/05/07	KWG0712491	
2,4,5-Trichlorophenol	ND	U	57	8.6	5	11/15/07	12/05/07	KWG0712491	
2-Chloronaphthalene	ND	U ↓	57	9.2	5	11/15/07	12/05/07	KWG0712491	
2-Nitroaniline	ND	U	120	19	5	11/15/07	12/05/07	KWG0712491	
Dimethyl Phthalate	ND	U	57	5.7	5	11/15/07	12/05/07	KWG0712491	
2,6-Dinitrotoluene	ND	U	57	12	5	11/15/07	12/05/07	KWG0712491	
3-Nitroaniline	ND	U UJ10	120	15	5	11/15/07	12/05/07	KWG0712491	
2,4-Dinitrophenol	ND	U ↓	1200	97	5	11/15/07	12/05/07	KWG0712491	

Comments: 01/31/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	PCM-06DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-005	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
4-Nitrophenol	ND	U	570	110	5	11/15/07	12/05/07	KWG0712491	
2,4-Dinitrotoluene	ND	U	57	8.6	5	11/15/07	12/05/07	KWG0712491	
4-Chlorophenyl Phenyl Ether	ND	U UJ10	57	8.0	5	11/15/07	12/05/07	KWG0712491	
Diethyl Phthalate	ND	U	57	7.5	5	11/15/07	12/05/07	KWG0712491	
4-Nitroaniline	ND	U UJ10	120	11	5	11/15/07	12/05/07	KWG0712491	
2-Methyl-4,6-dinitrophenol	ND	U	570	8.0	5	11/15/07	12/05/07	KWG0712491	
N-Nitrosodiphenylamine	ND	U UJ10	57	9.2	5	11/15/07	12/05/07	KWG0712491	
Azobenzene†	ND	U ↓	57	6.3	5	11/15/07	12/05/07	KWG0712491	
4 Bromophenyl Phenyl Ether	ND	U	57	9.2	5	11/15/07	12/05/07	KWG0712491	
Hexachlorobenzene	ND	U	57	6.9	5	11/15/07	12/05/07	KWG0712491	
Pentachlorophenol	ND	U UJ10	570	120	5	11/15/07	12/05/07	KWG0712491	
Carbazole	**66**	D	57	7.5	5	11/15/07	12/05/07	KWG0712491	
Di-n-butyl Phthalate	ND	U	120	45	5	11/15/07	12/05/07	KWG0712491	
Butyl Benzyl Phthalate	ND	U	57	19	5	11/15/07	12/05/07	KWG0712491	
3,3'-Dichlorobenzidine	ND	U UJ10	570	22	5	11/15/07	12/05/07	KWG0712491	
Bis(2-ethylhexyl) Phthalate	**82**	JD	570	40	5	11/15/07	12/05/07	KWG0712491	
Di-n-octyl Phthalate	ND	U	57	9.7	5	11/15/07	12/05/07	KWG0712491	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	0	10-86	12/05/07	Outside Control Limits
Phenol-d6	0	17-101	12/05/07	Outside Control Limits
Nitrobenzene-d5	35	10-108	12/05/07	Acceptable
2-Fluorobiphenyl	43	10-108	12/05/07	Acceptable
2,4,6-Tribromophenol	0	21-110	12/05/07	Outside Control Limits
Terphenyl-d14	57	26-122	12/05/07	Acceptable

† Analyte Comments

4-Methylphenol	This analyte cannot be separated from 3-Methylphenol.
Azobenzene	1,2-Diphenylhydrazine is reported as Azobenzene.

Comments: SDG B608

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client: Anchor Environmental
Project: Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4
Sample Matrix: Sediment

Service Request: K0710375
Date Collected: 11/05/2007
Date Received: 11/06/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name: PCM-09DS-071105
Lab Code: K0710375-006

Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry

Level: Low

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Bis(2-chloroethyl) Ether	ND	U UJ 10	110	21	10	11/15/07	12/05/07	KWG0712491	
Phenol	ND	U ↓	330	22	10	11/15/07	12/05/07	KWG0712491	
Aniline	ND	U R	220	17	10	11/15/07	12/05/07	KWG0712491	*
2-Chlorophenol	ND	U UJ	110	22	10	11/15/07	12/05/07	KWG0712491	
1,3-Dichlorobenzene	ND	U	110	33	10	11/15/07	12/05/07	KWG0712491	
1,4-Dichlorobenzene	ND	U	110	32	10	11/15/07	12/05/07	KWG0712491	
1,2-Dichlorobenzene	ND	U	110	32	10	11/15/07	12/05/07	KWG0712491	
Benzyl Alcohol	ND	U	220	24	10	11/15/07	12/05/07	KWG0712491	
Bis(2-chloroisopropyl) Ether	ND	U ↓	110	29	10	11/15/07	12/05/07	KWG0712491	
2-Methylphenol	ND	U R	110	17	10	11/15/07	12/05/07	KWG0712491	*
Hexachloroethane	ND	U UJ	110	35	10	11/15/07	12/05/07	KWG0712491	
N-Nitrosodi-n-propylamine	ND	U ↓	110	27	10	11/15/07	12/05/07	KWG0712491	
4-Methylphenol†	ND	U R	110	17	10	11/15/07	12/05/07	KWG0712491	*
Nitrobenzene	ND	U UJ	110	25	10	11/15/07	12/05/07	KWG0712491	
Isophorone	ND	U	110	11	10	11/15/07	12/05/07	KWG0712491	
2-Nitrophenol	ND	U ↓	110	17	10	11/15/07	12/05/07	KWG0712491	
2,4-Dimethylphenol	ND	U R	550	61	10	11/15/07	12/05/07	KWG0712491	*
Bis(2-chloroethoxy)methane	ND	U UJ	110	17	10	11/15/07	12/05/07	KWG0712491	
2,4-Dichlorophenol	ND	U	110	11	10	11/15/07	12/05/07	KWG0712491	
Benzoic Acid	ND	U	2200	1100	10	11/15/07	12/05/07	KWG0712491	
1,2,4-Trichlorobenzene	ND	U	110	29	10	11/15/07	12/05/07	KWG0712491	
4-Chloroaniline	ND	U ↓	110	21	10	11/15/07	12/05/07	KWG0712491	
Hexachlorobutadiene	ND	U	110	28	10	11/15/07	12/05/07	KWG0712491	
4-Chloro-3-methylphenol	ND	U UJ 10	110	16	10	11/15/07	12/05/07	KWG0712491	
Hexachlorocyclopentadiene	ND	U	550	320	10	11/15/07	12/05/07	KWG0712491	
2,4,6-Trichlorophenol	ND	U	110	16	10	11/15/07	12/05/07	KWG0712491	
2,4,5-Trichlorophenol	ND	U	110	17	10	11/15/07	12/05/07	KWG0712491	
2-Chloronaphthalene	ND	U ↓	110	18	10	11/15/07	12/05/07	KWG0712491	
2-Nitroaniline	ND	U	220	36	10	11/15/07	12/05/07	KWG0712491	
Dimethyl Phthalate	ND	U	110	11	10	11/15/07	12/05/07	KWG0712491	
2,6-Dinitrotoluene	ND	U	110	22	10	11/15/07	12/05/07	KWG0712491	
3-Nitroaniline	ND	U UJ 10	220	28	10	11/15/07	12/05/07	KWG0712491	
2,4-Dinitrophenol	ND	U ↓	2200	190	10	11/15/07	12/05/07	KWG0712491	

Comments: 2/3/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	PCM-09DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-006	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C		

Analyte Name	Result	Q		MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
4-Nitrophenol	ND	U		1100	200	10	11/15/07	12/05/07	KWG0712491	
2,4-Dinitrotoluene	ND	U		110	17	10	11/15/07	12/05/07	KWG0712491	
4-Chlorophenyl Phenyl Ether	ND	U	UJ10	110	16	10	11/15/07	12/05/07	KWG0712491	
Diethyl Phthalate	ND	U		110	15	10	11/15/07	12/05/07	KWG0712491	
4-Nitroaniline	ND	U	UJ10	220	20	10	11/15/07	12/05/07	KWG0712491	
2-Methyl-4,6-dinitrophenol	ND	U		1100	16	10	11/15/07	12/05/07	KWG0712491	
N-Nitrosodiphenylamine	ND	U	UJ10	110	18	10	11/15/07	12/05/07	KWG0712491	
Azobenzene†	ND	U	↓	110	13	10	11/15/07	12/05/07	KWG0712491	
4-Bromophenyl Phenyl Ether	ND	U		110	18	10	11/15/07	12/05/07	KWG0712491	
Hexachlorobenzene	ND	U		110	14	10	11/15/07	12/05/07	KWG0712491	
Pentachlorophenol	ND	U	UJ10	1100	220	10	11/15/07	12/05/07	KWG0712491	
Carbazole	87	JD		110	15	10	11/15/07	12/05/07	KWG0712491	
Di-n-butyl Phthalate	ND	U		220	87	10	11/15/07	12/05/07	KWG0712491	
Butyl Benzyl Phthalate	ND	U		110	36	10	11/15/07	12/05/07	KWG0712491	
3,3'-Dichlorobenzidine	ND	U	UJ10	1100	41	10	11/15/07	12/05/07	KWG0712491	
Bis(2-ethylhexyl) Phthalate	160	JD		1100	77	10	11/15/07	12/05/07	KWG0712491	
Di-n-octyl Phthalate	ND	U		110	19	10	11/15/07	12/05/07	KWG0712491	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	0	10-86	12/05/07	Outside Control Limits
Phenol-d6	0	17-101	12/05/07	Outside Control Limits
Nitrobenzene-d5	41	10-108	12/05/07	Acceptable
2-Fluorobiphenyl	50	10-108	12/05/07	Acceptable
2,4,6-Tribromophenol	0	21-110	12/05/07	Outside Control Limits
Terphenyl-d14	63	26-122	12/05/07	Acceptable

† Analyte Comments

4-Methylphenol	This analyte cannot be separated from 3-Methylphenol.
Azobenzene	1,2-Diphenylhydrazine is reported as Azobenzene.

Comments: 8/13/08

LDC #: 18144A2a **VALIDATION COMPLETENESS WORKSHEET** Date: 1/30/08
SDG #: K0710375 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: CL
2nd Reviewer: W

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/5/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RSD. r²
IV.	Continuing calibration ICV	A	
V.	Blanks	A	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:
MS sed.s

1	PCM-02DS-071105	11	KNF0T12491-5	21		31	
2	PCM-06DS-071105	12		22		32	
3	PCM-09DS-071105	13		23		33	
4	PCM-02DS-071105MS	14		24		34	
5	PCM-02DS-071105MSD	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 18144A29
SDG #: K0710375
METHOD: GC/MS BNA (EPA SW 846 Method 8270)

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: Q
2nd Reviewer: K

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		~~1 (20x)~~ All	Surr diluted	( )	No anal (>5x)
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* QC limits are advisory	QC Limits (Soil)	QC Limits (Water)		QC Limits (Soil)	QC Limits (Water)
S1 (NBZ) = Nitrobenzene-d5	23-120	35-114	S5 (2FP) = 2-Fluorophenol	25-121	21-100
S2 (FBP) = 2-Fluorobiphenyl	30-115	43-116	S6 (TBP) = 2,4,6-Tribromophenol	19-122	10-123
S3 (TPH) = Terphenyl-d14	18-137	33-141	S7 (2CP) = 2-Chlorophenol-d4	20-130*	33-110*
S4 (PHL) = Phenol-d5	24-113	10-94	S8 (DCB) = 1,2-Dichlorobenzene-d4	20-130*	16-110*

SUR.2S

LDC #: 18144A29
SDG #: K0710375

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

Y N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y N N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		4/5	A	( )	( )	19 (≤42)	1	J/UJ/A
			↓	( )	( )	42 (↓)		
			KK	( )	( )	41 (↓)		
			TOR out due to dilution	( )		( )		No Recal
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

LDC #: 18144A2a
SDG #: K071037S

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: 9
2nd Reviewer: ck

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?

Y N N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KWG0712491-3/4	See attachment	( )	( )	( )	MI + Blk	See Qual
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client: Anchor Environmental
Project: Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4
Sample Matrix: Sediment

Service Request: K0710375
Date Extracted: 11/15/2007
Date Analyzed: 12/05/2007

Lab Control Spike/Duplicate Lab Control Spike Summary
Semi-Volatile Organic Compounds by GC/MS

Extraction Method: EPA 3541
Analysis Method: 8270C

Units: ug/Kg
Basis: Dry
Level: Low
Extraction Lot: KWG0712491

Analyte Name	Lab Control Sample KWG0712491-3 Lab Control Spike Result	Expected	%Rec	Duplicate Lab Control Sample KWG0712491-4 Duplicate Lab Control Spike Result	Expected	%Rec	%Rec Limits	RPD	RPD Limit
Bis(2-chloroethyl) Ether	127	250	51	107	250	43	10-175	16	40
Phenol	130	250	52	105	250	42	23-104	21	40
Aniline	5.55	250	2 *	6.85	250	3 *	10-79	21	40
2-Chlorophenol	120	250	48	96.0	250	38	22-97	22	40
1,3-Dichlorobenzene	123	250	49	98.4	250	39	15-88	22	40
1,4-Dichlorobenzene	125	250	50	101	250	41	16-89	21	40
1,2-Dichlorobenzene	122	250	49	99.0	250	40	18-91	21	40
Benzyl Alcohol	113	250	45	89.2	250	36	23-101	23	40
Bis(2-chloroisopropyl) Ether	131	250	52	109	250	43	20-95	18	40
2-Methylphenol	30.3	250	12 *	23.7	250	9 *	23-93	24	40
Hexachloroethane	126	250	51	98.6	250	39	17-89	25	40
N-Nitrosodi-n-propylamine	111	250	44	91.6	250	37	27-99	19	40
4-Methylphenol	27.1	250	11 *	20.7	250	8 *	24-94	27	40
Nitrobenzene	127	250	51	105	250	42	24-98	19	40
Isophorone	136	250	54	119	250	48	23-103	13	40
2-Nitrophenol	132	250	53	110	250	44	25-101	18	40
2,4-Dimethylphenol	12.9	250	5 *	8.91	250	4 *	10-83	36	40
Bis(2-chloroethoxy)methane	139	250	56	113	250	45	26-101	21	40
2,4-Dichlorophenol	118	250	47	101	250	41	27-98	15	40
Benzoic Acid	105	750	14	77.2	750	10	10-53	30	40
1,2,4-Trichlorobenzene	141	250	56	117	250	47	20-95	19	40
4-Chloroaniline	43.2	250	17	46.8	250	19	10-87	8	40
Hexachlorobutadiene	156	250	62	125	250	50	18-96	22	40
4-Chloro-3-methylphenol	107	250	43	87.9	250	35	30-101	20	40
Hexachlorocyclopentadiene	126	250	50	106	250	42	10-99	18	40
2,4,6-Trichlorophenol	108	250	43	91.0	250	36	30-98	17	40
2,4,5-Trichlorophenol	127	250	51	112	250	45	30-100	12	40
2-Chloronaphthalene	125	250	50	110	250	44	28-101	12	40
2-Nitroaniline	141	250	56	136	250	54	33-105	4	40
Dimethyl Phthalate	150	250	60	135	250	54	33-107	11	40
2,6-Dinitrotoluene	147	250	59	146	250	58	33-108	1	40
3-Nitroaniline	115	250	46	104	250	42	27-100	10	40
2,4-Dinitrophenol	97.0	250	39	89.4	250	36	10-102	8	40
4-Nitrophenol	183	250	73	162	250	65	31-118	12	40
2,4-Dinitrotoluene	151	250	61	143	250	57	37-111	6	40

50-140

Qual

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

COLUMBIA ANALYTICAL SERVICES, INC.

QA/QC Report

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Extracted:**	11/15/2007
Sample Matrix:	Sediment	**Date Analyzed:**	12/05/2007

Lab Control Spike/Duplicate Lab Control Spike Summary
Semi-Volatile Organic Compounds by GC/MS

Extraction Method:	EPA 3541	**Units:**	ug/Kg
Analysis Method:	8270C	**Basis:**	Dry
		Level:	Low
		Extraction Lot:	KWG0712491

		Lab Control Sample KWG0712491-3 Lab Control Spike			Duplicate Lab Control Sample KWG0712491-4 Duplicate Lab Control Spike					
	Analyte Name	**Result**	**Expected**	**%Rec**	**Result**	**Expected**	**%Rec**	**%Rec Limits**	**RPD**	**RPD Limit**
AM	4-Chlorophenyl Phenyl Ether	133	250	53	119	250	48	31-100	11	40
LL	Diethyl Phthalate	152	250	61	142	250	57	35-107	6	40
OO	4-Nitroaniline	126	250	50	116	250	46	30-107	8	40
	2-Methyl-4,6-dinitrophenol	142	250	57	124	250	50	17-111	14	40
QQ	N-Nitrosodiphenylamine	101	250	40	88.2	250	35	30-102	14	40
	Azobenzene	124	250	50	118	250	47	29-105	5	40
RR	4-Bromophenyl Phenyl Ether	139	250	56	129	250	52	35-101	8	40
SS	Hexachlorobenzene	157	250	63	145	250	58	35-103	8	40
TT	Pentachlorophenol	136	250	54	116	250	46	29-97	16	40
WW	Carbazole	165	250	66	156	250	62	38-110	5	40
XX	Di-n-butyl Phthalate	184	250	74	172	250	69	37-118	7	40
AAA	Butyl Benzyl Phthalate	187	250	75	173	250	69	36-123	7	40
BBB	3,3'-Dichlorobenzidine	62.6	250	25	44.6	250	18	10-83	34	40
EEE	Bis(2-ethylhexyl) Phthalate	186	250	74	167	250	67	34-133	10	40
FFF	Di-n-octyl Phthalate	189	250	76	176	250	70	34-125	7	40

Results flagged with an asterisk (*) indicate values outside control criteria.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 7, 2007
LDC Report Date:	January 30, 2008
Matrix:	Sediment
Parameters:	Semivolatiles
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710470

Sample Identification

PCM-14DS-071107

Introduction

This data review covers one sediment sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8270C for Semivolatiles.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals.

All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 15.0% for each individual compound and less than or equal to 30.0% for calibration check compounds (CCCs).

In the case where %RSD was greater than 15.0%, the laboratory used a calibration curve to evaluate the compound. All coefficients of determination (r^2) were greater than or equal to 0.990 .

For the purposes of technical evaluation, all compounds were evaluated against the 30.0% (%RSD) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

Average relative response factors (RRF) for all semivolatile target compounds and system performance check compounds (SPCCs) were greater than or equal to 0.05 as required.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

Percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were within the method criteria of less than or equal to 20.0% for calibration check compounds (CCCs).

For the purposes of technical evaluation, all compounds were evaluated against the 25.0% (%D) National Functional Guideline criteria. Unless noted above, all compounds were within the validation criteria.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration RRF values were greater than or equal to 0.05 .

V. Blanks

Method blanks were reviewed for each matrix as applicable. No semivolatile contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for PCM-14DS-071107. Since the sample was diluted out, no data were qualified.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were not within QC limits. Since there were no associated samples, no data were qualified.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
KWG0712491-3/4 (All samples in SDG K0710470)	Aniline 2-Methylphenol 4-Methylphenol 2,4-Dimethylphenol	2 (50-140) 12 (50-140) 11 (50-140) 5 (50-140)	3 (50-140) 9 (50-140) 8 (50-140) 4 (50-140)	- - - -	J (all detects) R (all non-detects)	P

LCS ID (Associated Samples)	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Flag	A or P
KWG0712491-3/4 (All samples in SDG K0710470)	Bis(2-chloroethyl) ether	-	43 (50-140)	-	J (all detects) UJ (all non-detects)	P
	Phenol	-	42 (50-140)	-		
	2-Chlorophenol	48 (50-140)	38 (50-140)	-		
	1,3-Dichlorobenzene	49 (50-140)	39 (50-140)	-		
	1,4-Dichlorobenzene	-	41 (50-140)	-		
	1,2-Dichlorobenzene	49 (50-140)	40 (50-140)	-		
	Benzyl alcohol	45 (50-140)	36 (50-140)	-		
	Bis(2-chloroisopropyl)ether	-	43 (50-140)	-		
	Hexachloroethane	-	39 (50-140)	-		
	N-Nitroso-di-n-propylamine	44 (50-140)	37 (50-140)	-		
	Nitrobenzene	-	42 (50-140)	-		
	Isophorone	-	48 (50-140)	-		
	2-Nitrophenol	-	44 (50-140)	-		
	Bis(2-chloroethoxy)methane	-	45 (50-140)	-		
	2,4-Dichlorophenol	47 (50-140)	41 (50-140)	-		
	Benzoic acid	14 (50-140)	10 (50-140)	-		
	1,2,4-Trichlorobenzene	-	47 (50-140)	-		
	4-Chloroaniline	14 (50-140)	19 (50-140)	-		
	4-Chloro-3-methylphenol	43 (50-140)	35 (50-140)	-		
	Hexachlorocyclopentadiene	-	42 (50-140)	-		
	2,4,6-Trichlorophenol	43 (50-140)	36 (50-140)	-		
	2,4,5-Trichlorophenol	-	45 (50-140)	-		
	2-Chloronaphthalene	-	44 (50-140)	-		
	3-Nitroaniline	46 (50-140)	42 (50-140)	-		
	2,4-Dinitrophenol	39 (50-140)	36 (50-140)	-		
	4-Chlorophenyl-phenyl ether	-	48 (50-140)	-		
	4-Nitroaniline	-	46 (50-140)	-		
	N-Nitrosodiphenylamine	40 (50-140)	35 (50-140)	-		
	Azobenzene	-	47 (50-140)	-		
	Pentachlorophenol	-	46 (50-140)	-		
	3,3'-Dichlorobenzidine	25 (50-140)	18 (50-140)	-		

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

The analysis was conducted within all specifications of the method.

Due to severe problems with the LCS/LCSD %Rs, data were rejected in one sample.

Due to LCS/LCSD %R problems, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Semivolatiles - Data Qualification Summary - SDG K0710470

SDG	Sample	Compound	Flag	A or P	Reason
K0710470	PCM-14DS-071107	Aniline 2-Methylphenol 4-Methylphenol 2,4-Dimethylphenol	J (all detects) R (all non-detects)	P	Laboratory control samples (%R)
K0710470	PCM-14DS-071107	Bis(2-chloroethyl) ether Phenol 2-Chlorophenol 1,3-Dichlorobenzene 1,4-Dichlorobenzene 1,2-Dichlorobenzene Benzyl alcohol Bis(2-chloroisopropyl)ether Hexachloroethane N-Nitroso-di-n-propylamine Nitrobenzene Isophorone 2-Nitrophenol Bis(2-chloroethoxy)methane 2,4-Dichlorophenol Benzoic acid 1,2,4-Trichlorobenzene 4-Chloroaniline 4-Chloro-3-methylphenol Hexachlorocyclopentadiene 2,4,6-Trichlorophenol 2,4,5-Trichlorophenol 2-Chloronaphthalene 3-Nitroaniline 2,4-Dinitrophenol 4-Chlorophenyl-phenyl ether 4-Nitroaniline N-Nitrosodiphenylamine Azobenzene Pentachlorophenol 3,3'-Dichlorobenzidine	J (all detects) UJ (all non-detects)	P	Laboratory control samples (%R)

NW Natural Gasco Site
Semivolatiles - Laboratory Blank Data Qualification Summary - SDG K0710470

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	PCM-14DS-071107	**Units:**	ug/Kg
Lab Code:	K0710470-006	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Bis(2-chloroethyl) Ether	ND	U UJ	44	9.5	5	11/15/07	12/05/07	KWG0712491	
Phenol	ND	U	140	10	5	11/15/07	12/05/07	KWG0712491	
Aniline	ND	U R	87	7.5	5	11/15/07	12/05/07	KWG0712491	*
2-Chlorophenol	ND	U UJ	44	10	5	11/15/07	12/05/07	KWG0712491	
1,3-Dichlorobenzene	ND	U	44	15	5	11/15/07	12/05/07	KWG0712491	
1,4-Dichlorobenzene	ND	U	44	15	5	11/15/07	12/05/07	KWG0712491	
1,2-Dichlorobenzene	ND	U	44	15	5	11/15/07	12/05/07	KWG0712491	
Benzyl Alcohol	ND	U	87	11	5	11/15/07	12/05/07	KWG0712491	
Bis(2-chloroisopropyl) Ether	ND	U	44	13	5	11/15/07	12/05/07	KWG0712491	
2-Methylphenol	ND	U R	44	7.5	5	11/15/07	12/05/07	KWG0712491	*
Hexachloroethane	ND	U UJ	44	16	5	11/15/07	12/05/07	KWG0712491	
N-Nitrosodi-n-propylamine	ND	U	44	12	5	11/15/07	12/05/07	KWG0712491	
4-Methylphenol†	ND	U R	44	7.5	5	11/15/07	12/05/07	KWG0712491	*
Nitrobenzene	ND	U UJ	44	11	5	11/15/07	12/05/07	KWG0712491	
Isophorone	ND	U	44	5.0	5	11/15/07	12/05/07	KWG0712491	
2-Nitrophenol	ND	U	44	7.5	5	11/15/07	12/05/07	KWG0712491	
2,4-Dimethylphenol	ND	U R	220	28	5	11/15/07	12/05/07	KWG0712491	*
Bis(2-chloroethoxy)methane	ND	U UJ	44	7.5	5	11/15/07	12/05/07	KWG0712491	
2,4-Dichlorophenol	ND	U	44	5.0	5	11/15/07	12/05/07	KWG0712491	
Benzoic Acid	ND	U	870	480	5	11/15/07	12/05/07	KWG0712491	
1,2,4-Trichlorobenzene	ND	U	44	13	5	11/15/07	12/05/07	KWG0712491	
4-Chloroaniline	ND	U	44	9.5	5	11/15/07	12/05/07	KWG0712491	
Hexachlorobutadiene	ND	U	44	13	5	11/15/07	12/05/07	KWG0712491	
4-Chloro-3-methylphenol	ND	U UJ	44	7.0	5	11/15/07	12/05/07	KWG0712491	
Hexachlorocyclopentadiene	ND	U	220	150	5	11/15/07	12/05/07	KWG0712491	
2,4,6-Trichlorophenol	ND	U	44	7.0	5	11/15/07	12/05/07	KWG0712491	
2,4,5-Trichlorophenol	ND	U	44	7.5	5	11/15/07	12/05/07	KWG0712491	
2-Chloronaphthalene	ND	U	44	8.0	5	11/15/07	12/05/07	KWG0712491	
2-Nitroaniline	ND	U	87	16	5	11/15/07	12/05/07	KWG0712491	
Dimethyl Phthalate	ND	U	44	5.0	5	11/15/07	12/05/07	KWG0712491	
2,6-Dinitrotoluene	ND	U	44	10	5	11/15/07	12/05/07	KWG0712491	
3-Nitroaniline	ND	U UJ	87	13	5	11/15/07	12/05/07	KWG0712491	
2,4-Dinitrophenol	ND	U	870	85	5	11/15/07	12/05/07	KWG0712491	

Comments: ND3108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Semi-Volatile Organic Compounds by GC/MS

Sample Name:	PCM-14DS-071107	**Units:**	ug/Kg
Lab Code:	K0710470-006	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
4-Nitrophenol	ND	U	440	90	5	11/15/07	12/05/07	KWG0712491	
2,4-Dinitrotoluene	ND	U	44	7.5	5	11/15/07	12/05/07	KWG0712491	
4-Chlorophenyl Phenyl Ether	ND	U UJ10	44	7.0	5	11/15/07	12/05/07	KWG0712491	
Diethyl Phthalate	ND	U	44	6.5	5	11/15/07	12/05/07	KWG0712491	
4-Nitroaniline	ND	U UJ10	87	9.0	5	11/15/07	12/05/07	KWG0712491	
2-Methyl-4,6-dinitrophenol	ND	U	440	7.0	5	11/15/07	12/05/07	KWG0712491	
N-Nitrosodiphenylamine	ND	U UJ10	44	8.0	5	11/15/07	12/05/07	KWG0712491	
Azobenzene†	ND	U ↓	44	5.5	5	11/15/07	12/05/07	KWG0712491	
4-Bromophenyl Phenyl Ether	ND	U	44	8.0	5	11/15/07	12/05/07	KWG0712491	
Hexachlorobenzene	ND	U	44	6.0	5	11/15/07	12/05/07	KWG0712491	
Pentachlorophenol	ND	U UJ10	440	100	5	11/15/07	12/05/07	KWG0712491	
Carbazole	**20**	JD	44	6.5	5	11/15/07	12/05/07	KWG0712491	
Di-n-butyl Phthalate	ND	U	87	40	5	11/15/07	12/05/07	KWG0712491	
Butyl Benzyl Phthalate	ND	U	44	16	5	11/15/07	12/05/07	KWG0712491	
3,3'-Dichlorobenzidine	ND	U UJ10	440	19	5	11/15/07	12/05/07	KWG0712491	
Bis(2-ethylhexyl) Phthalate	**53**	JD	440	35	5	11/15/07	12/05/07	KWG0712491	
Di-n-octyl Phthalate	ND	U	44	8.5	5	11/15/07	12/05/07	KWG0712491	

* See Case Narrative

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2-Fluorophenol	0	10-86	12/05/07	Outside Control Limits
Phenol-d6	0	17-101	12/05/07	Outside Control Limits
Nitrobenzene-d5	43	10-108	12/05/07	Acceptable
2-Fluorobiphenyl	42	10-108	12/05/07	Acceptable
2,4,6-Tribromophenol	0	21-110	12/05/07	Outside Control Limits
Terphenyl-d14	54	26-122	12/05/07	Acceptable

† Analyte Comments

4-Methylphenol	This analyte cannot be separated from 3-Methylphenol.
Azobenzene	1,2-Diphenylhydrazine is reported as Azobenzene.

Comments: SC 113108

LDC #: 18144C2a

SDG #: K0710470

Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 1/30/08

Page: 1 of 1

Reviewer: CL

2nd Reviewer: K

METHOD: GC/MS Semivolatiles (EPA SW 846 Method 8270C)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/7/07
II.	GC/MS Instrument performance check	A	RSD. Y2
III.	Initial calibration	A	RSD. Y2
IV.	Continuing calibration / ICV	A	2570
V.	Blanks	A	
VI.	Surrogate spikes	SW	#1 - diluted out.
VII.	Matrix spike/Matrix spike duplicates	SW	No spl ass'd - No Anal
VIII.	Laboratory control samples	SW	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:

1	PCM-14DS-071107 Sed	11	KWG0TP491-5	21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 18444c2a
SDG #: k0710470

VALIDATION FINDINGS WORKSHEET
Laboratory Control Samples (LCS)

Page: 1 of 1
Reviewer: a
2nd Reviewer: u

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a LCS required?

Y (N) N/A Were the LCS/LCSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	LCS/LCSD ID	Compound	LCS %R (Limits)	LCSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		KWG0712491-2/4	See attachment	( )	( )	( )	MW-Blk	See qual (See A k0710375)
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

NW Natural Gasco Site
Data Validation Reports
LDC# 18144

PAHs

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 5, 2007
LDC Report Date:	January 31, 2008
Matrix:	Sediment/Water
Parameters:	Polynuclear Aromatic Hydrocarbons
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710375

Sample Identification

PCM-09SC-071105
PCM-09PW-071105
PCM-10SC-071105
PCM-02DS-071105
PCM-06DS-071105
PCM-09DS-071105

Introduction

This data review covers 5 sediment samples and one water sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per a modification of EPA SW 846 Method 8270C using Selected Ion Monitoring (SIM) for Polynuclear Aromatic Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals. All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

Average relative response factors (RRF) for all target compounds were within validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% .

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration RRF values were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polynuclear aromatic hydrocarbon contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
KWG0712172-4	11/7/07	Naphthalene	0.0042 ug/L	All water samples in SDG K0710375
KWG0712490-5	11/15/07	Naphthalene	0.43 ug/Kg	All sediment samples in SDG K0710375

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. Surrogate recoveries (%R) were not within QC limits for PCM-02DS-071105. Since the samples were diluted out, no data were qualified.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the level III data validation all results are considered valid and usable for all purposes.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG K0710375

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG K0710375

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Pore water	**Date Received:**	11/06/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-09PW-071105	**Units:**	ug/L
Lab Code:	K0710375-002	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**640**	D	21	3.2	1000	11/07/07	11/15/07	KWG0712172	
2-Methylnaphthalene	**11**	D	0.42	0.048	20	11/07/07	11/15/07	KWG0712172	
Acenaphthylene	**22**	D	0.42	0.071	20	11/07/07	11/15/07	KWG0712172	
Acenaphthene	**190**	D	0.42	0.092	20	11/07/07	11/15/07	KWG0712172	
Fluorene	**11**	D	0.42	0.080	20	11/07/07	11/15/07	KWG0712172	
Phenanthrene	**47**	D	0.42	0.11	20	11/07/07	11/15/07	KWG0712172	
Anthracene	**3.5**		0.021	0.0038	1	11/07/07	11/13/07	KWG0712172	
Fluoranthene	**1.1**		0.021	0.0046	1	11/07/07	11/13/07	KWG0712172	
Pyrene	**1.1**		0.021	0.0037	1	11/07/07	11/13/07	KWG0712172	
Benz(a)anthracene	**0.054**		0.021	0.0028	1	11/07/07	11/13/07	KWG0712172	
Chrysene	**0.051**		0.021	0.0036	1	11/07/07	11/13/07	KWG0712172	
Benzo(b)fluoranthene	**0.031**		0.021	0.0024	1	11/07/07	11/13/07	KWG0712172	
Benzo(k)fluoranthene	**0.010**	J	0.021	0.0027	1	11/07/07	11/13/07	KWG0712172	
Benzo(a)pyrene	**0.035**		0.021	0.0045	1	11/07/07	11/13/07	KWG0712172	
Indeno(1,2,3-cd)pyrene	**0.021**		0.021	0.0028	1	11/07/07	11/13/07	KWG0712172	
Dibenz(a,h)anthracene	**0.0032**	J	0.021	0.0027	1	11/07/07	11/13/07	KWG0712172	
Benzo(g,h,i)perylene	**0.024**		0.021	0.0031	1	11/07/07	11/13/07	KWG0712172	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	74	26-131	11/13/07	Acceptable
Fluoranthene-d10	79	28-150	11/13/07	Acceptable
Terphenyl-d14	82	32-157	11/13/07	Acceptable

Comments: 11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-09SC-071105	**Units:**	ug/Kg
Lab Code:	K0710375-001	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**940**		4.8	0.37	1	11/15/07	12/06/07	KWG0712490	
2-Methylnaphthalene	**83**		4.8	0.39	1	11/15/07	12/06/07	KWG0712490	
Acenaphthylene	**250**		4.8	0.24	1	11/15/07	12/06/07	KWG0712490	
Acenaphthene	**1400**		4.8	0.23	1	11/15/07	12/06/07	KWG0712490	
Fluorene	**630**		4.8	0.50	1	11/15/07	12/06/07	KWG0712490	
Phenanthrene	**6400**	D	48	7.5	10	11/15/07	12/11/07	KWG0712490	
Anthracene	**1200**		4.8	0.47	1	11/15/07	12/06/07	KWG0712490	
Fluoranthene	**4500**	D	48	6.1	10	11/15/07	12/11/07	KWG0712490	
Pyrene	**5200**	D	48	3.7	10	11/15/07	12/11/07	KWG0712490	
Benz(a)anthracene	**1000**		4.8	0.48	1	11/15/07	12/06/07	KWG0712490	
Chrysene	**1400**		4.8	0.25	1	11/15/07	12/06/07	KWG0712490	
Benzo(b)fluoranthene	**1200**		4.8	0.25	1	11/15/07	12/06/07	KWG0712490	
Benzo(k)fluoranthene	**500**		4.8	0.15	1	11/15/07	12/06/07	KWG0712490	
Benzo(a)pyrene	**1400**		4.8	0.14	1	11/15/07	12/06/07	KWG0712490	
Indeno(1,2,3-cd)pyrene	**1100**		4.8	0.16	1	11/15/07	12/06/07	KWG0712490	
Dibenz(a,h)anthracene	**120**		4.8	0.28	1	11/15/07	12/06/07	KWG0712490	
Benzo(g,h,i)perylene	**1100**		4.8	0.64	1	11/15/07	12/06/07	KWG0712490	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	81	10-123	12/06/07	Acceptable
Fluoranthene-d10	86	10-136	12/06/07	Acceptable
Terphenyl-d14	86	32-123	12/06/07	Acceptable

Comments: RR81273

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-10SC-071105	**Units:**	ug/Kg
Lab Code:	K0710375-003	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**59**		4.8	0.37	1	11/15/07	12/06/07	KWG0712490	
2-Methylnaphthalene	**3.4**	J	4.8	0.39	1	11/15/07	12/06/07	KWG0712490	
Acenaphthylene	**39**		4.8	0.24	1	11/15/07	12/06/07	KWG0712490	
Acenaphthene	**140**		4.8	0.23	1	11/15/07	12/06/07	KWG0712490	
Fluorene	**10**		4.8	0.50	1	11/15/07	12/06/07	KWG0712490	
Phenanthrene	**230**		4.8	0.75	1	11/15/07	12/06/07	KWG0712490	
Anthracene	**160**		4.8	0.47	1	11/15/07	12/06/07	KWG0712490	
Fluoranthene	**850**		4.8	0.61	1	11/15/07	12/06/07	KWG0712490	
Pyrene	**970**		4.8	0.37	1	11/15/07	12/06/07	KWG0712490	
Benz(a)anthracene	**200**		4.8	0.48	1	11/15/07	12/06/07	KWG0712490	
Chrysene	**270**		4.8	0.25	1	11/15/07	12/06/07	KWG0712490	
Benzo(b)fluoranthene	**260**		4.8	0.25	1	11/15/07	12/06/07	KWG0712490	
Benzo(k)fluoranthene	**120**		4.8	0.15	1	11/15/07	12/06/07	KWG0712490	
Benzo(a)pyrene	**280**		4.8	0.14	1	11/15/07	12/06/07	KWG0712490	
Indeno(1,2,3-cd)pyrene	**230**		4.8	0.16	1	11/15/07	12/06/07	KWG0712490	
Dibenz(a,h)anthracene	**27**		4.8	0.28	1	11/15/07	12/06/07	KWG0712490	
Benzo(g,h,i)perylene	**270**		4.8	0.64	1	11/15/07	12/06/07	KWG0712490	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	81	10-123	12/06/07	Acceptable
Fluoranthene-d10	82	10-136	12/06/07	Acceptable
Terphenyl-d14	83	32-123	12/06/07	Acceptable

Comments: 12/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-02DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-004	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**10000**	D	290	21	50	11/15/07	12/06/07	KWG0712490	
2-Methylnaphthalene	**1800**	D	290	23	50	11/15/07	12/06/07	KWG0712490	
Acenaphthylene	**2100**	D	290	14	50	11/15/07	12/06/07	KWG0712490	
Acenaphthene	**7700**	D	290	14	50	11/15/07	12/06/07	KWG0712490	
Fluorene	**4700**	D	290	29	50	11/15/07	12/06/07	KWG0712490	
Phenanthrene	**42000**	D	290	43	50	11/15/07	12/06/07	KWG0712490	
Anthracene	**17000**	D	290	27	50	11/15/07	12/06/07	KWG0712490	
Fluoranthene	**59000**	D	290	35	50	11/15/07	12/06/07	KWG0712490	
Pyrene	**70000**	D	290	21	50	11/15/07	12/06/07	KWG0712490	
Benz(a)anthracene	**19000**	D	290	28	50	11/15/07	12/06/07	KWG0712490	
Chrysene	**24000**	D	290	15	50	11/15/07	12/06/07	KWG0712490	
Benzo(b)fluoranthene	**24000**	D	290	15	50	11/15/07	12/06/07	KWG0712490	
Benzo(k)fluoranthene	**8900**	D	290	8.5	50	11/15/07	12/06/07	KWG0712490	
Benzo(a)pyrene	**29000**	D	290	8.0	50	11/15/07	12/06/07	KWG0712490	
Indeno(1,2,3-cd)pyrene	**24000**	D	290	9.1	50	11/15/07	12/06/07	KWG0712490	
Dibenz(a,h)anthracene	**2600**	D	290	16	50	11/15/07	12/06/07	KWG0712490	
Benzo(g,h,i)perylene	**27000**	D	290	37	50	11/15/07	12/06/07	KWG0712490	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	124	10-123	12/06/07	Outside Control Limits
Fluoranthene-d10	121	10-136	12/06/07	Acceptable
Terphenyl-d14	138	32-123	12/06/07	Outside Control Limits

Comments: 12/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-06DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-005	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**2400**	D	53	4.0	10	11/15/07	12/06/07	KWG0712490	
2-Methylnaphthalene	**830**	D	53	4.2	10	11/15/07	12/06/07	KWG0712490	
Acenaphthylene	**430**	D	53	2.6	10	11/15/07	12/06/07	KWG0712490	
Acenaphthene	**2100**	D	53	2.5	10	11/15/07	12/06/07	KWG0712490	
Fluorene	**1200**	D	53	5.3	10	11/15/07	12/06/07	KWG0712490	
Phenanthrene	**8200**	D	53	8.0	10	11/15/07	12/06/07	KWG0712490	
Anthracene	**2500**	D	53	5.0	10	11/15/07	12/06/07	KWG0712490	
Fluoranthene	**9200**	D	53	6.5	10	11/15/07	12/06/07	KWG0712490	
Pyrene	**11000**	D	53	4.0	10	11/15/07	12/06/07	KWG0712490	
Benz(a)anthracene	**2700**	D	53	5.1	10	11/15/07	12/06/07	KWG0712490	
Chrysene	**3800**	D	53	2.7	10	11/15/07	12/06/07	KWG0712490	
Benzo(b)fluoranthene	**3700**	D	53	2.7	10	11/15/07	12/06/07	KWG0712490	
Benzo(k)fluoranthene	**1700**	D	53	1.6	10	11/15/07	12/06/07	KWG0712490	
Benzo(a)pyrene	**4300**	D	53	1.5	10	11/15/07	12/06/07	KWG0712490	
Indeno(1,2,3-cd)pyrene	**3500**	D	53	1.7	10	11/15/07	12/06/07	KWG0712490	
Dibenz(a,h)anthracene	**380**	D	53	3.0	10	11/15/07	12/06/07	KWG0712490	
Benzo(g,h,i)perylene	**3900**	D	53	6.8	10	11/15/07	12/06/07	KWG0712490	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	82	10-123	12/06/07	Acceptable
Fluoranthene-d10	86	10-136	12/06/07	Acceptable
Terphenyl-d14	85	32-123	12/06/07	Acceptable

Comments: 12/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-09DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-006	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**670**	D	52	3.9	10	11/15/07	12/06/07	KWG0712490	
2-Methylnaphthalene	**120**	D	52	4.1	10	11/15/07	12/06/07	KWG0712490	
Acenaphthylene	**490**	D	52	2.5	10	11/15/07	12/06/07	KWG0712490	
Acenaphthene	**600**	D	52	2.4	10	11/15/07	12/06/07	KWG0712490	
Fluorene	**400**	D	52	5.2	10	11/15/07	12/06/07	KWG0712490	
Phenanthrene	**4800**	D	52	7.8	10	11/15/07	12/06/07	KWG0712490	
Anthracene	**2000**	D	52	4.9	10	11/15/07	12/06/07	KWG0712490	
Fluoranthene	**10000**	D	52	6.4	10	11/15/07	12/06/07	KWG0712490	
Pyrene	**12000**	D	52	3.9	10	11/15/07	12/06/07	KWG0712490	
Benz(a)anthracene	**3600**	D	52	5.0	10	11/15/07	12/06/07	KWG0712490	
Chrysene	**4500**	D	52	2.6	10	11/15/07	12/06/07	KWG0712490	
Benzo(b)fluoranthene	**5100**	D	52	2.6	10	11/15/07	12/06/07	KWG0712490	
Benzo(k)fluoranthene	**2000**	D	52	1.6	10	11/15/07	12/06/07	KWG0712490	
Benzo(a)pyrene	**5900**	D	52	1.5	10	11/15/07	12/06/07	KWG0712490	
Indeno(1,2,3-cd)pyrene	**4800**	D	52	1.7	10	11/15/07	12/06/07	KWG0712490	
Dibenz(a,h)anthracene	**550**	D	52	3.0	10	11/15/07	12/06/07	KWG0712490	
Benzo(g,h,i)perylene	**5200**	D	52	6.7	10	11/15/07	12/06/07	KWG0712490	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	68	10-123	12/06/07	Acceptable
Fluoranthene-d10	76	10-136	12/06/07	Acceptable
Terphenyl-d14	78	32-123	12/06/07	Acceptable

Comments: 8013108

LDC #: 18144A2b
SDG #: K0710375
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/30/08
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/5/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	25%
V.	Blanks	SW	
VI.	Surrogate spikes	SW	
VII.	Matrix spike/Matrix spike duplicates	N	client specified.
VIII.	Laboratory control samples	A	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	PCM-09SC-071105 sed	11	KWF0712T2-4	21		31	
2	PCM-09PW-071105 W	12	KWF-0712A90-5	22		32	
3	PCM-10SC-071105 sed	13		23		33	
4	PCM-02DS-071105	14		24		34	
5	PCM-06DS-071105	15		25		35	
6	PCM-09DS-071105	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

LDC #: 18144A2b
SDG #: K0710375

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 11/7/07 **Blank analysis date:** 11/14/07
Conc. units: ug/L Associated Samples: M H2O S

Compound	Blank ID	Sample Identification								
KW4OT	12172-4	1 (1000)								
S	0.0042	(640)								

Blank extraction date: 11/15/07 **Blank analysis date:** 12/6/07
Conc. units: ug/kg Associated Samples: M soils (>5X)

Compound	Blank ID	Sample Identification								
KW4OT	12490-5									
S	0.43									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18144A2b
SDG #: K0710375

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		4	sum out	( )	No Canal (SF > 10x)
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* QC limits are advisory	QC Limits (Soil)	QC Limits (Water)		QC Limits (Soil)	QC Limits (Water)
S1 (NBZ) = Nitrobenzene-d5	23-120	35-114	S5 (2FP) = 2-Fluorophenol	25-121	21-100
S2 (FBP) = 2-Fluorobiphenyl	30-115	43-116	S6 (TBP) = 2,4,6-Tribromophenol	19-122	10-123
S3 (TPH) = Terphenyl-d14	18-137	33-141	S7 (2CP) = 2-Chlorophenol-d4	20-130*	33-110*
S4 (PHL) = Phenol-d5	24-113	10-94	S8 (DCB) = 1,2-Dichlorobenzene-d4	20-130*	16-110*

SUR.2S

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 8 through November 9, 2007
LDC Report Date:	January 30, 2008
Matrix:	Sediment/Water
Parameters:	Polynuclear Aromatic Hydrocarbons
Validation Level:	EPA Level III
Laboratory:	Analytical Resources, Inc.
Sample Delivery Group (SDG):	K0710558

Sample Identification

PCM-13DSW-071109
PCM-01DSW-071109
PCM-02DSW-071109
PCM-03DSW-071109
PCM-04DSW-071109
PCM-05DSW-071109
PCM-06DSW-071109
PCM-21DSW-071109
PCM-08DSW-071109
PCM-09DSW-071109
PCM-10DSW-071109
PCM-08SC-071108
PCM-08PW-071108
PCM-SCRB-071108
PCM-PWRB-071108
PCM-DRB-071108
PCM-BRB-071108
PCM-19DSW-071109
PCM-20DSW-071109
PCM-05DSW-071109MS

Introduction

This data review covers one sediment sample and 19 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per a modification of EPA SW 846 Method 8270C using Selected Ion Monitoring (SIM) for Polynuclear Aromatic Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals. All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

Average relative response factors (RRF) for all target compounds were within validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% .

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration RRF values were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polynuclear aromatic hydrocarbon contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
KWG0712581-4	11/15/07	Naphthalene Acenaphthylene	0.0034 ug/L 0.0036 ug/L	All water samples in SDG K0710558
KWG0712652-5	11/19/07	Naphthalene	0.37 ug/Kg	All sediment samples in SDG K0710558

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
PCM-13DSW-071109	Naphthalene	0.0048 ug/L	0.020U ug/L
PCM-01DSW-071109	Naphthalene	0.016 ug/L	0.021U ug/L
PCM-02DSW-071109	Naphthalene	0.013 ug/L	0.021U ug/L
PCM-04DSW-071109	Acenaphthylene	0.0091 ug/L	0.020U ug/L
PCM-05DSW-071109	Naphthalene	0.011 ug/L	0.020U ug/L
PCM-09DSW-071109	Acenaphthylene	0.0041 ug/L	0.019U ug/L
PCM-10DSW-071109	Acenaphthylene	0.012 ug/L	0.021U ug/L
PCM-20DSW-071109	Naphthalene	0.0074 ug/L	0.021U ug/L

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

The laboratory has indicated that there were no matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to method blank contamination problems, data were qualified as not detected in eight samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

Samples PCM-SCRB-071108, PCM-PWRB-071108, PCM-DRB-071108, and PCM-BRB-071108 were identified as rinsate blanks. No polynuclear aromatic hydrocarbon contaminants were found in these blanks with the following exceptions:

Rinsate Blank ID	Compound	Concentration (ug/L)
PCM-SCRB-071108	Naphthalene 2-Methylnaphthalene Phenanthrene	0.081 0.019 0.0064
PCM-PWRB-071108	Naphthalene 2-Methylnaphthalene Acenaphthene Fluorene Phenanthrene Fluoranthene Pyrene Benzo(a)anthracene Chrysene	0.11 0.021 0.0097 0.0046 0.045 0.039 0.021 0.0039 0.0053
PCM-DRB-071108	Naphthalene 2-Methylnaphthalene Phenanthrene	0.070 0.018 0.0057
PCM-BRB-071108	Naphthalene 2-Methylnaphthalene	0.063 0.017

NW Natural Gasco Site
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG K0710558

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG K0710558

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
K0710558	PCM-13DSW-071109	Naphthalene	0.020U ug/L	A
K0710558	PCM-01DSW-071109	Naphthalene	0.021U ug/L	A
K0710558	PCM-02DSW-071109	Naphthalene	0.021U ug/L	A
K0710558	PCM-04DSW-071109	Acenaphthylene	0.020U ug/L	A
K0710558	PCM-05DSW-071109	Naphthalene	0.020U ug/L	A
K0710558	PCM-09DSW-071109	Acenaphthylene	0.019U ug/L	A
K0710558	PCM-10DSW-071109	Acenaphthylene	0.021U ug/L	A
K0710558	PCM-20DSW-071109	Naphthalene	0.021U ug/L	A

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-13DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-001	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.0048**	J	0.020U 0.020	0.0030	1	11/15/07	11/30/07	KWG0712581	
2-Methylnaphthalene	ND	U	0.020	0.0023	1	11/15/07	11/30/07	KWG0712581	
Acenaphthylene	ND	U	0.020	0.0034	1	11/15/07	11/30/07	KWG0712581	
Acenaphthene	ND	U	0.020	0.0044	1	11/15/07	11/30/07	KWG0712581	
Fluorene	ND	U	0.020	0.0038	1	11/15/07	11/30/07	KWG0712581	
Phenanthrene	ND	U	0.020	0.0050	1	11/15/07	11/30/07	KWG0712581	
Anthracene	ND	U	0.020	0.0036	1	11/15/07	11/30/07	KWG0712581	
Fluoranthene	ND	U	0.020	0.0044	1	11/15/07	11/30/07	KWG0712581	
Pyrene	ND	U	0.020	0.0035	1	11/15/07	11/30/07	KWG0712581	
Benz(a)anthracene	ND	U	0.020	0.0026	1	11/15/07	11/30/07	KWG0712581	
Chrysene	ND	U	0.020	0.0034	1	11/15/07	11/30/07	KWG0712581	
Benzo(b)fluoranthene	ND	U	0.020	0.0023	1	11/15/07	11/30/07	KWG0712581	
Benzo(k)fluoranthene	ND	U	0.020	0.0025	1	11/15/07	11/30/07	KWG0712581	
Benzo(a)pyrene	ND	U	0.020	0.0043	1	11/15/07	11/30/07	KWG0712581	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	0.0026	1	11/15/07	11/30/07	KWG0712581	
Dibenz(a,h)anthracene	ND	U	0.020	0.0025	1	11/15/07	11/30/07	KWG0712581	
Benzo(g,h,i)perylene	ND	U	0.020	0.0029	1	11/15/07	11/30/07	KWG0712581	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	73	26-131	11/30/07	Acceptable
Fluoranthene-d10	79	28-150	11/30/07	Acceptable
Terphenyl-d14	82	32-157	11/30/07	Acceptable

Comments: K0713108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-01DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-002	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.016**	J 0.02147	0.021	0.0032	1	11/15/07	11/30/07	KWG0712581	
2-Methylnaphthalene	**0.0040**	J	0.021	0.0024	1	11/15/07	11/30/07	KWG0712581	
Acenaphthylene	ND	U	0.021	0.0036	1	11/15/07	11/30/07	KWG0712581	
Acenaphthene	**0.0062**	J	0.021	0.0046	1	11/15/07	11/30/07	KWG0712581	
Fluorene	ND	U	0.021	0.0040	1	11/15/07	11/30/07	KWG0712581	
Phenanthrene	**0.0082**	J	0.021	0.0053	1	11/15/07	11/30/07	KWG0712581	
Anthracene	ND	U	0.021	0.0038	1	11/15/07	11/30/07	KWG0712581	
Fluoranthene	**0.011**	J	0.021	0.0046	1	11/15/07	11/30/07	KWG0712581	
Pyrene	**0.0092**	J	0.021	0.0037	1	11/15/07	11/30/07	KWG0712581	
Benz(a)anthracene	ND	U	0.021	0.0028	1	11/15/07	11/30/07	KWG0712581	
Chrysene	ND	U	0.021	0.0036	1	11/15/07	11/30/07	KWG0712581	
Benzo(b)fluoranthene	ND	U	0.021	0.0024	1	11/15/07	11/30/07	KWG0712581	
Benzo(k)fluoranthene	ND	U	0.021	0.0027	1	11/15/07	11/30/07	KWG0712581	
Benzo(a)pyrene	ND	U	0.021	0.0045	1	11/15/07	11/30/07	KWG0712581	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	0.0028	1	11/15/07	11/30/07	KWG0712581	
Dibenz(a,h)anthracene	ND	U	0.021	0.0027	1	11/15/07	11/30/07	KWG0712581	
Benzo(g,h,i)perylene	ND	U	0.021	0.0031	1	11/15/07	11/30/07	KWG0712581	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	77	26-131	11/30/07	Acceptable
Fluoranthene-d10	83	28-150	11/30/07	Acceptable
Terphenyl-d14	88	32-157	11/30/07	Acceptable

Comments: MoB108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-02DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-003	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.013**	J 0.021 U 7	0.021	0.0031	1	11/15/07	11/30/07	KWG0712581	
2-Methylnaphthalene	**0.0026**	J	0.021	0.0024	1	11/15/07	11/30/07	KWG0712581	
Acenaphthylene	ND	U	0.021	0.0035	1	11/15/07	11/30/07	KWG0712581	
Acenaphthene	ND	U	0.021	0.0045	1	11/15/07	11/30/07	KWG0712581	
Fluorene	ND	U	0.021	0.0039	1	11/15/07	11/30/07	KWG0712581	
Phenanthrene	ND	U	0.021	0.0052	1	11/15/07	11/30/07	KWG0712581	
Anthracene	ND	U	0.021	0.0037	1	11/15/07	11/30/07	KWG0712581	
Fluoranthene	**0.0076**	J	0.021	0.0045	1	11/15/07	11/30/07	KWG0712581	
Pyrene	**0.0041**	J	0.021	0.0036	1	11/15/07	11/30/07	KWG0712581	
Benz(a)anthracene	ND	U	0.021	0.0027	1	11/15/07	11/30/07	KWG0712581	
Chrysene	ND	U	0.021	0.0035	1	11/15/07	11/30/07	KWG0712581	
Benzo(b)fluoranthene	ND	U	0.021	0.0024	1	11/15/07	11/30/07	KWG0712581	
Benzo(k)fluoranthene	ND	U	0.021	0.0026	1	11/15/07	11/30/07	KWG0712581	
Benzo(a)pyrene	ND	U	0.021	0.0044	1	11/15/07	11/30/07	KWG0712581	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	0.0027	1	11/15/07	11/30/07	KWG0712581	
Dibenz(a,h)anthracene	ND	U	0.021	0.0026	1	11/15/07	11/30/07	KWG0712581	
Benzo(g,h,i)perylene	ND	U	0.021	0.0030	1	11/15/07	11/30/07	KWG0712581	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	77	26-131	11/30/07	Acceptable
Fluoranthene-d10	84	28-150	11/30/07	Acceptable
Terphenyl-d14	87	32-157	11/30/07	Acceptable

Comments: 12/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-03DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-004	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.025**		0.020	0.0030	1	11/15/07	11/30/07	KWG0712581	
2-Methylnaphthalene	**0.0039**	J	0.020	0.0023	1	11/15/07	11/30/07	KWG0712581	
Acenaphthylene	ND	U	0.020	0.0034	1	11/15/07	11/30/07	KWG0712581	
Acenaphthene	**0.0045**	J	0.020	0.0044	1	11/15/07	11/30/07	KWG0712581	
Fluorene	ND	U	0.020	0.0038	1	11/15/07	11/30/07	KWG0712581	
Phenanthrene	**0.0057**	J	0.020	0.0050	1	11/15/07	11/30/07	KWG0712581	
Anthracene	ND	U	0.020	0.0036	1	11/15/07	11/30/07	KWG0712581	
Fluoranthene	**0.0064**	J	0.020	0.0044	1	11/15/07	11/30/07	KWG0712581	
Pyrene	**0.0046**	J	0.020	0.0035	1	11/15/07	11/30/07	KWG0712581	
Benz(a)anthracene	ND	U	0.020	0.0026	1	11/15/07	11/30/07	KWG0712581	
Chrysene	ND	U	0.020	0.0034	1	11/15/07	11/30/07	KWG0712581	
Benzo(b)fluoranthene	ND	U	0.020	0.0023	1	11/15/07	11/30/07	KWG0712581	
Benzo(k)fluoranthene	ND	U	0.020	0.0025	1	11/15/07	11/30/07	KWG0712581	
Benzo(a)pyrene	ND	U	0.020	0.0043	1	11/15/07	11/30/07	KWG0712581	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	0.0026	1	11/15/07	11/30/07	KWG0712581	
Dibenz(a,h)anthracene	ND	U	0.020	0.0025	1	11/15/07	11/30/07	KWG0712581	
Benzo(g,h,i)perylene	ND	U	0.020	0.0029	1	11/15/07	11/30/07	KWG0712581	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	64	26-131	11/30/07	Acceptable
Fluoranthene-d10	73	28-150	11/30/07	Acceptable
Terphenyl-d14	75	32-157	11/30/07	Acceptable

Comments: 12/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-04DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-005	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.20**		0.020	0.0030	1	11/15/07	11/30/07	KWG0712581	
2-Methylnaphthalene	**0.027**		0.020	0.0023	1	11/15/07	11/30/07	KWG0712581	
Acenaphthylene	**0.0091**	J 0.020 U	0.020	0.0034	1	11/15/07	11/30/07	KWG0712581	
Acenaphthene	**0.026**		0.020	0.0044	1	11/15/07	11/30/07	KWG0712581	
Fluorene	**0.0094**	J	0.020	0.0038	1	11/15/07	11/30/07	KWG0712581	
Phenanthrene	**0.029**		0.020	0.0050	1	11/15/07	11/30/07	KWG0712581	
Anthracene	**0.0071**	J	0.020	0.0036	1	11/15/07	11/30/07	KWG0712581	
Fluoranthene	**0.025**		0.020	0.0044	1	11/15/07	11/30/07	KWG0712581	
Pyrene	**0.023**		0.020	0.0035	1	11/15/07	11/30/07	KWG0712581	
Benz(a)anthracene	**0.0080**	J	0.020	0.0026	1	11/15/07	11/30/07	KWG0712581	
Chrysene	**0.012**	J	0.020	0.0034	1	11/15/07	11/30/07	KWG0712581	
Benzo(b)fluoranthene	**0.0067**	J	0.020	0.0023	1	11/15/07	11/30/07	KWG0712581	
Benzo(k)fluoranthene	**0.0039**	J	0.020	0.0025	1	11/15/07	11/30/07	KWG0712581	
Benzo(a)pyrene	**0.0056**	J	0.020	0.0043	1	11/15/07	11/30/07	KWG0712581	
Indeno(1,2,3-cd)pyrene	**0.0081**	J	0.020	0.0026	1	11/15/07	11/30/07	KWG0712581	
Dibenz(a,h)anthracene	**0.0026**	J	0.020	0.0025	1	11/15/07	11/30/07	KWG0712581	
Benzo(g,h,i)perylene	**0.0079**	J	0.020	0.0029	1	11/15/07	11/30/07	KWG0712581	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	74	26-131	11/30/07	Acceptable
Fluoranthene-d10	77	28-150	11/30/07	Acceptable
Terphenyl-d14	82	32-157	11/30/07	Acceptable

Comments: RL 13108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-05DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-006	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.011**	J D.020U7	0.020	0.0030	1	11/15/07	11/30/07	KWG0712581	
2-Methylnaphthalene	**0.0025**	J	0.020	0.0023	1	11/15/07	11/30/07	KWG0712581	
Acenaphthylene	ND	U	0.020	0.0034	1	11/15/07	11/30/07	KWG0712581	
Acenaphthene	ND	U	0.020	0.0044	1	11/15/07	11/30/07	KWG0712581	
Fluorene	ND	U	0.020	0.0038	1	11/15/07	11/30/07	KWG0712581	
Phenanthrene	**0.0059**	J	0.020	0.0050	1	11/15/07	11/30/07	KWG0712581	
Anthracene	ND	U	0.020	0.0036	1	11/15/07	11/30/07	KWG0712581	
Fluoranthene	**0.0063**	J	0.020	0.0044	1	11/15/07	11/30/07	KWG0712581	
Pyrene	**0.0046**	J	0.020	0.0035	1	11/15/07	11/30/07	KWG0712581	
Benz(a)anthracene	ND	U	0.020	0.0026	1	11/15/07	11/30/07	KWG0712581	
Chrysene	ND	U	0.020	0.0034	1	11/15/07	11/30/07	KWG0712581	
Benzo(b)fluoranthene	ND	U	0.020	0.0023	1	11/15/07	11/30/07	KWG0712581	
Benzo(k)fluoranthene	ND	U	0.020	0.0025	1	11/15/07	11/30/07	KWG0712581	
Benzo(a)pyrene	ND	U	0.020	0.0043	1	11/15/07	11/30/07	KWG0712581	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	0.0026	1	11/15/07	11/30/07	KWG0712581	
Dibenz(a,h)anthracene	ND	U	0.020	0.0025	1	11/15/07	11/30/07	KWG0712581	
Benzo(g,h,i)perylene	ND	U	0.020	0.0029	1	11/15/07	11/30/07	KWG0712581	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	81	26-131	11/30/07	Acceptable
Fluoranthene-d10	86	28-150	11/30/07	Acceptable
Terphenyl-d14	89	32-157	11/30/07	Acceptable

Comments: 1/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-06DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-007	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.11**		0.020	0.0030	1	11/15/07	11/30/07	KWG0712581	
2-Methylnaphthalene	**0.0061**	J	0.020	0.0023	1	11/15/07	11/30/07	KWG0712581	
Acenaphthylene	ND	U	0.020	0.0034	1	11/15/07	11/30/07	KWG0712581	
Acenaphthene	**0.013**	J	0.020	0.0044	1	11/15/07	11/30/07	KWG0712581	
Fluorene	ND	U	0.020	0.0038	1	11/15/07	11/30/07	KWG0712581	
Phenanthrene	**0.011**	J	0.020	0.0050	1	11/15/07	11/30/07	KWG0712581	
Anthracene	**0.0047**	J	0.020	0.0036	1	11/15/07	11/30/07	KWG0712581	
Fluoranthene	**0.0083**	J	0.020	0.0044	1	11/15/07	11/30/07	KWG0712581	
Pyrene	**0.0067**	J	0.020	0.0035	1	11/15/07	11/30/07	KWG0712581	
Benz(a)anthracene	ND	U	0.020	0.0026	1	11/15/07	11/30/07	KWG0712581	
Chrysene	ND	U	0.020	0.0034	1	11/15/07	11/30/07	KWG0712581	
Benzo(b)fluoranthene	ND	U	0.020	0.0023	1	11/15/07	11/30/07	KWG0712581	
Benzo(k)fluoranthene	ND	U	0.020	0.0025	1	11/15/07	11/30/07	KWG0712581	
Benzo(a)pyrene	ND	U	0.020	0.0043	1	11/15/07	11/30/07	KWG0712581	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	0.0026	1	11/15/07	11/30/07	KWG0712581	
Dibenz(a,h)anthracene	ND	U	0.020	0.0025	1	11/15/07	11/30/07	KWG0712581	
Benzo(g,h,i)perylene	ND	U	0.020	0.0029	1	11/15/07	11/30/07	KWG0712581	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	81	26-131	11/30/07	Acceptable
Fluoranthene-d10	84	28-150	11/30/07	Acceptable
Terphenyl-d14	88	32-157	11/30/07	Acceptable

Comments: PF 6/3/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-21DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-008	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.11**		0.021	0.0031	1	11/15/07	11/30/07	KWG0712581	
2-Methylnaphthalene	**0.011**	J	0.021	0.0024	1	11/15/07	11/30/07	KWG0712581	
Acenaphthylene	ND	U	0.021	0.0035	1	11/15/07	11/30/07	KWG0712581	
Acenaphthene	**0.020**	J	0.021	0.0045	1	11/15/07	11/30/07	KWG0712581	
Fluorene	**0.0080**	J	0.021	0.0039	1	11/15/07	11/30/07	KWG0712581	
Phenanthrene	**0.024**		0.021	0.0052	1	11/15/07	11/30/07	KWG0712581	
Anthracene	**0.0062**	J	0.021	0.0037	1	11/15/07	11/30/07	KWG0712581	
Fluoranthene	**0.024**		0.021	0.0045	1	11/15/07	11/30/07	KWG0712581	
Pyrene	**0.021**		0.021	0.0036	1	11/15/07	11/30/07	KWG0712581	
Benz(a)anthracene	**0.0075**	J	0.021	0.0027	1	11/15/07	11/30/07	KWG0712581	
Chrysene	**0.0068**	J	0.021	0.0035	1	11/15/07	11/30/07	KWG0712581	
Benzo(b)fluoranthene	**0.0056**	J	0.021	0.0024	1	11/15/07	11/30/07	KWG0712581	
Benzo(k)fluoranthene	**0.0027**	J	0.021	0.0026	1	11/15/07	11/30/07	KWG0712581	
Benzo(a)pyrene	**0.0062**	J	0.021	0.0044	1	11/15/07	11/30/07	KWG0712581	
Indeno(1,2,3-cd)pyrene	**0.0047**	J	0.021	0.0027	1	11/15/07	11/30/07	KWG0712581	
Dibenz(a,h)anthracene	ND	U	0.021	0.0026	1	11/15/07	11/30/07	KWG0712581	
Benzo(g,h,i)perylene	**0.0041**	J	0.021	0.0030	1	11/15/07	11/30/07	KWG0712581	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	82	26-131	11/30/07	Acceptable
Fluoranthene-d10	87	28-150	11/30/07	Acceptable
Terphenyl-d14	90	32-157	11/30/07	Acceptable

Comments: 1/6/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-08DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-009	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.052**		0.021	0.0031	1	11/15/07	11/29/07	KWG0712581	
2-Methylnaphthalene	**0.0048**	J	0.021	0.0024	1	11/15/07	11/29/07	KWG0712581	
Acenaphthylene	ND	U	0.021	0.0035	1	11/15/07	11/29/07	KWG0712581	
Acenaphthene	**0.010**	J	0.021	0.0045	1	11/15/07	11/29/07	KWG0712581	
Fluorene	**0.0044**	J	0.021	0.0039	1	11/15/07	11/29/07	KWG0712581	
Phenanthrene	**0.012**	J	0.021	0.0052	1	11/15/07	11/29/07	KWG0712581	
Anthracene	ND	U	0.021	0.0037	1	11/15/07	11/29/07	KWG0712581	
Fluoranthene	**0.012**	J	0.021	0.0045	1	11/15/07	11/29/07	KWG0712581	
Pyrene	**0.0091**	J	0.021	0.0036	1	11/15/07	11/29/07	KWG0712581	
Benz(a)anthracene	**0.0050**	J	0.021	0.0027	1	11/15/07	11/29/07	KWG0712581	
Chrysene	ND	U	0.021	0.0035	1	11/15/07	11/29/07	KWG0712581	
Benzo(b)fluoranthene	ND	U	0.021	0.0024	1	11/15/07	11/29/07	KWG0712581	
Benzo(k)fluoranthene	ND	U	0.021	0.0026	1	11/15/07	11/29/07	KWG0712581	
Benzo(a)pyrene	ND	U	0.021	0.0044	1	11/15/07	11/29/07	KWG0712581	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	0.0027	1	11/15/07	11/29/07	KWG0712581	
Dibenz(a,h)anthracene	ND	U	0.021	0.0026	1	11/15/07	11/29/07	KWG0712581	
Benzo(g,h,i)perylene	ND	U	0.021	0.0030	1	11/15/07	11/29/07	KWG0712581	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	75	26-131	11/29/07	Acceptable
Fluoranthene-d10	82	28-150	11/29/07	Acceptable
Terphenyl-d14	87	32-157	11/29/07	Acceptable

Comments: DL 113108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-09DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-010	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.11**		0.019	0.0030	1	11/15/07	11/29/07	KWG0712581	
2-Methylnaphthalene	**0.0091**	J	0.019	0.0023	1	11/15/07	11/29/07	KWG0712581	
Acenaphthylene	**0.0041**	J 0.0194	0.019	0.0034	1	11/15/07	11/29/07	KWG0712581	
Acenaphthene	**0.020**		0.019	0.0044	1	11/15/07	11/29/07	KWG0712581	
Fluorene	**0.0065**	J	0.019	0.0038	1	11/15/07	11/29/07	KWG0712581	
Phenanthrene	**0.019**		0.019	0.0050	1	11/15/07	11/29/07	KWG0712581	
Anthracene	**0.0077**	J	0.019	0.0036	1	11/15/07	11/29/07	KWG0712581	
Fluoranthene	**0.021**		0.019	0.0044	1	11/15/07	11/29/07	KWG0712581	
Pyrene	**0.019**	J	0.019	0.0035	1	11/15/07	11/29/07	KWG0712581	
Benz(a)anthracene	**0.0067**	J	0.019	0.0026	1	11/15/07	11/29/07	KWG0712581	
Chrysene	**0.012**	J	0.019	0.0034	1	11/15/07	11/29/07	KWG0712581	
Benzo(b)fluoranthene	**0.0042**	J	0.019	0.0023	1	11/15/07	11/29/07	KWG0712581	
Benzo(k)fluoranthene	ND	U	0.019	0.0025	1	11/15/07	11/29/07	KWG0712581	
Benzo(a)pyrene	ND	U	0.019	0.0043	1	11/15/07	11/29/07	KWG0712581	
Indeno(1,2,3-cd)pyrene	ND	U	0.019	0.0026	1	11/15/07	11/29/07	KWG0712581	
Dibenz(a,h)anthracene	ND	U	0.019	0.0025	1	11/15/07	11/29/07	KWG0712581	
Benzo(g,h,i)perylene	**0.0039**	J	0.019	0.0029	1	11/15/07	11/29/07	KWG0712581	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	73	26-131	11/29/07	Acceptable
Fluoranthene-d10	84	28-150	11/29/07	Acceptable
Terphenyl-d14	89	32-157	11/29/07	Acceptable

Comments: 01/31/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-10DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-011	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.11**		0.021	0.0031	1	11/15/07	11/29/07	KWG0712581	
2-Methylnaphthalene	**0.018**	J	0.021	0.0024	1	11/15/07	11/29/07	KWG0712581	
Acenaphthylene	**0.012**	J 0.021 U 7	0.021	0.0035	1	11/15/07	11/29/07	KWG0712581	
Acenaphthene	**0.051**		0.021	0.0045	1	11/15/07	11/29/07	KWG0712581	
Fluorene	**0.015**	J	0.021	0.0039	1	11/15/07	11/29/07	KWG0712581	
Phenanthrene	**0.055**		0.021	0.0052	1	11/15/07	11/29/07	KWG0712581	
Anthracene	**0.016**	J	0.021	0.0037	1	11/15/07	11/29/07	KWG0712581	
Fluoranthene	**0.094**		0.021	0.0045	1	11/15/07	11/29/07	KWG0712581	
Pyrene	**0.097**		0.021	0.0036	1	11/15/07	11/29/07	KWG0712581	
Benz(a)anthracene	**0.029**		0.021	0.0027	1	11/15/07	11/29/07	KWG0712581	
Chrysene	**0.035**		0.021	0.0035	1	11/15/07	11/29/07	KWG0712581	
Benzo(b)fluoranthene	**0.033**		0.021	0.0024	1	11/15/07	11/29/07	KWG0712581	
Benzo(k)fluoranthene	**0.016**	J	0.021	0.0026	1	11/15/07	11/29/07	KWG0712581	
Benzo(a)pyrene	**0.031**		0.021	0.0044	1	11/15/07	11/29/07	KWG0712581	
Indeno(1,2,3-cd)pyrene	**0.022**		0.021	0.0027	1	11/15/07	11/29/07	KWG0712581	
Dibenz(a,h)anthracene	ND	U	0.021	0.0026	1	11/15/07	11/29/07	KWG0712581	
Benzo(g,h,i)perylene	**0.030**		0.021	0.0030	1	11/15/07	11/29/07	KWG0712581	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	80	26-131	11/29/07	Acceptable
Fluoranthene-d10	88	28-150	11/29/07	Acceptable
Terphenyl-d14	91	32-157	11/29/07	Acceptable

Comments: 0/3/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Sediment	**Date Received:**	11/09/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-08SC-071108	**Units:**	ug/Kg
Lab Code:	K0710558-012	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**630**		4.3	0.37	1	11/19/07	12/09/07	KWG0712652	
2-Methylnaphthalene	**210**		4.3	0.39	1	11/19/07	12/09/07	KWG0712652	
Acenaphthylene	**190**		4.3	0.24	1	11/19/07	12/09/07	KWG0712652	
Acenaphthene	**2500**	D	43	2.3	10	11/19/07	12/10/07	KWG0712652	
Fluorene	**970**		4.3	0.50	1	11/19/07	12/09/07	KWG0712652	
Phenanthrene	**10000**	D	43	7.5	10	11/19/07	12/10/07	KWG0712652	
Anthracene	**2300**	D	43	4.7	10	11/19/07	12/10/07	KWG0712652	
Fluoranthene	**7400**	D	43	6.1	10	11/19/07	12/10/07	KWG0712652	
Pyrene	**8800**	D	43	3.7	10	11/19/07	12/10/07	KWG0712652	
Benz(a)anthracene	**1700**	D	43	4.8	10	11/19/07	12/10/07	KWG0712652	
Chrysene	**2300**	D	43	2.5	10	11/19/07	12/10/07	KWG0712652	
Benzo(b)fluoranthene	**2100**	D	43	2.5	10	11/19/07	12/10/07	KWG0712652	
Benzo(k)fluoranthene	**670**		4.3	0.15	1	11/19/07	12/09/07	KWG0712652	
Benzo(a)pyrene	**2400**	D	43	1.4	10	11/19/07	12/10/07	KWG0712652	
Indeno(1,2,3-cd)pyrene	**1800**	D	43	1.6	10	11/19/07	12/10/07	KWG0712652	
Dibenz(a,h)anthracene	**190**		4.3	0.28	1	11/19/07	12/09/07	KWG0712652	
Benzo(g,h,i)perylene	**2000**	D	43	6.4	10	11/19/07	12/10/07	KWG0712652	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	73	10-123	12/09/07	Acceptable
Fluoranthene-d10	75	10-136	12/09/07	Acceptable
Terphenyl-d14	78	32-123	12/09/07	Acceptable

Comments: SC 01/31/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Pore water	**Date Received:**	11/09/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-08PW-071108	**Units:**	ug/L
Lab Code:	K0710558-013	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**1900**	D	11	1.6	500	11/15/07	12/09/07	KWG0712581	
2-Methylnaphthalene	**5.4**	D	0.21	0.024	10	11/15/07	12/09/07	KWG0712581	
Acenaphthylene	**33**	D	0.21	0.036	10	11/15/07	12/09/07	KWG0712581	
Acenaphthene	**180**	D	11	2.3	500	11/15/07	12/09/07	KWG0712581	
Fluorene	**19**	D	0.21	0.040	10	11/15/07	12/09/07	KWG0712581	
Phenanthrene	**100**	D	0.21	0.053	10	11/15/07	12/09/07	KWG0712581	
Anthracene	**5.8**		0.021	0.0038	1	11/15/07	11/29/07	KWG0712581	
Fluoranthene	**1.9**		0.021	0.0046	1	11/15/07	11/29/07	KWG0712581	
Pyrene	**1.2**		0.021	0.0037	1	11/15/07	11/29/07	KWG0712581	
Benz(a)anthracene	**0.030**		0.021	0.0028	1	11/15/07	11/29/07	KWG0712581	
Chrysene	**0.019**	J	0.021	0.0036	1	11/15/07	11/29/07	KWG0712581	
Benzo(b)fluoranthene	**0.010**	J	0.021	0.0024	1	11/15/07	11/29/07	KWG0712581	
Benzo(k)fluoranthene	**0.0039**	J	0.021	0.0027	1	11/15/07	11/29/07	KWG0712581	
Benzo(a)pyrene	**0.012**	J	0.021	0.0045	1	11/15/07	11/29/07	KWG0712581	
Indeno(1,2,3-cd)pyrene	**0.0073**	J	0.021	0.0028	1	11/15/07	11/29/07	KWG0712581	
Dibenz(a,h)anthracene	ND	U	0.021	0.0027	1	11/15/07	11/29/07	KWG0712581	
Benzo(g,h,i)perylene	**0.0076**	J	0.021	0.0031	1	11/15/07	11/29/07	KWG0712581	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	78	26-131	11/29/07	Acceptable
Fluoranthene-d10	75	28-150	11/29/07	Acceptable
Terphenyl-d14	91	32-157	11/29/07	Acceptable

Comments: SL 1/31/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-SCRB-071108	**Units:**	ug/L
Lab Code:	K0710558-015	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.081**		0.020	0.0030	1	11/15/07	11/29/07	KWG0712581	
2-Methylnaphthalene	**0.019**	J	0.020	0.0023	1	11/15/07	11/29/07	KWG0712581	
Acenaphthylene	ND	U	0.020	0.0034	1	11/15/07	11/29/07	KWG0712581	
Acenaphthene	ND	U	0.020	0.0044	1	11/15/07	11/29/07	KWG0712581	
Fluorene	ND	U	0.020	0.0038	1	11/15/07	11/29/07	KWG0712581	
Phenanthrene	**0.0064**	J	0.020	0.0050	1	11/15/07	11/29/07	KWG0712581	
Anthracene	ND	U	0.020	0.0036	1	11/15/07	11/29/07	KWG0712581	
Fluoranthene	ND	U	0.020	0.0044	1	11/15/07	11/29/07	KWG0712581	
Pyrene	ND	U	0.020	0.0035	1	11/15/07	11/29/07	KWG0712581	
Benz(a)anthracene	ND	U	0.020	0.0026	1	11/15/07	11/29/07	KWG0712581	
Chrysene	ND	U	0.020	0.0034	1	11/15/07	11/29/07	KWG0712581	
Benzo(b)fluoranthene	ND	U	0.020	0.0023	1	11/15/07	11/29/07	KWG0712581	
Benzo(k)fluoranthene	ND	U	0.020	0.0025	1	11/15/07	11/29/07	KWG0712581	
Benzo(a)pyrene	ND	U	0.020	0.0043	1	11/15/07	11/29/07	KWG0712581	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	0.0026	1	11/15/07	11/29/07	KWG0712581	
Dibenz(a,h)anthracene	ND	U	0.020	0.0025	1	11/15/07	11/29/07	KWG0712581	
Benzo(g,h,i)perylene	ND	U	0.020	0.0029	1	11/15/07	11/29/07	KWG0712581	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	76	26-131	11/29/07	Acceptable
Fluoranthene-d10	80	28-150	11/29/07	Acceptable
Terphenyl-d14	86	32-157	11/29/07	Acceptable

Comments: SL 01310e

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-PWRB-071108	**Units:**	ug/L
Lab Code:	K0710558-016	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.11**		0.020	0.0030	1	11/15/07	11/29/07	KWG0712581	
2-Methylnaphthalene	**0.021**		0.020	0.0023	1	11/15/07	11/29/07	KWG0712581	
Acenaphthylene	ND	U	0.020	0.0034	1	11/15/07	11/29/07	KWG0712581	
Acenaphthene	**0.0097**	J	0.020	0.0044	1	11/15/07	11/29/07	KWG0712581	
Fluorene	**0.0046**	J	0.020	0.0038	1	11/15/07	11/29/07	KWG0712581	
Phenanthrene	**0.045**		0.020	0.0050	1	11/15/07	11/29/07	KWG0712581	
Anthracene	ND	U	0.020	0.0036	1	11/15/07	11/29/07	KWG0712581	
Fluoranthene	**0.039**		0.020	0.0044	1	11/15/07	11/29/07	KWG0712581	
Pyrene	**0.021**		0.020	0.0035	1	11/15/07	11/29/07	KWG0712581	
Benz(a)anthracene	**0.0039**	J	0.020	0.0026	1	11/15/07	11/29/07	KWG0712581	
Chrysene	**0.0053**	J	0.020	0.0034	1	11/15/07	11/29/07	KWG0712581	
Benzo(b)fluoranthene	ND	U	0.020	0.0023	1	11/15/07	11/29/07	KWG0712581	
Benzo(k)fluoranthene	ND	U	0.020	0.0025	1	11/15/07	11/29/07	KWG0712581	
Benzo(a)pyrene	ND	U	0.020	0.0043	1	11/15/07	11/29/07	KWG0712581	
Indeno(1,2,3-cd)pyrene	ND	U	0.020	0.0026	1	11/15/07	11/29/07	KWG0712581	
Dibenz(a,h)anthracene	ND	U	0.020	0.0025	1	11/15/07	11/29/07	KWG0712581	
Benzo(g,h,i)perylene	ND	U	0.020	0.0029	1	11/15/07	11/29/07	KWG0712581	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	81	26-131	11/29/07	Acceptable
Fluoranthene-d10	87	28-150	11/29/07	Acceptable
Terphenyl-d14	96	32-157	11/29/07	Acceptable

Comments: SL 01/3/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-DRB-071108	**Units:**	ug/L
Lab Code:	K0710558-017	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.070**		0.021	0.0031	1	11/15/07	11/29/07	KWG0712581	
2-Methylnaphthalene	**0.018**	J	0.021	0.0024	1	11/15/07	11/29/07	KWG0712581	
Acenaphthylene	ND	U	0.021	0.0035	1	11/15/07	11/29/07	KWG0712581	
Acenaphthene	ND	U	0.021	0.0045	1	11/15/07	11/29/07	KWG0712581	
Fluorene	ND	U	0.021	0.0039	1	11/15/07	11/29/07	KWG0712581	
Phenanthrene	**0.0057**	J	0.021	0.0052	1	11/15/07	11/29/07	KWG0712581	
Anthracene	ND	U	0.021	0.0037	1	11/15/07	11/29/07	KWG0712581	
Fluoranthene	ND	U	0.021	0.0045	1	11/15/07	11/29/07	KWG0712581	
Pyrene	ND	U	0.021	0.0036	1	11/15/07	11/29/07	KWG0712581	
Benz(a)anthracene	ND	U	0.021	0.0027	1	11/15/07	11/29/07	KWG0712581	
Chrysene	ND	U	0.021	0.0035	1	11/15/07	11/29/07	KWG0712581	
Benzo(b)fluoranthene	ND	U	0.021	0.0024	1	11/15/07	11/29/07	KWG0712581	
Benzo(k)fluoranthene	ND	U	0.021	0.0026	1	11/15/07	11/29/07	KWG0712581	
Benzo(a)pyrene	ND	U	0.021	0.0044	1	11/15/07	11/29/07	KWG0712581	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	0.0027	1	11/15/07	11/29/07	KWG0712581	
Dibenz(a,h)anthracene	ND	U	0.021	0.0026	1	11/15/07	11/29/07	KWG0712581	
Benzo(g,h,i)perylene	ND	U	0.021	0.0030	1	11/15/07	11/29/07	KWG0712581	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	75	26-131	11/29/07	Acceptable
Fluoranthene-d10	78	28-150	11/29/07	Acceptable
Terphenyl-d14	85	32-157	11/29/07	Acceptable

Comments: 5(0/3108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-BRB-071108	**Units:**	ug/L
Lab Code:	K0710558-018	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.063**		0.019	0.0030	1	11/15/07	11/29/07	KWG0712581	
2-Methylnaphthalene	**0.017**	J	0.019	0.0023	1	11/15/07	11/29/07	KWG0712581	
Acenaphthylene	ND	U	0.019	0.0034	1	11/15/07	11/29/07	KWG0712581	
Acenaphthene	ND	U	0.019	0.0044	1	11/15/07	11/29/07	KWG0712581	
Fluorene	ND	U	0.019	0.0038	1	11/15/07	11/29/07	KWG0712581	
Phenanthrene	ND	U	0.019	0.0050	1	11/15/07	11/29/07	KWG0712581	
Anthracene	ND	U	0.019	0.0036	1	11/15/07	11/29/07	KWG0712581	
Fluoranthene	ND	U	0.019	0.0044	1	11/15/07	11/29/07	KWG0712581	
Pyrene	ND	U	0.019	0.0035	1	11/15/07	11/29/07	KWG0712581	
Benz(a)anthracene	ND	U	0.019	0.0026	1	11/15/07	11/29/07	KWG0712581	
Chrysene	ND	U	0.019	0.0034	1	11/15/07	11/29/07	KWG0712581	
Benzo(b)fluoranthene	ND	U	0.019	0.0023	1	11/15/07	11/29/07	KWG0712581	
Benzo(k)fluoranthene	ND	U	0.019	0.0025	1	11/15/07	11/29/07	KWG0712581	
Benzo(a)pyrene	ND	U	0.019	0.0043	1	11/15/07	11/29/07	KWG0712581	
Indeno(1,2,3-cd)pyrene	ND	U	0.019	0.0026	1	11/15/07	11/29/07	KWG0712581	
Dibenz(a,h)anthracene	ND	U	0.019	0.0025	1	11/15/07	11/29/07	KWG0712581	
Benzo(g,h,i)perylene	ND	U	0.019	0.0029	1	11/15/07	11/29/07	KWG0712581	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	79	26-131	11/29/07	Acceptable
Fluoranthene-d10	82	28-150	11/29/07	Acceptable
Terphenyl-d14	92	32-157	11/29/07	Acceptable

Comments: SL 013108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-19DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-019	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.023**		0.021	0.0032	1	11/15/07	11/29/07	KWG0712581	
2-Methylnaphthalene	**0.0043**	J	0.021	0.0024	1	11/15/07	11/29/07	KWG0712581	
Acenaphthylene	ND	U	0.021	0.0036	1	11/15/07	11/29/07	KWG0712581	
Acenaphthene	**0.0067**	J	0.021	0.0046	1	11/15/07	11/29/07	KWG0712581	
Fluorene	ND	U	0.021	0.0040	1	11/15/07	11/29/07	KWG0712581	
Phenanthrene	**0.013**	J	0.021	0.0053	1	11/15/07	11/29/07	KWG0712581	
Anthracene	ND	U	0.021	0.0038	1	11/15/07	11/29/07	KWG0712581	
Fluoranthene	ND	U	0.021	0.0046	1	11/15/07	11/29/07	KWG0712581	
Pyrene	ND	U	0.021	0.0037	1	11/15/07	11/29/07	KWG0712581	
Benz(a)anthracene	ND	U	0.021	0.0028	1	11/15/07	11/29/07	KWG0712581	
Chrysene	ND	U	0.021	0.0036	1	11/15/07	11/29/07	KWG0712581	
Benzo(b)fluoranthene	ND	U	0.021	0.0024	1	11/15/07	11/29/07	KWG0712581	
Benzo(k)fluoranthene	ND	U	0.021	0.0027	1	11/15/07	11/29/07	KWG0712581	
Benzo(a)pyrene	ND	U	0.021	0.0045	1	11/15/07	11/29/07	KWG0712581	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	0.0028	1	11/15/07	11/29/07	KWG0712581	
Dibenz(a,h)anthracene	ND	U	0.021	0.0027	1	11/15/07	11/29/07	KWG0712581	
Benzo(g,h,i)perylene	ND	U	0.021	0.0031	1	11/15/07	11/29/07	KWG0712581	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	80	26-131	11/29/07	Acceptable
Fluoranthene-d10	89	28-150	11/29/07	Acceptable
Terphenyl-d14	88	32-157	11/29/07	Acceptable

Comments: R 01/31/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/09/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-20DSW-071109	**Units:**	ug/L
Lab Code:	K0710558-020	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**0.0074**	J	0.021	0.0031	1	11/15/07	11/29/07	KWG0712581	
2-Methylnaphthalene	**0.0034**	J	0.021	0.0024	1	11/15/07	11/29/07	KWG0712581	
Acenaphthylene	ND	U	0.021	0.0035	1	11/15/07	11/29/07	KWG0712581	
Acenaphthene	ND	U	0.021	0.0045	1	11/15/07	11/29/07	KWG0712581	
Fluorene	ND	U	0.021	0.0039	1	11/15/07	11/29/07	KWG0712581	
Phenanthrene	ND	U	0.021	0.0052	1	11/15/07	11/29/07	KWG0712581	
Anthracene	ND	U	0.021	0.0037	1	11/15/07	11/29/07	KWG0712581	
Fluoranthene	ND	U	0.021	0.0045	1	11/15/07	11/29/07	KWG0712581	
Pyrene	ND	U	0.021	0.0036	1	11/15/07	11/29/07	KWG0712581	
Benz(a)anthracene	ND	U	0.021	0.0027	1	11/15/07	11/29/07	KWG0712581	
Chrysene	ND	U	0.021	0.0035	1	11/15/07	11/29/07	KWG0712581	
Benzo(b)fluoranthene	ND	U	0.021	0.0024	1	11/15/07	11/29/07	KWG0712581	
Benzo(k)fluoranthene	ND	U	0.021	0.0026	1	11/15/07	11/29/07	KWG0712581	
Benzo(a)pyrene	ND	U	0.021	0.0044	1	11/15/07	11/29/07	KWG0712581	
Indeno(1,2,3-cd)pyrene	ND	U	0.021	0.0027	1	11/15/07	11/29/07	KWG0712581	
Dibenz(a,h)anthracene	ND	U	0.021	0.0026	1	11/15/07	11/29/07	KWG0712581	
Benzo(g,h,i)perylene	ND	U	0.021	0.0030	1	11/15/07	11/29/07	KWG0712581	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	67	26-131	11/29/07	Acceptable
Fluoranthene-d10	74	28-150	11/29/07	Acceptable
Terphenyl-d14	72	32-157	11/29/07	Acceptable

Comments: SL 013108

LDC #: 18144B2b **VALIDATION COMPLETENESS WORKSHEET** Date: 1/20/08
SDG #: K0710558 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: 2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/8/07 – 9/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	25/0
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	MS only
VIII.	Laboratory control samples	A	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	SW	RB=4. 15. 16. 17.

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:

1	PCM-13DSW-071109 W	11	PCM-10DSW-071109 W	21	KWG 0712581-4	31	
2	PCM-01DSW-071109	12	PCM-08SC-071108 Sed	22	KWG 0712651-5	32	
3	PCM-02DSW-071109	13	PCM-08PW-071108 W	23		33	
4	PCM-03DSW-071109	14	PCM-SCRB-071108	24		34	
5	PCM-04DSW-071109	15	PCM-PWRB-071108	25		35	
6	PCM-05DSW-071109	16	PCM-DRB-071108	26		36	
7	PCM-06RSW-071109	17	PCM-BRB-071108	27		37	
8	PCM-21DSW-071109	18	PCM-19DSW-071109	28		38	
9	PCM-08DSW-071109	19	PCM-20DSW-071109	29		39	
10	PCM-09DSW-071109	20	PCM-05DSW-071109MS	30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 18144B3b
SDG #: K0710558

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 11/15/07 **Blank analysis date:** 11/30/07
Conc. units: ug/L Associated Samples: M H2Os

Compound	Blank ID	Sample Identification								
KWG0712581-4		1	2	3	4	5	6	10	11	19
S	0.0034	0.0048/0.020U	0.016/0.021U	0.013/0.021U	0.075	0.20	0.011/0.020U	0.11	0.11	0.0074/0.021U
DD	0.0036					0.0091/0.020U		0.0041/0.019U	0.012/0.021U	

Others > 5X NND

Blank extraction date: 11/19/07 **Blank analysis date:** 12/8/07
Conc. units: ug/kg Associated Samples: M sed. (>5x)

Compound	Blank ID	Sample Identification								
KWG0712652-5										
S	0.37									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18144B2b
SDG #: K0710558

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: 9
2nd reviewer: VC

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds identified in the field blanks?

Sample: 14 Field Blank / Trip Blank / Rinsate (circle one) RB

Compound	Concentration Units ug/L
S	0.081
N	0.019
UU	0.0064

Sample: 15 Field Blank / Trip Blank / Rinsate (circle one) RB

Compound	Concentration Units ug/L
S	0.11
N	0.021
GG	0.0097
NN	0.0046
UU	0.045
YY	0.039

Sample: 15 Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units (ug/L)
ZZ	0.021
CCC	0.0039
DDD	0.0053

LDC #: 18448b
SDG #: K0710558

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: 9
2nd reviewer: K

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds identified in the field blanks?

Sample: 16 Field Blank / Trip Blank / Rinsate (circle one) (FB)

Compound	Concentration Units (ug/L)
S	0.070
W	0.018
UU	0.0057

Sample: 17 Field Blank / Trip Blank / Rinsate (circle one) (FB)

Compound	Concentration Units (ug/L)
S	0.063
W	0.017

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ( )

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 7, 2007
LDC Report Date:	January 31, 2008
Matrix:	Sediment/Water
Parameters:	Polynuclear Aromatic Hydrocarbons
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710470

Sample Identification

PCM-02SC-071107
PCM-02PW-071107
PCM-05SC-071107
PCM-04SC-071107
PCM-04PW-071107
PCM-14DS-071107
PCM-02SC-071107MS
PCM-02SC-071107MSD

Introduction

This data review covers 6 sediment samples and 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per a modification of EPA SW 846 Method 8270C using Selected Ion Monitoring (SIM) for Polynuclear Aromatic Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals. All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

Average relative response factors (RRF) for all target compounds were within validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% .

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration RRF values were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polynuclear aromatic hydrocarbon contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
KWG0712598-5	11/16/07	Phenanthrene Fluoranthene Pyrene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)anthracene Chrysene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene	1.2 ug/Kg 1.3 ug/Kg 1.5 ug/Kg 0.50 ug/Kg 0.19 ug/Kg 0.60 ug/Kg 0.50 ug/Kg 0.44 ug/Kg 0.41 ug/Kg	All sediment samples in SDG K0710470

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
KWG0712525-4	11/14/07	Benzo(b)fluoranthene Benzo(k)fluoranthene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	0.0030 ug/L 0.0032 ug/L 0.0041 ug/L 0.0035 ug/L 0.0057 ug/L	All water samples in SDG K0710470

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
PCM-02PW-071107	Benzo(b)fluoranthene	0.0052 ug/L	0.022U ug/L

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) were not within QC limits. Since the sample concentration was greater than the spiked concentration, no data were qualified.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits.

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to method blank contamination problems, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG K0710470

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG K0710470

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
K0710470	PCM-02PW-071107	Benzo(b)fluoranthene	0.022U ug/L	A

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-02SC-071107	**Units:**	ug/Kg
Lab Code:	K0710470-001	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**310**		4.8	0.37	1	11/16/07	12/08/07	KWG0712598	
2-Methylnaphthalene	**94**		4.8	0.39	1	11/16/07	12/08/07	KWG0712598	
Acenaphthylene	**42**		4.8	0.24	1	11/16/07	12/08/07	KWG0712598	
Acenaphthene	**550**		4.8	0.23	1	11/16/07	12/08/07	KWG0712598	
Fluorene	**250**		4.8	0.50	1	11/16/07	12/08/07	KWG0712598	
Phenanthrene	**2000**	D	9.5	1.5	2	11/16/07	12/10/07	KWG0712598	
Anthracene	**380**		4.8	0.47	1	11/16/07	12/08/07	KWG0712598	
Fluoranthene	**1400**		4.8	0.61	1	11/16/07	12/08/07	KWG0712598	
Pyrene	**1600**		4.8	0.37	1	11/16/07	12/08/07	KWG0712598	
Benz(a)anthracene	**360**		4.8	0.48	1	11/16/07	12/08/07	KWG0712598	
Chrysene	**430**		4.8	0.25	1	11/16/07	12/08/07	KWG0712598	
Benzo(b)fluoranthene	**430**		4.8	0.25	1	11/16/07	12/08/07	KWG0712598	
Benzo(k)fluoranthene	**150**		4.8	0.15	1	11/16/07	12/08/07	KWG0712598	
Benzo(a)pyrene	**500**		4.8	0.14	1	11/16/07	12/08/07	KWG0712598	
Indeno(1,2,3-cd)pyrene	**360**		4.8	0.16	1	11/16/07	12/08/07	KWG0712598	
Dibenz(a,h)anthracene	**39**		4.8	0.28	1	11/16/07	12/08/07	KWG0712598	
Benzo(g,h,i)perylene	**410**		4.8	0.64	1	11/16/07	12/08/07	KWG0712598	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	65	10-123	12/08/07	Acceptable
Fluoranthene-d10	67	10-136	12/08/07	Acceptable
Terphenyl-d14	73	32-123	12/08/07	Acceptable

Comments: SL 1/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Pore water	**Date Received:**	11/08/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-02PW-071107	**Units:**	ug/L
Lab Code:	K0710470-002	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**2500**	D	22	3.2	1000	11/14/07	11/27/07	KWG0712525	
2-Methylnaphthalene	**56**	D	0.43	0.049	20	11/14/07	11/21/07	KWG0712525	
Acenaphthylene	**2.0**		0.022	0.0036	1	11/14/07	11/20/07	KWG0712525	
Acenaphthene	**370**	D	22	4.7	1000	11/14/07	11/27/07	KWG0712525	
Fluorene	**54**	D	0.43	0.080	20	11/14/07	11/21/07	KWG0712525	
Phenanthrene	**100**	D	0.43	0.11	20	11/14/07	11/21/07	KWG0712525	
Anthracene	**11**	D	0.43	0.076	20	11/14/07	11/21/07	KWG0712525	
Fluoranthene	**1.9**		0.022	0.0047	1	11/14/07	11/20/07	KWG0712525	
Pyrene	**1.4**		0.022	0.0037	1	11/14/07	11/20/07	KWG0712525	
Benz(a)anthracene	**0.021**	J	0.022	0.0028	1	11/14/07	11/20/07	KWG0712525	
Chrysene	**0.012**	J	0.022	0.0036	1	11/14/07	11/20/07	KWG0712525	
Benzo(b)fluoranthene	**0.0052**	J	0.022	0.0025	1	11/14/07	11/20/07	KWG0712525	
Benzo(k)fluoranthene	ND	U	0.022	0.0027	1	11/14/07	11/20/07	KWG0712525	
Benzo(a)pyrene	**0.0048**	J	0.022	0.0046	1	11/14/07	11/20/07	KWG0712525	
Indeno(1,2,3-cd)pyrene	ND	U	0.022	0.0028	1	11/14/07	11/20/07	KWG0712525	
Dibenz(a,h)anthracene	ND	U	0.022	0.0027	1	11/14/07	11/20/07	KWG0712525	
Benzo(g,h,i)perylene	ND	U	0.022	0.0031	1	11/14/07	11/20/07	KWG0712525	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	60	26-131	11/20/07	Acceptable
Fluoranthene-d10	65	28-150	11/20/07	Acceptable
Terphenyl-d14	83	32-157	11/20/07	Acceptable

Comments: SL 2/13/08

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-05SC-071107	**Units:**	ug/Kg
Lab Code:	K0710470-003	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**1100**		4.6	0.37	1	11/16/07	12/08/07	KWG0712598	
2-Methylnaphthalene	**330**		4.6	0.39	1	11/16/07	12/08/07	KWG0712598	
Acenaphthylene	**150**		4.6	0.24	1	11/16/07	12/08/07	KWG0712598	
Acenaphthene	**1200**		4.6	0.23	1	11/16/07	12/08/07	KWG0712598	
Fluorene	**740**		4.6	0.50	1	11/16/07	12/08/07	KWG0712598	
Phenanthrene	**5800**	D	46	7.5	10	11/16/07	12/10/07	KWG0712598	
Anthracene	**1300**		4.6	0.47	1	11/16/07	12/08/07	KWG0712598	
Fluoranthene	**4100**	D	46	6.1	10	11/16/07	12/10/07	KWG0712598	
Pyrene	**5200**	D	46	3.7	10	11/16/07	12/10/07	KWG0712598	
Benz(a)anthracene	**1100**		4.6	0.48	1	11/16/07	12/08/07	KWG0712598	
Chrysene	**1500**		4.6	0.25	1	11/16/07	12/08/07	KWG0712598	
Benzo(b)fluoranthene	**1300**		4.6	0.25	1	11/16/07	12/08/07	KWG0712598	
Benzo(k)fluoranthene	**400**		4.6	0.15	1	11/16/07	12/08/07	KWG0712598	
Benzo(a)pyrene	**1500**		4.6	0.14	1	11/16/07	12/08/07	KWG0712598	
Indeno(1,2,3-cd)pyrene	**1100**		4.6	0.16	1	11/16/07	12/08/07	KWG0712598	
Dibenz(a,h)anthracene	**110**		4.6	0.28	1	11/16/07	12/08/07	KWG0712598	
Benzo(g,h,i)perylene	**1200**		4.6	0.64	1	11/16/07	12/08/07	KWG0712598	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	69	10-123	12/08/07	Acceptable
Fluoranthene-d10	70	10-136	12/08/07	Acceptable
Terphenyl-d14	74	32-123	12/08/07	Acceptable

Comments: 01318

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-04SC-071107	**Units:**	ug/Kg
Lab Code:	K0710470-004	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**2400**	D	43	3.7	10	11/16/07	12/10/07	KWG0712598	
2-Methylnaphthalene	**630**		4.3	0.39	1	11/16/07	12/08/07	KWG0712598	
Acenaphthylene	**460**		4.3	0.24	1	11/16/07	12/08/07	KWG0712598	
Acenaphthene	**2300**	D	43	2.3	10	11/16/07	12/10/07	KWG0712598	
Fluorene	**1200**		4.3	0.50	1	11/16/07	12/08/07	KWG0712598	
Phenanthrene	**9500**	D	43	7.5	10	11/16/07	12/10/07	KWG0712598	
Anthracene	**1600**		4.3	0.47	1	11/16/07	12/08/07	KWG0712598	
Fluoranthene	**6500**	D	43	6.1	10	11/16/07	12/10/07	KWG0712598	
Pyrene	**7500**	D	43	3.7	10	11/16/07	12/10/07	KWG0712598	
Benz(a)anthracene	**1600**		4.3	0.48	1	11/16/07	12/08/07	KWG0712598	
Chrysene	**2000**	D	43	2.5	10	11/16/07	12/10/07	KWG0712598	
Benzo(b)fluoranthene	**2000**	D	43	2.5	10	11/16/07	12/10/07	KWG0712598	
Benzo(k)fluoranthene	**610**		4.3	0.15	1	11/16/07	12/08/07	KWG0712598	
Benzo(a)pyrene	**2200**	D	43	1.4	10	11/16/07	12/10/07	KWG0712598	
Indeno(1,2,3-cd)pyrene	**1600**		4.3	0.16	1	11/16/07	12/08/07	KWG0712598	
Dibenz(a,h)anthracene	**170**		4.3	0.28	1	11/16/07	12/08/07	KWG0712598	
Benzo(g,h,i)perylene	**1800**	D	43	6.4	10	11/16/07	12/10/07	KWG0712598	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	71	10-123	12/08/07	Acceptable
Fluoranthene-d10	77	10-136	12/08/07	Acceptable
Terphenyl-d14	77	32-123	12/08/07	Acceptable

Comments: SL 01/31/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Pore water	**Date Received:**	11/08/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-04PW-071107	**Units:**	ug/L
Lab Code:	K0710470-005	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**510**	D	1.7	0.25	50	11/14/07	11/27/07	KWG0712525	
2-Methylnaphthalene	**6.4**		0.033	0.0038	1	11/14/07	11/20/07	KWG0712525	
Acenaphthylene	**17**	D	0.33	0.056	10	11/14/07	11/21/07	KWG0712525	
Acenaphthene	**49**	D	0.33	0.073	10	11/14/07	11/21/07	KWG0712525	
Fluorene	**6.1**		0.033	0.0063	1	11/14/07	11/20/07	KWG0712525	
Phenanthrene	**7.9**		0.033	0.0082	1	11/14/07	11/20/07	KWG0712525	
Anthracene	**1.1**		0.033	0.0060	1	11/14/07	11/20/07	KWG0712525	
Fluoranthene	**1.4**		0.033	0.0073	1	11/14/07	11/20/07	KWG0712525	
Pyrene	**1.3**		0.033	0.0058	1	11/14/07	11/20/07	KWG0712525	
Benz(a)anthracene	**0.23**		0.033	0.0043	1	11/14/07	11/20/07	KWG0712525	
Chrysene	**0.47**		0.033	0.0056	1	11/14/07	11/20/07	KWG0712525	
Benzo(b)fluoranthene	**0.25**		0.033	0.0038	1	11/14/07	11/20/07	KWG0712525	
Benzo(k)fluoranthene	**0.10**		0.033	0.0041	1	11/14/07	11/20/07	KWG0712525	
Benzo(a)pyrene	**0.29**		0.033	0.0071	1	11/14/07	11/20/07	KWG0712525	
Indeno(1,2,3-cd)pyrene	**0.24**		0.033	0.0043	1	11/14/07	11/20/07	KWG0712525	
Dibenz(a,h)anthracene	**0.036**		0.033	0.0041	1	11/14/07	11/20/07	KWG0712525	
Benzo(g,h,i)perylene	**0.26**		0.033	0.0048	1	11/14/07	11/20/07	KWG0712525	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	86	26-131	11/20/07	Acceptable
Fluoranthene-d10	85	28-150	11/20/07	Acceptable
Terphenyl-d14	83	32-157	11/20/07	Acceptable

Comments: SC 013108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Polynuclear Aromatic Hydrocarbons

Sample Name:	PCM-14DS-071107	**Units:**	ug/Kg
Lab Code:	K0710470-006	**Basis:**	Dry
Extraction Method:	EPA 3541	**Level:**	Low
Analysis Method:	8270C SIM		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Naphthalene	**350**		4.9	0.37	1	11/16/07	12/08/07	KWG0712598	
2-Methylnaphthalene	**78**		4.9	0.39	1	11/16/07	12/08/07	KWG0712598	
Acenaphthylene	**66**		4.9	0.24	1	11/16/07	12/08/07	KWG0712598	
Acenaphthene	**220**		4.9	0.23	1	11/16/07	12/08/07	KWG0712598	
Fluorene	**86**		4.9	0.50	1	11/16/07	12/08/07	KWG0712598	
Phenanthrene	**630**		4.9	0.75	1	11/16/07	12/08/07	KWG0712598	
Anthracene	**200**		4.9	0.47	1	11/16/07	12/08/07	KWG0712598	
Fluoranthene	**1400**		4.9	0.61	1	11/16/07	12/08/07	KWG0712598	
Pyrene	**1700**		4.9	0.37	1	11/16/07	12/08/07	KWG0712598	
Benz(a)anthracene	**700**		4.9	0.48	1	11/16/07	12/08/07	KWG0712598	
Chrysene	**910**		4.9	0.25	1	11/16/07	12/08/07	KWG0712598	
Benzo(b)fluoranthene	**980**		4.9	0.25	1	11/16/07	12/08/07	KWG0712598	
Benzo(k)fluoranthene	**310**		4.9	0.15	1	11/16/07	12/08/07	KWG0712598	
Benzo(a)pyrene	**1100**		4.9	0.14	1	11/16/07	12/08/07	KWG0712598	
Indeno(1,2,3-cd)pyrene	**780**		4.9	0.16	1	11/16/07	12/08/07	KWG0712598	
Dibenz(a,h)anthracene	**100**		4.9	0.28	1	11/16/07	12/08/07	KWG0712598	
Benzo(g,h,i)perylene	**850**		4.9	0.64	1	11/16/07	12/08/07	KWG0712598	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Fluorene-d10	74	10-123	12/08/07	Acceptable
Fluoranthene-d10	77	10-136	12/08/07	Acceptable
Terphenyl-d14	83	32-123	12/08/07	Acceptable

Comments: 12B109

LDC #: 18144C2b
SDG #: K0710470
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/30/08
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/7/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	25%D
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	SW	
VIII.	Laboratory control samples	A	LCS/D
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	A	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	PCM-02SC-071107	11	KWF071225-4	21		31	
2	PCM-02PW-071107	12	KWF071298-5	22		32	
3	PCM-05SC-071107	13		23		33	
4	PCM-04SC-071107	14		24		34	
5	PCM-04PW-071107	15		25		35	
6	PCM-14DS-071107	16		26		36	
7	PCM-02SC-071107MS	17		27		37	
8	PCM-02SC-071107MSD	18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 18144Cb
SDG #: K0710470

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: Q
2nd Reviewer: A

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 11/16/07 **Blank analysis date:** 12/8/07
Conc. units: ug/Kg Associated Samples: All soils (>5x)

Compound	Blank ID	Sample Identification								
KWG0712598-1										
III	1.2									
XX	1.3									
ZZ	1.5									
~~GGG~~	0.50									
HHH	0.19									
CCC	0.60									
DDD	0.50									

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								
III	0.44									
~~NN~~	0.41									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18144c-b
SDG #: K0710470

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)
Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 11/14/07 **Blank analysis date:** 11/20/07
Conc. units: [illegible] Associated Samples: MH2OS

Compound	Blank ID	Sample Identification								
KWG	0712525-4		2		5 > 5X					
GGG	0.0030		0.0052 / 0.0224							
HHH	0.0032									
VVV	0.0041									
KKK	0.0035									
LLL	0.0057									

Blank extraction date:_____ **Blank analysis date:**_____
Conc. units:_____ Associated Samples:_____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18144C2b
SDG #: K0704470

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: a
2nd Reviewer: M

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were a matrix spike (MS) and matrix spike duplicate (MSD) analyzed for each matrix in this SDG? If no, indicate which matrix does not have an associated MS/MSD. Soil / Water.

(Y) N N/A Was a MS/MSD analyzed every 20 samples of each matrix?

Y (N) N/A Were the MS/MSD percent recoveries (%R) and the relative percent differences (RPD) within the QC limits?

#	Date	MS/MSD ID	Compound	MS %R (Limits)	MSD %R (Limits)	RPD (Limits)	Associated Samples	Qualifications
		7/8	5	31 (50-140	16 (50-140	( )		
				( )	( )	( )		
				( )	( )	( )		
		7/8	%R out due to dilution. (10x)					No qual
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		
				( )	( )	( )		

	Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)		Compound	QC Limits (Soil)	RPD (Soil)	QC Limits (Water)	RPD (Water)
A.	Phenol	26-90%	≤ 35%	12-110%	≤ 42%	GG.	Acenaphthene	31-137%	≤ 19%	46-118%	≤ 31%
C.	2-Chlorophenol	25-102%	≤ 50%	27-123%	≤ 40%	II.	4-Nitrophenol	11-114%	≤ 50%	10-80%	≤ 50%
E.	1,4-Dichlorobenzene	28-104%	≤ 27%	36-97%	≤ 28%	KK.	2,4-Dinitrotoluene	28-89%	≤ 47%	24-96%	≤ 38%
J.	N-Nitroso-di-n-propylamine	41-126%	≤ 38%	41-116%	≤ 38%	TT.	Pentachlorophenol	17-109%	≤ 47%	9-103%	≤ 50%
R.	1,2,4-Trichlorobenzene	38-107%	≤ 23%	39-98%	≤ 28%	ZZ.	Pyrene	35-142%	≤ 36%	26-127%	≤ 31%
V.	4-Chloro-3-methylphenol	26-103%	≤ 33%	23-97%	≤ 42%						

NW Natural Gasco Site
Data Validation Reports
LDC# 18144

Pesticides

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NW Natural Gasco Site

Collection Date: November 5, 2007

LDC Report Date: January 31, 2008

Matrix: Sediment

Parameters: Chlorinated Pesticides

Validation Level: EPA Level III

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): K0710375

Sample Identification

PCM-09SC-071105
PCM-10SC-071105
PCM-02DS-071105
PCM-06DS-071105
PCM-09DS-071105
PCM-10SC-071105MS
PCM-10SC-071105MSD

Introduction

This data review covers 7 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8081A for Chlorinated Pesticides.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of single and multicomponent compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for selected compounds.

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination (r^2) was greater than or equal to 0.990 .

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
12/20/07	1219F05154	DB-XLB	Methoxychlor cis-Nonachlor trans-Nonachlor 2,4'-DDT Mirex	16 21 17 19 17	PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105	J (all detects) UJ (all non-detects)	A
12/20/07	1219F05154	DB-35MS	cis-Nonachlor trans-Nonachlor Mirex Hexachloroethane	18 17 16 16	PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105	J (all detects) UJ (all non-detects)	A

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

The individual 4,4'-DDT and Endrin breakdowns (%BD) were less than or equal to 15.0%.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
KWG0712505-13	11/15/07	Endosulfan sulfate	0.13 ug/Kg	All samples in SDG K0710375

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and Reported CRQLs

The sample results for detected compounds from the two columns were within 40% relative percent difference (RPD) with the following exceptions:

Sample	Compound	RPD	Flag	A or P
PCM-09SC-071105	Methoxychlor	78.3	J (all detects)	A
PCM-10SC-071105	Heptachlor epoxide	69.4	J (all detects)	A
PCM-02DS-071105	Heptachlor epoxide 4,4'-DDE	97.7 66.7	J (all detects) J (all detects)	A
PCM-09DS-071105	Hexachlorobenzene 2,4'-DDD 2,4'-DDT Hexachloroethane	85.7 81.9 76.9 93.1	J (all detects) J (all detects) J (all detects) J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to calibration %D and compound quantitation RPD problems, data were qualified as estimated in five samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Chlorinated Pesticides - Data Qualification Summary - SDG K0710375

SDG	Sample	Compound	Flag	A or P	Reason
K0710375	PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105	Methoxychlor cis-Nonachlor trans-Nonachlor 2,4'-DDT Mirex Hexachloroethane	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
K0710375	PCM-09SC-071105	Methoxychlor	J (all detects)	A	Compound quantitation and CRQLs (RPD)
K0710375	PCM-10SC-071105	Heptachlor epoxide	J (all detects)	A	Compound quantitation and CRQLs (RPD)
K0710375	PCM-02DS-071105	Heptachlor epoxide 4,4'-DDE	J (all detects) J (all detects)	A	Compound quantitation and CRQLs (RPD)
K0710375	PCM-09DS-071105	Hexachlorobenzene 2,4'-DDD 2,4'-DDT Hexachloroethane	J (all detects) J (all detects) J (all detects) J (all detects)	A	Compound quantitation and CRQLs (RPD)

NW Natural Gasco Site
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG K0710375

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Organochlorine Pesticides

Sample Name:	PCM-09SC-071105	**Units:**	ug/Kg
Lab Code:	K0710375-001	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8081A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.0	0.26	1	11/15/07	12/17/07	KWG0712505	
beta-BHC	ND	U	1.0	0.30	1	11/15/07	12/17/07	KWG0712505	
gamma-BHC (Lindane)	ND	Ui	1.0	0.73	1	11/15/07	12/17/07	KWG0712505	
delta-BHC	ND	Ui	1.0	0.099	1	11/15/07	12/17/07	KWG0712505	
Heptachlor	ND	Ui	1.0	0.096	1	11/15/07	12/17/07	KWG0712505	
Aldrin	**1.1**		1.0	0.15	1	11/15/07	12/17/07	KWG0712505	
Heptachlor Epoxide	**0.52**	J	1.0	0.13	1	11/15/07	12/17/07	KWG0712505	
gamma-Chlordane†	ND	Ui	1.0	1.0	1	11/15/07	12/17/07	KWG0712505	
Endosulfan I	ND	Ui	1.0	0.40	1	11/15/07	12/17/07	KWG0712505	
alpha-Chlordane	ND	U	1.0	0.23	1	11/15/07	12/17/07	KWG0712505	
Dieldrin	ND	U	1.0	0.29	1	11/15/07	12/17/07	KWG0712505	
4,4'-DDE	ND	Ui	1.0	0.21	1	11/15/07	12/17/07	KWG0712505	
Endrin	ND	U	1.0	0.20	1	11/15/07	12/17/07	KWG0712505	
Endosulfan II	ND	U	1.0	0.19	1	11/15/07	12/17/07	KWG0712505	
4,4'-DDD	ND	Ui	1.0	0.47	1	11/15/07	12/17/07	KWG0712505	
Endrin Aldehyde	ND	Ui	1.0	0.078	1	11/15/07	12/17/07	KWG0712505	
Endosulfan Sulfate	ND	Ui	1.0	1.0	1	11/15/07	12/17/07	KWG0712505	
4,4'-DDT	ND	Ui	1.0	0.17	1	11/15/07	12/17/07	KWG0712505	
Endrin Ketone	ND	U	1.0	0.082	1	11/15/07	12/17/07	KWG0712505	
Methoxychlor	**0.32**	JP	1.0	0.10	1	11/15/07	12/17/07	KWG0712505	
Toxaphene	ND	Ui	50	33	1	11/15/07	12/17/07	KWG0712505	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	86	32-138	12/17/07	Acceptable
Decachlorobiphenyl	91	23-162	12/17/07	Acceptable

† Analyte Comments

gamma-Chlordane	For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: 1/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Organochlorine Pesticides

Sample Name:	PCM-10SC-071105	**Units:**	ug/Kg
Lab Code:	K0710375-003	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8081A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.0	0.26	1	11/15/07	12/17/07	KWG0712505	
beta-BHC	ND	U	1.0	0.30	1	11/15/07	12/17/07	KWG0712505	
gamma-BHC (Lindane)	ND	Ui	1.0	0.27	1	11/15/07	12/17/07	KWG0712505	
delta-BHC	ND	U	1.0	0.055	1	11/15/07	12/17/07	KWG0712505	
Heptachlor	ND	U	1.0	0.080	1	11/15/07	12/17/07	KWG0712505	
Aldrin	ND	Ui	1.0	0.18	1	11/15/07	12/17/07	KWG0712505	
Heptachlor Epoxide	**0.16**	JP	1.0	0.13	1	11/15/07	12/17/07	KWG0712505	
gamma-Chlordane†	ND	U	1.0	0.064	1	11/15/07	12/17/07	KWG0712505	
Endosulfan I	ND	U	1.0	0.17	1	11/15/07	12/17/07	KWG0712505	
alpha-Chlordane	ND	U	1.0	0.23	1	11/15/07	12/17/07	KWG0712505	
Dieldrin	ND	U	1.0	0.29	1	11/15/07	12/17/07	KWG0712505	
4,4'-DDE	ND	U	1.0	0.10	1	11/15/07	12/17/07	KWG0712505	
Endrin	ND	U	1.0	0.20	1	11/15/07	12/17/07	KWG0712505	
Endosulfan II	ND	U	1.0	0.19	1	11/15/07	12/17/07	KWG0712505	
4,4'-DDD	ND	U	1.0	0.12	1	11/15/07	12/17/07	KWG0712505	
Endrin Aldehyde	ND	U	1.0	0.053	1	11/15/07	12/17/07	KWG0712505	
Endosulfan Sulfate	ND	U	1.0	0.079	1	11/15/07	12/17/07	KWG0712505	
4,4'-DDT	ND	U	1.0	0.064	1	11/15/07	12/17/07	KWG0712505	
Endrin Ketone	ND	U	1.0	0.082	1	11/15/07	12/17/07	KWG0712505	
Methoxychlor	ND	U	1.0	0.10	1	11/15/07	12/17/07	KWG0712505	
Toxaphene	ND	U	50	9.0	1	11/15/07	12/17/07	KWG0712505	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	85	32-138	12/17/07	Acceptable
Decachlorobiphenyl	89	23-162	12/17/07	Acceptable

† Analyte Comments

gamma-Chlordane	For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Organochlorine Pesticides

Sample Name:	PCM-02DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-004	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8081A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	Ui	5.9	1.7	5	11/15/07	12/20/07	KWG0712505	
Hexachlorobenzene	ND	U	5.9	0.47	5	11/15/07	12/20/07	KWG0712505	
beta-BHC	ND	Ui	12	12	5	11/15/07	12/20/07	KWG0712505	
gamma-BHC (Lindane)	ND	Ui	5.9	3.8	5	11/15/07	12/20/07	KWG0712505	
delta-BHC	ND	Ui	5.9	5.9	5	11/15/07	12/20/07	KWG0712505	
Heptachlor	**3.6**	JD	5.9	0.47	5	11/15/07	12/20/07	KWG0712505	
Aldrin	ND	Ui	7.0	7.0	5	11/15/07	12/20/07	KWG0712505	
Heptachlor Epoxide	**3.2**	JPD J|2	5.9	0.77	5	11/15/07	12/20/07	KWG0712505	
gamma-Chlordane†	ND	Ui	5.9	5.9	5	11/15/07	12/20/07	KWG0712505	
Endosulfan I	ND	Ui	5.9	1.8	5	11/15/07	12/20/07	KWG0712505	
alpha-Chlordane	ND	Ui	5.9	1.5	5	11/15/07	12/20/07	KWG0712505	
Dieldrin	ND	U	5.9	1.7	5	11/15/07	12/20/07	KWG0712505	
4,4'-DDE	**5.4**	JPD J|2	5.9	0.59	5	11/15/07	12/20/07	KWG0712505	
Endrin	ND	U	5.9	1.2	5	11/15/07	12/20/07	KWG0712505	
Endosulfan II	ND	U	5.9	1.2	5	11/15/07	12/20/07	KWG0712505	
4,4'-DDD	**25**	D	5.9	0.71	5	11/15/07	12/20/07	KWG0712505	
Endrin Aldehyde	ND	Ui	5.9	5.9	5	11/15/07	12/20/07	KWG0712505	
Endosulfan Sulfate	ND	Ui	5.9	5.9	5	11/15/07	12/20/07	KWG0712505	
4,4'-DDT	**20**	D	5.9	0.38	5	11/15/07	12/20/07	KWG0712505	
Endrin Ketone	ND	Ui	5.9	5.5	5	11/15/07	12/20/07	KWG0712505	
Methoxychlor	ND	Ui UJ5	9.4	9.4	5	11/15/07	12/20/07	KWG0712505	
Toxaphene	ND	Ui	400	400	5	11/15/07	12/20/07	KWG0712505	
Oxychlordane	ND	Ui	5.9	4.5	5	11/15/07	12/20/07	KWG0712505	
2,4'-DDE	ND	U	5.9	1.4	5	11/15/07	12/20/07	KWG0712505	
cis-Nonachlor	**4.2**	JD J5	5.9	0.42	5	11/15/07	12/20/07	KWG0712505	*
2,4'-DDD	ND	Ui	19	19	5	11/15/07	12/20/07	KWG0712505	
trans-Nonachlor	ND	Ui UJ5	5.9	2.7	5	11/15/07	12/20/07	KWG0712505	
2,4'-DDT	**11**	D J5	5.9	0.82	5	11/15/07	12/20/07	KWG0712505	
Mirex	ND	Ui UJ5	5.9	2.1	5	11/15/07	12/20/07	KWG0712505	
Hexachloroethane	ND	U ↓	5.9	0.88	5	11/15/07	12/20/07	KWG0712505	
Hexachlorobutadiene	ND	U	5.9	0.77	5	11/15/07	12/20/07	KWG0712505	

* See Case Narrative

Comments: 1/6/13108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Organochlorine Pesticides

Sample Name:	PCM-06DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-005	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8081A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	5.8	1.5	5	11/15/07	12/20/07	KWG0712505	
Hexachlorobenzene	ND	Ui	5.8	4.4	5	11/15/07	12/20/07	KWG0712505	
beta-BHC	ND	U	5.8	1.8	5	11/15/07	12/20/07	KWG0712505	
gamma-BHC (Lindane)	ND	Ui	9.6	9.6	5	11/15/07	12/20/07	KWG0712505	
delta-BHC	ND	Ui	5.8	2.2	5	11/15/07	12/20/07	KWG0712505	
Heptachlor	**4.7**	JD	5.8	0.47	5	11/15/07	12/20/07	KWG0712505	
Aldrin	ND	Ui	9.5	9.5	5	11/15/07	12/20/07	KWG0712505	
Heptachlor Epoxide	ND	Ui	5.8	5.8	5	11/15/07	12/20/07	KWG0712505	
gamma-Chlordane†	ND	Ui	5.8	5.8	5	11/15/07	12/20/07	KWG0712505	
Endosulfan I	ND	Ui	5.8	5.8	5	11/15/07	12/20/07	KWG0712505	
alpha-Chlordane	ND	U	5.8	1.4	5	11/15/07	12/20/07	KWG0712505	
Dieldrin	ND	U	5.8	1.7	5	11/15/07	12/20/07	KWG0712505	
4,4'-DDE	**5.8**	D	5.8	0.58	5	11/15/07	12/20/07	KWG0712505	
Endrin	ND	Ui	5.8	5.8	5	11/15/07	12/20/07	KWG0712505	
Endosulfan II	ND	Ui	5.8	4.8	5	11/15/07	12/20/07	KWG0712505	
4,4'-DDD	**12**	D	5.8	0.70	5	11/15/07	12/20/07	KWG0712505	
Endrin Aldehyde	ND	Ui	5.8	5.8	5	11/15/07	12/20/07	KWG0712505	
Endosulfan Sulfate	ND	Ui	5.8	5.8	5	11/15/07	12/20/07	KWG0712505	
4,4'-DDT	**15**	D	5.8	0.37	5	11/15/07	12/20/07	KWG0712505	
Endrin Ketone	ND	U	5.8	0.48	5	11/15/07	12/20/07	KWG0712505	
Methoxychlor	ND	Ui UJ5	17	17	5	11/15/07	12/20/07	KWG0712505	
Toxaphene	ND	Ui	380	380	5	11/15/07	12/20/07	KWG0712505	
Oxychlordane	ND	Ui	6.8	6.8	5	11/15/07	12/20/07	KWG0712505	
2,4'-DDE	ND	Ui	5.8	1.9	5	11/15/07	12/20/07	KWG0712505	
cis-Nonachlor	ND	Ui UJ5	5.8	5.8	5	11/15/07	12/20/07	KWG0712505	
2,4'-DDD	ND	Ui	19	19	5	11/15/07	12/20/07	KWG0712505	
trans-Nonachlor	ND	Ui UJ5	5.8	4.2	5	11/15/07	12/20/07	KWG0712505	
2,4'-DDT	ND	Ui	5.8	5.8	5	11/15/07	12/20/07	KWG0712505	
Mirex	ND	U	5.8	0.37	5	11/15/07	12/20/07	KWG0712505	
Hexachloroethane	ND	U	5.8	0.87	5	11/15/07	12/20/07	KWG0712505	
Hexachlorobutadiene	ND	U	5.8	0.75	5	11/15/07	12/20/07	KWG0712505	

Comments: 20/31/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Organochlorine Pesticides

Sample Name:	PCM-09DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-006	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8081A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	Ui	1.1	0.35	1	11/15/07	12/20/07	KWG0712505	
Hexachlorobenzene	**0.40**	JP J|2	1.1	0.087	1	11/15/07	12/20/07	KWG0712505	
beta-BHC	ND	Ui	1.1	1.1	1	11/15/07	12/20/07	KWG0712505	
gamma-BHC (Lindane)	ND	Ui	2.5	2.5	1	11/15/07	12/20/07	KWG0712505	
delta-BHC	ND	Ui	1.1	0.46	1	11/15/07	12/20/07	KWG0712505	
Heptachlor	ND	Ui	1.1	1.1	1	11/15/07	12/20/07	KWG0712505	
Aldrin	ND	Ui	1.6	1.6	1	11/15/07	12/20/07	KWG0712505	
Heptachlor Epoxide	ND	Ui	1.1	1.1	1	11/15/07	12/20/07	KWG0712505	
gamma-Chlordane†	ND	Ui	1.1	1.1	1	11/15/07	12/20/07	KWG0712505	
Endosulfan I	ND	U	1.1	0.19	1	11/15/07	12/20/07	KWG0712505	
alpha-Chlordane	ND	U	1.1	0.26	1	11/15/07	12/20/07	KWG0712505	
Dieldrin	ND	U	1.1	0.32	1	11/15/07	12/20/07	KWG0712505	
4,4'-DDE	**3.8**		1.1	0.11	1	11/15/07	12/20/07	KWG0712505	
Endrin	ND	Ui	1.1	0.61	1	11/15/07	12/20/07	KWG0712505	
Endosulfan II	ND	U	1.1	0.21	1	11/15/07	12/20/07	KWG0712505	
4,4'-DDD	**12**		1.1	0.14	1	11/15/07	12/20/07	KWG0712505	
Endrin Aldehyde	ND	U	1.1	0.059	1	11/15/07	12/20/07	KWG0712505	
Endosulfan Sulfate	ND	Ui	1.1	1.1	1	11/15/07	12/20/07	KWG0712505	
4,4'-DDT	**36**		1.1	0.071	1	11/15/07	12/20/07	KWG0712505	*
Endrin Ketone	ND	U	1.1	0.090	1	11/15/07	12/20/07	KWG0712505	
Methoxychlor	ND	Ui UJ5	1.1	0.75	1	11/15/07	12/20/07	KWG0712505	
Toxaphene	ND	Ui	97	97	1	11/15/07	12/20/07	KWG0712505	
Oxychlordane	ND	Ui	1.1	0.95	1	11/15/07	12/20/07	KWG0712505	
2,4'-DDE	ND	U	1.1	0.26	1	11/15/07	12/20/07	KWG0712505	
cis-Nonachlor	**1.6**	J5	1.1	0.078	1	11/15/07	12/20/07	KWG0712505	*
2,4'-DDD	**3.1**	P J|2	1.1	0.23	1	11/15/07	12/20/07	KWG0712505	
trans-Nonachlor	ND	Ui UJ5	1.1	0.63	1	11/15/07	12/20/07	KWG0712505	
2,4'-DDT	**3.6**	P J5,12	1.1	0.16	1	11/15/07	12/20/07	KWG0712505	*
Mirex	ND	U UJ5	1.1	0.069	1	11/15/07	12/20/07	KWG0712505	
Hexachloroethane	**0.74**	JP J5,12	1.1	0.17	1	11/15/07	12/20/07	KWG0712505	
Hexachlorobutadiene	ND	U	1.1	0.15	1	11/15/07	12/20/07	KWG0712505	

* See Case Narrative

Comments: 12/31/08

LDC #: 18144A3a
SDG #: K0710375
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/30/08
Page: 1 of 1
Reviewer: a
2nd Reviewer: K

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/05/07
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	A	RSD, r^2
IV.	Continuing calibration/ICV	SW	15%
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	PCM-09SC-071105 sed	11	KWF0712505-3	21		31	
2	PCM-10SC-071105	12		22		32	
3	PCM-02DS-071105	13		23		33	
4	PCM-06DS-071105	14		24		34	
5	PCM-09DS-071105	15		25		35	
6	PCM-10SC-071105MS	16		26		36	
7	PCM-10SC-071105MSD	17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG. trans-Nonachlor
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH. 2,4'-DDT
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II. Mirex
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ. Hexachloroethane
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK. Hexachlorobenzene
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. cis-Nonachlor	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. 2,4'-DDD	NN.

Notes: _____

LDC #: 18144A3a
SDG #: K0T103T5

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: A
2nd Reviewer: A

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)
Please see qualifications below for all questions answered "N" Not applicable questions are identified as "N/A".

What type or calibration verification calculation was performed? ___ %D or ___ RPD

Y N N/A Were Evaluation mix standards run before initial calibration and before samples?

Y N N/A Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard (≤15.0% for individual breakdowns)?

Y N N/A Was at least one standard run daily to verify the working curve?

Y N N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤15.0%?

Level IV/B Only

Y N N/A Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 15.0)	RT (Limits)	Associated Samples	Qualifications
	12/20/07	I=19F05	DB-XLB	P	16	( )	3-5	J / UN / A
				AE	21	( )		
				GG	17	( )		
				HH	19	( )		
				II	17	( )		
			DB-35MS	EE	18	( )		
				GG	17	( )		
				II	16	( )		
				VV	16	( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

A. alpha-BHC	E. Heptachlor	I. Dieldrin	M. 4,4'-DDD	Q. Endrin ketone	U. Toxaphene	Y. Aroclor-1242	CC. DB 608	GG.
B. beta-BHC	F. Aldrin	J. 4,4'-DDE	N. Endosulfan sulfate	R. Endrin aldehyde	V. Aroclor-1016	Z. Aroclor-1248	DD. DB 1701	HH.
C. delta-BHC	G. Heptachlor epoxide	K. Endrin	O. 4,4'-DDT	S. alpha-Chlordane	W. Aroclor-1221	AA. Aroclor-1254	EE.	II.
D. gamma-BHC	H. Endosulfan I	L. Endosulfan II	P. Methoxychlor	T. gamma-Chlordane	X. Aroclor-1232	BB. Aroclor-1260	FF.	JJ.

LDC #: 18144A39
SDG #: K0710375

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: Q
2nd Reviewer: A

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 11/15/07 **Blank analysis date:** 12/17/07
Conc. units: ug/kg Associated Samples: All

Compound	Blank ID	Sample Identification								
	KQ710385-13									
N	0.13									

Blank extraction date: _____ **Blank analysis date:** _____
Conc. units: _____ Associated Samples: _____

Compound	Blank ID	Sample Identification								

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18444A39
SDG #: K0710375

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: 9
2nd Reviewer: K

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y N N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	RPD %D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	P	1	78.3	Vdets/A
	F	2	69.4	
	F	3	97.7	
	J		66.7	
	KK	5	85.7	
	FF		81.9	
	HH		76.9	
	VV		93.1	↓

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 8, 2007
LDC Report Date:	January 31, 2008
Matrix:	Sediment/Water
Parameters:	Chlorinated Pesticides
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710558

Sample Identification

PCM-08SC-071108
PCM-SCRB-071108
PCM-BRB-071108

Introduction

This data review covers one sediment sample and 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8081A for Chlorinated Pesticides.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of single and multicomponent compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
12/20/07	1219F051	DB-XLB	Methoxychlor	16	All sediment samples in SDG K0710558	J (all detects) UJ (all non-detects)	A

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

The individual 4,4'-DDT and Endrin breakdowns (%BD) were less than or equal to 15.0%.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
KWG0712586-3	11/15/07	4,4'-DDT	0.0042 ug/L	All water samples in SDG K0710558
KWG0712505-13	11/15/07	Endosulfan sulfate	0.13 ug/Kg	All sediment samples in SDG K0710558

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and Reported CRQLs

The sample results for detected compounds from the two columns were within 40% relative percent difference (RPD) with the following exceptions:

Sample	Compound	RPD	Flag	A or P
PCM-BRB-071108	Heptachlor	43.1	J (all detects)	A
PCM-08SC-071108	4,4'-DDD	68.7	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to calibration %D and compound quantitation RPD problems, data were qualified as estimated in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

Samples PCM-SCRB-071108 and PCM-BRB-071108 were identified as rinsate blanks. No chlorinated pesticide contaminants were found in these blanks with the following exceptions:

Rinsate Blank ID	Compound	Concentration (ug/L)
PCM-SCRB-071108	Aldrin	0.00050
PCM-BRB-071108	Heptachlor	0.00062

NW Natural Gasco Site
Chlorinated Pesticides - Data Qualification Summary - SDG K0710558

SDG	Sample	Compound	Flag	A or P	Reason
K0710558	PCM-08SC-071108	Methoxychlor	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
K0710558	PCM-BRB-071108	Heptachlor	J (all detects)	A	Compound quantitation and CRQLs (RPD)
K0710558	PCM-08SC-071108	4,4'-DDD	J (all detects)	A	Compound quantitation and CRQLs (RPD)

NW Natural Gasco Site
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG K0710558

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Sediment	**Date Received:**	11/09/2007

Organochlorine Pesticides

Sample Name:	PCM-08SC-071108	**Units:**	ug/Kg
Lab Code:	K0710558-012	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8081A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.99	0.26	1	11/15/07	12/20/07	KWG0712505	
beta-BHC	ND	Ui	0.99	0.82	1	11/15/07	12/20/07	KWG0712505	
gamma-BHC (Lindane)	ND	Ui	0.99	0.96	1	11/15/07	12/20/07	KWG0712505	
delta-BHC	ND	Ui	0.99	0.65	1	11/15/07	12/20/07	KWG0712505	
Heptachlor	ND	Ui	0.99	0.74	1	11/15/07	12/20/07	KWG0712505	
Aldrin	ND	Ui	1.8	1.8	1	11/15/07	12/20/07	KWG0712505	
Heptachlor Epoxide	ND	U	0.99	0.13	1	11/15/07	12/20/07	KWG0712505	
gamma-Chlordane†	ND	U	0.99	0.064	1	11/15/07	12/20/07	KWG0712505	
Endosulfan I	ND	Ui	0.99	0.70	1	11/15/07	12/20/07	KWG0712505	
alpha-Chlordane	ND	Ui	0.99	0.54	1	11/15/07	12/20/07	KWG0712505	
Dieldrin	ND	U	0.99	0.29	1	11/15/07	12/20/07	KWG0712505	
4,4'-DDE	ND	Ui	0.99	0.99	1	11/15/07	12/20/07	KWG0712505	
Endrin	ND	U	0.99	0.20	1	11/15/07	12/20/07	KWG0712505	
Endosulfan II	ND	U	0.99	0.19	1	11/15/07	12/20/07	KWG0712505	
4,4'-DDD	**0.43**	JP J12	0.99	0.12	1	11/15/07	12/20/07	KWG0712505	
Endrin Aldehyde	ND	Ui	0.99	0.60	1	11/15/07	12/20/07	KWG0712505	
Endosulfan Sulfate	ND	Ui	0.99	0.99	1	11/15/07	12/20/07	KWG0712505	
4,4'-DDT	ND	Ui	0.99	0.88	1	11/15/07	12/20/07	KWG0712505	
Endrin Ketone	ND	U	0.99	0.082	1	11/15/07	12/20/07	KWG0712505	
Methoxychlor	ND	Ui	0.99	0.37	1	11/15/07	12/20/07	KWG0712505	
Toxaphene	ND	Ui	52	52	1	11/15/07	12/20/07	KWG0712505	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	96	32-138	12/20/07	Acceptable
Decachlorobiphenyl	90	23-162	12/20/07	Acceptable

† Analyte Comments

gamma-Chlordane	For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: 1/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Organochlorine Pesticides

Sample Name:	PCM-SCRB-071108	**Units:**	ug/L
Lab Code:	K0710558-015	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8081A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.011	0.00035	1	11/15/07	12/20/07	KWG0712586	
beta-BHC	ND	Ui	0.011	0.011	1	11/15/07	12/20/07	KWG0712586	
gamma-BHC (Lindane)	ND	U	0.011	0.00046	1	11/15/07	12/20/07	KWG0712586	
delta-BHC	ND	Ui	0.011	0.0068	1	11/15/07	12/20/07	KWG0712586	
Heptachlor	ND	U	0.011	0.00038	1	11/15/07	12/20/07	KWG0712586	
Aldrin	**0.00050**	J	0.011	0.00042	1	11/15/07	12/20/07	KWG0712586	
Heptachlor Epoxide	ND	Ui	0.011	0.0012	1	11/15/07	12/20/07	KWG0712586	
gamma-Chlordane†	ND	U	0.011	0.00034	1	11/15/07	12/20/07	KWG0712586	
Endosulfan I	ND	U	0.011	0.00046	1	11/15/07	12/20/07	KWG0712586	
alpha-Chlordane	ND	U	0.011	0.0042	1	11/15/07	12/20/07	KWG0712586	
Dieldrin	ND	Ui	0.011	0.00048	1	11/15/07	12/20/07	KWG0712586	
4,4'-DDE	ND	U	0.011	0.00038	1	11/15/07	12/20/07	KWG0712586	
Endrin	ND	Ui	0.011	0.0011	1	11/15/07	12/20/07	KWG0712586	
Endosulfan II	ND	U	0.011	0.00042	1	11/15/07	12/20/07	KWG0712586	
4,4'-DDD	ND	U	0.011	0.0016	1	11/15/07	12/20/07	KWG0712586	
Endrin Aldehyde	ND	Ui	0.011	0.00061	1	11/15/07	12/20/07	KWG0712586	
Endosulfan Sulfate	ND	U	0.011	0.00049	1	11/15/07	12/20/07	KWG0712586	
4,4'-DDT	ND	Ui	0.011	0.00092	1	11/15/07	12/20/07	KWG0712586	
Endrin Ketone	ND	U	0.011	0.00069	1	11/15/07	12/20/07	KWG0712586	
Methoxychlor	ND	U	0.011	0.00097	1	11/15/07	12/20/07	KWG0712586	
Toxaphene	ND	Ui	0.53	0.051	1	11/15/07	12/20/07	KWG0712586	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	55	16-111	12/20/07	Acceptable
Decachlorobiphenyl	50	14-145	12/20/07	Acceptable

† Analyte Comments

gamma-Chlordane	For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: 4/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Organochlorine Pesticides

Sample Name:	PCM-BRB-071108	**Units:**	ug/L
Lab Code:	K0710558-018	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8081A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.0097	0.00033	1	11/15/07	12/20/07	KWG0712586	
beta-BHC	ND	Ui	0.0097	0.0097	1	11/15/07	12/20/07	KWG0712586	
gamma-BHC (Lindane)	ND	U	0.0097	0.00044	1	11/15/07	12/20/07	KWG0712586	
delta-BHC	ND	Ui	0.0097	0.0076	1	11/15/07	12/20/07	KWG0712586	
Heptachlor	**0.00062**	JP	0.0097	0.00036	1	11/15/07	12/20/07	KWG0712586	
Aldrin	ND	U	0.0097	0.00040	1	11/15/07	12/20/07	KWG0712586	
Heptachlor Epoxide	ND	Ui	0.0097	0.00099	1	11/15/07	12/20/07	KWG0712586	
gamma-Chlordane†	ND	U	0.0097	0.00032	1	11/15/07	12/20/07	KWG0712586	
Endosulfan I	ND	Ui	0.0097	0.0097	1	11/15/07	12/20/07	KWG0712586	
alpha-Chlordane	ND	U	0.0097	0.0040	1	11/15/07	12/20/07	KWG0712586	
Dieldrin	ND	U	0.0097	0.00035	1	11/15/07	12/20/07	KWG0712586	
4,4'-DDE	ND	U	0.0097	0.00036	1	11/15/07	12/20/07	KWG0712586	
Endrin	ND	U	0.0097	0.00068	1	11/15/07	12/20/07	KWG0712586	
Endosulfan II	ND	U	0.0097	0.00040	1	11/15/07	12/20/07	KWG0712586	
4,4'-DDD	ND	U	0.0097	0.0015	1	11/15/07	12/20/07	KWG0712586	
Endrin Aldehyde	ND	U	0.0097	0.00046	1	11/15/07	12/20/07	KWG0712586	
Endosulfan Sulfate	ND	U	0.0097	0.00047	1	11/15/07	12/20/07	KWG0712586	
4,4'-DDT	ND	Ui	0.0097	0.0097	1	11/15/07	12/20/07	KWG0712586	
Endrin Ketone	ND	U	0.0097	0.00066	1	11/15/07	12/20/07	KWG0712586	
Methoxychlor	ND	U	0.0097	0.00093	1	11/15/07	12/20/07	KWG0712586	
Toxaphene	ND	Ui	0.49	0.050	1	11/15/07	12/20/07	KWG0712586	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	59	16-111	12/20/07	Acceptable
Decachlorobiphenyl	70	14-145	12/20/07	Acceptable

† Analyte Comments

gamma-Chlordane	For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments:

LDC #: 18144B3a
SDG #: K0710558
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/30/08
Page: 1 of 1
Reviewer: a
2nd Reviewer: [illegible]

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/8/07
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	SW	15%D
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS/D
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	SW	RB=2,3

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	PCM-08SC-071108 Sed	11	KWG0712586-3	21		31	
2	PCM-SCRB-071108 W	12	KWG0712505-13	22		32	
3	PCM-BRB-071108 ↓	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE.	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF.	NN.

Notes:_____

LDC #: 18144B39
SDG #: K070558

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: 9
2nd Reviewer: K

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)

Please see qualifications below for all questions answered "N" Not applicable questions are identified as "N/A".

What type or calibration verification calculation was performed? ___ %D or ___ RPD

(Y) N N/A Were Evaluation mix standards run before initial calibration and before samples?

(Y) N N/A Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard (≤15.0% for individual breakdowns)?

(Y) N N/A Was at least one standard run daily to verify the working curve?

Y (N) N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of ≤15.0%?

Level IV/D Only

Y N (N/A) Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 15.0)	RT (Limits)	Associated Samples	Qualifications
	12/06/07	1219F051	~~DB-XLB~~	P	16	( )	all seds	J/UJ/A
			~~DB-35MS~~			( )	KING07F505-13	
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

A. alpha-BHC	E. Heptachlor	I. Dieldrin	M. 4,4'-DDD	Q. Endrin ketone	U. Toxaphene	Y. Aroclor-1242	CC. DB 608	GG.
B. beta-BHC	F. Aldrin	J. 4,4'-DDE	N. Endosulfan sulfate	R. Endrin aldehyde	V. Aroclor-1016	Z. Aroclor-1248	DD. DB 1701	HH.
C. delta-BHC	G. Heptachlor epoxide	K. Endrin	O. 4,4'-DDT	S. alpha-Chlordane	W. Aroclor-1221	AA. Aroclor-1254	EE.	II.
D. gamma-BHC	H. Endosulfan I	L. Endosulfan II	P. Methoxychlor	T. gamma-Chlordane	X. Aroclor-1232	BB. Aroclor-1260	FF.	JJ.

LDC #: 18144B3a
SDG #: K0710558

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: M

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a given method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
Y N N/A Was a method blank performed with each extraction batch?
Y N N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Level IV/D Only
Y N N/A (Gasoline and aromatics only)Was a method blank analyzed with each 24 hour batch?
Y N N/A Was a method blank analyzed for each analytical / extraction batch of ≤20 samples?

Blank extraction date: 11/15/07 Blank analysis date: 12/19/07 Associated samples: all H2Os
Conc. units: ug/L

Compound	Blank ID	Sample Identification						
	KWG0712586-3							
0	0.0042							

Blank extraction date: 11/15/07 Blank analysis date: 12/17/07 Associated samples: all sed.
Conc. units: ug/Kg

Compound	Blank ID	Sample Identification						
	KWG0712505-3							
N	0.13							

ALL CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 18444B39
SDG #: K0710558

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 4

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y N N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	~~RPD~~ %D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	e	3	43.1	✓ dets/D
	M	1	68.7	✓

Comments: _____

LDC #: 18144B39
SDG #: K0710558

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: 9
2nd reviewer: M

METHOD: ~~GC/MS BNA (EPA SW 846 Method 8270)~~ 4C

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds identified in the field blanks?

Sample: 2 Field Blank / Trip Blank / Rinsate (circle one) RB

Compound	Concentration Units (µg/L)
Aldrin	0.00050

Sample: 3 Field Blank / Trip Blank / Rinsate (circle one) RB

Compound	Concentration Units (µg/L)
Heptachlor	0.00062

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ( )

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 7, 2007
LDC Report Date:	February 1, 2008
Matrix:	Sediment
Parameters:	Chlorinated Pesticides
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710470

Sample Identification

PCM-02SC-071107
PCM-05SC-071107
PCM-04SC-071107
PCM-14DS-071107
PCM-14DS-071107MS
PCM-14DS-071107MSD

Introduction

This data review covers 6 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8081A for Chlorinated Pesticides.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of single and multicomponent compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for selected compounds.

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination (r^2) was greater than or equal to 0.990 .

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
12/20/07	1219F051	DB-XLB	Methoxychlor	16	PCM-02SC-071107 PCM-05SC-071107 PCM-04SC-071107 PCM-14DS-071107 PCM-14DS-071107MS PCM-14DS-071107MSD	J (all detects) UJ (all non-detects)	A

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

The individual 4,4'-DDT and Endrin breakdowns (%BD) were less than or equal to 15.0%.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No chlorinated pesticide contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound	Concentration	Associated Samples
KWG0712505-13	11/15/07	Endosulfan sulfate	0.13 ug/Kg	All samples in SDG K0710470

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
PCM-05SC-071107	Endosulfan sulfate	0.14 ug/Kg	0.99U ug/Kg

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and Reported CRQLs

The sample results for detected compounds from the two columns were within 40% relative percent difference (RPD) with the following exceptions:

Sample	Compound	RPD	Flag	A or P
PCM-02SC-071107	4,4'-DDD	82.4	J (all detects)	A
PCM-05SC-071107	Endosulfan sulfate	94.3	J (all detects)	A
PCM-14DS-071107	Hexachlorobenzene gamma-Chlordane 2,4'-DDD	57.1 50.0 46.2	J (all detects) J (all detects) J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to calibration %D and compound quantitation RPD problems, data were qualified as estimated in four samples.

Due to method blank contamination problems, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Chlorinated Pesticides - Data Qualification Summary - SDG K0710470

SDG	Sample	Compound	Flag	A or P	Reason
K0710470	PCM-02SC-071107 PCM-05SC-071107 PCM-04SC-071107 PCM-14DS-071107	Methoxychlor	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
K0710470	PCM-02SC-071107	4,4'-DDD	J (all detects)	A	Compound quantitation and CRQLs (RPD)
K0710470	PCM-05SC-071107	Endosulfan sulfate	J (all detects)	A	Compound quantitation and CRQLs (RPD)
K0710470	PCM-14DS-071107	Hexachlorobenzene gamma-Chlordane 2,4'-DDD	J (all detects) J (all detects) J (all detects)	A	Compound quantitation and CRQLs (RPD)

NW Natural Gasco Site
Chlorinated Pesticides - Laboratory Blank Data Qualification Summary - SDG K0710470

SDG	Sample	Compound	Modified Final Concentration	A or P
K0710470	PCM-05SC-071107	Endosulfan sulfate	0.99U ug/Kg	A

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Organochlorine Pesticides

Sample Name:	PCM-02SC-071107	**Units:**	ug/Kg
Lab Code:	K0710470-001	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8081A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	1.0	0.26	1	11/15/07	12/20/07	KWG0712505	
beta-BHC	ND	U	1.0	0.30	1	11/15/07	12/20/07	KWG0712505	
gamma-BHC (Lindane)	ND	Ui	1.0	0.25	1	11/15/07	12/20/07	KWG0712505	
delta-BHC	ND	U	1.0	0.055	1	11/15/07	12/20/07	KWG0712505	
Heptachlor	ND	U	1.0	0.080	1	11/15/07	12/20/07	KWG0712505	
Aldrin	ND	U	1.0	0.15	1	11/15/07	12/20/07	KWG0712505	
Heptachlor Epoxide	ND	Ui	1.0	0.23	1	11/15/07	12/20/07	KWG0712505	
gamma-Chlordane†	ND	U	1.0	0.064	1	11/15/07	12/20/07	KWG0712505	
Endosulfan I	ND	U	1.0	0.17	1	11/15/07	12/20/07	KWG0712505	
alpha-Chlordane	ND	U	1.0	0.23	1	11/15/07	12/20/07	KWG0712505	
Dieldrin	ND	U	1.0	0.29	1	11/15/07	12/20/07	KWG0712505	
4,4'-DDE	ND	U	1.0	0.10	1	11/15/07	12/20/07	KWG0712505	
Endrin	ND	U	1.0	0.20	1	11/15/07	12/20/07	KWG0712505	
Endosulfan II	ND	U	1.0	0.19	1	11/15/07	12/20/07	KWG0712505	
4,4'-DDD	**0.50**	JP J12	1.0	0.12	1	11/15/07	12/20/07	KWG0712505	
Endrin Aldehyde	ND	U	1.0	0.053	1	11/15/07	12/20/07	KWG0712505	
Endosulfan Sulfate	ND	U	1.0	0.079	1	11/15/07	12/20/07	KWG0712505	
4,4'-DDT	ND	Ui	1.0	0.52	1	11/15/07	12/20/07	KWG0712505	
Endrin Ketone	ND	U	1.0	0.082	1	11/15/07	12/20/07	KWG0712505	
Methoxychlor	ND	U U5	1.0	0.10	1	11/15/07	12/20/07	KWG0712505	
Toxaphene	ND	Ui	50	13	1	11/15/07	12/20/07	KWG0712505	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	89	32-138	12/20/07	Acceptable
Decachlorobiphenyl	93	23-162	12/20/07	Acceptable

† Analyte Comments

gamma-Chlordane	For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: 8/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Organochlorine Pesticides

Sample Name:	PCM-05SC-071107	**Units:**	ug/Kg
Lab Code:	K0710470-003	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8081A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.99	0.26	1	11/15/07	12/20/07	KWG0712505	
beta-BHC	ND	U	0.99	0.30	1	11/15/07	12/20/07	KWG0712505	
gamma-BHC (Lindane)	ND	Ui	0.99	0.78	1	11/15/07	12/20/07	KWG0712505	
delta-BHC	ND	Ui	0.99	0.32	1	11/15/07	12/20/07	KWG0712505	
Heptachlor	ND	Ui	0.99	0.73	1	11/15/07	12/20/07	KWG0712505	
Aldrin	ND	Ui	1.5	1.5	1	11/15/07	12/20/07	KWG0712505	
Heptachlor Epoxide	ND	U	0.99	0.13	1	11/15/07	12/20/07	KWG0712505	
gamma-Chlordane†	ND	U	0.99	0.064	1	11/15/07	12/20/07	KWG0712505	
Endosulfan I	ND	Ui	0.99	0.32	1	11/15/07	12/20/07	KWG0712505	
alpha-Chlordane	ND	Ui	0.99	0.32	1	11/15/07	12/20/07	KWG0712505	
Dieldrin	ND	U	0.99	0.29	1	11/15/07	12/20/07	KWG0712505	
4,4'-DDE	ND	Ui	0.99	0.99	1	11/15/07	12/20/07	KWG0712505	
Endrin	ND	U	0.99	0.20	1	11/15/07	12/20/07	KWG0712505	
Endosulfan II	ND	U	0.99	0.19	1	11/15/07	12/20/07	KWG0712505	
4,4'-DDD	**1.6**		0.99	0.12	1	11/15/07	12/20/07	KWG0712505	
Endrin Aldehyde	ND	Ui	0.99	0.56	1	11/15/07	12/20/07	KWG0712505	
Endosulfan Sulfate	**0.14**	JP JH2	0.99	0.079 0.99417		11/15/07	12/20/07	KWG0712505	
4,4'-DDT	ND	Ui	0.99	0.78	1	11/15/07	12/20/07	KWG0712505	
Endrin Ketone	ND	U	0.99	0.082	1	11/15/07	12/20/07	KWG0712505	
Methoxychlor	ND	U UJ5	0.99	0.10	1	11/15/07	12/20/07	KWG0712505	
Toxaphene	ND	Ui	50	29	1	11/15/07	12/20/07	KWG0712505	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	92	32-138	12/20/07	Acceptable
Decachlorobiphenyl	89	23-162	12/20/07	Acceptable

† Analyte Comments

gamma-Chlordane — For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: SL 013108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Organochlorine Pesticides

Sample Name:	PCM-04SC-071107	**Units:**	ug/Kg
Lab Code:	K0710470-004	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8081A		

Analyte Name	Result	Q		MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U		1.0	0.26	1	11/15/07	12/20/07	KWG0712505	
beta-BHC	ND	Ui		1.0	1.0	1	11/15/07	12/20/07	KWG0712505	
gamma-BHC (Lindane)	ND	Ui		1.1	1.1	1	11/15/07	12/20/07	KWG0712505	
delta-BHC	ND	Ui		1.0	0.46	1	11/15/07	12/20/07	KWG0712505	
Heptachlor	ND	Ui		1.0	1.0	1	11/15/07	12/20/07	KWG0712505	
Aldrin	ND	Ui		1.6	1.6	1	11/15/07	12/20/07	KWG0712505	
Heptachlor Epoxide	**0.54**	J		1.0	0.13	1	11/15/07	12/20/07	KWG0712505	
gamma-Chlordane†	ND	U		1.0	0.064	1	11/15/07	12/20/07	KWG0712505	
Endosulfan I	ND	Ui		1.1	1.1	1	11/15/07	12/20/07	KWG0712505	
alpha-Chlordane	ND	Ui		1.0	0.47	1	11/15/07	12/20/07	KWG0712505	
Dieldrin	ND	U		1.0	0.29	1	11/15/07	12/20/07	KWG0712505	
4,4'-DDE	ND	U		1.0	0.10	1	11/15/07	12/20/07	KWG0712505	
Endrin	ND	U		1.0	0.20	1	11/15/07	12/20/07	KWG0712505	
Endosulfan II	ND	U		1.0	0.19	1	11/15/07	12/20/07	KWG0712505	
4,4'-DDD	**0.68**	J		1.0	0.12	1	11/15/07	12/20/07	KWG0712505	
Endrin Aldehyde	ND	Ui		1.0	1.0	1	11/15/07	12/20/07	KWG0712505	
Endosulfan Sulfate	ND	Ui		1.0	0.33	1	11/15/07	12/20/07	KWG0712505	
4,4'-DDT	ND	Ui		1.0	0.53	1	11/15/07	12/20/07	KWG0712505	
Endrin Ketone	ND	Ui		1.0	0.17	1	11/15/07	12/20/07	KWG0712505	
Methoxychlor	ND	Ui	UJS	1.0	0.30	1	11/15/07	12/20/07	KWG0712505	
Toxaphene	ND	Ui		60	60	1	11/15/07	12/20/07	KWG0712505	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tetrachloro-m-xylene	86	32-138	12/20/07	Acceptable
Decachlorobiphenyl	82	23-162	12/20/07	Acceptable

† Analyte Comments

gamma-Chlordane	For this analyte (CAS Registry No. 5103-74-2), USEPA has corrected the name to be beta-Chlordane, also known as trans-Chlordane.

Comments: SC 1/31/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Organochlorine Pesticides

Sample Name:	PCM-14DS-071107	**Units:**	ug/Kg
Lab Code:	K0710470-006	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8081A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
alpha-BHC	ND	U	0.99	0.26	1	11/15/07	12/20/07	KWG0712505	
Hexachlorobenzene	**0.45**	JP J|2	0.99	0.079	1	11/15/07	12/20/07	KWG0712505	
beta-BHC	ND	U	0.99	0.30	1	11/15/07	12/20/07	KWG0712505	
gamma-BHC (Lindane)	ND	Ui	0.99	0.98	1	11/15/07	12/20/07	KWG0712505	
delta-BHC	ND	U	0.99	0.055	1	11/15/07	12/20/07	KWG0712505	
Heptachlor	ND	Ui	0.99	0.70	1	11/15/07	12/20/07	KWG0712505	
Aldrin	ND	Ui	0.99	0.29	1	11/15/07	12/20/07	KWG0712505	
Heptachlor Epoxide	ND	U	0.99	0.13	1	11/15/07	12/20/07	KWG0712505	
gamma-Chlordane†	**0.45**	JP J|2	0.99	0.064	1	11/15/07	12/20/07	KWG0712505	
Endosulfan I	ND	U	0.99	0.17	1	11/15/07	12/20/07	KWG0712505	
alpha-Chlordane	ND	U	0.99	0.23	1	11/15/07	12/20/07	KWG0712505	
Dieldrin	ND	Ui	0.99	0.99	1	11/15/07	12/20/07	KWG0712505	
4,4'-DDE	**2.6**		0.99	0.10	1	11/15/07	12/20/07	KWG0712505	
Endrin	ND	Ui	2.6	2.6	1	11/15/07	12/20/07	KWG0712505	
Endosulfan II	ND	U	0.99	0.19	1	11/15/07	12/20/07	KWG0712505	
4,4'-DDD	**6.6**		0.99	0.12	1	11/15/07	12/20/07	KWG0712505	
Endrin Aldehyde	ND	Ui	0.99	0.36	1	11/15/07	12/20/07	KWG0712505	
Endosulfan Sulfate	ND	Ui	0.99	0.99	1	11/15/07	12/20/07	KWG0712505	
4,4'-DDT	**3.7**		0.99	0.064	1	11/15/07	12/20/07	KWG0712505	*
Endrin Ketone	ND	Ui	0.99	0.28	1	11/15/07	12/20/07	KWG0712505	
Methoxychlor	ND	Ui UJS	0.99	0.59	1	11/15/07	12/20/07	KWG0712505	
Toxaphene	ND	Ui	50	31	1	11/15/07	12/20/07	KWG0712505	
Oxychlordane	ND	Ui	0.99	0.47	1	11/15/07	12/20/07	KWG0712505	
2,4'-DDE	ND	Ui	0.99	0.44	1	11/15/07	12/20/07	KWG0712505	
cis-Nonachlor	ND	Ui	0.99	0.41	1	11/15/07	12/20/07	KWG0712505	
2,4'-DDD	**4.0**	P J|2	0.99	0.21	1	11/15/07	12/20/07	KWG0712505	*
trans-Nonachlor	ND	U	0.99	0.066	1	11/15/07	12/20/07	KWG0712505	
2,4'-DDT	**2.9**		0.99	0.14	1	11/15/07	12/20/07	KWG0712505	*
Mirex	ND	U	0.99	0.063	1	11/15/07	12/20/07	KWG0712505	
Hexachloroethane	**0.38**	J	0.99	0.15	1	11/15/07	12/20/07	KWG0712505	
Hexachlorobutadiene	ND	Ui	0.99	0.99	1	11/15/07	12/20/07	KWG0712505	

* See Case Narrative

Comments: SL 01/2/08

LDC #: 18144C3a **VALIDATION COMPLETENESS WORKSHEET** Date: 11/30/08
SDG #: K0710470 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: Q
2nd Reviewer: A

METHOD: GC Chlorinated Pesticides (EPA SW 846 Method 8081A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/7/07
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	A	RSD. ≤ 2
IV.	Continuing calibration/ICV	SW	RPD ≤ 15%
V.	Blanks	SW	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	SW	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	PCM-02SC-071107 lead	11	KNF0712505-13	21		31	
2	PCM-05SC-071107	12		22		32	
3	PCM-04SC-071107	13		23		33	
4	PCM-14DS-071107	14		24		34	
5	PCM-14DS-071107MS	15		25		35	
6	PCM-14DS-071107MSD	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

VALIDATION FINDINGS WORKSHEET

METHOD: Pesticide/PCBs (EPASW 846 Method 8081/8082)

A. alpha-BHC	I. Dieldrin	Q. Endrin ketone	Y. Aroclor-1242	GG.
B. beta-BHC	J. 4,4'-DDE	R. Endrin aldehyde	Z. Aroclor-1248	HH.
C. delta-BHC	K. Endrin	S. alpha-Chlordane	AA. Aroclor-1254	II.
D. gamma-BHC	L. Endosulfan II	T. gamma-Chlordane	BB. Aroclor-1260	JJ.
E. Heptachlor	M. 4,4'-DDD	U. Toxaphene	CC. DB 608	KK.
F. Aldrin	N. Endosulfan sulfate	V. Aroclor-1016	DD. DB 1701	LL.
G. Heptachlor epoxide	O. 4,4'-DDT	W. Aroclor-1221	EE. Hexachlorobenzene	MM.
H. Endosulfan I	P. Methoxychlor	X. Aroclor-1232	FF. 2,4'-DDT	NN.

Notes:_____

LDC #: 18144c39
SDG #: K071024-70

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Pesticides/PCBs (EPA SW 846 Method 8081/8082)
Please see qualifications below for all questions answered "N" Not applicable questions are identified as "N/A".

What type or calibration verification calculation was performed? %D or RPD

Y (N) N/A Were Evaluation mix standards run before initial calibration and before samples?

Y (N) N/A Were Endrin & 4,4'-DDT breakdowns acceptable in the Evaluation Mix standard (≤15.0% for individual breakdowns)?

Y (N) N/A Was at least one standard run daily to verify the working curve?

Y (N) N/A Did the continuing calibration standards meet the percent difference (%D) / relative percent difference (RPD) criteria of <15.0%?

Level IV/D Only

Y N (N/A) Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Column	Compound	%D (Limit ≤ 15.0)	RT (Limits)	Associated Samples	Qualifications
	12/20/07	1219F05	DB-XLB	4	16	( )	M1-LNB	J/UJ/A
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

A. alpha-BHC	E. Heptachlor	I. Dieldrin	M. 4,4'-DDD	Q. Endrin ketone	U. Toxaphene	Y. Aroclor-1242	CC. DB 608	GG.
B. beta-BHC	F. Aldrin	J. 4,4'-DDE	N. Endosulfan sulfate	R. Endrin aldehyde	V. Aroclor-1016	Z. Aroclor-1248	DD. DB 1701	HH.
C. delta-BHC	G. Heptachlor epoxide	K. Endrin	O. 4,4'-DDT	S. alpha-Chlordane	W. Aroclor-1221	AA. Aroclor-1254	EE.	II.
D. gamma-BHC	H. Endosulfan I	L. Endosulfan II	P. Methoxychlor	T. gamma-Chlordane	X. Aroclor-1232	BB. Aroclor-1260	FF.	JJ.

LDC #: 18144C39
SDG #: K0710470

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: M

METHOD: __✓__ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Were all samples associated with a given method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
Y N N/A Was a method blank performed with each extraction batch?
(Y) N N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Level IV/D Only

Y N ~~N/A~~ (Gasoline and aromatics only)Was a method blank analyzed with each 24 hour batch?
Y N (N/A) Was a method blank analyzed for each analytical / extraction batch of ≤20 samples?

Blank extraction date: 11/15/07 **Blank analysis date:** 12/17/07 **Associated samples:** all

Conc. units: ug/kg

Compound	Blank ID	Sample Identification						
	HW4071505-MB 2							
N	0.13	0.14/0.994						

Blank extraction date: _____ **Blank analysis date:** _____ **Associated samples:** _____

Conc. units: _____

Compound	Blank ID	Sample Identification						

ALL CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 18144C39
SDG #: K0710470

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: 9
2nd Reviewer: 4

METHOD: ✓ GC __ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N (N/A) Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N (N/A) Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y (N) N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	~~RPD~~ %D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	M	1	82.4	dets/A
	N	2	94.3	
	EE	4	57.1	
	T		50.0	
	FF		46.2	

Comments: _____

NW Natural Gasco Site
Data Validation Reports
LDC# 18144

PCBs

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 5, 2007
LDC Report Date:	January 31, 2008
Matrix:	Sediment
Parameters:	Polychlorinated Biphenyls
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710375

Sample Identification

PCM-09SC-071105
PCM-10SC-071105
PCM-02DS-071105
PCM-06DS-071105
PCM-09DS-071105
PCM-09SC-071105MS
PCM-09SC-071105MSD

Introduction

This data review covers 7 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8082 for Polychlorinated Biphenyls.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of multicomponent compounds was performed for the primary (quantitation) column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated biphenyl contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and Reported CRQLs

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the level III data validation all results are considered valid and usable for all purposes.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Polychlorinated Biphenyls - Data Qualification Summary - SDG K0710375

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG K0710375

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Polychlorinated Biphenyls (PCBs)

Sample Name:	PCM-09SC-071105	**Units:**	ug/Kg
Lab Code:	K0710375-001	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8082		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	10	4.9	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1221	ND	Ui	20	9.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1232	ND	Ui	10	7.6	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1242	ND	Ui	10	4.3	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1248	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1254	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1260	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1262	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1268	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	73	33-141	12/13/07	Acceptable

Comments: 12/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Polychlorinated Biphenyls (PCBs)

Sample Name:	PCM-10SC-071105	**Units:**	ug/Kg
Lab Code:	K0710375-003	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8082		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1221	ND	U	20	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1232	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1242	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1248	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1254	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1260	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1262	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1268	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	76	33-141	12/13/07	Acceptable

Comments: 12/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Polychlorinated Biphenyls (PCBs)

Sample Name:	PCM-02DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-004	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8082		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	12	12	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1221	ND	Ui	24	19	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1232	ND	Ui	12	7.9	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1242	ND	Ui	12	5.8	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1248	ND	Ui	12	4.9	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1254	ND	Ui	53	53	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1260	ND	Ui	12	8.5	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1262	ND	Ui	12	6.8	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1268	ND	U	12	2.0	1	11/15/07	12/13/07	KWG0712506	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	68	33-141	12/13/07	Acceptable

Comments: R 01310 8

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Polychlorinated Biphenyls (PCBs)

Sample Name:	PCM-06DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-005	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8082		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	12	6.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1221	ND	Ui	29	29	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1232	ND	Ui	15	15	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1242	ND	Ui	12	8.8	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1248	ND	Ui	12	5.4	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1254	ND	Ui	27	27	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1260	ND	Ui	12	7.4	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1262	ND	Ui	12	4.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1268	ND	U	12	2.0	1	11/15/07	12/13/07	KWG0712506	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	77	33-141	12/13/07	Acceptable

Comments: R 01/31/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Polychlorinated Biphenyls (PCBs)

Sample Name:	PCM-09DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-006	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8082		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	11	2.4	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1221	ND	Ui	22	12	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1232	ND	Ui	11	5.3	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1242	ND	Ui	11	2.8	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1248	ND	Ui	11	5.3	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1254	ND	Ui	29	29	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1260	ND	Ui	11	8.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1262	ND	Ui	11	6.2	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1268	ND	U	11	1.9	1	11/15/07	12/13/07	KWG0712506	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	76	33-141	12/13/07	Acceptable

Comments: #013108

LDC #: 18144A3b
SDG #: K0710375
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/30/08
Page: 1 of 1
Reviewer: Q
2nd Reviewer: L

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/5/07
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	15/70
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:
Used

1	PCM-09SC-071105	11	KWG0712506-4	21		31	
2	PCM-10SC-071105	12		22		32	
3	PCM-02DS-071105	13		23		33	
4	PCM-06DS-071105	14		24		34	
5	PCM-09DS-071105	15		25		35	
6	PCM-09SC-071105MS	16		26		36	
7	PCM-09SC-071105MSD	17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 8, 2007
LDC Report Date:	February 1, 2008
Matrix:	Sediment/Water
Parameters:	Polychlorinated Biphenyls
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710558

Sample Identification

PCM-SCRB-071108
PCM-BRB-071108
PCM-08SC-071108

Introduction

This data review covers one sediment sample and 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8082 for Polychlorinated Biphenyls.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of multicomponent compounds was performed for the primary (quantitation) column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated biphenyl contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and Reported CRQLs

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the level III data validation all results are considered valid and usable for all purposes.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

Samples PCM-SCRB-071108 and PCM-BRB-071108 were identified as rinsate blanks. No polychlorinated biphenyl contaminants were found in these blanks.

NW Natural Gasco Site
Polychlorinated Biphenyls - Data Qualification Summary - SDG K0710558

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG K0710558

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Sediment	**Date Received:**	11/09/2007

Polychlorinated Biphenyls (PCBs)

Sample Name:	PCM-08SC-071108	**Units:**	ug/Kg
Lab Code:	K0710558-012	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8082		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	9.9	5.6	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1221	ND	Ui	20	12	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1232	ND	Ui	9.9	9.9	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1242	ND	Ui	9.9	5.6	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1248	ND	Ui	9.9	3.1	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1254	ND	U	9.9	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1260	ND	U	9.9	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1262	ND	U	9.9	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1268	ND	U	9.9	1.7	1	11/15/07	12/13/07	KWG0712506	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	81	33-141	12/13/07	Acceptable

Comments: R013108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Polychlorinated Biphenyls (PCBs)

Sample Name:	PCM-SCRB-071108	**Units:**	ug/L
Lab Code:	K0710558-015	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8082		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	0.21	0.024	1	11/15/07	12/04/07	KWG0712585	
Aroclor 1221	ND	U	0.42	0.057	1	11/15/07	12/04/07	KWG0712585	
Aroclor 1232	ND	Ui	0.21	0.21	1	11/15/07	12/04/07	KWG0712585	
Aroclor 1242	ND	Ui	0.21	0.016	1	11/15/07	12/04/07	KWG0712585	
Aroclor 1248	ND	U	0.21	0.0096	1	11/15/07	12/04/07	KWG0712585	
Aroclor 1254	ND	U	0.21	0.011	1	11/15/07	12/04/07	KWG0712585	
Aroclor 1260	ND	U	0.21	0.0058	1	11/15/07	12/04/07	KWG0712585	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	44	27-121	12/04/07	Acceptable

Comments: K013108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Polychlorinated Biphenyls (PCBs)

Sample Name:	PCM-BRB-071108	**Units:**	ug/L
Lab Code:	K0710558-018	**Basis:**	NA
Extraction Method:	EPA 3520C	**Level:**	Low
Analysis Method:	8082		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	0.20	0.023	1	11/15/07	12/04/07	KWG0712585	
Aroclor 1221	ND	Ui	0.39	0.078	1	11/15/07	12/04/07	KWG0712585	
Aroclor 1232	ND	Ui	0.20	0.20	1	11/15/07	12/04/07	KWG0712585	
Aroclor 1242	ND	Ui	0.20	0.0086	1	11/15/07	12/04/07	KWG0712585	
Aroclor 1248	ND	U	0.20	0.0092	1	11/15/07	12/04/07	KWG0712585	
Aroclor 1254	ND	U	0.20	0.010	1	11/15/07	12/04/07	KWG0712585	
Aroclor 1260	ND	U	0.20	0.0055	1	11/15/07	12/04/07	KWG0712585	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	59	27-121	12/04/07	Acceptable

Comments: 11/13/08

LDC #: 18144B3b
SDG #: K0710558
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/30/08
Page: 1 of 1
Reviewer: Q
2nd Reviewer: N

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/8/07
II.	GC/ECD Instrument Performance Check	N	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	ICV ≤ 15%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A/N	client specified PCM-08SC-071108
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	ND	RB = 1, 2

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	PCM-SCRB-071108 W	11	KWG0712585-3	21		31	
2	PCM-BRB-071108 V	12	KWG0712506-4	22		32	
3	PCM-08SC-071108 S	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NW Natural Gasco Site

Collection Date: November 7, 2007

LDC Report Date: January 31, 2008

Matrix: Sediment

Parameters: Polychlorinated Biphenyls

Validation Level: EPA Level III

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): K0710470

Sample Identification

PCM-02SC-071107
PCM-05SC-071107
PCM-04SC-071107
PCM-14DS-071107

Introduction

This data review covers 4 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8082 for Polychlorinated Biphenyls.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XIV.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/ECD Instrument Performance Check

Instrument performance was acceptable unless noted otherwise under initial calibration and continuing calibration sections.

III. Initial Calibration

Initial calibration of multicomponent compounds was performed for the primary (quantitation) column as required by the method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

IV. Continuing Calibration

Continuing calibration was performed at required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polychlorinated biphenyl contaminants were found in the method blanks.

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VIII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Pesticide Cleanup Checks

a. Florisil Cartridge Check

Florisil cleanup was not required and therefore not performed in this SDG.

b. GPC Calibration

GPC cleanup was not required and therefore not performed in this SDG.

XI. Target Compound Identification

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and Reported CRQLs

Raw data were not reviewed for this SDG.

XIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the level III data validation all results are considered valid and usable for all purposes.

XIV. Field Duplicates

No field duplicates were identified in this SDG.

XV. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Polychlorinated Biphenyls - Data Qualification Summary - SDG K0710470

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Polychlorinated Biphenyls - Laboratory Blank Data Qualification Summary - SDG K0710470

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Polychlorinated Biphenyls (PCBs)

Sample Name:	PCM-02SC-071107	**Units:**	ug/Kg
Lab Code:	K0710470-001	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8082		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1221	ND	U	20	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1232	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1242	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1248	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1254	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1260	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1262	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1268	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	78	33-141	12/13/07	Acceptable

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Polychlorinated Biphenyls (PCBs)

Sample Name:	PCM-05SC-071107	**Units:**	ug/Kg
Lab Code:	K0710470-003	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8082		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	9.9	9.9	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1221	ND	Ui	20	20	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1232	ND	Ui	9.9	9.9	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1242	ND	Ui	9.9	9.9	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1248	ND	Ui	9.9	2.5	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1254	ND	U	9.9	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1260	ND	U	9.9	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1262	ND	U	9.9	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1268	ND	U	9.9	1.7	1	11/15/07	12/13/07	KWG0712506	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	77	33-141	12/13/07	Acceptable

Comments: SC 013108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Polychlorinated Biphenyls (PCBs)

Sample Name:	PCM-04SC-071107	**Units:**	ug/Kg
Lab Code:	K0710470-004	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8082		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	10	9.9	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1221	ND	Ui	20	20	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1232	ND	Ui	10	10	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1242	ND	Ui	10	6.8	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1248	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1254	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1260	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1262	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1268	ND	U	10	1.7	1	11/15/07	12/13/07	KWG0712506	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	72	33-141	12/13/07	Acceptable

Comments: SL 1/31/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Polychlorinated Biphenyls (PCBs)

Sample Name:	PCM-14DS-071107	**Units:**	ug/Kg
Lab Code:	K0710470-006	**Basis:**	Dry
Extraction Method:	EPA 3540C	**Level:**	Low
Analysis Method:	8082		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Aroclor 1016	ND	Ui	9.9	4.0	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1221	ND	Ui	21	21	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1232	ND	Ui	9.9	9.9	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1242	ND	Ui	9.9	2.1	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1248	ND	Ui	9.9	3.4	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1254	ND	Ui	23	23	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1260	ND	Ui	9.9	5.0	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1262	ND	Ui	9.9	4.1	1	11/15/07	12/13/07	KWG0712506	
Aroclor 1268	ND	U	9.9	1.7	1	11/15/07	12/13/07	KWG0712506	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Decachlorobiphenyl	79	33-141	12/13/07	Acceptable

Comments:

LDC #: 18144C3b
SDG #: K0710470
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/30/08
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Polychlorinated Biphenyls (EPA SW 846 Method 8082)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/7/07
II.	GC/ECD Instrument Performance Check	A	
III.	Initial calibration	A	
IV.	Continuing calibration/ICV	A	ICV≤15%
V.	Blanks	A	
VI.	Surrogate spikes	A	
VII.	Matrix spike/Matrix spike duplicates	A	
VIII.	Laboratory control samples	A	LCS
IX.	Regional quality assurance and quality control	N	
Xa.	Florisil cartridge check	N	
Xb.	GPC Calibration	N	
XI.	Target compound identification	N	
XII.	Compound quantitation and reported CRQLs	N	
XIII.	Overall assessment of data	A	
XIV.	Field duplicates	N	
XV.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	PCM-02SC-071107	11	KWG0712506-4	21		31	
2	PCM-05SC-071107	12		22		32	
3	PCM-04SC-071107	13		23		33	
4	PCM-14DS-071107	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

NW Natural Gasco Site
Data Validation Reports
LDC# 18144

Metals

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NW Natural Gasco Site

Collection Date: November 5, 2007

LDC Report Date: January 23, 2008

Matrix: Sediment/Water

Parameters: Metals

Validation Level: EPA Level III

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): K0710375

Sample Identification

PCM-09SC-071105
PCM-09PW-071105
PCM-09PW-071105F
PCM-10SC-071105
PCM-02DS-071105
PCM-06DS-071105
PCM-09DS-071105
PCM-09SC-071105MS
PCM-09SC-071105DUP
PCM-09PW-071105MS
PCM-09PW-071105DUP
PCM-02DS-071105MS
PCM-02DS-071105DUP

Sample IDs ending in "F" were analyzed for dissolved metals

Introduction

This data review covers 9 sediment samples and 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B, 6020, and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Cadmium, Chromium, Copper, Iron, Lead, Mercury, Nickel, Selenium, Silver, and Zinc.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Iron Lead	0.5 mg/Kg 0.05 mg/Kg	All sediment samples in SDG K0710375
PB (prep blank)	Chromium Copper Zinc	0.06 mg/Kg 0.06 mg/Kg 0.5 mg/Kg	PCM-09SC-071105 PCM-10SC-071105
PB (prep blank)	Zinc	0.23 mg/Kg	PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105
ICB/CCB	Mercury	0.120 ug/L	PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105
ICB/CCB	Iron	7.0 ug/L	All water samples in SDG K0710375

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
PCM-06DS-071105	Mercury	0.054 mg/Kg	0.054U mg/Kg

Sample	Analyte	Reported Concentration	Modified Final Concentration
PCM-09DS-071105	Mercury	0.049 mg/Kg	0.049U mg/Kg
PCM-09PW-071105F	Iron	33.1 ug/L	33.1U ug/L

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

V. Matrix Spike Analysis

Matrix spike (MS) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
PCM-09SC-071105DUP (All sediment samples in SDG K0710375)	Lead	24 (<20)	-	J (all detects) UJ (all non-detects)	A
PCM-09SC-071105DUP (PCM-09SC-071105 PCM-10SC-071105)	Nickel Zinc	24 (≤20) 29 (<20)	- -	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Internal Standards (ICP-MS)

Raw data were not reviewed for this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to Duplicate RPD problems, data were qualified as estimated in five samples.

Due to calibration blank contamination problems, data were qualified as not detected in three samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Metals - Data Qualification Summary - SDG K0710375

SDG	Sample	Analyte	Flag	A or P	Reason
K0710375	PCM-09SC-071105 PCM-10SC-071105 PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105	Lead	J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (RPD)
K0710375	PCM-09SC-071105 PCM-10SC-071105	Nickel Zinc	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (RPD)

NW Natural Gasco Site
Metals - Laboratory Blank Data Qualification Summary - SDG K0710375

SDG	Sample	Analyte	Modified Final Concentration	A or P
K0710375	PCM-06DS-071105	Mercury	0.054U mg/Kg	A
K0710375	PCM-09DS-071105	Mercury	0.049U mg/Kg	A
K0710375	PCM-09PW-071105F	Iron	33.1U ug/L	A

METALS

-I-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710375
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/05/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/06/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-09PW-071105 Lab Code: K0710375-002

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	12/3/07	12/11/07	2890		

% Solids: 0.0

11/13/08

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710375
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/05/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/06/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-09PW-071105 Lab Code: K0710375-002 DISS

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	12/3/07	12/11/07	33.1		

U7

% Solids: 0.0

11/13/08

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710375
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/05/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/06/07
Matrix:	SEDIMENT	Units:	MG/KG
		Basis:	Dry

Sample Name: PCM-09SC-071105 Lab Code: K0710375-001

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q	
Arsenic	6020	0.6	0.1	5	12/20/07	12/21/07	0.8			
Chromium	6020	0.24	0.05	5	12/20/07	12/21/07	5.99			
Copper	6020	0.12	0.02	5	12/20/07	12/21/07	12.4			
Iron	6010B	4.6	0.5	2	11/28/07	11/30/07	14000			
Lead	6020	0.06	0.02	5	12/20/07	12/21/07	1.56		*	J9
Nickel	6020	0.24	0.05	5	12/20/07	12/21/07	8.70		*	
Zinc	6020	0.59	0.11	5	12/20/07	12/21/07	22.0		*	

% Solids: 84.9

Comments:

K/13/08

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710375
Project No :	000029-02 BG12 T17.4	Date Collected:	11/05/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/06/07
Matrix:	SEDIMENT	Units:	MG/KG
		Basis:	Dry

Sample Name: PCM-10SC-071105 Lab Code: K0710375-003

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.6	0.1	5	12/20/07	12/21/07	0.7		
Chromium	6020	0.23	0.05	5	12/20/07	12/21/07	8.11		
Copper	6020	0.12	0.02	5	12/20/07	12/21/07	15.7		
Iron	6010B	4.6	0.5	2	11/28/07	11/30/07	27900		
Lead	6020	0.06	0.02	5	12/20/07	12/21/07	2.28		*
Nickel	6020	0.23	0.05	5	12/20/07	12/21/07	11.3		*
Zinc	6020	0.58	0.10	5	12/20/07	12/21/07	24.4		*

J9

% Solids: 85.8

Comments:

4/13/08

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710375
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/05/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/06/07
Matrix:	SEDIMENT	Units:	MG/KG
		Basis:	Dry

Sample Name: PCM-02DS-071105 Lab Code: K0710375-004

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q	
Aluminum	6010B	10.7	5.4	2	11/28/07	11/30/07	29500			
Antimony	6020	0.05	0.02	5	11/28/07	12/18/07	0.12			
Arsenic	6020	0.5	0.1	5	12/20/07	12/21/07	4.1			
Cadmium	6020	0.021	0.009	5	12/20/07	12/21/07	0.193			
Chromium	6010B	2.1	0.7	2	11/28/07	11/30/07	37.3			
Copper	6010B	2.1	0.7	2	11/28/07	11/30/07	42.6			
Iron	6010B	4.3	0.4	2	11/28/07	11/30/07	41500			
Lead	6020	0.05	0.02	5	12/20/07	12/21/07	16.9		*	J9
Mercury	7471A	0.020	0.002	1	11/19/07	11/21/07	0.065			
Nickel	6010B	4.3	3.2	2	11/28/07	11/30/07	28.5			J9
Selenium	7742	0.11	0.02	2	11/30/07	12/15/07	0.13			
Silver	6020	0.021	0.009	5	11/28/07	12/15/07	0.190			
Zinc	6010B	2.1	0.4	2	11/28/07	11/30/07	120			J9

% Solids: 42.5

Comments:

12/13/08

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710375
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/05/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/06/07
Matrix:	SEDIMENT	Units:	MG/KG
		Basis:	Dry

Sample Name: PCM-06DS-071105 Lab Code: K0710375-005

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q	
Aluminum	6010B	10.2	5.1	2	11/28/07	11/30/07	25100			
Antimony	6020	0.05	0.02	5	11/28/07	12/18/07	0.12			
Arsenic	6020	0.5	0.1	5	12/20/07	12/21/07	3.2			
Cadmium	6020	0.021	0.008	5	12/20/07	12/21/07	0.194			
Chromium	6010B	2.0	0.7	2	11/28/07	11/30/07	33.5			
Copper	6010B	2.0	0.7	2	11/28/07	11/30/07	39.2			
Iron	6010B	4.1	0.4	2	11/28/07	11/30/07	36700			
Lead	6020	0.05	0.02	5	12/20/07	12/21/07	11.8		*	J9
Mercury	7471A	0.020	0.002	1	11/19/07	11/21/07	0.054			U7
Nickel	6010B	4.1	3.1	2	11/28/07	11/30/07	26.3			~~J9~~
Selenium	7742	0.11	0.02	2	11/30/07	12/15/07	0.15			
Silver	6020	0.020	0.008	5	11/28/07	12/15/07	0.196			
Zinc	6010B	2.0	0.4	2	11/28/07	11/30/07	105			~~J9~~

% Solids: 43.4

Comments:

7/13/08

METALS

-I-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710375
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/05/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/06/07
Matrix:	SEDIMENT	Units:	MG/KG
		Basis:	Dry

Sample Name: PCM-09DS-071105 Lab Code: K0710375-006

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q	
Aluminum	6010B	9.8	4.9	2	11/28/07	11/30/07	23900			
Antimony	6020	0.05	0.02	5	11/28/07	12/18/07	0.11			
Arsenic	6020	0.5	0.1	5	12/20/07	12/21/07	3.1			
Cadmium	6020	0.020	0.008	5	12/20/07	12/21/07	0.186			
Chromium	6010B	2.0	0.7	2	11/28/07	11/30/07	32.4			
Copper	6010B	2.0	0.7	2	11/28/07	11/30/07	37.2			
Iron	6010B	3.9	0.4	2	11/28/07	11/30/07	35200			
Lead	6020	0.05	0.02	5	12/20/07	12/21/07	12.6		*	J9
Mercury	7471A	0.019	0.002	1	11/19/07	11/21/07	0.049			U7
Nickel	6010B	3.9	2.9	2	11/28/07	11/30/07	22.6			~~J9~~
Selenium	7742	0.10	0.02	2	11/30/07	12/15/07	0.13			
Silver	6020	0.019	0.008	5	11/28/07	12/15/07	0.178			
Zinc	6010B	2.0	0.4	2	11/28/07	11/30/07	100			~~J9~~

% Solids: 45.5

Comments:

12/3/08

LDC #: 18144A4 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/21/07
SDG #: K0710375 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: ak
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6010B/6020)/7000

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/5/07
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	A	MS/Dup
VI.	Duplicate Sample Analysis	SW	
VII.	Laboratory Control Samples (LCS)	A	LCS
VIII.	Internal Standard (ICP-MS)	N	Not reviewed for level III
IX.	Furnace Atomic Absorption QC	A	
X.	ICP Serial Dilution	A SW	~~60~~ Ni Cd Xmn (7up)
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

Note: A = Acceptable ND = No compounds detected D = Duplicate
N = Not provided/applicable R = Rinsate TB = Trip blank
SW = See worksheet FB = Field blank EB = Equipment blank

Validated Samples:

Sediment + water

1	PCM-09SC-071105 S	11	PCM-09PW-071105DUP W	21		11	
2	PCM-09PW-071105 W	12	PCM-02DS-071105MS S	22		12	
3	PCM-09PW-071105F	13	PCM-02DS-071105DUP	23		13	
4	PCM-10SC-071105 S	14	MB	24		14	
5	PCM-02DS-071105	15		25		15	
6	PCM-06DS-071105	16		26		16	
7	PCM-09DS-071105	17		27		17	
8	PCM-09SC-071105MS	18		28		18	
9	PCM-09SC-071105DUP	19		29		19	
10	PCM-09PW-071105MS W	20		30		20	

Notes: Samples appended with "F" were analyzed for dissolved metals

LDC #: 18144A4
SDG #: K5710375

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: PVL
2nd reviewer:

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1, 4	Sed	Al, Sb, (As), Ba, Be, Cd, Ca, (Cr), Co, (Cu), (Fe), (Pb), Mg, Mn, Hg, (Ni), K, Se, Ag, Na, Tl, V, (Zn), Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
2-3	W	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, (Fe), Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
5-7	Sed	(Al), (Sb), (As), Ba, Be, (Cd), Ca, (Cr), Co, (Cu), (Fe), (Pb), Mg, Mn, (Hg), (Ni), K, (Se), (Ag), Na, Tl, V, (Zn), Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
QC sample ↓ 8-9	Sed	(Al), (Sb), (As), Ba, Be, (Cd), Ca, (Cr), Co, (Cu), (Fe), (Pb), Mg, Mn, Hg, (Ni), K, Se, (Ag), Na, Tl, V, (Zn), Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
10-11	W	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, (Fe), Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
12-13	Sed	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, (Se), Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
Analysis Method		
ICP		(Al), Sb, As, Ba, Be, Cd, Ca, (Cr), Co, (Cu), (Fe), Pb, Mg, Mn, Hg, (Ni), K, Se, Ag, Na, Tl, V, (Zn), Mo, B, Si, CN, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
ICP-MS		Al, (Sb), (As), Ba, Be, (Cd), Ca, (Cr), Co, (Cu), Fe, (Pb), Mg, Mn, Hg, (Ni), K, Se, (Ag), Na, Tl, V, (Zn), Mo, B, Si, CN, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, (Se), Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___

Comments: (Mercury by CVAA if performed)

LDC #: 18144A4
SDG #: K0710375

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

METHOD: Trace Metals (EPA SW 846 Method 6010/7000) Soil preparation factor applied: Hg: 100x
Sample Concentration units, unless otherwise noted: mg/kg Associated Samples:

Pb: All sediment
Hg, Zn #1: 5-7
Cr, Co, Cu, Zn #2: 1, 4

Reviewer: CM
2nd Reviewer:

Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Blank Action Limit	Sample Identification: 6	7									
Al															Al
Sb															Sb
As															As
Ba															Ba
Be															Be
Cd															Cd
Ca															Ca
Cr	0.06			0.30											Cr
Co															Co
Cu	0.06			0.30											Cu
Fe	0.5			2.5											Fe
Pb	0.05			0.25											Pb
Mg															Mg
Mn															Mn
Hg			0.120	0.06	0.054	0.049									Hg
Ni															Ni
K															K
Se															Se
Ag															Ag
Na															Na
Tl															Tl
V															V
Zn #1	0.5			2.5											Zn
#2 #2	0.25			1.15											B
Mo															Mo
Sr															Sr

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 18144A4

SDG #: JC531037S

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer: ak

2nd Reviewer: 1

METHOD: Trace Metals (EPA SW 846 Method 6010/7000) Soil preparation factor applied: _____

Sample Concentration units, unless otherwise noted: mg/L Associated Samples: All water

Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Blank Action Limit	Sample Identification: 3										
Al															Al
Sb															Sb
As															As
Ba															Ba
Be															Be
Cd															Cd
Ca															Ca
Cr															Cr
Co															Co
Cu															Cu
Fe			7.0	35.0	33.1										Fe
Pb															Pb
Mg															Mg
Mn															Mn
Hg															Hg
Ni															Ni
K															K
Se															Se
Ag															Ag
Na															Na
Tl															Tl
V															V
Zn															Zn
B															B
Mo															Mo
Sr															Sr

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 18144A4
SDG #: K0710375

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: A1
2nd Reviewer: L

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y (N) N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤ 35% for soil samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L.. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
	9	Sed	Pb	24 (≤20)		4 All Soil	J / UJ / A
			Ni	24 ↓		1, 4 ↓	↓
			Zn	29 ↓			

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NW Natural Gasco Site

Collection Date: November 8 through November 9, 2007

LDC Report Date: February 1, 2008

Matrix: Sediment/Water

Parameters: Metals

Validation Level: EPA Level III

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): K0710558

Sample Identification

PCM-13DSW-071109	PCM-08SC-071108MS
PCM-01DSW-071109	PCM-08SC-071108DUP
PCM-02DSW-071109	PCM-SCRB-071108MS
PCM-03DSW-071109	PCM-SCRB-071108DUP
PCM-04DSW-071109	
PCM-05DSW-071109	
PCM-06DSW-071109	
PCM-21DSW-071109	
PCM-08DSW-071109	
PCM-09DSW-071109	
PCM-10DSW-071109	
PCM-08SC-071108	
PCM-08PW-071108	
PCM-08PW-071108F	
PCM-SCRB-071108	
PCM-PWRB-071108	
PCM-DRB-071108	
PCM-BRB-071108	
PCM-19DSW-071109	
PCM-20DSW-071109	

Sample IDs ending in "F" were analyzed for dissolved metals

Introduction

This data review covers 3 sediment samples and 21 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B and 6020 for Metals. The metals analyzed were Arsenic, Chromium, Copper, Iron, Lead, Nickel, and Zinc.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Chromium Copper Iron Lead Zinc	0.06 mg/Kg 0.06 mg/Kg 0.5 mg/Kg 0.05 mg/Kg 0.23 mg/Kg	All sediment samples in SDG K0710558
ICB/CCB	Iron	7.4 ug/L	All samples in SDG K0710558
PB (prep blank)	Nickel	0.09 ug/L	PCM-SCRB-071108 PCM-DRB-071108 PCM-BRB-071108

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks.

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

V. Matrix Spike Analysis

Matrix spike (MS) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits with the following exceptions:

DUP ID (Associated Samples)	Analyte	RPD (Limits)	Difference (Limits)	Flag	A or P
PCM-08SC-071108DUP (All sediment samples in SDG K0710558)	Chromium	29 (≤20)	-	J (all detects) UJ (all non-detects)	A
	Copper	24 (≤20)	-	J (all detects) UJ (all non-detects)	

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Internal Standards (ICP-MS)

Raw data were not reviewed for this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to Duplicate RPD problems, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

Samples PCM-SCRB-071108, PCM-PWRB-071108, PCM-DRB-071108, and PCM-BRB-071108 were identified as rinsate blanks. No metal contaminants were found in these blanks with the following exceptions:

Rinsate Blank ID	Analyte	Concentration (ug/L)
PCM-SCRB-071108	Chromium Copper Iron Lead Zinc	0.12 0.04 4.8 0.032 1.2
PCM-PWRB-071108	Iron	8.0
PCM-DRB-071108	Chromium Lead Zinc	0.08 0.061 1.8
PCM-BRB-071108	Chromium Lead Zinc	0.14 0.020 0.7

NW Natural Gasco Site
Metals - Data Qualification Summary - SDG K0710558

SDG	Sample	Analyte	Flag	A or P	Reason
K0710558	PCM-08SC-071108	Chromium Copper	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	A	Duplicate sample analysis (RPD)

NW Natural Gasco Site
Metals - Laboratory Blank Data Qualification Summary - SDG K0710558

No Sample Data Qualified in this SDG

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BG12 T127.4	Date Collected:	11/09/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-13DSW-071109 Lab Code: K0710558-001

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	11/16/07	12/3/07	445		

12/21/08

% Solids: 0.0

Comments:

METALS

-I-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BG12 T127.4	Date Collected:	11/09/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-01DSW-071109 Lab Code: K0710558-002

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	11/16/07	12/3/07	450		

12/13/07

% Solids: 0.0

Comments:

METALS

-I-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BG12 T127.4	Date Collected:	11/09/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-02DSW-071109 Lab Code: K0710558-003

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	11/16/07	12/3/07	414		

12/13/08

% Solids: 0.0

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BG12 T127.4	Date Collected:	11/09/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-03DSW-071109 Lab Code: K0710558-004

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	11/16/07	12/3/07	434		

12/13/08

% Solids: 0.0

Comments:

METALS

-i-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BG12 T127.4	Date Collected:	11/09/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-04DSW-071109 Lab Code: K0710558-005

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	11/16/07	12/3/07	397		

12/3/08

% Solids: 0.0

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BG12 T127.4	Date Collected:	11/09/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-05DSW-071109 Lab Code: K0710558-006

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	11/16/07	12/3/07	368		

12/31/08

% Solids: 0.0

Comments:

METALS

-I-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BG12 T127.4	Date Collected:	11/09/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-06DSW-071109 Lab Code: K0710558-007

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	11/16/07	12/3/07	414		

12/13/08

% Solids: 0.0

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BG12 T127.4	Date Collected:	11/09/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-21DSW-071109 Lab Code: K0710558-008

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	11/16/07	12/3/07	396		

12/13/08

% Solids: 0.0

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BG12 T127.4	Date Collected:	11/09/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-08DSW-071109 Lab Code: K0710558-009

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	11/16/07	12/3/07	388		

12/13/08

% Solids: 0.0

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BG12 T127.4	Date Collected:	11/09/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-09DSW-071109 Lab Code: K0710558-010

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	11/16/07	12/3/07	403		

11/13/08

% Solids: 0.0

Comments:

METALS

-I-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BG12 T127.4	Date Collected:	11/09/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-10DSW-071109 Lab Code: K0710558-011

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	11/16/07	12/3/07	437		

% Solids: 0.0

Comments:

METALS

-I-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/08/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	SEDIMENT	Units:	MG/KG
		Basis:	Dry

Sample Name: PCM-08SC-071108 Lab Code: K0710558-012

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.6	0.1	5	12/20/07	12/21/07	0.6		
Chromium	6020	0.24	0.05	5	12/20/07	12/21/07	7.79		*
Copper	6020	0.12	0.02	5	12/20/07	12/21/07	17.9		*
Iron	6010B	4.8	0.5	2	11/30/07	12/3/07	23900		
Lead	6020	0.06	0.02	5	12/20/07	12/21/07	2.30		
Nickel	6020	0.24	0.05	5	12/20/07	12/21/07	10.8		
Zinc	6020	0.61	0.11	5	12/20/07	12/21/07	28.0		

J9 ↓

% Solids: 80.0

1/4/13/08

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BG12 T127.4	Date Collected:	11/08/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-08PW-071108 Lab Code: K0710558-013

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	11/16/07	12/3/07	2750		

12/13/08

% Solids: 0.0

Comments:

Columbia Analytical Services

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BGI2 T127.4	Date Collected:	11/08/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-08PW-071108 Lab Code: K0710558-013 DISS

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	11/16/07	12/3/07	41.0		

% Solids: 0.0

Comments:

SL 01/3/08

METALS

-t-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BG12 T127.4	Date Collected:	11/08/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-SCRB-071108

Lab Code: K0710558-015

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.50	0.08	1	11/16/07	12/12/07	0.08	U	
Chromium	6020	0.20	0.07	1	11/16/07	12/12/07	0.12	B	
Copper	6020	0.10	0.02	1	11/16/07	12/12/07	0.04	B	
Iron	6010B	20.0	3.0	1	11/16/07	12/3/07	4.8	B	
Lead	6020	0.020	0.009	1	11/16/07	12/12/07	0.032		
Nickel	6020	0.20	0.04	1	11/16/07	12/12/07	0.04	U	
Zinc	6020	0.5	0.1	1	11/16/07	12/12/07	1.2		

SL 1/31/08

% Solids: 0.0

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BG12 T127.4	Date Collected:	11/08/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-PWRB-071108 Lab Code: K0710558-016

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	11/16/07	12/3/07	8.0	B	

SL 01/31/08

% Solids: 0.0

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BG12 T127.4	Date Collected:	11/08/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-DRB-071108 Lab Code: K0710558-017

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.50	0.08	1	11/16/07	12/12/07	0.08	U	
Chromium	6020	0.20	0.07	1	11/16/07	12/12/07	0.08	B	
Copper	6020	0.10	0.02	1	11/16/07	12/12/07	0.02	U	
Iron	6010B	20.0	3.0	1	11/16/07	12/3/07	3.0	U	
Lead	6020	0.020	0.009	1	11/16/07	12/12/07	0.061		
Nickel	6020	0.20	0.04	1	11/16/07	12/12/07	0.04	U	
Zinc	6020	0.5	0.1	1	11/16/07	12/12/07	1.8		

12/13/08

% Solids: 0.0

Comments:

METALS

-i-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BG12 T127.4	Date Collected:	11/08/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-BRB-071108 Lab Code: K0710558-018

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.50	0.08	1	11/16/07	12/12/07	0.08	U	
Chromium	6020	0.20	0.07	1	11/16/07	12/12/07	0.14	B	
Copper	6020	0.10	0.02	1	11/16/07	12/12/07	0.02	U	
Iron	6010B	20.0	3.0	1	11/16/07	12/3/07	3.0	U	
Lead	6020	0.020	0.009	1	11/16/07	12/12/07	0.020		
Nickel	6020	0.20	0.04	1	11/16/07	12/12/07	0.04	U	
Zinc	6020	0.5	0.1	1	11/16/07	12/12/07	0.7		

1/3/08

% Solids: 0.0

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BG12 T127.4	Date Collected:	11/09/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-19DSW-071109 Lab Code: K0710558-019

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	11/16/07	12/3/07	423		

RL 01/08

% Solids: 0.0

Comments:

METALS

-I-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710558
Project No.:	000029-02 BG12 T127.4	Date Collected:	11/09/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/09/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-20DSW-071109 Lab Code: K0710558-020

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	11/16/07	12/3/07	372		

12/3/08

% Solids: 0.0

Comments:

LDC #: 18144B4 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/21/08
SDG #: K0710558 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: AA
2nd Reviewer:

METHOD: Metals (EPA SW 846 Method 6010B/6020)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/8 → 11/9/07
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	A	MS/Dup
VI.	Duplicate Sample Analysis	SW	
VII.	Laboratory Control Samples (LCS)	A	LCS
VIII.	Internal Standard (ICP-MS)	N	Not Reviewed for Level III
IX.	Furnace Atomic Absorption QC	N	Not utilized
X.	ICP Serial Dilution	A	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	SW	RB: 15, 16, 17, 18

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:

Sediment + water

1	PCM-13DSW-071109 W	11	PCM-10DSW-071109 W	21	PCM-08SC-071108MS S	11		
2	PCM-01DSW-071109	12	PCM-08SC-071108 S	22	PCM-08SC-071108DUP	12		
3	PCM-02DSW-071109	13	PCM-08PW-071108 W	23	PCM-SCRB-071108MS W	13		
4	PCM-03DSW-071109	14	PCM-08PW-071108F	24	PCM-SCRB-071108DUP	14		
5	PCM-04DSW-071109	15	PCM-SCRB-071108	25	MB	15		
6	PCM-05DSW-071109	16	PCM-PWRB-071108	26		16		
7	PCM-06DSW-071109 D	17	PCM-DRB-071108	27		17		
8	PCM-21DSW-071109	18	PCM-BRB-071108	28		18		
9	PCM-08DSW-071109	19	PCM-19DSW-071109	29		19		
10	PCM-09DSW-071109	20	PCM-20DSW-071109	30		20		

Notes: Samples appended with "F" were analyzed for dissolved metals

LDC #: 18144B4
SDG #: E0710558

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Page: 1 of 1
Reviewer: [illegible]
2nd reviewer: [illegible]

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1-11, 16,	W	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
13-14,		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
19-20		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
12	Sed	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
15, 17-18	W	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
21-22	Sed	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
23-24	W	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
ICP-MS		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN⁻,

QC sample

Comments: Mercury by CVAA if performed

ELEMENTS.4

LDC #: 18144B4
SDG #: 160310558
METHOD: Trace Metals (EPA SW 846 Method 6010/7000)
Sample Concentration units, unless otherwise noted: mg/kg

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Soil preparation factor applied: Fe: 200x
Associated Samples: All Sediment (>5x)

Reviewer: [illegible]
2nd Reviewer: [illegible]

Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Blank Action Limit	Sample Identification										
Al															Al
Sb															Sb
As															As
Ba															Ba
Be															Be
Cd															Cd
Ca															Ca
Cr	0.06			0.30											Cr
Co															Co
Cu	0.06			0.30											Cu
Fe	0.5		7.4	7.4											Fe
Pb	0.05			0.25											Pb
Mg															Mg
Mn															Mn
Hg															Hg
Ni															Ni
K															K
Se															Se
Ag															Ag
Na															Na
Tl															Tl
V															V
Zn	0.23			1.15											Zn
B															B
Mo															Mo
Sr															Sr

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

BLNKSMP.4S2

LDC #: 18144B4
SDG #: K071055B

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

Reviewer: CK
2nd Reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000) Soil preparation factor applied:
Sample Concentration units, unless otherwise noted: ug/L Associated Samples:
Ni: 15, 17, 18
Fe: All water (NDn >5x)

Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Blank Action Limit	Sample Identification										
Al															Al
Sb															Sb
As															As
Ba															Ba
Be															Be
Cd															Cd
Ca															Ca
Cr															Cr
Co															Co
Cu															Cu
Fe			7.4	37.0											Fe
Pb															Pb
Mg															Mg
Mn															Mn
Hg															Hg
Ni		0.09		0.45											Ni
K															K
Se															Se
Ag															Ag
Na															Na
Tl															Tl
V															V
Zn															Zn
B															B
Mo															Mo
Sr															Sr

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".

Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 18144B4
SDG #: K0710558

VALIDATION FINDINGS WORKSHEET
Duplicate Analysis

Reviewer: ak
2nd Reviewer: L

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a duplicate sample analyzed for each matrix in this SDG?

Y (N) N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤ 35% for soil samples? If no, see qualifications below. A control limit of ±R.L. (±2X R.L. for soil) was used for sample values that were <5X the R.L., including the case when only one of the duplicate sample values was <5X R.L. If field blanks were used for laboratory duplicates, note in the Overall Assessment.

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	Duplicate ID	Matrix	Analyte	RPD (Limits)	Difference (Limits)	Associated Samples	Qualifications
	22	Sed	Cr	29 (≤20)		All sediment	J / UJ / A
			Cu	24		L	

Comments:

LDC #: 18144B4
SDG #: K0310558

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: AL
2nd reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

(Y) N N/A Were field blanks identified in this SDG?
(Y) N N/A Were target analytes detected in the field blanks?

Sample: 15 Field Blank / Trip Blank / Rinsate / (Other FB) (circle one)

Analyte	Concentration Units (ug/L)
Cr	0.12
Cu	0.04
Fe	4.8
Pb	0.032
Zn	1.2

Sample: 16 Field Blank / Trip Blank / Rinsate / (Other FB) (circle one)

Analyte	Concentration Units (ug/L)
Fe	8.0

LDC #: 19144B4
SDG #: K0710558

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: CL
2nd reviewer:

METHOD: Trace Metals (EPA SW 846 Method 6010/7000)

(Y) N N/A Were field blanks identified in this SDG?
(Y) N N/A Were target analytes detected in the field blanks?

Sample: 17 Field Blank / Trip Blank / Rinsate / (Other RB) (circle one)

Analyte	Concentration Units (mg/L)
Cu	0.08
Pb	0.061
Zn	1.8

Sample: 18 Field Blank / Trip Blank / Rinsate / (Other RB) (circle one)

Analyte	Concentration Units (µg/L)
Cu	0.14
Pb	0.020
Zn	0.7

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NW Natural Gasco Site

Collection Date: November 7, 2007

LDC Report Date: January 23, 2008

Matrix: Sediment/Water

Parameters: Metals

Validation Level: EPA Level III

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): K0710470

Sample Identification

PCM-02SC-071107
PCM-02PW-071107
PCM-02PW-071107F
PCM-05SC-071107
PCM-04SC-071107
PCM-04PW-071107
PCM-04PW-071107F
PCM-14DS-071107
PCM-02SC-071107MS
PCM-02SC-071107DUP
PCM-14DS-071107MS
PCM-14DS-071107DUP

Sample IDs ending in "F" were analyzed for dissolved metals

Introduction

This data review covers 8 sediment samples and 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Methods 6010B, 6020, and 7000 for Metals. The metals analyzed were Aluminum, Antimony, Arsenic, Cadmium, Chromium, Copper, Iron, Lead, Mercury, Nickel, Selenium, Silver, and Zinc.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blanks are summarized in Section III.

Field duplicates are summarized in Section XIII.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

An initial calibration was performed.

The frequency and analysis criteria of the initial calibration verification (ICV) and continuing calibration verification (CCV) were met.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Maximum Concentration	Associated Samples
PB (prep blank)	Iron Lead	1.1 mg/Kg 0.05 mg/Kg	All sediment samples in SDG K0710470
PB (prep blank)	Chromium Copper Zinc	0.06 mg/Kg 0.06 mg/Kg 0.23 mg/Kg	PCM-02SC-071107 PCM-05SC-071107 PCM-04SC-071107
ICB/CCB	Mercury	0.120 ug/L	PCM-14DS-071107
ICB/CCB	Iron	7.0 ug/L	All samples in SDG K0710470

Data qualification by the initial, continuing and preparation blanks (ICB/CCB/PBs) was based on the maximum contaminant concentration in the ICB/CCB/PBs in the analysis of each analyte. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Analyte	Reported Concentration	Modified Final Concentration
PCM-14DS-071107	Mercury	0.054 mg/Kg	0.054U mg/Kg

IV. ICP Interference Check Sample (ICS) Analysis

The frequency of analysis was met.

The criteria for analysis were met.

V. Matrix Spike Analysis

Matrix spike (MS) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VI. Duplicate Sample Analysis

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VII. Laboratory Control Samples (LCS)

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VIII. Internal Standards (ICP-MS)

Raw data were not reviewed for this SDG.

IX. Furnace Atomic Absorption QC

Graphite furnace atomic absorption was not utilized in this SDG.

X. ICP Serial Dilution

ICP serial dilution analysis was performed by the laboratory. The analysis criteria were met.

XI. Sample Result Verification

Raw data were not reviewed for this SDG.

XII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to calibration blank contamination problems, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

XIII. Field Duplicates

No field duplicates were identified in this SDG.

XIV. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Metals - Data Qualification Summary - SDG K0710470

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Metals - Laboratory Blank Data Qualification Summary - SDG K0710470

SDG	Sample	Analyte	Modified Final Concentration	A or P
K0710470	PCM-14DS-071107	Mercury	0.054U mg/Kg	A

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710470
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/07/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/08/07
Matrix:	SEDIMENT	Units:	MG/KG
		Basis:	Dry

Sample Name: PCM-02SC-071107 Lab Code: K0710470-001

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.6	0.1	5	12/20/07	12/21/07	0.8		
Chromium	6020	0.24	0.05	5	12/20/07	12/21/07	5.46		
Copper	6020	0.12	0.02	5	12/20/07	12/21/07	7.35		
Iron	6010B	4.8	0.7	2	11/30/07	12/11/07	11400		
Lead	6020	0.06	0.02	5	12/20/07	12/21/07	1.34		
Nickel	6020	0.24	0.05	5	12/20/07	12/21/07	6.14		
Zinc	6020	0.60	0.11	5	12/20/07	12/21/07	19.3		

% Solids: 82.9

12/31/08

Comments:

METALS

-I-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710470
Project No.:	000029-02 B612 T17.4	Date Collected:	11/07/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/08/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-02PW-071107 Lab Code: K0710470-002

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	12/3/07	12/11/07	5970		

12/13/08

% Solids: 0.0

Comments:

METALS

-I-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710470
Project No.:	000029-02 B612 T17.4	Date Collected:	11/07/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/08/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-02PW-071107 Lab Code: K0710470-002 DISS

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	12/3/07	12/11/07	1340		

12/13/08

% Solids: 0.0

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710470
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/07/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/08/07
Matrix:	SEDIMENT	Units:	MG/KG
		Basis:	Dry

Sample Name: PCM-05SC-071107 Lab Code: K0710470-003

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.6	0.1	5	12/20/07	12/21/07	0.8		
Chromium	6020	0.24	0.05	5	12/20/07	12/21/07	19.4		
Copper	6020	0.12	0.02	5	12/20/07	12/21/07	10.4		
Iron	6010B	4.9	0.7	2	11/30/07	12/11/07	17000		
Lead	6020	0.06	0.02	5	12/20/07	12/21/07	1.97		
Nickel	6020	0.24	0.05	5	12/20/07	12/21/07	7.89		
Zinc	6020	0.61	0.11	5	12/20/07	12/21/07	22.2		

1/13/08

% Solids: 82.3

Comments:

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710470
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/07/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/08/07
Matrix:	SEDIMENT	Units:	MG/KG
		Basis:	Dry

Sample Name: PCM-04SC-071107 Lab Code: K0710470-004

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Arsenic	6020	0.6	0.1	5	12/20/07	12/21/07	0.9		
Chromium	6020	0.25	0.05	5	12/20/07	12/21/07	10.2		
Copper	6020	0.12	0.02	5	12/20/07	12/21/07	14.4		
Iron	6010B	4.8	0.7	2	11/30/07	12/11/07	21100		
Lead	6020	0.06	0.02	5	12/20/07	12/21/07	3.85		
Nickel	6020	0.25	0.05	5	12/20/07	12/21/07	9.90		
Zinc	6020	0.62	0.11	5	12/20/07	12/21/07	26.6		

12/13/08

% Solids: 80.2

Comments:

Columbia Analytical Services

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710470
Project No.:	000029-02 B612 T17.4	Date Collected:	11/07/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/08/07
Matrix:	WATER	Units:	µG/L
		Basis:	NA

Sample Name: PCM-04PW-071107 Lab Code: K0710470-005

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	12/3/07	12/11/07	13100		

% Solids: 0.0

Comments:

Form I - IN

METALS

-1-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710470
Project No.:	000029-02 B612 T17.4	Date Collected:	11/07/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/08/07
Matrix:	WATER	Units:	pG/L
		Basis:	NA

Sample Name: PCM-04PW-071107 Lab Code: K0710470-005 DISS

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q
Iron	6010B	20.0	3.0	1	12/3/07	12/11/07	1240		

SL 1/3/08

% Solids: 0.0

Comments:

METALS

-I-

INORGANIC ANALYSIS DATA SHEET

Client:	Anchor Environmental	Service Request:	K0710470
Project No.:	000029-02 BG12 T17.4	Date Collected:	11/07/07
Project Name:	Gasco Long-Term Monitoring Year 1	Date Received:	11/08/07
Matrix:	SEDIMENT	Units:	MG/KG
		Basis:	Dry

Sample Name: PCM-14DS-071107 Lab Code: K0710470-006

Analyte	Analysis Method	MRL	MDL	Dil.	Date Extracted	Date Analyzed	Result	C	Q	
Aluminum	6010B	9.6	6.7	2	11/30/07	12/11/07	13600			
Antimony	6020	0.05	0.02	5	11/30/07	12/18/07	0.08			
Arsenic	6020	0.5	0.1	5	12/20/07	12/21/07	2.4			
Cadmium	6020	0.020	0.008	5	12/20/07	12/21/07	0.104			
Chromium	6010B	1.9	0.3	2	11/30/07	12/11/07	19.0			
Copper	6010B	1.9	0.7	2	11/30/07	12/11/07	20.6			
Iron	6010B	3.8	0.6	2	11/30/07	12/11/07	24600			
Lead	6020	0.05	0.02	5	12/20/07	12/21/07	7.48			
Mercury	7471A	0.019	0.002	1	11/19/07	11/21/07	0.054			U7
Nickel	6010B	3.8	0.4	2	11/30/07	12/11/07	15.1			
Selenium	7742	0.10	0.02	2	11/30/07	12/15/07	0.10			
Silver	6020	0.019	0.008	5	11/30/07	12/15/07	0.122			
Zinc	6010B	1.9	0.8	2	11/30/07	12/11/07	61.9			

12/13/07

% Solids: 57.0

Comments:

LDC #: 18144C4 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/21/08
SDG #: K0710470 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: ok
2nd Reviewer: ✓

METHOD: Metals (EPA SW 846 Method 6010B/6020) 7000

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/7/07
II.	Calibration	A	
III.	Blanks	SW	
IV.	ICP Interference Check Sample (ICS) Analysis	A	
V.	Matrix Spike Analysis	A	MS/Dup
VI.	Duplicate Sample Analysis	A	
VII.	Laboratory Control Samples (LCS)	A	LCS
VIII.	Internal Standard (ICP-MS)	N	Not Reviewed for Level III
IX.	Furnace Atomic Absorption QC	A	
X.	ICP Serial Dilution	A	
XI.	Sample Result Verification	N	
XII.	Overall Assessment of Data	A	
XIII.	Field Duplicates	N	
XIV.	Field Blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:

Sediment + water

1	PCM-02SC-071107 S	11	~~PCM-02PW-071107MS~~ W	21		11		
2	PCM-02PW-071107 W	12	~~PCM-02PW-071107DUP~~	22		12		
3	PCM-02PW-071107F	13	PCM-14DS-071107MS S	23		13		
4	PCM-05SC-071107 S	14	PCM-14DS-071107DUP	24		14		
5	PCM-04SC-071107	15	MB	25		15		
6	PCM-04PW-071107 W	16		26		16		
7	PCM-04PW-071107F	17		27		17		
8	PCM-14DS-071107 S	18		28		18		
9	PCM-02SC-071107MS	19		29		19		
10	PCM-02SC-071107DUP	20		30		20		

Notes: Samples appended with "F" were analyzed for dissolved metals

LDC #: 18144 c4
SDG #: 1607104320

VALIDATION FINDINGS WORKSHEET
Sample Specific Element Reference

Reviewer: AT
2nd reviewer: L

All circled elements are applicable to each sample.

Sample ID	Matrix	Target Analyte List (TAL)
1, 4-5	Sed	Al, Sb, (As) Ba, Be, Cd, Ca, (Cr) Co, (Cu) (Fe) (Pb) Mg, Mn, Hg, (Ni) K, Se, Ag, Na, Tl, V, (Zn) Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
2-3, 6-7	W	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, (Fe) Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
8	Sed	(Al) (Sb) (As) Ba, Be, (Cd) Ca, (Cr) Co, (Cu) (Fe) (Pb) Mg, Mn, (Hg) (Ni) K, (Se) (Ag) Na, Tl, V, (Zn) Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
9-10	Sed	(Al) (Sb) (As) Ba, Be, (Cd) Ca, (Cr) Co, (Cu) (Fe) (Pb) Mg, Mn, Hg, (Ni) K, (Se) (Ag) Na, Tl, V, (Zn) Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
13-14	Sed	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, (Se) Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
Analysis Method		
ICP		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, (Fe) Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
ICP Trace		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, Se, Ag, Na, Tl, V, Zn, Mo, B, Si, CN, ___ ___
ICP-MS		Al, Sb, (As) Ba, Be, Cd, Ca, (Cr) Co, (Cu) Fe, (Pb) Mg, Mn, Hg, (Ni) K, Se, Ag, Na, Tl, V, (Zn) Mo, B, Si, CN, ___ ___
GFAA		Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Hg, Ni, K, (Se) Ag, Na, Tl, V, Zn, Mo, B, Si, CN,

QC sample

Comments: (Mercury by CVAA if performed)

LDC #: 18144C4
SDG #: K0710470

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

METHOD: Trace Metals (EPA SW 846 Method 6010/7000) Soil preparation factor applied: Hg: 100x, Fe: 200x
Sample Concentration units, unless otherwise noted: mg/kg Associated Samples:

Fe, Pb: All sediment
Cr, Cu, Zn: 1, 4-5
Hg Zn: 8

Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Blank Action Limit	Sample Identification: 8										
Al															Al
Sb															Sb
As															As
Ba															Ba
Be															Be
Cd															Cd
Ca															Ca
Cr	0.06			0.30											Cr
Co															Co
Cu	0.06			0.30											Cu
Fe	1.1		7.0	7.0											Fe
Pb	0.05			0.25											Pb
Mg															Mg
Mn															Mn
Hg			0.120	0.06	0.054										Hg
Ni															Ni
K															K
Se															Se
Ag															Ag
Na															Na
Tl															Tl
V															V
Zn	0.23			1.15											Zn
B															B
Mo															Mo
Sr															Sr

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note: a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

LDC #: 18144 C4
SDG #: 160710470

VALIDATION FINDINGS WORKSHEET
PB/ICB/CCB QUALIFIED SAMPLES

METHOD: Trace Metals (EPA SW 846 Method 6010/7000) Soil preparation factor applied: _____
Sample Concentration units, unless otherwise noted: mg/L Associated Samples: All water (>5x)

Reviewer: AL
2nd Reviewer: [illegible]

Analyte	Maximum PB* (mg/Kg)	Maximum PB* (ug/L)	Maximum ICB/CCB* (ug/L)	Blank Action Limit	Sample Identification										
Al															Al
Sb															Sb
As															As
Ba															Ba
Be															Be
Cd															Cd
Ca															Ca
Cr															Cr
Co															Co
Cu															Cu
Fe			7.0	35.0											Fe
Pb															Pb
Mg															Mg
Mn															Mn
Hg															Hg
Ni															Ni
K															K
Se															Se
Ag															Ag
Na															Na
Tl															Tl
V															V
Zn															Zn
B															B
Mo															Mo
Sr															Sr

Samples with analyte concentrations within five times the associated ICB, CCB or PB concentration are listed above with the identifications from the Validation Completeness Worksheet. These sample results were qualified as not detected, "U".
Note : a - The listed analyte concentration is the highest ICB, CCB, or PB detected in the analysis of each element.

NW Natural Gasco Site
Data Validation Reports
LDC# 18144

Herbicides

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 5, 2007
LDC Report Date:	January 31, 2008
Matrix:	Sediment
Parameters:	Herbicides
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710375

Sample Identification

PCM-02DS-071105
PCM-06DS-071105
PCM-09DS-071105

Introduction

This data review covers 3 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8151A for Herbicides.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for selected compounds.

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination (r^2) was greater than or equal to 0.990 .

b. Calibration Verification

Calibration verification was performed at the required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
11/7/07	1107R021-ICV	RTX-35	2,4-D	49	All samples in SDG K0710375	J (all detects) UJ (all non-detects)	A

III. Blanks

Method blanks were reviewed for each matrix as applicable. No herbicide contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/(Matrix Spike) Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to calibration %D problems, data were qualified as estimated in three samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Herbicides - Data Qualification Summary - SDG K0710375

SDG	Sample	Compound	Flag	A or P	Reason
K0710375	PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105	2,4-D	J (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)

NW Natural Gasco Site
Herbicides - Laboratory Blank Data Qualification Summary - SDG K0710375

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Chlorinated Herbicides

Sample Name:	PCM-02DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-004	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dalapon	ND	U	120	73	1	11/19/07	12/13/07	KWG0712682	
Dicamba	ND	U	120	8.2	1	11/19/07	12/13/07	KWG0712682	
MCPP	ND	U	24000	590	1	11/19/07	12/13/07	KWG0712682	
MCPA	ND	Ui	24000	2000	1	11/19/07	12/13/07	KWG0712682	
Dichlorprop	ND	U	120	7.1	1	11/19/07	12/13/07	KWG0712682	
2,4-D	ND	Ui UJS	120	23	1	11/19/07	12/13/07	KWG0712682	
2,4,5-TP (Silvex)	ND	U	120	8.5	1	11/19/07	12/13/07	KWG0712682	
2,4,5-T	ND	U	120	9.4	1	11/19/07	12/13/07	KWG0712682	
2,4-DB	ND	Ui	120	120	1	11/19/07	12/13/07	KWG0712682	
Dinoseb	ND	Ui	120	37	1	11/19/07	12/13/07	KWG0712682	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	84	18-153	12/13/07	Acceptable

Comments: 11/3/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Chlorinated Herbicides

Sample Name:	PCM-06DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-005	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dalapon	ND	U	120	71	1	11/19/07	12/13/07	KWG0712682	
Dicamba	ND	U	120	8.0	1	11/19/07	12/13/07	KWG0712682	
MCPP	ND	U	23000	570	1	11/19/07	12/13/07	KWG0712682	
MCPA	ND	U	23000	1200	1	11/19/07	12/13/07	KWG0712682	
Dichlorprop	ND	U	120	6.9	1	11/19/07	12/13/07	KWG0712682	
2,4-D	ND	Ui UJS	120	24	1	11/19/07	12/13/07	KWG0712682	
2,4,5-TP (Silvex)	ND	U	120	8.2	1	11/19/07	12/13/07	KWG0712682	
2,4,5-T	ND	U	120	9.1	1	11/19/07	12/13/07	KWG0712682	
2,4-DB	ND	Ui	150	150	1	11/19/07	12/13/07	KWG0712682	
Dinoseb	ND	U	120	15	1	11/19/07	12/13/07	KWG0712682	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	64	18-153	12/13/07	Acceptable

Comments: KDB 1/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Chlorinated Herbicides

Sample Name:	PCM-09DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-006	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151A		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dalapon	ND	U	110	68	1	11/19/07	12/13/07	KWG0712682	
Dicamba	ND	U	110	7.6	1	11/19/07	12/13/07	KWG0712682	
MCPP	ND	Ui	22000	12000	1	11/19/07	12/13/07	KWG0712682	
MCPA	ND	Ui	22000	2300	1	11/19/07	12/13/07	KWG0712682	
Dichlorprop	ND	U	110	6.6	1	11/19/07	12/13/07	KWG0712682	
2,4-D	ND	Ui	110	12	1	11/19/07	12/13/07	KWG0712682	
2,4,5-TP (Silvex)	ND	U	110	7.9	1	11/19/07	12/13/07	KWG0712682	
2,4,5-T	ND	U	110	8.7	1	11/19/07	12/13/07	KWG0712682	
2,4-DB	ND	Ui	110	110	1	11/19/07	12/13/07	KWG0712682	
Dinoseb	ND	U	110	14	1	11/19/07	12/13/07	KWG0712682	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	73	18-153	12/13/07	Acceptable

Comments: 12/31/08

LDC #: 18144A5
SDG #: K0710375
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/30/08
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Herbicides (EPA SW 846 Method 8151A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/5/07
IIa.	Initial calibration	A	RSD. r²
IIb.	Calibration verification/ICV	SW	1570
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	client specified
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	PCM-02DS-071105 Sed	11	KWG0712682-4	21		31	
2	PCM-06DS-071105	12		22		32	
3	PCM-09DS-071105	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

VALIDATION FINDINGS WORKSHEET

METHOD: ____GC ____HPLC

8310	8330	8151	8141	8141(Con't)	8021B
A. Acenaphthene	A. HMX	A. 2,4-D	A. Dichlorvos	V. Fensulfothion	V. Benzene
B. Acenaphthylene	B. RDX	B. 2,4-DB	B. Mevinphos	W. Bolstar	CC. Toluene
C. Anthracene	C. 1,3,5-Trinitrobenzene	C. 2,4,5-T	C. Demeton-O	X. EPN	EE. Ethyl Benzene
D. Benzo(a)anthracene	D. 1,3-Dinitrobenzene	D. 2,4,5-TP	D. Demeton-S	Y. Azinphos-methyl	SSS. O-Xylene
E. Benzo(a)pyrene	E. Tetryl	E. Dinoseb	E. Ethoprop	Z. Coumaphos	RRR. MP-Xylene
F. Benzo(b)fluoranthene	F. Nitrobenzene	F. Dichlorprop	F. Naled	AA. Parathion	GG. Total Xylene
G. Benzo(g,h,i)perylene	G. 2.4.6-Trinitrotoluene	G. Dicamba	G. Sulfotep	BB. Trichloronate	
H. Benzo(k)fluoranthene	H. 4-Amino-2,6-dinitrotoluene	H. Dalapon	H. Phorate	CC. Trichlorinate	
I. Chrysene	I. 2-Amino-4,6-dinitrotoluene	I. MCPP	I. Dimethoate	DD. Trifluralin	
J. Dibenz(a,h)anthracene	J. 2,4-Dinitrotolune	J. MCPA	J. Diazinon	EE. Def	
K. Fluoranthene	K. 2,6-Dinitrotoluene	K. Pentachlorophenol	K. Disulfoton	FF. Prowl	
L. Fluorene	L. 2-Nitrotoluene	L.. 2,4,5-TP (silvex)	L. Parathion-methyl	GG. Ethion	
M. Indeno(1,2,3-cd)pyrene	M. 3-Nitrotoluene	M. Silvex	M. Ronnel	HH. Tetrachlorvinphos	
N. Naphthalene	N. 4-Nitrotoluene		N. Malathion	II. Sulprofos	
O. Phenanthrene	O.		O. Chlorpyrifos		
P. Pyrene	P.		P. Fenthion		
Q.	Q		Q. Parathion-ethyl		
R.			R. Trichloronate		
S.			S. Merphos		
			T. Stirofos		
			U. Tokuthion		

Notes: _____

LDC #: 81444A5
SDG #: K0710375

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: 9

METHOD: ✓ GC __ HPLC

2nd Reviewer: K

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
What type of continuing calibration calculation was performed? __%D or __RPD
Y N N/A Were continuing calibration standards analyzed at the required frequencies?
Y N N/A Did the continuing calibration standards meet the %D / RPD validation criteria of ≤15.0%?
Level IV Only
Y N N/A Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	~~Detector/~~ Column	Compound	%D / RPD (Limit ≤ 15.0)	RT (limit)	Associated Samples	Qualifications
	11/7/07	1107R021 (ICV)	RTX-35	A	49	( )	All + Blk	✓/UJ/A
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 7, 2007
LDC Report Date:	January 31, 2008
Matrix:	Sediment
Parameters:	Herbicides
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710470

Sample Identification

PCM-14DS-071107

Introduction

This data review covers one sediment sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8151A for Herbicides.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for selected compounds.

A curve fit, based on the initial calibration, was established for quantitation for selected compounds. The coefficient of determination (r^2) was greater than or equal to 0.990 .

b. Calibration Verification

Calibration verification was performed at the required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds with the following exceptions:

Date	Standard	Column	Compound	%D	Associated Samples	Flag	A or P
11/7/07	1107R021-ICV	RTX-35	2,4-D	49	All samples in SDG K0710470	J (all detects) UJ (all non-detects)	A

III. Blanks

Method blanks were reviewed for each matrix as applicable. No herbicide contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/(Matrix Spike) Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to calibration %D problems, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Herbicides - Data Qualification Summary - SDG K0710470

SDG	Sample	Compound	Flag	A or P	Reason
K0710470	PCM-14DS-071107	2,4-D	J (all detects) UJ (all non-detects)	A	Continuing calibration (ICV %D)

NW Natural Gasco Site
Herbicides - Laboratory Blank Data Qualification Summary - SDG K0710470

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Chlorinated Herbicides

Sample Name:	PCM-14DS-071107	**Units:**	ug/Kg
Lab Code:	K0710470-006	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151A		

Analyte Name	Result	Q		MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Dalapon	ND	U		88	55	1	11/19/07	12/13/07	KWG0712682	
Dicamba	ND	U		88	6.2	1	11/19/07	12/13/07	KWG0712682	
MCPP	ND	U		18000	440	1	11/19/07	12/13/07	KWG0712682	
MCPA	ND	Ui		18000	1400	1	11/19/07	12/13/07	KWG0712682	
Dichlorprop	ND	U		88	5.3	1	11/19/07	12/13/07	KWG0712682	
2,4-D	22	J	J5	88	6.5	1	11/19/07	12/13/07	KWG0712682	
2,4,5-TP (Silvex)	ND	U		88	6.3	1	11/19/07	12/13/07	KWG0712682	
2,4,5-T	ND	U		88	7.0	1	11/19/07	12/13/07	KWG0712682	
2,4-DB	ND	U		88	13	1	11/19/07	12/13/07	KWG0712682	
Dinoseb	ND	U		88	11	1	11/19/07	12/13/07	KWG0712682	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
2,4-Dichlorophenylacetic Acid	68	18-153	12/13/07	Acceptable

Comments: 12/13/08

LDC #: 18144C5

SDG #: K0710470

Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 1/30/08

Page: 1 of 1

Reviewer: 9

2nd Reviewer: MC

METHOD: GC Herbicides (EPA SW 846 Method 8151A)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/7/07
IIa.	Initial calibration	A	RSD. r²
IIb.	Calibration verification/ICV	SW	~~RF~~ 1570
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	client specified
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	PCM-14DS-071107 sed	11	KWG0712682-4	21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 18444C5
SDG #: K071047O

VALIDATION FINDINGS WORKSHEET
Continuing Calibration

Page: 1 of 1
Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

2nd Reviewer: [illegible]

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
What type of continuing calibration calculation was performed? ___%D or ___RPD

(Y) N N/A Were continuing calibration standards analyzed at the required frequencies?
Y (N) N/A Did the continuing calibration standards meet the %D / RPD validation criteria of ≤15.0%?
Level IV Only
Y N (N/A) Were the retention times for all calibrated compounds within their respective acceptance windows?

#	Date	Standard ID	Detector/ Column	Compound	%D / RPD (Limit ≤ 15.0)	RT (limit)	Associated Samples	Qualifications
	11/7/07	1107R021 (ICV)	DBX-35	2,4-D	4.9	( )	All + Blk	Y/UY/UB
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		
						( )		

NW Natural Gasco Site
Data Validation Reports
LDC# 18144

Wet Chemistry

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NW Natural Gasco Site

Collection Date: November 5, 2007

LDC Report Date: January 23, 2008

Matrix: Sediment/Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): K0710375

Sample Identification

PCM-09SC-071105
PCM-09PW-071105
PCM-10SC-071105
PCM-02DS-071105
PCM-06DS-071105
PCM-09DS-071105
PCM-09PW-071105MS
PCM-09PW-071105DUP
PCM-02DS-071105MS
PCM-02DS-071105DUP
PCM-06DS-071105MS
PCM-06DS-071105MSD
PCM-06DS-071105DUP
PCM-09DS-071105DUP

Introduction

This data review covers 11 sediment samples and 3 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.3 for Total Solids, EPA Method 350.1 for Ammonia as Nitrogen, EPA SW 846 Method 7196A for Hexavalent Chromium, EPA SW 846 Method 9012A and Standard Method 4500-CN-E for Total Cyanide, EPA SW 846 Method 9030M and Standard Method 4500-S2-D for Sulfide, Standard Method 4500-CN-E for Dissolved Cyanide, Standard Method 4500-CN-E for Amenable to Chlorination Cyanide, Standard Method 5310C for Dissolved Organic Carbon, Standard Method 5310C and PSEP Method for Total Organic Carbon, PSEP Method for Particle Size, and ASTM Method D4282-02 for Free Cyanide.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105 PCM-06DS-071105MS PCM-06DS-071105MSD PCM-06DS-071105DUP	Hexavalent chromium	15 days	7 days	J (all detects) R (all non-detects)	P
PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105	Ammonia as N	14 days	7 days	J (all detects) UJ (all non-detects)	P
PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105 PCM-02DS-071105MS PCM-02DS-071105DUP	Sulfide	11 days	7 days	J (all detects) UJ (all non-detects)	P
PCM-09SC-071105 PCM-10SC-071105 PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105	Total organic carbon	36 days	14 days	J (all detects) R (all non-detects)	P

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration of each method were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks with the following exceptions:

Method Blank ID	Analyte	Concentration	Associated Samples
ICB/CCB	Dissolved organic carbon	0.04 ug/L	PCM-09PW-071105

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
PCM-06DS-071105MS/MSD (PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105)	Hexavalent chromium	0 (65-135)	0 (65-135)	-	J (all detects) R (all non-detects)	A

V. Duplicates

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VII. Sample Result Verification

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

Due to severe problems with the analysis holding time and MS/MSD %Rs, Hexavalent chromium data were rejected in one sample.

Due to analysis holding time and MS/MSD %R problems, Ammonia as Nitrogen, Sulfide and Total organic carbon data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Wet Chemistry - Data Qualification Summary - SDG K0710375

SDG	Sample	Analyte	Flag	A or P	Reason
K0710375	PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105	Hexavalent chromium	J (all detects) R (all non-detects)	P	Technical holding times
K0710375	PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105	Ammonia as N Sulfide	J (all detects) UJ (all non-detects) J (all detects) UJ (all non-detects)	P	Technical holding times
K0710375	PCM-09SC-071105 PCM-10SC-071105 PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105	Total organic carbon	J (all detects) R (all non-detects)	P	Technical holding times
K0710375	PCM-02DS-071105 PCM-06DS-071105 PCM-09DS-071105	Hexavalent chromium	J (all detects) R (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)

NW Natural Gasco Site
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG K0710375

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710375
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/05/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/06/07
Sample Matrix :	SEDIMENT		

Ammonia as Nitrogen

Prep Method :	EPA Plumb 5-1981 KCl	Units :	mg/Kg
Analysis Method :	350.1M	Basis :	Dry
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-02DS-071105	K0710375-004	3.0	0.6	5	11/7/2007	11/19/07	75.7	J1
PCM-06DS-071105	K0710375-005	6.0	1.2	10	11/7/2007	11/19/07	116	↓
PCM-09DS-071105	K0710375-006	3.0	0.6	5	11/7/2007	11/19/07	62.8	↓
Method Blank	K0710375-MB	0.6	0.12	1	11/7/2007	11/19/07	ND	

M Modified for analysis of soil.

11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710375
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/05/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/06/07
Sample Matrix :	SEDIMENT		

Cyanide, Total

Prep Method :	Method	Units :	mg/Kg
Analysis Method :	9012A	Basis :	Dry
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-09SC-071105	K0710375-001	0.12	0.04	1	11/15/2007	11/15/07	0.10	J
PCM-10SC-071105	K0710375-003	0.12	0.04	1	11/15/2007	11/15/07	0.09	J
Method Blank	K0710375-MB	0.12	0.04	1	11/15/2007	11/15/07	ND	

11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710375
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/05/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/06/07
Sample Matrix :	PORE WATER		

Cyanide, Total

Prep Method :	Method	Units :	mg/L
Analysis Method :	SM 4500-CN- E	Basis :	NA
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-09PW-071105	K0710375-002	0.01	0.003	1	11/9/2007	11/13/07	0.04	
Method Blank	K0710375-MB	0.01	0.003	1	11/9/2007	11/13/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710375
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/05/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/06/07
Sample Matrix :	PORE WATER		

Cyanide, Dissolved

Prep Method :	SM 4500-CN-G	Units :	mg/L
Analysis Method :	SM 4500-CN- E	Basis :	NA
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-09PW-071105	K0710375-002	0.01	0.003	1	11/15/2007	11/15/07	0.03	
Method Blank	K0710375-MB	0.01	0.003	1	11/15/2007	11/15/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710375
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/05/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/06/07
Sample Matrix :	PORE WATER		

Cyanide, Free

Prep Method :	Method	Units :	ug/L
Analysis Method :	ASTM D4282-02	Basis :	NA
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date/Time Analyzed	Result	Result Notes
PCM-09PW-071105	K0710375-002	10	5	1	11/7/2007	11/07/07 11:35	7	J
Method Blank	K0710375-MB	10	5	1	11/7/2007	11/07/07 11:35	ND	

11/31/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710375
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/05/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/06/07
Sample Matrix :	PORE WATER		

Cyanide, Amenable to Chlorination

Prep Method :	SM 4500-CN-G	Units :	mg/L
Analysis Method :	SM 4500-CN- E	Basis :	NA
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-09PW-071105	K0710375-002	0.01	0.002	1	11/14/2007	11/15/07	ND	
Method Blank	K0710375-MB	0.01	0.002	1	11/14/2007	11/15/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

11/30/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710375
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/05/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/06/07
Sample Matrix :	SEDIMENT		

Chromium, Hexavalent

Prep Method :	EPA 3060A	Units :	mg/Kg
Analysis Method :	7196A	Basis :	Dry
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-02DS-071105	K0710375-004	12	1.5	1	11/19/2007	11/20/07	ND	R1, S
PCM-06DS-071105	K0710375-005	12	1.5	1	11/19/2007	11/20/07	ND	↓
PCM-09DS-071105	K0710375-006	12	1.5	1	11/19/2007	11/20/07	ND	
Method Blank	K0710375-MB	12	1.5	1	11/19/2007	11/20/07	ND	

12/03/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710375
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/05/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/06/07
Sample Matrix :	SEDIMENT		

Sulfide, Total

Prep Method :	EPA 9030B Modified	Units :	mg/Kg
Analysis Method :	9030M	Basis :	Dry
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-02DS-071105	K0710375-004	1.2	0.5	1	11/16/2007	11/16/07	ND	UJ1
PCM-06DS-071105	K0710375-005	1.2	0.5	1	11/16/2007	11/16/07	2.3	J1
PCM-09DS-071105	K0710375-006	1.2	0.5	1	11/16/2007	11/16/07	ND	UJ1
Method Blank	K0710375-MB	1.2	0.5	1	11/16/2007	11/16/07	ND	

SL 013108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710375
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/05/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/06/07
Sample Matrix :	PORE WATER		

Sulfide, Total

Analysis Method : SM 4500-S2- D
Test Notes :

Units : mg/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-09PW-071105	K0710375-002	0.05	0.004	1	11/08/07	0.038	J
Method Blank	K0710375-MB	0.05	0.004	1	11/08/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710375
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/05/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/06/07
Sample Matrix :	PORE WATER		

Carbon, Dissolved Organic (DOC)

Analysis Method : SM 5310 C
Test Notes :

Units : mg/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-09PW-071105	K0710375-002	0.5	0.04	1	11/07/07	4.3	
Method Blank	K0710375-MB	0.5	0.04	1	11/07/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710375
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/05/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/06/07
Sample Matrix :	PORE WATER		

Carbon, Total Organic

Analysis Method SM 5310 C
Test Notes :

Units : mg/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-09PW-071105	K0710375-002	0.5	0.04	1	11/08/07	5.0	
Method Blank	K0710375-MB	0.5	0.04	1	11/08/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

Report By:CLEAF

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Anchor Environmental
Project Name : Gasco Long-Term Monitoring Year 1
Project Number : 000029-02 B612 T17.4
Sample Matrix : SEDIMENT

Service Request : K0710375
Date Collected : 11/05/07
Date Received : 11/06/07

Carbon, Total Organic (TOC)

Prep Method : METHOD
Analysis Method : PSEP TOC
Test Notes :

Units : Percent
Basis : Dry

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-09SC-071105	K0710375-001	0.05	0.02	1	11/13/2007	12/11/07	0.12	J1
PCM-10SC-071105	K0710375-003	0.05	0.02	1	11/13/2007	12/11/07	0.11	
PCM-02DS-071105	K0710375-004	0.05	0.02	1	11/13/2007	12/11/07	2.56	
PCM-06DS-071105	K0710375-005	0.05	0.02	1	11/13/2007	12/11/07	2.30	
PCM-09DS-071105	K0710375-006	0.05	0.02	1	11/13/2007	12/11/07	2.25	
Method Blank	K0710375-MB	0.05	0.02	1	11/13/2007	12/11/07	ND	

12/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Moni/000029-02 B612 T17.4		
Sample Matrix:	Sediment		

Total Solids

Prep Method:	NONE	**Units:**	PERCENT
Analysis Method:	160.3M	**Basis:**	Wet
Test Notes:			

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
PCM-09SC-071105	K0710375-001	11/05/2007	11/06/2007	11/07/2007	84.9	
PCM-10SC-071105	K0710375-003	11/05/2007	11/06/2007	11/07/2007	85.8	
PCM-02DS-071105	K0710375-004	11/05/2007	11/06/2007	11/07/2007	42.5	
PCM-06DS-071105	K0710375-005	11/05/2007	11/06/2007	11/07/2007	43.4	
PCM-09DS-071105	K0710375-006	11/05/2007	11/06/2007	11/07/2007	45.5	

PL 0B108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/5/2007
Sample Matrix:	Sediment	**Date Received:**	11/6/2007
		Date Analyzed:	11/30/2007

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: PCM-09SC-071105
Lab Code: K0710375-001

Sand Fraction:	Dry Weight (Grams)	76.6710
Sand Fraction:	Weight Recovered (Grams)	76.6719
Sand Fraction:	Percent Recovery	100

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel	<-1 Ø	16.7495	19.8
Sand, Very Coarse	-1 to 0 Ø	15.0934	17.8
Sand, Coarse	0 to 1 Ø	19.2353	22.7
Sand, Medium	1 to 2 Ø	17.8119	21.0
Sand, Fine	2 to 3 Ø	7.0726	8.35
Sand, Very Fine	3 to 4 Ø	0.6898	0.81
Silt	4 to 8 Ø	0.6450	0.76
Clay	> 8 Ø	0.1650	0.19
	Total	77.4625	91.4

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/5/2007
Sample Matrix:	Sediment	**Date Received:**	11/6/2007
		Date Analyzed:	11/30/2007

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: PCM-10SC-071105
Lab Code: K0710375-003

Sand Fraction:	Dry Weight (Grams)	74.8878
Sand Fraction:	Weight Recovered (Grams)	74.7172
Sand Fraction:	Percent Recovery	99.8

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel	<-1 Ø	21.2127	24.8
Sand, Very Coarse	-1 to 0 Ø	13.1967	15.4
Sand, Coarse	0 to 1 Ø	19.5949	22.9
Sand, Medium	1 to 2 Ø	14.6402	17.1
Sand, Fine	2 to 3 Ø	4.9890	5.84
Sand, Very Fine	3 to 4 Ø	1.0119	1.18
Silt	4 to 8 Ø	2.0300	2.38
Clay	> 8 Ø	0.9150	1.07
	Total	77.5904	90.8

12/31/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-0	**Date Collected:**	11/5/2007
Sample Matrix:	Sediment	**Date Received:**	11/6/2007
		Date Analyzed:	11/30/2007

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: PCM-02DS-071105
Lab Code: K0710375-004

Sand Fraction:	Dry Weight (Grams)	9.6846
Sand Fraction:	Weight Recovered (Grams)	9.7095
Sand Fraction:	Percent Recovery	100

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel	<-1 Ø	0.1114	0.52
Very Coarse Sand	-1 to 0 Ø	0.1845	0.87
Coarse Sand	0 to 1 Ø	0.2152	1.01
Medium Sand	1 to 2 Ø	0.6391	3.01
Fine Sand	2 to 3 Ø	2.0464	9.63
Very Fine Sand	3 to 4 Ø	5.3124	25.0
62.5 µm	4 to 5 Ø	4.8300	22.7
31.3 µm	5 to 6 Ø	2.3450	11.0
15.6 µm	6 to 7 Ø	1.5750	7.41
7.8 µm	7 to 8 Ø	0.8700	4.10
3.9 µm	8 to 9 Ø	0.5250	2.47
1.95 µm	9 to 10 Ø	0.3400	1.60
0.98 µm	> 10 Ø	0.2550	1.20
		19.2490	90.6

12/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-0	**Date Collected:**	11/5/2007
Sample Matrix:	Sediment	**Date Received:**	11/6/2007
		Date Analyzed:	11/30/2007

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: PCM-06DS-071105
Lab Code: K0710375-005

Sand Fraction:	Dry Weight (Grams)	9.2756
Sand Fraction:	Weight Recovered (Grams)	9.4258
Sand Fraction:	Percent Recovery	102

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel	<-1 Ø	0.2077	0.98
Very Coarse Sand	-1 to 0 Ø	0.1301	0.62
Coarse Sand	0 to 1 Ø	0.2538	1.20
Medium Sand	1 to 2 Ø	0.4696	2.22
Fine Sand	2 to 3 Ø	1.6335	7.73
Very Fine Sand	3 to 4 Ø	5.6139	26.6
62.5 µm	4 to 5 Ø	4.4400	21.0
31.3 µm	5 to 6 Ø	2.0150	9.54
15.6 µm	6 to 7 Ø	1.8300	8.66
7.8 µm	7 to 8 Ø	0.9350	4.42
3.9 µm	8 to 9 Ø	0.5450	2.58
1.95 µm	9 to 10 Ø	0.2900	1.37
0.98 µm	> 10 Ø	0.4700	2.22
		18.8336	89.1

12/3/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-C	**Date Collected:**	11/5/2007
Sample Matrix:	Sediment	**Date Received:**	11/6/2007
		Date Analyzed:	11/30/2007

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: PCM-09DS-071105
Lab Code: K0710375-006

Sand Fraction:	Dry Weight (Grams)	9.1706
Sand Fraction:	Weight Recovered (Grams)	9.2732
Sand Fraction:	Percent Recovery	101

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel	<-1 Ø	0.1170	0.52
Very Coarse Sand	-1 to 0 Ø	0.1947	0.87
Coarse Sand	0 to 1 Ø	0.4980	2.22
Medium Sand	1 to 2 Ø	1.5019	6.70
Fine Sand	2 to 3 Ø	1.7811	7.95
Very Fine Sand	3 to 4 Ø	4.1740	18.6
62.5 µm	4 to 5 Ø	6.1900	27.6
31.3 µm	5 to 6 Ø	2.0900	9.32
15.6 µm	6 to 7 Ø	1.7850	7.96
7.8 µm	7 to 8 Ø	0.8950	3.99
3.9 µm	8 to 9 Ø	0.6200	2.77
1.95 µm	9 to 10 Ø	0.3400	1.52
0.98 µm	> 10 Ø	0.3500	1.56
		20.5367	91.6

12/3/08

LDC #: 18144A6 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/21/08
SDG #: K0710375 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: AL
2nd Reviewer: V

METHOD: Ammonia-N (EPA Method 350.1/~~Plumb 5-1981 KCl~~), Total Cyanide (EPA SW846 Method 9012A/SM4500-CN-~~C~~/E), Dissolved Cyanide (SM4500-CN/~~C~~/E), Free Cyanide (ASTM D4282-02), Amendable to Chlorine Cyanide (SM 4500-CN-~~C~~/E), Hexavalent Chromium (EPA SW846 Method 7196A), ~~ORP (ASTM D1498-76)~~, Particle Size (PSEP), ~~pH (EPA SW846 Method 9045C)~~, Sulfide (EPA SW846 Method 9030M/SM4500-S2-D), Total Solids (EPA Method 160.3), DOC (SM5310C), TOC (SM5310C/PSEP Method)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 11/5/07
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	SW	
IV	Matrix Spike/Matrix Spike Duplicates	SW	MS/MSD/Dup
V	Duplicates	A ~~SW~~	
VI.	Laboratory control samples	A	LCS
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

Sediment water

1	PCM-09SC-071105	S	11	PCM-06DS-071105MS	S	21		31	
2	PCM-09PW-071105	W	12	PCM-06DS-071105MSD	↓	22		32	
3	PCM-10SC-071105	S	13	PCM-06DS-071105DUP	↓	23		33	
4	PCM-02DS-071105	↓	14	FB		24		34	
5	PCM-06DS-071105		15	PCM-09DS-071105Dup		25		35	
6	PCM-09DS-071105	↓	16			26		36	
7	PCM-09PW-071105MS	W	17			27		37	
8	PCM-09PW-071105DUP	↓	18			28		38	
9	PCM-02DS-071105MS	S	19			29		39	
10	PCM-02DS-071105DUP	↓	20			30		40	

Notes:

LDC #: 18144A6
SDG #: K0710335

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Reviewer: AL
2nd reviewer: L

All circled methods are applicable to each sample.

Sample ID	Parameter
1, 3	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK (CN) NH_3 TKN (TOC) CR^{6+} (Tot. Solids) (Part. Size) (Tot. Sulfide)
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
2	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK (CN) NH_3 TKN (TOC) CR^{6+} (Doc) (Tot. Sulfide)
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
4 - 6	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN (NH3) TKN (TOC) (CR6+) (Tot. Solids) (Part. Size) (Tot. Sulfide)
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
QC sample 7 - 8	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK (CN) NH_3 TKN (TOC) CR^{6+} (Doc) (Tot. Sulfide)
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
9 - 10	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} (Tot. Sulfide) ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
11 - 13	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC (CR6+) ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
15	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} (Tot Solids) ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} ____ ____ ____ ____

Comments: _____

LDC #: 16144A6
SDG #: 620/2375

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Page: 1 of 1
Reviewer: AL
2nd reviewer:

All circled dates have exceeded the technical holding time.
(Y) N N/A Were all samples preserved as applicable to each method ?
(Y) N N/A Were all cooler temperatures within validation criteria?

Method:	~~D4282~~	7196A	~~Phen~~ 350.3	9030B	PSEP	
Parameters:	~~Free~~ CN	Cr^{6+}	NH3-N	Sulfides	TOC	
Technical holding time:	~~24 hrs~~	7 days	7 days	7 days	14 days	

Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
2,7,8	~~11/5/07~~ 1330	~~11/9/07~~ 1130			(46 hrs)		J/UJ/P
4-6, 11-13	11/5/07		11/20/07		(15 days)		J/R/P
4-6	↓			11/19/07	(14 days)		J/UJ/P
4-6, 9-10	↓				11/16/07	(11 days)	J/UJ/P
1+3-6	11/5/07					12/11/07 (36 days)	J/R/P

HT.6

LDC #: 18144A6
SDG #: 1657103375

VALIDATION FINDINGS WORKSHEET
Blanks

Reviewer: AA
2nd Reviewer: [illegible]

METHOD: Inorganics, Method Sm Com

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".
(Y) N N/A Were all samples associated with a given method blank?
(Y) N N/A Were any inorganic contaminants detected above the reporting limit in the method blanks? If yes, please see qualifications below.

Conc. units: mg/L

Associated Samples: 2 (>5x)

Analyte	Blank ID	Maximum ICB/CCB	Blank Action Limit	Sample Identification								
DOC		0.04	0.20									

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 18744A6
SDG #: K071375

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Page: 1 of 1
Reviewer: CA
2nd Reviewer:

METHOD: Inorganics, EPA Method Sw Conv

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of ~~75-125?~~ 65-135 If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

(Y) N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	11 | 12	Sed	Cr6+	0	0		4-6	J | R | A

Comments:

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NW Natural Gasco Site

Collection Date: November 8 through November 9, 2007

LDC Report Date: February 1, 2008

Matrix: Sediment/Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): K0710558

Sample Identification

PCM-13DSW-071109	PCM-13DSW-071109DUP
PCM-01DSW-071109	PCM-01DSW-071109MS
PCM-02DSW-071109	PCM-01DSW-071109DUP
PCM-03DSW-071109	PCM-08SC-071108DUP
PCM-04DSW-071109	PCM-08SC-071108TRP
PCM-05DSW-071109	
PCM-06DSW-071109	
PCM-21DSW-071109	
PCM-08DSW-071109	
PCM-09DSW-071109	
PCM-10DSW-071109	
PCM-08SC-071108	
PCM-08PW-071108	
PCM-SCRB-071108	
PCM-PWRB-071108	
PCM-DRB-071108	
PCM-BRB-071108	
PCM-19DSW-071109	
PCM-20DSW-071109	
PCM-13DSW-071109MS	

Introduction

This data review covers 3 sediment samples and 22 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.3 for Total Solids, EPA SW 846 Method 9012A and Standard Method 4500-CN-E for Total Cyanide, EPA SW 846 Method 9030M and Standard Method 4500-S2-D for Sulfide, Standard Method 4500-CN-E for Dissolved Cyanide, Standard Method 4500-CN-E for Amenable to Chlorination Cyanide, Standard Method 5310C for Dissolved Organic Carbon, Standard Method 5310C and PSEP Method for Total Organic Carbon, PSEP Method for Particle Size, ASTM Method D2540D for Total Suspended Solids, and ASTM Method D4282-02 for Free Cyanide.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
PCM-08SC-071108	Total organic carbon	32 days	14 days	J (all detects) R (all non-detects)	P

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration of each method were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Duplicates/Triplicates

Duplicate (DUP) and triplicate (TRP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

VII. Sample Result Verification

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to analysis holding time problems, Total organic carbon data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

Samples PCM-SCRB-071108, PCM-PWRB-071108, PCM-DRB-071108, and PCM-BRB-071108 were identified as rinsate blanks. No contaminant concentrations were found in these blanks.

NW Natural Gasco Site
Wet Chemistry - Data Qualification Summary - SDG K0710558

SDG	Sample	Analyte	Flag	A or P	Reason
K0710558	PCM-08SC-071108	Total organic carbon	J (all detects) R (all non-detects)	P	Technical holding times

NW Natural Gasco Site
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG K0710558

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710558
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/08/07
Project Number :	000029-02 B612 T127.4	**Date Received :**	11/09/07
Sample Matrix :	SEDIMENT		

Cyanide, Total

Prep Method :	Method	Units :	mg/Kg
Analysis Method :	9012A	Basis :	Dry
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-08SC-071108	K0710558-012	0.12	0.04	1	11/20/2007	11/21/07	0.23	
Method Blank	K0710558-MB	0.12	0.04	1	11/20/2007	11/21/07	ND	

11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Anchor Environmental
Project Name : Gasco Long-Term Monitoring Year 1
Project Number : 000029-02 B612 T127.4
Sample Matrix : WATER

Service Request : K0710558
Date Collected : 11/08,09/07
Date Received : 11/09/07

Cyanide, Total

Prep Method : SM 4500-CN- C
Analysis Method : SM 4500-CN- E
Test Notes :

Units : mg/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-13DSW-071109	K0710558-001	0.01	0.003	1	11/12/2007	11/13/07	ND	
PCM-01DSW-071109	K0710558-002	0.01	0.003	1	11/12/2007	11/13/07	ND	
PCM-02DSW-071109	K0710558-003	0.01	0.003	1	11/12/2007	11/13/07	ND	
PCM-03DSW-071109	K0710558-004	0.01	0.003	1	11/12/2007	11/13/07	ND	
PCM-04DSW-071109	K0710558-005	0.01	0.003	1	11/12/2007	11/13/07	ND	
PCM-05DSW-071109	K0710558-006	0.01	0.003	1	11/12/2007	11/13/07	ND	
PCM-06DSW-071109	K0710558-007	0.01	0.003	1	11/12/2007	11/13/07	ND	
PCM-21DSW-071109	K0710558-008	0.01	0.003	1	11/12/2007	11/13/07	ND	
PCM-08DSW-071109	K0710558-009	0.01	0.003	1	11/12/2007	11/13/07	ND	
PCM-09DSW-071109	K0710558-010	0.01	0.003	1	11/12/2007	11/13/07	ND	
PCM-10DSW-071109	K0710558-011	0.01	0.003	1	11/12/2007	11/13/07	ND	
PCM-SCRB-071108	K0710558-015	0.01	0.003	1	11/12/2007	11/13/07	ND	
PCM-PWRB-071108	K0710558-016	0.01	0.003	1	11/12/2007	11/13/07	ND	
PCM-DRB-071108	K0710558-017	0.01	0.003	1	11/12/2007	11/13/07	ND	
PCM-BRB-071108	K0710558-018	0.01	0.003	1	11/12/2007	11/13/07	ND	
PCM-19DSW-071109	K0710558-019	0.01	0.003	1	11/12/2007	11/13/07	ND	
PCM-20DSW-071109	K0710558-020	0.01	0.003	1	11/12/2007	11/13/07	ND	
Method Blank	K0710558-MB	0.01	0.003	1	11/12/2007	11/13/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Anchor Environmental
Project Name : Gasco Long-Term Monitoring Year 1
Project Number : 000029-02 B612 T127.4
Sample Matrix : PORE WATER

Service Request : K0710558
Date Collected : 11/08/07
Date Received : 11/09/07

Cyanide, Total

Prep Method : SM 4500-CN- C
Analysis Method : SM 4500-CN- E
Test Notes :

Units : mg/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-08PW-071108	K0710558-013	0.01	0.003	1	11/12/2007	11/13/07	0.07	
Method Blank	K0710558-MB	0.01	0.003	1	11/12/2007	11/13/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710558
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/08/07
Project Number :	000029-02 B612 T127.4	**Date Received :**	11/09/07
Sample Matrix :	PORE WATER		

Cyanide, Dissolved

Prep Method :	SM 4500-CN-C	Units :	mg/L
Analysis Method :	SM 4500-CN- E	Basis :	NA
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-08PW-071108	K0710558-013	0.01	0.003	1	11/15/2007	11/15/07	0.07	
Method Blank	K0710558-MB	0.01	0.003	1	11/15/2007	11/15/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

Ed3108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Anchor Environmental
Project Name : Gasco Long-Term Monitoring Year 1
Project Number : 000029-02 B612 T127.4
Sample Matrix : WATER

Service Request : K0710558
Date Collected : 11/08,09/07
Date Received : 11/09/07

Cyanide, Free

Analysis Method : ASTM D4282-02
Test Notes :

Units : ug/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-13DSW-071109	K0710558-001	10	5.0	1	11/10/07	ND	
PCM-01DSW-071109	K0710558-002	10	5.0	1	11/10/07	ND	
PCM-02DSW-071109	K0710558-003	10	5.0	1	11/10/07	ND	
PCM-03DSW-071109	K0710558-004	10	5.0	1	11/10/07	ND	
PCM-04DSW-071109	K0710558-005	10	5.0	1	11/10/07	ND	
PCM-05DSW-071109	K0710558-006	10	5.0	1	11/10/07	ND	
PCM-06DSW-071109	K0710558-007	10	5.0	1	11/10/07	ND	
PCM-21DSW-071109	K0710558-008	10	5.0	1	11/10/07	ND	
PCM-08DSW-071109	K0710558-009	10	5.0	1	11/10/07	ND	
PCM-09DSW-071109	K0710558-010	10	5.0	1	11/10/07	ND	
PCM-10DSW-071109	K0710558-011	10	5.0	1	11/10/07	ND	
PCM-SCRB-071108	K0710558-015	10	5.0	1	11/10/07	ND	
PCM-PWRB-071108	K0710558-016	10	5.0	1	11/10/07	ND	
PCM-DRB-071108	K0710558-017	10	5.0	1	11/10/07	ND	
PCM-BRB-071108	K0710558-018	10	5.0	1	11/10/07	ND	
PCM-19DSW-071109	K0710558-019	10	5.0	1	11/10/07	ND	
PCM-20DSW-071109	K0710558-020	10	5.0	1	11/10/07	ND	
Method Blank	K0710558-MB	10	5.0	1	11/10/07	ND	

SL 1/23/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Anchor Environmental
Project Name : Gasco Long-Term Monitoring Year 1
Project Number : 000029-02 B612 T127.4
Sample Matrix : PORE WATER

Service Request : K0710558
Date Collected : 11/08/07
Date Received : 11/09/07

Cyanide, Free

Analysis Method : ASTM D4282-02
Test Notes :

Units : ug/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-08PW-071108	K0710558-013	10	5.0	1	11/10/07	9.0	J
Method Blank	K0710558-MB	10	5.0	1	11/10/07	ND	

SL 01/31/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	NA	**Date Collected:**	1/6/2005
Sample Matrix:	Water	**Date Received:**	1/11/2005

Cyanide, Amenable to Chlorination

Prep Method:	SM 4500-CN-C	Units:	mg/L (ppm)
Analysis Method:	SM 4500-CN-E	Basis:	NA
Test Notes:			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
PCM-13DSW-071109	K0710558-001	0.01	0.003	1	11/12/2007	11/13/2007	ND	
PCM-01DSW-071109	K0710558-002	0.01	0.003	1	11/12/2007	11/13/2007	ND	
PCM-02DSW-071109	K0710558-003	0.01	0.003	1	11/12/2007	11/13/2007	ND	
PCM-03DSW-071109	K0710558-004	0.01	0.003	1	11/12/2007	11/13/2007	ND	
PCM-04DSW-071109	K0710558-005	0.01	0.003	1	11/12/2007	11/13/2007	ND	
PCM-05DSW-071109	K0710558-006	0.01	0.003	1	11/12/2007	11/13/2007	ND	
PCM-06DSW-071109	K0710558-007	0.01	0.003	1	11/12/2007	11/13/2007	ND	
PCM-21DSW-071109	K0710558-008	0.01	0.003	1	11/12/2007	11/13/2007	ND	
PCM-08DSW-071109	K0710558-009	0.01	0.003	1	11/12/2007	11/13/2007	ND	
PCM-09DSW-071109	K0710558-010	0.01	0.003	1	11/12/2007	11/13/2007	ND	
PCM-10DSW-071109	K0710558-011	0.01	0.003	1	11/12/2007	11/13/2007	ND	
PCM-08PW-071108	K0710558-013	0.01	0.003	1	11/14/2007	11/15/2007	ND	
PCM-SCRB-071108	K0710558-015	0.01	0.003	1	11/12/2007	11/13/2007	ND	
PCM-PWRB-071108	K0710558-016	0.01	0.003	1	11/12/2007	11/13/2007	ND	
PCM-DRB-071108	K0710558-017	0.01	0.003	1	11/12/2007	11/13/2007	ND	
PCM-BRB-071108	K0710558-018	0.01	0.003	1	11/12/2007	11/13/2007	ND	
PCM-19DSW-071109	K0710558-019	0.01	0.003	1	11/12/2007	11/13/2007	ND	
PCM-20DSW-071109	K0710558-020	0.01	0.003	1	11/12/2007	11/13/2007	ND	
Method Blank	K0710558-MB	0.01	0.003	1	11/12/2007	11/13/2007	ND	
Method Blank	K0710558-MB	0.01	0.003	1	11/14/2007	11/15/2007	ND	

11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Anchor Environmental
Project Name : Gasco Long-Term Monitoring Year 1
Project Number : 000029-02 B612 T127.4
Sample Matrix : WATER

Service Request : K0710558
Date Collected : 11/09/07
Date Received : 11/09/07

Sulfide

Analysis Method : SM 4500-S2- D
Test Notes :

Units : mg/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-13DSW-071109	K0710558-001	0.05	0.004	1	11/12/07	ND	
PCM-01DSW-071109	K0710558-002	0.05	0.004	1	11/12/07	ND	
PCM-02DSW-071109	K0710558-003	0.05	0.004	1	11/12/07	ND	
PCM-03DSW-071109	K0710558-004	0.05	0.004	1	11/12/07	ND	
PCM-04DSW-071109	K0710558-005	0.05	0.004	1	11/12/07	ND	
PCM-05DSW-071109	K0710558-006	0.05	0.004	1	11/12/07	ND	
PCM-06DSW-071109	K0710558-007	0.05	0.004	1	11/12/07	ND	
PCM-21DSW-071109	K0710558-008	0.05	0.004	1	11/12/07	ND	
PCM-08DSW-071109	K0710558-009	0.05	0.004	1	11/12/07	ND	
PCM-09DSW-071109	K0710558-010	0.05	0.004	1	11/12/07	ND	
PCM-10DSW-071109	K0710558-011	0.05	0.004	1	11/12/07	ND	
PCM-19DSW-071109	K0710558-019	0.05	0.004	1	11/12/07	ND	
PCM-20DSW-071109	K0710558-020	0.05	0.004	1	11/12/07	ND	
Method Blank	K0710558-MB	0.05	0.004	1	11/12/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710558
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/08/07
Project Number :	000029-02 B612 T127.4	**Date Received :**	11/09/07
Sample Matrix :	PORE WATER		

Sulfide

Analysis Method : SM 4500-S2- D
Test Notes :

Units : mg/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-08PW-071108	K0710558-013	0.05	0.004	1	11/12/07	ND	
Method Blank	K0710558-MB	0.05	0.004	1	11/12/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

12/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710558
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/09/07
Project Number :	000029-02 B612 T127.4	**Date Received :**	11/09/07
Sample Matrix :	WATER		

Carbon, Dissolved Organic (DOC)

Analysis Method : SM 5310 C
Test Notes :

Units : mg/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-13DSW-071109	K0710558-001	0.5	0.04	1	11/13/07	1.9	
PCM-01DSW-071109	K0710558-002	0.5	0.04	1	11/13/07	1.9	
PCM-02DSW-071109	K0710558-003	0.5	0.04	1	11/13/07	2.0	
PCM-03DSW-071109	K0710558-004	0.5	0.04	1	11/13/07	2.0	
PCM-04DSW-071109	K0710558-005	0.5	0.04	1	11/13/07	1.9	
PCM-05DSW-071109	K0710558-006	0.5	0.04	1	11/13/07	2.0	
PCM-06DSW-071109	K0710558-007	0.5	0.04	1	11/13/07	1.9	
PCM-21DSW-071109	K0710558-008	0.5	0.04	1	11/13/07	2.0	
PCM-08DSW-071109	K0710558-009	0.5	0.04	1	11/13/07	1.9	
PCM-09DSW-071109	K0710558-010	0.5	0.04	1	11/13/07	1.9	
PCM-10DSW-071109	K0710558-011	0.5	0.04	1	11/13/07	1.8	
PCM-19DSW-071109	K0710558-019	0.5	0.04	1	11/13/07	1.8	
PCM-20DSW-071109	K0710558-020	0.5	0.04	1	11/13/07	1.9	
Method Blank	K0710558-MB	0.5	0.04	1	11/13/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710558
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/08/07
Project Number :	000029-02 B612 T127.4	**Date Received :**	11/09/07
Sample Matrix :	PORE WATER		

Carbon, Dissolved Organic (DOC)

Units : mg/L
Analysis Method : SM 5310 C
Basis : NA
Test Notes :

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-08PW-071108	K0710558-013	0.5	0.04	1	11/13/07	7.6	
Method Blank	K0710558-MB	0.5	0.04	1	11/13/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

12/3-08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Anchor Environmental
Project Name : Gasco Long-Term Monitoring Year 1
Project Number : 000029-02 B612 T127.4
Sample Matrix : WATER

Service Request : K0710558
Date Collected : 11/09/07
Date Received : 11/09/07

Carbon, Total Organic

Analysis Method : SM 5310 C
Test Notes :

Units : mg/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-13DSW-071109	K0710558-001	0.5	0.04	1	11/13/07	2.0	
PCM-01DSW-071109	K0710558-002	0.5	0.04	1	11/13/07	1.9	
PCM-02DSW-071109	K0710558-003	0.5	0.04	1	11/13/07	2.0	
PCM-03DSW-071109	K0710558-004	0.5	0.04	1	11/13/07	1.9	
PCM-04DSW-071109	K0710558-005	0.5	0.04	1	11/13/07	1.9	
PCM-05DSW-071109	K0710558-006	0.5	0.04	1	11/13/07	1.9	
PCM-06DSW-071109	K0710558-007	0.5	0.04	1	11/13/07	1.9	
PCM-21DSW-071109	K0710558-008	0.5	0.04	1	11/13/07	1.9	
PCM-08DSW-071109	K0710558-009	0.5	0.04	1	11/13/07	1.9	
PCM-09DSW-071109	K0710558-010	0.5	0.04	1	11/13/07	1.9	
PCM-10DSW-071109	K0710558-011	0.5	0.04	1	11/13/07	1.9	
PCM-19DSW-071109	K0710558-019	0.5	0.04	1	11/13/07	1.9	
PCM-20DSW-071109	K0710558-020	0.5	0.04	1	11/13/07	1.9	
Method Blank	K0710558-MB	0.5	0.04	1	11/13/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710558
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/08/07
Project Number :	000029-02 B612 T127.4	**Date Received :**	11/09/07
Sample Matrix :	PORE WATER		

Carbon, Total Organic

Analysis Method : SM 5310 C
Test Notes :

Units : mg/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-08PW-071108	K0710558-013	1.0	0.080	2	11/13/07	8.7	
Method Blank	K0710558-MB	0.5	0.04	1	11/13/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

8 013108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710558
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/08/07
Project Number :	000029-02 B612 T127.4	**Date Received :**	11/09/07
Sample Matrix :	SEDIMENT		

Carbon, Total Organic (TOC)

Prep Method :	Method	Units :	Percent
Analysis Method :	PSEP TOC	Basis :	Dry
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-08SC-071108	K0710558-012	0.05	0.02	1	11/13/2007	12/10/07	0.32	J1
Method Blank	K0710558-MB	0.05	0.02	1	11/13/2007	12/10/07	ND	

SL 01/31/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	Service Request:	K0710558
Project:	Gasco Long-Term Moni/000029-02 B612 T127.		
Sample Matrix:	Sediment		

Total Solids

Prep Method:	NONE	Units:	PERCENT
Analysis Method:	160.3M	Basis:	Wet
Test Notes:			

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
PCM-08SC-071108	K0710558-012	11/08/2007	11/09/2007	11/12/2007	80.0	

SL 013108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client : Anchor Environmental
Project Name : Gasco Long-Term Monitoring Year 1
Project Number : 000029-02 B612 T127.4
Sample Matrix : WATER

Service Request : K0710558
Date Collected : 11/09/07
Date Received : 11/09/07

Solids, Total Suspended (TSS)

Analysis Method : SM 2540 D
Test Notes :

Units : mg/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-13DSW-071109	K0710558-001	1	5	1	11/12/07	7	
PCM-01DSW-071109	K0710558-002	1	5	1	11/12/07	6	
PCM-02DSW-071109	K0710558-003	1	5	1	11/12/07	7	
PCM-03DSW-071109	K0710558-004	1	5	1	11/12/07	6	
PCM-04DSW-071109	K0710558-005	1	5	1	11/12/07	5	
PCM-05DSW-071109	K0710558-006	1	5	1	11/12/07	7	
PCM-06DSW-071109	K0710558-007	1	5	1	11/12/07	7	
PCM-21DSW-071109	K0710558-008	1	5	1	11/12/07	6	
PCM-08DSW-071109	K0710558-009	1	5	1	11/12/07	7	
PCM-09DSW-071109	K0710558-010	1	5	1	11/12/07	6	
PCM-10DSW-071109	K0710558-011	1	5	1	11/12/07	7	
PCM-19DSW-071109	K0710558-019	1	5	1	11/12/07	6	
PCM-20DSW-071109	K0710558-020	1	5	1	11/12/07	8	
Method Blank	K0710558-MB	1	5	1	11/12/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/8/2007
Sample Matrix:	Sediment	**Date Received:**	11/9/2007
		Date Analyzed:	11/30/2007

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: PCM-08SC-071108
Lab Code: K0710558-012

Sand Fraction:	Dry Weight (Grams)	73.4481
Sand Fraction:	Weight Recovered (Grams)	73.5915
Sand Fraction:	Percent Recovery	100

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel	<-1 Ø	25.8414	32.4
Sand, Very Coarse	-1 to 0 Ø	12.7840	16.0
Sand, Coarse	0 to 1 Ø	16.6531	20.9
Sand, Medium	1 to 2 Ø	12.1786	15.3
Sand, Fine	2 to 3 Ø	4.9077	6.16
Sand, Very Fine	3 to 4 Ø	1.1878	1.49
Silt	4 to 8 Ø	1.9450	2.44
Clay	> 8 Ø	0.7600	0.95
	Total	76.2576	95.6

LDC #: 18144B6 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/21/08
SDG #: K0710558 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: OK
2nd Reviewer: ✓

METHOD: Total Cyanide (EPA SW846 Method 9012A/SM4500-CN-~~G~~E), Dissolved Cyanide (SM4500-CN~~G~~E), Free Cyanide (ASTM D4282-02), Amendable to Chlorine Cyanide (SM 4500-CN-~~G~~E), Particle Size (PSEP), Sulfide (EPA SW846 Method 9030M/SM4500-S2-D), Total Solids (EPA Method 160.3), DOC (SM5310C), TOC (SM5310C/PSEP Method), TSS (ASTM D2540D)
The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 11/8 → 11/9/07
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	A	MS/Dup/TRP
V	Duplicates	A	
VI.	Laboratory control samples	A	LCS/LCSD
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	ND	RB: 14, 15, 16, 17

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:

Sediment + water

1	PCM-13DSW-071109	W	11	PCM-10DSW-071109	W	21	PCM-13DSW-071109DUP	W	31	
2	PCM-01DSW-071109		12	PCM-08SC-071108	S	22	PCM-01DSW-071109MS		32	
3	PCM-02DSW-071109		13	PCM-08PW-071108	W	23	PCM-01DSW-071109DUP		33	
4	PCM-03DSW-071109		14	PCM-SCRB-071108		24	PCM-08SC-071108MS/DUP	S	34	
5	PCM-04DSW-071109		15	PCM-PWRB-071108		25	PCM-08SC-071108TRP		35	
6	PCM-05DSW-071109		16	PCM-DRB-071108		26	PB		36	
7	PCM-06DSW-071109	D	17	PCM-BRB-071108		27			37	
8	PCM-21DSW-071109		18	PCM-19DSW-071109		28			38	
9	PCM-08DSW-071109		19	PCM-20DSW-071109		29			39	
10	PCM-09DSW-071109		20	PCM-13DSW-071109MS		30			40	

Notes: _____

LDC #: 15144B5
SDG #: K071055V

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: AA
2nd reviewer: ✓

All circled methods are applicable to each sample.

Sample ID	Parameter
1-11, 13,	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK (CN) NH_3 TKN (TOC) CR^{6+} (DOC) (TSS) (Sulfide)
18-19	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}
12	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK (CN) NH_3 TKN (TOC) CR^{6+} (Tot. Solid) (Part. Size)
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}
14-17	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK (CN) NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}
20-21	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK (CN) NH_3 TKN (TOC) CR^{6+} (DOC) (Sulfide)
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}
22-23	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK (CN) NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}
24-25	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+} (Tot. Solid) (Part Size)
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN NH_3 TKN TOC CR^{6+}

AC sample

Comments:

LDC #: 18144B6
SDG #: 14710558

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: AL
2nd reviewer:

All circled dates have exceeded the technical holding time.
(Y) N N/A Were all samples preserved as applicable to each method ?
(Y) N N/A Were all cooler temperatures within validation criteria?

Method:	PSEP	~~D4282~~				
Parameters:	TOC	~~TOC~~ CNC				
Technical holding time:	14 days					

Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
12	11/8/07	12/10/07	(32 days)				J/R/P

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NW Natural Gasco Site

Collection Date: November 7, 2007

LDC Report Date: January 23, 2008

Matrix: Sediment/Water

Parameters: Wet Chemistry

Validation Level: EPA Level III

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): K0710470

Sample Identification

PCM-02SC-071107
PCM-02PW-071107
PCM-05SC-071107
PCM-04SC-071107
PCM-04PW-071107
PCM-14DS-071107
PCM-02SC-071107MS
PCM-02SC-071107DUP
PCM-02SC-071107TRP
PCM-02PW-071107MS
PCM-02PW-071107DUP
PCM-14DS-071107MS
PCM-14DS-071107MSD
PCM-14DS-071107DUP

Introduction

This data review covers 10 sediment samples and 4 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA Method 160.3 for Total Solids, EPA Method 350.1 for Ammonia as Nitrogen, EPA SW 846 Method 7196A for Hexavalent Chromium, EPA SW 846 Method 9012A and Standard Method 4500-CN-E for Total Cyanide, EPA SW 846 Method 9030M and Standard Method 4500-S2-D for Sulfide, Standard Method 4500-CN-E for Dissolved Cyanide, Standard Method 4500-CN-E for Amenable to Chlorination Cyanide, Standard Method 5310C for Dissolved Organic Carbon, Standard Method 5310C and PSEP Method for Total Organic Carbon, PSEP Method for Particle Size, and ASTM Method D4282-02 for Free Cyanide.

The review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (October 2004) as there are no current guidelines for the methods stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Analyte	Total Time From Sample Collection Until Analysis	Required Holding Time From Sample Collection Until Analysis	Flag	A or P
PCM-14DS-071107 PCM-14DS-071107MS PCM-14DS-071107MSD PCM-14DS-071107DUP	Hexavalent chromium	21 days	7 days	J (all detects) R (all non-detects)	P
PCM-02SC-071107 PCM-05SC-071107 PCM-04SC-071107 PCM-14DS-071107	Total organic carbon	33 days	14 days	J (all detects) R (all non-detects)	P
PCM-14DS-071107 PCM-14DS-071107MS PCM-14DS-071107DUP	Ammonia as N	12 days	7 days	J (all detects) UJ (all non-detects)	P

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

All criteria for the initial calibration of each method were met.

b. Calibration Verification

Calibration verification frequency and analysis criteria were met for each method when applicable.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No contaminant concentrations were found in the initial, continuing and preparation blanks.

IV. Matrix Spike/Matrix Spike Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) analyses were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits with the following exceptions:

Spike ID (Associated Samples)	Analyte	MS (%R) (Limits)	MSD (%R) (Limits)	RPD (Limits)	Flag	A or P
PCM-14DS-071107MS/MSD (PCM-14DS-071107)	Hexavalent chromium	8 (65-135)	24 (65-135)	-	J (all detects) R (all non-detects)	A
	Sulfide	24 (65-135)	22 (65-135)	-	J (all detects) R (all non-detects)	

V. Duplicates and Triplicates

Duplicate (DUP) and triplicate (TRP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

VI. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

VII. Sample Result Verification

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method.

Due to severe problems with the MS/MSD %Rs, Sulfide data were rejected in one sample.

Due to analysis holding time and MS/MSD %R problems, Ammonia as Nitrogen, Hexavalent chromium and Total organic carbon data were qualified as estimated in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Wet Chemistry - Data Qualification Summary - SDG K0710470

SDG	Sample	Analyte	Flag	A or P	Reason
K0710470	PCM-14DS-071107	Hexavalent chromium	J (all detects) R (all non-detects)	P	Technical holding times
K0710470	PCM-02SC-071107 PCM-05SC-071107 PCM-04SC-071107 PCM-14DS-071107	Total organic carbon	J (all detects) R (all non-detects)	P	Technical holding times
K0710470	PCM-14DS-071107	Ammonia as N	J (all detects) UJ (all non-detects)	P	Technical holding times
K0710470	PCM-14DS-071107	Hexavalent chromium Sulfide	J (all detects) R (all non-detects) J (all detects) R (all non-detects)	A	Matrix spike/Matrix spike duplicates (%R)

NW Natural Gasco Site
Wet Chemistry - Laboratory Blank Data Qualification Summary - SDG K0710470

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710470
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/07/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/08/07
Sample Matrix :	SEDIMENT		

Ammonia as Nitrogen

Prep Method :	EPA Plumb 5-1981 KCl	Units :	mg/Kg
Analysis Method :	350.1M	Basis :	Dry
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-14DS-071107	K0710470-006	0.44	0.053	1	11/13/2007	11/19/07	23.2	J1
Method Blank	K0710470-MB	0.44	0.053	1	11/13/2007	11/19/07	ND	

M Modified

11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710470
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/07/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/08/07
Sample Matrix :	PORE WATER		

Cyanide, Total

Prep Method :	SM 4500-CN- C	Units :	mg/L
Analysis Method :	SM 4500-CN- E	Basis :	NA
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-02PW-071107	K0710470-002	0.01	0.003	1	11/9/2007	11/13/07	0.04	
PCM-04PW-071107	K0710470-005	0.05	0.015	5	11/9/2007	11/13/07	0.14	
Method Blank	K0710470-MB	0.01	0.003	1	11/9/2007	11/13/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

K013108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710470
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/07/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/08/07
Sample Matrix :	SEDIMENT		

Cyanide, Total

Prep Method :	Method	Units :	mg/Kg
Analysis Method :	9012A	Basis :	Dry
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-02SC-071107	K0710470-001	0.13	0.038	1	11/20/2007	11/21/07	0.13	
PCM-05SC-071107	K0710470-003	0.13	0.038	1	11/20/2007	11/21/07	0.10	J
PCM-04SC-071107	K0710470-004	0.13	0.038	1	11/20/2007	11/21/07	0.22	
Method Blank	K0710470-MB	0.13	0.038	1	11/20/2007	11/21/07	ND	

11/23/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710470
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/07/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/08/07
Sample Matrix :	PORE WATER		

Cyanide, Dissolved

Prep Method :	SM 4500-CN-C	Units :	mg/L
Analysis Method :	SM 4500-CN- E	Basis :	NA
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-02PW-071107	K0710470-002	0.01	0.003	1	11/15/2007	11/15/07	0.04	
PCM-04PW-071107	K0710470-005	0.01	0.003	2	11/15/2007	11/15/07	0.19	
Method Blank	K0710470-MB	0.01	0.003	1	11/15/2007	11/15/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710470
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/07/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/08/07
Sample Matrix :	PORE WATER		

Cyanide, Free

Units : ug/L
Analysis Method : ASTM D4282-02 Basis : NA
Test Notes :

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-02PW-071107	K0710470-002	10	5	1	11/09/07	ND	
PCM-04PW-071107	K0710470-005	10	5	1	11/09/07	6	J
Method Blank	K0710470-MB	10	5	1	11/09/07	ND	

12/3/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710470
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/07/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/08/07
Sample Matrix :	PORE WATER		

Cyanide, Amenable to Chlorination

Prep Method :	SM 4500-CN- G	Units :	mg/L
Analysis Method :	SM 4500-CN- E	Basis :	NA
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-02PW-071107	K0710470-002	0.01	0.003	1	11/14/2007	11/15/07	ND	
PCM-04PW-071107	K0710470-005	0.01	0.003	1	11/14/2007	11/15/07	ND	
Method Blank	K0710470-MB	0.01	0.003	1	11/14/2007	11/15/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710470
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/07/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/08/07
Sample Matrix :	SEDIMENT		

Chromium, Hexavalent

Prep Method :	EPA 3060A	Units :	mg/Kg
Analysis Method :	7196A	Basis :	Dry
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-14DS-071107	K0710470-006	0.9	0.11	1	11/27/2007	11/28/07	0.14	J J1, 8
Method Blank	K0710470-MB	0.9	0.11	1	11/27/2007	11/28/07	ND	

11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710470
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/07/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/08/07
Sample Matrix :	PORE WATER		

Sulfide

Analysis Method : SM 4500-S2- D
Test Notes :

Units : mg/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-02PW-071107	K0710470-002	0.05	0.004	1	11/12/07	0.027	J
PCM-04PW-071107	K0710470-005	0.05	0.004	1	11/12/07	0.19	
Method Blank	K0710470-MB	0.05	0.004	1	11/12/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

SL 01/31/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710470
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/07/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/08/07
Sample Matrix :	SEDIMENT		

Sulfide, Total

Prep Method :	EPA 9030B Modified	Units :	mg/Kg
Analysis Method :	9030M	Basis :	Dry
Test Notes :			

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Prepared	Date Analyzed	Result	Result Notes
PCM-14DS-071107	K0710470-006	1.0	0.4	1	11/12/2007	11/12/07	ND	R8
Method Blank	K0710470-MB	1.0	0.4	1	11/12/2007	11/12/07	ND	

8/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710470
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/07/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/08/07
Sample Matrix :	PORE WATER		

Carbon, Dissolved Organic (DOC)

Analysis Method : SM 5310 C
Test Notes :

Units : mg/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-02PW-071107	K0710470-002	0.5	0.04	1	11/13/07	6.4	
PCM-04PW-071107	K0710470-005	0.5	0.04	1	11/13/07	7.4	
Method Blank	K0710470-MB	0.5	0.04	1	11/13/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710470
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/07/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/08/07
Sample Matrix :	SEDIMENT		

Carbon, Total Organic (TOC)

Analysis Method : PSEP TOC
Test Notes :

Units : Percent
Basis : Dry

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-02SC-071107	K0710470-001	0.05	0.02	1	12/10/07	0.06	J↓
PCM-05SC-071107	K0710470-003	0.05	0.02	1	12/10/07	0.08	↓
PCM-04SC-071107	K0710470-004	0.05	0.02	1	12/10/07	0.17	↓
PCM-14DS-071107	K0710470-006	0.05	0.02	1	12/10/07	0.46	↓
Method Blank	K0710470-MB	0.05	0.02	1	12/10/07	ND	

SL 01/31/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client :	Anchor Environmental	**Service Request :**	K0710470
Project Name :	Gasco Long-Term Monitoring Year 1	**Date Collected :**	11/07/07
Project Number :	000029-02 B612 T17.4	**Date Received :**	11/08/07
Sample Matrix :	PORE WATER		

Carbon, Total Organic

Analysis Method : SM 5310 C
Test Notes :

Units : mg/L
Basis : NA

Sample Name	Lab Code	MRL	MDL	Dilution Factor	Date Analyzed	Result	Result Notes
PCM-02PW-071107	K0710470-002	0.5	0.04	1	11/13/07	7.4	
PCM-04PW-071107	K0710470-005	1.0	0.08	2	11/13/07	9.4	
Method Blank	K0710470-MB	0.5	0.04	1	11/13/07	ND	

SM Standard Methods for the Examination of Water and Wastewater, 20th Ed., 1998.

SL 23108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	Service Request:	K0710470
Project:	Gasco Long-Term Moni/000029-02 B612 T17.4		
Sample Matrix:	Sediment		

Total Solids

Prep Method:	NONE	Units:	PERCENT
Analysis Method:	160.3M	Basis:	Wet
Test Notes:			

Sample Name	Lab Code	Date Collected	Date Received	Date Analyzed	Result	Result Notes
PCM-02SC-071107	K0710470-001	11/07/2007	11/08/2007	11/08/2007	82.9	
PCM-05SC-071107	K0710470-003	11/07/2007	11/08/2007	11/08/2007	82.3	
PCM-04SC-071107	K0710470-004	11/07/2007	11/08/2007	11/08/2007	80.2	
PCM-14DS-071107	K0710470-006	11/07/2007	11/08/2007	11/08/2007	57.0	

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/7/2007
Sample Matrix:	Sediment	**Date Received:**	11/8/2007
		Date Analyzed:	11/30/2007

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: PCM-02SC-071107
Lab Code: K0710470-001

Sand Fraction: Dry Weight (Grams)	76.4199
Sand Fraction: Weight Recovered (Grams)	76.4531
Sand Fraction: Percent Recovery	100

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel	<-1 Ø	5.3817	6.54
Sand, Very Coarse	-1 to 0 Ø	11.5346	14.0
Sand, Coarse	0 to 1 Ø	21.8676	26.6
Sand, Medium	1 to 2 Ø	27.0924	32.9
Sand, Fine	2 to 3 Ø	9.9798	12.1
Sand, Very Fine	3 to 4 Ø	0.5856	0.71
Silt	4 to 8 Ø	0.4230	0.51
Clay	> 8 Ø	0.0700	0.09
	Total	76.9347	93.5

SL 013109

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/7/2007
Sample Matrix:	Sediment	**Date Received:**	11/8/2007
		Date Analyzed:	11/30/2007

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: PCM-05SC-071107
Lab Code: K0710470-003

Sand Fraction:	Dry Weight (Grams)	74.4090
Sand Fraction:	Weight Recovered (Grams)	74.4923
Sand Fraction:	Percent Recovery	100

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel	<-1 Ø	13.1388	16.0
Sand, Very Coarse	-1 to 0 Ø	9.3247	11.4
Sand, Coarse	0 to 1 Ø	17.2216	21.0
Sand, Medium	1 to 2 Ø	22.8200	27.8
Sand, Fine	2 to 3 Ø	11.0486	13.5
Sand, Very Fine	3 to 4 Ø	0.9171	1.12
Silt	4 to 8 Ø	0.8130	0.99
Clay	> 8 Ø	0.2600	0.32
	Total	75.5438	92.1

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/7/2007
Sample Matrix:	Sediment	**Date Received:**	11/8/2007
		Date Analyzed:	11/30/2007

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: PCM-04SC-071107
Lab Code: K0710470-004

Sand Fraction: Dry Weight (Grams)	73.1606
Sand Fraction: Weight Recovered (Grams)	73.2300
Sand Fraction: Percent Recovery	100

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel	<-1 Ø	23.2049	29.2
Sand, Very Coarse	-1 to 0 Ø	13.3701	16.8
Sand, Coarse	0 to 1 Ø	14.4875	18.2
Sand, Medium	1 to 2 Ø	14.1054	17.8
Sand, Fine	2 to 3 Ø	6.8737	8.65
Sand, Very Fine	3 to 4 Ø	1.1445	1.44
Silt	4 to 8 Ø	1.9080	2.40
Clay	> 8 Ø	0.7250	0.91
	Total	75.8191	95.4

12/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Report

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-0	**Date Collected:**	11/7/2007
Sample Matrix:	Sediment	**Date Received:**	11/8/2007
		Date Analyzed:	11/30/2007

Particle Size Determination
Puget Sound Estuary Program Protocol

Sample Name: PCM-14DS-071107
Lab Code: K0710470-006

Sand Fraction: Dry Weight (Grams)	15.8046
Sand Fraction: Weight Recovered (Grams)	15.8752
Sand Fraction: Percent Recovery	100

Description	Phi Size	Dry Weight (Grams)	Percent of Total Weight Recovered
Gravel	<-1 Ø	0.0736	0.27
Very Coarse Sand	-1 to 0 Ø	0.8309	3.00
Coarse Sand	0 to 1 Ø	2.3559	8.52
Medium Sand	1 to 2 Ø	9.8434	35.6
Fine Sand	2 to 3 Ø	1.7134	6.20
Very Fine Sand	3 to 4 Ø	0.8488	3.07
62.5 µm	4 to 5 Ø	3.1650	11.45
31.3 µm	5 to 6 Ø	2.1450	7.76
15.6 µm	6 to 7 Ø	1.3700	4.95
7.8 µm	7 to 8 Ø	0.8550	3.09
3.9 µm	8 to 9 Ø	0.4800	1.74
1.95 µm	9 to 10 Ø	0.2600	0.94
0.98 µm	> 10 Ø	0.3900	1.41
		24.3310	88.0

Approved By: _____ Date: 12/17/07

12/13/08

LDC #: 18144C6 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/21/08
SDG #: K0710470 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: AL
2nd Reviewer:

METHOD: Ammonia-N (EPA Method 350.1/~~Plumb 5-1981-KCl~~), Total Cyanide (EPA SW846 Method 9012A/SM4500-CN-~~C~~/E), Dissolved Cyanide (SM4500-CN-~~C~~/E), Free Cyanide (ASTM D4282-02), Amendable to Chlorine Cyanide (SM 4500-CN-~~C~~/E), Hexavalent Chromium (EPA SW846 Method 7196A), ~~ORP (ASTM-D1498-76)~~, Particle Size (PSEP), ~~pH (EPA SW846 Method 9045C~~), Sulfide (EPA SW846 Method 9030M/SM4500-S2-D), Total Solids (EPA Method 160.3), DOC (SM5310C), TOC (SM5310C/PSEP Method)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 11/7/07
IIa.	Initial calibration	A	
IIb.	Calibration verification	A	
III.	Blanks	A	
IV	Matrix Spike/Matrix Spike Duplicates	SW	MS/MSD/Dup/TRP
V	Duplicates	A	
VI.	Laboratory control samples	A	LCS
VII.	Sample result verification	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: Sediment + water

1	PCM-02SC-071107 S	11	PCM-02PW-071107DUP W	21		31			
2	PCM-02PW-071107 W	12	PCM-14DS-071107MS S	22		32			
3	PCM-05SC-071107 S	13	PCM-14DS-071107MSD	23		33			
4	PCM-04SC-071107	14	PCM-14DS-071107DUP	24		34			
5	PCM-04PW-071107 W	15	PB	25		35			
6	PCM-14DS-071107 S	16		26		36			
7	PCM-02SC-071107MS	17		27		37			
8	PCM-02SC-071107DUP	18		28		38			
9	PCM-02SC-071107TRP	19		29		39			
10	PCM-02PW-071107MS W	20		30		40			

Notes:

LDC #: 18144C6
SDG #: 460310430

VALIDATION FINDINGS WORKSHEET
Sample Specific Analysis Reference

Page: 1 of 1
Reviewer: CL
2nd reviewer: [illegible]

All circled methods are applicable to each sample.

Sample ID	Parameter
1, 3-4	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK (CN) NH_3 TKN (TOC) CR^{6+} (Tot. Solids) (Part. Sim)
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
2, 5	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK (CN) NH_3 TKN (TOC) CR^{6+} (DOC) (Tot. Sulfide)
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
6	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- (NH_3) TKN (TOC) (CR6+) (Tot. Solids) (Tot. Sulfide) (Part. Sim)
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
QC sample 7, 10, 11	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK (CN) NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
8	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} (Tot. Solids) ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
9	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} (Tot. Solids) ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
12, 14	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- (NH_3) TKN TOC (CR6+) (Tot. Sulfide) ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
13	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC (CR6+) (Tot. Sulfide) ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____
	pH TDS Cl F NO_3 NO_2 SO_4 PO_4 ALK CN^- NH_3 TKN TOC CR^{6+} ____ ____ ____ ____

Comments: _____

LDC #: 18144C6
SDG #: K071047O

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: e!
2nd reviewer: [illegible]

All circled dates have exceeded the technical holding time.
(Y) N N/A Were all samples preserved as applicable to each method ?
(Y) N N/A Were all cooler temperatures within validation criteria?

Method:		7196A	PSEP	300.1			
Parameters:		Cr^{6+}	TOC	Nitrate-N			
Technical holding time:		7 days	14 days	7 days			
Sample ID	Sampling date	Analysis date	Analysis date	Analysis date	Analysis date	Analysis date	Qualifier
6, 12-13, 14	11/7/07	11/28/07		(21 days)			J/A/P
1, 3-4, 6	11/7/07		12/10/07		(33 days)		J/A/P
6, 12, 14	11/7/07			11/19/07	(1x test)		J/W/P

LDC #: 18744C6
SDG #: K0710420

VALIDATION FINDINGS WORKSHEET
Matrix Spike/Matrix Spike Duplicates

Reviewer: AL
2nd Reviewer: L

METHOD: Inorganics, EPA Method Sm Com

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a matrix spike analyzed for each matrix in this SDG?

Y (N) N/A Were matrix spike percent recoveries (%R) within the control limits of ~~75-125?~~ 65-135 If the sample concentration exceeded the spike concentration by a factor of 4 or more, no action was taken.

(Y) N N/A Were all duplicate sample relative percent differences (RPD) ≤ 20% for water samples and ≤35% for soil samples?

LEVEL IV ONLY:

Y N (N/A) Were recalculated results acceptable? See Level IV Recalculation Worksheet for recalculations.

#	MS/MSD ID	Matrix	Analyte	MS %Recovery	MSD %Recovery	RPD (Limits)	Associated Samples	Qualifications
	12/13	Sed	Cr^{6+}	8	24		6	J / A / A
			Tot. Solids	24	22		↓	J / A / A

Comments:

NW Natural Gasco Site
Data Validation Reports
LDC# 18144

GRO

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 5, 2007
LDC Report Date:	January 31, 2008
Matrix:	Sediment
Parameters:	Gasoline Range Organics
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710375

Sample Identification

PCM-09SC-071105
PCM-10SC-071105
PCM-02DS-071105
PCM-06DS-071105
PCM-09DS-071105
PCM-06DS-071105DUP

Introduction

This data review covers 6 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per NWTPH-Gx Method for Gasoline Range Organics.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No gasoline range organic contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Analysis Date	Compound	Concentration	Associated Samples
KWG0712424-3	11/14/07	Gasoline range organics	3.1 mg/Kg	All samples in SDG K0710375

Sarnple concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
PCM-09SC-071105	Gasoline range organics	3.8 mg/Kg	5.8U mg/Kg
PCM-10SC-071105	Gasoline range organics	2.4 mg/Kg	5.8U mg/Kg
PCM-06DS-071105	Gasoline range organics	6.7 mg/Kg	12U mg/Kg
PCM-09DS-071105	Gasoline range organics	5.0 mg/Kg	11U mg/Kg

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to method blank contamination problems, data were qualified as not detected in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Gasoline Range Organics - Data Qualification Summary - SDG K0710375

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG K0710375

SDG	Sample	Compound	Modified Final Concentration	A or P
K0710375	PCM-09SC-071105	Gasoline range organics	5.8U mg/Kg	A
K0710375	PCM-10SC-071105	Gasoline range organics	5.8U mg/Kg	A
K0710375	PCM-06DS-071105	Gasoline range organics	12U mg/Kg	A
K0710375	PCM-09DS-071105	Gasoline range organics	11U mg/Kg	A

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Gasoline Range Organics

Sample Name:	PCM-09SC-071105	**Units:**	mg/Kg
Lab Code:	K0710375-001	**Basis:**	Dry
Extraction Method:	EPA 5035/5030B	**Level:**	Med
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	3.8	J	5.847 5.8	0.70	1	11/13/07	11/14/07	KWG0712424	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	91	50-150	11/14/07	Acceptable

Comments: 61308

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Gasoline Range Organics

Sample Name:	PCM-10SC-071105	**Units:**	mg/Kg
Lab Code:	K0710375-003	**Basis:**	Dry
Extraction Method:	EPA 5035/5030B	**Level:**	Med
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	2.4	J 5.8U7	5.8	0.69	1	11/13/07	11/14/07	KWG0712424	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	95	50-150	11/14/07	Acceptable

Comments: KS 13 08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Gasoline Range Organics

Sample Name:	PCM-02DS-071105	**Units:**	mg/Kg
Lab Code:	K0710375-004	**Basis:**	Dry
Extraction Method:	EPA 5035/5030B	**Level:**	Med
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	24	Z	12	1.4	1	11/13/07	11/14/07	KWG0712424	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	71	50-150	11/14/07	Acceptable

Comments: 11/13/07

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Casco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Gasoline Range Organics

Sample Name:	PCM-06DS-071105	**Units:**	mg/Kg
Lab Code:	K0710375-005	**Basis:**	Dry
Extraction Method:	EPA 5035/5030B	**Level:**	Med
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q		MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	6.7	J	1247	12	1.4	1	11/13/07	11/14/07	KWG0712424	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	77	50-150	11/14/07	Acceptable

Comments: 11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17 4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Gasoline Range Organics

Sample Name:	PCM-09DS-071105	**Units:**	mg/Kg
Lab Code:	K0710375-006	**Basis:**	Dry
Extraction Method:	EPA 5035/5030B	**Level:**	Med
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q		MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	5.0	J	1147	11	1.3	1	11/13/07	11/14/07	KWG0712424	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	79	50-150	11/14/07	Acceptable

Comments: 11/13/08

LDC #: 18144A7 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/30/08
SDG #: K0710375 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: Q
2nd Reviewer:

METHOD: Gasoline Range Organics (NWTPH-Gx)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/5/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	%R 15/0
III.	Blanks	SW	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates /DUP	N/A	client spiked
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples:
11 soils

1	PCM-09SC-071105	11	KWG0712424-3	21		31	
2	PCM-10SC-071105	12		22		32	
3	PCM-02DS-071105	13		23		33	
4	PCM-06DS-071105	14		24		34	
5	PCM-09DS-071105	15		25		35	
6	PCM-06DS-071105DUP	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes:

LDC #: 18144A7
SDG #: K071037S

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: Q
2nd Reviewer: K

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a given method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
Y N N/A Was a method blank performed with each extraction batch?
Y N N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Level IV/D Only

Y N N/A (Gasoline and aromatics only)Was a method blank analyzed with each 24 hour batch?
Y N N/A Was a method blank analyzed for each analytical / extraction batch of ≤20 samples?

Blank extraction date: ___ **Blank analysis date:** 11/14/07 **Associated samples:** MN

Conc. units: mg/kg

Compound	Blank ID	Sample Identification						
	KWG071424-3	1	2	3	4	5		
GRO	3.1	3.8/5.8U	2.4/5.8U	(24)	6.7/12U	5.0/11U		

Blank extraction date: ___ **Blank analysis date:** ___ **Associated samples:** ___

Conc. units: ___

Compound	Blank ID	Sample Identification						

ALL CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 8, 2007
LDC Report Date:	January 31, 2008
Matrix:	Sediment/Water
Parameters:	Gasoline Range Organics
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710558

Sample Identification

PCM-08SC-071108
PCM-SCRB-071108
PCM-BRB-071108

Introduction

This data review covers one sediment sample and 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per NWTPH-Gx Method for Gasoline Range Organics.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No gasoline range organic contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Analysis Date	Compound	Concentration	Associated Samples
KWG0712648-4	11/19/07	Gasoline range organics	1.2 mg/Kg	All sediment samples in SDG K0807031

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
PCM-08SC-071108	Gasoline range organics	2.9 mg/Kg	6.1U mg/Kg

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to method blank contamination problems, data were qualified as not detected in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

Samples PCM-SCRB-071108 and PCM-BRB-071108 were identified as rinsate blanks. No gasoline range organic contaminants were found in these blanks with the following exceptions:

Rinsate Blank ID	Compound	Concentration (ug/L)
PCM-SCRB-071108	Gasoline range organics	17
PCM-BRB-071108	Gasoline range organics	15

NW Natural Gasco Site
Gasoline Range Organics - Data Qualification Summary - SDG K0710558

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG K0710558

SDG	Sample	Compound	Modified Final Concentration	A or P
K0710558	PCM-08SC-071108	Gasoline range organics	6.1U mg/Kg	A

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Sediment	**Date Received:**	11/09/2007

Gasoline Range Organics

Sample Name:	PCM-08SC-071108	**Units:**	mg/Kg
Lab Code:	K0710558-012	**Basis:**	Dry
Extraction Method:	EPA 5035/5030B	**Level:**	Med
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q		MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	2.9	J	6.147	6.1	0.74	1	11/19/07	11/20/07	KWG0712648	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	92	50-150	11/20/07	Acceptable

Comments: 70B108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Gasoline Range Organics

Sample Name:	PCM-SCRB-071108	**Units:**	ug/L
Lab Code:	K0710558-015	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	17	J	250	13	1	11/19/07	11/19/07	KWG0712740	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	92	50-150	11/19/07	Acceptable

Comments: 11/21/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Gasoline Range Organics

Sample Name:	PCM-BRB-071108	**Units:**	ug/L
Lab Code:	K0710558-018	**Basis:**	NA
Extraction Method:	EPA 5030B	**Level:**	Low
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	**15**	J	250	13	1	11/19/07	11/19/07	KWG0712740	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
1,4-Difluorobenzene	95	50-150	11/19/07	Acceptable

Comments: PCO 3108

LDC #: 18144B7 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/30/08
SDG #: K0710558 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Gasoline Range Organics (NWTPH-Gx)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/8/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	15/0
III.	Blanks	SW	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	client specified
IVc.	Laboratory control samples	A	LCS/D
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	SW	FB = 2 . 3

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	PCM-08SC-071108 Soil	11	KWF0712740-4	21		31	
2	PCM-SCRB-071108 W	12	KWF0712648-4	22		32	
3	PCM-BRB-071108 ✓	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 18144B7
SDG #: K071055

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a given method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
Y N N/A Was a method blank performed with each extraction batch?
Y N N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Level IV/D Only

Y N N/A (Gasoline and aromatics only)Was a method blank analyzed with each 24 hour batch?
Y N N/A Was a method blank analyzed for each analytical / extraction batch of ≤20 samples?

Blank extraction date: ___ **Blank analysis date:** 11/17/07 **Associated samples:** Mseds
Conc. units: MG/KG

Compound	Blank ID	Sample Identification						
[illegible]	KWG071648-4		1					
GRO	1.2		2.9/6.4					

Blank extraction date: ___ **Blank analysis date:** ___ **Associated samples:** ___
Conc. units: ___

Compound	Blank ID	Sample Identification						
[illegible]								

ALL CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

LDC #: 18144B7
SDG #: K0710558

VALIDATION FINDINGS WORKSHEET
Field Blanks

Page: 1 of 1
Reviewer: A
2nd reviewer: M

METHOD: GC/~~MS VOA (EPA SW 846 Method 8260B)~~

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds detected in the field blanks?

Sample: 2 Field Blank / Trip Blank / Rinsate / Other RB (circle one)

Compound	Concentration Units (ug/L)
4RU	17

Sample: 3 Field Blank / Trip Blank / Rinsate / Other RB (circle one)

Compound	Concentration Units (ug/L)
4RO	15

Sample: _____ Field Blank / Trip Blank / Rinsate / Other _____ (circle one)

Compound	Concentration Units ( )

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 7, 2007
LDC Report Date:	January 31, 2008
Matrix:	Sediment
Parameters:	Gasoline Range Organics
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710470

Sample Identification

PCM-02SC-071107
PCM-05SC-071107
PCM-04SC-071107
PCM-14DS-071107
PCM-02SC-071107DUP

Introduction

This data review covers 5 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per NWTPH-Gx Method for Gasoline Range Organics.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No gasoline range organic contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Analysis Date	Compound	Concentration	Associated Samples
KWG0712648-4	11/19/07	Gasoline range organics	1.2 mg/Kg	All samples in SDG K0710470

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>5X blank contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound	Reported Concentration	Modified Final Concentration
PCM-02SC-071107	Gasoline range organics	1.9 mg/Kg	6.0U mg/Kg
PCM-05SC-071107	Gasoline range organics	3.3 mg/Kg	6.0U mg/Kg
PCM-04SC-071107	Gasoline range organics	3.9 mg/Kg	6.2U mg/Kg
PCM-14DS-071107	Gasoline range organics	4.2 mg/Kg	8.8U mg/Kg

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to method blank contamination problems, data were qualified as not detected in four samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Gasoline Range Organics - Data Qualification Summary - SDG K0710470

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Gasoline Range Organics - Laboratory Blank Data Qualification Summary - SDG K0710470

SDG	Sample	Compound	Modified Final Concentration	A or P
K0710470	PCM-02SC-071107	Gasoline range organics	6.0U mg/Kg	A
K0710470	PCM-05SC-071107	Gasoline range organics	6.0U mg/Kg	A
K0710470	PCM-04SC-071107	Gasoline range organics	6.2U mg/Kg	A
K0710470	PCM-14DS-071107	Gasoline range organics	8.8U mg/Kg	A

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Gasoline Range Organics

Sample Name:	PCM-02SC-071107	**Units:**	mg/Kg
Lab Code:	K0710470-001	**Basis:**	Dry
Extraction Method:	EPA 5035/5030B	**Level:**	Med
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	1.9	J6.047	6.0	0.72	1	11/19/07	11/19/07	KWG0712648	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	91	50-150	11/19/07	Acceptable

Comments: SL 11/30/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Gasoline Range Organics

Sample Name:	PCM-05SC-071107	**Units:**	mg/Kg
Lab Code:	K0710470-003	**Basis:**	Dry
Extraction Method:	EPA 5035/5030B	**Level:**	Med
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	3.3	J b0U7	6.0	0.72	1	11/19/07	11/20/07	KWG0712648	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	90	50-150	11/20/07	Acceptable

Comments: 8/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Gasoline Range Organics

Sample Name:	PCM-04SC-071107	**Units:**	mg/Kg
Lab Code:	K0710470-004	**Basis:**	Dry
Extraction Method:	EPA 5035/5030B	**Level:**	Med
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	3.9	J 6.247	6.2	0.74	1	11/19/07	11/20/07	KWG0712648	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	94	50-150	11/20/07	Acceptable

Comments: SC 1/3/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring; Year 1/000029-02 B612 T17 4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Gasoline Range Organics

Sample Name:	PCM-14DS-071107	**Units:**	mg/Kg
Lab Code:	K0710470-006	**Basis:**	Dry
Extraction Method:	EPA 5035/5030B	**Level:**	Med
Analysis Method:	NWTPH-Gx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Gasoline Range Organics-NWTPH	4.2	J	8.8	1.1	1	11/19/07	11/20/07	KWG0712648	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromofluorobenzene	83	50-150	11/20/07	Acceptable

Comments: 8/23/08

LDC #: 18144C7 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/30/08
SDG #: K0710470 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: Gasoline Range Organics (NWTPH-Gx)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/7/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	1570
III.	Blanks	SW	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates /DUP	N/A	client specified
IVc.	Laboratory control samples	A	LCS/8
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:
MS ed S

1	PCM-02SC-071107	11	SW	21		31	
2	PCM-05SC-071107	12		22		32	
3	PCM-04SC-071107	13		23		33	
4	PCM-14DS-071107	14		24		34	
5	PCM-02SC-071107DUP	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 18144CT
SDG #: K0710470

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: 9
2nd Reviewer: U

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were all samples associated with a given method blank?
Y N N/A Was a method blank performed for each matrix and whenever a sample extraction procedure was performed?
Y N N/A Was a method blank performed with each extraction batch?
Y N N/A Were any contaminants found in the method blanks? If yes, please see findings below.

Level IV/D Only

Y N N/A (Gasoline and aromatics only)Was a method blank analyzed with each 24 hour batch?
Y N N/A Was a method blank analyzed for each analytical / extraction batch of ≤20 samples?

Blank extraction date: — **Blank analysis date:** 11/19/07 **Associated samples:** MM
Conc. units: mg/kg

Compound	Blank ID	Sample Identification						
KWG0712648-4		1	2	3	4			
GRO	1.2	1.9/6.0U	3.3/6.0U	3.9/6.2U	4.2/8.8U			

Blank extraction date: _____ **Blank analysis date:** _____ **Associated samples:** _____
Conc. units: _____

Compound	Blank ID	Sample Identification						

ALL CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
All contaminants within five times the method blank concentration were qualified as not detected, "U".

NW Natural Gasco Site
Data Validation Reports
LDC# 18144

DRO & RRO

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 5, 2007
LDC Report Date:	January 31, 2008
Matrix:	Sediment
Parameters:	Diesel Range Organics & Residual Range Organics
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710375

Sample Identification

PCM-09SC-071105
PCM-10SC-071105
PCM-02DS-071105
PCM-06DS-071105
PCM-09DS-071105
PCM-10SC-071105DUP

Introduction

This data review covers 6 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per NWTPH-Dx Method for Diesel Range Organics and Residual Range Organics.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No diesel range organic or residual range organic contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

Duplicate (DUP) sample analyses were reviewed for each matrix as applicable. Results were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the level III data validation all results are considered valid and usable for all purposes.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Diesel Range Organics & Residual Range Organics - Data Qualification Summary - SDG K0710375

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Diesel Range Organics & Residual Range Organics - Laboratory Blank Data Qualification Summary - SDG K0710375

No Sample Data Qualified in this SDG

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Diesel and Residual Range Organics

Sample Name:	PCM-09SC-071105	**Units:**	mg/Kg
Lab Code:	K0710375-001	**Basis:**	Dry
Extraction Method:	EPA 3550B	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	74	Z	12	1.5	1	11/08/07	11/09/07	KWG0712228	
Residual Range Organics (RRO)	64	J	120	3.5	1	11/08/07	11/09/07	KWG0712228	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	100	50-150	11/09/07	Acceptable
n-Triacontane	125	50-150	11/09/07	Acceptable

Comments: K0B108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Diesel and Residual Range Organics

Sample Name:	PCM-10SC-071105	**Units:**	mg/Kg
Lab Code:	K0710375-003	**Basis:**	Dry
Extraction Method:	EPA 3550B	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**19**	Z	12	1.4	1	11/08/07	11/14/07	KWG0712228	
Residual Range Organics (RRO)	**23**	J	120	3.4	1	11/08/07	11/14/07	KWG0712228	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	109	50-150	11/14/07	Acceptable
n-Triacontane	142	50-150	11/14/07	Acceptable

Comments: R0713108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Diesel and Residual Range Organics

Sample Name:	PCM-02DS-071105	**Units:**	mg/Kg
Lab Code:	K0710375-004	**Basis:**	Dry
Extraction Method:	EPA 3550B	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	4100	DZ	300	15	5	11/08/07	11/10/07	KWG0712228	
Residual Range Organics (RRO)	3700	DZ	1200	35	5	11/08/07	11/10/07	KWG0712228	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	132	50-150	11/10/07	Acceptable
n-Triacontane	114	50-150	11/10/07	Acceptable

Comments: 12/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Diesel and Residual Range Organics

Sample Name:	PCM-06DS-071105	**Units:**	mg/Kg
Lab Code:	K0710375-005	**Basis:**	Dry
Extraction Method:	EPA 3550B	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**190**	H	57	2.8	1	11/08/07	11/14/07	KWG0712228	
Residual Range Organics (RRO)	**730**	O	230	6.7	1	11/08/07	11/14/07	KWG0712228	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	102	50-150	11/14/07	Acceptable
n-Triacontane	113	50-150	11/14/07	Acceptable

Comments: RC 12/3/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Diesel and Residual Range Organics

Sample Name:	PCM-09DS-071105	**Units:**	mg/Kg
Lab Code:	K0710375-006	**Basis:**	Dry
Extraction Method:	EPA 3550B	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**260**	H	55	2.7	1	11/08/07	11/14/07	KWG0712228	
Residual Range Organics (RRO)	**840**	O	220	6.4	1	11/08/07	11/14/07	KWG0712228	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	104	50-150	11/14/07	Acceptable
n-Triacontane	116	50-150	11/14/07	Acceptable

Comments: 0131108

LDC #: 18144A8

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 1/30/08
Page: 1 of 1
Reviewer: Q
2nd Reviewer: N

SDG #: K0710375
Laboratory: Columbia Analytical Services

METHOD: Diesel Range Organics & Residual Range Organics (NWTPH-Dx)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/5/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	1571
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates/DUP	N/A	client specified.
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:
All Soils

1	PCM-09SC-071105	11	KW60T12228-6	21		31	
2	PCM-10SC-071105	12		22		32	
3	PCM-02DS-071105	13		23		33	
4	PCM-06DS-071105	14		24		34	
5	PCM-09DS-071105	15		25		35	
6	PCM-10SC-071105DUP	16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 8, 2007
LDC Report Date:	January 31, 2008
Matrix:	Sediment/Water
Parameters:	Diesel Range Organics & Residual Range Organics
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710558

Sample Identification

PCM-08SC-071108
PCM-SCRB-071108
PCM-BRB-071108

Introduction

This data review covers one sediment sample and 2 water samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per NWTPH-Dx Method for Diesel Range Organics and Residual Range Organics.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No diesel range organic or residual range organic contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the level III data validation all results are considered valid and usable for all purposes.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

Samples PCM-SCRB-071108 and PCM-BRB-071108 were identified as rinsate blanks. No diesel range organic or residual range organic contaminants were found in these blanks with the following exceptions:

Rinsate Blank ID	Compound	Concentration (ug/L)
PCM-SCRB-071108	Diesel range organics Residual range organics	21 23
PCM-BRB-071108	Diesel range organics Residual range organics	15 19

NW Natural Gasco Site
Diesel Range Organics & Residual Range Organics - Data Qualification Summary - SDG K0710558

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Diesel Range Organics & Residual Range Organics - Laboratory Blank Data Qualification Summary - SDG K0710558

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Sediment	**Date Received:**	11/09/2007

Diesel and Residual Range Organics

Sample Name:	PCM-08SC-071108	**Units:**	mg/Kg
Lab Code:	K0710558-012	**Basis:**	Dry
Extraction Method:	EPA 3550B	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**140**	Z	31	1.5	1	11/13/07	11/16/07	KWG0712327	
Residual Range Organics (RRO)	**120**	J	130	3.7	1	11/13/07	11/16/07	KWG0712327	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	91	50-150	11/16/07	Acceptable
n-Triacontane	99	50-150	11/16/07	Acceptable

Comments: K0713108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Diesel and Residual Range Organics

Sample Name:	PCM-SCRB-071108	**Units:**	ug/L
Lab Code:	K0710558-015	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**21**	J	270	12	1	11/14/07	11/17/07	KWG0712411	
Residual Range Organics (RRO)	**23**	J	530	21	1	11/14/07	11/17/07	KWG0712411	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	84	50-150	11/17/07	Acceptable
n-Triacontane	82	50-150	11/17/07	Acceptable

Comments: 11/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710558
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T127.4	**Date Collected:**	11/08/2007
Sample Matrix:	Water	**Date Received:**	11/09/2007

Diesel and Residual Range Organics

Sample Name:	PCM-BRB-071108	**Units:**	ug/L
Lab Code:	K0710558-018	**Basis:**	NA
Extraction Method:	EPA 3510C	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	15	J	250	11	1	11/14/07	11/17/07	KWG0712411	
Residual Range Organics (RRO)	19	J	500	19	1	11/14/07	11/17/07	KWG0712411	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	96	50-150	11/17/07	Acceptable
n-Triacontane	94	50-150	11/17/07	Acceptable

Comments: R 01/31/08

LDC #: 18144B8 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/30/08
SDG #: K0710558 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: 9
2nd Reviewer: M

METHOD: Diesel Range Organics & Residual Range Organics (NWTPH-Dx)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/8/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	FC 1570
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	client spikied.
IVc.	Laboratory control samples	A	LCS/D
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	SW	RB=2 of 3

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	PCM-08SC-071108 soil	11	KWG0712411-5	21		31	
2	PCM-SCRB-071108 W	12	KWG0712327-4	22		32	
3	PCM-BRB-071108 W	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 184438
SDG #: K071055 8

VALIDATION FINDINGS WORKSHEET
Field Blanks

Reviewer: 9
2nd reviewer: 1

METHOD: GC/~~MS BNA~~ ~~(EPA SW 846 Method 8270)~~

Y N N/A Were field blanks identified in this SDG?
Y N N/A Were target compounds identified in the field blanks?

Sample: 2 Field Blank / Trip Blank / Rinsate (circle one) (FB)

Compound	Concentration Units (ug/L)
DRO	21
RRO	23

Sample: 3 Field Blank / Trip Blank / Rinsate (circle one) (FB)

Compound	Concentration Units (ug/L)
DRO	15
RRO	19

Sample: _____ Field Blank / Trip Blank / Rinsate (circle one)

Compound	Concentration Units ( )

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 7, 2007
LDC Report Date:	January 31, 2008
Matrix:	Sediment
Parameters:	Diesel Range Organics & Residual Range Organics
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710470

Sample Identification

PCM-02SC-071107
PCM-05SC-071107
PCM-04SC-071107
PCM-14DS-071107

Introduction

This data review covers 4 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per NWTPH-Dx Method for Diesel Range Organics and Residual Range Organics.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed as required by the method.

The percent relative standard deviations (%RSD) of calibration factors for compounds were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at required frequencies. The percent differences (%D) of amounts in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No diesel range organic or residual range organic contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the level III data validation all results are considered valid and usable for all purposes.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Diesel Range Organics & Residual Range Organics - Data Qualification Summary - SDG K0710470

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Diesel Range Organics & Residual Range Organics - Laboratory Blank Data Qualification Summary - SDG K0710470

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17 4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Diesel and Residual Range Organics

Sample Name:	PCM-02SC-071107	**Units:**	mg/Kg
Lab Code:	K0710470-001	**Basis:**	Dry
Extraction Method:	EPA 3550B	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**11**	J	12	1.5	1	11/13/07	11/16/07	KWG0712327	
Residual Range Organics (RRO)	**9.9**	J	120	3.5	1	11/13/07	11/16/07	KWG0712327	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	87	50-150	11/16/07	Acceptable
n-Triacontane	90	50-150	11/16/07	Acceptable

Comments: 8/13/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Diesel and Residual Range Organics

Sample Name:	PCM-05SC-071107	**Units:**	mg/Kg
Lab Code:	K0710470-003	**Basis:**	Dry
Extraction Method:	EPA 3550B	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	81	Z	13	1.5	1	11/13/07	11/16/07	KWG0712327	
Residual Range Organics (RRO)	85	J	130	3.6	1	11/13/07	11/16/07	KWG0712327	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	90	50-150	11/16/07	Acceptable
n-Triacontane	96	50-150	11/16/07	Acceptable

Comments: R 3/3/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Diesel and Residual Range Organics

Sample Name:	PCM-04SC-071107	**Units:**	mg/Kg
Lab Code:	K0710470-004	**Basis:**	Dry
Extraction Method:	EPA 3550B	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**140**	Z	13	1.5	1	11/13/07	11/16/07	KWG0712327	
Residual Range Organics (RRO)	**130**	Z	130	3.7	1	11/13/07	11/16/07	KWG0712327	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	89	50-150	11/16/07	Acceptable
n-Triacontane	95	50-150	11/16/07	Acceptable

Comments: SC 12/3/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Diesel and Residual Range Organics

Sample Name:	PCM-14DS-071107	**Units:**	mg/Kg
Lab Code:	K0710470-006	**Basis:**	Dry
Extraction Method:	EPA 3550B	**Level:**	Low
Analysis Method:	NWTPH-Dx		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Diesel Range Organics (DRO)	**69**	Z	44	2.2	1	11/13/07	11/16/07	KWG0712327	
Residual Range Organics (RRO)	**240**	Z	180	5.1	1	11/13/07	11/16/07	KWG0712327	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
o-Terphenyl	87	50-150	11/16/07	Acceptable
n-Triacontane	93	50-150	11/16/07	Acceptable

Comments: 12/10/08

LDC #: 18144C8 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/30/08
SDG #: K0710470 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: a
2nd Reviewer: 1

METHOD: Diesel Range Organics & Residual Range Organics (NWTPH-Dx)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/7/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	15/0
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	client specified
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	PCM-02SC-071107 Sed	11	KWG0712337-4	21		31	
2	PCM-05SC-071107	12		22		32	
3	PCM-04SC-071107	13		23		33	
4	PCM-14DS-071107	14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

NW Natural Gasco Site
Data Validation Reports
LDC# 18144

Butyltins

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NW Natural Gasco Site

Collection Date: November 5, 2007

LDC Report Date: January 31, 2008

Matrix: Sediment

Parameters: Butyltins

Validation Level: EPA Level III

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): K0710375

Sample Identification

PCM-02DS-071105
PCM-06DS-071105
PCM-09DS-071105

Introduction

This data review covers 3 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per Krone Method for Butyltins.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and the confirmation column as required by this method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at the required frequencies.

The percent differences (%D) of continuing standard mixtures were within the 25.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No butyltin contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

The sample results for detected compounds from the two columns were within 40% relative percent difference (RPD) with the following exceptions:

Sample	Compound	RPD	Flag	A or P
PCM-09DS-071105	Tri-n-butyltin	47.1	J (all detects)	A

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to compound quantitation RPD problems, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Butyltins - Data Qualification Summary - SDG K0710375

SDG	Sample	Compound	Flag	A or P	Reason
K0710375	PCM-09DS-071105	Tri-n-butyltin	J (all detects)	A	Compound quantitation and CRQLs (RPD)

NW Natural Gasco Site
Butyltins - Laboratory Blank Data Qualification Summary - SDG K0710375

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Butyltins (as cation)

Sample Name:	PCM-02DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-004	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	Krone		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.3	0.17	1	11/13/07	11/19/07	KWG0712329	
Tri-n-butyltin	**2.0**	J	2.3	0.14	1	11/13/07	11/19/07	KWG0712329	
Di-n-butyltin	**1.2**	J	2.3	0.066	1	11/13/07	11/19/07	KWG0712329	
n-Butyltin	ND	U	2.3	0.071	1	11/13/07	11/19/07	KWG0712329	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	44	10-116	11/19/07	Acceptable

Comments: 11/21/08

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Butyltins (as cation)

Sample Name:	PCM-06DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-005	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	Krone		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.3	0.17	1	11/13/07	11/19/07	KWG0712329	
Tri-n-butyltin	**2.6**		2.3	0.13	1	11/13/07	11/19/07	KWG0712329	
Di-n-butyltin	**1.5**	J	2.3	0.065	1	11/13/07	11/19/07	KWG0712329	
n-Butyltin	**0.64**	J	2.3	0.070	1	11/13/07	11/19/07	KWG0712329	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	59	10-116	11/19/07	Acceptable

Comments: L013108

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Butyltins (as cation)

Sample Name:	PCM-09DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-006	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	Krone		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	2.2	0.16	1	11/13/07	11/19/07	KWG0712329	
Tri-n-butyltin	**2.1**	JP~~J~~ 12	2.2	0.13	1	11/13/07	11/19/07	KWG0712329	
Di-n-butyltin	**1.7**	J	2.2	0.062	1	11/13/07	11/19/07	KWG0712329	
n-Butyltin	**0.81**	J	2.2	0.066	1	11/13/07	11/19/07	KWG0712329	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	54	10-116	11/19/07	Acceptable

Comments: 11/13/08

LDC #: 18144A19 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/30/08
SDG #: K0710375 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: Q
2nd Reviewer: [illegible]

METHOD: GC Butyltins (Krone Method)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/5/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	25%
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	client specified.
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	SW	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	PCM-02DS-071105 sed	11	KW-60712379-4	21		31	
2	PCM-06DS-071105	12		22		32	
3	PCM-09DS-071105	13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

LDC #: 18144A19
SDG #: K071037S

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: 9
2nd Reviewer: 4

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y N N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	RPD %D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	Tri-n-butyltin	3	47.1	Jdets / A

Comments: _____

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 7, 2007
LDC Report Date:	January 31, 2008
Matrix:	Sediment
Parameters:	Butyltins
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710470

Sample Identification

PCM-14DS-071107

Introduction

This data review covers one sediment sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per Krone Method for Butyltins.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and the confirmation column as required by this method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% .

b. Calibration Verification

Calibration verification was performed at the required frequencies.

The percent differences (%D) of continuing standard mixtures were within the 25.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No butyltin contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

The quality control criteria reviewed were met and are considered acceptable. Based upon the level III data validation all results are considered valid and usable for all purposes.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Butyltins - Data Qualification Summary - SDG K0710470

No Sample Data Qualified in this SDG

NW Natural Gasco Site
Butyltins - Laboratory Blank Data Qualification Summary - SDG K0710470

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Butyltins (as cation)

Sample Name:	PCM-14DS-071107	**Units:**	ug/Kg
Lab Code:	K0710470-006	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	Krone		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
Tetra-n-butyltin	ND	U	1.8	0.13	1	11/13/07	11/20/07	KWG0712329	
Tri-n-butyltin	**3.7**		1.8	0.099	1	11/13/07	11/20/07	KWG0712329	
Di-n-butyltin	**1.7**	J	1.8	0.050	1	11/13/07	11/20/07	KWG0712329	
n-Butyltin	**0.74**	J	1.8	0.053	1	11/13/07	11/20/07	KWG0712329	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
Tri-n-propyltin	63	10-116	11/20/07	Acceptable

Comments: 11/13/08

LDC #: 18144C19 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/30/08
SDG #: K0710470 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: Q
2nd Reviewer: A

METHOD: GC Butyltins (Krone Method)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/7/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	%R x570
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	N	client specific.
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	PCM-14DS-071107 Sed	11	K	21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

NW Natural Gasco Site
Data Validation Reports
LDC# 18144

Chlorinated Phenols

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name: NW Natural Gasco Site

Collection Date: November 5, 2007

LDC Report Date: January 31, 2008

Matrix: Sediment

Parameters: Phenols

Validation Level: EPA Level III

Laboratory: Columbia Analytical Services, Inc.

Sample Delivery Group (SDG): K0710375

Sample Identification

PCM-02DS-071105
PCM-06DS-071105
PCM-09DS-071105
PCM-09DS-071105MS
PCM-09DS-071105MSD

Introduction

This data review covers 5 sediment samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8151M for Phenols.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

b. Calibration Verification

Calibration verification was performed at the required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No phenol contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

The sample results for detected compounds from the two columns were within 40% relative percent difference with the following exceptions:

Sample	Compound	%D	Flag	A or P
PCM-02DS-071105	2,4,6-Trichlorophenol 2,3,5,6-Tetrachlorophenol	73.3 70.8	J (all detects) J (all detects)	A
PCM-06DS-071105	2,3,5,6-Tetrachlorophenol Pentachlorophenol	55.9 63.7	J (all detects) J (all detects)	A

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

Data flags are summarized at the end of this report if data has been qualified.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

The sample results for detected compounds from the two columns were within 40% relative percent difference with the following exceptions:

Sample	Compound	%D	Flag	A or P
PCM-02DS-071105	2,4,6-Trichlorophenol 2,3,5,6-Tetrachlorophenol	73.3 70.8	J (all detects) J (all detects)	A
PCM-06DS-071105	2,3,5,6-Tetrachlorophenol Pentachlorophenol	55.9 63.7	J (all detects) J (all detects)	A

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to compound quantitation RPD problems, data were qualified as estimated in two samples.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Phenols - Data Qualification Summary - SDG K0710375

SDG	Sample	Compound	Flag	A or P	Reason
K0710375	PCM-02DS-071105	2,4,6-Trichlorophenol 2,3,5,6-Tetrachlorophenol	J (all detects) J (all detects)	A	Compound quantitation and CRQLs (RPD)
K0710375	PCM-06DS-071105	2,3,5,6-Tetrachlorophenol Pentachlorophenol	J (all detects) J (all detects)	A	Compound quantitation and CRQLs (RPD)

NW Natural Gasco Site
Phenols - Laboratory Blank Data Qualification Summary - SDG K0710375

No Sample Data Qualified in this SDG

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Chlorinated Phenols

Sample Name:	PCM-02DS-071105	**Units:**	ng/Kg
Lab Code:	K0710375-004	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
2,4,6-Trichlorophenol	**0.38**	JP J|2	12	0.25	1	11/13/07	12/12/07	KWG0712416	
2,4,5-Trichlorophenol	ND	U	12	1.3	1	11/13/07	12/12/07	KWG0712416	
2,3,4,5-Tetrachlorophenol	ND	Ui	12	1.8	1	11/13/07	12/12/07	KWG0712416	
2,3,5,6-Tetrachlorophenol†	**0.62**	JP J|2	12	0.39	1	11/13/07	12/12/07	KWG0712416	
Pentachlorophenol	**3.4**	J	12	0.37	1	11/13/07	12/12/07	KWG0712416	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	103	21-128	12/12/07	Acceptable

† Analyte Comments

11/12/08

2,3,5,6-Tetrachlorophenol	This analyte cannot be separated from 2,3,4,6-Tetrachlorophenol.

Comments:

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Chlorinated Phenols

Sample Name:	PCM-06DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-005	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
2,4,6-Trichlorophenol	ND	U	12	0.25	1	11/13/07	12/12/07	KWG0712416	
2,4,5-Trichlorophenol	ND	U	12	1.3	1	11/13/07	12/12/07	KWG0712416	
2,3,4,5-Tetrachlorophenol	ND	U	12	0.48	1	11/13/07	12/12/07	KWG0712416	
2,3,5,6-Tetrachlorophenol†	**0.87**	JP J|2	12	0.39	1	11/13/07	12/12/07	KWG0712416	
Pentachlorophenol	**12**	P ↓	12	0.36	1	11/13/07	12/12/07	KWG0712416	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	89	21-128	12/12/07	Acceptable

† Analyte Comments

12/31/08

2,3,5,6-Tetrachlorophenol	This analyte cannot be separated from 2,3,4,6-Tetrachlorophenol.

Comments:

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710375
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/05/2007
Sample Matrix:	Sediment	**Date Received:**	11/06/2007

Chlorinated Phenols

Sample Name:	PCM-09DS-071105	**Units:**	ug/Kg
Lab Code:	K0710375-006	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
2,4,6-Trichlorophenol	ND	U	11	0.23	1	11/13/07	12/12/07	KWG0712416	
2,4,5-Trichlorophenol	ND	U	11	1.2	1	11/13/07	12/12/07	KWG0712416	
2,3,4,5-Tetrachlorophenol	ND	U	11	0.43	1	11/13/07	12/12/07	KWG0712416	
2,3,5,6-Tetrachlorophenol†	ND	U	11	0.35	1	11/13/07	12/12/07	KWG0712416	
Pentachlorophenol	ND	Ui	11	3.7	1	11/13/07	12/12/07	KWG0712416	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	71	21-128	12/12/07	Acceptable

† Analyte Comments

12/13/08

2,3,5,6-Tetrachlorophenol	This analyte cannot be separated from 2,3,4,6-Tetrachlorophenol.

Comments:

LDC #: 18144A33 **VALIDATION COMPLETENESS WORKSHEET** Date: 1/30/08
SDG #: K0710375 Level III Page: 1 of 1
Laboratory: Columbia Analytical Services Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Phenols (EPA SW 846 Method 8151M)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/5/07
IIa.	Initial calibration	A	20%
IIb.	Calibration verification/ICV	A	15%
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	SW N	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:
MI soils

1	PCM-02DS-071105	11	KW4070724164	21		31	
2	PCM-06DS-071105	12		22		32	
3	PCM-09DS-071105	13		23		33	
4	PCM-09DS-071105MS	14		24		34	
5	PCM-09DS-071105MSD	15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

VALIDATION FINDINGS WORKSHEET

METHOD: GC/~~MS BNA (EPA SW 846 Method 8270)~~

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT. 2.3.5.6-Tetrachlorophenol
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 18144A33
SDG #: K0710375

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: A
2nd Reviewer: [illegible]

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/D Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y N N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	%D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	Y	1	73.3	✓ dets / A
	TTT		70.8	
	TTT	~~1~~ 2	55.9	
	TT		63.7	✓

Comments: _____

COMQUA%DNew.wpd

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	November 7, 2007
LDC Report Date:	February 1, 2008
Matrix:	Sediment
Parameters:	Phenols
Validation Level:	EPA Level III
Laboratory:	Columbia Analytical Services, Inc.
Sample Delivery Group (SDG):	K0710470

Sample Identification

PCM-14DS-071107

Introduction

This data review covers one sediment sample listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per EPA SW 846 Method 8151M for Phenols.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section III.

Field duplicates are summarized in Section IX.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met.

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. Calibration

a. Initial Calibration

Initial calibration of compounds was performed for the primary (quantitation) column and confirmation column as required by this method.

The percent relative standard deviations (%RSD) were less than or equal to 20.0% for all compounds.

b. Calibration Verification

Calibration verification was performed at the required frequencies.

The percent differences (%D) of calibration factors in continuing standard mixtures were within the 15.0% QC limits.

The percent differences (%D) of the second source calibration standard were less than or equal to 15.0% for all compounds.

III. Blanks

Method blanks were reviewed for each matrix as applicable. No phenol contaminants were found in the method blanks.

IV. Accuracy and Precision Data

a. Surrogate Recovery

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

b. Matrix Spike/(Matrix Spike) Duplicates

Matrix spike (MS) and matrix spike duplicate (MSD) samples were reviewed for each matrix as applicable. Percent recoveries (%R) and relative percent differences (RPD) were within QC limits.

c. Laboratory Control Samples

Laboratory control samples were reviewed for each matrix as applicable. Percent recoveries (%R) were within QC limits.

V. Target Compound Identification

Raw data were not reviewed for this SDG.

VI. Compound Quantitation and CRQLs

The sample results for detected compounds from the two columns were within 40% relative percent difference with the following exceptions:

Sample	Compound	%D	Flag	A or P
PCM-14DS-071107	2,4,6-Trichlorophenol	44.9	J (all detects)	A

Raw data were not reviewed for this SDG.

VII. System Performance

Raw data were not reviewed for this SDG.

VIII. Overall Assessment of Data

The analysis was conducted within all specifications of the method. No results were rejected in this SDG.

Due to compound quantitation RPD problems, data were qualified as estimated in one sample.

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

IX. Field Duplicates

No field duplicates were identified in this SDG.

X. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Phenols - Data Qualification Summary - SDG K0710470

SDG	Sample	Compound	Flag	A or P	Reason
K0710470	PCM-14DS-071107	2,4,6-Trichlorophenol	J (all detects)	A	Compound quantitation and CRQLs (RPD)

NW Natural Gasco Site
Phenols - Laboratory Blank Data Qualification Summary - SDG K0710470

No Sample Data Qualified in this SDG

COLUMBIA ANALYTICAL SERVICES, INC.

Analytical Results

Client:	Anchor Environmental	**Service Request:**	K0710470
Project:	Gasco Long-Term Monitoring Year 1/000029-02 B612 T17.4	**Date Collected:**	11/07/2007
Sample Matrix:	Sediment	**Date Received:**	11/08/2007

Chlorinated Phenols

Sample Name:	PCM-14DS-071107	**Units:**	ug/Kg
Lab Code:	K0710470-006	**Basis:**	Dry
Extraction Method:	METHOD	**Level:**	Low
Analysis Method:	8151M		

Analyte Name	Result	Q	MRL	MDL	Dilution Factor	Date Extracted	Date Analyzed	Extraction Lot	Note
2,4,6-Trichlorophenol	**0.30**	JP J|2	8.5	0.19	1	11/13/07	12/13/07	KWG0712416	
2,4,5-Trichlorophenol	ND	U	8.5	0.93	1	11/13/07	12/13/07	KWG0712416	
2,3,4,5-Tetrachlorophenol	ND	U	8.5	0.36	1	11/13/07	12/13/07	KWG0712416	
2,3,5,6-Tetrachlorophenol†	ND	U	8.5	0.29	1	11/13/07	12/13/07	KWG0712416	
Pentachlorophenol	ND	Ui	8.5	2.6	1	11/13/07	12/13/07	KWG0712416	

Surrogate Name	%Rec	Control Limits	Date Analyzed	Note
4-Bromo-2,6-dichlorophenol	80	21-128	12/13/07	Acceptable

† **Analyte Comments**

2,3,5,6-Tetrachlorophenol	This analyte cannot be separated from 2,3,4,6-Tetrachlorophenol.

Comments: SR 01/3/08

LDC #: 18144C33
SDG #: K0710470
Laboratory: Columbia Analytical Services

VALIDATION COMPLETENESS WORKSHEET
Level III

Date: 1/30/08
Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC Phenols (EPA SW 846 Method 8151M)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	A	Sampling dates: 11/7/07
IIa.	Initial calibration	A	
IIb.	Calibration verification/ICV	A	1570
III.	Blanks	A	
IVa.	Surrogate recovery	A	
IVb.	Matrix spike/Matrix spike duplicates	A	
IVc.	Laboratory control samples	A	LCS
V.	Target compound identification	N	
VI.	Compound Quantitation and CRQLs	SW	
VII.	System Performance	N	
VIII.	Overall assessment of data	A	
IX.	Field duplicates	N	
X.	Field blanks	N	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet
ND = No compounds detected
R = Rinsate
FB = Field blank
D = Duplicate
TB = Trip blank
EB = Equipment blank

Validated Samples:

1	PCM-14DS-071107 Sed	11	KWG0712164	21		31	
2		12		22		32	
3		13		23		33	
4		14		24		34	
5		15		25		35	
6		16		26		36	
7		17		27		37	
8		18		28		38	
9		19		29		39	
10		20		30		40	

Notes: _____

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU.
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

LDC #: 18444C33
SDG #: K0710470

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Reviewer: 9
2nd Reviewer: A

METHOD: ✓ GC ___ HPLC

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Level IV/B Only

Y N N/A Were CRQLs adjusted for sample dilutions, dry weight factors, etc.?
Y N N/A Did the reported results for detected target compounds agree within 10.0% of the recalculated results?
Y N N/A Did the percent difference of detected compounds between two columns./detectors ≤40%?
If no, please see findings bellow.

#	Compound Name	Sample ID	RPD %D Between Two Columns/Detectors Limit (≤ 40%)	Qualifications
	Y	1	44.9	Jdets/A

Comments: _____

LABORATORY DATA CONSULTANTS, INC.
7750 El Camino Real, Suite 2L Carlsbad, CA 92009 Phone: 760/634-0437 Fax: 760/634-0439

Anchor Environmental, LLC
1423 3rd Avenue, Suite 300
Seattle, WA 98101-2226
ATTN: Ms. Joy Dunay

February 27, 2008

SUBJECT: NW Natural Gasco Pilot Cap Monitoring Year 1, Data Validation

Dear Ms. Dunay,

Enclosed is the final validation report for the fraction listed below. This SDG was received on February 19, 2008. Attachment 1 is a summary of the samples that were reviewed for each analysis.

LDC Project # 18316:

SDG #	Fraction
MG10	Polynuclear Aromatic Hydrocarbons

The data validation was performed under EPA Level III guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Contract Laboratory Program National Functional Guidelines for Organic Data Review, October 1999
- 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

Please feel free to contact us if you have any questions.

Sincerely,

Stella S. Cuenco
Project Manager/Senior Chemist

502 Pages-EX EDD

LDC #18316 (Anchor Environmental-Seattle WA / NW Natural - Gasco Pilot Cap Monitoring Year 1)

LDC	SDG#	DATE REC'D	(3) DATE DUE	PAHs (8270C -SIM)																															
Matrix: Liquid/Sediment				L	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S	W	S
A	MG10	02/19/08	03/11/08	22	0																														
Total	T/SC			22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22

Shaded cells indicate Level IV validation (all other cells are Level III validation). These sample counts do not include MS, MSD, or DUP's.

NW Natural Gasco Pilot Cap Monitoring Year 1
Data Validation Reports
LDC# 18316

Polynuclear Aromatic Hydrocarbons

Laboratory Data Consultants, Inc.
Data Validation Report

Project/Site Name:	NW Natural Gasco Site
Collection Date:	December 11, 2007
LDC Report Date:	February 25, 2008
Matrix:	Liquid
Parameters:	Polynuclear Aromatic Hydrocarbons
Validation Level:	EPA Level III
Laboratory:	Analytical Resources, Inc.
Sample Delivery Group (SDG):	MG10

Sample Identification

PCM-01 TSW-071211
PCM-01 TSW-071211DL
PCM-02 TSW-071211
PCM-02 TSW-071211DL
PCM-03 TSW-071211
PCM-03 TSW-071211DL
PCM-04 TSW-071211
PCM-04 TSW-071211DL
PCM-05 TSW-071211
PCM-05 TSW-071211DL
PCM-06 TSW-071211
PCM-06 TSW-071211DL
PCM-21 TSW-071211
PCM-21 TSW-071211DL
PCM-08 TSW-071211
PCM-08 TSW-071211DL
PCM-09 TSW-071211
PCM-09 TSW-071211DL
PCM-10 TSW-071211
PCM-10 TSW-071211DL
PCM-13 TSW-071211
PCM-13 TSW-071211DL

Introduction

This data review covers 22 liquid samples listed on the cover sheet including dilutions and reanalysis as applicable. The analyses were per a modification of EPA SW 846 Method 8270C using Selected Ion Monitoring (SIM) for Polynuclear Aromatic Hydrocarbons.

This review follows a modified outline of the USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (October 1999) as there are no current guidelines for the method stated above.

A qualification summary table is provided at the end of this report if data has been qualified. Flags are classified as P (protocol) or A (advisory) to indicate whether the flag is due to a laboratory deviation from a specified protocol or is of technical advisory nature.

Blank results are summarized in Section V.

Field duplicates are summarized in Section XVI.

Raw data were not reviewed for this SDG. The review was based on QC data.

The following are definitions of the data qualifiers:

U Indicates the compound or analyte was analyzed for but not detected at or above the stated limit.

J Indicates an estimated value.

R Quality control indicates the data is not usable.

N Presumptive evidence of presence of the constituent.

UJ Indicates the compound or analyte was analyzed for but not detected. The sample detection limit is an estimated value.

A Indicates the finding is based upon technical validation criteria.

P Indicates the finding is related to a protocol/contractual deviation.

None Indicates the data was not significantly impacted by the finding, therefore qualification was not required.

I. Technical Holding Times

All technical holding time requirements were met with the following exceptions:

Sample	Compound	Total Days From Sample Collection Until Extraction	Required Holding Time (in Days) From Sample Collection Until Extraction	Flag	A or P
All samples in SDG MG10	All TCL compounds	34	7	J (all detects) UJ (all non-detects)	P

The chain-of-custodies were reviewed for documentation of cooler temperatures. All cooler temperatures met validation criteria.

II. GC/MS Instrument Performance Check

Instrument performance was checked at 12 hour intervals. All ion abundance requirements were met.

III. Initial Calibration

Initial calibration was performed using required standard concentrations.

Percent relative standard deviations (%RSD) were less than or equal to 30.0% for all compounds.

Average relative response factors (RRF) for all target compounds were within validation criteria.

IV. Continuing Calibration

Continuing calibration was performed at the required frequencies.

All of the continuing calibration percent differences (%D) between the initial calibration RRF and the continuing calibration RRF were less than or equal to 25.0% with the following exceptions:

Date	Compound	%D	Associated Samples	Flag	A or P
2/5/08	Pyrene	25.83792	PCM-01 TSW-071211DL PCM-02 TSW-071211DL PCM-03 TSW-071211DL PCM-04 TSW-071211DL PCM-05 TSW-071211DL PCM-06 TSW-071211DL PCM-21 TSW-071211DL PCM-08 TSW-071211DL PCM-09 TSW-071211DL PCM-10 TSW-071211DL PCM-13 TSW-071211DL DAY ZERO / DIALYSIS BLANKDL	J (all detects) UJ (all non-detects)	A

The percent differences (%D) of the second source calibration standard were less than or equal to 25.0% for all compounds.

All of the continuing calibration RRF values were within validation criteria.

V. Blanks

Method blanks were reviewed for each matrix as applicable. No polynuclear aromatic hydrocarbon contaminants were found in the method blanks with the following exceptions:

Method Blank ID	Extraction Date	Compound TIC (RT in minutes)	Concentration	Associated Samples
DAY ZERO / DIALYSIS BLANK	1/14/08	Naphthalene Phenanthrene Pyrene	94 ug/L 29 ug/L 16 ug/L	All samples in SDG MG10
DAY ZERO / DIALYSIS BLANKDL	1/14/08	Naphthalene	92 ug/L	All samples in SDG MG10

Sample concentrations were compared to concentrations detected in the method blanks. The sample concentrations were either not detected or were significantly greater (>10X for common contaminants, >5X for other contaminants) than the concentrations found in the associated method blanks with the following exceptions:

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
PCM-01 TSW-071211	Naphthalene	90 ug/L	90U ug/L
PCM-01 TSW-071211DL (10X)	Phenanthrene Pyrene	400 ug/L 490 ug/L	400U ug/L 490U ug/L
PCM-02 TSW-071211	Naphthalene	140 ug/L	140U ug/L
PCM-02 TSW-071211DL (10X)	Naphthalene Phenanthrene	120 ug/L 680 ug/L	120U ug/L 680U ug/L
PCM-03 TSW-071211	Naphthalene	120 ug/L	120U ug/L
PCM-03 TSW-071211DL (10X)	Naphthalene Phenanthrene	120 ug/L 900 ug/L	120U ug/L 900U ug/L
PCM-04 TSW-071211	Naphthalene	98 ug/L	98U ug/L
PCM-04 TSW-071211DL (10X)	Phenanthrene	1100 ug/L	1100U ug/L
PCM-05 TSW-071211	Naphthalene	250 ug/L	250U ug/L
PCM-05 TSW-071211DL (10X)	Naphthalene Phenanthrene	290 ug/L 610 ug/L	290U ug/L 610U ug/L

Sample	Compound TIC (RT in minutes)	Reported Concentration	Modified Final Concentration
PCM-06 TSW-071211	Naphthalene	130 ug/L	130U ug/L
PCM-06 TSW-071211DL (10X)	Naphthalene Phenanthrene	150 ug/L 600 ug/L	150U ug/L 600U ug/L
PCM-21 TSW-071211	Naphthalene	200 ug/L	200U ug/L
PCM-21 TSW-071211DL (10X)	Naphthalene Phenanthrene	220 ug/L 910 ug/L	220U ug/L 910U ug/L
PCM-08 TSW-071211	Naphthalene	260 ug/L	260U ug/L
PCM-08 TSW-071211DL (10X)	Naphthalene Phenanthrene	330 ug/L 880 ug/L	330U ug/L 880U ug/L
PCM-09 TSW-071211	Naphthalene	230 ug/L	230U ug/L
PCM-09 TSW-071211DL (10X)	Naphthalene Phenanthrene	280 ug/L 700 ug/L	280U ug/L 700U ug/L
PCM-10 TSW-071211	Naphthalene	210 ug/L	210U ug/L
PCM-10 TSW-071211DL (10X)	Naphthalene Phenanthrene	240 ug/L 880 ug/L	240U ug/L 880U ug/L
PCM-13 TSW-071211	Naphthalene	170 ug/L	170U ug/L
PCM-13 TSW-071211DL (5X)	Naphthalene Phenanthrene	180 ug/L 340 ug/L	180U ug/L 340U ug/L

VI. Surrogate Spikes

Surrogates were added to all samples and blanks as required by the method. All surrogate recoveries (%R) were within QC limits.

VII. Matrix Spike/Matrix Spike Duplicates

The laboratory has indicated that there were no matrix spike (MS) and matrix spike duplicate (MSD) analyses specified for the samples in this SDG, and therefore matrix spike and matrix spike duplicate analyses were not performed for this SDG.

VIII. Laboratory Control Samples (LCS)

Laboratory control sample data were not provided and therefore not reviewed.

IX. Regional Quality Assurance and Quality Control

Not applicable.

X. Internal Standards

All internal standard areas and retention times were within QC limits with the following exceptions:

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
PCM-02 TSW-071211	Perylene-d12	77555 (94638-378550)	Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A
PCM-03 TSW-071211	Perylene-d12	87958 (94638-378550)	Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A
PCM-04 TSW-071211	Perylene-d12	58737 (94638-378550)	Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A
PCM-05 TSW-071211	Perylene-d12	56027 (94638-378550)	Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A
PCM-06 TSW-071211	Perylene-d12	59795 (94638-378550)	Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A

Sample	Internal Standards	Area (Limits)	Compound	Flag	A or P
PCM-21 TSW-071211	Perylene-d12	49705 (94638-378550)	Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A
PCM-08 TSW-071211	Perylene-d12	50351 (94638-378550)	Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A
PCM-09 TSW-071211	Perylene-d12	45344 (94638-378550)	Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A
PCM-10 TSW-071211	Perylene-d12	44552 (94638-378550)	Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A
PCM-13 TSW-071211	Perylene-d12	41322 (94638-378550)	Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A
DAY ZERO / DIALYSIS BLANK	Perylene-d12	42082 (94638-378550)	Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A

XI. Target Compound Identifications

Raw data were not reviewed for this SDG.

XII. Compound Quantitation and CRQLs

All compound quantitation and CRQLs were within validation criteria with the following exceptions:

Sample	Compound	Finding	Criteria	Flag	A or P
PCM-03 TSW-071211 PCM-04 TSW-071211 PCM-05 TSW-071211 PCM-21 TSW-071211 PCM-08 TSW-071211 PCM-09 TSW-071211 PCM-10 TSW-071211	Fluoranthene Pyrene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects) J (all detects)	A
PCM-06 TSW-071211 PCM-13 TSW-071211	Pyrene	Sample result exceeded calibration range.	Reported result should be within calibration range.	J (all detects)	A

Raw data were not reviewed for this SDG.

XIII. Tentatively Identified Compounds (TICs)

Raw data were not reviewed for this SDG.

XIV. System Performance

Raw data were not reviewed for this SDG.

XV. Overall Assessment

The analysis was conducted within all specifications of the method.

Due to extraction holding time, calibration %D and internal standard area problems, data were qualified as estimated in eleven samples.

Due to method blank contamination problems, data were qualified as not detected in eleven samples.

In the case where more than one result was reported for an individual sample, the least technically acceptable results were rejected as follows:

Sample	Compound	Flag	A or P
PCM-03 TSW-071211 PCM-04 TSW-071211 PCM-05 TSW-071211 PCM-21 TSW-071211 PCM-08 TSW-071211 PCM-09 TSW-071211 PCM-10 TSW-071211	Fluoranthene Pyrene	R R	A

Sample	Compound	Flag	A or P
PCM-03 TSW-071211DL PCM-04 TSW-071211DL PCM-05 TSW-071211DL PCM-21 TSW-071211DL PCM-08 TSW-071211DL PCM-09 TSW-071211DL PCM-10 TSW-071211DL	All TCL compounds except Fluoranthene Pyrene	R	A
PCM-06 TSW-071211 PCM-13 TSW-071211	Pyrene	R	A
PCM-06 TSW-071211DL PCM-13 TSW-071211DL	All TCL compounds except Pyrene	R	A
PCM-01 TSW-071211DL PCM-02 TSW-071211DL	All TCL compounds	R	A

The quality control criteria reviewed, other than those discussed above, were met and are considered acceptable. Sample results that were found to be rejected (R) are unusable for all purposes. Sample results that were found to be estimated (J) are usable for limited purposes only. Based upon the level III data validation all other results are considered valid and usable for all purposes.

Data flags are summarized at the end of this report.

XVI. Field Duplicates

No field duplicates were identified in this SDG.

XVII. Field Blanks

No field blanks were identified in this SDG.

NW Natural Gasco Site
Polynuclear Aromatic Hydrocarbons - Data Qualification Summary - SDG MG10

SDG	Sample	Compound	Flag	A or P	Reason
MG10	PCM-01 TSW-071211 PCM-01 TSW-071211DL PCM-02 TSW-071211 PCM-02 TSW-071211DL PCM-03 TSW-071211 PCM-03 TSW-071211DL PCM-04 TSW-071211 PCM-04 TSW-071211DL PCM-05 TSW-071211 PCM-05 TSW-071211DL PCM-06 TSW-071211 PCM-06 TSW-071211DL PCM-21 TSW-071211 PCM-21 TSW-071211DL PCM-08 TSW-071211 PCM-08 TSW-071211DL PCM-09 TSW-071211 PCM-09 TSW-071211DL PCM-10 TSW-071211 PCM-10 TSW-071211DL PCM-13 TSW-071211 PCM-13 TSW-071211DL	All TCL compounds	J (all detects) UJ (all non-detects)	P	Technical holding times
MG10	PCM-01 TSW-071211DL PCM-02 TSW-071211DL PCM-03 TSW-071211DL PCM-04 TSW-071211DL PCM-05 TSW-071211DL PCM-06 TSW-071211DL PCM-21 TSW-071211DL PCM-08 TSW-071211DL PCM-09 TSW-071211DL PCM-10 TSW-071211DL PCM-13 TSW-071211DL	Pyrene	J (all detects) UJ (all non-detects)	A	Continuing calibration (%D)
MG10	PCM-02 TSW-071211 PCM-03 TSW-071211 PCM-04 TSW-071211 PCM-05 TSW-071211 PCM-06 TSW-071211 PCM-21 TSW-071211 PCM-08 TSW-071211 PCM-09 TSW-071211 PCM-10 TSW-071211 PCM-13 TSW-071211	Pyrene Benzo(a)anthracene Chrysene Benzo(b)fluoranthene Benzo(k)fluoranthene Benzo(a)pyrene Indeno(1,2,3-cd)pyrene Dibenz(a,h)anthracene Benzo(g,h,i)perylene	J (all detects) UJ (all non-detects)	A	Internal standards (area)
MG10	PCM-03 TSW-071211 PCM-04 TSW-071211 PCM-05 TSW-071211 PCM-21 TSW-071211 PCM-08 TSW-071211 PCM-09 TSW-071211 PCM-10 TSW-071211	Fluoranthene Pyrene	J (all detects) J (all detects)	A	Compound quantitation and CRQLs
MG10	PCM-06 TSW-071211 PCM-13 TSW-071211	Pyrene	J (all detects)	A	Compound quantitation and CRQLs
MG10	PCM-03 TSW-071211 PCM-04 TSW-071211 PCM-05 TSW-071211 PCM-21 TSW-071211 PCM-08 TSW-071211 PCM-09 TSW-071211 PCM-10 TSW-071211	Fluoranthene Pyrene	R R	A	Overall assessment of data

SDG	Sample	Compound	Flag	A or P	Reason
MG10	PCM-03 TSW-071211DL PCM-04 TSW-071211DL PCM-05 TSW-071211DL PCM-21 TSW-071211DL PCM-08 TSW-071211DL PCM-09 TSW-071211DL PCM-10 TSW-071211DL	All TCL compounds except Fluoranthene Pyrene	R	A	Overall assessment of data
MG10	PCM-06 TSW-071211 PCM-13 TSW-071211	Pyrene	R	A	Overall assessment of data
MG10	PCM-06 TSW-071211DL PCM-13 TSW-071211DL	All TCL compounds except Pyrene	R	A	Overall assessment of data
MG10	PCM-01 TSW-071211DL PCM-02 TSW-071211DL	All TCL compounds	R	A	Overall assessment of data

NW Natural Gasco Site
Polynuclear Aromatic Hydrocarbons - Laboratory Blank Data Qualification Summary - SDG MG10

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
MG10	PCM-01 TSW-071211	Naphthalene	90U ug/L	A
MG10	PCM-01 TSW-071211DL (10X)	Phenanthrene Pyrene	400U ug/L 490U ug/L	A
MG10	PCM-02 TSW-071211	Naphthalene	140U ug/L	A
MG10	PCM-02 TSW-071211DL (10X)	Naphthalene Phenanthrene	120U ug/L 680U ug/L	A
MG10	PCM-03 TSW-071211	Naphthalene	120U ug/L	A
MG10	PCM-03 TSW-071211DL (10X)	Naphthalene Phenanthrene	120U ug/L 900U ug/L	A
MG10	PCM-04 TSW-071211	Naphthalene	98U ug/L	A
MG10	PCM-04 TSW-071211DL (10X)	Phenanthrene	1100U ug/L	A
MG10	PCM-05 TSW-071211	Naphthalene	250U ug/L	A
MG10	PCM-05 TSW-071211DL (10X)	Naphthalene Phenanthrene	290U ug/L 610U ug/L	A
MG10	PCM-06 TSW-071211	Naphthalene	130U ug/L	A

SDG	Sample	Compound TIC (RT in minutes)	Modified Final Concentration	A or P
MG10	PCM-06 TSW-071211DL (10X)	Naphthalene Phenanthrene	150U ug/L 600U ug/L	A
MG10	PCM-21 TSW-071211	Naphthalene	200U ug/L	A
MG10	PCM-21 TSW-071211DL (10X)	Naphthalene Phenanthrene	220U ug/L 910U ug/L	A
MG10	PCM-08 TSW-071211	Naphthalene	260U ug/L	A
MG10	PCM-08 TSW-071211DL (10X)	Naphthalene Phenanthrene	330U ug/L 880U ug/L	A
MG10	PCM-09 TSW-071211	Naphthalene	230U ug/L	A
MG10	PCM-09 TSW-071211DL (10X)	Naphthalene Phenanthrene	280U ug/L 700U ug/L	A
MG10	PCM-10 TSW-071211	Naphthalene	210U ug/L	A
MG10	PCM-10 TSW-071211DL (10X)	Naphthalene Phenanthrene	240U ug/L 880U ug/L	A
MG10	PCM-13 TSW-071211	Naphthalene	170U ug/L	A
MG10	PCM-13 TSW-071211DL (5X)	Naphthalene Phenanthrene	180U ug/L 340U ug/L	A

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-01 TSW-071211
SAMPLE

Lab Sample ID: MG10A
LIMS ID: 08-1230
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/02/08 15:43
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result	
91-20-3	Naphthalene	10	90	UJ (1) (7)
208-96-8	Acenaphthylene	10	< 10 U	UJ
83-32-9	Acenaphthene	10	72	J
86-73-7	Fluorene	10	63	
85-01-8	Phenanthrene	10	370	
120-12-7	Anthracene	10	76	
206-44-0	Fluoranthene	10	620	
129-00-0	Pyrene	10	580	
56-55-3	Benzo(a)anthracene	10	83	
218-01-9	Chrysene	10	96	
205-99-2	Benzo(b)fluoranthene	10	11	
207-08-9	Benzo(k)fluoranthene	10	11	
50-32-8	Benzo(a)pyrene	10	12	V
193-39-5	Indeno(1,2,3-cd)pyrene	10	< 10 U	UJ
53-70-3	Dibenz(a,h)anthracene	10	< 10 U	
191-24-2	Benzo(g,h,i)perylene	10	< 10 U	

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Phenanthrene	13.2%
d10-Pyrene	40.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-01 TSW-071211
DILUTION

Lab Sample ID: MG10A
LIMS ID: 08-1230
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/05/08 11:59
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 10.0

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	100	< 100 U
208-96-8	Acenaphthylene	100	< 100 U
83-32-9	Acenaphthene	100	< 100 U
86-73-7	Fluorene	100	< 100 U
85-01-8	**Phenanthrene**	**100**	**400**
120-12-7	Anthracene	100	< 100 U
206-44-0	**Fluoranthene**	**100**	**710**
129-00-0	**Pyrene**	**100**	**490**
56-55-3	Benzo(a)anthracene	100	< 100 U
218-01-9	Chrysene	100	< 100 U
205-99-2	Benzo(b)fluoranthene	100	< 100 U
207-08-9	Benzo(k)fluoranthene	100	< 100 U
50-32-8	Benzo(a)pyrene	100	< 100 U
193-39-5	Indeno(1,2,3-cd)pyrene	100	< 100 U
53-70-3	Dibenz(a,h)anthracene	100	< 100 U
191-24-2	Benzo(g,h,i)perylene	100	< 100 U

RD-2)

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery	
d10-Phenanthrene	15.4%
d10-Pyrene	38.1%

2/22/08

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-02 TSW-071211
SAMPLE

Lab Sample ID: MG10B
LIMS ID: 08-1231
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/02/08 16:12
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result	
91-20-3	Naphthalene	10	140	UJ (1) (7)
208-96-8	Acenaphthylene	10	12	J
83-32-9	Acenaphthene	10	200	
86-73-7	Fluorene	10	93	
85-01-8	Phenanthrene	10	650	
120-12-7	Anthracene	10	280	
206-44-0	Fluoranthene	10	990	
129-00-0	Pyrene	10	2,200	(19)
56-55-3	Benzo(a)anthracene	10	240	
218-01-9	Chrysene	10	250	
205-99-2	Benzo(b)fluoranthene	10	31	
207-08-9	Benzo(k)fluoranthene	10	31	
50-32-8	Benzo(a)pyrene	10	41	
193-39-5	Indeno(1,2,3-cd)pyrene	10	< 10 U	UJ
53-70-3	Dibenz(a,h)anthracene	10	< 10 U	
191-24-2	Benzo(g,h,i)perylene	10	< 10 U	

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Phenanthrene	20.1%
d10-Pyrene	111%

2/22/08

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-02 TSW-071211
DILUTION

Lab Sample ID: MG10B
LIMS ID: 08-1231
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/05/08 12:27
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 10.0

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	**100**	**120**
208-96-8	Acenaphthylene	100	< 100 U
83-32-9	**Acenaphthene**	**100**	**190**
86-73-7	Fluorene	100	< 100 U
85-01-8	**Phenanthrene**	**100**	**680**
120-12-7	Anthracene	100	< 100 U
206-44-0	**Fluoranthene**	**100**	**1,100**
129-00-0	**Pyrene**	**100**	**890**
56-55-3	**Benzo(a)anthracene**	**100**	**140**
218-01-9	**Chrysene**	**100**	**150**
205-99-2	Benzo(b)fluoranthene	100	< 100 U
207-08-9	Benzo(k)fluoranthene	100	< 100 U
50-32-8	Benzo(a)pyrene	100	< 100 U
193-39-5	Indeno(1,2,3-cd)pyrene	100	< 100 U
53-70-3	Dibenz(a,h)anthracene	100	< 100 U
191-24-2	Benzo(g,h,i)perylene	100	< 100 U

R(2-2)

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Phenanthrene	21.2%
d10-Pyrene	48.8%

2/22/08

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-03 TSW-071211
SAMPLE

Lab Sample ID: MG10C
LIMS ID: 08-1232
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/02/08 16:41
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result	
91-20-3	Naphthalene	10	120	UJ (7) (1)
208-96-8	Acenaphthylene	10	13	J (1)
83-32-9	Acenaphthene	10	180	
86-73-7	Fluorene	10	110	
85-01-8	Phenanthrene	10	790	
120-12-7	Anthracene	10	330	
206-44-0	Fluoranthene	10	1,500	E R (22)
129-00-0	Pyrene	10	3,000	E
56-55-3	Benzo(a)anthracene	10	320	J (1) (19)
218-01-9	Chrysene	10	320	
205-99-2	Benzo(b)fluoranthene	10	63	
207-08-9	Benzo(k)fluoranthene	10	16	
50-32-8	Benzo(a)pyrene	10	43	
193-39-5	Indeno(1,2,3-cd)pyrene	10	< 10	U UJ
53-70-3	Dibenz(a,h)anthracene	10	< 10	U
191-24-2	Benzo(g,h,i)perylene	10	< 10	U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery	
d10-Phenanthrene	19.5%
d10-Pyrene	99.7%

2/22/08

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-03 TSW-071211
DILUTION

Lab Sample ID: MG10C
LIMS ID: 08-1232
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/05/08 12:56
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 10.0

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	100	120
208-96-8	Acenaphthylene	100	< 100 U
83-32-9	Acenaphthene	100	190
86-73-7	Fluorene	100	110
85-01-8	Phenanthrene	100	900
120-12-7	Anthracene	100	130
206-44-0	Fluoranthene	100	1,700
129-00-0	Pyrene	100	1,300
56-55-3	Benzo(a)anthracene	100	170
218-01-9	Chrysene	100	210
205-99-2	Benzo(b)fluoranthene	100	< 100 U
207-08-9	Benzo(k)fluoranthene	100	< 100 U
50-32-8	Benzo(a)pyrene	100	< 100 U
193-39-5	Indeno(1,2,3-cd)pyrene	100	< 100 U
53-70-3	Dibenz(a,h)anthracene	100	< 100 U
191-24-2	Benzo(g,h,i)perylene	100	< 100 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Phenanthrene	21.3%
d10-Pyrene	50.2%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-04 TSW-071211
SAMPLE

Lab Sample ID: MG10D
LIMS ID: 08-1233
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/02/08 17:10
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result	
91-20-3	Naphthalene	10	98	UJ (7)(1)
208-96-8	Acenaphthylene	10	17	J (1)
83-32-9	Acenaphthene	10	210	
86-73-7	Fluorene	10	120	
85-01-8	Phenanthrene	10	950	
120-12-7	Anthracene	10	640	
206-44-0	Fluoranthene	10	1,900 E	R (2-2)
129-00-0	Pyrene	10	5,900 E	
56-55-3	Benzo(a)anthracene	10	540	J (1, 19)
218-01-9	Chrysene	10	500	
205-99-2	Benzo(b)fluoranthene	10	89	
207-08-9	Benzo(k)fluoranthene	10	24	
50-32-8	Benzo(a)pyrene	10	63	
193-39-5	Indeno(1,2,3-cd)pyrene	10	< 10 U	UJ
53-70-3	Dibenz(a,h)anthracene	10	< 10 U	
191-24-2	Benzo(g,h,i)perylene	10	13	J

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Phenanthrene	16.0%
d10-Pyrene	139%

022208

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-04 TSW-071211
DILUTION

Lab Sample ID: MG10D
LIMS ID: 08-1233
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/05/08 13:24
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 10.0

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	100	< 100 U
208-96-8	Acenaphthylene	100	< 100 U
83-32-9	**Acenaphthene**	**100**	**220**
86-73-7	**Fluorene**	**100**	**140**
85-01-8	**Phenanthrene**	**100**	**1,100**
120-12-7	**Anthracene**	**100**	**180**
206-44-0	**Fluoranthene**	**100**	**2,400**
129-00-0	**Pyrene**	**100**	**1,900**
56-55-3	**Benzo(a)anthracene**	**100**	**230**
218-01-9	**Chrysene**	**100**	**270**
205-99-2	Benzo(b)fluoranthene	100	< 100 U
207-08-9	Benzo(k)fluoranthene	100	< 100 U
50-32-8	Benzo(a)pyrene	100	< 100 U
193-39-5	Indeno(1,2,3-cd)pyrene	100	< 100 U
53-70-3	Dibenz(a,h)anthracene	100	< 100 U
191-24-2	Benzo(g,h,i)perylene	100	< 100 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate	Recovery
d10-Phenanthrene	18.5%
d10-Pyrene	48.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-05 TSW-071211
SAMPLE

Lab Sample ID: MG10E
LIMS ID: 08-1234
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/02/08 17:39
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result	
91-20-3	Naphthalene	10	250	UJ (7)(1)
208-96-8	Acenaphthylene	10	< 10 U	UJ
83-32-9	Acenaphthene	10	200	J
86-73-7	Fluorene	10	78	
85-01-8	Phenanthrene	10	540	
120-12-7	Anthracene	10	360	
206-44-0	Fluoranthene	10	1,200 E	R(2-2)
129-00-0	Pyrene	10	3,900 E	
56-55-3	Benzo(a)anthracene	10	400	J (1,19)
218-01-9	Chrysene	10	380	
205-99-2	Benzo(b)fluoranthene	10	57	
207-08-9	Benzo(k)fluoranthene	10	21	
50-32-8	Benzo(a)pyrene	10	45	
193-39-5	Indeno(1,2,3-cd)pyrene	10	< 10 U	UJ
53-70-3	Dibenz(a,h)anthracene	10	< 10 U	
191-24-2	Benzo(g,h,i)perylene	10	< 10 U	

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Phenanthrene	17.1%
d10-Pyrene	141%

4/22/08

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-05 TSW-071211
DILUTION

Lab Sample ID: MG10E
LIMS ID: 08-1234
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/05/08 13:53
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 10.0

CAS Number	Analyte	RL	Result	
91-20-3	**Naphthalene**	**100**	**290**	R(2,2)
208-96-8	Acenaphthylene	100	< 100 U	
83-32-9	**Acenaphthene**	**100**	**210**	
86-73-7	Fluorene	100	< 100 U	
85-01-8	**Phenanthrene**	**100**	**610**	
120-12-7	Anthracene	100	< 100 U	
206-44-0	**Fluoranthene**	**100**	**1,400**	J (1)
129-00-0	**Pyrene**	**100**	**1,100**	J (1,5)
56-55-3	**Benzo(a)anthracene**	**100**	**160**	R(2,2)
218-01-9	**Chrysene**	**100**	**180**	
205-99-2	Benzo(b)fluoranthene	100	< 100 U	
207-08-9	Benzo(k)fluoranthene	100	< 100 U	
50-32-8	Benzo(a)pyrene	100	< 100 U	
193-39-5	Indeno(1,2,3-cd)pyrene	100	< 100 U	
53-70-3	Dibenz(a,h)anthracene	100	< 100 U	
191-24-2	Benzo(g,h,i)perylene	100	< 100 U	

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Phenanthrene	20.4%
d10-Pyrene	45.7%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-06 TSW-071211
SAMPLE

Lab Sample ID: MG10F
LIMS ID: 08-1235
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/02/08 18:09
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result	
91-20-3	Naphthalene	10	130	UJ(7)(1)
208-96-8	Acenaphthylene	10	11	J
83-32-9	Acenaphthene	10	170	
86-73-7	Fluorene	10	86	
85-01-8	Phenanthrene	10	530	
120-12-7	Anthracene	10	320	
206-44-0	Fluoranthene	10	910	
129-00-0	Pyrene	10	2,600 E	R(2)
56-55-3	Benzo(a)anthracene	10	240	J (1,19)
218-01-9	Chrysene	10	250	
205-99-2	Benzo(b)fluoranthene	10	42	
207-08-9	Benzo(k)fluoranthene	10	11	
50-32-8	Benzo(a)pyrene	10	28	
193-39-5	Indeno(1,2,3-cd)pyrene	10	< 10 U	UJ
53-70-3	Dibenz(a,h)anthracene	10	< 10 U	
191-24-2	Benzo(g,h,i)perylene	10	< 10 U	

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Phenanthrene	20.7%
d10-Pyrene	137%

022708

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-06 TSW-071211
DILUTION

Lab Sample ID: MG10F
LIMS ID: 08-1235
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 86 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/05/08 14:21
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 10.0

CAS Number	Analyte	RL	Result	
91-20-3	**Naphthalene**	100	150	R(2)
208-96-8	Acenaphthylene	100	< 100 U	
83-32-9	**Acenaphthene**	100	190	
86-73-7	Fluorene	100	< 100 U	
85-01-8	**Phenanthrene**	100	600	
120-12-7	Anthracene	100	< 100 U	
206-44-0	**Fluoranthene**	100	1,100	J(1,5)
129-00-0	**Pyrene**	100	810	R(2)
56-55-3	**Benzo(a)anthracene**	100	110	
218-01-9	**Chrysene**	100	120	
205-99-2	Benzo(b)fluoranthene	100	< 100 U	
207-08-9	Benzo(k)fluoranthene	100	< 100 U	
50-32-8	Benzo(a)pyrene	100	< 100 U	
193-39-5	Indeno(1,2,3-cd)pyrene	100	< 100 U	
53-70-3	Dibenz(a,h)anthracene	100	< 100 U	
191-24-2	Benzo(g,h,i)perylene	100	< 100 U	

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Phenanthrene	23.0%
d10-Pyrene	48.3%

0034

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-21 TSW-071211
SAMPLE

Lab Sample ID: MG10G
LIMS ID: 08-1236
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/02/08 18:38
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result	
91-20-3	Naphthalene	10	200	UJ(7)(1)
208-96-8	Acenaphthylene	10	19	J
83-32-9	Acenaphthene	10	180	
86-73-7	Fluorene	10	100	
85-01-8	Phenanthrene	10	800	
120-12-7	Anthracene	10	740	
206-44-0	Fluoranthene	10	1,700 E	R(2)
129-00-0	Pyrene	10	6,200 E	
56-55-3	Benzo(a)anthracene	10	650	J(1,19)
218-01-9	Chrysene	10	750	
205-99-2	Benzo(b)fluoranthene	10	200	
207-08-9	Benzo(k)fluoranthene	10	58	
50-32-8	Benzo(a)pyrene	10	160	
193-39-5	Indeno(1,2,3-cd)pyrene	10	44	
53-70-3	Dibenz(a,h)anthracene	10	< 10 U	UJ
191-24-2	Benzo(g,h,i)perylene	10	63	J

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Phenanthrene	18.0%
d10-Pyrene	160%

2/22/08

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-21 TSW-071211
DILUTION

Lab Sample ID: MG10G
LIMS ID: 08-1236
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/05/08 14:50
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 10.0

CAS Number	Analyte	RL	Result	
91-20-3	**Naphthalene**	**100**	**220**	R(2,2)
208-96-8	Acenaphthylene	100	< 100 U	
83-32-9	**Acenaphthene**	**100**	**210**	
86-73-7	**Fluorene**	**100**	**120**	
85-01-8	**Phenanthrene**	**100**	**910**	
120-12-7	**Anthracene**	**100**	**160**	
206-44-0	**Fluoranthene**	**100**	**2,200**	J (1)
129-00-0	**Pyrene**	**100**	**1,600**	J (1,5)
56-55-3	**Benzo(a)anthracene**	**100**	**300**	R(2,2)
218-01-9	**Chrysene**	**100**	**350**	
205-99-2	Benzo(b)fluoranthene	100	< 100 U	
207-08-9	Benzo(k)fluoranthene	100	< 100 U	
50-32-8	**Benzo(a)pyrene**	**100**	**160**	
193-39-5	Indeno(1,2,3-cd)pyrene	100	< 100 U	
53-70-3	Dibenz(a,h)anthracene	100	< 100 U	
191-24-2	Benzo(g,h,i)perylene	100	< 100 U	

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery	
d10-Phenanthrene	21.2%
d10-Pyrene	47.1%

Bo22208

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-08 TSW-071211
SAMPLE

Lab Sample ID: MG10H
LIMS ID: 08-1237
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/02/08 19:07
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result	
91-20-3	Naphthalene	10	260	UJ(7)(1)
208-96-8	Acenaphthylene	10	15	J
83-32-9	Acenaphthene	10	230	
86-73-7	Fluorene	10	120	
85-01-8	Phenanthrene	10	760	
120-12-7	Anthracene	10	590	
206-44-0	Fluoranthene	10	1,200 E	R(2)
129-00-0	Pyrene	10	4,200 E	
56-55-3	Benzo(a)anthracene	10	360	J (1,19)
218-01-9	Chrysene	10	380	
205-99-2	Benzo(b)fluoranthene	10	71	
207-08-9	Benzo(k)fluoranthene	10	24	
50-32-8	Benzo(a)pyrene	10	55	
193-39-5	Indeno(1,2,3-cd)pyrene	10	11	
53-70-3	Dibenz(a,h)anthracene	10	< 10 U	UJ
191-24-2	Benzo(g,h,i)perylene	10	19	J

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Phenanthrene	22.4%
d10-Pyrene	151%

R 02220 P

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-08 TSW-071211
DILUTION

Lab Sample ID: MG10H
LIMS ID: 08-1237
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/05/08 15:19
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 10.0

CAS Number	Analyte	RL	Result
91-20-3	**Naphthalene**	100	330
208-96-8	Acenaphthylene	100	< 100 U
83-32-9	**Acenaphthene**	100	260
86-73-7	**Fluorene**	100	130
85-01-8	**Phenanthrene**	100	880
120-12-7	**Anthracene**	100	130
206-44-0	**Fluoranthene**	100	1,500
129-00-0	**Pyrene**	100	1,100
56-55-3	**Benzo(a)anthracene**	100	180
218-01-9	**Chrysene**	100	180
205-99-2	Benzo(b)fluoranthene	100	< 100 U
207-08-9	Benzo(k)fluoranthene	100	< 100 U
50-32-8	Benzo(a)pyrene	100	< 100 U
193-39-5	Indeno(1,2,3-cd)pyrene	100	< 100 U
53-70-3	Dibenz(a,h)anthracene	100	< 100 U
191-24-2	Benzo(g,h,i)perylene	100	< 100 U

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery	
d10-Phenanthrene	26.4%
d10-Pyrene	49.1%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS
Page 1 of 1

Sample ID: PCM-09 TSW-071211
SAMPLE

Lab Sample ID: MG10I
LIMS ID: 08-1238
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/02/08 19:36
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result	
91-20-3	Naphthalene	10	230	
208-96-8	Acenaphthylene	10	17	
83-32-9	Acenaphthene	10	180	
86-73-7	Fluorene	10	96	
85-01-8	Phenanthrene	10	640	
120-12-7	Anthracene	10	560	
206-44-0	Fluoranthene	10	1,200	E
129-00-0	Pyrene	10	4,700	E
56-55-3	Benzo(a)anthracene	10	400	
218-01-9	Chrysene	10	450	
205-99-2	Benzo(b)fluoranthene	10	100	
207-08-9	Benzo(k)fluoranthene	10	31	
50-32-8	Benzo(a)pyrene	10	80	
193-39-5	Indeno(1,2,3-cd)pyrene	10	17	
53-70-3	Dibenz(a,h)anthracene	10	< 10	U
191-24-2	Benzo(g,h,i)perylene	10	29	

UJ (7) (1)
J
R (2-2)
J (1,19)
UJ
J

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Phenanthrene	17.4%
d10-Pyrene	159%

2/22/08

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-09 TSW-071211
DILUTION

Lab Sample ID: MG10I
LIMS ID: 08-1238
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/05/08 15:47
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 10.0

CAS Number	Analyte	RL	Result	
91-20-3	**Naphthalene**	100	280	
208-96-8	Acenaphthylene	100	< 100	U
83-32-9	**Acenaphthene**	100	190	
86-73-7	**Fluorene**	100	100	
85-01-8	**Phenanthrene**	100	700	
120-12-7	**Anthracene**	100	110	
206-44-0	**Fluoranthene**	100	1,600	
129-00-0	**Pyrene**	100	1,200	
56-55-3	**Benzo(a)anthracene**	100	210	
218-01-9	**Chrysene**	100	220	
205-99-2	Benzo(b)fluoranthene	100	< 100	U
207-08-9	Benzo(k)fluoranthene	100	< 100	U
50-32-8	Benzo(a)pyrene	100	< 100	U
193-39-5	Indeno(1,2,3-cd)pyrene	100	< 100	U
53-70-3	Dibenz(a,h)anthracene	100	< 100	U
191-24-2	Benzo(g,h,i)perylene	100	< 100	U

R(2-2)
J (1)
J (1,5)
R(2-2)

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Phenanthrene	19.0%
d10-Pyrene	46.8%

R0222208

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-10 TSW-071211
SAMPLE

Lab Sample ID: MG10J
LIMS ID: 08-1239
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/02/08 20:05
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result	
91-20-3	Naphthalene	10	210	
208-96-8	Acenaphthylene	10	20	
83-32-9	Acenaphthene	10	200	
86-73-7	Fluorene	10	110	
85-01-8	Phenanthrene	10	890	
120-12-7	Anthracene	10	750	
206-44-0	Fluoranthene	10	1,200 E	
129-00-0	Pyrene	10	4,800 E	
56-55-3	Benzo(a)anthracene	10	320	
218-01-9	Chrysene	10	370	
205-99-2	Benzo(b)fluoranthene	10	84	
207-08-9	Benzo(k)fluoranthene	10	28	
50-32-8	Benzo(a)pyrene	10	68	
193-39-5	Indeno(1,2,3-cd)pyrene	10	17	
53-70-3	Dibenz(a,h)anthracene	10	< 10 U	
191-24-2	Benzo(g,h,i)perylene	10	28	

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Phenanthrene	15.5%
d10-Pyrene	150%

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-10 TSW-071211
DILUTION

Lab Sample ID: MG10J
LIMS ID: 08-1239
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/05/08 16:16
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 10.0

CAS Number	Analyte	RL	Result	
91-20-3	**Naphthalene**	**100**	**240**	R(2-2)
208-96-8	Acenaphthylene	100	< 100 U	
83-32-9	**Acenaphthene**	**100**	**210**	
86-73-7	**Fluorene**	**100**	**120**	
85-01-8	**Phenanthrene**	**100**	**880**	
120-12-7	**Anthracene**	**100**	**150**	J(1)
206-44-0	**Fluoranthene**	**100**	**1,600**	↓(1.5)
129-00-0	**Pyrene**	**100**	**1,200**	
56-55-3	**Benzo(a)anthracene**	**100**	**180**	R(2-2)
218-01-9	**Chrysene**	**100**	**200**	
205-99-2	Benzo(b)fluoranthene	100	< 100 U	
207-08-9	Benzo(k)fluoranthene	100	< 100 U	
50-32-8	Benzo(a)pyrene	100	< 100 U	
193-39-5	Indeno(1,2,3-cd)pyrene	100	< 100 U	
53-70-3	Dibenz(a,h)anthracene	100	< 100 U	
191-24-2	Benzo(g,h,i)perylene	100	< 100 U	

Reported in µg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Phenanthrene	16.7%
d10-Pyrene	45.4%

2/22/08

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-13 TSW-071211
SAMPLE

Lab Sample ID: MG10K
LIMS ID: 08-1240
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/02/08 20:34
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 1.00

CAS Number	Analyte	RL	Result
91-20-3	Naphthalene	10	170
208-96-8	Acenaphthylene	10	13
83-32-9	Acenaphthene	10	65
86-73-7	Fluorene	10	60
85-01-8	Phenanthrene	10	340
120-12-7	Anthracene	10	350
206-44-0	Fluoranthene	10	430
129-00-0	Pyrene	10	1,700 E
56-55-3	Benzo(a)anthracene	10	110
218-01-9	Chrysene	10	140
205-99-2	Benzo(b)fluoranthene	10	18
207-08-9	Benzo(k)fluoranthene	10	< 10 U
50-32-8	Benzo(a)pyrene	10	12
193-39-5	Indeno(1,2,3-cd)pyrene	10	< 10 U
53-70-3	Dibenz(a,h)anthracene	10	< 10 U
191-24-2	Benzo(g,h,i)perylene	10	< 10 U

UJ(7)(1) J
R(22) J (1,19)
UJ J UJ

Reported in pg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Phenanthrene	17.8%
d10-Pyrene	172%

2/22/08

ANALYTICAL RESOURCES INCORPORATED

ORGANICS ANALYSIS DATA SHEET
PNAs by Low Level SW8270D-SIM GC/MS

Sample ID: PCM-13 TSW-071211
DILUTION

Lab Sample ID: MG10K
LIMS ID: 08-1240
Matrix: Extract
Data Release Authorized:
Reported: 02/08/08

QC Report No: MG10-Anchor Environmental, LLC
Project: Gasco Year 1 Event 2 Longterm Monit
Event: 000029-02 B6 12 T17.4
Date Sampled: 12/11/07
Date Received: 01/23/08

Date Extracted: 01/14/08
Date Analyzed: 02/05/08 16:45
Instrument/Analyst: NT2/VTS

Sample Amount: 1.00 mL
Final Extract Volume: 1.0 mL
Dilution Factor: 5.00

CAS Number	Analyte	RL	Result	
91-20-3	**Naphthalene**	**50**	**180**	R(2,2)
208-96-8	Acenaphthylene	50	< 50 U	
83-32-9	**Acenaphthene**	**50**	**67**	
86-73-7	**Fluorene**	**50**	**71**	
85-01-8	**Phenanthrene**	**50**	**340**	
120-12-7	**Anthracene**	**50**	**56**	
206-44-0	**Fluoranthene**	**50**	**540**	J(1.5)
129-00-0	**Pyrene**	**50**	**410**	
56-55-3	**Benzo(a)anthracene**	**50**	**51**	R(2,2)
218-01-9	**Chrysene**	**50**	**80**	
205-99-2	Benzo(b)fluoranthene	50	< 50 U	
207-08-9	Benzo(k)fluoranthene	50	< 50 U	
50-32-8	Benzo(a)pyrene	50	< 50 U	
193-39-5	Indeno(1,2,3-cd)pyrene	50	< 50 U	
53-70-3	Dibenz(a,h)anthracene	50	< 50 U	
191-24-2	Benzo(g,h,i)perylene	50	< 50 U	

Reported in pg/L (ppb)

SIM Semivolatile Surrogate Recovery

d10-Phenanthrene	18.6%
d10-Pyrene	47.0%

022208

LDC #: 18316A2b

SDG #: MG10

Laboratory: Analytical Resources, Inc.

VALIDATION COMPLETENESS WORKSHEET

Level III

Date: 2/20/08

Page: 1 of 1

Reviewer:

2nd Reviewer:

METHOD: GC/MS Polynuclear Aromatic Hydrocarbons (EPA SW 846 Method 8270C-SIM)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Technical holding times	SW	Sampling dates: 12/11/07
II.	GC/MS Instrument performance check	A	
III.	Initial calibration	A	RRF no SPCC
IV.	Continuing calibration/ICV	SW	ICV ≤ 25
V.	Blanks	SW	
VI.	Surrogate spikes	~~NA~~ SW	
VII.	Matrix spike/Matrix spike duplicates	N	client specified
VIII.	Laboratory control samples	NA	test not provided not reviewed
IX.	Regional Quality Assurance and Quality Control	N	
X.	Internal standards	SW	
XI.	Target compound identification	N	
XII.	Compound quantitation/CRQLs	N	
XIII.	Tentatively identified compounds (TICs)	N	
XIV.	System performance	N	
XV.	Overall assessment of data	A	
XVI.	Field duplicates	N	
XVII.	Field blanks	N	

Note: A = Acceptable; N = Not provided/applicable; SW = See worksheet; ND = No compounds detected; R = Rinsate; FB = Field blank; D = Duplicate; TB = Trip blank; EB = Equipment blank

Validated Samples: water

1	PCM-01 TSW-071211	11	PCM-06 TSW-071211	21	PCM-13 TSW-071211	31	
2	PCM-01 TSW-071211DL	12	PCM-06 TSW-071211DL	22	PCM-13 TSW-071211DL	32	
3	PCM-02 TSW-071211	13	PCM-21 TSW-071211	23	DAY ZERO / DIALYSIS BLANK *	33	
4	PCM-02 TSW-071211DL	14	PCM-21 TSW-071211DL	24	DAY ZERO / DIALYSIS BLANKDL *	34	
5	PCM-03 TSW-071211	15	PCM-08 TSW-071211	25		35	
6	PCM-03 TSW-071211DL	16	PCM-08 TSW-071211DL	26		36	
7	PCM-04 TSW-071211	17	PCM-09 TSW-071211	27		37	
8	PCM-04 TSW-071211DL	18	PCM-09 TSW-071211DL	28		38	
9	PCM-05 TSW-071211	19	PCM-10 TSW-071211	29		39	
10	PCM-05 TSW-071211DL	20	PCM-10 TSW-071211DL	30		40	

* Blank

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

A. Phenol**	P. Bis(2-chloroethoxy)methane	EE. 2,6-Dinitrotoluene	TT. Pentachlorophenol**	III. Benzo(a)pyrene**
B. Bis (2-chloroethyl) ether	Q. 2,4-Dichlorophenol**	FF. 3-Nitroaniline	UU. Phenanthrene	JJJ. Indeno(1,2,3-cd)pyrene
C. 2-Chlorophenol	R. 1,2,4-Trichlorobenzene	GG. Acenaphthene**	VV. Anthracene	KKK. Dibenz(a,h)anthracene
D. 1,3-Dichlorobenzene	S. Naphthalene	HH. 2,4-Dinitrophenol*	WW. Carbazole	LLL. Benzo(g,h,i)perylene
E. 1,4-Dichlorobenzene**	T. 4-Chloroaniline	II. 4-Nitrophenol*	XX. Di-n-butylphthalate	MMM. Bis(2-Chloroisopropyl)ether
F. 1,2-Dichlorobenzene	U. Hexachlorobutadiene**	JJ. Dibenzofuran	YY. Fluoranthene**	NNN. Aniline
G. 2-Methylphenol	V. 4-Chloro-3-methylphenol**	KK. 2,4-Dinitrotoluene	ZZ. Pyrene	OOO. N-Nitrosodimethylamine
H. 2,2'-Oxybis(1-chloropropane)	W. 2-Methylnaphthalene	LL. Diethylphthalate	AAA. Butylbenzylphthalate	PPP. Benzoic Acid
I. 4-Methylphenol	X. Hexachlorocyclopentadiene*	MM. 4-Chlorophenyl-phenyl ether	BBB. 3,3'-Dichlorobenzidine	QQQ. Benzyl alcohol
J. N-Nitroso-di-n-propylamine*	Y. 2,4,6-Trichlorophenol**	NN. Fluorene	CCC. Benzo(a)anthracene	RRR. Pyridine
K. Hexachloroethane	Z. 2,4,5-Trichlorophenol	OO. 4-Nitroaniline	DDD. Chrysene	SSS. Benzidine
L. Nitrobenzene	AA. 2-Chloronaphthalene	PP. 4,6-Dinitro-2-methylphenol	EEE. Bis(2-ethylhexyl)phthalate	TTT.
M. Isophorone	BB. 2-Nitroaniline	QQ. N-Nitrosodiphenylamine (1)**	FFF. Di-n-octylphthalate**	UUU
N. 2-Nitrophenol**	CC. Dimethylphthalate	RR. 4-Bromophenyl-phenylether	GGG. Benzo(b)fluoranthene	VVV.
O. 2,4-Dimethylphenol	DD. Acenaphthylene	SS. Hexachlorobenzene	HHH. Benzo(k)fluoranthene	WWW.

Notes: * = System performance check compound (SPCC) for RRF; ** = Calibration check compound (CCC) for %RSD.

LDC #: 18316A5
SDG #: pre cond

VALIDATION FINDINGS WORKSHEET
Technical Holding Times

Reviewer: [illegible]
2nd Reviewer: [illegible]

All circled dates have exceeded the technical holding times.
Y N N/A Were all cooler temperatures within validation criteria?

METHOD : GC/MS BNA (EPA SW 846 Method 8270)

Sample ID	Matrix	Preserved	Sampling Date	Extraction date	Analysis date	Total # of Days	Qualifier
All	water	no	12/11/07	1/14/08	2/2 – 2/5/08	34	J/UJ/R

TECHNICAL HOLDING TIME CRITERIA

Water: Extracted within 7 days, analyzed within 40 days.
Soil: Extracted within 14 days, analyzed within 40 days.

LDC #: 18316A26
SDG #: see cover

VALIDATION FINDINGS WORKSHEET

Continuing Calibration

Page: 1 of 1
Reviewer: 5
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270C)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

(Y) N N/A Was a continuing calibration standard analyzed at least once every 12 hours of sample analysis for each instrument?

(Y) N N/A Were percent differences (%D) and relative response factors (RRF) within method criteria for all CCC's and SPCC's ?

Y (N) N/A Were all %D and RRFs within the validation criteria of ≤25 %D and ≥0.05 RRF ?

#	Date	Standard ID	Compound	Finding %D (Limit: ≤25.0%)	Finding RRF (Limit: ≥0.05)	Associated Samples	Qualifications
	2/5/08	CCV	ZZ	25.8379		2, 4, 6, 8, 10,	J/UJ/A
						12, 14, 16, 18	
						20, 22	
						Day zero/Dialysis	
						Blank DL	

LDC #: 18316A2b
SDG #: per cover

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 1/14/08 **Blank analysis date:** 2/2/08
Conc. units: ug/L Associated Samples: A 11

Compound	Blank ID	Blank ID	Sample Identification							
	Day zero / Dialysis Blank	Day zero / Dialysis Blk DP2	5X	1	2 (10X)	3	4 (10X)	5	6 (10X)	7
S	94	92	470	90/U	–	140/U	120/U	120/U	120/U	98/U
UU	29	–	145	–	400/U	–	680/U	–	900/U	–
ZZ	16	–	80	–	490/U	–	~~880/U~~ –	–	–	–

Blank extraction date: 1/14/08 **Blank analysis date:** 2/2/08
Conc. units: ug/L Associated Samples: A 11

Compound	Blank ID	Sample Identification								
	Day zero / Dialysis Blank	Day zero / Dialysis Blank DP2	5X	8 (10X)	9	10 (10X)	11	12 (10X)	13	14 (10X)
S	94	92	470	~~1100/U~~	250/U	290/U	130/U	150/U	200/U	220/U
UU	29	–	145	1100/U	–	610/U	–	600/U	–	910/U
ZZ	16	–	80	–	–	–	–	–	–	–

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18316A26
SDG #: fee carey

VALIDATION FINDINGS WORKSHEET
Blanks

Page: 1 of 1
Reviewer: B
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was a method blank analyzed for each matrix?
Y N N/A Was a method blank analyzed for each concentration preparation level?
Y N N/A Was a method blank associated with every sample?
Y N N/A Was the blank contaminated? If yes, please see qualification below.

Blank extraction date: 1/14/08 **Blank analysis date:** 2/2/08
Conc. units: ug/L Associated Samples: A 11

Compound	Blank ID	Blank ID	Sample Identification							
	Day Zero/ Dialysis Blank	Day Zero/ Dialysis Blank D	5X	15	16 (10X)	17	18 (10X)	19	20 (10X)	21
S	94	92	470	260/U	330/U	230/U	280/U	210/U	240/U	170/U
UU	29	—	145	—	880/U	—	700/U	—	880/U	—
ZZ	16	—	80	—	—	—	—	—	—	—

Blank extraction date: 1/14/08 **Blank analysis date:** 2/2/08
Conc. units: ug/L Associated Samples: A 11

Compound	Blank ID	Blank ID	Sample Identification							
			5X	22 (5X)						
S			470	180/U						
UU			145	340/U						
ZZ			80	—						

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:
Common contaminants such as the phthalates and TICs noted above that were detected in samples within ten times the associated method blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 18316A20
SDG #: per cover

VALIDATION FINDINGS WORKSHEET
Surrogate Recovery

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualification below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were percent recoveries (%R) for surrogates within QC limits?
Y N N/A If 2 or more base neutral or acid surrogates were outside QC limits, was a reanalysis performed to confirm %R?
Y N N/A If any %R was less than 10 percent, was a reanalysis performed to confirm %R?

#	Date	Sample ID	Surrogate	%R (Limits)	Qualifications
		21	d10-Pyrene	172 (30-160)	no qual
				( )	
		Day Zero/Dialysis Blank	↓	175 (30-160)	↓
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	
				( )	

* QC limits are advisory	QC Limits (Soil)	QC Limits (Water)		QC Limits (Soil)	QC Limits (Water)
S1 (NBZ) = Nitrobenzene-d5	23-120	35-114	S5 (2FP) = 2-Fluorophenol	25-121	21-100
S2 (FBP) = 2-Fluorobiphenyl	30-115	43-116	S6 (TBP) = 2,4,6-Tribromophenol	19-122	10-123
S3 (TPH) = Terphenyl-d14	18-137	33-141	S7 (2CP) = 2-Chlorophenol-d4	20-130*	33-110*
S4 (PHL) = Phenol-d5	24-113	10-94	S8 (DCB) = 1,2-Dichlorobenzene-d4	20-130*	16-110*

LDC #: 18316A2D
SDG #: Re Level

VALIDATION FINDINGS WORKSHEET
Internal Standards

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y (N) N/A Were all internal standard area counts within -50 to +100 of the associated calibration standard?

Y N (N/A) Were the retention times of the internal standards within +/- 30 seconds of the retention times of the associated calibration standard?

#	Date	Sample ID	Internal Standard	Area (Limits)	RT (Limits)	Qualifications
		3	PRY	77555 (94638-378550)		J/UJ/A equal
		5		87958		
		7		58737		
		9		56027		
		11		59795		
		13		49705		
		15		50351		
		17		45344		
		19		44552		
		21		41322		
		Day Zero/Dialysis Blk	↓	42082	↓	↓

* QC limits are advisory

IS1 (DCB) = 1,4-Dichlorobenzene-d4
IS2 (NPT) = Naphthalene-d8
IS3 (ANT) = Acenaphthene-d10
IS4 (PHN) = Phenanthrene-d10
IS5 (CRY) = Chrysene-d12
IS6 (PRY) = Perylene-d12

LDC #: 18316A2b
SDG #: file cover

VALIDATION FINDINGS WORKSHEET
Compound Quantitation and Reported CRQLs

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?

Y N N/A Were compound quantitation and CRQLs adjusted to reflect all sample dilutions and dry weight factors applicable to level IV validation?

#	Date	compound ~~Sample ID~~	Finding	Associated Samples	Qualifications
		YY, ZZ	exceeded cal Range	5, 7, 9, 13, 15	J/A dit
				17, 19	↓
		ZZ	↓	11, 21	↓

Comments: See sample calculation verification worksheet for recalculations

COMQUA.2S

SDG #: [illegible]

VALIDATION FINDINGS WORKSHEET

Overall Assessment of Data

Page: 1 of 1
Reviewer: [illegible]
2nd Reviewer: [illegible]

METHOD: GC/MS BNA (EPA SW 846 Method 8270)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

All available information pertaining to the data were reviewed using professional judgement to compliment the determination of the overall quality of the data.

Y N N/A Was the overall quality and usability of the data acceptable?

#	Date	compound ~~Sample ID~~	Finding	Associated Samples	Qualifications
		YY, ZZ	exceeded cal Range	5, 7, 9, 13, 15, 17, 19	R/A
		All except above	diluted	6, 8, 10, 14, 16, 18, 20	R/A
		ZZ	exceeded cal Range	11, 21	R/A
		All except above	diluted	12, 22	R/A
		All	diluted	2, 4	R/A

Comments:

OVR.2S