SAF-RC-236
100N Groundwater Sample Collection Supporting UPR-100-N-17
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 7/30/13
INITIAL/DATE

COMMENTS:

SDG X0002 SAF-RC-236

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location: 100-N Groundwater Samples, Well 199-N-96A, 199-N-173, and 199-N-19

GEL Laboratories LLC
a member of The GEL Group INC

PO Box 30712 Charleston, SC 29417
2040 Savage Road Charleston, SC 29407
P 843.556.8171 F 843.766.1178

www.gel.com

July 23, 2013

Joan Kessner
WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354

Re: RC-236A Groundwater
Work Order: 328213
SDG: X0002

Dear Joan Kessner:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on June 25, 2013. This original data report has been prepared and reviewed in accordance with GEL's standard operating procedures.

Our policy is to provide high quality, personalized analytical services to enable you to meet your analytical needs on time every time. We trust that you will find everything in order and to your satisfaction. If you have any questions, please do not hesitate to call me at (843) 556-8171, ext. 1616.

Sincerely,

Orlette Johnson
Project Manager

Purchase Order: 1510
Chain of Custody: RC-236A-023, RC-236A-024, RC-236A-025, RC-236A-026, RC-236A-027 and RC-236A-028
Enclosures

Table of Contents

Case Narrative.....1

Chain of Custody and Supporting Documentation.....3

Laboratory Certifications.....11

Volatile Analysis.....13

Case Narrative.....14

Sample Data Summary.....21

Quality Control Summary.....25

HPLC Polynuclear Aromatic Hydrocarbon Analysis.....32

Sample Data Summary.....34

QC Summary.....39

Standard Data.....53

QC Data.....71

Miscellaneous Data.....76

FID Diesel Range Organics Analysis.....94

Case Narrative.....95

Sample Data Summary.....101

Quality Control Summary.....105

Miscellaneous.....108

GC Volatiles (GRO) Analysis.....110

Case Narrative.....111

Sample Data Summary.....116
Quality Control Summary.....120
Metals Analysis.....123
Case Narrative.....124
Sample Data Summary.....129
Quality Control Summary.....137
General Chem Analysis.....147
Case Narrative.....148
Sample Data Summary.....159
Quality Control Summary.....167

Case Narrative

Receipt Narrative
for
WC-HANFORD, INC.
SDG: X0002
Work Order: 328213

July 23, 2013

Laboratory Identification:

GEL Laboratories LLC
2040 Savage Road
Charleston, South Carolina 29407
(843) 556-8171

Summary:

Sample receipt: The samples arrived at GEL Laboratories LLC, Charleston, South Carolina on June 25, 2013 for analysis. The samples were delivered with proper chain of custody documentation and signatures. All sample containers arrived without any visible signs of tampering or breakage. GEL is not currently certified for NWTPH-Dx and NWTPH-Gx analyses. The laboratory has passed the applicable PTs and has applied for certification..

Sample Identification: The laboratory received the following samples:

Laboratory ID	Client ID
328213001	B2PM35
328213002	B2PM36
328213003	B2PM38
328213004	B2PM39
328213005	B2PM41
328213006	B2PM42

Case Narrative:

Sample analyses were conducted using methodology as outlined in GEL's Standard Operating Procedures. Any technical or administrative problems during analysis, data review, and reduction are contained in the analytical case narratives in the enclosed data package.

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist, Data Package Qualifier Definitions and data from the following fractions: Diesel Range Organics, GC Volatiles (GRO), GC/MS Volatile, General Chemistry, HPLC Polynuclear Aromatic Hydrocarbon and Metals.

Orlette Johnson
Project Manager

Chain of Custody and Supporting Documentation

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

328213

C.O.C. # **RC-236A-023**

Page 1 of 1

Collector	Dan Woehle	**Contact/Requester**	THOMPSON, WS	**Telephone No.**	372-9597
SAF No.	RC-236A	**Sampling Origin**	199-N-96A	**Purchase Order/Charge Code**	303123ES20
Project Title	100-N Groundwater Sample Collection S	**Logbook No.**	HNF-N-506 55/63	**Ice Chest No.**	GWS-244
Shipped To (Lab)	GEL Laboratories, LLC	**Method of Shipment**	Commercial Carrier	**Bill of Lading/Air Bill No.**	7916077826983
Protocol	CHARACTERIZATION	**Priority:**	**15 Days** **PRIORITY**	**Offsite Property No.**	4455

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

** The field NCOs prior to purging the well for sample collection, will use a transparent bailer to collect a grab sample to evaluate the presence of an oil sheen. They are to record their observations, along with any odors observed on the Field Sampling Report provided.

** The RCCC acknowledges that the analytical holding time for Nitrate, Nitrite, and Phosphate by EPA methods 300.0 or 9056 will not be met.

B2PM35	N	W	6-24-13	1203	2x1-L G	1664A_OILGREASE: COMMON	28 Days	HCl to pH <2/Cool~4C
B2PM35	N	W			1x1-L aG	WTPH_DIESEL: COMMON; WTPH_MOTOR OIL: COMMON	14/40 Days	HCl to pH <2/Cool~4C
B2PM35	N	W			4x40-mL aGs*	WTPH_GASOLINE: COMMON	14 Days	HCl to pH <2/Cool~4C
B2PM35	N	W			1x500-mL G/P	6010_METALS_ICP (Supertrace): COMMON; 6010_METALS_ICP (Supertrace): COMMON (Add-on)	6 Months	HNO3 to pH <2
B2PM35	N	W			1x20-mL P	Activity Scan	6 Months	None
B2PM35	N	W			1x250-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool~4C
B2PM35	N	W			2x1-L aG	8310_PAHs: COMMON	7/40 Days	Cool~4C
B2PM35	N	W	6-24-13	1203	4x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool~4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Dan Woehle			JUN 24 2013 1300	L.D. Wall CHPRC		L.D. Wall	JUN 24 2013 1300
L.D. Wall CHPRC		L.D. Wall	JUN 24 2013 1400	FEDEX			
				Jennifer Pellegrini			6-25-13 0910

Matrix *

S	=	Soil	DS	=	Drum Solids
SE	=	Sediment	DL	=	Drum Liquids
SO	=	Solid	T	=	Tissue
SL	=	Sludge	WI	=	Wipe
W	=	Water	L	=	Liquid
O	=	Oil	V	=	Vegetation
A	=	Air	X	=	Other

FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

PRINTED O 6/13/2013

A-6004-842 (REV 2)

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **RC-236A-024**

Page 1 of 1

Collector	Dan Woehle	**Contact/Requester**	THOMPSON, WS	**Telephone No.**	372-9597
SAF No.	RC-236A	**Sampling Origin**	199-N-96A	**Purchase Order/Charge Code**	303123ES20
Project Title	100-N Groundwater Sample Collection S	**Logbook No.**	HNF-N-506 55 / 63	**Ice Chest No.**	GWS-244
Shipped To (Lab)	GEL Laboratories, LLC	**Method of Shipment**	Commercial Carrier	**Bill of Lading/Air Bill No.**	7960 7982 6983
Protocol	CHARACTERIZATION	**Priority:**	**15 Days** **PRIORITY**	**Offsite Property No.**	4455

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

** The field NCOs prior to purging the well for sample collection, will use a transparent bailer to collect a grab sample to evaluate the presence of an oil sheen. They are to record their observations, along with any odors observed on the Field Sampling Report provided.

** The RCCC acknowledges that the analytical holding time for Nitrate, Nitrite, and Phosphate by EPA methods 300.0 or 9056 will not be met.

B2PM36	N	W	6-24-13	1203	1x20-mL P	Activity Scan	6 Months	None
B2PM36	N	W	6-24-13	1203	1x250-mL G/P	9056_ANIONS_IC: COMMON; 9056_ANIONS_IC: COMMON (Add-on)	28 Days/48 Hours	Cool~4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
	Dan Woehle	[signature]	JUN 24 2013 1300		L.D. Wall CHPRC	[signature]	JUN 24 2013 1300
Relinquished By	L.D. Wall CHPRC	[signature]	JUN 24 2013 1400	Received By	FEDEX		Date/Time
Relinquished By			Date/Time	Received By	[signature]	Jennifer Pellegrini	6-25-13 0910
Relinquished By			Date/Time	Received By			Date/Time

Matrix *

S	= Soil	DS	= Drum Solids		
SE	= Sediment	DL	= Drum Liquids		
SO	= Solid	T	= Tissue		
SL	= Sludge	WI	= Wipe		
W	= Water	L	= Liquid		
O	= Oil	V	= Vegetation		
A	= Air	X	= Other		

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

PRINTED O 6/13/2013

A-6004-842 (REV 2)

8410

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # RC-236A-025 Page 1 of 1

Collector	Dan Woehle	Contact/Requester	THOMPSON, WS	Telephone No.	372-9597
SAF No.	RC-236A	Sampling Origin	199-N-173	Purchase Order/Charge Code	303123ES20
Project Title	100-N Groundwater Sample Collection S	Logbook No.	HNF-N-506 55 / 63	Ice Chest No.	GWS-006
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.	7960798959 40
Protocol	CHARACTERIZATION	Priority: 15 Days	PRIORITY	Offsite Property No.	4454

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

** The field NCOs prior to purging the well for sample collection, will use a transparent bailer to collect a grab sample to evaluate the presence of an oil sheen. They are to record their observations, along with any odors observed on the Field Sampling Report provided.

** The RCCC acknowledges that the analytical holding time for Nitrate, Nitrite, and Phosphate by EPA methods 300.0 or 9056 will not be met.

B2PM38	N	W	6-24-13	1102	2x1-L G	1664A_OILGREASE: COMMON	28 Days	HCl to pH <2/Cool~4C
B2PM38	N	W			1x1-L aG	WTPH_DIESEL: COMMON; WTPH_MOTOR OIL: COMMON	14/40 Days	HCl to pH <2/Cool~4C
B2PM38	N	W			4x40-mL aGs*	WTPH_GASOLINE: COMMON	14 Days	HCl to pH <2/Cool~4C
B2PM38	N	W			1x500-mL G/P	6010_METALS_ICP (Supertrace): COMMON; 6010_METALS_ICP (Supertrace): COMMON (Add-on)	6 Months	HNO3 to pH <2
B2PM38	N	W			1x20-mL P	Activity Scan	6 Months	None
B2PM38	N	W			1x250-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool~4C
B2PM38	N	W			2x1-L aG	8310_PAHs: COMMON	7/40 Days	Cool~4C
B2PM38	N	W	6-24-13	1102	4x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool~4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Dan Woehle			JUN 24 2013 1300	L.D. Wall CHPRC			JUN 24 2013 1300
L.D. Wall CHPRC			JUN 24 2013 1400	FEDEX			
				Jennifer Pellegrini			6-25-13 0910

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

PRINTED O 6/13/2013

A-6004-842 (REV 2)

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **RC-236A-026**

Page 1 of 1

Collector	Dan Woehle	**Contact/Requester**	THOMPSON, WS	**Telephone No.**	372-9597
SAF No.	RC-236A	**Sampling Origin**	199-N-173	**Purchase Order/Charge Code**	303123ES20
Project Title	100-N Groundwater Sample Collection S	**Logbook No.**	HNF-N-506 55 / 63	**Ice Chest No.**	GWS-244
Shipped To (Lab)	GEL Laboratories, LLC	**Method of Shipment**	Commercial Carrier	**Bill of Lading/Air Bill No.**	7960 7982 6983
Protocol	CHARACTERIZATION	**Priority:**	**15 Days** **PRIORITY**	**Offsite Property No.**	4455

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

** The field NCOs prior to purging the well for sample collection, will use a transparent bailer to collect a grab sample to evaluate the presence of an oil sheen. They are to record their observations, along with any odors observed on the Field Sampling Report provided.

** The RCCC acknowledges that the analytical holding time for Nitrate, Nitrite, and Phosphate by EPA methods 300.0 or 9056 will not be met.

B2PM39	N	W	6-24-13	1102	1x20-mL P	Activity Scan	6 Months	None
B2PM39	N	W	6-24-13	1102	1x250-mL G/P	9056_ANIONS_IC: COMMON; 9056_ANIONS_IC: COMMON (Add-on)	28 Days/48 Hours	Cool~4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Dan Woehle			JUN 24 2013 1300	L.D. Wall CHPRC			JUN 24 2013 1300
L.D. Wall CHPRC	L.D. Wall		JUN 24 2013 1400	FEDEX			
					Jennifer Pellegrini		6-25-13 0910

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

CH2MHill Plateau Remediation Company

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. # **RC-236A-027**

Page 1 of 1

Collector	Dan Woehle	**Contact/Requester**	THOMPSON, WS	**Telephone No.**	372-9597
SAF No.	RC-236A	**Sampling Origin**	199-N-19	**Purchase Order/Charge Code**	303123ES20
Project Title	100-N Groundwater Sample Collection S	**Logbook No.**	HNF-N-506 55 163	**Ice Chest No.**	GWS-006
Shipped To (Lab)	GEL Laboratories, LLC	**Method of Shipment**	Commercial Carrier	**Bill of Lading/Air Bill No.**	7960798959 40
Protocol	CHARACTERIZATION	**Priority:**	**15 Days** **PRIORITY**	**Offsite Property No.**	LW. 6/24/13 ~~N/A~~ 4454

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

** The field NCOs prior to purging the well for sample collection, will use a transparent bailer to collect a grab sample to evaluate the presence of an oil sheen. They are to record their observations, along with any odors observed on the Field Sampling Report provided.

** The RCCC acknowledges that the analytical holding time for Nitrate, Nitrite, and Phosphate by EPA methods 300.0 or 9056 will not be met.

B2PM41	N	W	6-24-13	0946	2x1-L G	1664A_OILGREASE: COMMON	28 Days	HCl to pH <2/Cool~4C
B2PM41	N	W			1x1-L aG	WTPH_DIESEL: COMMON; WTPH_MOTOR OIL: COMMON	14/40 Days	HCl to pH <2/Cool~4C
B2PM41	N	W			4x40-mL aGs*	WTPH_GASOLINE: COMMON	14 Days	HCl to pH <2/Cool~4C
B2PM41	N	W			1x500-mL G/P	6010_METALS_ICP (Supertrace): COMMON; 6010_METALS_ICP (Supertrace): COMMON (Add-on)	6 Months	HNO3 to pH <2
B2PM41	N	W			1x20-mL P	Activity Scan	6 Months	None
B2PM41	N	W			1x250-mL G/P	2320_ALKALINITY: COMMON	14 Days	Cool~4C
B2PM41	N	W			2x1-L aG	8310_PAHs: COMMON	7/40 Days	Cool~4C
B2PM41	N	W	6-24-13	0946	4x40-mL aGs*	8260_VOA_GCMS: COMMON	14 Days	HCl or H2SO4 to pH <2/Cool~4C

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Dan Woehle		[signature]	JUN 24 2013 1300	L.D. Wall CHPRC		[signature]	JUN 24 2013 1300
L.D. Wall CHPRC		[signature]	JUN 24 2013 1400	FEDEX			
				[signature]	Jennifer Pellegrini		6-25-13 0910

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Date/Time

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	C.O.C. # RC-236A-028 Page 1 of 1

Collector	Dan Woehle	Contact/Requester	THOMPSON, WS	Telephone No.	372-9597
SAF No.	RC-236A	Sampling Origin	199-N-19	Purchase Order/Charge Code	303123ES20
Project Title	100-N Groundwater Sample Collection S	Logbook No.	HNF-N-506 55163	Ice Chest No.	GWS-244
Shipped To (Lab)	GEL Laboratories, LLC	Method of Shipment	Commercial Carrier	Bill of Lading/Air Bill No.	7960 7982 6983
Protocol	CHARACTERIZATION	Priority:	15 Days PRIORITY	Offsite Property No.	4455

POSSIBLE SAMPLE HAZARDS/REMARKS

Contains Radioactive Material at concentrations that may or may not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL INSTRUCTIONS **Hold Time** Total Activity Exemption: Yes ☑ No ☐

** The field NCOs prior to purging the well for sample collection, will use a transparent bailer to collect a grab sample to evaluate the presence of an oil sheen. They are to record their observations, along with any odors observed on the Field Sampling Report provided.

** The RCCC acknowledges that the analytical holding time for Nitrate, Nitrite, and Phosphate by EPA methods 300.0 or 9056 will not be met.

B2PM42	N	W	6-24-13	0946	1x20-mL P	Activity Scan	6 Months	None
B2PM42	N	W	6-24-13	0946	1x250-mL G/P	9056_ANIONS_IC: COMMON; 9056_ANIONS_IC: COMMON (Add-on)	28 Days/48 Hours	Cool~4C

Relinquished By (Print / Sign)	Date/Time	Received By (Print / Sign)	Date/Time
Dan Woehle	JUN 24 2013 1300	L.D. Wall CHPRC	JUN 24 2013 1300
L.D. Wall CHPRC	JUN 24 2013 1400	FEDEX	
		Jennifer Pellegrini	6-25-13 0910

Matrix *

S	= Soil	DS	= Drum Solids
SE	= Sediment	DL	= Drum Liquids
SO	= Solid	T	= Tissue
SL	= Sludge	WI	= Wipe
W	= Water	L	= Liquid
O	= Oil	V	= Vegetation
A	= Air	X	= Other

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: WCHN	SDG/AR/COC/Work Order: 328213
Received By: JP	Date Received: 10-25-13

Suspected Hazard Information	Yes	No	*If Net Counts > 100cpm on samples not marked "radioactive", contact the Radiation Safety Group for further investigation.
COC/Samples marked as radioactive?		✓	Maximum Net Counts Observed* (Observed Counts - Area Background Counts): 0cpm
Classified Radioactive II or III by RSO?		✓	If yes, Were swipes taken of sample contatiners < action levels?
COC/Samples marked containing PCBs?		✓	
Package, COC, and/or Samples marked as beryllium or asbestos containing?		✓	If yes, samples are to be segregeated as Safety Controlled Samples, and opened by the GEL Safety Group.
Shipped as a DOT Hazardous?		✓	Hazard Class Shipped: UN#:
Samples identified as Foreign Soil?		✓	

	Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (Required for Non-Conforming Items)
1	Shipping containers received intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
2	Samples requiring cold preservation within (0 ≤ 6 deg. C)?*	✓			Preservation Method: (Ice bags) Blue ice Dry ice None Other (describe) *all temperatures are recorded in Celsius 4
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: 41502209 Secondary Temperature Device Serial # (If Applicable):
3	Chain of custody documents included with shipment?	✓			
4	Sample containers intact and sealed?	✓			Circle Applicable: Seals broken Damaged container Leaking container Other (describe)
5	Samples requiring chemical preservation at proper pH?	✓			Sample ID's, containers affected and observed pH: If Preservation added, Lot#:
6	VOA vials free of headspace (defined as < 6mm bubble)?	✓			Sample ID's and containers affected:
7	Are Encore containers present?			✓	(If yes, immediately deliver to Volatiles laboratory)
8	Samples received within holding time?	✓			ID's and tests affected:
9	Sample ID's on COC match ID's on bottles?	✓			Sample ID's and containers affected:
10	Date & time on COC match date & time on bottles?	✓			Sample ID's affected:
11	Number of containers received match number indicated on COC?	✓			Sample ID's affected:
12	Are sample containers identifiable as GEL provided?			✓	
13	COC form is properly signed in relinquished/received sections?	✓			
14	Carrier and tracking number.				Circle Applicable: (FedEx Air) FedEx Ground UPS Field Services Courier Other 7960 7989 5940 " 7982 6983

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials JP Date 10-25-13 Page 1 of 1

Laboratory Certifications

List of current GEL Certifications as of 23 July 2013

State	Certification
Alaska	UST−110
Arkansas	88−0651
CLIA	42D0904046
California NELAP	01151CA
Colorado	SC00012
Connecticut	PH−0169
Delaware	SC00012
DoD ELAP A2LA ISO 17025	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330−12−00283, P330−12−00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC00012
Idaho	SC00012
Illinois NELAP	200029
Indiana	C−SC−01
Kansas NELAP	E−10332
Kentucky	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA130005
Maryland	270
Massachusetts	M−SC012
Nevada	SC000122011−1
New Hampshire NELAP	2054
New Jersey NELAP	SC002
New Mexico	SC00012
New York NELAP	11501
North Carolina	233
North Carolina SDWA	45709
Oklahoma	9904
Pennsylvania NELAP	68−00485
Plant Material Permit	PDEP−12−00260
South Carolina Chemistry	10120001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235−13−8
Utah NELAP	SC000122013−8
Vermont	VT87156
Virginia NELAP	460202
Washington	C780−12
Wisconsin	999887790

Volatile Analysis

Case Narrative

ChemStation Case Narrative
WC-HANFORD, INC. (WCHN)
SDG X0002

Method/Analysis Information

Procedure:	**Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer**
Analytical Method:	SW846 8260B
Analytical Batch Number:	1311060

Sample Analysis

The following client and quality control samples were analyzed to complete this SDG using the methods referenced in the Analysis Information section:

Sample ID	Client ID
328213001	B2PM35
328213003	B2PM38
328213005	B2PM41
1202900084	Method Blank (MB)
1202900085	328172001(B2PM27) Post Spike (PS)
1202900086	328172001(B2PM27) Post Spike Duplicate (PSD)
1202900087	Laboratory Control Sample (LCS)
1202901701	Method Blank (MB)
1202901702	Laboratory Control Sample (LCS)

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

The samples in this SDG were analyzed on an "as received" basis.

Preparation/Analytical Method Verification

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-038 REV# 19.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP) section 19.1.2. False positive analytes are designated on the quantitation report with a ’d’ qualifier.

Calibration Information

A complete list of the initial calibration data files with the correct dates and times of analysis are shown in the Calibration History report located in the Standard Data section of the data package.

The surrogate compounds were calibrated using a minimum five-point calibration curve. The surrogates were added by the auto sampler at a concentration of 50 ug/L or 20 ug/L for low level analyses. GEL Laboratories LLC will not have surrogate recoveries reported for Dibromofluoromethane. This is due to increased regulations for this analyte and an industry shortage.

Initial Calibration
All initial calibration requirements have been met for this sample delivery group (SDG).

Continuing Calibration Verification Requirements
All associated calibration verification standard(s) (CCV) met the acceptance criteria.

Quality Control (QC) Information

Blank (MB) Statement
The blanks analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries
Surrogate recoveries in all client and quality control samples were within the acceptance limits.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

QC Sample Designation
Sample 328172001 (B2PM27) was designated for spike analysis.

Matrix Spike (PS) Recovery Statement
The spike 1202900085 (B2PM27) recoveries were not all within the acceptance limits. See the Data Exception Report in the miscellaneous section of the data package.

Matrix Spike Duplicate (PSD) Recovery Statement
The spike duplicate 1202900086 (B2PM27) recoveries were not all within the acceptance limits. See the Data Exception Report in the miscellaneous section of the data package.

Relative Percent Difference (RPD) Statement
The RPDs between the matrix spike pair met the acceptance limits.

Internal Standard (ISTD) Acceptance
The internal standard responses in all client and quality control samples met the required acceptance criteria.

Technical Information

Holding Time Specifications
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection or sample receipt. Those holding times expressed in hours are calculated in the ALPHALIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Sample Preservation and Integrity
All samples met the sample preservation and integrity requirements.

Sample Dilutions/Methanol Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
The samples were analyzed on two instruments in order to meet the client criteria.

Miscellaneous Information

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Data Exception (DER) Documentation
The following DER was generated for this SDG: 1198681.

Manual Integrations
Data files associated with the initial calibration, continuing calibration check, and samples did not require manual integrations.

TIC Comment
Tentatively identified compounds (TIC) were not required for this SDG.

Additional Comments
Additional comments were not required for this SDG.

Residual Chlorine
Residual Chlorine was not detected in any of the samples in this SDG.

System Configuration

The Volatile-GC/MS analysis was performed on the following instrument configuration:

The Volatile-GC/MS analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOA4.I	Agilent 6890/5973 GC/MS w/ OI 4560/Archon Autosampler	HP6890/HP5973	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10
VOA6.I	Agilent 6890N/5975 GC/MS w/ OI 4560/Archon Autosampler	HP6890N/HP5975	DB-624	J&W, 60m x 0.25mm x 1.4um	Trap 10

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all the

requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

DATA EXCEPTION REPORT

Mo.Day Yr.	Division:	Quality Criteria:	Type:
01-JUL-13	Industrial	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
VOA GC/MS	SW846 8260B	Liquid	WCHN
Batch ID:	**Sample Numbers:**		
1311060	See Below		

Potentially affected work order(s)(SDG): 328172(X0001),328213(X0002),328338(X0003)

Application Issues:

Failed Recovery for MS/PS

Failed Recovery for LCS/LCSD

Failed Recovery for MSD/PSD

Specification and Requirements Exception Description:	DER Disposition:
1. QC samples 1202900085MS and 1202900086MSD were outside the spike recovery acceptance limits for Acetone and 2-Butanone.	1. Narrate and report data. The MS/MSD recover in a similar manner, pass %RPD and are within GEL's SPC limits.

Originator's Name:

Amy Jamison 01-JUL-13

Data Validator/Group Leader:

Erin Haubert 01-JUL-13

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report
for

WCHN001 WC-HANFORD, INC.

Client SDG: X0002 GEL Work Order: 328213

The Qualifiers in this report are defined as follows:

J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated

T Spike and/or spike duplicate sample recovery is outside control limits.

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

DL Indicates that sample is diluted.

RA Indicates that sample is re-analyzed without re-extraction.

RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: Erin Haubert **Name: Erin Haubert**

Date: 09 JUL 2013 **Title: Data Validator**

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 9, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-236A Groundwater

Client Sample ID:	B2PM35	Project:	WCHN RC-236A
Sample ID:	328213001	Client ID:	WCHN001
Matrix:	Water		
Collect Date:	24-JUN-13 12:03		
Receive Date:	25-JUN-13		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
8260_VOA_GCMS:COMMON "As Received"											
1,1,1-Trichloroethane	U	0.300	0.300	5.00	ug/L	1	ACJ	06/27/13	1623	1311060	1
1,1,2-Trichloroethane	U	0.300	0.300	5.00	ug/L	1					
1,1-Dichloroethane	U	0.300	0.300	10.0	ug/L	1					
1,1-Dichloroethylene	U	0.300	0.300	10.0	ug/L	1					
1,2-Dichloroethane	U	0.300	0.300	5.00	ug/L	1					
4-Methyl-2-pentanone	U	1.50	1.50	10.0	ug/L	1					
Benzene	U	0.300	0.300	5.00	ug/L	1					
Carbon disulfide	U	1.50	1.50	5.00	ug/L	1					
Carbon tetrachloride	U	0.300	0.300	5.00	ug/L	1					
Chlorobenzene	U	0.300	0.300	5.00	ug/L	1					
Chloroform	U	0.300	0.300	5.00	ug/L	1					
Ethylbenzene	U	0.300	0.300	5.00	ug/L	1					
Methylene chloride	U	1.00	1.00	5.00	ug/L	1					
Tetrachloroethylene	U	0.300	0.300	5.00	ug/L	1					
Toluene	U	0.300	0.300	5.00	ug/L	1					
Trichloroethylene	U	0.300	0.300	5.00	ug/L	1					
Vinyl chloride	U	0.300	0.300	10.0	ug/L	1					
Xylenes (total)	U	0.300	0.300	10.0	ug/L	1					
2-Butanone	TU	2.00	2.00	10.0	ug/L	1	ACJ	06/28/13	1525	1311060	2
Acetone	TU	2.50	2.50	20.0	ug/L	1					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	
2	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	8260_VOA_GCMS:COMMON "As Received"	46.8 ug/L	50.0	93.6	(78%-124%)
Bromofluorobenzene	8260_VOA_GCMS:COMMON "As Received"	50.6 ug/L	50.0	101	(80%-120%)
Toluene-d8	8260_VOA_GCMS:COMMON "As Received"	50.1 ug/L	50.0	100	(80%-120%)
1,2-Dichloroethane-d4	8260_VOA_GCMS:COMMON "As Received"	48.4 ug/L	50.0	96.8	(78%-124%)
Bromofluorobenzene	8260_VOA_GCMS:COMMON "As Received"	49.8 ug/L	50.0	99.5	(80%-120%)
Toluene-d8	8260_VOA_GCMS:COMMON "As Received"	49.1 ug/L	50.0	98.3	(80%-120%)

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 9, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-236A Groundwater

Client Sample ID:	B2PM38	Project:	WCHN RC-236A
Sample ID:	328213003	Client ID:	WCHN001
Matrix:	Water		
Collect Date:	24-JUN-13 11:02		
Receive Date:	25-JUN-13		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
8260_VOA_GCMS:COMMON "As Received"											
1,1,1-Trichloroethane	U	0.300	0.300	5.00	ug/L	1	ACJ	06/27/13	1651	1311060	1
1,1,2-Trichloroethane	U	0.300	0.300	5.00	ug/L	1					
1,1-Dichloroethane	U	0.300	0.300	10.0	ug/L	1					
1,1-Dichloroethylene	U	0.300	0.300	10.0	ug/L	1					
1,2-Dichloroethane	U	0.300	0.300	5.00	ug/L	1					
4-Methyl-2-pentanone	U	1.50	1.50	10.0	ug/L	1					
Benzene	U	0.300	0.300	5.00	ug/L	1					
Carbon disulfide	U	1.50	1.50	5.00	ug/L	1					
Carbon tetrachloride	U	0.300	0.300	5.00	ug/L	1					
Chlorobenzene	U	0.300	0.300	5.00	ug/L	1					
Chloroform	U	0.300	0.300	5.00	ug/L	1					
Ethylbenzene	U	0.300	0.300	5.00	ug/L	1					
Methylene chloride	U	1.00	1.00	5.00	ug/L	1					
Tetrachloroethylene	U	0.300	0.300	5.00	ug/L	1					
Toluene	U	0.300	0.300	5.00	ug/L	1					
Trichloroethylene	U	0.300	0.300	5.00	ug/L	1					
Vinyl chloride	U	0.300	0.300	10.0	ug/L	1					
Xylenes (total)	U	0.300	0.300	10.0	ug/L	1					
2-Butanone	TU	2.00	2.00	10.0	ug/L	1	ACJ	06/28/13	1554	1311060	2
Acetone	TU	2.50	2.50	20.0	ug/L	1					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	
2	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	8260_VOA_GCMS:COMMON "As Received"	46.8 ug/L	50.0	93.6	(78%-124%)
Bromofluorobenzene	8260_VOA_GCMS:COMMON "As Received"	51.3 ug/L	50.0	103	(80%-120%)
Toluene-d8	8260_VOA_GCMS:COMMON "As Received"	51.8 ug/L	50.0	104	(80%-120%)
1,2-Dichloroethane-d4	8260_VOA_GCMS:COMMON "As Received"	48.5 ug/L	50.0	97.0	(78%-124%)
Bromofluorobenzene	8260_VOA_GCMS:COMMON "As Received"	49.6 ug/L	50.0	99.2	(80%-120%)
Toluene-d8	8260_VOA_GCMS:COMMON "As Received"	49.4 ug/L	50.0	98.9	(80%-120%)

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 9, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-236A Groundwater

Client Sample ID:	B2PM41	Project:	WCHN RC-236A
Sample ID:	328213005	Client ID:	WCHN001
Matrix:	Water		
Collect Date:	24-JUN-13 09:46		
Receive Date:	25-JUN-13		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
8260_VOA_GCMS:COMMON "As Received"											
1,1,1-Trichloroethane	U	0.300	0.300	5.00	ug/L	1	ACJ	06/27/13	1719	1311060	1
1,1,2-Trichloroethane	U	0.300	0.300	5.00	ug/L	1					
1,1-Dichloroethane	U	0.300	0.300	10.0	ug/L	1					
1,1-Dichloroethylene	U	0.300	0.300	10.0	ug/L	1					
1,2-Dichloroethane	U	0.300	0.300	5.00	ug/L	1					
4-Methyl-2-pentanone	U	1.50	1.50	10.0	ug/L	1					
Benzene	U	0.300	0.300	5.00	ug/L	1					
Carbon disulfide	U	1.50	1.50	5.00	ug/L	1					
Carbon tetrachloride	U	0.300	0.300	5.00	ug/L	1					
Chlorobenzene	U	0.300	0.300	5.00	ug/L	1					
Chloroform	J	1.69	0.300	5.00	ug/L	1					
Ethylbenzene	U	0.300	0.300	5.00	ug/L	1					
Methylene chloride	U	1.00	1.00	5.00	ug/L	1					
Tetrachloroethylene	U	0.300	0.300	5.00	ug/L	1					
Toluene	U	0.300	0.300	5.00	ug/L	1					
Trichloroethylene	U	0.300	0.300	5.00	ug/L	1					
Vinyl chloride	U	0.300	0.300	10.0	ug/L	1					
Xylenes (total)	U	0.300	0.300	10.0	ug/L	1					
2-Butanone	TU	2.00	2.00	10.0	ug/L	1	ACJ	06/28/13	1623	1311060	2
Acetone	TU	2.50	2.50	20.0	ug/L	1					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8260B	
2	SW846 8260B	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1,2-Dichloroethane-d4	8260_VOA_GCMS:COMMON "As Received"	47.4 ug/L	50.0	94.8	(78%-124%)
Bromofluorobenzene	8260_VOA_GCMS:COMMON "As Received"	50.4 ug/L	50.0	101	(80%-120%)
Toluene-d8	8260_VOA_GCMS:COMMON "As Received"	51.0 ug/L	50.0	102	(80%-120%)
1,2-Dichloroethane-d4	8260_VOA_GCMS:COMMON "As Received"	47.6 ug/L	50.0	95.3	(78%-124%)
Bromofluorobenzene	8260_VOA_GCMS:COMMON "As Received"	48.3 ug/L	50.0	96.6	(80%-120%)
Toluene-d8	8260_VOA_GCMS:COMMON "As Received"	47.3 ug/L	50.0	94.6	(80%-120%)

Notes:

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: July 9, 2013

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington

Contact: **Joan Kessner**

Workorder: **328213**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch 1311060											
QC1202900087 LCS											
1,1,1-Trichloroethane	50.0			52.6	ug/L		105	(80%-120%)	ACJ	06/27/13	11:12
1,1,2-Trichloroethane	50.0			50.0	ug/L		99.9	(80%-120%)			
1,1-Dichloroethane	50.0			50.8	ug/L		102	(80%-120%)			
1,1-Dichloroethylene	50.0			53.4	ug/L		107	(80%-120%)			
1,2-Dichloroethane	50.0			49.6	ug/L		99.1	(80%-120%)			
4-Methyl-2-pentanone	250			272	ug/L		109	(80%-120%)			
Benzene	50.0			50.1	ug/L		100	(80%-120%)			
Carbon disulfide	250			271	ug/L		109	(80%-120%)			
Carbon tetrachloride	50.0			53.3	ug/L		107	(80%-120%)			
Chlorobenzene	50.0			51.0	ug/L		102	(80%-120%)			
Chloroform	50.0			50.6	ug/L		101	(80%-120%)			
Ethylbenzene	50.0			49.4	ug/L		98.7	(80%-120%)			
Methylene chloride	50.0			51.9	ug/L		104	(80%-120%)			
Tetrachloroethylene	50.0			50.4	ug/L		101	(80%-120%)			
Toluene	50.0			50.2	ug/L		100	(80%-120%)			
Trichloroethylene	50.0			51.0	ug/L		102	(80%-120%)			
Vinyl chloride	50.0			48.1	ug/L		96.2	(80%-120%)			
Xylenes (total)	150			150	ug/L		100	(80%-120%)			
**1,2-Dichloroethane-d4	50.0			47.5	ug/L		94.9	(78%-124%)			
				48.7							

QC Summary

Workorder: 328213

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1311060										
**Bromofluorobenzene	50.0				ug/L		97.4	(80%-120%)		
**Toluene-d8	50.0			49.6	ug/L		99.2	(80%-120%)	ACJ	06/27/13 11:12
QC1202901702 LCS										
2-Butanone	250			232	ug/L		92.8	(80%-120%)		06/28/13 12:02
Acetone	250			209	ug/L		83.7	(80%-120%)		
**1,2-Dichloroethane-d4	50.0			51.1	ug/L		102	(78%-124%)		
**Bromofluorobenzene	50.0			48.7	ug/L		97.4	(80%-120%)		
**Toluene-d8	50.0			50.3	ug/L		101	(80%-120%)		
QC1202900084 MB										
1,1,1-Trichloroethane			U	0.300	ug/L					06/27/13 13:33
1,1,2-Trichloroethane			U	0.300	ug/L					
1,1-Dichloroethane			U	0.300	ug/L					
1,1-Dichloroethylene			U	0.300	ug/L					
1,2-Dichloroethane			U	0.300	ug/L					
4-Methyl-2-pentanone			U	1.50	ug/L					
Benzene			U	0.300	ug/L					
Carbon disulfide			U	1.50	ug/L					
Carbon tetrachloride			U	0.300	ug/L					
Chlorobenzene			U	0.300	ug/L					
Chloroform			U	0.300	ug/L					
Ethylbenzene			U	0.300	ug/L					
Methylene chloride			U	1.00	ug/L					
Tetrachloroethylene			U	0.300	ug/L					
Toluene			U	0.300	ug/L					

QC Summary

Workorder: 328213

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1311060											
Trichloroethylene				U	0.300	ug/L				ACJ	06/27/13 13:33
Vinyl chloride				U	0.300	ug/L					
Xylenes (total)				U	0.300	ug/L					
**1,2-Dichloroethane-d4	50.0				45.3	ug/L		90.7	(78%-124%)		
**Bromofluorobenzene	50.0				50.0	ug/L		99.9	(80%-120%)		
**Toluene-d8	50.0				50.9	ug/L		102	(80%-120%)		
QC1202901701 MB											
2-Butanone				U	2.00	ug/L					06/28/13 12:59
Acetone				U	2.50	ug/L					
**1,2-Dichloroethane-d4	50.0				49.4	ug/L		98.8	(78%-124%)		
**Bromofluorobenzene	50.0				49.9	ug/L		99.9	(80%-120%)		
**Toluene-d8	50.0				49.2	ug/L		98.4	(80%-120%)		
QC1202900085 328172001 PS											
1,1,1-Trichloroethane	50.0	U	0.00		46.3	ug/L		92.6	(75%-125%)		06/27/13 20:07
1,1,2-Trichloroethane	50.0	U	0.00		52.0	ug/L		104	(75%-125%)		
1,1-Dichloroethane	50.0	U	0.00		49.2	ug/L		98.3	(75%-125%)		
1,1-Dichloroethylene	50.0	U	0.00		50.0	ug/L		99.9	(75%-125%)		
1,2-Dichloroethane	50.0	U	0.00		44.9	ug/L		89.9	(75%-125%)		
2-Butanone	250	TU	0.00	T	179	ug/L		71.7*	(75%-125%)		06/28/13 18:18
4-Methyl-2-pentanone	250	U	0.00		271	ug/L		108	(75%-125%)		06/27/13 20:07
Acetone	250	TU	0.00	T	114	ug/L		45.4*	(75%-125%)		06/28/13 18:18
Benzene	50.0	U	0.00		50.7	ug/L		101	(75%-125%)		06/27/13 20:07
Carbon disulfide	250	U	0.00		268	ug/L		107	(75%-125%)		

QC Summary

Workorder: 328213

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1311060											
Carbon tetrachloride	50.0	U	0.00		46.2	ug/L		92.4	(75%-125%)	ACJ	06/27/13 20:07
Chlorobenzene	50.0	U	0.00		51.1	ug/L		102	(75%-125%)		
Chloroform	50.0	J	0.970		48.8	ug/L		95.6	(75%-125%)		
Ethylbenzene	50.0	U	0.00		48.1	ug/L		96.1	(75%-125%)		
Methylene chloride	50.0	U	0.00		53.5	ug/L		107	(75%-125%)		
Tetrachloroethylene	50.0	J	0.430		49.4	ug/L		97.9	(75%-125%)		
Toluene	50.0	U	0.00		49.8	ug/L		99.6	(75%-125%)		
Trichloroethylene	50.0	U	0.00		48.3	ug/L		96.5	(75%-125%)		
Vinyl chloride	50.0	U	0.00		47.5	ug/L		95.1	(75%-125%)		
Xylenes (total)	150	U	0.00		148	ug/L		98.6	(75%-125%)		
**1,2-Dichloroethane-d4	50.0		47.2		42.2	ug/L		84.5	(78%-124%)		
**1,2-Dichloroethane-d4	50.0		49.7		49.8	ug/L		99.5	(78%-124%)		06/28/13 18:18
**Bromofluorobenzene	50.0		50.7		48.3	ug/L		96.7	(80%-120%)		06/27/13 20:07
**Bromofluorobenzene	50.0		50.9		49.0	ug/L		97.9	(80%-120%)		06/28/13 18:18
**Toluene-d8	50.0		49.6		49.7	ug/L		99.4	(80%-120%)		
**Toluene-d8	50.0		50.6		50.8	ug/L		102	(80%-120%)		06/27/13 20:07
QC1202900086 328172001 PSD											
1,1,1-Trichloroethane	50.0	U	0.00		46.2	ug/L	0.173	92.4	(0%-20%)		06/27/13 20:35
1,1,2-Trichloroethane	50.0	U	0.00		49.7	ug/L	4.45	99.4	(0%-20%)		
1,1-Dichloroethane	50.0	U	0.00		48.1	ug/L	2.14	96.2	(0%-20%)		
1,1-Dichloroethylene	50.0	U	0.00		47.9	ug/L	4.29	95.7	(0%-20%)		
1,2-Dichloroethane	50.0	U	0.00		44.0	ug/L	2.16	88	(0%-20%)		

QC Summary

Workorder: 328213

Volatile-GC/MS
Batch 1311060

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
2-Butanone	250	TU	0.00	T	181	ug/L	0.728	72.3*	(0%-20%)	ACJ	06/28/13 18:47
4-Methyl-2-pentanone	250	U	0.00		248	ug/L	8.71	99.3	(0%-20%)		06/27/13 20:35
Acetone	250	TU	0.00	T	113	ug/L	0.159	45.4*	(0%-20%)		06/28/13 18:47
Benzene	50.0	U	0.00		49.3	ug/L	2.78	98.6	(0%-20%)		06/27/13 20:35
Carbon disulfide	250	U	0.00		261	ug/L	2.54	104	(0%-20%)		
Carbon tetrachloride	50.0	U	0.00		45.8	ug/L	0.870	91.6	(0%-20%)		
Chlorobenzene	50.0	U	0.00		49.8	ug/L	2.62	99.6	(0%-20%)		
Chloroform	50.0	J	0.970		47.6	ug/L	2.41	93.3	(0%-20%)		
Ethylbenzene	50.0	U	0.00		46.7	ug/L	2.87	93.4	(0%-20%)		
Methylene chloride	50.0	U	0.00		51.8	ug/L	3.21	104	(0%-20%)		
Tetrachloroethylene	50.0	J	0.430		48.0	ug/L	2.73	95.2	(0%-20%)		
Toluene	50.0	U	0.00		48.9	ug/L	1.95	97.7	(0%-20%)		
Trichloroethylene	50.0	U	0.00		47.0	ug/L	2.67	94	(0%-20%)		
Vinyl chloride	50.0	U	0.00		46.5	ug/L	2.23	93	(0%-20%)		
Xylenes (total)	150	U	0.00		143	ug/L	3.26	95.5	(0%-20%)		
**1,2-Dichloroethane-d4	50.0		47.2		41.2	ug/L		82.4	(78%-124%)		
**1,2-Dichloroethane-d4	50.0		49.7		49.2	ug/L		98.3	(78%-124%)		06/28/13 18:47
**Bromofluorobenzene	50.0		50.7		48.2	ug/L		96.3	(80%-120%)		06/27/13 20:35
**Bromofluorobenzene	50.0		50.9		49.5	ug/L		98.9	(80%-120%)		06/28/13 18:47
**Toluene-d8	50.0		49.6		50.1	ug/L		100	(80%-120%)		
**Toluene-d8	50.0		50.6		50.4	ug/L		101	(80%-120%)		06/27/13 20:35

QC Summary

Workorder: **328213**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- o Analyte failed to recover within LCS limits (0rganics only)

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

HPLC Polynuclear Aromatic Hydrocarbon Analysis

Roadmap for WCHN X0002 HPLC_PAH

This roadmap was analyzed by cww on 06-28-2013, 17:19.
This roadmap was reviewed by map on 06-29-2013, 06:26.
This roadmap was packaged by map on 06-29-2013, 07:41.

Sample

exclude	manual	datafile	smpid	injdate	injtime	sublist	clientid	dilution	batchid	comment
☐	N	/chem/hplce.i/p062713.b/ph5f2724.d	328213001	28-JUN-2013	01:29	X0002.sub	B2PM35	1	1310598	
☐	N	/chem/hplce.i/p062713.b/ph5f2727.d	328213003	28-JUN-2013	03:35	X0002.sub	B2PM38	1	1310598	
☐	N	/chem/hplce.i/p062713.b/ph5f2728.d	328213005	28-JUN-2013	04:17	X0002.sub	B2PM41	1	1310598	

QC Sample

exclude	manual	datafile	smpid	sampletype	injdate	injtime	sublist	clientid	dilution	batchid	comment
☐	N	/chem/hplce.i/p062713.b/ph5f2713A.d	1202898884	mb	27-JUN-2013	17:46	X0002.sub	PAHBLK01	1	1310598	2 analytes detected, none in samples.
☐	N	/chem/hplce.i/p062713.b/ph5f2714A.d	1202898885	lcs	27-JUN-2013	18:28	X0002.sub	PAHBLK01LCS	1	1310598	Pass
☐	N	/chem/hplce.i/p062713.b/ph5f2725.d	1202899234	ms	28-JUN-2013	02:11	X0002.sub	B2PM35MS	1	1310598	Pass
☐	N	/chem/hplce.i/p062713.b/ph5f2726.d	1202899235	msd	28-JUN-2013	02:53	X0002.sub	B2PM35MSD	1	1310598	Pass

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report
for

WCHN001 WC-HANFORD, INC.

Client SDG: X0002 GEL Work Order: 328213

The Qualifiers in this report are defined as follows:

B The analyte was detected in both the associated QC blank and in the sample.

J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

DL Indicates that sample is diluted.

RA Indicates that sample is re-analyzed without re-extraction.

RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: Michael A. Penny Jr. **Name: Michael Penny**

Date: 29 JUN 2013 **Title: Group Leader**

PAH by HPLC
Certificate of Analysis
Sample Summary

SDG Number:	**X0002**	**Date Collected:**	**06/24/2013 12:03**	**Matrix:**	**WATER**
Lab Sample ID:	**328213001**	**Date Received:**	**06/25/2013 09:10**		
		Client:	**WCHN001**	**Project:**	**WCHN RC-236A**
Client ID:	**B2PM35**	**Method:**	**SW846 8310**	**SOP Ref:**	**GL-OA-E-030**
Batch ID:	**1310598**	**Inst:**	**HPLCE.I**	**Dilution:**	**1**
Run Date:	**06/28/2013 01:29**	**Analyst:**	**CWW**	**Inj. Vol:**	**20 uL**
Prep Date:	**06/26/2013 13:05**	**Aliquot:**	**1000 mL**	**Final Volume:**	**1 mL**
Data File:	**ph5f2724.d**	**Column:**	**C-18, DAD/FLD**	**Level:**	**LOW**

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
83-32-9	Acenaphthene	U	0.500	ug/L	0.150	0.500	20.0
208-96-8	Acenaphthylene	U	0.500	ug/L	0.150	0.500	25.0
120-12-7	Anthracene	U	0.500	ug/L	0.150	0.500	10.0
56-55-3	Benzo(a)anthracene	U	0.050	ug/L	0.016	0.050	0.300
50-32-8	Benzo(a)pyrene	U	0.050	ug/L	0.016	0.050	0.500
205-99-2	Benzo(b)fluoranthene	U	0.050	ug/L	0.016	0.050	0.500
191-24-2	Benzo(ghi)perylene	U	0.050	ug/L	0.016	0.050	1.00
207-08-9	Benzo(k)fluoranthene	U	0.025	ug/L	0.008	0.025	0.500
218-01-9	Chrysene	U	0.050	ug/L	0.016	0.050	5.00
53-70-3	Dibenzo(a,h)anthracene	U	0.050	ug/L	0.016	0.050	1.00
206-44-0	Fluoranthene	U	0.050	ug/L	0.016	0.050	5.00
86-73-7	Fluorene	U	0.500	ug/L	0.150	0.500	3.00
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.050	ug/L	0.016	0.050	1.00
91-20-3	Naphthalene	U	0.500	ug/L	0.150	0.500	20.0
85-01-8	Phenanthrene	U	0.500	ug/L	0.182	0.500	10.0
129-00-0	Pyrene	U	0.050	ug/L	0.016	0.050	5.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
Decafluorobiphenyl	130	250	ug/L	52.0	(21%-96%)

PAH by HPLC
Certificate of Analysis
Sample Summary

SDG Number:	**X0002**	**Date Collected:**	**06/24/2013 11:02**	**Matrix:**	**WATER**
Lab Sample ID:	**328213003**	**Date Received:**	**06/25/2013 09:10**		
		Client:	**WCHN001**	**Project:**	**WCHN RC-236A**
Client ID:	**B2PM38**	**Method:**	**SW846 8310**	**SOP Ref:**	**GL-OA-E-030**
Batch ID:	**1310598**	**Inst:**	**HPLCE.I**	**Dilution:**	**1**
Run Date:	**06/28/2013 03:35**	**Analyst:**	**CWW**	**Inj. Vol:**	**20 uL**
Prep Date:	**06/26/2013 13:05**	**Aliquot:**	**1040 mL**	**Final Volume:**	**1 mL**
Data File:	**ph5f2727.d**	**Column:**	**C-18, DAD/FLD**	**Level:**	**LOW**

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
83-32-9	Acenaphthene	U	0.481	ug/L	0.144	0.481	20.0
208-96-8	Acenaphthylene	JX	0.176	ug/L	0.144	0.481	25.0
120-12-7	Anthracene	U	0.481	ug/L	0.144	0.481	10.0
56-55-3	Benzo(a)anthracene	U	0.0481	ug/L	0.0154	0.0481	0.300
50-32-8	Benzo(a)pyrene	U	0.0481	ug/L	0.0154	0.0481	0.500
205-99-2	Benzo(b)fluoranthene	U	0.0481	ug/L	0.0154	0.0481	0.500
191-24-2	Benzo(ghi)perylene	U	0.0481	ug/L	0.0154	0.0481	1.00
207-08-9	Benzo(k)fluoranthene	U	0.024	ug/L	0.00769	0.024	0.500
218-01-9	Chrysene	U	0.0481	ug/L	0.0154	0.0481	5.00
53-70-3	Dibenzo(a,h)anthracene	U	0.0481	ug/L	0.0154	0.0481	1.00
206-44-0	Fluoranthene	U	0.0481	ug/L	0.0154	0.0481	5.00
86-73-7	Fluorene	U	0.481	ug/L	0.144	0.481	3.00
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.0481	ug/L	0.0154	0.0481	1.00
91-20-3	Naphthalene	U	0.481	ug/L	0.144	0.481	20.0
85-01-8	Phenanthrene	U	0.481	ug/L	0.175	0.481	10.0
129-00-0	Pyrene	U	0.0481	ug/L	0.0154	0.0481	5.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
Decafluorobiphenyl	152	240	ug/L	63.3	(21%-96%)

PAH by HPLC
Certificate of Analysis
Sample Summary

SDG Number:	**X0002**	**Date Collected:**	**06/24/2013 09:46**	**Matrix:**	**WATER**
Lab Sample ID:	**328213005**	**Date Received:**	**06/25/2013 09:10**		
		Client:	**WCHN001**	**Project:**	**WCHN RC-236A**
Client ID:	**B2PM41**	**Method:**	**SW846 8310**	**SOP Ref:**	**GL-OA-E-030**
Batch ID:	**1310598**	**Inst:**	**HPLCE.I**	**Dilution:**	**1**
Run Date:	**06/28/2013 04:17**	**Analyst:**	**CWW**	**Inj. Vol:**	**20 uL**
Prep Date:	**06/26/2013 13:05**	**Aliquot:**	**1070 mL**	**Final Volume:**	**1 mL**
Data File:	**ph5f2728.d**	**Column:**	**C-18, DAD/FLD**	**Level:**	**LOW**

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
83-32-9	Acenaphthene	U	0.467	ug/L	0.140	0.467	20.0
208-96-8	Acenaphthylene	U	0.467	ug/L	0.140	0.467	25.0
120-12-7	Anthracene	U	0.467	ug/L	0.140	0.467	10.0
56-55-3	Benzo(a)anthracene	U	0.0467	ug/L	0.015	0.0467	0.300
50-32-8	Benzo(a)pyrene	U	0.0467	ug/L	0.015	0.0467	0.500
205-99-2	Benzo(b)fluoranthene	U	0.0467	ug/L	0.015	0.0467	0.500
191-24-2	Benzo(ghi)perylene	U	0.0467	ug/L	0.015	0.0467	1.00
207-08-9	Benzo(k)fluoranthene	U	0.0234	ug/L	0.00748	0.0234	0.500
218-01-9	Chrysene	U	0.0467	ug/L	0.015	0.0467	5.00
53-70-3	Dibenzo(a,h)anthracene	U	0.0467	ug/L	0.015	0.0467	1.00
206-44-0	Fluoranthene	U	0.0467	ug/L	0.015	0.0467	5.00
86-73-7	Fluorene	U	0.467	ug/L	0.140	0.467	3.00
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.0467	ug/L	0.015	0.0467	1.00
91-20-3	Naphthalene	U	0.467	ug/L	0.140	0.467	20.0
85-01-8	Phenanthrene	U	0.467	ug/L	0.170	0.467	10.0
129-00-0	Pyrene	U	0.0467	ug/L	0.015	0.0467	5.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
Decafluorobiphenyl	95.1	234	ug/L	40.7	(21%-96%)

QC Summary

PAH by HPLC

Surrogate Recovery Report

SDG Number: X0002

Matrix Type: LIQUID

PACK Column (1) : C-18, DAD/FLD

Sample ID	Client ID	DFBF %REC
1202898884	MB for batch 1310597	57
1202898885	LCS for batch 1310597	52
328213001	B2PM35	52
1202899234	B2PM35MS	68
1202899235	B2PM35MSD	65
328213003	B2PM38	63
328213005	B2PM41	41

Surrogate	Acceptance Limits
DFBF = Decafluorobiphenyl	(21%-96%)

* Recovery outside Acceptance Limits
\# Column to be used to flag recovery values
D Sample Diluted

PAH by HPLC

Quality Control Summary
Spike Recovery Report

SDG Number: **X0002**
Client ID: **LCS for batch 1310597**
Lab Sample ID: **1202898885**
Instrument: **HPLCE.I**
Analyst: **CWW**
Inj. Vol: **20 uL**

Sample Type: **Laboratory Control Sample**
Matrix: **WATER**
Analysis Date: **06/27/2013 18:28**
Prep Batch ID: **1310597**
Batch ID: **1310598**
Dilution: 1

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L	Spike Conc. ug/L	Recovery %	Acceptance Limits
91-20-3	LCS	Naphthalene	50.0	0.0	36.1	72	54-108
208-96-8	LCS	Acenaphthylene	50.0	0.0	41.2	82	52-100
83-32-9	LCS	Acenaphthene	50.0	0.0	40.5	81	53-107
86-73-7	LCS	Fluorene	50.0	0.0	42.4	85	62-130
85-01-8	LCS	Phenanthrene	50.0	0.0	43.0	86	69-130
120-12-7	LCS	Anthracene	50.0	0.0	46.4	93	70-130
206-44-0	LCS	Fluoranthene	5.00	0.0	4.31	86	70-130
129-00-0	LCS	Pyrene	5.00	0.0	4.68	94	70-130
56-55-3	LCS	Benzo(a)anthracene	5.00	0.0	4.59	92	70-130
218-01-9	LCS	Chrysene	5.00	0.0	5.13	103	70-130
205-99-2	LCS	Benzo(b)fluoranthene	5.00	0.0	4.49	90	70-130
207-08-9	LCS	Benzo(k)fluoranthene	2.50	0.0	2.08	83	70-130
50-32-8	LCS	Benzo(a)pyrene	5.00	0.0	4.66	93	70-130
193-39-5	LCS	Indeno(1,2,3-cd)pyrene	5.00	0.0	4.63	93	57-114
53-70-3	LCS	Dibenzo(a,h)anthracene	5.00	0.0	3.48	70	30-118
191-24-2	LCS	Benzo(ghi)perylene	5.00	0.0	3.26	65	42-115

PAH by HPLC

Quality Control Summary
Spike Recovery Report

SDG Number: **X0002**
Client ID: **B2PM35MS**
Lab Sample ID: **1202899234**
Instrument: **HPLCE.I**
Analyst: **CWW**
Inj. Vol: **20 uL**

Sample Type: **Matrix Spike**
Matrix: **WATER**
Analysis Date: **06/28/2013 02:11**
Prep Batch ID: **1310597**
Batch ID: **1310598**
Dilution: 1

CAS No		Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits
91-20-3	MS	Naphthalene	50.0	0.00	U	39.0	78	32-104
208-96-8	MS	Acenaphthylene	50.0	0.00	U	42.3	85	26-121
83-32-9	MS	Acenaphthene	50.0	0.00	U	42.1	84	27-118
86-73-7	MS	Fluorene	50.0	0.00	U	43.8	88	29-123
85-01-8	MS	Phenanthrene	50.0	0.00	U	44.2	88	35-126
120-12-7	MS	Anthracene	50.0	0.00	U	47.1	94	36-122
206-44-0	MS	Fluoranthene	5.00	0.00	U	4.47	89	32-134
129-00-0	MS	Pyrene	5.00	0.00	U	4.84	97	32-134
56-55-3	MS	Benzo(a)anthracene	5.00	0.00	U	4.77	95	35-129
218-01-9	MS	Chrysene	5.00	0.00	U	5.33	107	25-141
205-99-2	MS	Benzo(b)fluoranthene	5.00	0.00	U	4.67	93	29-133
207-08-9	MS	Benzo(k)fluoranthene	2.50	0.00	U	2.17	87	28-134
50-32-8	MS	Benzo(a)pyrene	5.00	0.00	U	4.82	96	25-135
193-39-5	MS	Indeno(1,2,3-cd)pyrene	5.00	0.00	U	4.84	97	25-135
53-70-3	MS	Dibenzo(a,h)anthracene	5.00	0.00	U	4.12	82	25-133
191-24-2	MS	Benzo(ghi)perylene	5.00	0.00	U	4.07	81	27-140

PAH by HPLC

Quality Control Summary
Spike Recovery Report

SDG Number: **X0002**
Client ID: **B2PM35MSD**
Lab Sample ID: **1202899235**
Instrument: **HPLCE.I**
Analyst: **CWW**
Inj. Vol: **20 uL**

Sample Type: **Matrix Spike Duplicate**
Matrix: **WATER**
Analysis Date: **06/28/2013 02:53**
Prep Batch ID: **1310597**
Batch ID: **1310598**
Dilution: 1

CAS No	Parmname	Amount Added ug/L	Sample Conc. ug/L		Spike Conc. ug/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
91-20-3	MSD Naphthalene	50.0	0.00	U	38.2	76	32-104	2	0-20
208-96-8	MSD Acenaphthylene	50.0	0.00	U	41.0	82	26-121	3	0-20
83-32-9	MSD Acenaphthene	50.0	0.00	U	40.8	82	27-118	3	0-20
86-73-7	MSD Fluorene	50.0	0.00	U	42.1	84	29-123	4	0-20
85-01-8	MSD Phenanthrene	50.0	0.00	U	42.6	85	35-126	4	0-20
120-12-7	MSD Anthracene	50.0	0.00	U	45.8	92	36-122	3	0-20
206-44-0	MSD Fluoranthene	5.00	0.00	U	4.34	87	32-134	3	0-20
129-00-0	MSD Pyrene	5.00	0.00	U	4.72	94	32-134	3	0-20
56-55-3	MSD Benzo(a)anthracene	5.00	0.00	U	4.65	93	35-129	2	0-20
218-01-9	MSD Chrysene	5.00	0.00	U	5.19	104	25-141	3	0-20
205-99-2	MSD Benzo(b)fluoranthene	5.00	0.00	U	4.56	91	29-133	2	0-20
207-08-9	MSD Benzo(k)fluoranthene	2.50	0.00	U	2.11	84	28-134	3	0-20
50-32-8	MSD Benzo(a)pyrene	5.00	0.00	U	4.70	94	25-135	3	0-20
193-39-5	MSD Indeno(1,2,3-cd)pyrene	5.00	0.00	U	4.69	94	25-135	3	0-20
53-70-3	MSD Dibenzo(a,h)anthracene	5.00	0.00	U	3.91	78	25-133	5	0-20
191-24-2	MSD Benzo(ghi)perylene	5.00	0.00	U	3.95	79	27-140	3	0-20

Method Blank Summary

SDG Number:	**X0002**	**Client:**	**WCHN001**	**Matrix:**	**WATER**
Client ID:	**MB for batch 1310597**	**Instrument ID:**	**HPLCE.I**	**Data File:**	**ph5f2713.d**
Lab Sample ID:	**1202898884**	**Prep Date:**	**06/26/2013 13:05**	**Analyzed:**	**06/27/13 17:46**
Column:	**C-18, DAD/FLD**	**Level:**	**LOW**		

This method blank applies to the following samples and quality control samples:

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01 LCS for batch 1310597	1202898885	ph5f2714.d	06/27/13	1828
02 B2PM35	328213001	ph5f2724.d	06/28/13	0129
03 B2PM35MS	1202899234	ph5f2725.d	06/28/13	0211
04 B2PM35MSD	1202899235	ph5f2726.d	06/28/13	0253
05 B2PM38	328213003	ph5f2727.d	06/28/13	0335
06 B2PM41	328213005	ph5f2728.d	06/28/13	0417

Identification Summary

SDG Number:	**X0002**	**Client ID:**	**MB for batch 1310597**
Lab Sample ID:	**1202898884**	**Data File:**	**ph5f2713.d**
Analyzed:	**27-JUN-13 17:46**	**Inst:**	**HPLCE.I**
Detector 1:	**Diode Array Detector**	**Detector 2:**	**Fluorescence Detector**

Analyte	Detector	RT	RT Window	Conc.	RPD
Benzo(k)fluoranthene					0
	1	19.4	19.3 - 19.5	.0176	
	2	19.4	19.3 - 19.5	.0176	
Dibenzo(a,h)anthracene					3.98
	1	21.4	21.3 - 21.5	.0197	
	2	21.4	21.3 - 21.5	.0205	

Identification Summary

SDG Number: X0002
Client ID: LCS for batch 1310597
Lab Sample ID: 1202898885
Data File: ph5f2714.d
Analyzed: 27-JUN-13 18:28
Inst: HPLCE.I
Detector 1: Diode Array Detector
Detector 2: Fluorescence Detector

Analyte	Detector	RT	RT Window	Conc.	RPD
Naphthalene					2.98
	1	8.06	8.02 - 8.09	36.1	
	2	8.09	8.05 - 8.12	35.04	
Acenaphthene					3.21
	1	11	10.9 - 11	40.5	
	2	11	11 - 11.1	39.22	
Fluorene					2.46
	1	10.6	10.5 - 10.6	42.41	
	2	10.6	10.6 - 10.7	41.38	
Phenanthrene					.77
	1	11.4	11.4 - 11.5	43.01	
	2	11.5	11.4 - 11.5	42.68	
Anthracene					3.02
	1	12	11.9 - 12.1	46.35	
	2	12	12 - 12.1	47.77	
Fluoranthene					0
	1	13.5	13.4 - 13.5	4.31	
	2	13.5	13.4 - 13.5	4.31	
Pyrene					1.07
	1	14.4	14.3 - 14.4	4.68	
	2	14.4	14.3 - 14.5	4.63	
Benzo(a)anthracene					0
	1	16.4	16.3 - 16.5	4.59	
	2	16.5	16.4 - 16.5	4.59	
Chrysene					1.37
	1	16.2	16.1 - 16.2	5.13	
	2	16.2	16.1 - 16.3	5.06	
Benzo(b)fluoranthene					.446
	1	19.1	19 - 19.2	4.49	
	2	19.1	19 - 19.2	4.47	
Benzo(k)fluoranthene					1.45
	1	19.4	19.3 - 19.5	2.08	
	2	19.4	19.3 - 19.5	2.05	
Benzo(a)pyrene					1.51
	1	20.2	20.1 - 20.3	4.66	
	2	20.2	20.1 - 20.3	4.59	

Identification Summary

Analyte	Detector	RT	RT Window	Conc.	RPD
Indeno(1,2,3-cd)pyrene					.646
	1	23	22.9 - 23.1	4.63	
	2	23	22.9 - 23.1	4.66	
Dibenzo(a,h)anthracene					.866
	1	21.4	21.3 - 21.5	3.48	
	2	21.5	21.3 - 21.5	3.45	
Benzo(ghi)perylene					1.55
	1	23.4	23.2 - 23.5	3.26	
	2	23.4	23.3 - 23.5	3.21	

Identification Summary

SDG Number: X0002
Client ID: B2PM35(328213001MS)
Lab Sample ID: 1202899234
Data File: ph5f2725.d
Analyzed: 28-JUN-13 02:11
Inst: HPLCE.I
Detector 1: Diode Array Detector
Detector 2: Fluorescence Detector

Analyte	Detector	RT	RT Window	Conc.	RPD
Naphthalene					3.95
	1	8.06	8.02 - 8.1	39.03	
	2	8.09	8.05 - 8.12	37.52	
Acenaphthene					.238
	1	11	10.9 - 11	42.05	
	2	11	11 - 11.1	41.95	
Fluorene					2.9
	1	10.6	10.5 - 10.6	43.76	
	2	10.6	10.6 - 10.7	42.51	
Phenanthrene					.704
	1	11.4	11.4 - 11.5	44.18	
	2	11.5	11.4 - 11.5	43.87	
Anthracene					3.6
	1	12	11.9 - 12.1	47.13	
	2	12	12 - 12.1	48.86	
Fluoranthene					.224
	1	13.5	13.4 - 13.5	4.47	
	2	13.5	13.4 - 13.6	4.46	
Pyrene					1.67
	1	14.4	14.3 - 14.4	4.84	
	2	14.4	14.3 - 14.5	4.76	
Benzo(a)anthracene					.631
	1	16.4	16.4 - 16.5	4.77	
	2	16.5	16.4 - 16.5	4.74	
Chrysene					1.32
	1	16.2	16.1 - 16.3	5.33	
	2	16.2	16.1 - 16.3	5.26	
Benzo(b)fluoranthene					.429
	1	19.1	19 - 19.2	4.67	
	2	19.1	19 - 19.2	4.65	
Benzo(k)fluoranthene					1.39
	1	19.4	19.3 - 19.5	2.17	
	2	19.5	19.3 - 19.5	2.14	
Benzo(a)pyrene					2.52
	1	20.2	20.1 - 20.3	4.82	
	2	20.2	20.1 - 20.3	4.7	

Identification Summary

Analyte	Detector	RT	RT Window	Conc.	RPD
Indeno(1,2,3-cd)pyrene					.823
	1	23	22.9 - 23.1	4.84	
	2	23	22.9 - 23.2	4.88	
Dibenzo(a,h)anthracene					.976
	1	21.4	21.3 - 21.5	4.12	
	2	21.5	21.3 - 21.6	4.08	
Benzo(ghi)perylene					1.73
	1	23.4	23.3 - 23.5	4.07	
	2	23.4	23.3 - 23.5	4	

Identification Summary

SDG Number:	**X0002**	**Client ID:**	**B2PM35(328213001MSD)**
Lab Sample ID:	**1202899235**	**Data File:**	**ph5f2726.d**
Analyzed:	**28-JUN-13 02:53**	**Inst:**	**HPLCE.I**
Detector 1:	**Diode Array Detector**	**Detector 2:**	**Fluorescence Detector**

Analyte	Detector	RT	RT Window	Conc.	RPD
Naphthalene					3.68
	1	8.06	8.02 - 8.1	38.22	
	2	8.09	8.05 - 8.12	36.84	
Acenaphthene					.393
	1	11	10.9 - 11	40.76	
	2	11	11 - 11.1	40.6	
Fluorene					2.77
	1	10.6	10.5 - 10.6	42.08	
	2	10.6	10.6 - 10.7	40.93	
Phenanthrene					.943
	1	11.4	11.4 - 11.5	42.64	
	2	11.5	11.4 - 11.5	42.24	
Anthracene					3.24
	1	12	11.9 - 12.1	45.8	
	2	12	12 - 12.1	47.31	
Fluoranthene					.23
	1	13.5	13.4 - 13.5	4.34	
	2	13.5	13.4 - 13.6	4.35	
Pyrene					1.93
	1	14.4	14.3 - 14.4	4.72	
	2	14.4	14.3 - 14.5	4.63	
Benzo(a)anthracene					.857
	1	16.4	16.4 - 16.5	4.65	
	2	16.5	16.4 - 16.5	4.69	
Chrysene					1.95
	1	16.2	16.1 - 16.3	5.19	
	2	16.2	16.1 - 16.3	5.09	
Benzo(b)fluoranthene					.66
	1	19.1	19 - 19.2	4.56	
	2	19.1	19 - 19.2	4.53	
Benzo(k)fluoranthene					1.43
	1	19.4	19.3 - 19.5	2.11	
	2	19.4	19.3 - 19.5	2.08	
Benzo(a)pyrene					1.72
	1	20.2	20.1 - 20.3	4.7	
	2	20.2	20.1 - 20.3	4.62	

Identification Summary

Analyte	Detector	RT	RT Window	Conc.	RPD
Indeno(1,2,3-cd)pyrene					.426
	1	23	22.9 - 23.1	4.69	
	2	23	22.9 - 23.2	4.71	
Dibenzo(a,h)anthracene					.77
	1	21.4	21.3 - 21.5	3.91	
	2	21.5	21.3 - 21.6	3.88	
Benzo(ghi)perylene					1.79
	1	23.4	23.3 - 23.5	3.95	
	2	23.4	23.3 - 23.5	3.88	

Identification Summary

SDG Number:	**X0002**	**Client ID:**	**B2PM38**
Lab Sample ID:	**328213003**	**Data File:**	**ph5f2727.d**
Analyzed:	**28-JUN-13 03:35**	**Inst:**	**HPLCE.I**
Detector 1:	**Diode Array Detector**	**Detector 2:**	**Fluorescence Detector**

Analyte	Detector	RT	RT Window	Conc.	RPD

Standard Data

SW846 8310									
Calibration Standard Concentration Levels									
	Level 1	**Level 2**	**Level 3**	**Level 4**	**Level 5**	**Level 6**	**Level 7**	**Level 8**	**CCV**
Decafluorobiphenyl	2.5	5	25	50	125	250	375	500	250
Naphthalene	0.5	1	5	10	25	50	75	100	5
Acenaphthylene	0.5	1	5	10	25	50	75	100	5
1-Methylnaphthalene	0.5	1	5	10	25	50	75	100	5
2-Methylnaphthalene	0.5	1	5	10	25	50	75	100	5
Acenaphthene	0.5	1	5	10	25	50	75	100	5
Fluorene	0.5	1	5	10	25	50	75	100	5
Phenanthrene	0.5	1	5	10	25	50	75	100	5
Anthracene	0.5	1	5	10	25	50	75	100	5
Fluoranthene	0.05	0.1	0.5	1	2.5	5	7.5	10	0.5
Pyrene	0.05	0.1	0.5	1	2.5	5	7.5	10	0.5
Benzo(a)anthracene	0.05	0.1	0.5	1	2.5	5	7.5	10	0.5
Chrysene	0.05	0.1	0.5	1	2.5	5	7.5	10	0.5
Benzo(b)fluoranthene	0.05	0.1	0.5	1	2.5	5	7.5	10	0.5
Benzo(k)fluoranthene	0.03	0.05	0.25	0.5	1.25	2.5	3.75	5	0.25
Benzo(a)pyrene	0.05	0.1	0.5	1	2.5	5	7.5	10	0.5
Dibenzo(a,h)anthracene	0.05	0.1	0.5	1	2.5	5	7.5	10	0.5
Benzo(g,h,i)perylene	0.05	0.1	0.5	1	2.5	5	7.5	10	0.5
Indeno(1,2,3-cd)pyrene	0.05	0.1	0.5	1	2.5	5	7.5	10	0.5
All values are ug/ml without the prep factor.									

Report Date: 11-Apr-2013 12:20

Calibration History

Method : /chem/hplce.i/p032813.b/8310-032813.m
Start Cal Date: 28-MAR-2013 12:25
End Cal Date : 28-MAR-2013 17:20

Initial Calibration

Injection Date	Sublist	Calibration File
Cal Level: 1 , Cal Amount: 500.00000		
28-MAR-2013 17:20	8310+	/chem/hplce.i/p032813.b/ph5c2811.d
Cal Level: 2 , Cal Amount: 1000.00000		
28-MAR-2013 14:32	8310+	/chem/hplce.i/p032813.b/ph5c2807.d
Cal Level: 3 , Cal Amount: 5000.00000		
28-MAR-2013 16:38	8310+	/chem/hplce.i/p032813.b/ph5c2810.d
Cal Level: 4 , Cal Amount: 10000.00000		
28-MAR-2013 13:50	8310+	/chem/hplce.i/p032813.b/ph5c2806.d
Cal Level: 5 , Cal Amount: 25000.00000		
28-MAR-2013 15:56	8310+	/chem/hplce.i/p032813.b/ph5c2809.d
Cal Level: 6 , Cal Amount: 50000.00000		
28-MAR-2013 13:07	8310+	/chem/hplce.i/p032813.b/ph5c2805.d
Cal Level: 7 , Cal Amount: 75000.00000		
28-MAR-2013 15:14	8310+	/chem/hplce.i/p032813.b/ph5c2808.d
Cal Level: 8 , Cal Amount: 100000.00000		
28-MAR-2013 12:25	8310+	/chem/hplce.i/p032813.b/ph5c2804.d

Continuing Calibration
Ccal Level Mode: GLOBAL LEVEL 9

Ccal Level: 9 , Ccal Amount: 50000		
28-MAR-2013 18:44	8310+	/chem/hplce.i/p032813.b/ph5c2813.d

GEL Laboratories LLC

INITIAL CALIBRATION DATA

Start Cal Date : 28-MAR-2013 12:25
End Cal Date : 28-MAR-2013 17:20
Quant Method : ESTD
Origin : Disabled
Target Version : 3.50
Integrator : Falcon
Method file : /chem/hplce.i/p032813.b/8310-032813.m
Cal Date : 11-Apr-2013 12:18 cww
Curve Type : Average

Calibration File Names:
Level 1: /chem/hplce.i/p032813.b/ph5c2811.d
Level 2: /chem/hplce.i/p032813.b/ph5c2807.d
Level 3: /chem/hplce.i/p032813.b/ph5c2810.d
Level 4: /chem/hplce.i/p032813.b/ph5c2806.d
Level 5: /chem/hplce.i/p032813.b/ph5c2809.d
Level 6: /chem/hplce.i/p032813.b/ph5c2805.d
Level 7: /chem/hplce.i/p032813.b/ph5c2808.d
Level 8: /chem/hplce.i/p032813.b/ph5c2804.d

Compound	500.000 Level 1 / 7.500e+04 Level 7	1000.000 Level 2 / 1.000e+05 Level 8	5000.000 Level 3	1.000e+04 Level 4	2.500e+04 Level 5	5.000e+04 Level 6	RRF	% RSD
1 Naphthalene(1)	5.10400	4.70700	4.72160	4.68440	4.65756	4.52622		
	4.42105	4.47573					4.66220	4.533
(2)	30.99800	29.96700	29.94660	29.48350	28.07424	25.71204		
	23.85293	22.91114					27.61818	11.119
2 Acenaphthylene	39.83200	38.27600	38.86380	39.03650	39.11896	38.33266		
	37.87267	38.48340					38.72700	1.585
3 1-Methylnaphthalene(1)	16.74800	16.39700	16.54460	16.40330	16.35204	16.14032		
	15.94369	16.14052					16.33368	1.556
(2)	18.67000	17.61800	17.48820	17.47170	17.87816	17.35248		
	16.88088	16.73907					17.51231	3.419
4 2-Methylnaphthalene(1)	19.97600	19.14400	18.59620	18.47040	18.25620	17.69360		
	17.34932	17.63578					18.39019	4.726
(2)	27.06000	26.10800	26.05500	25.95370	25.65772	24.55932		
	23.67439	23.12230					25.27380	5.351

GEL Laboratories LLC

INITIAL CALIBRATION DATA

Start Cal Date : 28-MAR-2013 12:25
End Cal Date : 28-MAR-2013 17:20
Quant Method : ESTD
Origin : Disabled
Target Version : 3.50
Integrator : Falcon
Method file : /chem/hplce.i/p032813.b/8310-032813.m
Cal Date : 11-Apr-2013 12:18 cww
Curve Type : Average

Compound	500.000 Level 1	1000.000 Level 2	5000.000 Level 3	1.000e+04 Level 4	2.500e+04 Level 5	5.000e+04 Level 6	RRF	% RSD
	7.500e+04 Level 7	1.000e+05 Level 8						
5 Fluorene(1)	90.44800	87.26300	88.46180	88.38150	88.45648	86.47766		
	85.19260	86.19254					87.60920	1.898
(2)	114	111	112	112	111	107		
	104	104					110	3.495
6 Acenaphthene(1)	32.52400	31.12600	31.63780	31.58220	31.67084	31.03086		
	30.65489	31.15623					31.42285	1.804
(2)	30.45800	28.56300	27.35540	27.41880	27.21184	27.12178		
	25.42051	26.29701					27.48079	5.485
7 Phenanthrene(1)	297	287	291	290	287	271		
	252	233					276	8.199
(2)	69.85600	67.48100	68.73760	69.27490	70.17448	70.96640		
	72.00233	76.67186					70.64557	3.955
8 Anthracene(1)	221	212	213	211	207	189		
	172	160					198	11.050
(2)	60.65600	58.74800	59.07600	59.31340	59.04776	57.43100		
	55.33565	54.75024					58.04476	3.540
10 Fluoranthene(1)	202	190	192	193	195	191		
	189	193					193	2.137
(2)	570	551	556	560	559	546		
	535	544					553	1.967

GEL Laboratories LLC

INITIAL CALIBRATION DATA

Start Cal Date : 28-MAR-2013 12:25
End Cal Date : 28-MAR-2013 17:20
Quant Method : ESTD
Origin : Disabled
Target Version : 3.50
Integrator : Falcon
Method file : /chem/hplce.i/p032813.b/8310-032813.m
Cal Date : 11-Apr-2013 12:18 cww
Curve Type : Average

Compound	500.000 Level 1	1000.000 Level 2	5000.000 Level 3	1.000e+04 Level 4	2.500e+04 Level 5	5.000e+04 Level 6	RRF	% RSD
	7.500e+04 Level 7	1.000e+05 Level 8						
11 Pyrene(1)	249	242	247	249	248	242		
	239	243					245	1.636
(2)	157	149	151	151	153	149		
	149	152					151	1.702
12 Chrysene(1)	51.46000	48.69000	50.90200	50.59100	50.00280	49.53160		
	48.78827	49.65410					49.95247	1.973
(2)	94.04000	90.56000	93.10600	93.66400	93.23240	90.77980		
	89.93013	91.10710					92.05243	1.756
13 Benzo(a)anthracene(1)	65.14000	62.90000	61.92200	61.82000	62.38120	60.32980		
	59.51853	60.38810					61.79995	2.874
(2)	50.96000	48.74000	48.09800	48.01000	48.86080	48.16920		
	47.37960	48.24030					48.55724	2.208
14 Benzo(b)fluoranthene(1)	182	178	188	187	189	185		
	183	187					185	1.989
(2)	89.76000	87.60000	89.04200	89.23200	89.98440	87.95060		
	86.83173	88.62360					88.62804	1.236
15 Benzo(k)fluoranthene(1)	224	225	229	231	234	230		
	228	233					229	1.592
(2)	434	422	429	432	430	421		
	411	416					424	1.908

GEL Laboratories LLC

INITIAL CALIBRATION DATA

Start Cal Date : 28-MAR-2013 12:25
End Cal Date : 28-MAR-2013 17:20
Quant Method : ESTD
Origin : Disabled
Target Version : 3.50
Integrator : Falcon
Method file : /chem/hplce.i/p032813.b/8310-032813.m
Cal Date : 11-Apr-2013 12:18 cww
Curve Type : Average

Compound	500.000 Level 1	1000.000 Level 2	5000.000 Level 3	1.000e+04 Level 4	2.500e+04 Level 5	5.000e+04 Level 6	RRF	% RSD
	7.500e+04 Level 7	1.000e+05 Level 8						
16 Benzo(a)pyrene(1)	138	135	140	144	144	142		
	140	143					141	2.167
(2)	232	227	231	233	233	228		
	223	226					229	1.557
17 Dibenzo(a,h)anthracene(1)	278	265	271	276	276	269		
	265	269					271	1.836
(2)	168	163	167	168	169	167		
	165	169					167	1.295
18 Indeno(1,2,3-cd)pyrene(1)	185	191	193	195	196	193		
	191	195					192	1.741
(2)	74.06000	71.19000	71.48800	72.24600	73.47560	72.63020		
	71.55720	73.14030					72.47341	1.428
19 Benzo(ghi)perylene(1)	126	115	116	118	120	118		
	117	120					119	2.774
(2)	305	286	291	291	295	290		
	287	292					292	2.009
$ 9 Decafluorobiphenyl	45.01240	43.90680	44.68388	44.69436	44.70291	43.62193		
	42.38775	41.37729					43.79842	2.961

FORM 7
HPLC CALIBRATION VERIFICATION SUMMARY

Lab Name: GEL LABORATORIES, LLC Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Instrument ID: HPLCE Calibration Date: 03/28/13 Time: 1844

Lab File ID: PH5C2813 Init. Calib. Date(s): 03/28/13 03/28/13

Init. Calib. Times: 1225 1720

GC Column: C-18, DAD/FLD ID: 4.60 (mm)

COMPOUND	$\overline{RRF}$	RRF 50000	MIN RRF	%D	MAX %D
Acenaphthene	31.423	29.926	0.01	4.8	15.0
(2)	27.481	25.647	0.01	6.7	15.0
Pyrene	244.751	233.452	0.01	4.6	15.0
(2)	151.424	144.871	0.01	4.3	15.0
Naphthalene	4.662	4.430	0.01	5.0	15.0
(2)	27.618	25.425	0.01	7.9	15.0
Acenaphthylene	38.727	38.627	0.01	0.2	15.0
1-Methylnaphthalene	16.334	15.122	0.01	7.4	15.0
(2)	17.512	16.039	0.01	8.4	15.0
2-Methylnaphthalene	18.390	17.570	0.01	4.4	15.0
(2)	25.274	24.692	0.01	2.3	15.0
Fluorene	87.609	85.910	0.01	1.9	15.0
(2)	109.622	106.906	0.01	2.5	15.0
Phenanthrene	275.881	266.795	0.01	3.3	15.0
(2)	70.646	69.599	0.01	1.5	15.0
Anthracene	198.057	195.623	0.01	1.2	15.0
(2)	58.045	59.910	0.01	-3.2	15.0
Fluoranthene	192.997	174.656	0.01	9.5	15.0
(2)	552.596	508.637	0.01	8.0	15.0
Benzo(a)anthracene	61.800	61.140	0.01	1.1	15.0
(2)	48.557	48.622	0.01	-0.1	15.0
Chrysene	49.952	50.979	0.01	-2.0	15.0
(2)	92.052	94.684	0.01	-2.8	15.0
Benzo(b)fluoranthene	184.869	174.718	0.01	5.5	15.0
(2)	88.628	83.691	0.01	5.6	15.0
Benzo(k)fluoranthene	229.289	207.218	0.01	9.6	15.0
(2)	424.400	379.059	0.01	10.7	15.0
Benzo(a)pyrene	140.749	143.515	0.01	-2.0	15.0
(2)	229.100	230.675	0.01	-0.7	15.0
Indeno(1,2,3-cd)pyrene	192.267	188.586	0.01	1.9	15.0
(2)	72.473	71.093	0.01	1.9	15.0
Dibenzo(a,h)anthracene	271.084	269.720	0.01	0.5	15.0
(2)	167.063	167.591	0.01	-0.3	15.0
Benzo(ghi)perylene	118.762	119.336	0.01	-0.5	15.0
(2)	292.246	295.672	0.01	-1.2	15.0
Decafluorobiphenyl	43.798	45.580	0.01	-4.1	15.0

FORM VII HPLC

FORM 7
HPLC CALIBRATION VERIFICATION SUMMARY

Lab Name: GEL LABORATORIES, LLC Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Instrument ID: HPLCE Calibration Date: 06/27/13 Time: 1622

Lab File ID: PH5F2711 Init. Calib. Date(s): 03/28/13 03/28/13

Init. Calib. Times: 1225 1720

GC Column: C-18, DAD/FLD ID: 4.60 (mm)

COMPOUND	$\overline{RRF}$	RRF 50000	MIN RRF	%D	MAX %D
Acenaphthene	31.423	32.125	0.01	-2.2	15.0
(2)	27.481	27.500	0.01	-0.1	15.0
Pyrene	244.751	251.054	0.01	-2.6	15.0
(2)	151.424	155.878	0.01	-2.9	15.0
Naphthalene	4.662	4.686	0.01	-0.5	15.0
(2)	27.618	25.919	0.01	6.2	15.0
Acenaphthylene	38.727	39.564	0.01	-2.2	15.0
1-Methylnaphthalene	16.334	16.706	0.01	-2.3	15.0
(2)	17.512	17.365	0.01	0.8	15.0
2-Methylnaphthalene	18.390	18.146	0.01	1.3	15.0
(2)	25.274	25.206	0.01	0.3	15.0
Fluorene	87.609	89.457	0.01	-2.1	15.0
(2)	109.622	108.335	0.01	1.2	15.0
Phenanthrene	275.881	280.491	0.01	-1.7	15.0
(2)	70.646	73.743	0.01	-4.4	15.0
Anthracene	198.057	194.545	0.01	1.8	15.0
(2)	58.045	59.122	0.01	-1.8	15.0
Fluoranthene	192.997	198.733	0.01	-3.0	15.0
(2)	552.596	568.470	0.01	-2.9	15.0
Benzo(a)anthracene	61.800	62.944	0.01	-1.8	15.0
(2)	48.557	49.867	0.01	-2.7	15.0
Chrysene	49.952	51.503	0.01	-3.1	15.0
(2)	92.052	93.637	0.01	-1.7	15.0
Benzo(b)fluoranthene	184.869	192.565	0.01	-4.2	15.0
(2)	88.628	91.215	0.01	-2.9	15.0
Benzo(k)fluoranthene	229.289	239.304	0.01	-4.4	15.0
(2)	424.400	436.302	0.01	-2.8	15.0
Benzo(a)pyrene	140.749	146.744	0.01	-4.2	15.0
(2)	229.100	235.643	0.01	-2.8	15.0
Indeno(1,2,3-cd)pyrene	192.267	200.349	0.01	-4.2	15.0
(2)	72.473	76.116	0.01	-5.0	15.0
Dibenzo(a,h)anthracene	271.084	280.261	0.01	-3.4	15.0
(2)	167.063	172.426	0.01	-3.2	15.0
Benzo(ghi)perylene	118.762	123.321	0.01	-3.8	15.0
(2)	292.246	300.920	0.01	-3.0	15.0
Decafluorobiphenyl	43.798	44.820	0.01	-2.3	15.0

FORM VII HPLC

FORM 7
HPLC CALIBRATION VERIFICATION SUMMARY

Lab Name: GEL LABORATORIES, LLC Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Instrument ID: HPLCE Calibration Date: 06/28/13 Time: 0005

Lab File ID: PH5F2722 Init. Calib. Date(s): 03/28/13 03/28/13

Init. Calib. Times: 1225 1720

GC Column: C-18, DAD/FLD ID: 4.60 (mm)

COMPOUND	$\overline{RRF}$	RRF 50000	MIN RRF	%D	MAX %D
Acenaphthene	31.423	32.332	0.01	-2.9	15.0
(2)	27.481	27.452	0.01	0.1	15.0
Pyrene	244.751	252.400	0.01	-3.1	15.0
(2)	151.424	154.029	0.01	-1.7	15.0
Naphthalene	4.662	4.688	0.01	-0.6	15.0
(2)	27.618	25.882	0.01	6.3	15.0
Acenaphthylene	38.727	39.793	0.01	-2.8	15.0
1-Methylnaphthalene	16.334	16.781	0.01	-2.7	15.0
(2)	17.512	17.593	0.01	-0.5	15.0
2-Methylnaphthalene	18.390	18.294	0.01	0.5	15.0
(2)	25.274	24.924	0.01	1.4	15.0
Fluorene	87.609	90.015	0.01	-2.7	15.0
(2)	109.622	108.836	0.01	0.7	15.0
Phenanthrene	275.881	281.739	0.01	-2.1	15.0
(2)	70.646	73.938	0.01	-4.6	15.0
Anthracene	198.057	195.011	0.01	1.5	15.0
(2)	58.045	59.967	0.01	-3.3	15.0
Fluoranthene	192.997	199.919	0.01	-3.6	15.0
(2)	552.596	571.445	0.01	-3.4	15.0
Benzo(a)anthracene	61.800	63.515	0.01	-2.8	15.0
(2)	48.557	50.928	0.01	-4.9	15.0
Chrysene	49.952	51.557	0.01	-3.2	15.0
(2)	92.052	93.726	0.01	-1.8	15.0
Benzo(b)fluoranthene	184.869	193.071	0.01	-4.4	15.0
(2)	88.628	92.741	0.01	-4.6	15.0
Benzo(k)fluoranthene	229.289	239.678	0.01	-4.5	15.0
(2)	424.400	438.160	0.01	-3.2	15.0
Benzo(a)pyrene	140.749	147.607	0.01	-4.9	15.0
(2)	229.100	235.957	0.01	-3.0	15.0
Indeno(1,2,3-cd)pyrene	192.267	201.612	0.01	-4.9	15.0
(2)	72.473	76.486	0.01	-5.5	15.0
Dibenzo(a,h)anthracene	271.084	281.817	0.01	-4.0	15.0
(2)	167.063	172.728	0.01	-3.4	15.0
Benzo(ghi)perylene	118.762	124.032	0.01	-4.4	15.0
(2)	292.246	297.286	0.01	-1.7	15.0
Decafluorobiphenyl	43.798	45.096	0.01	-3.0	15.0

FORM VII HPLC

FORM 7
HPLC CALIBRATION VERIFICATION SUMMARY

Lab Name: GEL LABORATORIES, LLC Contract: N/A

Lab Code: N/A Case No.: N/A SAS No.: N/A SDG No.: N/A

Instrument ID: HPLCE Calibration Date: 06/28/13 Time: 0830

Lab File ID: PH5F2734 Init. Calib. Date(s): 03/28/13 03/28/13

Init. Calib. Times: 1225 1720

GC Column: C-18, DAD/FLD ID: 4.60 (mm)

COMPOUND	$\overline{RRF}$	RRF 50000	MIN RRF	%D	MAX %D
Acenaphthene	31.423	32.211	0.01	-2.5	15.0
(2)	27.481	26.504	0.01	3.6	15.0
Pyrene	244.751	251.270	0.01	-2.7	15.0
(2)	151.424	152.863	0.01	-1.0	15.0
Naphthalene	4.662	4.670	0.01	-0.2	15.0
(2)	27.618	25.836	0.01	6.4	15.0
Acenaphthylene	38.727	39.678	0.01	-2.4	15.0
1-Methylnaphthalene	16.334	16.733	0.01	-2.4	15.0
(2)	17.512	17.242	0.01	1.5	15.0
2-Methylnaphthalene	18.390	18.247	0.01	0.8	15.0
(2)	25.274	24.846	0.01	1.7	15.0
Fluorene	87.609	89.730	0.01	-2.4	15.0
(2)	109.622	108.655	0.01	0.9	15.0
Phenanthrene	275.881	281.164	0.01	-1.9	15.0
(2)	70.646	73.001	0.01	-3.3	15.0
Anthracene	198.057	195.127	0.01	1.5	15.0
(2)	58.045	59.370	0.01	-2.3	15.0
Fluoranthene	192.997	199.258	0.01	-3.2	15.0
(2)	552.596	568.183	0.01	-2.8	15.0
Benzo(a)anthracene	61.800	62.995	0.01	-1.9	15.0
(2)	48.557	48.853	0.01	-0.6	15.0
Chrysene	49.952	51.738	0.01	-3.6	15.0
(2)	92.052	94.026	0.01	-2.1	15.0
Benzo(b)fluoranthene	184.869	192.932	0.01	-4.4	15.0
(2)	88.628	91.897	0.01	-3.7	15.0
Benzo(k)fluoranthene	229.289	239.422	0.01	-4.4	15.0
(2)	424.400	435.191	0.01	-2.5	15.0
Benzo(a)pyrene	140.749	146.821	0.01	-4.3	15.0
(2)	229.100	232.865	0.01	-1.6	15.0
Indeno(1,2,3-cd)pyrene	192.267	200.689	0.01	-4.4	15.0
(2)	72.473	75.167	0.01	-3.7	15.0
Dibenzo(a,h)anthracene	271.084	280.566	0.01	-3.5	15.0
(2)	167.063	171.239	0.01	-2.5	15.0
Benzo(ghi)perylene	118.762	123.866	0.01	-4.3	15.0
(2)	292.246	295.722	0.01	-1.2	15.0
Decafluorobiphenyl	43.798	44.996	0.01	-2.7	15.0

FORM VII HPLC

Analytical Sequence

Lab Name: GEL Labortories LLC. **Client SDG:** X0002

GC Column: C-18, DAD/FLD

Instrument ID: HPLCE.

Analytical Sequence for Blanks, Samples, and Standards is given below:

Filename	Sample Number	Lab Sample ID	Analysis Date/Time
ph5f2710.d	PAHIBLK03	INST_BLK	27-JUN-13 15:40
ph5f2711.d	PAHSTD	WPA130627-10	27-JUN-13 16:22
ph5f2712.d	PAHIBLK04	INST_BLK	27-JUN-13 17:04
ph5f2713.d	PAHBLK01	1202898884	27-JUN-13 17:46
ph5f2714.d	PAHBLK01LCS	1202898885	27-JUN-13 18:28
ph5f2715.d	ZZZZZZZ	ZZZZZZZ	27-JUN-13 19:10
ph5f2718.d	ZZZZZZZ	ZZZZZZZ	27-JUN-13 21:16
ph5f2719.d	ZZZZZZZ	ZZZZZZZ	27-JUN-13 21:58
ph5f2720.d	ZZZZZZZ	ZZZZZZZ	27-JUN-13 22:41
ph5f2721.d	PAHIBLK05	INST_BLK	27-JUN-13 23:23
ph5f2722.d	PAHSTD	WPA130627-10	28-JUN-13 00:05
ph5f2723.d	PAHIBLK06	INST_BLK	28-JUN-13 00:47
ph5f2724.d	B2PM35	328213001	28-JUN-13 01:29
ph5f2725.d	B2PM35MS	1202899234	28-JUN-13 02:11
ph5f2726.d	B2PM35MSD	1202899235	28-JUN-13 02:53
ph5f2727.d	B2PM38	328213003	28-JUN-13 03:35
ph5f2728.d	B2PM41	328213005	28-JUN-13 04:17
ph5f2729.d	PAHIBLK07	INST_BLK	28-JUN-13 04:59
ph5f2733.d	PAHIBLK08	INST_BLK	28-JUN-13 07:48
ph5f2734.d	PAHSTD	WPA130628-10	28-JUN-13 08:30

Analytical Sequence

Lab Name: GEL Labortories LLC. **Client SDG:** X0002

GC Column: C-18, DAD/FLD

Instrument ID: HPLCE.

Analytical Sequence for Blanks, Samples, and Standards is given below:

Filename	Sample Number	Lab Sample ID	Analysis Date/Time
ph5c2803.d	PAHIBLK02	INST_BLK	28-MAR-13 11:43
ph5c2804.d	PAHSTD100000	IPA130226-01	28-MAR-13 12:25
ph5c2805RT.d	PAHSTD50000	WPA130328-18	28-MAR-13 13:07
ph5c2805.d	PAHSTD50000	WPA130328-18	28-MAR-13 13:07
ph5c2806.d	PAHSTD10000	WPA130328-16	28-MAR-13 13:50
ph5c2807.d	PAHSTD1000	WPA130328-14	28-MAR-13 14:32
ph5c2808.d	PAHSTD75000	WPA130328-19	28-MAR-13 15:14
ph5c2809.d	PAHSTD25000	WPA130328-17	28-MAR-13 15:56
ph5c2810.d	PAHSTD5000	WPA130328-15	28-MAR-13 16:38
ph5c2811.d	PAHSTD500	WPA130328-13	28-MAR-13 17:20
ph5c2812.d	PAHIBLK03	INST_BLK	28-MAR-13 18:02
ph5c2813.d	PAHSTD	WPA130328-01	28-MAR-13 18:44
ph5c2814.d	PAHIBLK04	INST_BLK	28-MAR-13 19:26

GEL Laboratories LLC

COMPOUND LISTING

Method file : /chem/hplce.i/p032813.b/8310-032813.m
Quant Method : ESTD Target Version : 3.50
Inj. Date : 28-Mar-2013 13:07 Number of Cpnds : 19
Data Type : LC 3d DATA

ICAL

Compound	RT	RT Window	RF	Wl/ch
1 Naphthalene	8.054	8.015-8.093	4.662e+00	300.00
	8.086	8.047-8.125	2.762e+01	A
2 Acenaphthylene	8.960	8.909-9.011	3.873e+01	300.00
3 1-Methylnaphthalene	9.934	9.886-9.982	1.633e+01	300.00
	9.965	9.917-10.013	1.751e+01	A
4 2-Methylnaphthalene	10.161	10.113-10.209	1.839e+01	250.00
	10.195	10.147-10.243	2.527e+01	A
5 Fluorene	10.587	10.536-10.638	8.761e+01	250.00
	10.613	10.562-10.664	1.096e+02	A
6 Acenaphthene	10.987	10.936-11.038	3.142e+01	300.00
	11.016	10.965-11.067	2.748e+01	A
7 Phenanthrene	11.427	11.376-11.478	2.759e+02	250.00
	11.455	11.404-11.506	7.065e+01	A
8 Anthracene	12.007	11.953-12.061	1.981e+02	234.00
	12.038	11.984-12.092	5.804e+01	A
$ 9 Decafluorobiphenyl	12.874	12.805-12.943	4.380e+01	224.00
10 Fluoranthene	13.474	13.414-13.534	1.930e+02	234.00
	13.500	13.440-13.560	5.526e+02	A
11 Pyrene	14.374	14.308-14.440	2.448e+02	234.00
	14.407	14.341-14.473	1.514e+02	A
12 Chrysene	16.187	16.109-16.265	4.995e+01	300.00
	16.222	16.144-16.300	9.205e+01	A
13 Benzo(a)anthracene	16.441	16.360-16.521	6.180e+01	300.00
	16.474	16.393-16.555	4.856e+01	A
14 Benzo(b)fluoranthene	19.087	18.994-19.180	1.849e+02	250.00
	19.123	19.030-19.216	8.863e+01	A
15 Benzo(k)fluoranthene	19.421	19.322-19.520	2.293e+02	234.00
	19.447	19.348-19.546	4.244e+02	A
16 Benzo(a)pyrene	20.207	20.105-20.309	1.407e+02	250.00
	20.239	20.137-20.341	2.291e+02	A
17 Dibenzo(a,h)anthracene	21.427	21.313-21.541	2.711e+02	300.00
	21.456	21.342-21.570	1.671e+02	A
18 Indeno(1,2,3-cd)pyrene	23.014	22.900-23.128	1.923e+02	250.00
	23.047	22.933-23.161	7.247e+01	A
19 Benzo(ghi)perylene	23.401	23.287-23.515	1.188e+02	300.00
	23.429	23.315-23.543	2.922e+02	A

GEL Laboratories LLC

COMPOUND LISTING

Method file : /chem/hplce.i/p062713.b/8310-032813.m
Quant Method : ESTD Target Version : 3.50
Inj. Date : 27-Jun-2013 10:03 Number of Cpnds : 19
Data Type : LC 3d DATA

Compound	RT	RT Window	RF	Wl/ch
1 Naphthalene	8.050	8.011-8.089	4.662e+00	300.00
	8.078	8.039-8.117	2.762e+01	A
2 Acenaphthylene	8.957	8.906-9.008	3.873e+01	300.00
3 1-Methylnaphthalene	9.923	9.875-9.971	1.633e+01	300.00
	9.958	9.910-10.006	1.751e+01	A
4 2-Methylnaphthalene	10.157	10.109-10.205	1.839e+01	250.00
	10.181	10.133-10.229	2.527e+01	A
5 Fluorene	10.577	10.526-10.628	8.761e+01	250.00
	10.606	10.555-10.657	1.096e+02	A
6 Acenaphthene	10.977	10.926-11.028	3.142e+01	300.00
	11.002	10.951-11.053	2.748e+01	A
7 Phenanthrene	11.417	11.366-11.468	2.759e+02	250.00
	11.441	11.390-11.492	7.065e+01	A
8 Anthracene	11.997	11.943-12.051	1.981e+02	234.00
	12.024	11.970-12.078	5.804e+01	A
$ 9 Decafluorobiphenyl	12.870	12.801-12.939	4.380e+01	224.00
10 Fluoranthene	13.457	13.397-13.517	1.930e+02	234.00
	13.486	13.426-13.546	5.526e+02	A
11 Pyrene	14.357	14.291-14.423	2.448e+02	234.00
	14.386	14.320-14.452	1.514e+02	A
12 Chrysene	16.170	16.092-16.248	4.995e+01	300.00
	16.200	16.122-16.278	9.205e+01	A
13 Benzo(a)anthracene	16.423	16.342-16.504	6.180e+01	300.00
	16.452	16.371-16.533	4.856e+01	A
14 Benzo(b)fluoranthene	19.070	18.977-19.163	1.849e+02	250.00
	19.094	19.001-19.187	8.863e+01	A
15 Benzo(k)fluoranthene	19.397	19.298-19.496	2.293e+02	234.00
	19.426	19.327-19.525	4.244e+02	A
16 Benzo(a)pyrene	20.190	20.088-20.292	1.407e+02	250.00
	20.218	20.116-20.320	2.291e+02	A
17 Dibenzo(a,h)anthracene	21.403	21.289-21.517	2.711e+02	300.00
	21.434	21.320-21.548	1.671e+02	A
18 Indeno(1,2,3-cd)pyrene	22.997	22.883-23.111	1.923e+02	250.00
	23.018	22.904-23.132	7.247e+01	A
19 Benzo(ghi)perylene	23.377	23.263-23.491	1.188e+02	300.00
	23.407	23.293-23.521	2.922e+02	A

GEL Laboratories LLC

COMPOUND LISTING

Method file : /chem/hplce.i/p062713.b/8310-032813.m
Quant Method : ESTD Target Version : 3.50
Inj. Date : 27-Jun-2013 16:22 Number of Cpnds : 19
Data Type : LC 3d DATA

Compound	RT	RT Window	RF	Wl/ch
1 Naphthalene	8.056	8.017-8.095	4.662e+00	300.00
	8.086	8.047-8.125	2.762e+01	A
2 Acenaphthylene	8.962	8.911-9.013	3.873e+01	300.00
3 1-Methylnaphthalene	9.929	9.881-9.977	1.633e+01	300.00
	9.958	9.910-10.006	1.751e+01	A
4 2-Methylnaphthalene	10.162	10.114-10.210	1.839e+01	250.00
	10.188	10.140-10.236	2.527e+01	A
5 Fluorene	10.582	10.531-10.633	8.761e+01	250.00
	10.613	10.562-10.664	1.096e+02	A
6 Acenaphthene	10.982	10.931-11.033	3.142e+01	300.00
	11.009	10.958-11.060	2.748e+01	A
7 Phenanthrene	11.416	11.365-11.467	2.759e+02	250.00
	11.448	11.397-11.499	7.065e+01	A
8 Anthracene	12.002	11.948-12.056	1.981e+02	234.00
	12.031	11.977-12.085	5.804e+01	A
$ 9 Decafluorobiphenyl	12.876	12.807-12.945	4.380e+01	224.00
10 Fluoranthene	13.462	13.402-13.522	1.930e+02	234.00
	13.486	13.426-13.546	5.526e+02	A
11 Pyrene	14.362	14.296-14.428	2.448e+02	234.00
	14.393	14.327-14.459	1.514e+02	A
12 Chrysene	16.169	16.091-16.247	4.995e+01	300.00
	16.200	16.122-16.278	9.205e+01	A
13 Benzo(a)anthracene	16.422	16.341-16.503	6.180e+01	300.00
	16.452	16.371-16.533	4.856e+01	A
14 Benzo(b)fluoranthene	19.062	18.969-19.155	1.849e+02	250.00
	19.087	18.994-19.180	8.863e+01	A
15 Benzo(k)fluoranthene	19.389	19.290-19.488	2.293e+02	234.00
	19.418	19.319-19.517	4.244e+02	A
16 Benzo(a)pyrene	20.176	20.074-20.278	1.407e+02	250.00
	20.210	20.108-20.312	2.291e+02	A
17 Dibenzo(a,h)anthracene	21.396	21.282-21.510	2.711e+02	300.00
	21.420	21.306-21.534	1.671e+02	A
18 Indeno(1,2,3-cd)pyrene	22.976	22.862-23.090	1.923e+02	250.00
	23.004	22.890-23.118	7.247e+01	A
19 Benzo(ghi)perylene	23.362	23.248-23.476	1.188e+02	300.00
	23.386	23.272-23.500	2.922e+02	A

GEL Laboratories LLC

COMPOUND LISTING

Method file : /chem/hplce.i/p062713.b/8310-032813.m
Quant Method : ESTD Target Version : 3.50
Inj. Date : 28-Jun-2013 00:05 Number of Cpnds : 19
Data Type : LC 3d DATA

Compound	RT	RT Window	RF	Wl/ch
1 Naphthalene	8.057	8.018-8.096	4.662e+00	300.00
	8.086	8.047-8.125	2.762e+01	A
2 Acenaphthylene	8.963	8.912-9.014	3.873e+01	300.00
3 1-Methylnaphthalene	9.937	9.889-9.985	1.633e+01	300.00
	9.965	9.917-10.013	1.751e+01	A
4 2-Methylnaphthalene	10.164	10.116-10.211	1.839e+01	250.00
	10.195	10.147-10.243	2.527e+01	A
5 Fluorene	10.590	10.539-10.641	8.761e+01	250.00
	10.613	10.562-10.664	1.096e+02	A
6 Acenaphthene	10.983	10.932-11.034	3.142e+01	300.00
	11.016	10.965-11.067	2.748e+01	A
7 Phenanthrene	11.424	11.373-11.475	2.759e+02	250.00
	11.455	11.404-11.506	7.065e+01	A
8 Anthracene	12.004	11.950-12.057	1.981e+02	234.00
	12.031	11.977-12.085	5.804e+01	A
$ 9 Decafluorobiphenyl	12.877	12.808-12.946	4.380e+01	224.00
10 Fluoranthene	13.470	13.410-13.530	1.930e+02	234.00
	13.500	13.440-13.560	5.526e+02	A
11 Pyrene	14.377	14.311-14.443	2.448e+02	234.00
	14.400	14.334-14.466	1.514e+02	A
12 Chrysene	16.190	16.112-16.268	4.995e+01	300.00
	16.214	16.136-16.292	9.205e+01	A
13 Benzo(a)anthracene	16.444	16.363-16.524	6.180e+01	300.00
	16.466	16.385-16.547	4.856e+01	A
14 Benzo(b)fluoranthene	19.090	18.997-19.183	1.849e+02	250.00
	19.116	19.023-19.209	8.863e+01	A
15 Benzo(k)fluoranthene	19.417	19.318-19.516	2.293e+02	234.00
	19.447	19.348-19.546	4.244e+02	A
16 Benzo(a)pyrene	20.210	20.108-20.312	1.407e+02	250.00
	20.232	20.130-20.334	2.291e+02	A
17 Dibenzo(a,h)anthracene	21.424	21.309-21.538	2.711e+02	300.00
	21.449	21.335-21.563	1.671e+02	A
18 Indeno(1,2,3-cd)pyrene	23.010	22.896-23.124	1.923e+02	250.00
	23.040	22.926-23.154	7.247e+01	A
19 Benzo(ghi)perylene	23.397	23.283-23.511	1.188e+02	300.00
	23.429	23.315-23.543	2.922e+02	A

GEL Laboratories LLC

COMPOUND LISTING

Method file : /chem/hplce.i/p062713.b/8310-032813.m
Quant Method : ESTD Target Version : 3.50
Inj. Date : 28-Jun-2013 08:30 Number of Cpnds : 19
Data Type : LC 3d DATA

	Compound	RT	RT Window	RF	Wl/ch
	1 Naphthalene	8.050	8.011-8.089	4.662e+00	300.00
		8.086	8.047-8.125	2.762e+01	A
	2 Acenaphthylene	8.957	8.906-9.008	3.873e+01	300.00
	3 1-Methylnaphthalene	9.930	9.882-9.978	1.633e+01	300.00
		9.958	9.910-10.006	1.751e+01	A
	4 2-Methylnaphthalene	10.157	10.109-10.205	1.839e+01	250.00
		10.188	10.140-10.236	2.527e+01	A
	5 Fluorene	10.577	10.526-10.628	8.761e+01	250.00
		10.613	10.562-10.664	1.096e+02	A
	6 Acenaphthene	10.977	10.926-11.028	3.142e+01	300.00
		11.009	10.958-11.060	2.748e+01	A
	7 Phenanthrene	11.417	11.366-11.468	2.759e+02	250.00
		11.448	11.397-11.499	7.065e+01	A
	8 Anthracene	11.997	11.943-12.051	1.981e+02	234.00
		12.031	11.977-12.085	5.804e+01	A
$	9 Decafluorobiphenyl	12.870	12.801-12.939	4.380e+01	224.00
	10 Fluoranthene	13.457	13.397-13.517	1.930e+02	234.00
		13.486	13.426-13.546	5.526e+02	A
	11 Pyrene	14.357	14.291-14.423	2.448e+02	234.00
		14.393	14.327-14.459	1.514e+02	A
	12 Chrysene	16.170	16.092-16.248	4.995e+01	300.00
		16.207	16.129-16.285	9.205e+01	A
	13 Benzo(a)anthracene	16.424	16.343-16.505	6.180e+01	300.00
		16.459	16.378-16.540	4.856e+01	A
	14 Benzo(b)fluoranthene	19.070	18.977-19.163	1.849e+02	250.00
		19.102	19.009-19.195	8.863e+01	A
	15 Benzo(k)fluoranthene	19.397	19.298-19.496	2.293e+02	234.00
		19.433	19.334-19.532	4.244e+02	A
	16 Benzo(a)pyrene	20.184	20.082-20.286	1.407e+02	250.00
		20.218	20.116-20.320	2.291e+02	A
	17 Dibenzo(a,h)anthracene	21.404	21.290-21.518	2.711e+02	300.00
		21.434	21.320-21.548	1.671e+02	A
	18 Indeno(1,2,3-cd)pyrene	22.990	22.876-23.104	1.923e+02	250.00
		23.026	22.912-23.140	7.247e+01	A
	19 Benzo(ghi)perylene	23.377	23.263-23.491	1.188e+02	300.00
		23.407	23.293-23.521	2.922e+02	A

QC Data

PAH by HPLC
Certificate of Analysis
Sample Summary

SDG Number:	**X0002**			**Matrix:**	**WATER**
Lab Sample ID:	**1202898884**				
Client Sample:	**QC for batch 1310597**	**Client:**	**WCHN001**	**Project:**	**QC**
Client ID:	**MB for batch 1310597**	**Method:**	**SW846 8310**	**SOP Ref:**	**GL-OA-E-030**
Batch ID:	**1310598**	**Inst:**	**HPLCE.I**	**Dilution:**	**1**
Run Date:	**06/27/2013 17:46**	**Analyst:**	**CWW**	**Inj. Vol:**	**20 uL**
Prep Date:	**06/26/2013 13:05**	**Aliquot:**	**1000 mL**	**Final Volume:**	**1 mL**
Data File:	**ph5f2713.d**	**Column:**	**C-18, DAD/FLD**	**Level:**	**LOW**

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
83-32-9	Acenaphthene	U	0.500	ug/L	0.150	0.500	20.0
208-96-8	Acenaphthylene	U	0.500	ug/L	0.150	0.500	25.0
120-12-7	Anthracene	U	0.500	ug/L	0.150	0.500	10.0
56-55-3	Benzo(a)anthracene	U	0.050	ug/L	0.016	0.050	0.300
50-32-8	Benzo(a)pyrene	U	0.050	ug/L	0.016	0.050	0.500
205-99-2	Benzo(b)fluoranthene	U	0.050	ug/L	0.016	0.050	0.500
191-24-2	Benzo(ghi)perylene	U	0.050	ug/L	0.016	0.050	1.00
207-08-9	Benzo(k)fluoranthene	J	0.0176	ug/L	0.008	0.025	0.500
218-01-9	Chrysene	U	0.050	ug/L	0.016	0.050	5.00
53-70-3	Dibenzo(a,h)anthracene	J	0.0197	ug/L	0.016	0.050	1.00
206-44-0	Fluoranthene	U	0.050	ug/L	0.016	0.050	5.00
86-73-7	Fluorene	U	0.500	ug/L	0.150	0.500	3.00
193-39-5	Indeno(1,2,3-cd)pyrene	U	0.050	ug/L	0.016	0.050	1.00
91-20-3	Naphthalene	U	0.500	ug/L	0.150	0.500	20.0
85-01-8	Phenanthrene	U	0.500	ug/L	0.182	0.500	10.0
129-00-0	Pyrene	U	0.050	ug/L	0.016	0.050	5.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
Decafluorobiphenyl	143	250	ug/L	57.1	(21%-96%)

PAH by HPLC
Certificate of Analysis
Sample Summary

SDG Number:	**X0002**			**Matrix:**	**WATER**
Lab Sample ID:	**1202898885**				
Client Sample:	**QC for batch 1310597**	**Client:**	**WCHN001**	**Project:**	**QC**
Client ID:	**LCS for batch 1310597**	**Method:**	**SW846 8310**	**SOP Ref:**	**GL-OA-E-030**
Batch ID:	**1310598**	**Inst:**	**HPLCE.I**	**Dilution:**	**1**
Run Date:	**06/27/2013 18:28**	**Analyst:**	**CWW**	**Inj. Vol:**	**20 uL**
Prep Date:	**06/26/2013 13:05**	**Aliquot:**	**1000 mL**	**Final Volume:**	**1 mL**
Data File:	**ph5f2714.d**	**Column:**	**C-18, DAD/FLD**	**Level:**	**LOW**

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
83-32-9	Acenaphthene		40.5	ug/L	0.150	0.500	20.0
208-96-8	Acenaphthylene		41.2	ug/L	0.150	0.500	25.0
120-12-7	Anthracene		46.4	ug/L	0.150	0.500	10.0
56-55-3	Benzo(a)anthracene		4.59	ug/L	0.016	0.050	0.300
50-32-8	Benzo(a)pyrene		4.66	ug/L	0.016	0.050	0.500
205-99-2	Benzo(b)fluoranthene		4.49	ug/L	0.016	0.050	0.500
191-24-2	Benzo(ghi)perylene		3.26	ug/L	0.016	0.050	1.00
207-08-9	Benzo(k)fluoranthene	B	2.08	ug/L	0.008	0.025	0.500
218-01-9	Chrysene		5.13	ug/L	0.016	0.050	5.00
53-70-3	Dibenzo(a,h)anthracene	B	3.48	ug/L	0.016	0.050	1.00
206-44-0	Fluoranthene		4.31	ug/L	0.016	0.050	5.00
86-73-7	Fluorene		42.4	ug/L	0.150	0.500	3.00
193-39-5	Indeno(1,2,3-cd)pyrene		4.63	ug/L	0.016	0.050	1.00
91-20-3	Naphthalene		36.1	ug/L	0.150	0.500	20.0
85-01-8	Phenanthrene		43.0	ug/L	0.182	0.500	10.0
129-00-0	Pyrene		4.68	ug/L	0.016	0.050	5.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
Decafluorobiphenyl	131	250	ug/L	52.3	(21%-96%)

PAH by HPLC
Certificate of Analysis
Sample Summary

SDG Number:	**X0002**	**Date Collected:**	**06/24/2013 12:03**	**Matrix:**	**WATER**
Lab Sample ID:	**1202899234**	**Date Received:**	**06/25/2013 09:10**		
Client Sample:	**QC for batch 1310597**	**Client:**	**WCHN001**	**Project:**	**QC**
Client ID:	**B2PM35MS**	**Method:**	**SW846 8310**	**SOP Ref:**	**GL-OA-E-030**
Batch ID:	**1310598**	**Inst:**	**HPLCE.I**	**Dilution:**	**1**
Run Date:	**06/28/2013 02:11**	**Analyst:**	**CWW**	**Inj. Vol:**	**20 uL**
Prep Date:	**06/26/2013 13:05**	**Aliquot:**	**500 mL**	**Final Volume:**	**.5 mL**
Data File:	**ph5f2725.d**	**Column:**	**C-18, DAD/FLD**	**Level:**	**LOW**

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
83-32-9	Acenaphthene		42.1	ug/L	0.150	0.500	20.0
208-96-8	Acenaphthylene		42.3	ug/L	0.150	0.500	25.0
120-12-7	Anthracene		47.1	ug/L	0.150	0.500	10.0
56-55-3	Benzo(a)anthracene		4.77	ug/L	0.016	0.050	0.300
50-32-8	Benzo(a)pyrene		4.82	ug/L	0.016	0.050	0.500
205-99-2	Benzo(b)fluoranthene		4.67	ug/L	0.016	0.050	0.500
191-24-2	Benzo(ghi)perylene		4.07	ug/L	0.016	0.050	1.00
207-08-9	Benzo(k)fluoranthene	B	2.17	ug/L	0.008	0.025	0.500
218-01-9	Chrysene		5.33	ug/L	0.016	0.050	5.00
53-70-3	Dibenzo(a,h)anthracene	B	4.12	ug/L	0.016	0.050	1.00
206-44-0	Fluoranthene		4.47	ug/L	0.016	0.050	5.00
86-73-7	Fluorene		43.8	ug/L	0.150	0.500	3.00
193-39-5	Indeno(1,2,3-cd)pyrene		4.84	ug/L	0.016	0.050	1.00
91-20-3	Naphthalene		39.0	ug/L	0.150	0.500	20.0
85-01-8	Phenanthrene		44.2	ug/L	0.182	0.500	10.0
129-00-0	Pyrene		4.84	ug/L	0.016	0.050	5.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
Decafluorobiphenyl	169	250	ug/L	67.6	(21%-96%)

PAH by HPLC
Certificate of Analysis
Sample Summary

SDG Number:	**X0002**	**Date Collected:**	**06/24/2013 12:03**	**Matrix:**	**WATER**
Lab Sample ID:	**1202899235**	**Date Received:**	**06/25/2013 09:10**		
Client Sample:	**QC for batch 1310597**	**Client:**	**WCHN001**	**Project:**	**QC**
Client ID:	**B2PM35MSD**	**Method:**	**SW846 8310**	**SOP Ref:**	**GL-OA-E-030**
Batch ID:	**1310598**	**Inst:**	**HPLCE.I**	**Dilution:**	**1**
Run Date:	**06/28/2013 02:53**	**Analyst:**	**CWW**	**Inj. Vol:**	**20 uL**
Prep Date:	**06/26/2013 13:05**	**Aliquot:**	**500 mL**	**Final Volume:**	**.5 mL**
Data File:	**ph5f2726.d**	**Column:**	**C-18, DAD/FLD**	**Level:**	**LOW**

CAS No.	Parmname	Qualifier	Result	Units	MDL/LOD	PQL/LOQ	RDL
83-32-9	Acenaphthene		40.8	ug/L	0.150	0.500	20.0
208-96-8	Acenaphthylene		41.0	ug/L	0.150	0.500	25.0
120-12-7	Anthracene		45.8	ug/L	0.150	0.500	10.0
56-55-3	Benzo(a)anthracene		4.65	ug/L	0.016	0.050	0.300
50-32-8	Benzo(a)pyrene		4.70	ug/L	0.016	0.050	0.500
205-99-2	Benzo(b)fluoranthene		4.56	ug/L	0.016	0.050	0.500
191-24-2	Benzo(ghi)perylene		3.95	ug/L	0.016	0.050	1.00
207-08-9	Benzo(k)fluoranthene	B	2.11	ug/L	0.008	0.025	0.500
218-01-9	Chrysene		5.19	ug/L	0.016	0.050	5.00
53-70-3	Dibenzo(a,h)anthracene	B	3.91	ug/L	0.016	0.050	1.00
206-44-0	Fluoranthene		4.34	ug/L	0.016	0.050	5.00
86-73-7	Fluorene		42.1	ug/L	0.150	0.500	3.00
193-39-5	Indeno(1,2,3-cd)pyrene		4.69	ug/L	0.016	0.050	1.00
91-20-3	Naphthalene		38.2	ug/L	0.150	0.500	20.0
85-01-8	Phenanthrene		42.6	ug/L	0.182	0.500	10.0
129-00-0	Pyrene		4.72	ug/L	0.016	0.050	5.00

Surrogate/Tracer recovery	Result	Nominal		Recovery%	Acceptable Limits
Decafluorobiphenyl	163	250	ug/L	65.4	(21%-96%)

Miscellaneous Data

Prep Logbook

Extraction of Semivolatile and Nonvolatile Organic Compounds from Groundwater, Wastewater, and Other Aqueous Samples

Batch ID: 1310597 **Verified by:** _____

Analyst: Rodricous Corbett

Method: SW846 3510C

Lab SOP: GL-OA-E-013 REV# 27

Instrument: Semi-Volatiles Manual

Sample ID	Run Date	Initial Volume (mL)	Initial pH	Final Volume (mL)	Prepped Factor (mL/mL)
1202898884 MB	26-JUN-2013 13:05:00	1000	7	1	0.001
1202898885 LCS	26-JUN-2013 13:05:00	1000	7	1	0.001
328172001	26-JUN-2013 13:05:00	1000	7	1	0.001
1202899001 MS (328172001)	26-JUN-2013 13:05:00	500	7	0.5	0.001
1202899002 MSD (328172001)	26-JUN-2013 13:05:00	500	7	0.5	0.001
328172003	26-JUN-2013 13:05:00	1040	7	1	0.00096
328172005	26-JUN-2013 13:05:00	1050	7	1	0.00095
328172007	26-JUN-2013 13:05:00	1040	7	1	0.00096
328213001	26-JUN-2013 13:05:00	1000	7	1	0.001
1202899234 MS (328213001)	26-JUN-2013 13:05:00	500	7	0.5	0.001
1202899235 MSD (328213001)	26-JUN-2013 13:05:00	500	7	0.5	0.001
328213003	26-JUN-2013 13:05:00	1040	7	1	0.00096
328213005	26-JUN-2013 13:05:00	1070	7	1	0.00093

Type	Sample Id	Description	Serial Number	Spike Amt	Units
LCS	1202898885	8310 PAH SPIKE	UE130325-15	1	mL
MS	1202899001	8310 PAH SPIKE	UE130325-15	.5	mL
MS	1202899234	8310 PAH SPIKE	UE130325-15	.5	mL
MSD	1202899002	8310 PAH SPIKE	UE130325-15	.5	mL
MSD	1202899235	8310 PAH SPIKE	UE130325-15	.5	mL
SURR	All	Decafluorobiphenyl 250 mg/L	UE120907-07	.5	mL
SURR	All	Decafluorobiphenyl 250 mg/L	UE120907-07	1	mL
REGNT	All	HPLC Grade Acetonitrile	1918726	5	mL
REGNT	All	Methylene Chloride	1930519-D	180	mL
SOURC	All	SODIUM SULFATE	1928534	30	g

Comments:

Verified By: DPF

Final Solvent: ACN

GEL ORGANIC RUN LOG INSTRUMENT ID: HPLC E

DATE:03/28/13 METHOD: 8310 OPERATOR:CWW REVIEWED BY:_____
DATE:_____

HARDWARE CONFIGURATION & METHOD SUMMARY: No.4 on pg.4 REF MAT:1866573,1871083
Extr. Injection Volume: 100 ul

Sequence Number:P032813 Initial Calibration Date(s):See Calibration History SOP: GL-OA-E-030 Rev. 15
Alt. Check Std. ID:WPA130328-01 & WPA130328-10

Data File	GEL Lab Sample ID	Analyst	Injection Date/Time	Batch	SDG	Dilution	Client	Comments
ph5c2801.d	INST_BLK	CWW	28-MAR-2013 10:19	------	p032813	1.0	INST_BLK	
ph5c2802.d	WPA130328-01	CWW	28-MAR-2013 11:01	RESTEK	p032813	1.0	8310 ICV	Duse, used to establish RTs
ph5c2803.d	INST_BLK	CWW	28-MAR-2013 11:43	------	p032813	1.0	INST_BLK	
ph5c2804.d	IPA130226-01	CWW	28-MAR-2013 12:25	O2SI	p032813	1.0	8310 LVL8	O2SI
ph5c2805.d	WPA130328-18	CWW	28-MAR-2013 13:07	O2SI	p032813	1.0	8310 LVL6	O2SI
ph5c2805RT.d	WPA130328-18	CWW	28-MAR-2013 13:07	O2SI	p032813	1.0	8310 LVL6	Duse, for ICAL RT use only
ph5c2806.d	WPA130328-16	CWW	28-MAR-2013 13:50	O2SI	p032813	1.0	8310 LVL4	O2SI
ph5c2807.d	WPA130328-14	CWW	28-MAR-2013 14:32	O2SI	p032813	1.0	8310 LVL2	O2SI
ph5c2808.d	WPA130328-19	CWW	28-MAR-2013 15:14	O2SI	p032813	1.0	8310 LVL7	O2SI
ph5c2809.d	WPA130328-17	CWW	28-MAR-2013 15:56	O2SI	p032813	1.0	8310 LVL5	O2SI
ph5c2810.d	WPA130328-15	CWW	28-MAR-2013 16:38	O2SI	p032813	1.0	8310 LVL3	O2SI
ph5c2811.d	WPA130328-13	CWW	28-MAR-2013 17:20	O2SI	p032813	1.0	8310 LVL1	O2SI
ph5c2812.d	INST_BLK	CWW	28-MAR-2013 18:02	------	p032813	1.0	INST_BLK	
ph5c2813.d	WPA130328-01	CWW	28-MAR-2013 18:44	RESTEK	p032813	1.0	8310 ICV	RESTEK
ph5c2813A.d	WPA130328-01	CWW	28-MAR-2013 18:44	RESTEK	p032813	1.0	8310 ICV	Pass, 11394920 @ 12.875
ph5c2814.d	INST_BLK	CWW	28-MAR-2013 19:26	------	p032813	1.0	INST_BLK	
ph5c2815.d	1202846577	CWW	28-MAR-2013 20:08	1290094	2013MDLV1_HPLPAHX_L	1.0	MB	

Instrument Batch: /chem/hplce.i/p032813.b Page: 1

Data File	GEL Lab Sample ID	Analyst	Injection Date/Time	Batch	SDG	Dilution	Client	Comments
ph5c2815A.d	1202846577	CWW	28-MAR-2013 20:08	1290094	2013_HPLPAHX_L-W	1.0	MB	

ph5c2816.d	1202846578	CWW	28-MAR-2013 20:50	1290094	2013MDLV1_HPLPAHX_L	1.0	LCS	Pass
ph5c2816A.d	1202846578	CWW	28-MAR-2013 20:50	1290094	2013_HPLPAHX_L-W	1.0	LCS	Pass
ph5c2817.d	317770001	CWW	28-MAR-2013 21:33	1290094	2013_HPLPAHX_L-W	1.0	QC MDL1	
ph5c2818.d	317770002	CWW	28-MAR-2013 22:15	1290094	2013_HPLPAHX_L-W	1.0	QC MDL2	
ph5c2819.d	317770003	CWW	28-MAR-2013 22:57	1290094	2013_HPLPAHX_L-W	1.0	QC MDL3	
ph5c2820.d	317770004	CWW	28-MAR-2013 23:39	1290094	2013_HPLPAHX_L-W	1.0	QC MDL4	
ph5c2821.d	317770005	CWW	29-MAR-2013 00:21	1290094	2013_HPLPAHX_L-W	1.0	QC MDL5	
ph5c2822.d	317770006	CWW	29-MAR-2013 01:03	1290094	2013_HPLPAHX_L-W	1.0	QC MDL6	
ph5c2823.d	317770007	CWW	29-MAR-2013 01:45	1290094	2013_HPLPAHX_L-W	1.0	QC MDL7	
ph5c2824.d	317770008	CWW	29-MAR-2013 02:28	1290094	2013_HPLPAHX_L-W	1.0	QC MDL8	
ph5c2825.d	WPA130328-10	CWW	29-MAR-2013 03:10	O2SI	p032813	1.0	8310 CCV	Pass, 10977885 @ 12.850
ph5c2826.d	INST_BLK	CWW	29-MAR-2013 03:52	------	p032813	1.0	INST_BLK	
ph5c2827.d	317578001	CWW	29-MAR-2013 04:34	1290094	2013MDLV1_HPLPAHX_L	1.0	QC .5xMDLV	
ph5c2828.d	317578002	CWW	29-MAR-2013 05:16	1290094	2013MDLV1_HPLPAHX_L	1.0	QC 1xMDLV	
ph5c2829.d	317578003	CWW	29-MAR-2013 05:58	1290094	2013MDLV1_HPLPAHX_L	1.0	QC 3xMDLV	
ph5c2830.d	317578004	CWW	29-MAR-2013 06:40	1290094	2013MDLV1_HPLPAHX_L	1.0	QC LOQ	
ph5c2831.d	INST_BLK	CWW	29-MAR-2013 07:22	------	p032813	1.0	INST_BLK	
ph5c2832.d	UE130325-15	CWW	29-MAR-2013 08:04	Screen	p032813	1.0	Spike	Pass, Inhouse use
ph5c2833.d	INST_BLK	CWW	29-MAR-2013 08:46	------	p032813	1.0	INST_BLK	

Data File	GEL Lab Sample ID	Analyst	Injection Date/Time	Batch	SDG	Dilution	Client	Comments
ph5c2834.d	WPA130328-10	CWW	29-MAR-2013 09:28	O2SI	p032813	1.0	8310 CCV	Pass, 11061138 @ 12.842
ph5c2835.d	INST_BLK	CWW	29-MAR-2013 10:10	------	p032813	1.0	INST_BLK	
ph5c2836.d	1202850619	CWW	29-MAR-2013 10:52	1291771	322616	1.0	MB	
ph5c2837.d	1202850620	CWW	29-MAR-2013 11:34	1291771	322616	1.0	LCS	Pass
ph5c2838.d	322616001	CWW	29-MAR-2013 12:17	1291771	322616	1.0	KMRN	
ph5c2839.d	1202850621	CWW	29-MAR-2013 12:59	1291771	322616	1.0	001MS	Pass

ph5c2840.d	1202850622	CWW	29-MAR-2013 13:41	1291771	322616		1.0	001MSD	Pass
ph5c2841.d	INST_BLK	CWW	29-MAR-2013 14:23	------	p032813		1.0	INST_BLK	
ph5c2842.d	WPA130328-10	CWW	29-MAR-2013 15:05	O2SI	p032813		1.0	8310 CCV	Pass, 10944161 @ 12.883
ph5c2843.d	INST_BLK	CWW	29-MAR-2013 15:47	------	p032813		1.0	INST_BLK	

GEL ORGANIC RUN LOG INSTRUMENT ID: HPLC E

DATE:06/27/13 METHOD: 8310 OPERATOR:CWW REVIEWED BY:_____
DATE:_____

HARDWARE CONFIGURATION & METHOD SUMMARY: No.4 on pg.4 REF MAT:1915542,1918726
Extr. Injection Volume: 100 ul

Sequence Number:P062713 Initial Calibration Date(s):See Calibration History SOP: GL-OA-E-030 Rev. 15
Alt. Check Std. ID:WPA130627-10 & WPA130628-10

Data File	GEL Lab Sample ID	Analyst	Injection Date/Time	Batch	SDG	Dilution	Client	Comments
ph5f2701.d	INST_BLK	CWW	27-JUN-2013 09:21	------	p062713	1.0	INST_BLK	
ph5f2702.d	WPA130627-10	CWW	27-JUN-2013 10:03	RESTEK	p062713	1.0	8310 CCV	Pass, 11112332 @ 12.870
ph5f2703.d	INST_BLK	CWW	27-JUN-2013 10:45	------	p062713	1.0	INST_BLK	
ph5f2704.d	1202895700	CWW	27-JUN-2013 11:27	1309313	2013MDLV2_HPLPAHX_L	1.0	MB	
ph5f2705.d	1202895701	CWW	27-JUN-2013 12:09	1309313	2013MDLV2_HPLPAHX_L	1.0	LCS	Pass
ph5f2706.d	323218001	CWW	27-JUN-2013 12:51	1309313	2013MDLV2_HPLPAHX_L	1.0	QC .5xMDLV	
ph5f2707.d	323218002	CWW	27-JUN-2013 13:33	1309313	2013MDLV2_HPLPAHX_L	1.0	QC 1xMDLV	
ph5f2708.d	323218003	CWW	27-JUN-2013 14:16	1309313	2013MDLV2_HPLPAHX_L	1.0	QC LOD	
ph5f2709.d	323218004	CWW	27-JUN-2013 14:58	1309313	2013MDLV2_HPLPAHX_L	1.0	QC LOQ	
ph5f2710.d	INST_BLK	CWW	27-JUN-2013 15:40	------	p062713	1.0	INST_BLK	
ph5f2711.d	WPA130627-10	CWW	27-JUN-2013 16:22	O2SI	p062713	1.0	8310 CCV	Pass, 11204985 @ 12.876
ph5f2712.d	INST_BLK	CWW	27-JUN-2013 17:04	------	p062713	1.0	INST_BLK	
ph5f2713.d	1202898884	CWW	27-JUN-2013 17:46	1310598	X0001	1.0	MB	2 analytes detected, none in samples.
ph5f2713A.d	1202898884	CWW	27-JUN-2013 17:46	1310598	X0002	1.0	MB	2 analytes detected, none in samples.
ph5f2714.d	1202898885	CWW	27-JUN-2013 18:28	1310598	X0001	1.0	LCS	Pass
ph5f2714A.d	1202898885	CWW	27-JUN-2013 18:28	1310598	X0002	1.0	LCS	Pass
ph5f2715.d	328172001	CWW	27-JUN-2013 19:10	1310598	X0001	1.0	WCHN	

Instrument Batch: /chem/hplce.i/p062713.b Page: 1

Data File	GEL Lab Sample ID	Analyst	Injection Date/Time	Batch	SDG	Dilution	Client	Comments
ph5f2716.d	1202899001	CWW	27-JUN-2013 19:52	1310598	X0001	1.0	001MS	Pass

ph5f2717.d	1202899002	CWW	27-JUN-2013 20:34	1310598	X0001		1.0	001MSD	Pass
ph5f2718.d	328172003	CWW	27-JUN-2013 21:16	1310598	X0001		1.0	WCHN	
ph5f2719.d	328172005	CWW	27-JUN-2013 21:58	1310598	X0001		1.0	WCHN	
ph5f2720.d	328172007	CWW	27-JUN-2013 22:41	1310598	X0001		1.0	WCHN	
ph5f2721.d	INST_BLK	CWW	27-JUN-2013 23:23	------	p062713		1.0	INST_BLK	
ph5f2722.d	WPA130627-10	CWW	28-JUN-2013 00:05	O2SI	p062713		1.0	8310 CCV	Pass, 11274127 @ 12.877
ph5f2723.d	INST_BLK	CWW	28-JUN-2013 00:47	------	p062713		1.0	INST_BLK	
ph5f2724.d	328213001	CWW	28-JUN-2013 01:29	1310598	X0002		1.0	WCHN	
ph5f2725.d	1202899234	CWW	28-JUN-2013 02:11	1310598	X0002		1.0	001MS	Pass
ph5f2726.d	1202899235	CWW	28-JUN-2013 02:53	1310598	X0002		1.0	001MSD	Pass
ph5f2727.d	328213003	CWW	28-JUN-2013 03:35	1310598	X0002		1.0	WCHN	
ph5f2728.d	328213005	CWW	28-JUN-2013 04:17	1310598	X0002		1.0	WCHN	
ph5f2729.d	INST_BLK	CWW	28-JUN-2013 04:59	------	p062713		1.0	INST_BLK	
ph5f2730.d	1202896908	CWW	28-JUN-2013 05:42	1309806	13065391		1.0	MB	Benzo(k)fluoranthene detected
ph5f2731.d	1202896909	CWW	28-JUN-2013 06:24	1309806	13065391		1.0	LCS	Pass
ph5f2732.d	1202896910	CWW	28-JUN-2013 07:06	1309806	13065391		1.0	LCSD	Pass
ph5f2733.d	INST_BLK	CWW	28-JUN-2013 07:48	------	p062713		1.0	INST_BLK	
ph5f2734.d	WPA130628-10	CWW	28-JUN-2013 08:30	O2SI	p062713		1.0	8310 CCV	Pass, 11249058 @ 12.870
ph5f2735.d	INST_BLK	CWW	28-JUN-2013 09:12		p062713		1.0	INST_BLK	

DATA EXCEPTION REPORT

Mo.Day Yr.	Division:	Quality Criteria:	Type:
28-JUN-13	Federal	SOP	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
HPLC	SW846 8310	Liquid	WCHN001
Batch ID:	**Sample Numbers:**		
1310598	See below		

Potentially affected work order(s)(SDG): 328172(X0001),328213(X0002)

Application Issues:

Method Blank contamination

Specification and Requirements Exception Description:	DER Disposition:
1. The detection of two target analytes, less than the reporting limit (RL), were observed in 1202898884 (MB). The detection for Benzo(k)fluoranthene was 0.0176 ug/L and the RL is 0.025 ug/L, and the detection for Dibenzo(ghi)anthracene was 0.0197 ug/L and the RL is 0.050 ug/L. The detections were 'J' qualified.	1. The detection of these two target analytes were not observed in any of the associated samples in the batch, however the detections in the LCS and matrix spikes were qualified with a 'B' qualifier. Method Blank contamination will be noted in the case narrative and all data will be reported with the appropriate DER.

Originator's Name:

Charles Wilson 28-JUN-13

Data Validator/Group Leader:

Michael Penny 29-JUN-13

Standard Logbook

Serial ID:	1928534	**Open/Reference Date:**	12-JUN-13	**Lot Number :**	131945
Name:	O-Na2SO4-X	**Received:**	12-JUN-13		
Type:	Source Material	**Expires:**	12-JUN-14		
Employee:	Sharlene Robinson				
Supplier:	FISHER CHEMICAL				
Description:	SODIUM SULFATE				
Comments:	None				

Analyte	Concentration	Analyte	Concentration
Sodium Sulfate	45 kg		

Serial ID:	UE120907-07	**Open/Reference Date:**	07-SEP-12	**Amount :**	25 ml
Name:	8310PAHSURR	**Received:**	07-SEP-12	**Catalog Number :**	010387-01
Type:	Source Material	**Expires:**	07-SEP-13	**Lot Number :**	191486
Employee:	Stacey Grant			**Solvent :**	Acetonitrile
Supplier:	o2si				
Description:	Decafluorobiphenyl 250 mg/L				
Comments:	None				

Analyte	Concentration	Analyte	Concentration
Decafluorobiphenyl	250 mg/L		

Serial ID:	UE130325-15	**Open/Reference Date:**	25-MAR-13	**Catalog Number :**	G34-110092-02
Name:	8310PAHLCS	**Received:**	25-MAR-13	**Lot Number :**	205498
Type:	Source Material	**Expires:**	18-MAR-14	**Solvent :**	ACN
Employee:	Stacey Grant				
Supplier:	o2si				
Description:	8310 PAH SPIKE				
Comments:	None				

Analyte	Concentration	Analyte	Concentration
1-Methylnaphthalene	50 mg/L	2-Methylnaphthalene	50 mg/L
Acenaphthene	50 mg/L	Acenaphthylene	50 mg/L
Anthracene	50 mg/L	Benzo(a)anthracene	5 mg/L
Benzo(a)pyrene	5 mg/L	Benzo(b)fluoranthene	5 mg/L
Benzo(ghi)perylene	5 mg/L	Benzo(k)fluoranthene	2.5 mg/L
Chrysene	5 mg/L	Dibenzo(a,h)anthracene	5 mg/L
Fluoranthene	5 mg/L	Fluorene	50 mg/L
Indeno(1,2,3-cd)pyrene	5 mg/L	Naphthalene	50 mg/L
Phenanthrene	50 mg/L	Pyrene	5 mg/L

Serial ID:	UPA120521-01.3	**Open/Reference Date:**	26-FEB-13	**Amount :**	1 mL
Name:	8310 PAH Calibration Soluti	**Received:**	21-MAY-12	**Catalog Number :**	110092-01
Type:	Source Material	**Expires:**	26-FEB-14	**Lot Number :**	190320
Employee:	Michael Penny			**Solvent :**	Acetonitrile
Supplier:	O2Si				

Description: 8310 PAH Calibration Solution
Comments: None

Analyte	Concentration	Analyte	Concentration
1-Methylnaphthalene	1000 mg/L	2-Methylnaphthalene	1000 mg/L
Acenaphthene	1000 mg/L	Acenaphthylene	1000 mg/L
Anthracene	1000 mg/L	Benzo(a)anthracene	100 mg/L
Benzo(a)pyrene	100 mg/L	Benzo(b)fluoranthene	100 mg/L
Benzo(ghi)perylene	100 mg/L	Benzo(k)fluoranthene	50 mg/L
Chrysene	100 mg/L	Dibenzo(a,h)anthracene	100 mg/L
Fluoranthene	100 mg/L	Fluorene	1000 mg/L
Indeno(1,2,3-cd)pyrene	100 mg/L	Naphthalene	1000 mg/L
Phenanthrene	1000 mg/L	Pyrene	100 mg/L

Serial ID: UPA120521-02.1 **Open/Reference Date:** 26-FEB-13 **Amount :** 1 ml
Name: Decafluorobiphenyl **Received:** 21-MAY-12 **Catalog Number :** 010387-03
Type: Source Material **Expires:** 26-FEB-14 **Lot Number :** 190321
Employee: Michael Penny **Solvent :** ACN
Supplier: o2si
Description: DCF 5000 mg/L for Calibration
Comments: None

Analyte	Concentration	Analyte	Concentration
Decafluorobiphenyl	5000 mg/L		

Serial ID: UPA120904-01.3 **Open/Reference Date:** 05-MAR-13 **Amount :** 1 ml
Name: Decafluorobiphenyl **Received:** 04-SEP-12 **Catalog Number :** S-11570A5-1ML
Type: Source Material **Expires:** 30-SEP-13 **Lot Number :** 97000
Employee: Charles Wilson **Solvent :** ACN
Supplier: ChemService
Description: Decafluorobiphenyl 2000ug/mL
Comments: None

Analyte	Concentration	Analyte	Concentration
Decafluorobiphenyl	2000 ug/mL		

Serial ID: UPA130321-01.1 **Open/Reference Date:** 28-MAR-13 **Amount :** 1 mL
Name: 8310 Calibration Solution **Received:** 21-MAR-13 **Catalog Number :** 31843
Type: Source Material **Expires:** 28-MAR-14 **Lot Number :** A079259
Employee: Charles Wilson **Solvent :** Acetonitrile
Supplier: Restek
Description: 8310 Quality Contol Check
Comments: None

Analyte	Concentration	Analyte	Concentration
1-Methylnaphthalene	100 ug/ml	2-Methylnaphthalene	100 ug/ml

Standard Logbook

Analyte	Concentration	Analyte	Concentration
Acenaphthene	100 ug/ml	Acenaphthylene	100 ug/ml
Anthracene	100 ug/ml	Benzo(a)anthracene	10 ug/ml
Benzo(a)pyrene	10 ug/ml	Benzo(b)fluoranthene	10 ug/ml
Benzo(ghi)perylene	10 ug/ml	Benzo(k)fluoranthene	5 ug/ml
Chrysene	10 ug/ml	Dibenzo(a,h)anthracene	10 ug/ml
Fluoranthene	10 ug/ml	Fluorene	100 ug/ml
Indeno(1,2,3-cd)pyrene	10 ug/ml	Naphthalene	100 ug/ml
Phenanthrene	100 ug/ml	Pyrene	10 ug/ml

Serial ID: IPA130226-01 **Open/Reference Date:** 26-FEB-13 **Balance Id :** N/A
Name: PAH Calibration Level 8(O2 **Received:** 26-FEB-13 **Instrument Id :** HPLC
Type: Intermediate **Expires:** 26-AUG-13 **Lot Number :** 1871083
Employee: Charles Wilson **Pipet Id :** N/A
Supplier: GEL **Solvent :** Acetonitrile
Description: PAH CALIBRATION LEVEL 8 (100/10/5)
Comments: None

Parent Material	Analyte	Parent Conc.	Aliquot	Final Vol.	Final Conc.
UPA120521-01.3	1-Methylnaphthalene	1000 mg/L	1 mL	10 ml	100 ug/ml
UPA120521-01.3	2-Methylnaphthalene	1000 mg/L	1 mL	10 ml	100 ug/ml
UPA120521-01.3	Acenaphthene	1000 mg/L	1 mL	10 ml	100 ug/ml
UPA120521-01.3	Acenaphthylene	1000 mg/L	1 mL	10 ml	100 ug/ml
UPA120521-01.3	Anthracene	1000 mg/L	1 mL	10 ml	100 ug/ml
UPA120521-01.3	Benzo(a)anthracene	100 mg/L	1 mL	10 ml	10 ug/ml
UPA120521-01.3	Benzo(a)pyrene	100 mg/L	1 mL	10 ml	10 ug/ml
UPA120521-01.3	Benzo(b)fluoranthene	100 mg/L	1 mL	10 ml	10 ug/ml
UPA120521-01.3	Benzo(ghi)perylene	100 mg/L	1 mL	10 ml	10 ug/ml
UPA120521-01.3	Benzo(k)fluoranthene	50 mg/L	1 mL	10 ml	5 ug/ml
UPA120521-01.3	Chrysene	100 mg/L	1 mL	10 ml	10 ug/ml
UPA120521-01.3	Dibenzo(a,h)anthracene	100 mg/L	1 mL	10 ml	10 ug/ml
UPA120521-01.3	Fluoranthene	100 mg/L	1 mL	10 ml	10 ug/ml
UPA120521-01.3	Fluorene	1000 mg/L	1 mL	10 ml	100 ug/ml
UPA120521-01.3	Indeno(1,2,3-cd)pyrene	100 mg/L	1 mL	10 ml	10 ug/ml
UPA120521-01.3	Naphthalene	1000 mg/L	1 mL	10 ml	100 ug/ml
UPA120521-01.3	Phenanthrene	1000 mg/L	1 mL	10 ml	100 ug/ml
UPA120521-01.3	Pyrene	100 mg/L	1 mL	10 ml	10 ug/ml
UPA120521-02.1	Decafluorobiphenyl	5000 mg/L	1 mL	10 ml	500 ug/ml

Serial ID: WPA130328-01 **Open/Reference Date:** 28-MAR-13 **Balance Id :** N/A
Name: PAH ICV (RESTEK) **Received:** 28-MAR-13 **Instrument Id :** HPLC
Type: Working **Expires:** 29-MAR-13 **Lot Number :** 1893321
Employee: Charles Wilson **Pipet Id :** N/A
Supplier: GEL **Solvent :** ACN
Description: PAH ICV (100/10/5)
Comments: None

Standard Logbook

Parent Material	Analyte	Parent Conc.	Aliquot	Final Vol.	Final Conc.
UPA120904-01.3	Decafluorobiphenyl	2000 ug/mL	125 uL	1 ml	500 ug/ml
UPA130321-01.1	1-Methylnaphthalene	100 ug/ml	500 uL	1 ml	100 ug/ml
UPA130321-01.1	2-Methylnaphthalene	100 ug/ml	500 uL	1 ml	100 ug/ml
UPA130321-01.1	Acenaphthene	100 ug/ml	500 uL	1 ml	100 ug/ml
UPA130321-01.1	Acenaphthylene	100 ug/ml	500 uL	1 ml	100 ug/ml
UPA130321-01.1	Anthracene	100 ug/ml	500 uL	1 ml	100 ug/ml
UPA130321-01.1	Benzo(a)anthracene	10 ug/ml	500 uL	1 ml	10 ug/ml
UPA130321-01.1	Benzo(a)pyrene	10 ug/ml	500 uL	1 ml	10 ug/ml
UPA130321-01.1	Benzo(b)fluoranthene	10 ug/ml	500 uL	1 ml	10 ug/ml
UPA130321-01.1	Benzo(ghi)perylene	10 ug/ml	500 uL	1 ml	10 ug/ml
UPA130321-01.1	Benzo(k)fluoranthene	5 ug/ml	500 uL	1 ml	5 ug/ml
UPA130321-01.1	Chrysene	10 ug/ml	500 uL	1 ml	10 ug/ml
UPA130321-01.1	Dibenzo(a,h)anthracene	10 ug/ml	500 uL	1 ml	10 ug/ml
UPA130321-01.1	Fluoranthene	10 ug/ml	500 uL	1 ml	10 ug/ml
UPA130321-01.1	Fluorene	100 ug/ml	500 uL	1 ml	100 ug/ml
UPA130321-01.1	Indeno(1,2,3-cd)pyrene	10 ug/ml	500 uL	1 ml	10 ug/ml
UPA130321-01.1	Naphthalene	100 ug/ml	500 uL	1 ml	100 ug/ml
UPA130321-01.1	Phenanthrene	100 ug/ml	500 uL	1 ml	100 ug/ml
UPA130321-01.1	Pyrene	10 ug/ml	500 uL	1 ml	10 ug/ml

Serial ID:	WPA130328-13	**Open/Reference Date:**	28-MAR-13	**Balance Id :**	NA
Name:	PAH Calibration Level 1	**Received:**	28-MAR-13	**Instrument Id :**	HPLC
Type:	Working	**Expires:**	29-MAR-13	**Lot Number :**	1893321
Employee:	Charles Wilson			**Pipet Id :**	NA
Supplier:	GEL			**Solvent :**	Acetonitrile

Description: 0.5/0.05/0.025/2.5 ppm

Comments: None

Parent Material	Analyte	Parent Conc.	Aliquot	Final Vol.	Final Conc.
IPA130226-01	1-Methylnaphthalene	100 ug/ml	5 uL	1 ml	.5 ug/mL
IPA130226-01	2-Methylnaphthalene	100 ug/ml	5 uL	1 ml	.5 ug/mL
IPA130226-01	Acenaphthene	100 ug/ml	5 uL	1 ml	.5 ug/mL
IPA130226-01	Acenaphthylene	100 ug/ml	5 uL	1 ml	.5 ug/mL
IPA130226-01	Anthracene	100 ug/ml	5 uL	1 ml	.5 ug/mL
IPA130226-01	Benzo(a)anthracene	10 ug/ml	5 uL	1 ml	.05 ug/mL
IPA130226-01	Benzo(a)pyrene	10 ug/ml	5 uL	1 ml	.05 ug/mL
IPA130226-01	Benzo(b)fluoranthene	10 ug/ml	5 uL	1 ml	.05 ug/mL
IPA130226-01	Benzo(ghi)perylene	10 ug/ml	5 uL	1 ml	.05 ug/mL
IPA130226-01	Benzo(k)fluoranthene	5 ug/ml	5 uL	1 ml	.025 ug/mL
IPA130226-01	Chrysene	10 ug/ml	5 uL	1 ml	.05 ug/mL
IPA130226-01	Decafluorobiphenyl	500 ug/ml	5 uL	1 ml	2.5 ug/mL
IPA130226-01	Dibenzo(a,h)anthracene	10 ug/ml	5 uL	1 ml	.05 ug/mL
IPA130226-01	Fluoranthene	10 ug/ml	5 uL	1 ml	.05 ug/mL
IPA130226-01	Fluorene	100 ug/ml	5 uL	1 ml	.5 ug/mL
IPA130226-01	Indeno(1,2,3-cd)pyrene	10 ug/ml	5 uL	1 ml	.05 ug/mL

Standard Logbook

Parent Material	Analyte	Parent Conc.	Aliquot	Final Vol.	Final Conc.
IPA130226-01	Naphthalene	100 ug/ml	5 uL	1 ml	.5 ug/mL
IPA130226-01	Phenanthrene	100 ug/ml	5 uL	1 ml	.5 ug/mL
IPA130226-01	Pyrene	10 ug/ml	5 uL	1 ml	.05 ug/mL

Serial ID: WPA130328-14 **Open/Reference Date:** 28-MAR-13 **Balance Id :** NA
Name: PAH Calibration Level 2 **Received:** 28-MAR-13 **Instrument Id :** HPLC
Type: Working **Expires:** 29-MAR-13 **Lot Number :** 1893321
Employee: Charles Wilson **Pipet Id :** NA
Supplier: GEL **Solvent :** Acetonitrile
Description: 1.0/0.1/0.05/5.0 ppm
Comments: None

Parent Material	Analyte	Parent Conc.	Aliquot	Final Vol.	Final Conc.
IPA130226-01	1-Methylnaphthalene	100 ug/ml	10 uL	1 ml	1 ug/mL
IPA130226-01	2-Methylnaphthalene	100 ug/ml	10 uL	1 ml	1 ug/mL
IPA130226-01	Acenaphthene	100 ug/ml	10 uL	1 ml	1 ug/mL
IPA130226-01	Acenaphthylene	100 ug/ml	10 uL	1 ml	1 ug/mL
IPA130226-01	Anthracene	100 ug/ml	10 uL	1 ml	1 ug/mL
IPA130226-01	Benzo(a)anthracene	10 ug/ml	10 uL	1 ml	.1 ug/mL
IPA130226-01	Benzo(a)pyrene	10 ug/ml	10 uL	1 ml	.1 ug/mL
IPA130226-01	Benzo(b)fluoranthene	10 ug/ml	10 uL	1 ml	.1 ug/mL
IPA130226-01	Benzo(ghi)perylene	10 ug/ml	10 uL	1 ml	.1 ug/mL
IPA130226-01	Benzo(k)fluoranthene	5 ug/ml	10 uL	1 ml	.05 ug/mL
IPA130226-01	Chrysene	10 ug/ml	10 uL	1 ml	.1 ug/mL
IPA130226-01	Decafluorobiphenyl	500 ug/ml	10 uL	1 ml	5 ug/mL
IPA130226-01	Dibenzo(a,h)anthracene	10 ug/ml	10 uL	1 ml	.1 ug/mL
IPA130226-01	Fluoranthene	10 ug/ml	10 uL	1 ml	.1 ug/mL
IPA130226-01	Fluorene	100 ug/ml	10 uL	1 ml	1 ug/mL
IPA130226-01	Indeno(1,2,3-cd)pyrene	10 ug/ml	10 uL	1 ml	.1 ug/mL
IPA130226-01	Naphthalene	100 ug/ml	10 uL	1 ml	1 ug/mL
IPA130226-01	Phenanthrene	100 ug/ml	10 uL	1 ml	1 ug/mL
IPA130226-01	Pyrene	10 ug/ml	10 uL	1 ml	.1 ug/mL

Serial ID: WPA130328-15 **Open/Reference Date:** 28-MAR-13 **Balance Id :** NA
Name: PAH Calibration Level 3 **Received:** 28-MAR-13 **Instrument Id :** HPLC
Type: Working **Expires:** 29-MAR-13 **Lot Number :** 1893321
Employee: Charles Wilson **Pipet Id :** NA
Supplier: GEL **Solvent :** Acetonitrile
Description: 5/0.5/0.25/25 ppm
Comments: None

Parent Material	Analyte	Parent Conc.	Aliquot	Final Vol.	Final Conc.
IPA130226-01	1-Methylnaphthalene	100 ug/ml	50 uL	1 ml	5 ug/mL
IPA130226-01	2-Methylnaphthalene	100 ug/ml	50 uL	1 ml	5 ug/mL
IPA130226-01	Acenaphthene	100 ug/ml	50 uL	1 ml	5 ug/mL

Standard Logbook

Parent Material	Analyte	Parent Conc.	Aliquot	Final Vol.	Final Conc.
IPA130226-01	Acenaphthylene	100 ug/ml	50 uL	1 ml	5 ug/mL
IPA130226-01	Anthracene	100 ug/ml	50 uL	1 ml	5 ug/mL
IPA130226-01	Benzo(a)anthracene	10 ug/ml	50 uL	1 ml	.5 ug/mL
IPA130226-01	Benzo(a)pyrene	10 ug/ml	50 uL	1 ml	.5 ug/mL
IPA130226-01	Benzo(b)fluoranthene	10 ug/ml	50 uL	1 ml	.5 ug/mL
IPA130226-01	Benzo(ghi)perylene	10 ug/ml	50 uL	1 ml	.5 ug/mL
IPA130226-01	Benzo(k)fluoranthene	5 ug/ml	50 uL	1 ml	.25 ug/mL
IPA130226-01	Chrysene	10 ug/ml	50 uL	1 ml	.5 ug/mL
IPA130226-01	Decafluorobiphenyl	500 ug/ml	50 uL	1 ml	25 ug/mL
IPA130226-01	Dibenzo(a,h)anthracene	10 ug/ml	50 uL	1 ml	.5 ug/mL
IPA130226-01	Fluoranthene	10 ug/ml	50 uL	1 ml	.5 ug/mL
IPA130226-01	Fluorene	100 ug/ml	50 uL	1 ml	5 ug/mL
IPA130226-01	Indeno(1,2,3-cd)pyrene	10 ug/ml	50 uL	1 ml	.5 ug/mL
IPA130226-01	Naphthalene	100 ug/ml	50 uL	1 ml	5 ug/mL
IPA130226-01	Phenanthrene	100 ug/ml	50 uL	1 ml	5 ug/mL
IPA130226-01	Pyrene	10 ug/ml	50 uL	1 ml	.5 ug/mL

Serial ID: WPA130328-16 **Open/Reference Date:** 28-MAR-13 **Balance Id :** NA
Name: PAH Calibration Level 4 **Received:** 28-MAR-13 **Instrument Id :** HPLC
Type: Working **Expires:** 29-MAR-13 **Lot Number :** 1893321
Employee: Charles Wilson **Pipet Id :** NA
Supplier: GEL **Solvent :** Acetonitrile
Description: 10/1.0/0.5/50 ppm
Comments: None

Parent Material	Analyte	Parent Conc.	Aliquot	Final Vol.	Final Conc.
IPA130226-01	1-Methylnaphthalene	100 ug/ml	100 uL	1 ml	10 ug/mL
IPA130226-01	2-Methylnaphthalene	100 ug/ml	100 uL	1 ml	10 ug/mL
IPA130226-01	Acenaphthene	100 ug/ml	100 uL	1 ml	10 ug/mL
IPA130226-01	Acenaphthylene	100 ug/ml	100 uL	1 ml	10 ug/mL
IPA130226-01	Anthracene	100 ug/ml	100 uL	1 ml	10 ug/mL
IPA130226-01	Benzo(a)anthracene	10 ug/ml	100 uL	1 ml	1 ug/mL
IPA130226-01	Benzo(a)pyrene	10 ug/ml	100 uL	1 ml	1 ug/mL
IPA130226-01	Benzo(b)fluoranthene	10 ug/ml	100 uL	1 ml	1 ug/mL
IPA130226-01	Benzo(ghi)perylene	10 ug/ml	100 uL	1 ml	1 ug/mL
IPA130226-01	Benzo(k)fluoranthene	5 ug/ml	100 uL	1 ml	.5 ug/mL
IPA130226-01	Chrysene	10 ug/ml	100 uL	1 ml	1 ug/mL
IPA130226-01	Decafluorobiphenyl	500 ug/ml	100 uL	1 ml	50 ug/mL
IPA130226-01	Dibenzo(a,h)anthracene	10 ug/ml	100 uL	1 ml	1 ug/mL
IPA130226-01	Fluoranthene	10 ug/ml	100 uL	1 ml	1 ug/mL
IPA130226-01	Fluorene	100 ug/ml	100 uL	1 ml	10 ug/mL
IPA130226-01	Indeno(1,2,3-cd)pyrene	10 ug/ml	100 uL	1 ml	1 ug/mL
IPA130226-01	Naphthalene	100 ug/ml	100 uL	1 ml	10 ug/mL
IPA130226-01	Phenanthrene	100 ug/ml	100 uL	1 ml	10 ug/mL
IPA130226-01	Pyrene	10 ug/ml	100 uL	1 ml	1 ug/mL

Standard Logbook

Serial ID:	WPA130328-17	**Open/Reference Date:**	28-MAR-13	**Balance Id :**	NA
Name:	PAH Calibration Level 5	**Received:**	28-MAR-13	**Instrument Id :**	HPLC
Type:	Working	**Expires:**	29-MAR-13	**Lot Number :**	1893321
Employee:	Charles Wilson			**Pipet Id :**	NA
Supplier:	GEL			**Solvent :**	Acetonitrile

Description: 25/2.5/1.25/125 ppm

Comments: None

Parent Material	Analyte	Parent Conc.	Aliquot	Final Vol.	Final Conc.
IPA130226-01	1-Methylnaphthalene	100 ug/ml	250 uL	1 ml	25 ug/mL
IPA130226-01	2-Methylnaphthalene	100 ug/ml	250 uL	1 ml	25 ug/mL
IPA130226-01	Acenaphthene	100 ug/ml	250 uL	1 ml	25 ug/mL
IPA130226-01	Acenaphthylene	100 ug/ml	250 uL	1 ml	25 ug/mL
IPA130226-01	Anthracene	100 ug/ml	250 uL	1 ml	25 ug/mL
IPA130226-01	Benzo(a)anthracene	10 ug/ml	250 uL	1 ml	2.5 ug/mL
IPA130226-01	Benzo(a)pyrene	10 ug/ml	250 uL	1 ml	2.5 ug/mL
IPA130226-01	Benzo(b)fluoranthene	10 ug/ml	250 uL	1 ml	2.5 ug/mL
IPA130226-01	Benzo(ghi)perylene	10 ug/ml	250 uL	1 ml	2.5 ug/mL
IPA130226-01	Benzo(k)fluoranthene	5 ug/ml	250 uL	1 ml	1.25 ug/mL
IPA130226-01	Chrysene	10 ug/ml	250 uL	1 ml	2.5 ug/mL
IPA130226-01	Decafluorobiphenyl	500 ug/ml	250 uL	1 ml	125 ug/mL
IPA130226-01	Dibenzo(a,h)anthracene	10 ug/ml	250 uL	1 ml	2.5 ug/mL
IPA130226-01	Fluoranthene	10 ug/ml	250 uL	1 ml	2.5 ug/mL
IPA130226-01	Fluorene	100 ug/ml	250 uL	1 ml	25 ug/mL
IPA130226-01	Indeno(1,2,3-cd)pyrene	10 ug/ml	250 uL	1 ml	2.5 ug/mL
IPA130226-01	Naphthalene	100 ug/ml	250 uL	1 ml	25 ug/mL
IPA130226-01	Phenanthrene	100 ug/ml	250 uL	1 ml	25 ug/mL
IPA130226-01	Pyrene	10 ug/ml	250 uL	1 ml	2.5 ug/mL

Serial ID:	WPA130328-18	**Open/Reference Date:**	28-MAR-13	**Balance Id :**	NA
Name:	PAH Calibration Level 6	**Received:**	28-MAR-13	**Instrument Id :**	HPLC
Type:	Working	**Expires:**	29-MAR-13	**Lot Number :**	1893321
Employee:	Charles Wilson			**Pipet Id :**	NA
Supplier:	GEL			**Solvent :**	Acetonitrile

Description: 50/5.0/2.5/250 ppm

Comments: None

Parent Material	Analyte	Parent Conc.	Aliquot	Final Vol.	Final Conc.
IPA130226-01	1-Methylnaphthalene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	2-Methylnaphthalene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Acenaphthene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Acenaphthylene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Anthracene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Benzo(a)anthracene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Benzo(a)pyrene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Benzo(b)fluoranthene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Benzo(ghi)perylene	10 ug/ml	500 uL	1 ml	5 ug/mL

Parent Material	Analyte	Parent Conc.	Aliquot	Final Vol.	Final Conc.
IPA130226-01	Benzo(k)fluoranthene	5 ug/ml	500 uL	1 ml	2.5 ug/mL
IPA130226-01	Chrysene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Decafluorobiphenyl	500 ug/ml	500 uL	1 ml	250 ug/mL
IPA130226-01	Dibenzo(a,h)anthracene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Fluoranthene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Fluorene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Indeno(1,2,3-cd)pyrene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Naphthalene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Phenanthrene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Pyrene	10 ug/ml	500 uL	1 ml	5 ug/mL

Serial ID: WPA130328-19 **Open/Reference Date:** 28-MAR-13 **Balance Id :** N/A
Name: PAH Calibration Level 7 **Received:** 28-MAR-13 **Instrument Id :** HPLC
Type: Working **Expires:** 29-MAR-13 **Lot Number :** 1893321
Employee: Charles Wilson **Pipet Id :** N/A
Supplier: GEL **Solvent :** Acetonitrile
Description: 75/7.5/3.75/375 ppm
Comments: None

Parent Material	Analyte	Parent Conc.	Aliquot	Final Vol.	Final Conc.
IPA130226-01	1-Methylnaphthalene	100 ug/ml	750 uL	1 ml	75 ug/ml
IPA130226-01	2-Methylnaphthalene	100 ug/ml	750 uL	1 ml	75 ug/ml
IPA130226-01	Acenaphthene	100 ug/ml	750 uL	1 ml	75 ug/ml
IPA130226-01	Acenaphthylene	100 ug/ml	750 uL	1 ml	75 ug/ml
IPA130226-01	Anthracene	100 ug/ml	750 uL	1 ml	75 ug/ml
IPA130226-01	Benzo(a)anthracene	10 ug/ml	750 uL	1 ml	7.5 ug/ml
IPA130226-01	Benzo(a)pyrene	10 ug/ml	750 uL	1 ml	7.5 ug/ml
IPA130226-01	Benzo(b)fluoranthene	10 ug/ml	750 uL	1 ml	7.5 ug/ml
IPA130226-01	Benzo(ghi)perylene	10 ug/ml	750 uL	1 ml	7.5 ug/ml
IPA130226-01	Benzo(k)fluoranthene	5 ug/ml	750 uL	1 ml	3.75 ug/ml
IPA130226-01	Chrysene	10 ug/ml	750 uL	1 ml	7.5 ug/ml
IPA130226-01	Decafluorobiphenyl	500 ug/ml	750 uL	1 ml	375 ug/ml
IPA130226-01	Dibenzo(a,h)anthracene	10 ug/ml	750 uL	1 ml	7.5 ug/ml
IPA130226-01	Fluoranthene	10 ug/ml	750 uL	1 ml	7.5 ug/ml
IPA130226-01	Fluorene	100 ug/ml	750 uL	1 ml	75 ug/ml
IPA130226-01	Indeno(1,2,3-cd)pyrene	10 ug/ml	750 uL	1 ml	7.5 ug/ml
IPA130226-01	Naphthalene	100 ug/ml	750 uL	1 ml	75 ug/ml
IPA130226-01	Phenanthrene	100 ug/ml	750 uL	1 ml	75 ug/ml
IPA130226-01	Pyrene	10 ug/ml	750 uL	1 ml	7.5 ug/ml

Serial ID: WPA130627-10 **Open/Reference Date:** 27-JUN-13 **Balance Id :** N/A
Name: 8310 Calibration Check **Received:** 27-JUN-13 **Instrument Id :** HPLC
Type: Working **Expires:** 28-JUN-13 **Lot Number :** 1915542
Employee: Charles Wilson **Pipet Id :** N/A
Supplier: GEL **Solvent :** Acetonitrile

Standard Logbook

Description: 8310 O2SI Calibration Check Standard

Comments: None

Parent Material	Analyte	Parent Conc.	Aliquot	Final Vol.	Final Conc.
IPA130226-01	1-Methylnaphthalene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	2-Methylnaphthalene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Acenaphthene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Acenaphthylene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Anthracene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Benzo(a)anthracene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Benzo(a)pyrene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Benzo(b)fluoranthene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Benzo(ghi)perylene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Benzo(k)fluoranthene	5 ug/ml	500 uL	1 ml	2.5 ug/mL
IPA130226-01	Chrysene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Decafluorobiphenyl	500 ug/ml	500 uL	1 ml	250 ug/mL
IPA130226-01	Dibenzo(a,h)anthracene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Fluoranthene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Fluorene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Indeno(1,2,3-cd)pyrene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Naphthalene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Phenanthrene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Pyrene	10 ug/ml	500 uL	1 ml	5 ug/mL

Serial ID:	WPA130628-10	**Open/Reference Date:**	28-JUN-13	**Balance Id :**	N/A
Name:	8310 Calibration Check	**Received:**	28-JUN-13	**Instrument Id :**	HPLC
Type:	Working	**Expires:**	29-JUN-13	**Lot Number :**	1915542
Employee:	Charles Wilson			**Pipet Id :**	N/A
Supplier:	GEL			**Solvent :**	Acetonitrile

Description: 8310 O2SI Calibration Check Standard

Comments: None

Parent Material	Analyte	Parent Conc.	Aliquot	Final Vol.	Final Conc.
IPA130226-01	1-Methylnaphthalene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	2-Methylnaphthalene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Acenaphthene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Acenaphthylene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Anthracene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Benzo(a)anthracene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Benzo(a)pyrene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Benzo(b)fluoranthene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Benzo(ghi)perylene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Benzo(k)fluoranthene	5 ug/ml	500 uL	1 ml	2.5 ug/mL
IPA130226-01	Chrysene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Decafluorobiphenyl	500 ug/ml	500 uL	1 ml	250 ug/mL
IPA130226-01	Dibenzo(a,h)anthracene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Fluoranthene	10 ug/ml	500 uL	1 ml	5 ug/mL

Standard Logbook

Parent Material	Analyte	Parent Conc.	Aliquot	Final Vol.	Final Conc.
IPA130226-01	Fluorene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Indeno(1,2,3-cd)pyrene	10 ug/ml	500 uL	1 ml	5 ug/mL
IPA130226-01	Naphthalene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Phenanthrene	100 ug/ml	500 uL	1 ml	50 ug/mL
IPA130226-01	Pyrene	10 ug/ml	500 uL	1 ml	5 ug/mL

Serial ID: 1918726
Name: H-Acetonitrile
Type: Reagent/Solvent
Employee: Michael Penny
Supplier: EMD
Description: HPLC Grade Acetonitrile
Comments: None

Open/Reference Date: 16-MAY-13
Received: 16-MAY-13
Expires: 16-MAY-14

Balance Id : NA
Catalog Number : AX0145-1
Lot Number : 53077
Pipet Id : NA
Storage : Flammable

Serial ID: 1930519-D
Name: O-Dichloromethane-X
Type: Reagent/Solvent
Employee: Alberto Velasco
Supplier: Burdick & Jackson
Description: Methylene Chloride
Comments: None

Open/Reference Date: 17-JUN-13
Received: 17-JUN-13
Expires: 17-JUN-14

Lot Number : DH824

FID Diesel Range Organics Analysis

Case Narrative

FID Diesel Range Organics
WC-HANFORD, INC. (WCHN)
SDG X0002

Method/Analysis Information

Procedure:	**Analysis of Diesel Range Organics by Flame Ionization Detector**
Analytical Method:	NWTPH-Dx
Prep Method:	SW846 3535A
Analytical Batch Number:	1310886
Prep Batch Number:	1310885

Sample Analysis

The following samples were analyzed using the analytical protocol as established in NWTPH-Dx:

Sample ID	Client ID
328213001	B2PM35
328213003	B2PM38
328213005	B2PM41
1202899616	Method Blank (MB)
1202899617	Laboratory Control Sample (LCS)
1202899620	328213003(B2PM38) Matrix Spike (MS)
1202899621	328213003(B2PM38) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

Preparation/Analytical Method Verification

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-003 REV# 23.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP).

Calibration Information

Initial Calibration
All initial calibration requirements have been met for this sample delivery group (SDG).

Continuing Calibration Verification (CCV) Requirements
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria. Analyte peaks eluted within the established retention time windows for this method.

Quality Control (QC) Information

Method Blank (MB) Statement
The MB analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries
Samples 1202899620 (B2PM38MS), 1202899621 (B2PM38MSD) and 328213003 (B2PM38) did not meet surrogate recovery limits. The samples exceeded surrogate recovery limits due to matrix interference and an elevated baseline during the retention time of the surrogate.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

QC Sample Designation
Sample 328213003 (B2PM38) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement
The MS recovery was within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement
The MSD recovery was within the established acceptance limits.

MS/MSD Relative Percent Difference (RPD) Statement
The RPD between the MS and MSD met the acceptance limits.

Technical Information

Holding Time Specifications
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP. Analyte peaks eluted within the established retention time windows for this method.

Sample Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information

Electronic Package Comment

This package was generated using an electronic data processing program referred to as "virtual packaging". In an effort to increase quality and efficiency, the laboratory is developing systems to eventually generate all data packages electronically. The following change from "traditional" packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative.

Data Exception (DER) Documentation

Data exception report (DER) is generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. DER #1199873 was generated for this SDG.

Manual Integrations
Certain standards and samples may have required manual integration to correctly position the baseline as set in the calibration standard injections. If manual integration was performed, copies of all manual integration peak profiles are included in the raw data section of this fraction.

Additional Comments
The additional comments field is used to address special issues associated with each analysis, clarify method/contractual issues pertaining to the analysis, and to list any report documents generated as a result of sample analysis or review. The additional comments were not required.

System Configuration

The Diesel Range Organics analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
FID7.I	Agilent Gas Chromatograph	Agilent 6890N GC/FID	DB-5MS	30m x 0.25mm, 0.25um(J&W)

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

DATA EXCEPTION REPORT

Mo.Day Yr.	Division:	Quality Criteria:	Type:
04-JUL-13	Federal	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
GC/FID	NWTPH-Dx	Liquid	WCHN
Batch ID:	**Sample Numbers:**		
1310886	See Below		

Potentially affected work order(s)(SDG): 328172(X0001),328213(X0002)

Application Issues:

Failed Recovery for MS/PS

Failed RPD for MS/MSD, or PS/PSD

Failed Yield for Surrogates

Failed Recovery for MSD/PSD

Specification and Requirements Exception Description:	DER Disposition:
1. MS(1202899618) and MSD(1202899619) did not meet spike recovery limits. The relative percent difference between the MS and MSD did not meet acceptance limits.	1. The spike and RPD failures are attributed to matrix interference associated with high level hits of target analytes. The data have been reported.
2. WCHN sample 328172003, 328213003, MS(1202899620), and MSD(1202899621) did not meet surrogate recovery limits.	2. The samples exceeded surrogate recovery limits due to matrix interference and an elevated baseline during the retention time of the surrogate. The data have been reported.

Originator's Name:

Josh Brooks 04-JUL-13

Data Validator/Group Leader:

Jimin Cao 05-JUL-13

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report
for

WCHN001 WC-HANFORD, INC.

Client SDG: X0002 GEL Work Order: 328213

The Qualifiers in this report are defined as follows:

J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

DL Indicates that sample is diluted.

RA Indicates that sample is re-analyzed without re-extraction.

RE Indicates that sample is re-extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP-like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: Jimi Cao **Name: Jimin Cao**

Date: 11 JUL 2013 **Title: Data Validator**

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 11, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-236A Groundwater

Client Sample ID:	B2PM35	Project:	WCHN RC-236A
Sample ID:	328213001	Client ID:	WCHN001
Matrix:	Water		
Collect Date:	24-JUN-13 12:03		
Receive Date:	25-JUN-13		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW846 3535A/NWTPH-Dx DRO "As Received"											
Diesel Range Organics (C10-C20)	U	48.5	48.5	500	ug/L	1	JMB3	07/02/13	1831	1310886	1
Motor Oil (C20-C36)	J	90.2	48.5	500	ug/L	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3535A	3535A DRO IN LIQ PREP	SJW1	06/27/13	1210	1310885

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Dx	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o-Terphenyl	SW846 3535A/NWTPH-Dx DRO "As Received"	14.2 ug/L	19.4	72.9	(50%-150%)

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 11, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-236A Groundwater

Client Sample ID:	B2PM38	Project:	WCHN RC-236A
Sample ID:	328213003	Client ID:	WCHN001
Matrix:	Water		
Collect Date:	24-JUN-13 11:02		
Receive Date:	25-JUN-13		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW846 3535A/NWTPH-Dx DRO "As Received"											
Diesel Range Organics (C10-C20)		2990	50.0	500	ug/L	1	JMB3	07/03/13	1130	1310886	1
Motor Oil (C20-C36)		2760	50.0	500	ug/L	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3535A	3535A DRO IN LIQ PREP	SJW1	06/27/13	1210	1310885

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Dx	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o-Terphenyl	SW846 3535A/NWTPH-Dx DRO "As Received"	86.7 ug/L	20.0	433*	(50%-150%)

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 11, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-236A Groundwater

Client Sample ID:	B2PM41	Project:	WCHN RC-236A
Sample ID:	328213005	Client ID:	WCHN001
Matrix:	Water		
Collect Date:	24-JUN-13 09:46		
Receive Date:	25-JUN-13		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW846 3535A/NWTPH-Dx DRO "As Received"											
Diesel Range Organics (C10-C20)	J	111	48.1	500	ug/L	1	JMB3	07/02/13	1910	1310886	1
Motor Oil (C20-C36)	J	269	48.1	500	ug/L	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3535A	3535A DRO IN LIQ PREP	SJW1	06/27/13	1210	1310885

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Dx	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o-Terphenyl	SW846 3535A/NWTPH-Dx DRO "As Received"	15.4 ug/L	19.2	80.3	(50%-150%)

Notes:

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: July 11, 2013

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington

Contact: **Joan Kessner**

Workorder: **328213**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Diesel Range Organics										
Batch 1310886										
QC1202899617 LCS										
Diesel Range Organics (C10-C20)	2000			1440	ug/L		72.2	(70%-130%)	JMB3	07/02/13 16:34
Motor Oil (C20-C36)	2000			1640	ug/L		82.1	(70%-130%)		
**o-Terphenyl	20.0			27.8	ug/L		139	(50%-150%)		
QC1202899616 MB										
Diesel Range Organics (C10-C20)			U	50.0	ug/L					07/02/13 15:55
Motor Oil (C20-C36)			U	50.0	ug/L					
**o-Terphenyl	20.0			13.7	ug/L		68.5	(50%-150%)		
QC1202899620 328213003 MS										
Diesel Range Organics (C10-C20)	2000	2990		4550	ug/L		78	(70%-130%)		07/03/13 12:09
Motor Oil (C20-C36)	2000	2760		4500	ug/L		86.8	(70%-130%)		
**o-Terphenyl	40.0	86.7		68.4	ug/L		171*	(50%-150%)		
QC1202899621 328213003 MSD										
Diesel Range Organics (C10-C20)	2000	2990		4740	ug/L	4.07	87.4	(0%-20%)		07/03/13 12:48
Motor Oil (C20-C36)	2000	2760		4830	ug/L	7.14	103	(0%-20%)		
**o-Terphenyl	40.0	86.7		79.7	ug/L		199*	(50%-150%)		

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated

QC Summary

Workorder: 328213

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time

P	Aroclor target analyte with greater than 25% difference between column analyses.
T	Spike and/or spike duplicate sample recovery is outside control limits.
U	Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
X	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Y	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
Z	Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
o	Analyte failed to recover within LCS limits (0rganics only)

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Miscellaneous

Prep Logbook

Extraction of Semivolatile and Nonvolatile Organic Compounds from Groundwater, Wastewater, and Other Aqueous Samples

Batch ID: 1310885 **Verified by:** _____

Analyst: Sirena White

Method: SW846 3535A

Lab SOP: GL-OA-E-013 REV# 27

Instrument: Semi-Volatiles Manual

Sample ID	Run Date	Initial Volume (mL)	Ph 1	Ph 2	Final Volume (mL)	Prepped Factor (mL/mL)
1202899616 MB	27-JUN-2013 12:10:00	1000	7	0	1	0.001
1202899617 LCS	27-JUN-2013 12:10:00	1000	7	0	1	0.001
328172001	27-JUN-2013 12:10:00	1050	4	0	1	0.00095
328172003	27-JUN-2013 12:10:00	1000	6	0	1	0.001
1202899618 MS (328172003)	27-JUN-2013 12:10:00	500	6	0	0.5	0.001
1202899619 MSD (328172003)	27-JUN-2013 12:10:00	500	6	0	0.5	0.001
328172005	27-JUN-2013 12:10:00	1010	7	0	1	0.00099
328172007	27-JUN-2013 12:10:00	1020	7	0	1	0.00098
328213001	27-JUN-2013 12:10:00	1030	0	0	1	0.00097
328213003	27-JUN-2013 12:10:00	1000	4	0	1	0.001
1202899620 MS (328213003)	27-JUN-2013 12:10:00	500	4	0	0.5	0.001
1202899621 MSD (328213003)	27-JUN-2013 12:10:00	500	4	0	0.5	0.001
328213005	27-JUN-2013 12:10:00	1040	7	0	1	0.00096

Type	Sample Id	Description	Serial Number	Spike Amt	Units
LCS	1202899617	AZDRO SPIKE LCS STD,4000ug/ml	WFI130606-52	1	mL
MS	1202899618	AZDRO SPIKE LCS STD,4000ug/ml	WFI130606-52	.5	mL
MS	1202899620	AZDRO SPIKE LCS STD,4000ug/ml	WFI130606-52	.5	mL
MSD	1202899619	AZDRO SPIKE LCS STD,4000ug/ml	WFI130606-52	.5	mL
MSD	1202899621	AZDRO SPIKE LCS STD,4000ug/ml	WFI130606-52	.5	mL
SURR	All	20 ppm surrogate	WE130618-04	1	mL
REGNT	All	Methylene Chloride	1930519-D	120	mL
REGNT	All	Sulfuric Acid Sol., 1:1	1930933.2	15	mL
SOURC	All	SODIUM SULFATE	1928534	20	g

Comments:

Final Solvent: CH2Cl2
Verified by: SR

Cartridge Lot#: 97526-PY

GC Volatiles (GRO) Analysis

Case Narrative

GC Volatile Organics
WC-HANFORD, INC. (WCHN)
SDG X0002

Method/Analysis Information

Procedure:	**Volatile Total Petroleum Hydrocarbons by Flame Ionization Detector**
Analytical Method:	NWTPH-Gx
Analytical Batch Number:	1311087

Sample Analysis

The following client and quality control samples were analyzed to complete this sample delivery group/work order using the methods referenced in the Analysis Information section:

Sample ID	Client ID
328213001	B2PM35
328213003	B2PM38
328213005	B2PM41
1202900122	Method Blank (MB)
1202900123	328172001(B2PM27) Post Spike (PS)
1202900124	328172001(B2PM27) Post Spike Duplicate (PSD)
1202900125	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

NOTE: For volatile organic analyses the matrix spike designations may be indicated as "PS" or "PSD". The "PS" designation (post spike) indicates that the matrix was fortified prior to analysis but after applying any prep factors, such as a dilution. The laboratory considers the MS/MSD and PS/PSD designations interchangeable.

Gasoline Range Organics will be designated as GRO throughout this case narrative.

Raw data reports are processed and reviewed by the analyst using the Chemstation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP) section 19.1.2. False positive analytes are designated on the quantitation report with a ’d’ qualifier.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-OA-E-004 REV# 24.

Calibration Information

Initial Calibration
All initial calibration requirements have been met for this sample delivery group (SDG). See the calibration history report for a list of data files that were used to generate the initial calibration curve in the Standard Data Section of this data package.

CCV Requirements
All associated calibration verification standard(s) (ICV or CCV) met the acceptance criteria. Analyte peaks eluted within the established retention time windows for this method.

Quality Control (QC) Information

Method Blank (MB) Statement
The MB(s) analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries
Surrogate recoveries, in all samples and quality control samples, were within the acceptance limits.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

QC Sample Designation
Sample 328172001 (B2PM27) was selected for analysis as the matrix spike.

Matrix Spike (PS) Recovery Statement
The GRO recovery was within the acceptance limits.

Matrix Spike Duplicate (PSD) Recovery Statement
The GRO recovery was within the acceptance limits.

Relative Percent Difference (RPD) Statement
The RPD between the matrix spike pair met the acceptance limits.

Technical Information

Holding Time Specifications
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Sample Dilutions
The samples in this SDG did not require dilutions.

Sample Re-extraction/Re-analysis
Re-extractions or re-analyses were not required in this SDG.

Miscellaneous Information

Electronic Packaging Comment

This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator’s signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Data Exception (DER) Documentation
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Manual Integrations
Data files associated with the initial calibration, continuing calibration check(s), and samples may have been manually integrated to correct misidentification of peaks by the integration software.

Additional Comments
Additional comments were not required for this SDG.

System Configuration

The GRO Organics analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description	P & T Trap
VOC4A.I	Agilent 6890N GC/FID w/ OI 4560/Archon Autosampler	HP6890N GC/FID	DB-624	0.53mm x 3.0u x 15m	OI #10

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 − (843) 556−8171 − www.gel.com

Qualifier Definition Report
for

WCHN001 WC−HANFORD, INC.

Client SDG: X0002 GEL Work Order: 328213

The Qualifiers in this report are defined as follows:

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

DL Indicates that sample is diluted.
RA Indicates that sample is re−analyzed without re−extraction.
RE Indicates that sample is re−extracted.

Review/Validation

GEL requires all analytical data to be verified by a qualified data reviewer. In addition, all CLP−like deliverables receive a third level review of the fractional data package.

The following data validator verified the information presented in this data report:

Signature: Erin Haubert **Name:** **Erin Haubert**

Date: **28 JUN 2013** **Title:** **Data Validator**

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 24, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-236A Groundwater

Client SDG: X0002

Client Sample ID:	B2PM35	Project:	WCHN RC-236A
Sample ID:	328213001	Client ID:	WCHN001
Matrix:	WATER		
Collect Date:	24-JUN-13 12:03		
Receive Date:	25-JUN-13		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatiles GRO Organics											
NWTPH-Gx GRO Liquid "As Received"											
Gasoline Range Organics (C6 - C10)	U	16.7	16.7	500	ug/L	1	ACJ	06/27/13	1822	1311087	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Gx	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	NWTPH-Gx GRO Liquid "As Received"	47.4 ug/L	50.0	94.7	(50%-150%)

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 24, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-236A Groundwater

Client SDG: X0002

Client Sample ID:	B2PM38	Project:	WCHN RC-236A
Sample ID:	328213003	Client ID:	WCHN001
Matrix:	WATER		
Collect Date:	24-JUN-13 11:02		
Receive Date:	25-JUN-13		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatiles GRO Organics											
NWTPH-Gx GRO Liquid "As Received"											
Gasoline Range Organics (C6 - C10)	U	16.7	16.7	500	ug/L	1	ACJ	06/27/13	1850	1311087	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Gx	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	NWTPH-Gx GRO Liquid "As Received"	42.7 ug/L	50.0	85.3	(50%-150%)

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 24, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-236A Groundwater

Client SDG: X0002

Client Sample ID:	B2PM41	Project:	WCHN RC-236A
Sample ID:	328213005	Client ID:	WCHN001
Matrix:	WATER		
Collect Date:	24-JUN-13 09:46		
Receive Date:	25-JUN-13		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatiles GRO Organics											
NWTPH-Gx GRO Liquid "As Received"											
Gasoline Range Organics (C6 - C10)	U	16.7	16.7	500	ug/L	1	ACJ	06/27/13	1918	1311087	1

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Gx	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	NWTPH-Gx GRO Liquid "As Received"	46.7 ug/L	50.0	93.3	(50%-150%)

Notes:

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: July 24, 2013

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington

Contact: **Joan Kessner**

Workorder: **328213** **Client SDG:** X0002 **Project Description:** RC-236A Groundwater

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatiles GRO Organics										
Batch 1311087										
QC1202900125 LCS										
Gasoline Range Organics (C6 - C10)	500			451	ug/L		90.1	(70%-130%)	ACJ	06/27/13 14:00
**Bromofluorobenzene	50.0			51.6	ug/L		103	(50%-150%)		
QC1202900122 MB										
Gasoline Range Organics (C6 - C10)			U	16.7	ug/L					06/27/13 14:28
**Bromofluorobenzene	50.0			47.5	ug/L		94.9	(50%-150%)		
QC1202900123 328172001 PS										
Gasoline Range Organics (C6 - C10)	500	U	0.00	433	ug/L		86.7	(70%-130%)		06/27/13 16:58
**Bromofluorobenzene	50.0		48.9	49.4	ug/L		98.9	(50%-150%)		
QC1202900124 328172001 PSD										
Gasoline Range Organics (C6 - C10)	500	U	0.00	435	ug/L	0.293	86.9	(0%-20%)		06/27/13 17:26
**Bromofluorobenzene	50.0		48.9	65.3	ug/L		131	(50%-150%)		

Notes:

The Qualifiers in this report are defined as follows:

- A The TIC is a suspected aldol-condensation product
- B The analyte was detected in both the associated QC blank and in the sample.
- C Analyte has been confirmed by GC/MS analysis
- D Results are reported from a diluted aliquot of sample.
- E Concentration exceeds the calibration range of the instrument
- J The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).Value is estimated
- P Aroclor target analyte with greater than 25% difference between column analyses.
- T Spike and/or spike duplicate sample recovery is outside control limits.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- o Analyte failed to recover within LCS limits (0rganics only)

QC Summary

Workorder: **328213** **Client SDG:** X0002 **Project Description:** RC-236A Groundwater

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

Metals Analysis

Case Narrative

Metals Fractional Narrative
WC-HANFORD, INC. (WCHN)
SDG X0002

Sample Analysis

Sample ID	Client ID
328213001	B2PM35
328213003	B2PM38
328213005	B2PM41
1202898643	Method Blank (MB) **ICP**
1202898644	Laboratory Control Sample (LCS)
1202898647	328213001(B2PM35L) Serial Dilution (SD)
1202898645	328213001(B2PM35S) Matrix Spike (MS)
1202898646	328213001(B2PM35SD) Matrix Spike Duplicate (MSD)
1202898648	Method Blank (MB) **ICP-MS**
1202898649	Laboratory Control Sample (LCS)
1202898652	328213001(B2PM35L) Serial Dilution (SD)
1202898650	328213001(B2PM35S) Matrix Spike (MS)
1202898651	328213001(B2PM35SD) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on an "as received" basis.

Method/Analysis Information

Analytical Batch:	1310484 and 1310486
Prep Batch :	1310483 and 1310485
Standard Operating Procedures:	GL-MA-E-013 REV# 22, GL-MA-E-006 REV# 9 and GL-MA-E-014 REV# 25
Analytical Method:	SW846 3005A/6010C and SW846 3005A/6020A
Prep Method :	SW846 3005A

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

System Configuration

The Metals analysis-ICP was performed on a PE 7300 Optima radial/axial-viewing inductively coupled plasma atomic emission spectrometer. The instrument is equipped with a Burgener nebulizer, cyclonic spray chamber, and yttrium or scandium internal standard. Operating conditions for the ICP are set at a power level of 1500 watts. The instrument has a peristaltic pump flow rate of 1.4L/min, argon gas flows of 15 L/min and 0.2 L/min for the torch and auxiliary gases, and a flow setting of 0.65L/min for the nebulizer.

The Metals analysis - ICPMS was performed on a Perkin Elmer ELAN 9000 inductively coupled plasma mass spectrometer (ICP-MS). The instrument is equipped with a cross-flow nebulizer, quadruple mass spectrometer, and dual mode electron multiplier detector. Internal standards of scandium, germanium, indium, tantalum, and/or lutetium were utilized to cover the mass spectrum. Operating conditions are set at 1400W power and combined argon pressures of 360+/-7 kPa for the plasma and auxiliary gases, and 0.85 L/min carrier gas flow, and an initial lens voltage of 5.2.

Calibration Information

Instrument Calibration
All initial calibration requirements have been met for this sample delivery group (SDG).

CRDL Requirements
All CRDL standards met the advisory control limits.

ICSA/ICSAB Statement
All interference check samples (ICSA and ICSAB) associated with this SDG met the established acceptance criteria.

Continuing Calibration Blank (CCB) Requirements
All continuing calibration blanks (CCB) bracketing this batch met the established acceptance criteria.

Continuing Calibration Verification (CCV) Requirements
All continuing calibration verifications (CCV) bracketing this SDG met the acceptance criteria.

Quality Control (QC) Information

Method Blank (MB) Statement
The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Sample Statement
The following sample was selected as the quality control (QC) sample for this SDG: 328213001 (B2PM35).

Matrix Spike (MS) Recovery Statement
The percent recoveries (%R) obtained from the MS analyses are evaluated when the sample concentration is less than four times (4X) the spike concentration added. All applicable elements met the acceptance criteria.

Matrix Spike Duplicate (MSD) Recovery Statement
The percent recovery (%R) obtained from the MSD analyses are evaluated when the sample concentration is less than four time (4X) the spike concentration added. All applicable elements met the acceptance criteria.

MS/MSD Relative Percent Difference (RPD) Statement
The RPD(s) between the MS and MSD met the acceptance limits.

Serial Dilution % Difference Statement
The serial dilution is used to assess matrix suppression or enhancement. Raw element concentrations that are 25X the IDL/MDL for CVAA, 50X the IDL/MDL for ICP, and 100X the IDL/MDL for ICP-MS analyses are applicable for serial dilution assessment. All applicable analytes met the acceptance criteria of less than 10% difference (%D).

Technical Information

Holding Time Specifications
GEL assigns holding times based on the associated methodology, which assigns the date and time from sample collection of sample receipt. Those holding times expressed in hours are calculated in the AlphaLIMS system. Those holding times expressed as days expire at midnight on the day of expiration. All samples in this SDG met the specified holding time.

Preparation/Analytical Method Verification
All procedures were performed as stated in the SOP.

Sample Dilutions
Dilutions are performed to minimize matrix interferences resulting from elevated mineral element concentrations present in solid samples and/or to bring over range target analyte

concentrations into the linear calibration range of the instruments. Samples 328213003 and 328213005 required a dilution for tin in order to minimize suppression due to matrix interferences.

Preparation Information
The samples in this SDG were prepared exactly according to the cited SOP.

Miscellaneous Information

Electronic Packaging Comment
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:

Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. An electronic signature page inserted after the case narrative will include the data validator's signature and title. The signature page also includes the data qualifiers used in the fractional package. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Data Exception (DER) Documentation
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments
Additional comments were not required for this SDG.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Review Validation:

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

The following data validator verified the information presented in this case narrative:
Reviewer:_____ **Date:** 07/10/13

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Qualifier Definition Report
for

WCHN001 WC-HANFORD, INC.

Client SDG: X0002 GEL Work Order: 328213

The Qualifiers in this report are defined as follows:

* Duplicate analysis not within control limits

B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).

C Target analyte was detected in the sample and the associated blank, and the sample concentration was <= 5 times the blank concentration.

D Results are reported from a diluted aliquot of sample.

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Orlette Johnson.

Reviewed by _____ 07/10/13

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-236A Groundwater

Client Sample ID: B2PM35
Sample ID: 328213001
Matrix: Water
Collect Date: 24-JUN-13 12:03
Receive Date: 25-JUN-13
Collector: Client

Project: WCHN RC-236A
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP											
6010_METALS_ICP(Supertrace):COMMON (Add-on) "As Received"											
Aluminum	U	68.0	68.0	200	ug/L	1	HSC	06/27/13	1606	1310484	1
Antimony	U	3.50	3.50	10.0	ug/L	1					
Arsenic	U	5.00	5.00	30.0	ug/L	1					
Barium		18.5	1.00	5.00	ug/L	1					
Beryllium	U	1.00	1.00	5.00	ug/L	1					
Boron	U	15.0	15.0	50.0	ug/L	1					
Cadmium	U	1.00	1.00	5.00	ug/L	1					
Calcium		17400	50.0	200	ug/L	1					
Chromium		7.17	1.00	5.00	ug/L	1					
Cobalt	U	1.00	1.00	5.00	ug/L	1					
Copper	U	3.00	3.00	10.0	ug/L	1					
Iron	B	48.1	30.0	100	ug/L	1					
Lead	U	3.30	3.30	10.0	ug/L	1					
Magnesium		4200	110	300	ug/L	1					
Manganese	B	2.73	2.00	10.0	ug/L	1					
Molybdenum	U	2.00	2.00	10.0	ug/L	1					
Nickel	U	1.50	1.50	5.00	ug/L	1					
Phosphorous		1400	60.0	150	ug/L	1					
Potassium		1080	50.0	150	ug/L	1					
Selenium	U	6.00	6.00	30.0	ug/L	1					
Silicon		5290	25.0	100	ug/L	1					
Silver	U	1.00	1.00	5.00	ug/L	1					
Sodium		6510	100	300	ug/L	1					
Strontium		77.2	1.00	5.00	ug/L	1					
Thallium	U	5.00	5.00	20.0	ug/L	1					
Uranium	BC	16.7	10.0	50.0	ug/L	1					
Vanadium	B	1.75	1.00	5.00	ug/L	1					
Zinc	U	3.30	3.30	10.0	ug/L	1					
Tin	U	2.50	2.50	10.0	ug/L	1	HSC	06/28/13	1001	1310484	2
Metals Analysis-ICP-MS											
SW846 3005A/6020A Liquid - lithium & bismuth "As Received"											
Bismuth	B	0.628	0.500	100	ug/L	1	BAJ	06/28/13	1352	1310486	3
Lithium	U	2.00	2.00	25.0	ug/L	1	BAJ	06/28/13	1555	1310486	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 10, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-236A Groundwater

Client Sample ID:	B2PM35	Project:	WCHN RC-236A
Sample ID:	328213001	Client ID:	WCHN001

SW846 3005A	ICP-MS 3005A PREP	AXG2	06/27/13	0800	1310485
SW846 3005A	SW846 3005A for 6010C	AXG2	06/27/13	0815	1310483

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-236A Groundwater

Client Sample ID: B2PM38
Sample ID: 328213003
Matrix: Water
Collect Date: 24-JUN-13 11:02
Receive Date: 25-JUN-13
Collector: Client

Project: WCHN RC-236A
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP											
6010_METALS_ICP(Supertrace):COMMON (Add-on) "As Received"											
Aluminum	U	68.0	68.0	200	ug/L	1	HSC	06/27/13	1600	1310484	1
Antimony	U	3.50	3.50	10.0	ug/L	1					
Arsenic	U	5.00	5.00	30.0	ug/L	1					
Barium		121	1.00	5.00	ug/L	1					
Beryllium	U	1.00	1.00	5.00	ug/L	1					
Boron	B	15.5	15.0	50.0	ug/L	1					
Cadmium	U	1.00	1.00	5.00	ug/L	1					
Calcium		79500	50.0	200	ug/L	1					
Chromium	U	1.00	1.00	5.00	ug/L	1					
Cobalt	U	1.00	1.00	5.00	ug/L	1					
Copper	U	3.00	3.00	10.0	ug/L	1					
Iron	U	30.0	30.0	100	ug/L	1					
Lead	U	3.30	3.30	10.0	ug/L	1					
Magnesium		17500	110	300	ug/L	1					
Manganese		1320	2.00	10.0	ug/L	1					
Molybdenum	U	2.00	2.00	10.0	ug/L	1					
Nickel		6.15	1.50	5.00	ug/L	1					
Phosphorous	U	60.0	60.0	150	ug/L	1					
Potassium		4240	50.0	150	ug/L	1					
Selenium	U	6.00	6.00	30.0	ug/L	1					
Silicon		15800	25.0	100	ug/L	1					
Silver	U	1.00	1.00	5.00	ug/L	1					
Sodium		25900	100	300	ug/L	1					
Strontium		382	1.00	5.00	ug/L	1					
Thallium	U	5.00	5.00	20.0	ug/L	1					
Uranium	BC	45.3	10.0	50.0	ug/L	1					
Vanadium	B	1.23	1.00	5.00	ug/L	1					
Zinc	B	3.77	3.30	10.0	ug/L	1					
Tin	DU	12.5	12.5	50.0	ug/L	5	HSC	06/28/13	0955	1310484	2
Metals Analysis-ICP-MS											
SW846 3005A/6020A Liquid - lithium & bismuth "As Received"											
Bismuth	B	0.635	0.500	100	ug/L	1	BAJ	06/28/13	1418	1310486	3
Lithium	U	2.00	2.00	25.0	ug/L	1	BAJ	06/28/13	1613	1310486	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 10, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-236A Groundwater

Client Sample ID:	B2PM38	Project:	WCHN RC-236A
Sample ID:	328213003	Client ID:	WCHN001

SW846 3005A	ICP-MS 3005A PREP	AXG2	06/27/13	0800	1310485
SW846 3005A	SW846 3005A for 6010C	AXG2	06/27/13	0815	1310483

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 10, 2013

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-236A Groundwater

Client Sample ID: B2PM41
Sample ID: 328213005
Matrix: Water
Collect Date: 24-JUN-13 09:46
Receive Date: 25-JUN-13
Collector: Client

Project: WCHN RC-236A
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Metals Analysis-ICP											
6010_METALS_ICP(Supertrace):COMMON (Add-on) "As Received"											
Aluminum	U	68.0	68.0	200	ug/L	1	HSC	06/27/13	1603	1310484	1
Antimony	U	3.50	3.50	10.0	ug/L	1					
Arsenic	U	5.00	5.00	30.0	ug/L	1					
Barium		72.1	1.00	5.00	ug/L	1					
Beryllium	U	1.00	1.00	5.00	ug/L	1					
Boron	B	28.5	15.0	50.0	ug/L	1					
Cadmium	U	1.00	1.00	5.00	ug/L	1					
Calcium		106000	50.0	200	ug/L	1					
Chromium	B	4.45	1.00	5.00	ug/L	1					
Cobalt	U	1.00	1.00	5.00	ug/L	1					
Copper	U	3.00	3.00	10.0	ug/L	1					
Iron		223	30.0	100	ug/L	1					
Lead	U	3.30	3.30	10.0	ug/L	1					
Magnesium		22400	110	300	ug/L	1					
Manganese		13.3	2.00	10.0	ug/L	1					
Molybdenum	U	2.00	2.00	10.0	ug/L	1					
Nickel	B	1.83	1.50	5.00	ug/L	1					
Phosphorous	B	81.9	60.0	150	ug/L	1					
Potassium		6540	50.0	150	ug/L	1					
Selenium	U	6.00	6.00	30.0	ug/L	1					
Silicon		12900	25.0	100	ug/L	1					
Silver	U	1.00	1.00	5.00	ug/L	1					
Sodium		72500	100	300	ug/L	1					
Strontium		460	1.00	5.00	ug/L	1					
Thallium	U	5.00	5.00	20.0	ug/L	1					
Uranium	C	61.6	10.0	50.0	ug/L	1					
Vanadium	B	4.30	1.00	5.00	ug/L	1					
Zinc	B	4.66	3.30	10.0	ug/L	1					
Tin	DU	12.5	12.5	50.0	ug/L	5	HSC	06/28/13	0958	1310484	2
Metals Analysis-ICP-MS											
SW846 3005A/6020A Liquid - lithium & bismuth "As Received"											
Bismuth	B	0.587	0.500	100	ug/L	1	BAJ	06/28/13	1422	1310486	3
Lithium	B	5.52	2.00	25.0	ug/L	1	BAJ	06/28/13	1615	1310486	4

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 10, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-236A Groundwater

Client Sample ID:	B2PM41	Project:	WCHN RC-236A
Sample ID:	328213005	Client ID:	WCHN001

SW846 3005A	ICP-MS 3005A PREP	AXG2	06/27/13	0800	1310485
SW846 3005A	SW846 3005A for 6010C	AXG2	06/27/13	0815	1310483

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 3005A/6010C	
2	SW846 3005A/6010C	
3	SW846 3005A/6020A	
4	SW846 3005A/6020A	

Notes:

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: July 10, 2013

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington

Contact: **Joan Kessner**

Workorder: **328213**

Parmname	NOM		Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis - ICPMS											
Batch 1310486											
QC1202898649 LCS											
Bismuth	50.0			B	51.2	ug/L		102	(80%-120%)	BAJ	06/28/13 13:49
Lithium	50.0				51.5	ug/L		103	(80%-120%)		06/28/13 15:53
QC1202898648 MB											
Bismuth				U	0.500	ug/L					06/28/13 13:46
Lithium				U	2.00	ug/L					06/28/13 15:51
QC1202898650 328213001 MS											
Bismuth	50.0	B	0.628	B	53.2	ug/L		105	(75%-125%)		06/28/13 13:56
Lithium	50.0	U	2.00		54.5	ug/L		107	(75%-125%)		06/28/13 15:57
QC1202898651 328213001 MSD											
Bismuth	50.0	B	0.628	B	51.3	ug/L	3.63	101	(0%-20%)		06/28/13 13:59
Lithium	50.0	U	2.00		54.3	ug/L	0.370	106	(0%-20%)		06/28/13 16:00
QC1202898652 328213001 SDILT											
Bismuth		B	0.628	DU	2.50	ug/L	N/A				06/28/13 14:05
Lithium		U	1.10	DU	10.0	ug/L	N/A		(0%-10%)		06/28/13 16:04
Metals Analysis-ICP											
Batch 1310484											
QC1202898644 LCS											
Aluminum	5000				5010	ug/L		100	(80%-120%)	HSC	06/27/13 15:57
Antimony	500				517	ug/L		103	(80%-120%)		
Arsenic	500				492	ug/L		98.4	(80%-120%)		
Barium	500				517	ug/L		103	(80%-120%)		
Beryllium	500				509	ug/L		102	(80%-120%)		
Boron	500				485	ug/L		97.1	(80%-120%)		
Cadmium	500				521	ug/L		104	(80%-120%)		

QC Summary

Workorder: **328213**

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP										
Batch 1310484										
Calcium	5000			5210	ug/L		104	(80%-120%)	HSC	06/27/13 15:57
Chromium	500			518	ug/L		104	(80%-120%)		
Cobalt	500			519	ug/L		104	(80%-120%)		
Copper	500			522	ug/L		104	(80%-120%)		
Iron	5000			5340	ug/L		107	(80%-120%)		
Lead	500			526	ug/L		105	(80%-120%)		
Magnesium	5000			5380	ug/L		108	(80%-120%)		
Manganese	500			520	ug/L		104	(80%-120%)		
Molybdenum	500			513	ug/L		103	(80%-120%)		
Nickel	500			526	ug/L		105	(80%-120%)		
Phosphorous	500			536	ug/L		107	(80%-120%)		
Potassium	5000			5130	ug/L		103	(80%-120%)		
Selenium	500			511	ug/L		102	(80%-120%)		
Silicon	5000			5040	ug/L		101	(80%-120%)		
Silver	500			508	ug/L		102	(80%-120%)		
Sodium	5000			5180	ug/L		104	(80%-120%)		
Strontium	500			510	ug/L		102	(80%-120%)		
Thallium	500			504	ug/L		101	(80%-120%)		
Tin	500			517	ug/L		103	(80%-120%)		06/28/13 09:52
Uranium	500			474	ug/L		94.9	(80%-120%)		06/27/13 15:57
Vanadium	500			535	ug/L		107	(80%-120%)		

QC Summary

Workorder: 328213

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time
Metals Analysis-ICP											
Batch 1310484											
Zinc	500			504	ug/L		101	(80%-120%)			
QC1202898643 MB											
Aluminum			U	68.0	ug/L				HSC	06/27/13	15:54
Antimony			U	3.50	ug/L						
Arsenic			B	-5.25	ug/L						
Barium			U	1.00	ug/L						
Beryllium			U	1.00	ug/L						
Boron			U	15.0	ug/L						
Cadmium			U	1.00	ug/L						
Calcium			U	50.0	ug/L						
Chromium			U	1.00	ug/L						
Cobalt			U	1.00	ug/L						
Copper			U	3.00	ug/L						
Iron			U	30.0	ug/L						
Lead			U	3.30	ug/L						
Magnesium			U	110	ug/L						
Manganese			U	2.00	ug/L						
Molybdenum			U	2.00	ug/L						
Nickel			U	1.50	ug/L						
Phosphorous			U	60.0	ug/L						
Potassium			U	50.0	ug/L						
Selenium			U	6.00	ug/L						
Silicon			U	25.0	ug/L						

QC Summary

Workorder: **328213**

Parmname	NOM		Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP											
Batch 1310484											
Silver				U	1.00	ug/L				HSC	06/27/13 15:54
Sodium				U	100	ug/L					
Strontium				U	1.00	ug/L					
Thallium				U	5.00	ug/L					
Tin				U	2.50	ug/L					06/28/13 09:49
Uranium				B	12.6	ug/L					06/27/13 15:54
Vanadium				U	1.00	ug/L					
Zinc				U	3.30	ug/L					
QC1202898645 328213001 MS											
Aluminum	5000	U	68.0		4840	ug/L		95.7	(75%-125%)		06/27/13 16:09
Antimony	500	U	3.50		500	ug/L		99.7	(75%-125%)		
Arsenic	500	U	5.00		470	ug/L		93.4	(75%-125%)		
Barium	500		18.5		503	ug/L		97	(75%-125%)		
Beryllium	500	U	1.00		492	ug/L		98.3	(75%-125%)		
Boron	500	U	15.0		468	ug/L		92.4	(75%-125%)		
Cadmium	500	U	1.00		487	ug/L		97.3	(75%-125%)		
Calcium	5000		17400		21700	ug/L		85.7	(75%-125%)		
Chromium	500		7.17		494	ug/L		97.3	(75%-125%)		
Cobalt	500	U	1.00		481	ug/L		96.1	(75%-125%)		
Copper	500	U	3.00		491	ug/L		98.1	(75%-125%)		
Iron	5000	B	48.1		5310	ug/L		105	(75%-125%)		
Lead	500	U	3.30		496	ug/L		99.2	(75%-125%)		

QC Summary

Workorder: **328213**

Parmname	NOM		Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP											
Batch 1310484											
Magnesium	5000		4200		9040	ug/L		97	(75%-125%)	HSC	06/27/13 16:09
Manganese	500	B	2.73		487	ug/L		96.9	(75%-125%)		
Molybdenum	500	U	2.00		493	ug/L		98.6	(75%-125%)		
Nickel	500	U	1.50		486	ug/L		97.1	(75%-125%)		
Phosphorous	500		1400		1800	ug/L		79.9	(75%-125%)		
Potassium	5000		1080		5850	ug/L		95.5	(75%-125%)		
Selenium	500	U	6.00		474	ug/L		93.9	(75%-125%)		
Silicon	5000		5290		9880	ug/L		91.8	(75%-125%)		
Silver	500	U	1.00		476	ug/L		95.1	(75%-125%)		
Sodium	5000		6510		11000	ug/L		89.2	(75%-125%)		
Strontium	500		77.2		562	ug/L		96.9	(75%-125%)		
Thallium	500	U	5.00		468	ug/L		93.5	(75%-125%)		
Tin	500	U	2.50		491	ug/L		98.3	(75%-125%)		06/28/13 10:05
Uranium	500	BC	16.7		458	ug/L		88.3	(75%-125%)		06/27/13 16:09
Vanadium	500	B	1.75		509	ug/L		101	(75%-125%)		
Zinc	500	U	3.30		469	ug/L		93.6	(75%-125%)		
QC1202898646 328213001 MSD											
Aluminum	5000	U	68.0		5060	ug/L	4.48	100	(0%-20%)		06/27/13 16:13
Antimony	500	U	3.50		518	ug/L	3.49	103	(0%-20%)		
Arsenic	500	U	5.00		493	ug/L	4.78	98	(0%-20%)		
Barium	500		18.5		532	ug/L	5.45	103	(0%-20%)		
Beryllium	500	U	1.00		512	ug/L	4.12	102	(0%-20%)		

QC Summary

Workorder: **328213**

Metals Analysis-ICP
Batch 1310484

Parmname	NOM	Qual	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Boron	500	U	15.0		493	ug/L	5.15	97.4	(0%-20%)	HSC	06/27/13 16:13
Cadmium	500	U	1.00		513	ug/L	5.32	103	(0%-20%)		
Calcium	5000		17400		22600	ug/L	3.96	103	(0%-20%)		
Chromium	500		7.17		519	ug/L	5.07	102	(0%-20%)		
Cobalt	500	U	1.00		506	ug/L	5.23	101	(0%-20%)		
Copper	500	U	3.00		516	ug/L	4.85	103	(0%-20%)		
Iron	5000	B	48.1		5420	ug/L	2.06	107	(0%-20%)		
Lead	500	U	3.30		515	ug/L	3.88	103	(0%-20%)		
Magnesium	5000		4200		9470	ug/L	4.61	106	(0%-20%)		
Manganese	500	B	2.73		511	ug/L	4.86	102	(0%-20%)		
Molybdenum	500	U	2.00		511	ug/L	3.53	102	(0%-20%)		
Nickel	500	U	1.50		510	ug/L	4.74	102	(0%-20%)		
Phosphorous	500		1400		1890	ug/L	4.85	97.8	(0%-20%)		
Potassium	5000		1080		6080	ug/L	3.78	100	(0%-20%)		
Selenium	500	U	6.00		490	ug/L	3.32	97.1	(0%-20%)		
Silicon	5000		5290		10400	ug/L	4.67	101	(0%-20%)		
Silver	500	U	1.00		500	ug/L	4.98	99.9	(0%-20%)		
Sodium	5000		6510		11400	ug/L	4.22	98.7	(0%-20%)		
Strontium	500		77.2		584	ug/L	3.86	101	(0%-20%)		
Thallium	500	U	5.00		495	ug/L	5.71	99	(0%-20%)		
Tin	500	U	2.50		511	ug/L	3.81	102	(0%-20%)		06/28/13 10:08

QC Summary

Workorder: 328213

Parmname	NOM		Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP											
Batch 1310484											
Uranium	500	BC	16.7		489	ug/L	6.52	94.5	(0%-20%)		06/27/13 16:13
Vanadium	500	B	1.75		534	ug/L	4.84	106	(0%-20%)	HSC	
Zinc	500	U	3.30		492	ug/L	4.73	98.1	(0%-20%)		
QC1202898647 328213001 SDILT											
Aluminum		U	54.7	DU	340	ug/L	N/A		(0%-10%)		06/27/13 16:16
Antimony		U	1.44	DU	17.5	ug/L	N/A		(0%-10%)		
Arsenic		U	2.73	DU	25.0	ug/L	N/A		(0%-10%)		
Barium			18.5	D	3.91	ug/L	5.66		(0%-10%)		
Beryllium		U	0.0346	DU	5.00	ug/L	N/A		(0%-10%)		
Boron		U	5.63	DU	75.0	ug/L	N/A		(0%-10%)		
Cadmium		U	0.243	DU	5.00	ug/L	N/A		(0%-10%)		
Calcium			17400	D	3520	ug/L	1.13		(0%-10%)		
Chromium			7.17	D	1.56	ug/L	9.02		(0%-10%)		
Cobalt		U	-0.227	DU	5.00	ug/L	N/A		(0%-10%)		
Copper		U	0.573	DU	15.0	ug/L	N/A		(0%-10%)		
Iron		B	48.1	DU	150	ug/L	N/A		(0%-10%)		
Lead		U	-3.53	DU	16.5	ug/L	N/A		(0%-10%)		
Magnesium			4200	D	865	ug/L	3.03		(0%-10%)		
Manganese		B	2.73	DU	10.0	ug/L	N/A		(0%-10%)		
Molybdenum		U	0.580	DU	10.0	ug/L	N/A		(0%-10%)		
Nickel		U	0.821	DU	7.50	ug/L	N/A		(0%-10%)		
Phosphorous			1400	D	286	ug/L	2.18		(0%-10%)		
Potassium			1080	D	269	ug/L	24.5		(0%-10%)		

QC Summary

Workorder: **328213**

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date Time
Metals Analysis-ICP										
Batch 1310484										
Selenium	U	4.43	DU	30.0	ug/L	N/A		(0%-10%)	HSC	06/27/13 16:16
Silicon		5290	D	1070	ug/L	1		(0%-10%)		
Silver	U	0.0701	DU	5.00	ug/L	N/A		(0%-10%)		
Sodium		6510	D	1310	ug/L	.728		(0%-10%)		
Strontium		77.2	D	15.8	ug/L	2.12		(0%-10%)		
Thallium	U	-2.31	DU	25.0	ug/L	N/A		(0%-10%)		
Tin	U	-4.08	DU	12.5	ug/L	N/A		(0%-10%)		06/28/13 10:11
Uranium	BC	16.7	CD	13.8	ug/L	313		(0%-10%)		06/27/13 16:16
Vanadium	B	1.75	D	1.07	ug/L	205		(0%-10%)		
Zinc	U	1.12	DU	16.5	ug/L	N/A		(0%-10%)		

Notes:

The Qualifiers in this report are defined as follows:

- * Duplicate analysis not within control limits
- + Correlation coefficient for Method of Standard Additions (MSA) is < 0.995
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank, and the sample concentration was <= 5 times the blank concentration.
- D Results are reported from a diluted aliquot of sample.
- E Reported value is estimated due to interferences. See comment in narrative.
- M Duplicate precision not met.
- N Spike Sample recovery is outside control limits.
- S Reported value determined by the Method of Standard Additions (MSA)
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- W Post-digestion spike recovery for GFAA out of control limit. Sample absorbency < 50% of spike absorbency.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

QC Summary

Workorder: **328213**

Parmname	NOM	Sample	Qual	QC	Units	RPD/D%	REC%	Range	Anlst	Date	Time

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.

General Chem Analysis

Case Narrative

General Chemistry Narrative
WC-HANFORD, INC. (WCHN)
SDG X0002

Method/Analysis Information

Product:	**Ion Chromatography**		
Analytical Batch:	1310462	**Method:**	9056_ANIONS_IC: COMMON and COMMON (Add-on)

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 9056A:

Sample ID	Client ID
328213002	B2PM36
328213004	B2PM39
328213006	B2PM42
1202898594	Method Blank (MB)
1202898595	328213002(B2PM36) Sample Duplicate (DUP)
1202898596	328213002(B2PM36) Post Spike (PS)
1202898597	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-086 REV# 21.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Ion Chromatography analysis was performed on a Dionex ICS-5000 Ion Chromatograph.

Initial Calibration
All initial calibration requirements have been met for this SDG.

Continuing Calibration Blanks

All continuing calibration blanks (CCBs) associated with reported data from this batch were within acceptance limits.

Calibration Verification Information (CCV)
All continuing calibration verification standards (CCVs) associated with reported data from this batch were within acceptance limits.

Y Intercept Rule
The absolute value of the intercept is less than 3 times the MDL.

Quality Control (QC) Information

Method Blank (MB) Statement
The MBs analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery
The LCS spike recoveries met the acceptance limits.

Quality Control (QC) Designation
The following sample was selected for QC analysis: 328213002 (B2PM36).

Matrix Spike (MS)/Post Spike (PS) Recovery Statement
The spike recovery falls outside of the established acceptance limits due to matrix interference: 1202898596 (B2PM36).

Duplicate Relative Percent Difference (RPD) Statement
One or more of the values for the sample and/or duplicate are less than 5 times the Practical Quantitation Limit (PQL), and the difference is within one PQL value; therefore, the RPD is not applicable. 1202898595 (B2PM36) and 328213002 (B2PM36).

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times
Sample 328213006 (B2PM42) was initially analyzed within holding; however, the holding time had expired prior to reanalysis of diluted sample.

Sample Dilutions
The following samples in this sample group were diluted due to high concentration: 328213004 (B2PM39) and 328213006 (B2PM42).

Sample Re-analysis
The following samples were re-analyzed due to LCS failure for Bromide: 1202898594 (MB), 1202898595 (B2PM36), 1202898596 (B2PM36), 1202898597 (LCS), 328213002 (B2PM36), 328213004 (B2PM39) and 328213006 (B2PM42).

Miscellaneous Information

Data Exception (DER) Documentation

The following DER was generated for this SDG: 1197902 1202898596 (B2PM36), 328213002 (B2PM36), 328213004 (B2PM39) and 328213006 (B2PM42).

Manual Integrations
Manual integrations were not required for the samples in this SDG.

Additional Comments
Additional comments were not required for this SDG.

Electronic Packaging Comment
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product:	**n-Hexane Extractable Material**		
Analytical Batch:	1310635	**Method:**	EPA 1664A n-Hexane Extractable Material (Oil and Grease)

Sample Analysis

The following samples were analyzed using the analytical protocol as established in EPA 1664A/1664B:

Sample ID	Client ID
328213001	B2PM35
328213003	B2PM38
328213005	B2PM41
1202898984	Method Blank (MB)
1202898985	328172003(B2PM32) Matrix Spike (MS)
1202898986	328213001(B2PM35) Matrix Spike (MS)
1202898987	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-094 REV# 12.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Oil & Grease analysis was performed on a Sartorius Balance BAL745. Oil and Grease lab

Initial Calibration
All initial calibration requirements have been met for this SDG.

Quality Control (QC) Information

Method Blank (MB) Statement
The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery
The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation
The following samples were selected for QC analysis: 328172003 (B2PM32) and 328213001 (B2PM35).

Matrix Spike (MS)/Post Spike (PS) Recovery Statement
The MS/PS recoveries for this sample set were within the required acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times
All samples in this SDG met the specified holding time.

Sample Preservation/Integrity
Samples 1202898985 (B2PM32), 1202898986 (B2PM35), 328213001 (B2PM35), 328213003 (B2PM38) and 328213005 (B2PM41) were not preserved to a pH <2. The pH was adjusted by the analyst prior to analysis and the Project Manager was notified.

Sample Dilutions
The samples in this SDG did not require dilutions.

Sample Re-analysis
The samples in this SDG did not require re-analysis.

Sample Aliquot
Per EPA methodology, the entire sample was used for the analysis.

Miscellaneous Information

Data Exception (DER) Documentation
The following DERs were generated for this SDG: 1197941 1202898985 (B2PM32), 1202898986 (B2PM35), 328213001 (B2PM35), 328213003 (B2PM38) and 328213005 (B2PM41).

Additional Comments
More sample used due to sample volume provided by the client. 1202898985 (B2PM32), 1202898986 (B2PM35), 328213001 (B2PM35), 328213003 (B2PM38) and 328213005 (B2PM41).

Electronic Packaging Comment
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Method/Analysis Information

Product: **Alkalinity**

Analytical Batch: 1310847 **Method:** SM 2320B Total Alkalinity

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SM 2320B:

Sample ID	Client ID
328213001	B2PM35
328213003	B2PM38
328213005	B2PM41
1202899532	Method Blank (MB)
1202899533	328213001(B2PM35) Sample Duplicate (DUP)
1202899538	Laboratory Control Sample (LCS)

The samples in this SDG were analyzed on an "as received" basis.

SOP Reference
Procedure for preparation, analysis and reporting of analytical data are controlled by GEL Laboratories LLC as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with GL-GC-E-033 REV# 10.

Preparation/Analytical Method Verification

The SOP stated above has been prepared based on technical research and testing conducted by GEL Laboratories, LLC. and with guidance from the regulatory documents listed in this "Method/Analysis Information" section.

Calibration Information

The Titration analysis was performed on a Manually operated buret.

Initial Standardization
The titrant was properly standardized

Quality Control (QC) Information

Method Blank (MB) Statement
The MB analyzed with this SDG met the acceptance criteria.

Laboratory Control Sample (LCS) Recovery
The LCS spike recovery met the acceptance limits.

Quality Control (QC) Designation
The following sample was selected for QC analysis: 328213001 (B2PM35).

Matrix Spike (MS)/Post Spike (PS) Recovery Statement
The MS/PS recoveries for this sample set were within the required acceptance limits.

Duplicate Relative Percent Difference (RPD) Statement
The RPD between the sample and its duplicate met the acceptance limits.

Technical Information

GEL assigns holding times based on the date and time of sample collection. Those holding times expressed in hours are calculated in the AlphaLims system by hours. Those holding times expressed as days expire at midnight on the day of expiration.

Holding Times
All samples in this SDG met the specified holding time.

Sample Dilutions
The samples in this SDG did not require dilutions.

Sample Re-analysis
The samples in this SDG did not require re-analysis.

Miscellaneous Information

Data Exception (DER) Documentation
Data exception reports (DERs) are generated to document procedural anomalies that may deviate from referenced SOP or contractual documents. A data exception report (DER) was not generated for this SDG.

Additional Comments
Less sample was used because limited volume was provided by the client. 328213001 (B2PM35).

Electronic Packaging Comment
This data package was generated using an electronic data processing program referred to as virtual packaging. In an effort to increase quality and efficiency, the laboratory has developed systems to generate all data packages electronically. The following change from traditional packages should be noted:
Analyst/peer reviewer initials and dates are not present on the electronic data files. Presently, all initials and dates are present on the original raw data. These hard copies are temporarily stored in the laboratory. The data validator will always sign and date the case narrative. Data that are not generated electronically, such as hand written pages, will be scanned and inserted into the electronic package.

Certification Statement

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless otherwise noted in the analytical case narrative.

Review Validation:

GEL requires all analytical data to be verified by a qualified data validator. In addition, all data designated for CLP or CLP-like packaging will receive a third level validation upon completion of the data package.

The following data validator verified the information presented in this case narrative:

Reviewer:_____ Date:_____

DATA EXCEPTION REPORT

Mo.Day Yr.	Division:	Quality Criteria:	Type:
27-JUN-13	Industrial	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
IC	SW846 9056A	Liquid	WCHN
Batch ID:	**Sample Numbers:**		
1310462	See Below		

Potentially affected work order(s)(SDG): 328213(X0002)

Application Issues:

Failed Recovery for MS/PS

Container scanning event for custody missed

Sample Analyzed out of Holding

Specification and Requirements Exception Description:	DER Disposition:
1. Failed Recovery for MS/PS: QC 1202898596PS	1. The MS/PS failed required acceptance limits for Sulfate due to matrix interference. Of the remaining anions in the MS/PS, all meet required acceptance limits. The deviation is noted in the Case Narrative and DER, and the data has been reported.
2. Sample Analyzed out of Holding: 328213 006	2. Sample 328213006 was initially analyzed within holding; however, the holding time had expired prior to reanalysis of diluted sample.
3. Container scanning event for custody missed	3. Samples not scanned to batch prior to being analyzed because they were not logged or labeled at time of analysis.

Originator's Name:

Virginia Wininger 27-JUN-13

Data Validator/Group Leader:

Mary Sherwood 03-JUL-13

DATA EXCEPTION REPORT

Mo.Day Yr.	Division:	Quality Criteria:	Type:
27-JUN-13	Industrial	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
BALANCE	EPA 1664A/1664B	Liquid	WCHN

Batch ID:	Sample Numbers:
1310635	328172001, 328172003, 328172005, 328172007, 328213001, 328213003, 328213005, 1202898985, 1202898986

Potentially affected work order(s)(SDG): 328172(X0001),328213(X0002)

Application Issues:

Sample improperly preserved

Specification and Requirements Exception Description:	DER Disposition:
1. Sample improperly preserved 328172001, 328172003, 328172005, 328172007, 328213001, 328213003, 328213005, 1202898985, 1202898986	1. Samples were not preserved to a pH<2. The pH was adjusted by the analyst prior to the analysis and the Project Manager was notified.

Originator's Name:

John Thomas 28-JUN-13

Data Validator/Group Leader:

Thomas Lewis 28-JUN-13

Sample Data Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis Report
for

WCHN001 WC-HANFORD, INC.

Client SDG: X0002 GEL Work Order: 328213

The Qualifiers in this report are defined as follows:

B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).

D Results are reported from a diluted aliquot of sample.

U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.

X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the Certificate of Analysis.

The designation ND, if present, appears in the result column when the analyte concentration is not detected above the limit as defined in the 'U' qualifier above.

This data report has been prepared and reviewed in accordance with GEL Laboratories LLC standard operating procedures. Please direct any questions to your Project Manager, Orlette Johnson.

Reviewed by _____

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 9, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-236A Groundwater

Client Sample ID:	B2PM35	Project:	WCHN RC-236A
Sample ID:	328213001	Client ID:	WCHN001
Matrix:	Water		
Collect Date:	24-JUN-13 12:03		
Receive Date:	25-JUN-13		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Oil & Grease Analysis											
EPA 1664A n-Hexane Extractable Material (Oil and Grease) "As Received"											
Oil and Grease	B	1.67	1.37	4.90	mg/L		JXT1	06/27/13	1045	1310635	1
Titration Analysis											
SM 2320B Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		58.9	0.906	1.25	mg/L		LXA1	06/27/13	1628	1310847	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 1664A/1664B	
2	SM 2320B	

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 9, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-236A Groundwater

Client Sample ID:	B2PM36	Project:	WCHN RC-236A
Sample ID:	328213002	Client ID:	WCHN001
Matrix:	Water		
Collect Date:	24-JUN-13 12:03		
Receive Date:	25-JUN-13		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
9056_ANIONS_IC: COMMON, COMMON (Add-on) "As Received"											
Bromide	U	0.067	0.067	0.250	mg/L	1	VH1	06/26/13	0005	1310462	1
Chloride		0.862	0.067	0.200	mg/L	1					
Fluoride	B	0.0887	0.033	0.500	mg/L	1					
Nitrate-N		0.257	0.033	0.100	mg/L	1					
Nitrite-N	U	0.038	0.038	0.100	mg/L	1					
O-Phosphate as P		1.03	0.067	0.500	mg/L	1					
Sulfate		7.07	0.133	0.500	mg/L	1					
Bromide	U	0.067	0.067	0.250	mg/L	1	VH1	06/27/13	0213	1310462	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9056A	
2	SW846 9056A	

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 9, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-236A Groundwater

Client Sample ID:	B2PM38	Project:	WCHN RC-236A
Sample ID:	328213003	Client ID:	WCHN001
Matrix:	Water		
Collect Date:	24-JUN-13 11:02		
Receive Date:	25-JUN-13		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Oil & Grease Analysis											
EPA 1664A n-Hexane Extractable Material (Oil and Grease) "As Received"											
Oil and Grease	U	1.31	1.31	4.67	mg/L		JXT1	06/27/13	1045	1310635	1
Titration Analysis											
SM 2320B Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		244	0.725	1.00	mg/L		LXA1	06/27/13	1647	1310847	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 1664A/1664B	
2	SM 2320B	

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 9, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-236A Groundwater

Client Sample ID:	B2PM39	Project:	WCHN RC-236A
Sample ID:	328213004	Client ID:	WCHN001
Matrix:	Water		
Collect Date:	24-JUN-13 11:02		
Receive Date:	25-JUN-13		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
9056_ANIONS_IC: COMMON, COMMON (Add-on) "As Received"											
Chloride		3.56	0.067	0.200	mg/L	1	VH1	06/26/13	0139	1310462	1
Fluoride	B	0.171	0.033	0.500	mg/L	1					
Nitrate-N		0.203	0.033	0.100	mg/L	1					
Nitrite-N	U	0.038	0.038	0.100	mg/L	1					
O-Phosphate as P	U	0.067	0.067	0.500	mg/L	1					
Bromide	U	0.067	0.067	0.250	mg/L	1	VH1	06/27/13	0347	1310462	2
Sulfate	D	43.8	1.33	4.00	mg/L	10	VH1	06/27/13	0450	1310462	3

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9056A	
2	SW846 9056A	
3	SW846 9056A	

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 9, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-236A Groundwater

Client Sample ID:	B2PM41	Project:	WCHN RC-236A
Sample ID:	328213005	Client ID:	WCHN001
Matrix:	Water		
Collect Date:	24-JUN-13 09:46		
Receive Date:	25-JUN-13		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Oil & Grease Analysis											
EPA 1664A n-Hexane Extractable Material (Oil and Grease) "As Received"											
Oil and Grease	U	1.31	1.31	4.67	mg/L		JXT1	06/27/13	1045	1310635	1
Titration Analysis											
SM 2320B Total Alkalinity "As Received"											
Alkalinity, Total as CaCO3		182	0.725	1.00	mg/L		LXA1	06/27/13	1656	1310847	2

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 1664A/1664B	
2	SM 2320B	

Notes:

GEL LABORATORIES LLC

2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: July 9, 2013

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-236A Groundwater

Client Sample ID:	B2PM42	Project:	WCHN RC-236A
Sample ID:	328213006	Client ID:	WCHN001
Matrix:	Water		
Collect Date:	24-JUN-13 09:46		
Receive Date:	25-JUN-13		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography											
9056_ANIONS_IC: COMMON, COMMON (Add-on) "As Received"											
Fluoride	B	0.165	0.033	0.500	mg/L	1	VH1	06/26/13	0210	1310462	1
Nitrite-N	U	0.038	0.038	0.100	mg/L	1					
O-Phosphate as P	U	0.067	0.067	0.500	mg/L	1					
Bromide		0.282	0.067	0.250	mg/L	1	VH1	06/27/13	0418	1310462	2
Chloride	D	55.0	0.670	2.00	mg/L	10	VH1	06/27/13	0521	1310462	3
Nitrate-N	DX	14.4	0.330	1.00	mg/L	10					
Sulfate	D	135	1.33	4.00	mg/L	10					

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 9056A	
2	SW846 9056A	
3	SW846 9056A	

Notes:

Quality Control Summary

GEL LABORATORIES LLC

2040 Savage Road Charleston, SC 29407 - (843) 556-8171 - www.gel.com

QC Summary

Report Date: July 9, 2013

WC-Hanford, Inc.
2620 Fermi Avenue
MSIN H4-21
Richland, Washington

Contact: **Joan Kessner**

Workorder: **328213**

Parmname	NOM		Sample	Qual	QC	Units	RPD%		REC%	Range	Anlst	Date Time
Ion Chromatography												
Batch 1310462												
QC1202898595 328213002 DUP												
Bromide		U	0.067	U	0.067	mg/L	N/A	^			VH1	06/27/13 02:44
Chloride			0.862		0.875	mg/L	1.50	^		(+/-0.200)		06/26/13 00:36
Fluoride		B	0.0887	B	0.0762	mg/L	15.2	^		(+/-0.500)		
Nitrate-N			0.257		0.203	mg/L	23.6	^		(+/-0.075)		
Nitrite-N		U	0.038	U	0.038	mg/L	N/A	^				
O-Phosphate as P			1.03		0.891	mg/L	14.2	^		(+/-0.500)		
Sulfate			7.07		7.09	mg/L	0.226			(0%-20%)		
QC1202898597 LCS												
Bromide	1.25				1.37	mg/L			110	(90%-110%)		06/27/13 01:41
Chloride	5.00				5.13	mg/L			103	(90%-110%)		06/25/13 23:33
Fluoride	2.50				2.69	mg/L			107	(90%-110%)		
Nitrate-N	2.50				2.57	mg/L			103	(90%-110%)		
Nitrite-N	2.50				2.62	mg/L			105	(90%-110%)		
O-Phosphate as P	1.25				1.17	mg/L			94	(90%-110%)		
Sulfate	10.0				10.5	mg/L			105	(90%-110%)		
QC1202898594 MB												
Bromide				U	0.067	mg/L						06/27/13 01:10
Chloride				U	0.067	mg/L						06/25/13 23:02
Fluoride				U	0.033	mg/L						
Nitrate-N				U	0.033	mg/L						
Nitrite-N				U	0.038	mg/L						

QC Summary

Workorder: 328213

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Ion Chromatography											
Batch 1310462											
O-Phosphate as P				U	0.067	mg/L				VH1	06/25/13 23:02
Sulfate				U	0.133	mg/L					
QC1202898596 328213002 PS											
Bromide	1.25	U	0.00		1.35	mg/L		108	(90%-110%)		06/27/13 03:16
Chloride	5.00		0.862		5.56	mg/L		93.9	(90%-110%)		06/26/13 01:07
Fluoride	2.50	B	0.0887		2.44	mg/L		94.1	(90%-110%)		
Nitrate-N	2.50		0.257		2.57	mg/L		92.7	(90%-110%)		
Nitrite-N	2.50	U	0.00		2.33	mg/L		93.1	(90%-110%)		
O-Phosphate as P	1.25		1.03		2.17	mg/L		91.8	(90%-110%)		
Sulfate	10.0		7.07		18.2	mg/L		112*	(90%-110%)		
Oil & Grease Analysis											
Batch 1310635											
QC1202898987 LCS											
Oil and Grease	40.0			B	34.1	mg/L		85.3	(69%-109%)	JXT1	06/27/13 10:45
QC1202898984 MB											
Oil and Grease				U	1.40	mg/L					06/27/13 10:45
QC1202898985 328172003 MS											
Oil and Grease	39.8	B	2.70	B	37.2	mg/L		86.7	(60%-112%)		06/27/13 10:45
QC1202898986 328213001 MS											
Oil and Grease	37.6	B	1.67	B	34.9	mg/L		88.6	(60%-112%)		06/27/13 10:45
Titration Analysis											
Batch 1310847											
QC1202899533 328213001 DUP											
Alkalinity, Total as CaCO3			58.9		58.9	mg/L	0.00		(0%-20%)	LXA1	06/27/13 16:32
QC1202899538 LCS											
Alkalinity, Total as CaCO3	50.0				51.9	mg/L		104	(90%-110%)		06/27/13 12:09
QC1202899532 MB											
Alkalinity, Total as CaCO3				U	0.725	mg/L					06/27/13 12:09

QC Summary

Workorder: **328213**

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time

Notes:

The Qualifiers in this report are defined as follows:

- > Result greater than quantifiable range or greater than upper limit of the analysis range
- B The analyte was detected at a value less than the contract required detection limit (RDL), but greater than or equal to the IDL/MDL (as appropriate).
- C Target analyte was detected in the sample and the associated blank, and the sample concentration was <= 5 times the blank concentration.
- D Results are reported from a diluted aliquot of sample.
- U Analyzed for but not detected above limiting criteria. Includes MDL, MDA, PQL, zero, counting error, and total analytical error.
- X Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Y Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier
- Z Consult Case Narrative, Data Summary package, or Project Manager concerning this qualifier

N/A indicates that spike recovery limits do not apply when sample concentration exceeds spike conc. by a factor of 4 or more.
^ The Relative Percent Difference (RPD) obtained from the sample duplicate (DUP) is evaluated against the acceptance criteria when the sample is greater than five times (5X) the contract required detection limit (RL). In cases where either the sample or duplicate value is less than 5X the RL, a control limit of +/- the RL is used to evaluate the DUP result.
* Indicates that a Quality Control parameter was not within specifications.
For PS, PSD, and SDILT results, the values listed are the measured amounts, not final concentrations.

Where the analytical method has been performed under NELAP certification, the analysis has met all of the requirements of the NELAC standard unless qualified on the QC Summary.