SAF-RC-241
100N Sample Collection Supporting
100-N-85 Characterization Borehole
FINAL DATA PACKAGE

COMPLETE COPY OF DATA PACKAGE TO:

Kathy Wendt H4-21 KW 3/5/15
INITIAL/DATE

COMMENTS:

SDG X0093 SAF-RC-241

Rad only ☑ Chem only Rad & Chem

☑ Complete Partial

Sample Location: C9410 - I-0007, I-008, I-009, I-010

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

February 26, 2015

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

Re: RC-241 UPR-100-N-17 Archive
Work Order: 366868
SDG: X0093

Dear Joan Kessner:

GEL Laboratories, LLC (GEL) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on February 11, 2015. 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. 4505.

Sincerely,

Heather Shaffer

Heather Shaffer
Project Manager

Purchase Order: 1510
Chain of Custody: RC-241-021
Enclosures

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Case Narrative

Receipt Narrative
for
Eberline
SDG: X0093
Work Order: 366868

February 26, 2015

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 February 11, 2015 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. There are no additional comments concerning sample receipt.

Sample Identification: The laboratory received the following samples:

Laboratory ID	Client ID
366868001	B30C33
366868002	B30C35
366868003	B30C37
366868004	B30C39
366868005	B30C34
366868006	B30C36
366868007	B30C38
366868008	B30C40

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, FID Flame Ionization Detector, GC Volatiles (GRO), GC/MS Volatile and HPLC Polynuclear Aromatic Hydrocarbon.

Heather Shaffer

Heather Shaffer
Project Manager

Chain of Custody and Supporting Documentation

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-241-027	PAGE 1 OF 1
COLLECTOR: D.L. Floyd/CHPRC	COMPANY CONTACT: SUMNER, LC	TELEPHONE NO.: 376-3922	PROJECT COORDINATOR: KESSNER, JH	PRICE CODE: 8K	DATA TURNAROUND
SAMPLING LOCATION: C9410, I-010	PROJECT DESIGNATION: 100-N-85 Characterization Borehole - Soil		SAF NO.: RC-241	AIR QUALITY ☐	15 Days / 45 Days
ICE CHEST NO.: GWS-427	FIELD LOGBOOK NO.: ~~HNF-N-507-~~ 29-83	ACTUAL SAMPLE DEPTH: 67.90 FT	COA: 303630	METHOD OF SHIPMENT: FEDERAL EXPRESS	ORIGINAL
SHIPPED TO: GEL Laboratories, LLC	OFFSITE PROPERTY NO.: 5402		BILL OF LADING/AIR BILL NO.: 7728 7766 9949		

36668608

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

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Frozen/Cool <-7C and >-20C
HOLDING TIME	14 Days
TYPE OF CONTAINER	aGs
NO. OF CONTAINER(S)	5
VOLUME	40mL
SAMPLE ANALYSIS	VOA - 5035/8260 (TCL);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B30C39	SOIL	FEB 09 2015	1420	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: D.L. Floyd/CHPRC	DATE/TIME: FEB 09 2015 1535	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: FEB 09 2015 1535
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: FEB 10 2015 0933	RECEIVED BY/STORED IN: CHRIS FULTON CHPRC	DATE/TIME: FEB 10 2015 0933
RELINQUISHED BY/REMOVED FROM: SSU-1 CHRIS FULTON CHPRC	DATE/TIME: FEB 10 2015 1400	RECEIVED BY/STORED IN: FEDEX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM: FEDEX	DATE/TIME:	RECEIVED BY/STORED IN: Chelsea Leagle 02/11/15	DATE/TIME: 0845
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:

SPECIAL INSTRUCTIONS
** It is critical to ensure that the correct TAT and price code is marked on each COC.** The field NCOs are to identify on the COC and Field Sampling Report any samples with indications (visual, odor, or per meter) of high organic content.** Include sampling location (drilling ID) on the COC. TRVL-15-016

TRVL-15-016

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 1/21/2015

A-6003-618 (REV 2)

SAMPLE RECORD SHEET FOR VOC SAMPLE COLLECTION

Location: 100-N-85 C9410

Sampler Initials and Date: Ele 2-9-15

Sample Number [1]	Sample Suffix	Initial Weight [2] (grams)	Total Weight [3] (grams)	Soil Weight [4] (grams)
B30C39	K	29.19	36.07	6.88
B30C39	L	29.43	35.79	6.36
B30C39	M	29.12	39.19	10.07
B30C39	N	29.41	39.93	10.52
B30C39	P	29.46	38.50	9.04

[1] Enter sample number associated with the sampling event.

[2] Initial weight is to include all labels, stickers, bags, spin bars (for samples with suffix K, L, M, N and P) and anything else that will be associated with the bottle when it is weighed with the sample.

[3] Ensure that everything weighed for the empty bottle and no additional items (besides the sample) is weighed.

[4] Soil weight is the vial with sample minus Initial Weight.

A-6005-526 (REV 0)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-241-021	PAGE 1 OF 1
COLLECTOR: D.L. Floyd/CHPRC	COMPANY CONTACT: SUMNER, LC	TELEPHONE NO.: 376-3922	PROJECT COORDINATOR: KESSNER, JH	PRICE CODE: 8K	DATA TURNAROUND: 15 Days / 45 Days
SAMPLING LOCATION: C9410, I-007	PROJECT DESIGNATION: 100-N-85 Characterization Borehole - Soil		SAF NO.: RC-241	AIR QUALITY: ☐	
ICE CHEST NO.: GWS-427	FIELD LOGBOOK NO.: HNF-N-507-29.83	ACTUAL SAMPLE DEPTH: 52.80 FT	COA: 303630	METHOD OF SHIPMENT: FEDERAL EXPRESS	ORIGINAL
SHIPPED TO: GEL Laboratories, LLC	OFFSITE PROPERTY NO.: 5402		BILL OF LADING/AIR BILL NO.: 7728 7766 9949		

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

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Frozen/Cool <-7C and >-20C
HOLDING TIME	14 Days
TYPE OF CONTAINER	aGs
NO. OF CONTAINER(S)	5
VOLUME	40mL
SAMPLE ANALYSIS	VOA - 5035/8260 (TCL);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME
B30C33	SOIL	FEB 09 2015	0900

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: D.L. Floyd/CHPRC	DATE/TIME: FEB 09 2015 1535	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: FEB 09 2015 1535
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: 2/10/15 0927	RECEIVED BY/STORED IN: CHRIS FULTON CHPRC	DATE/TIME: FEB 10 2015 0927
RELINQUISHED BY/REMOVED FROM: CHRIS FULTON CHPRC	DATE/TIME: FEB 10 2015 1400	RECEIVED BY/STORED IN: FEDEX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM: Fedex	DATE/TIME:	RECEIVED BY/STORED IN: Cheyenne Sample	DATE/TIME: 02/11/15 0845
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:

SPECIAL INSTRUCTIONS
** It is critical to ensure that the correct TAT and price code is marked on each COC.** The field NCOs are to identify on the COC and Field Sampling Report any samples with indications (visual, odor, or per meter) of high organic content.** Include sampling location (drilling ID) on the COC. TRVL-15-016

TRVL-15-016

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

SAMPLE RECORD SHEET FOR VOC SAMPLE COLLECTION

Location: 100N-85 C 9410

Sampler Initials and Date: ELK 2-9-15

Sample Number [1]	Sample Suffix	Initial Weight [2] (grams)	Total Weight [3] (grams)	Soil Weight [4] (grams)
B 30C 33	K	29.39	35.98	6.59
B30C33	L	29.30	35.76	6.46
B30C33	M	29.68	37.36	7.68
B30C33	N	29.21	36.84	7.63
B30C33	P	29.35	35.52	6.17

[1] Enter sample number associated with the sampling event.

[2] Initial weight is to include all labels, stickers, bags, spin bars (for samples with suffix K, L, M, N and P) and anything else that will be associated with the bottle when it is weighed with the sample.

[3] Ensure that everything weighed for the empty bottle and no additional items (besides the sample) is weighed.

[4] Soil weight is the vial with sample minus Initial Weight.

A-6005-526 (REV 0)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-241-025	PAGE 1 OF 1
COLLECTOR: D.L. Floyd/CHPRC	COMPANY CONTACT: SUMNER, LC	TELEPHONE NO.: 376-3922	PROJECT COORDINATOR: KESSNER, JH	PRICE CODE: 8K	DATA TURNAROUND
SAMPLING LOCATION: C9410, I-009	PROJECT DESIGNATION: 100-N-85 Characterization Borehole - Soil		SAF NO.: RC-241	AIR QUALITY ☐	15 Days / 45 Days
ICE CHEST NO.: GWS-427	FIELD LOGBOOK NO.: HNF-N-507-~~24~~-83	ACTUAL SAMPLE DEPTH: 63.05 FT	COA: 303630	METHOD OF SHIPMENT: FEDERAL EXPRESS	ORIGINAL
SHIPPED TO: GEL Laboratories, LLC	OFFSITE PROPERTY NO.: 5402		BILL OF LADING/AIR BILL NO.: 7726 7766 9949		

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

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Frozen/Cool <-7C and >-20C
HOLDING TIME	14 Days
TYPE OF CONTAINER	aGs
NO. OF CONTAINER(S)	5
VOLUME	40mL
SAMPLE ANALYSIS	VOA - 5035/8260 (TCL);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B30C37	SOIL	FEB 09 2015	1300	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: D.L. Floyd/CHPRC	DATE/TIME: FEB 09 2015 1535	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: FEB 09 2015 1535
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: FEB 10 2015 0929	RECEIVED BY/STORED IN: CHRIS FULTON CHPRC	DATE/TIME: FEB 10 2015 0929
RELINQUISHED BY/REMOVED FROM: CHRIS FULTON CHPRC	DATE/TIME: FEB 10 2015 1400	RECEIVED BY/STORED IN: FEDEX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM: FEDEX	DATE/TIME:	RECEIVED BY/STORED IN: Cheyenne Eagle	DATE/TIME: 02/11/15 0845
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:

SPECIAL INSTRUCTIONS
** It is critical to ensure that the correct TAT and price code is marked on each COC.** The field NCOs are to identify on the COC and Field Sampling Report any samples with indications (visual, odor, or per meter) of high organic content.** Include sampling location (drilling ID) on the COC. TRVL-15-016

TRVL- 15- 016

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 1/21/2015

A-6003-618 (REV 2)

SAMPLE RECORD SHEET FOR VOC SAMPLE COLLECTION

Location: 100-N-85 C9410

Sampler Initials and Date:

Sample Number [1]	Sample Suffix	Initial Weight [2] (grams)	Total Weight [3] (grams)	Soil Weight [4] (grams)
B30C37	K	29.48	35.65	6.17
B30C37	L	29.34	37.81	8.47
B30C37	M	29.50	37.76	8.26
B30C37	N	29.53	35.82	6.29
B30C37	P	29.47	39.95	10.48

[1] Enter sample number associated with the sampling event.

[2] Initial weight is to include all labels, stickers, bags, spin bars (for samples with suffix K, L, M, N and P) and anything else that will be associated with the bottle when it is weighed with the sample.

[3] Ensure that everything weighed for the empty bottle and no additional items (besides the sample) is weighed.

[4] Soil weight is the vial with sample minus Initial Weight.

A-6005-526 (REV 0)

44 165

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-241-023	PAGE 1 OF 1
COLLECTOR: D.L. Floyd/CHPRC	COMPANY CONTACT: SUMNER, LC	TELEPHONE NO.: 376-3922	PROJECT COORDINATOR: KESSNER, JH	PRICE CODE: 8K	DATA TURNAROUND: 15 Days / 45 Days
SAMPLING LOCATION: C9410, I-008	PROJECT DESIGNATION: 100-N-85 Characterization Borehole - Soil		SAF NO.: RC-241	AIR QUALITY: ☐	
ICE CHEST NO.: GWS-427	FIELD LOGBOOK NO.: HNF-N-507-29-83	ACTUAL SAMPLE DEPTH: 57.80 FT	COA: 303630	METHOD OF SHIPMENT: FEDERAL EXPRESS	ORIGINAL
SHIPPED TO: GEL Laboratories, LLC	OFFSITE PROPERTY NO.: 5402		BILL OF LADING/AIR BILL NO.: 7728 7766 9949		

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

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Frozen/Cool <-7C and >-20C
HOLDING TIME	14 Days
TYPE OF CONTAINER	aGs
NO. OF CONTAINER(S)	5
VOLUME	40mL
SAMPLE ANALYSIS	VOA - 5035/8260 (TCL);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	
B30C35	SOIL	FEB 09 2015	1030	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: D.L. Floyd/CHPRC	DATE/TIME: FEB 09 2015 1535	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: FEB 09 2015 1535
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: FEB 10 2015 0932	RECEIVED BY/STORED IN: CHRIS FULTON CHPRC	DATE/TIME: FEB 10 2015 0932
RELINQUISHED BY/REMOVED FROM: CHRIS FULTON CHPRC	DATE/TIME: FEB 10 2015 1400	RECEIVED BY/STORED IN: FEDEX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM: FedEx	DATE/TIME:	RECEIVED BY/STORED IN: Chelsea Feagle	DATE/TIME: 02/11/15 0845
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:

SPECIAL INSTRUCTIONS
** It is critical to ensure that the correct TAT and price code is marked on each COC.** The field NCOs are to identify on the COC and Field Sampling Report any samples with indications (visual, odor, or per meter) of high organic content.** Include sampling location (drilling ID) on the COC. TRVL-15-016

TRVL-15-016

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 1/21/2015

A-6003-618 (REV 2)

SAMPLE RECORD SHEET FOR VOC SAMPLE COLLECTION

Location: 100-N-85 C9410

Sampler Initials and Date:

Sample Number [1]	Sample Suffix	Initial Weight [2] (grams)	Total Weight [3] (grams)	Soil Weight [4] (grams)
B30C35	K	29.46	35.75	6.29
B30C35	L	29.34	35.35	6.01
B30C35	M	29.26	37.66	8.40
B30C35	N	29.17	37.31	8.14
B30C35	P	29.39	35.88	6.49

[1] Enter sample number associated with the sampling event.

[2] Initial weight is to include all labels, stickers, bags, spin bars (for samples with suffix K, L, M, N and P) and anything else that will be associated with the bottle when it is weighed with the sample.

[3] Ensure that everything weighed for the empty bottle and no additional items (besides the sample) is weighed.

[4] Soil weight is the vial with sample minus Initial Weight.

A-6005-526 (REV 0)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-241-022	PAGE 1 OF 1
COLLECTOR: D.L. Floyd/CHPRC	COMPANY CONTACT: SUMNER, LC	TELEPHONE NO.: 376-3922	PROJECT COORDINATOR: KESSNER, JH	PRICE CODE: 8K	DATA TURNAROUND
SAMPLING LOCATION: C9410, I-007	PROJECT DESIGNATION: 100-N-85 Characterization Borehole - Soil		SAF NO.: RC-241	AIR QUALITY ☐	15 Days / 45 Days
ICE CHEST NO.: GWS-211	FIELD LOGBOOK NO.: HNF-N-507-29.83	ACTUAL SAMPLE DEPTH: 52.80 MT	COA: 303630	METHOD OF SHIPMENT: FEDERAL EXPRESS	ORIGINAL
SHIPPED TO: GEL Laboratories, LLC	OFFSITE PROPERTY NO.: 5402		BILL OF LADING/AIR BILL NO.: 7728 7766 9478		

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

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C
HOLDING TIME	14/40 Days	14 Days	14/40 Days	14 Days
TYPE OF CONTAINER	aG	Gs*	G	aG
NO. OF CONTAINER(S)	1	3	1	1
VOLUME	500mL	40mL	~~120~~mL 125 Dw3 1/29-15	~~120~~mL 125 Dw3 1/29-15
SAMPLE ANALYSIS	PAHS - 8310;	TPH-Gasoline Range - WTPH-G;	TPH-Diesel Range - WTPH-D +;	Extractable Petroleum Hydrocarbons (EPH);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B30C34	SOIL	FEB 09 2015	0900	✓	✓	✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: D.L. Floyd/CHPRC	DATE/TIME: FEB 09 2015/535	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: FEB 09 2015/535
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: FEB 10 2015 1015	RECEIVED BY/STORED IN: L.D. Wall CHPRC	DATE/TIME: FEB 10 2015 1015
RELINQUISHED BY/REMOVED FROM: L.D. Wall CHPRC	DATE/TIME: FEB 10 2015 1400	RECEIVED BY/STORED IN: FEDEX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM: Fedex	DATE/TIME:	RECEIVED BY/STORED IN: Cheyenne 02/11/15	DATE/TIME: 0845
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:

SPECIAL INSTRUCTIONS
** It is critical to ensure that the correct TAT and price code is marked on each COC.** The field NCOs are to identify on the COC and Field Sampling Report any samples with indications (visual, odor, or per meter) of high organic content.** Include sampling location (drilling ID) on the COC. TRVL-15-016

TRVL- 15- 016

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-241-024	PAGE 1 OF 1
COLLECTOR: D.L. Floyd/CHPRC	COMPANY CONTACT: SUMNER, LC	TELEPHONE NO.: 376-3922	PROJECT COORDINATOR: KESSNER, JH	PRICE CODE: 8K	DATA TURNAROUND
SAMPLING LOCATION: C9410, I-008	PROJECT DESIGNATION: 100-N-85 Characterization Borehole - Soil		SAF NO.: RC-241	AIR QUALITY ☐	15 Days / 45 Days
ICE CHEST NO.: GWS-211	FIELD LOGBOOK NO.: HNF-N-507-29.83	ACTUAL SAMPLE DEPTH: 57.80 FT	COA: 303630	METHOD OF SHIPMENT: FEDERAL EXPRESS	ORIGINAL
SHIPPED TO: GEL Laboratories, LLC	OFFSITE PROPERTY NO.: 5402		BILL OF LADING/AIR BILL NO.: 7728 7766 9478		

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

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C
HOLDING TIME	14/40 Days	14 Days	14/40 Days	14 Days
TYPE OF CONTAINER	aG	Gs*	G	aG
NO. OF CONTAINER(S)	1	3	1	1
VOLUME	500mL	40mL	~~120~~ 125 mL DWB 1-29-15	~~120~~ 125 mL DWB 1-29-15
SAMPLE ANALYSIS	PAHS - 8310;	TPH-Gasoline Range - WTPH-G;	TPH-Diesel Range - WTPH-D +;	Extractable Petroleum Hydrocarbons (EPH);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B30C36	SOIL	FEB 09 2015	1030	✓	✓	✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: D.L. Floyd/CHPRC	DATE/TIME: FEB 09 2015 1535	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: FEB 09 2015 1535
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: FEB 10 2015 1015	RECEIVED BY/STORED IN: L.D. Wall CHPRC	DATE/TIME: FEB 10 2015 1015
RELINQUISHED BY/REMOVED FROM: L.D. Wall CHPRC	DATE/TIME: FEB 10 2015 1400	RECEIVED BY/STORED IN: FEDEX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM: Fedex	DATE/TIME:	RECEIVED BY/STORED IN:	DATE/TIME: 02/11/15 0845
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:

SPECIAL INSTRUCTIONS
** It is critical to ensure that the correct TAT and price code is marked on each COC.** The field NCOs are to identify on the COC and Field Sampling Report any samples with indications (visual, odor, or per meter) of high organic content.** Include sampling location (drilling ID) on the COC. TRVL-15-016

TRVL-15-016

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

S1 W

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-241-028	PAGE 1 OF 1
COLLECTOR: D.L. Floyd/CHPRC	COMPANY CONTACT: SUMNER, LC	TELEPHONE NO.: 376-3922	PROJECT COORDINATOR: KESSNER, JH	PRICE CODE: 8K	DATA TURNAROUND
SAMPLING LOCATION: C9410, I-010	PROJECT DESIGNATION: 100-N-85 Characterization Borehole - Soil		SAF NO.: RC-241	AIR QUALITY ☐	15 Days / 45 Days
ICE CHEST NO.: GWS-211	FIELD LOGBOOK NO. HNF -N-507- 29.83	ACTUAL SAMPLE DEPTH: 67.90 FT	COA: 303630	METHOD OF SHIPMENT: FEDERAL EXPRESS	ORIGINAL
SHIPPED TO: GEL Laboratories, LLC	OFFSITE PROPERTY NO.: 5402		BILL OF LADING/AIR BILL NO.: 7728 7766 9478		

MATRIX*: A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegetation, W=Water, WI=Wipe, X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C
HOLDING TIME	14/40 Days	14 Days	14/40 Days	14 Days
TYPE OF CONTAINER	aG	Gs*	G	aG
NO. OF CONTAINER(S)	1	3	1 125	1 125
VOLUME	500mL	40mL	~~120~~mL 500 1-29-15	~~120~~mL 500 1-29-15
SAMPLE ANALYSIS	PAHS - 8310;	TPH-Gasoline Range - WTPH-G;	TPH-Diesel Range - WTPH-D +;	Extractable Petroleum Hydrocarbons (EPH);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B30C40	SOIL	FEB 09 2015	1420	✓	✓	✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: D.L. Floyd/CHPRC	DATE/TIME: FEB 09 2015 1535	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: FEB 09 2015 1535
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: FEB 10 2015 1015	RECEIVED BY/STORED IN: L.D. Wall	DATE/TIME: FEB 10 2015 1015
RELINQUISHED BY/REMOVED FROM: L.D. Wall	DATE/TIME: FEB 10 2015 1400	RECEIVED BY/STORED IN: FEDEX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM: Fedex	DATE/TIME:	RECEIVED BY/STORED IN:	DATE/TIME: 02/11/15 0845
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS
** It is critical to ensure that the correct TAT and price code is marked on each COC.** The field NCOs are to identify on the COC and Field Sampling Report any samples with indications (visual, odor, or per meter) of high organic content.** Include sampling location (drilling ID) on the COC. TRVL-15-016

TRVL-15-016

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME	

PRINTED ON 1/21/2015

A-6003-618 (REV 2)

CH2MHill Plateau Remediation Company	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST			RC-241-026	PAGE 1 OF 1
COLLECTOR: D.L. Floyd/CHPRC	COMPANY CONTACT: SUMNER, LC	TELEPHONE NO.: 376-3922	PROJECT COORDINATOR: KESSNER, JH	PRICE CODE: 8K	DATA TURNAROUND
SAMPLING LOCATION: C9410, I-009	PROJECT DESIGNATION: 100-N-85 Characterization Borehole - Soil		SAF NO.: RC-241	AIR QUALITY ☐	15 Days / 45 Days
ICE CHEST NO.: GWS-211	FIELD LOGBOOK NO.: HNF-N-507-29-83	ACTUAL SAMPLE DEPTH: 63.05 ft	COA: 303630	METHOD OF SHIPMENT: FEDERAL EXPRESS	ORIGINAL
SHIPPED TO: GEL Laboratories, LLC	OFFSITE PROPERTY NO.: 5402		BILL OF LADING/AIR BILL NO.: 7728776609478		

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

POSSIBLE SAMPLE HAZARDS/ REMARKS
*Contains Radioactive Material at concentrations that are not be regulated for transportation per 49 CFR/IATA Dangerous Goods Regulations but are not releasable per DOE Order 458.1.

SPECIAL HANDLING AND/OR STORAGE

PRESERVATION	Cool <=6C	Cool <=6C	Cool <=6C	Cool <=6C
HOLDING TIME	14/40 Days	14 Days	14/40 Days	14 Days
TYPE OF CONTAINER	aG	Gs*	G	aG
NO. OF CONTAINER(S)	1	3	1	1
VOLUME	500mL	40mL	120mL	120mL
SAMPLE ANALYSIS	PAHS - 8310;	TPH-Gasoline Range - WTPH-G;	TPH-Diesel Range - WTPH-D +;	Extractable Petroleum Hydrocarbons (EPH);

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME				
B30C38	SOIL	FEB 09 2015	1300	✓	✓	✓	✓

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM: D.L. Floyd/CHPRC	DATE/TIME: FEB 09 2015 1535	RECEIVED BY/STORED IN: SSU-1	DATE/TIME: FEB 09 2015 1535
RELINQUISHED BY/REMOVED FROM: SSU-1	DATE/TIME: FEB 10 2015 1015	RECEIVED BY/STORED IN: L.D. Wall CHPRC	DATE/TIME: FEB 10 2015 1015
RELINQUISHED BY/REMOVED FROM: L.D. Wall CHPRC	DATE/TIME: FEB 10 2015 1400	RECEIVED BY/STORED IN: FEDEX	DATE/TIME:
RELINQUISHED BY/REMOVED FROM: Fedex	DATE/TIME:	RECEIVED BY/STORED IN: Chelsea Geyle	DATE/TIME: 02/11/15 0845
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:
RELINQUISHED BY/REMOVED FROM	DATE/TIME:	RECEIVED BY/STORED IN	DATE/TIME:

SPECIAL INSTRUCTIONS

** It is critical to ensure that the correct TAT and price code is marked on each COC.** The field NCOs are to identify on the COC and Field Sampling Report any samples with indications (visual, odor, or per meter) of high organic content.** Include sampling location (drilling ID) on the COC. TRVL-15-016

TRVL-15-016

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

PRINTED ON 1/21/2015

A-6003-618 (REV 2)

GEL Laboratories LLC

SAMPLE RECEIPT & REVIEW FORM

Client: CRC	**SDG/AR/COC/Work Order:** 360658
Received By: CAS	**Date Received:** 02/11/15

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): 0 cpm
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 *see below
2a	Daily check performed and passed on IR temperature gun?	✓			Temperature Device Serial #: 130532-776 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: no times on vials ~~B0033~~ as B30C39 & B30C33 B30C40, one vial → time on container 1400
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 7728 7716 9949 - 2.5°C 9478 - 1.5°C

Comments (Use Continuation Form if needed):

PM (or PMA) review: Initials HS Date 2/11/15 Page 1 of 1

GL-CHL-SR-001

Laboratory Certifications

List of current GEL Certifications as of 26 February 2015

State	Certification
Alaska	UST−110
Arkansas	88−0651
CLIA	42D0904046
California	2940 Interim
Colorado	SC00012
Connecticut	PH−0169
Delaware	SC000122013−10
DoD ELAP/ ISO17025 A2LA	2567.01
Florida NELAP	E87156
Foreign Soils Permit	P330−12−00283, P330−12−00284
Georgia	SC00012
Georgia SDWA	967
Hawaii	SC000122013−10
Idaho Chemistry	SC00012
Idaho Radiochemistry	SC00012
Illinois NELAP	200029
Indiana	C−SC−01
Kansas NELAP	E−10332
Kentucky SDWA	90129
Kentucky Wastewater	90129
Louisiana NELAP	03046 (AI33904)
Louisiana SDWA	LA150001
Maryland	270
Massachusetts	M−SC012
Michigan	9976
Mississippi	SC000122013−10
Nebraska	NE−OS−26−13
Nevada	SC000122014−1
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 GVL	23611001
South Carolina Radiochemi	10120002
Tennessee	TN 02934
Texas NELAP	T104704235−15−10
Utah NELAP	SC000122014−16
Vermont	VT87156
Virginia NELAP	460202
Washington	C780−12

Volatile Analysis

Case Narrative

GC/MS Volatile
Technical Case Narrative
Eberline (WCHN)
SDG #: X0093
Work Order #: 366868

Method/Analysis Information

Procedure:	**Volatile Organic Compounds (VOC) by Gas Chromatograph/Mass Spectrometer**
Analytical Method:	SW846 5035/8260C
Prep Method:	SW846 5035
Analytical Batch Number:	1459254
Prep Batch Number:	1459250

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
366868001	B30C33
366868002	B30C35
366868003	B30C37
366868004	B30C39
1203268749	Method Blank (MB)
1203268750	Laboratory Control Sample (LCS)
1203268751	366868001(B30C33) Post Spike (PS)
1203268754	366868001(B30C33) Post Spike Duplicate (PSD)

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 data results reported met all SOP and method criteria, unless otherwise discussed below.

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# 21.

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 blank analyzed with this SDG met the acceptance criteria.

Surrogate Recoveries
Surrogate recoveries, in samples (See Below), were outside the acceptance limits. Sample re-analysis confirmed matrix interference. The initial results are reported.

Sample	Analyte	Value
366868001 (B30C33)	1,2-Dichloroethane-d4	68.1* (70%-128%)
	Toluene-d8	69.5* (80%-120%)
366868002 (B30C35)	Toluene-d8	72.3* (80%-120%)
366868003 (B30C37)	Toluene-d8	73.7* (80%-120%)
366868004 (B30C39)	1,2-Dichloroethane-d4	45.5* (70%-128%)
	Bromofluorobenzene	45.3* (63%-138%)
	Toluene-d8	46.8* (80%-120%)

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

QC Sample Designation
Sample 366868001 (B30C33) was designated for spike analysis.

Matrix Spike/Matrix Spike Duplicate Recovery Statement
The matrix spike (MS) and matrix spike duplicate (MSD) recoveries were within the required acceptance limits.

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

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
Samples were re-analyzed due to unacceptable surrogate or internal standard recoveries in the initial analysis. The re-analysis confirmed. The initial results are reported.

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
A data exception report (DER) 1385738 was generated for samples 366868001 (B30C33), 366868002 (B30C35), 366868003 (B30C37) and 366868004 (B30C39) in this SDG/batch.

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) may be requested for samples in this delivery group/work order. Please note that non-requested calibrated analytes detected in a client sample may be reported on the Form 1/Certificate of Analysis as TICs. TIC data, if requested, were included on the Sample Data Summary (Form 1) and included with the sample raw data.

Additional Comments
Additional comments were not required for this SDG.

System 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

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:
25-FEB-15	Industrial	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
VOA GC/MS	SW846 5035/8260C	Solid	WCHN
Batch ID:	**Sample Numbers:**		
1459254	See Below		

Potentially affected work order(s)(SDG): 366868(X0093)

Application Issues:

Failed Recovery for Surrogate or Tracer

Specification and Requirements Exception Description:	DER Disposition:
1. The following samples were below the surrogate recovery acceptance limits: 366868001,002,003 and 004.	1. Surrogate recoveries, in samples (See Below), were outside the acceptance limits. Sample re-analysis confirmed matrix interference. The initial results are reported. 366868001 (B30C33) 1,2-Dichloroethane-d4 [68.1* (70%-128%)], Toluene-d8 [69.5* (80%-120%)]. 366868002 (B30C35) Toluene-d8 [72.3* (80%-120%)]. 366868003 (B30C37) Toluene-d8 [73.7* (80%-120%)]. 366868004 (B30C39) 1,2-Dichloroethane-d4 [45.5* (70%-128%)], Bromofluorobenzene [45.3* (63%-138%)] and Toluene-d8 [46.8* (80%-120%)].

Originator's Name:

Amy Jamison 25-FEB-15

Data Validator/Group Leader:

Erin Haubert 26-FEB-15

GEL LABORATORIES LLC

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

Qualifier Definition Report
for

WCHN001 Eberline

Client SDG: X0093 GEL Work Order: 366868 Project: RC-241 UPR-100-N-17

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: Erin Haubert **Name: Erin Haubert**

Date: 02 MAR 2015 **Title: Data Validator**

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: **RC-241 UPR-100-N-17 Archive**

Report Date: February 26, 2015

Client SDG: X0093

Client Sample ID:	B30C33	Project:	WCHN0RC241
Sample ID:	366868001	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	09-FEB-15 09:00		
Receive Date:	11-FEB-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
Volatiles by SW846 8260C "As Received"											
1,1,1-Trichloroethane	U	0.232	0.232	1.55	ug/kg	1	ACJ	02/20/15	1500	1459254	1
1,1,2,2-Tetrachloroethane	U	0.232	0.232	1.55	ug/kg	1					
1,1,2-Trichloroethane	U	0.232	0.232	1.55	ug/kg	1					
1,1-Dichloroethane	U	0.232	0.232	1.55	ug/kg	1					
1,1-Dichloroethylene	U	0.232	0.232	1.55	ug/kg	1					
1,2-Dichloroethane	U	0.232	0.232	1.55	ug/kg	1					
1,2-Dichloroethylene (total)	U	0.232	0.232	3.10	ug/kg	1					
1,2-Dichloropropane	U	0.232	0.232	1.55	ug/kg	1					
2-Butanone	U	2.32	2.32	7.74	ug/kg	1					
2-Hexanone	U	2.32	2.32	7.74	ug/kg	1					
4-Methyl-2-pentanone	U	2.32	2.32	7.74	ug/kg	1					
Acetone	U	2.32	2.32	7.74	ug/kg	1					
Benzene	U	0.232	0.232	1.55	ug/kg	1					
Bromodichloromethane	U	0.232	0.232	1.55	ug/kg	1					
Bromoform	U	0.232	0.232	1.55	ug/kg	1					
Bromomethane	U	0.232	0.232	1.55	ug/kg	1					
Carbon disulfide	U	1.24	1.24	7.74	ug/kg	1					
Carbon tetrachloride	U	0.232	0.232	1.55	ug/kg	1					
Chlorobenzene	U	0.232	0.232	1.55	ug/kg	1					
Chloroethane	U	0.232	0.232	1.55	ug/kg	1					
Chloroform	U	0.232	0.232	1.55	ug/kg	1					
Chloromethane	U	0.232	0.232	1.55	ug/kg	1					
Dibromochloromethane	U	0.232	0.232	1.55	ug/kg	1					
Ethylbenzene	U	0.232	0.232	1.55	ug/kg	1					
Methylene chloride	U	1.24	1.24	3.87	ug/kg	1					
Styrene	U	0.232	0.232	1.55	ug/kg	1					
Tetrachloroethylene	U	0.232	0.232	1.55	ug/kg	1					
Toluene	J	0.333	0.232	1.55	ug/kg	1					
Trichloroethylene	U	0.232	0.232	1.55	ug/kg	1					
Vinyl chloride	U	0.232	0.232	1.55	ug/kg	1					
Xylenes (total)	U	0.232	0.232	4.64	ug/kg	1					
cis-1,2-Dichloroethylene	U	0.232	0.232	1.55	ug/kg	1					
cis-1,3-Dichloropropylene	U	0.232	0.232	1.55	ug/kg	1					
trans-1,2-Dichloroethylene	U	0.232	0.232	1.55	ug/kg	1					
trans-1,3-	U	0.232	0.232	1.55	ug/kg	1					

GEL LABORATORIES LLC

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

Certificate of Analysis

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: **RC-241 UPR-100-N-17 Archive**

Report Date: February 26, 2015

Client SDG: X0093

Client Sample ID: B30C33
Sample ID: 366868001

Project: WCHN0RC241
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

Volatile Organics

Volatiles by SW846 8260C "As Received"

Dichloropropylene

Surrogate/Tracer recovery	*Result*	*Nominal*	*Recovery%*	*Acceptable Limits*		*Date Time:*	*02/20/15 15 00*
Bromofluorobenzene	26.1 ug/kg	50.0	67.6	(63%-138%)			
1,2-Dichloroethane-d4	26.4 ug/kg	50.0	68.1	(70%-128%)	*		
Toluene-d8	26.9 ug/kg	50.0	69.5	(80%-120%)	*		

Tentatively Identified Compound (TIC)	*CAS No.*	*RT*	*Est. Concentration*	*Fit*	*Qual*	*Date Time:*	*02/20/15 15 00*
unknown hydrocarbon		4.489	7.98 ug/kg	0	J		

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 5035	5035/8260C Prep	ACJ	02/09/15	0900	1459250

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 5035/8260C	

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Certificate of Analysis

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: **RC-241 UPR-100-N-17 Archive**

Report Date: February 26, 2015

Client SDG: X0093

Client Sample ID:	B30C35	Project:	WCHN0RC241
Sample ID:	366868002	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	09-FEB-15 10:30		
Receive Date:	11-FEB-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
Volatiles by SW846 8260C "As Received"											
1,1,1-Trichloroethane	U	0.184	0.184	1.23	ug/kg	1	ACJ	02/20/15	1529	1459254	1
1,1,2,2-Tetrachloroethane	U	0.184	0.184	1.23	ug/kg	1					
1,1,2-Trichloroethane	U	0.184	0.184	1.23	ug/kg	1					
1,1-Dichloroethane	U	0.184	0.184	1.23	ug/kg	1					
1,1-Dichloroethylene	U	0.184	0.184	1.23	ug/kg	1					
1,2-Dichloroethane	U	0.184	0.184	1.23	ug/kg	1					
1,2-Dichloroethylene (total)	U	0.184	0.184	2.46	ug/kg	1					
1,2-Dichloropropane	U	0.184	0.184	1.23	ug/kg	1					
2-Butanone	U	1.84	1.84	6.14	ug/kg	1					
2-Hexanone	U	1.84	1.84	6.14	ug/kg	1					
4-Methyl-2-pentanone	U	1.84	1.84	6.14	ug/kg	1					
Acetone	U	1.84	1.84	6.14	ug/kg	1					
Benzene	U	0.184	0.184	1.23	ug/kg	1					
Bromodichloromethane	U	0.184	0.184	1.23	ug/kg	1					
Bromoform	U	0.184	0.184	1.23	ug/kg	1					
Bromomethane	U	0.184	0.184	1.23	ug/kg	1					
Carbon disulfide	U	0.983	0.983	6.14	ug/kg	1					
Carbon tetrachloride	U	0.184	0.184	1.23	ug/kg	1					
Chlorobenzene	U	0.184	0.184	1.23	ug/kg	1					
Chloroethane	U	0.184	0.184	1.23	ug/kg	1					
Chloroform	U	0.184	0.184	1.23	ug/kg	1					
Chloromethane	U	0.184	0.184	1.23	ug/kg	1					
Dibromochloromethane	U	0.184	0.184	1.23	ug/kg	1					
Ethylbenzene	U	0.184	0.184	1.23	ug/kg	1					
Methylene chloride	U	0.983	0.983	3.07	ug/kg	1					
Styrene	U	0.184	0.184	1.23	ug/kg	1					
Tetrachloroethylene	U	0.184	0.184	1.23	ug/kg	1					
Toluene	J	0.246	0.184	1.23	ug/kg	1					
Trichloroethylene	U	0.184	0.184	1.23	ug/kg	1					
Vinyl chloride	U	0.184	0.184	1.23	ug/kg	1					
Xylenes (total)	U	0.184	0.184	3.69	ug/kg	1					
cis-1,2-Dichloroethylene	U	0.184	0.184	1.23	ug/kg	1					
cis-1,3-Dichloropropylene	U	0.184	0.184	1.23	ug/kg	1					
trans-1,2-Dichloroethylene	U	0.184	0.184	1.23	ug/kg	1					
trans-1,3-	U	0.184	0.184	1.23	ug/kg	1					

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Certificate of Analysis

Company : WC-Hanford, Inc.
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Richland, Washington 99354
Contact: Joan Kessner
Project: **RC-241 UPR-100-N-17 Archive**

Report Date: February 26, 2015

Client SDG: X0093

Client Sample ID: B30C35
Sample ID: 366868002

Project: WCHN0RC241
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

Volatile Organics

Volatiles by SW846 8260C "As Received"

Dichloropropylene

Surrogate/Tracer recovery	*Result*	*Nominal*	*Recovery%*	*Acceptable Limits*		*Date Time:*	*02/20/15 15 29*
Bromofluorobenzene	21.8 ug/kg	50.0	70.9	(63%-138%)			
1,2-Dichloroethane-d4	22.0 ug/kg	50.0	71.8	(70%-128%)			
Toluene-d8	22.2 ug/kg	50.0	72.3	(80%-120%)	*		

Tentatively Identified Compound (TIC)	*CAS No.*	*RT*	*Est. Concentration*	*Fit*	*Qual*	*Date Time:*	*02/20/15 15 29*
unknown hydrocarbon		4.482	7.47 ug/kg	0	J		

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 5035	5035/8260C Prep	ACJ	02/09/15	1030	1459250

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 5035/8260C	

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Certificate of Analysis

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
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Richland, Washington 99354
Contact: Joan Kessner
Project: **RC-241 UPR-100-N-17 Archive**

Report Date: February 26, 2015

Client SDG: X0093

Client Sample ID:	B30C37	Project:	WCHN0RC241
Sample ID:	366868003	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	09-FEB-15 13:00		
Receive Date:	11-FEB-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
Volatiles by SW846 8260C "As Received"											
1,1,1-Trichloroethane	U	0.238	0.238	1.59	ug/kg	1	ACJ	02/20/15	1558	1459254	1
1,1,2,2-Tetrachloroethane	U	0.238	0.238	1.59	ug/kg	1					
1,1,2-Trichloroethane	U	0.238	0.238	1.59	ug/kg	1					
1,1-Dichloroethane	U	0.238	0.238	1.59	ug/kg	1					
1,1-Dichloroethylene	U	0.238	0.238	1.59	ug/kg	1					
1,2-Dichloroethane	U	0.238	0.238	1.59	ug/kg	1					
1,2-Dichloroethylene (total)	U	0.238	0.238	3.18	ug/kg	1					
1,2-Dichloropropane	U	0.238	0.238	1.59	ug/kg	1					
2-Butanone	U	2.38	2.38	7.95	ug/kg	1					
2-Hexanone	U	2.38	2.38	7.95	ug/kg	1					
4-Methyl-2-pentanone	U	2.38	2.38	7.95	ug/kg	1					
Acetone	U	2.38	2.38	7.95	ug/kg	1					
Benzene	U	0.238	0.238	1.59	ug/kg	1					
Bromodichloromethane	U	0.238	0.238	1.59	ug/kg	1					
Bromoform	U	0.238	0.238	1.59	ug/kg	1					
Bromomethane	U	0.238	0.238	1.59	ug/kg	1					
Carbon disulfide	U	1.27	1.27	7.95	ug/kg	1					
Carbon tetrachloride	U	0.238	0.238	1.59	ug/kg	1					
Chlorobenzene	U	0.238	0.238	1.59	ug/kg	1					
Chloroethane	U	0.238	0.238	1.59	ug/kg	1					
Chloroform	U	0.238	0.238	1.59	ug/kg	1					
Chloromethane	U	0.238	0.238	1.59	ug/kg	1					
Dibromochloromethane	U	0.238	0.238	1.59	ug/kg	1					
Ethylbenzene	U	0.238	0.238	1.59	ug/kg	1					
Methylene chloride	U	1.27	1.27	3.97	ug/kg	1					
Styrene	U	0.238	0.238	1.59	ug/kg	1					
Tetrachloroethylene	U	0.238	0.238	1.59	ug/kg	1					
Toluene	U	0.238	0.238	1.59	ug/kg	1					
Trichloroethylene	U	0.238	0.238	1.59	ug/kg	1					
Vinyl chloride	U	0.238	0.238	1.59	ug/kg	1					
Xylenes (total)	U	0.238	0.238	4.77	ug/kg	1					
cis-1,2-Dichloroethylene	U	0.238	0.238	1.59	ug/kg	1					
cis-1,3-Dichloropropylene	U	0.238	0.238	1.59	ug/kg	1					
trans-1,2-Dichloroethylene	U	0.238	0.238	1.59	ug/kg	1					
trans-1,3-	U	0.238	0.238	1.59	ug/kg	1					

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Certificate of Analysis

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: **RC-241 UPR-100-N-17 Archive**

Report Date: February 26, 2015

Client SDG: X0093

Client Sample ID: B30C37
Sample ID: 366868003

Project: WCHN0RC241
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

Volatile Organics

Volatiles by SW846 8260C "As Received"

Dichloropropylene

Surrogate/Tracer recovery	*Result*	*Nominal*	*Recovery%*	*Acceptable Limits*		*Date Time:*	*02/20/15 15 58*
1,2-Dichloroethane-d4	28.6 ug/kg	50.0	72.0	(70%-128%)			
Bromofluorobenzene	28.7 ug/kg	50.0	72.1	(63%-138%)			
Toluene-d8	29.3 ug/kg	50.0	73.7	(80%-120%)	*		

Tentatively Identified Compound (TIC)	*CAS No.*	*RT*	*Est. Concentration*	*Fit*	*Qual*	*Date Time:*	*02/20/15 15 58*
unknown hydrocarbon		4.482	8.08 ug/kg	0	J		

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 5035	5035/8260C Prep	ACJ	02/09/15	1300	1459250

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 5035/8260C	

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Certificate of Analysis

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: **RC-241 UPR-100-N-17 Archive**

Report Date: February 26, 2015

Client SDG: X0093

Client Sample ID:	B30C39	Project:	WCHN0RC241
Sample ID:	366868004	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	09-FEB-15 14:20		
Receive Date:	11-FEB-15		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatile Organics											
Volatiles by SW846 8260C "As Received"											
1,1,1-Trichloroethane	U	0.149	0.149	0.993	ug/kg	1	ACJ	02/20/15	1627	1459254	1
1,1,2,2-Tetrachloroethane	U	0.149	0.149	0.993	ug/kg	1					
1,1,2-Trichloroethane	U	0.149	0.149	0.993	ug/kg	1					
1,1-Dichloroethane	U	0.149	0.149	0.993	ug/kg	1					
1,1-Dichloroethylene	U	0.149	0.149	0.993	ug/kg	1					
1,2-Dichloroethane	U	0.149	0.149	0.993	ug/kg	1					
1,2-Dichloroethylene (total)	U	0.149	0.149	1.99	ug/kg	1					
1,2-Dichloropropane	U	0.149	0.149	0.993	ug/kg	1					
2-Butanone	U	1.49	1.49	4.97	ug/kg	1					
2-Hexanone	U	1.49	1.49	4.97	ug/kg	1					
4-Methyl-2-pentanone	U	1.49	1.49	4.97	ug/kg	1					
Acetone	U	1.49	1.49	4.97	ug/kg	1					
Benzene	U	0.149	0.149	0.993	ug/kg	1					
Bromodichloromethane	U	0.149	0.149	0.993	ug/kg	1					
Bromoform	U	0.149	0.149	0.993	ug/kg	1					
Bromomethane	U	0.149	0.149	0.993	ug/kg	1					
Carbon disulfide	U	0.794	0.794	4.97	ug/kg	1					
Carbon tetrachloride	U	0.149	0.149	0.993	ug/kg	1					
Chlorobenzene	U	0.149	0.149	0.993	ug/kg	1					
Chloroethane	U	0.149	0.149	0.993	ug/kg	1					
Chloroform	U	0.149	0.149	0.993	ug/kg	1					
Chloromethane	U	0.149	0.149	0.993	ug/kg	1					
Dibromochloromethane	U	0.149	0.149	0.993	ug/kg	1					
Ethylbenzene	U	0.149	0.149	0.993	ug/kg	1					
Methylene chloride	U	0.794	0.794	2.48	ug/kg	1					
Styrene	U	0.149	0.149	0.993	ug/kg	1					
Tetrachloroethylene	U	0.149	0.149	0.993	ug/kg	1					
Toluene	U	0.149	0.149	0.993	ug/kg	1					
Trichloroethylene	U	0.149	0.149	0.993	ug/kg	1					
Vinyl chloride	U	0.149	0.149	0.993	ug/kg	1					
Xylenes (total)	U	0.149	0.149	2.98	ug/kg	1					
cis-1,2-Dichloroethylene	U	0.149	0.149	0.993	ug/kg	1					
cis-1,3-Dichloropropylene	U	0.149	0.149	0.993	ug/kg	1					
trans-1,2-Dichloroethylene	U	0.149	0.149	0.993	ug/kg	1					
trans-1,3-	U	0.149	0.149	0.993	ug/kg	1					

GEL LABORATORIES LLC

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Certificate of Analysis

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: **RC-241 UPR-100-N-17 Archive**

Client SDG: X0093

Report Date: February 26, 2015

Client Sample ID: B30C39
Sample ID: 366868004

Project: WCHN0RC241
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	AnalystDate	Time	Batch	Method

Volatile Organics

Volatiles by SW846 8260C "As Received"

Dichloropropylene

Surrogate/Tracer recovery	*Result*	*Nominal*	*Recovery%*	*Acceptable Limits*		*Date Time:*	*02/20/15 16 27*
Bromofluorobenzene	11.3 ug/kg	50.0	45.3	(63%-138%)	*		
1,2-Dichloroethane-d4	11.3 ug/kg	50.0	45.5	(70%-128%)	*		
Toluene-d8	11.6 ug/kg	50.0	46.8	(80%-120%)	*		

Tentatively Identified Compound (TIC)	*CAS No.*	*RT*	*Est. Concentration*	*Fit*	*Qual*	*Date Time:*	*02/20/15 16 27*
unknown hydrocarbon		4.482	3.03 ug/kg	0	J		

The following Prep Methods were performed

Method	Description	Analyst	Date	Time	Prep Batch
SW846 5035	5035/8260C Prep	ACJ	02/09/15	1420	1459250

The following Analytical Methods were performed

Method	Description	Analyst Comments
1	SW846 5035/8260C	

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: February 26, 2015

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

Contact: **Joan Kessner**

Workorder: **366868** **Client SDG:** X0093 **Project Description:** RC-241 UPR-100-N-17 Archive

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1459254										
QC1203268750 LCS										
1,1,1-Trichloroethane	50.0			53.0	ug/kg		106	(70%-130%)	ACJ	02/20/15 12:05
1,1,2,2-Tetrachloroethane	50.0			51.2	ug/kg		102	(70%-130%)		
1,1,2-Trichloroethane	50.0			49.0	ug/kg		98	(70%-130%)		
1,1-Dichloroethane	50.0			48.2	ug/kg		96.4	(70%-130%)		
1,1-Dichloroethylene	50.0			45.3	ug/kg		90.5	(70%-130%)		
1,2-Dichloroethane	50.0			45.2	ug/kg		90.4	(70%-130%)		
1,2-Dichloroethylene (total)	100			98.0	ug/kg		98	(70%-130%)		
1,2-Dichloropropane	50.0			47.7	ug/kg		95.3	(70%-130%)		
2-Butanone	250			262	ug/kg		105	(70%-130%)		
2-Hexanone	250			277	ug/kg		111	(70%-130%)		
4-Methyl-2-pentanone	250			251	ug/kg		101	(70%-130%)		
Acetone	250			289	ug/kg		115	(70%-130%)		
Benzene	50.0			49.3	ug/kg		98.6	(70%-130%)		
Bromodichloromethane	50.0			49.1	ug/kg		98.2	(70%-130%)		
Bromoform	50.0			51.0	ug/kg		102	(70%-130%)		
Bromomethane	50.0			52.5	ug/kg		105	(70%-130%)		
Carbon disulfide	250			261	ug/kg		104	(70%-130%)		
Carbon tetrachloride	50.0			51.2	ug/kg		102	(70%-130%)		
Chlorobenzene	50.0			50.2	ug/kg		100	(70%-130%)		
Chloroethane	50.0			47.8	ug/kg		95.5	(70%-130%)		

QC Summary

Workorder: 366868 **Client SDG:** X0093 **Project Description:** RC-241 UPR-100-N-17 Archive

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS										
Batch 1459254										
Chloroform	50.0			49.4	ug/kg		98.8	(70%-130%)	ACJ	02/20/15 12:05
Chloromethane	50.0			49.6	ug/kg		99.2	(70%-130%)		
Dibromochloromethane	50.0			53.3	ug/kg		107	(70%-130%)		
Ethylbenzene	50.0			51.3	ug/kg		103	(70%-130%)		
Methylene chloride	50.0			49.5	ug/kg		99	(70%-130%)		
Styrene	50.0			52.9	ug/kg		106	(70%-130%)		
Tetrachloroethylene	50.0			52.2	ug/kg		104	(70%-130%)		
Toluene	50.0			50.1	ug/kg		100	(70%-130%)		
Trichloroethylene	50.0			50.6	ug/kg		101	(70%-130%)		
Vinyl chloride	50.0			53.9	ug/kg		108	(70%-130%)		
Xylenes (total)	150			158	ug/kg		105	(70%-130%)		
cis-1,2-Dichloroethylene	50.0			50.1	ug/kg		100	(70%-130%)		
cis-1,3-Dichloropropylene	50.0			50.7	ug/kg		101	(70%-130%)		
trans-1,2-Dichloroethylene	50.0			47.9	ug/kg		95.8	(70%-130%)		
trans-1,3-Dichloropropylene	50.0			49.6	ug/kg		99.1	(70%-130%)		
**1,2-Dichloroethane-d4	50.0			46.4	ug/L		92.9	(70%-128%)		
**Bromofluorobenzene	50.0			45.1	ug/L		90.2	(63%-138%)		
**Toluene-d8	50.0			49.5	ug/L		98.9	(80%-120%)		
QC1203268749 MB										
1,1,1-Trichloroethane			U	0.300	ug/kg					02/20/15 13:30
1,1,2,2-Tetrachloroethane			U	0.300	ug/kg					
1,1,2-Trichloroethane			U	0.300	ug/kg					

QC Summary

Workorder: **366868** **Client SDG:** X0093 **Project Description:** RC-241 UPR-100-N-17 Archive

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch 1459254											
1,1-Dichloroethane			U	0.300	ug/kg				ACJ	02/20/15	13:30
1,1-Dichloroethylene			U	0.300	ug/kg						
1,2-Dichloroethane			U	0.300	ug/kg						
1,2-Dichloroethylene (total)			U	0.300	ug/kg						
1,2-Dichloropropane			U	0.300	ug/kg						
2-Butanone			U	3.00	ug/kg						
2-Hexanone			U	3.00	ug/kg						
4-Methyl-2-pentanone			U	3.00	ug/kg						
Acetone			U	3.00	ug/kg						
Benzene			U	0.300	ug/kg						
Bromodichloromethane			U	0.300	ug/kg						
Bromoform			U	0.300	ug/kg						
Bromomethane			U	0.300	ug/kg						
Carbon disulfide			U	1.60	ug/kg						
Carbon tetrachloride			U	0.300	ug/kg						
Chlorobenzene			U	0.300	ug/kg						
Chloroethane			U	0.300	ug/kg						
Chloroform			U	0.300	ug/kg						
Chloromethane			U	0.300	ug/kg						
Dibromochloromethane			U	0.300	ug/kg						
Ethylbenzene			U	0.300	ug/kg						

QC Summary

Workorder: 366868 **Client SDG:** X0093 **Project Description:** RC-241 UPR-100-N-17 Archive

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS											
Batch 1459254											
Methylene chloride			U	1.60	ug/kg						
Styrene			U	0.300	ug/kg				ACJ	02/20/15	13:30
Tetrachloroethylene			U	0.300	ug/kg						
Toluene			U	0.300	ug/kg						
Trichloroethylene			U	0.300	ug/kg						
Vinyl chloride			U	0.300	ug/kg						
Xylenes (total)			U	0.300	ug/kg						
cis-1,2-Dichloroethylene			U	0.300	ug/kg						
cis-1,3-Dichloropropylene			U	0.300	ug/kg						
trans-1,2-Dichloroethylene			U	0.300	ug/kg						
trans-1,3-Dichloropropylene			U	0.300	ug/kg						
**1,2-Dichloroethane-d4	50.0			48.2	ug/L		96.3	(70%-128%)			
**Bromofluorobenzene	50.0			47.9	ug/L		95.8	(63%-138%)			
**Toluene-d8	50.0			50.7	ug/L		101	(80%-120%)			
QC1203268751 366868001 PS											
1,1,1-Trichloroethane	50.0	U	0.00	50.6	ug/L		101	(70%-130%)		02/20/15	18:21
1,1,2,2-Tetrachloroethane	50.0	U	0.00	53.4	ug/L		107	(70%-130%)			
1,1,2-Trichloroethane	50.0	U	0.00	50.8	ug/L		102	(70%-130%)			
1,1-Dichloroethane	50.0	U	0.00	48.7	ug/L		97.4	(70%-130%)			
1,1-Dichloroethylene	50.0	U	0.00	44.0	ug/L		88.1	(70%-130%)			
1,2-Dichloroethane	50.0	U	0.00	45.5	ug/L		91	(70%-130%)			
1,2-Dichloroethylene (total)	100	U	0.00	96.6	ug/L		96.6	(70%-130%)			
1,2-Dichloropropane	50.0	U	0.00	48.1	ug/L		96.2	(70%-130%)			

QC Summary

Workorder: 366868 **Client SDG:** X0093 **Project Description:** RC-241 UPR-100-N-17 Archive

Volatile-GC/MS

Batch 1459254

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
2-Butanone	250	U	0.00		273	ug/L		109	(70%-130%)	ACJ	02/20/15 18:21
2-Hexanone	250	U	0.00		287	ug/L		115	(70%-130%)		
4-Methyl-2-pentanone	250	U	0.00		260	ug/L		104	(70%-130%)		
Acetone	250	U	0.00		294	ug/L		117	(70%-130%)		
Benzene	50.0	U	0.00		48.8	ug/L		97.6	(70%-130%)		
Bromodichloromethane	50.0	U	0.00		48.9	ug/L		97.7	(70%-130%)		
Bromoform	50.0	U	0.00		52.4	ug/L		105	(70%-130%)		
Bromomethane	50.0	U	0.00		52.4	ug/L		105	(70%-130%)		
Carbon disulfide	250	U	0.00		252	ug/L		101	(70%-130%)		
Carbon tetrachloride	50.0	U	0.00		48.9	ug/L		97.8	(70%-130%)		
Chlorobenzene	50.0	U	0.00		49.4	ug/L		98.8	(70%-130%)		
Chloroethane	50.0	U	0.00		47.0	ug/L		94	(70%-130%)		
Chloroform	50.0	U	0.00		49.3	ug/L		98.7	(70%-130%)		
Chloromethane	50.0	U	0.00		51.4	ug/L		103	(70%-130%)		
Dibromochloromethane	50.0	U	0.00		54.0	ug/L		108	(70%-130%)		
Ethylbenzene	50.0	U	0.00		50.6	ug/L		101	(70%-130%)		
Methylene chloride	50.0	U	0.00		48.7	ug/L		97.4	(70%-130%)		
Styrene	50.0	U	0.00		52.6	ug/L		105	(70%-130%)		
Tetrachloroethylene	50.0	U	0.00		49.3	ug/L		98.5	(70%-130%)		
Toluene	50.0	J	0.430		49.7	ug/L		98.6	(70%-130%)		
Trichloroethylene	50.0	U	0.00		48.7	ug/L		97.4	(70%-130%)		

QC Summary

Workorder: 366868 **Client SDG:** X0093 **Project Description:** RC-241 UPR-100-N-17 Archive

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1459254											
Vinyl chloride	50.0	U	0.00		54.9	ug/L		110	(70%-130%)		
Xylenes (total)	150	U	0.00		153	ug/L		102	(70%-130%)	ACJ	02/20/15 18:21
cis-1,2-Dichloroethylene	50.0	U	0.00		50.1	ug/L		100	(70%-130%)		
cis-1,3-Dichloropropylene	50.0	U	0.00		50.0	ug/L		100	(70%-130%)		
trans-1,2-Dichloroethylene	50.0	U	0.00		46.5	ug/L		93	(70%-130%)		
trans-1,3-Dichloropropylene	50.0	U	0.00		50.1	ug/L		100	(70%-130%)		
**1,2-Dichloroethane-d4	50.0		34.1		50.0	ug/L		99.9	(70%-128%)		
**Bromofluorobenzene	50.0		33.8		44.8	ug/L		89.6	(63%-138%)		
**Toluene-d8	50.0		34.7		49.6	ug/L		99.2	(80%-120%)		
QC1203268754 366868001 PSD											
1,1,1-Trichloroethane	50.0	U	0.00		46.8	ug/L	7.89	93.6	(0%-20%)		02/20/15 18:50
1,1,2,2-Tetrachloroethane	50.0	U	0.00		52.7	ug/L	1.40	105	(0%-20%)		
1,1,2-Trichloroethane	50.0	U	0.00		49.7	ug/L	2.11	99.4	(0%-20%)		
1,1-Dichloroethane	50.0	U	0.00		45.0	ug/L	7.85	90	(0%-20%)		
1,1-Dichloroethylene	50.0	U	0.00		42.7	ug/L	3.18	85.3	(0%-20%)		
1,2-Dichloroethane	50.0	U	0.00		44.3	ug/L	2.61	88.6	(0%-20%)		
1,2-Dichloroethylene (total)	100	U	0.00		90.4	ug/L	6.58	90.4	(0%-20%)		
1,2-Dichloropropane	50.0	U	0.00		45.8	ug/L	5.01	91.5	(0%-20%)		
2-Butanone	250	U	0.00		295	ug/L	7.85	118	(0%-20%)		
2-Hexanone	250	U	0.00		301	ug/L	4.79	121	(0%-20%)		
4-Methyl-2-pentanone	250	U	0.00		278	ug/L	6.59	111	(0%-20%)		
Acetone	250	U	0.00		317	ug/L	7.66	127	(0%-20%)		
Benzene	50.0	U	0.00		46.0	ug/L	5.95	92	(0%-20%)		

QC Summary

Workorder: 366868 **Client SDG:** X0093 **Project Description:** RC-241 UPR-100-N-17 Archive

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatile-GC/MS											
Batch 1459254											
Bromodichloromethane	50.0	U	0.00		47.3	ug/L	3.14	94.7	(0%-20%)	ACJ	02/20/15 18:50
Bromoform	50.0	U	0.00		51.7	ug/L	1.42	103	(0%-20%)		
Bromomethane	50.0	U	0.00		50.9	ug/L	3.06	102	(0%-20%)		
Carbon disulfide	250	U	0.00		240	ug/L	4.92	95.8	(0%-20%)		
Carbon tetrachloride	50.0	U	0.00		45.8	ug/L	6.59	91.5	(0%-20%)		
Chlorobenzene	50.0	U	0.00		46.3	ug/L	6.61	92.5	(0%-20%)		
Chloroethane	50.0	U	0.00		46.9	ug/L	0.234	93.8	(0%-20%)		
Chloroform	50.0	U	0.00		46.0	ug/L	6.96	92	(0%-20%)		
Chloromethane	50.0	U	0.00		51.0	ug/L	0.801	102	(0%-20%)		
Dibromochloromethane	50.0	U	0.00		52.6	ug/L	2.57	105	(0%-20%)		
Ethylbenzene	50.0	U	0.00		46.2	ug/L	9.06	92.4	(0%-20%)		
Methylene chloride	50.0	U	0.00		47.6	ug/L	2.24	95.2	(0%-20%)		
Styrene	50.0	U	0.00		48.0	ug/L	9.10	96.1	(0%-20%)		
Tetrachloroethylene	50.0	U	0.00		45.5	ug/L	8.00	90.9	(0%-20%)		
Toluene	50.0	J	0.430		46.0	ug/L	7.73	91.2	(0%-20%)		
Trichloroethylene	50.0	U	0.00		45.2	ug/L	7.48	90.4	(0%-20%)		
Vinyl chloride	50.0	U	0.00		53.0	ug/L	3.54	106	(0%-20%)		
Xylenes (total)	150	U	0.00		140	ug/L	9.15	93.1	(0%-20%)		
cis-1,2-Dichloroethylene	50.0	U	0.00		47.0	ug/L	6.41	93.9	(0%-20%)		
cis-1,3-Dichloropropylene	50.0	U	0.00		47.9	ug/L	4.21	95.9	(0%-20%)		
trans-1,2-Dichloroethylene	50.0	U	0.00		43.5	ug/L	6.76	86.9	(0%-20%)		

QC Summary

Workorder: 366868 **Client SDG:** X0093 **Project Description:** RC-241 UPR-100-N-17 Archive

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
Volatile-GC/MS												
Batch 1459254												
trans-1,3-Dichloropropylene	50.0	U	0.00		48.9	ug/L	2.47	97.7	(0%-20%)			
**1,2-Dichloroethane-d4	50.0		34.1		48.7	ug/L		97.3	(70%-128%)	ACJ	02/20/15	18:50
**Bromofluorobenzene	50.0		33.8		43.9	ug/L		87.8	(63%-138%)			
**Toluene-d8	50.0		34.7		49.6	ug/L		99.1	(80%-120%)			

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 or %RPD not applicable.
^ 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

Closed-System Purge-and-Trap Collection and Extraction: Volatile Organics in Soil and Waste Samples

Batch ID: **1459250**
Analyst: Amy Jamison
Method: SW846 5035
Lab SOP: GL-OA-E-039 REV# 10
Instrument: Sartorius Balance B-001

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)	pH Check
366868001	09-FEB-2015 09:00:00	Soil	6.46	5	0.77399	
1203268751 PS (366868001)	09-FEB-2015 09:00:00	Soil	6.17	5	0.81037	
1203268754 PSD (366868001)	09-FEB-2015 09:00:00	Soil	7.68	5	0.65104	
366868002	09-FEB-2015 10:30:00	Soil	8.14	5	0.61425	
366868003	09-FEB-2015 13:00:00	Soil	6.29	5	0.79491	
366868004	09-FEB-2015 14:20:00	Soil	10.07	5	0.49652	
1203268750 LCS	20-FEB-2015 07:00:00	Soil	5	5	1	
1203268749 MB	20-FEB-2015 07:30:00	Soil	5	5	1	

Reagent/Solvent Lot ID	Description	Amount

Comments:

HPLC Polynuclear Aromatic Hydrocarbon Analysis

HPLC Polynuclear Aromatic Hydrocarbon
Technical Case Narrative
Eberline (WCHN)
SDG #: X0093
Work Order #: 366868

Method/Analysis Information

Procedure:	**Polynuclear Aromatic Hydrocarbons**
Analytical Method:	SW846 8310
Prep Method:	SW846 3550B
Analytical Batch Number:	1459170
Prep Batch Number:	1459169

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 8310:

Sample ID	Client ID
366868005	B30C34
366868006	B30C36
366868007	B30C38
366868008	B30C40
1203268562	MB for batch 1459169
1203268563	Laboratory Control Sample (LCS)
1203268564	366868005(B30C34) Matrix Spike (MS)
1203268565	366868005(B30C34) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on a "dry weight" 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-030 REV# 16.

Raw data reports are processed and reviewed by the analyst using the Target software package. False positives have been removed from the Target quantitation reports per standard operating procedures (SOP) section 18.0.

Calibration Information

Due to software limitations, the files displayed at the beginning of the Form 6 are only the last files uploaded for each individual level. A complete listing of all files used in the current ICAL are shown on the Calibration History that is included with each Level 4 or higher package. The last file by date in each level is the one currently uploaded for that level.

The linear equation used in Target and indicated on the initial calibration summary form is not a conventional linear equation (slope intercept formula) and does not match the equation found in SW-846 method 8000B. The x and y axes are inversed in Target, so that the instrument response is treated as the independent variable (x) and the concentration ratio is treated as the dependent variable (y). The equation used in Target to calculate sample results is adjusted to account for the linear equation inversion and reciprocal slope. The adjusted calculation has been independently verified to produce valid results.

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

CCV Requirements
All associated calibration verification standards (ICV or CCV) met the acceptance criteria.

Quality Control (QC) Information

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

Surrogate Recoveries
All the surrogate recoveries were within the established acceptance criteria for this SDG.

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

QC Sample Designation
Client sample 366868005 (B30C34) was chosen for matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement
The MS recoveries were within the established acceptance limits.

Matrix Spike Duplicate (MSD) Recovery Statement
The MSD recoveries were within the established acceptance limits.

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

Technical Information:

Holding Time Specifications
All samples in this SDG in this analytical batch met the specified holding time. 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.

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

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

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

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.

Manual Integrations
Some initial calibration standards, continuing calibration standards, and QC samples 1203268563 (LCS), 1203268564 (B30C34MS) and 1203268565 (B30C34MSD) required manual integrations due to software limitations.

Please see the raw data in the Miscellaneous Section.

Additional Comments
The Form 8 is used only as a sequence of the analysis.

Electronic Package Comment

The following 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. An electronic signature page inserted after the case narrative of each electronic package will indicate the analyst, reviewer, and report specialist names associated with the generation of the data and package. 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.

System Configuration

The laboratory utilizes a high performance liquid chromatography (HPLC) instrument configuration for Polynuclear Aromatic Hydrocarbons analyses.

The chromatographic hardware system consists of a HP Model 1100 HPLC with programmable gradient pumping and a 100uL loop injector.

The HPLC 1100 is coupled to a HP Model G1315A Diode Array UV detector which monitors absorbance at the following five wavelengths: 1) 224 nm; 2) 250 nm; 3) 270 nm; 4) 234 nm; 5) 300 nm.

The HPLC 1100 is also coupled to a HP Model G1321A Fluorescence Detector in series which monitors the following varying excitations and emissions 1) EX 230 nm EM 330 nm; 2) EX 210 nm EM 314 nm; 3) EX 250 nm EM 368 nm; 4) EX 237 nm EM 440 nm; 5) EX 277 nm EM 376 nm; 6) EX 255 nm EM 420 nm; 7) EX 230 nm EM 453 nm.

The Diode Array UV detector is used as the primary detector and the Fluorescence Detector is used as the confirmation detector. All results are reported from the primary Diode Array UV detector.

The HPLC system is identified with a designation of HPLC E in the raw data printouts.

Chromatographic Columns

Chromatographic separation of Polynuclear Aromatic Hydrocarbons is accomplished through analysis on the following reversed phase columns:

Phenomenex: Luna C18 (2), 100 A, 250 mm x 4.6 mm containing 5 um size particle.

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.

GEL LABORATORIES LLC

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

Qualifier Definition Report
for

WCHN001 Eberline

Client SDG: X0093 GEL Work Order: 366868 Project: RC-241 UPR-100-N-17

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

Date: 27 FEB 2015 **Title: Group Leader**

Roadmap for WCHN X0093 HPLC_PAH

This roadmap was analyzed by cww on 02-26-2015, 13:44.
This roadmap was reviewed by map on 02-26-2015, 15:46.
This roadmap was packaged by map on 02-27-2015, 08:12.

Sample

exclude	manual	datafile	smpid	injdate	injtime	sublist	clientid	dilution	batchid	comment
☐	N	/chem/hplce.i/p022415.b/ph5b2439.d	366868005	25-FEB-2015	12:29	X0093.sub	B30C34	1	1459170	
☐	N	/chem/hplce.i/p022415.b/ph5b2442.d	366868006	25-FEB-2015	14:36	X0093.sub	B30C36	1	1459170	
☐	N	/chem/hplce.i/p022415.b/ph5b2443.d	366868007	25-FEB-2015	15:18	X0093.sub	B30C38	1	1459170	
☐	N	/chem/hplce.i/p022415.b/ph5b2444.d	366868008	25-FEB-2015	16:00	X0093.sub	B30C40	1	1459170	

QC Sample

exclude	manual	datafile	smpid	sampletype	injdate	injtime	sublist	clientid	dilution	batchid	comment
☐	N	/chem/hplce.i/p022415.b/ph5b2437.d	1203268562	mb	25-FEB-2015	11:05	X0093.sub	PAHBLK01	1	1459170	
☐	N	/chem/hplce.i/p022415.b/ph5b2438.d	1203268563	lcs	25-FEB-2015	11:47	X0093.sub	PAHBLK01LCS	1	1459170	Pass
☐	N	/chem/hplce.i/p022415.b/ph5b2440.d	1203268564	ms	25-FEB-2015	13:11	X0093.sub	B30C34MS	1	1459170	Pass
☐	N	/chem/hplce.i/p022415.b/ph5b2441.d	1203268565	msd	25-FEB-2015	13:53	X0093.sub	B30C34MSD	1	1459170	Pass

Sample Data Summary

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: February 26, 2015

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-241 UPR-100-N-17 Archive

Client SDG: X0093

Client Sample ID:	B30C34	Project:	WCHN0RC241
Sample ID:	366868005	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	09-FEB-15 09:00		
Receive Date:	11-FEB-15		
Collector:	Client		
Moisture:	2.55%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
HPLC-PAH											
8310/3550 PAH Std list Soil "Dry Weight Corrected"											
Acenaphthene	U	5.11	5.11	17.0	ug/kg	1	CWW	02/25/15	1229	1459170	1
Acenaphthylene	U	5.11	5.11	17.0	ug/kg	1					
Anthracene	U	1.70	1.70	17.0	ug/kg	1					
Benzo(a)anthracene	U	0.545	0.545	1.70	ug/kg	1					
Benzo(a)pyrene	U	0.545	0.545	1.70	ug/kg	1					
Benzo(b)fluoranthene	U	0.545	0.545	1.70	ug/kg	1					
Benzo(ghi)perylene	U	0.545	0.545	1.70	ug/kg	1					
Benzo(k)fluoranthene	U	0.272	0.272	0.851	ug/kg	1					
Chrysene	U	0.545	0.545	1.70	ug/kg	1					
Dibenzo(a,h)anthracene	U	0.545	0.545	1.70	ug/kg	1					
Fluoranthene	U	0.545	0.545	1.70	ug/kg	1					
Fluorene	U	5.11	5.11	17.0	ug/kg	1					
Indeno(1,2,3-cd)pyrene	U	0.545	0.545	1.70	ug/kg	1					
Naphthalene	U	5.11	5.11	17.0	ug/kg	1					
Phenanthrene	U	5.11	5.11	17.0	ug/kg	1					
Pyrene	U	0.545	0.545	1.70	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3550B	3550B PAH BY HPLC Prep in soil	SJW1	02/23/15	1420	1459169

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8310	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	8310/3550 PAH Std list Soil "Dry Weight Corrected"	6710 ug/kg	8510	78.8	(46%-101%)

Notes:

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: February 26, 2015

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-241 UPR-100-N-17 Archive

Client SDG: X0093

Client Sample ID:	B30C36	Project:	WCHN0RC241
Sample ID:	366868006	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	09-FEB-15 10:30		
Receive Date:	11-FEB-15		
Collector:	Client		
Moisture:	6.62%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
HPLC-PAH											
8310/3550 PAH Std list Soil "Dry Weight Corrected"											
Acenaphthene	U	5.35	5.35	17.8	ug/kg	1	CWW	02/25/15	1436	1459170	1
Acenaphthylene	U	5.35	5.35	17.8	ug/kg	1					
Anthracene	U	1.78	1.78	17.8	ug/kg	1					
Benzo(a)anthracene	U	0.570	0.570	1.78	ug/kg	1					
Benzo(a)pyrene	U	0.570	0.570	1.78	ug/kg	1					
Benzo(b)fluoranthene	U	0.570	0.570	1.78	ug/kg	1					
Benzo(ghi)perylene	U	0.570	0.570	1.78	ug/kg	1					
Benzo(k)fluoranthene	U	0.285	0.285	0.891	ug/kg	1					
Chrysene	U	0.570	0.570	1.78	ug/kg	1					
Dibenzo(a,h)anthracene	U	0.570	0.570	1.78	ug/kg	1					
Fluoranthene	U	0.570	0.570	1.78	ug/kg	1					
Fluorene	U	5.35	5.35	17.8	ug/kg	1					
Indeno(1,2,3-cd)pyrene	U	0.570	0.570	1.78	ug/kg	1					
Naphthalene	U	5.35	5.35	17.8	ug/kg	1					
Phenanthrene	U	5.35	5.35	17.8	ug/kg	1					
Pyrene	U	0.570	0.570	1.78	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3550B	3550B PAH BY HPLC Prep in soil	SJW1	02/23/15	1420	1459169

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8310	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	8310/3550 PAH Std list Soil "Dry Weight Corrected"	7580 ug/kg	8910	85.1	(46%-101%)

Notes:

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Certificate of Analysis

Report Date: February 26, 2015

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-241 UPR-100-N-17 Archive

Client SDG: X0093

Client Sample ID:	B30C38	Project:	WCHN0RC241
Sample ID:	366868007	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	09-FEB-15 13:00		
Receive Date:	11-FEB-15		
Collector:	Client		
Moisture:	3.15%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
HPLC-PAH											
8310/3550 PAH Std list Soil "Dry Weight Corrected"											
Acenaphthene	U	5.16	5.16	17.2	ug/kg	1	CWW	02/25/15	1518	1459170	1
Acenaphthylene	U	5.16	5.16	17.2	ug/kg	1					
Anthracene	U	1.72	1.72	17.2	ug/kg	1					
Benzo(a)anthracene	U	0.551	0.551	1.72	ug/kg	1					
Benzo(a)pyrene	U	0.551	0.551	1.72	ug/kg	1					
Benzo(b)fluoranthene	U	0.551	0.551	1.72	ug/kg	1					
Benzo(ghi)perylene	U	0.551	0.551	1.72	ug/kg	1					
Benzo(k)fluoranthene	U	0.275	0.275	0.860	ug/kg	1					
Chrysene	U	0.551	0.551	1.72	ug/kg	1					
Dibenzo(a,h)anthracene	U	0.551	0.551	1.72	ug/kg	1					
Fluoranthene	U	0.551	0.551	1.72	ug/kg	1					
Fluorene	U	5.16	5.16	17.2	ug/kg	1					
Indeno(1,2,3-cd)pyrene	U	0.551	0.551	1.72	ug/kg	1					
Naphthalene	U	5.16	5.16	17.2	ug/kg	1					
Phenanthrene	U	5.16	5.16	17.2	ug/kg	1					
Pyrene	U	0.551	0.551	1.72	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3550B	3550B PAH BY HPLC Prep in soil	SJW1	02/23/15	1420	1459169

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8310	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	8310/3550 PAH Std list Soil "Dry Weight Corrected"	7210 ug/kg	8600	83.7	(46%-101%)

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: February 26, 2015

Company : WC-Hanford, Inc.
Address : 2620 Fermi Avenue
MSIN H4-21
Richland, Washington 99354
Contact: Joan Kessner
Project: RC-241 UPR-100-N-17 Archive
Client SDG: X0093

Client Sample ID: B30C40
Sample ID: 366868008
Matrix: SOIL
Collect Date: 09-FEB-15 14:20
Receive Date: 11-FEB-15
Collector: Client
Moisture: 7.82%
Project: WCHN0RC241
Client ID: WCHN001

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
HPLC-PAH											
8310/3550 PAH Std list Soil "Dry Weight Corrected"											
Acenaphthene	U	5.10	5.10	17.0	ug/kg	1	CWW	02/25/15	1600	1459170	1
Acenaphthylene	U	5.10	5.10	17.0	ug/kg	1					
Anthracene	U	1.70	1.70	17.0	ug/kg	1					
Benzo(a)anthracene	U	0.544	0.544	1.70	ug/kg	1					
Benzo(a)pyrene	U	0.544	0.544	1.70	ug/kg	1					
Benzo(b)fluoranthene	U	0.544	0.544	1.70	ug/kg	1					
Benzo(ghi)perylene	U	0.544	0.544	1.70	ug/kg	1					
Benzo(k)fluoranthene	U	0.272	0.272	0.850	ug/kg	1					
Chrysene	U	0.544	0.544	1.70	ug/kg	1					
Dibenzo(a,h)anthracene	U	0.544	0.544	1.70	ug/kg	1					
Fluoranthene	U	0.544	0.544	1.70	ug/kg	1					
Fluorene	U	5.10	5.10	17.0	ug/kg	1					
Indeno(1,2,3-cd)pyrene	U	0.544	0.544	1.70	ug/kg	1					
Naphthalene	U	5.10	5.10	17.0	ug/kg	1					
Phenanthrene	U	5.10	5.10	17.0	ug/kg	1					
Pyrene	U	0.544	0.544	1.70	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3550B	3550B PAH BY HPLC Prep in soil	SJW1	02/23/15	1420	1459169

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	SW846 8310	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Decafluorobiphenyl	8310/3550 PAH Std list Soil "Dry Weight Corrected"	7470 ug/kg	8500	87.9	(46%-101%)

Notes:

QC Summary

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QC Summary

Report Date: February 26, 2015

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

Contact: **Joan Kessner**

Workorder: **366868** **Client SDG:** X0093 **Project Description:** RC-241 UPR-100-N-17 Archive

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
HPLC-PAH										
Batch 1459170										
QC1203268563 LCS										
Acenaphthene	1660			1560	ug/kg		93.6	(66%-98%)	CWW	02/25/15 11:47
Acenaphthylene	1660			1500	ug/kg		89.9	(65%-95%)		
Anthracene	1660			1500	ug/kg		89.9	(71%-107%)		
Benzo(a)anthracene	166			152	ug/kg		91.3	(72%-103%)		
Benzo(a)pyrene	166			144	ug/kg		86.5	(68%-98%)		
Benzo(b)fluoranthene	166			150	ug/kg		90.3	(72%-99%)		
Benzo(ghi)perylene	166			153	ug/kg		91.7	(69%-98%)		
Benzo(k)fluoranthene	83.2			81.0	ug/kg		97.4	(62%-103%)		
Chrysene	166			149	ug/kg		89.5	(80%-113%)		
Dibenzo(a,h)anthracene	166			154	ug/kg		92.5	(83%-115%)		
Fluoranthene	166			145	ug/kg		87.1	(68%-98%)		
Fluorene	1660			1540	ug/kg		92.3	(68%-99%)		
Indeno(1,2,3-cd)pyrene	166			155	ug/kg		93.4	(76%-105%)		
Naphthalene	1660			1420	ug/kg		85.6	(62%-93%)		
Phenanthrene	1660			1480	ug/kg		89.1	(70%-98%)		
Pyrene	166			142	ug/kg		85.6	(73%-104%)		
**Decafluorobiphenyl	8320			7060	ug/kg		84.9	(46%-101%)		
QC1203268562 MB										
Acenaphthene			U	4.99	ug/kg					02/25/15 11:05
Acenaphthylene			U	4.99	ug/kg					

QC Summary

Workorder: 366868 **Client SDG:** X0093 **Project Description:** RC-241 UPR-100-N-17 Archive

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
HPLC-PAH											
Batch 1459170											
Anthracene				U	1.66	ug/kg					
Benzo(a)anthracene				U	0.532	ug/kg				CWW	02/25/15 11:05
Benzo(a)pyrene				U	0.532	ug/kg					
Benzo(b)fluoranthene				U	0.532	ug/kg					
Benzo(ghi)perylene				U	0.532	ug/kg					
Benzo(k)fluoranthene				U	0.266	ug/kg					
Chrysene				U	0.532	ug/kg					
Dibenzo(a,h)anthracene				U	0.532	ug/kg					
Fluoranthene				U	0.532	ug/kg					
Fluorene				U	4.99	ug/kg					
Indeno(1,2,3-cd)pyrene				U	0.532	ug/kg					
Naphthalene				U	4.99	ug/kg					
Phenanthrene				U	4.99	ug/kg					
Pyrene				U	0.532	ug/kg					
**Decafluorobiphenyl	8320				7200	ug/kg		86.5	(46%-101%)		
QC1203268564 366868005 MS											
Acenaphthene	1710	U	5.11		1560	ug/kg		91.3	(57%-97%)		02/25/15 13:11
Acenaphthylene	1710	U	5.11		1500	ug/kg		87.9	(55%-94%)		
Anthracene	1710	U	1.70		1520	ug/kg		89.2	(65%-103%)		
Benzo(a)anthracene	171	U	0.545		154	ug/kg		90.4	(53%-110%)		
Benzo(a)pyrene	171	U	0.545		147	ug/kg		86.1	(53%-105%)		
Benzo(b)fluoranthene	171	U	0.545		152	ug/kg		89.2	(52%-110%)		
Benzo(ghi)perylene	171	U	0.545		156	ug/kg		91.1	(44%-107%)		

QC Summary

Workorder: 366868 **Client SDG:** X0093 **Project Description:** RC-241 UPR-100-N-17 Archive

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
HPLC-PAH											
Batch 1459170											
Benzo(k)fluoranthene	85.4	U	0.272		82.2	ug/kg		96.2	(48%-116%)	CWW	02/25/15 13:11
Chrysene	171	U	0.545		152	ug/kg		88.9	(61%-118%)		
Dibenzo(a,h)anthracene	171	U	0.545		157	ug/kg		91.6	(63%-119%)		
Fluoranthene	171	U	0.545		148	ug/kg		86.7	(56%-100%)		
Fluorene	1710	U	5.11		1540	ug/kg		90.3	(59%-97%)		
Indeno(1,2,3-cd)pyrene	171	U	0.545		159	ug/kg		93.2	(53%-115%)		
Naphthalene	1710	U	5.11		1420	ug/kg		83.2	(54%-88%)		
Phenanthrene	1710	U	5.11		1510	ug/kg		88.4	(60%-99%)		
Pyrene	171	U	0.545		146	ug/kg		85.2	(54%-112%)		
**Decafluorobiphenyl	8540		6710		7140	ug/kg		83.5	(46%-101%)		
QC1203268565 366868005 MSD											
Acenaphthene	1710	U	5.11		1540	ug/kg	0.999	90.3	(0%-30%)		02/25/15 13:53
Acenaphthylene	1710	U	5.11		1480	ug/kg	1.21	86.8	(0%-30%)		
Anthracene	1710	U	1.70		1590	ug/kg	4.06	92.8	(0%-30%)		
Benzo(a)anthracene	171	U	0.545		162	ug/kg	4.96	94.9	(0%-30%)		
Benzo(a)pyrene	171	U	0.545		155	ug/kg	5.28	90.7	(0%-30%)		
Benzo(b)fluoranthene	171	U	0.545		161	ug/kg	5.22	93.9	(0%-30%)		
Benzo(ghi)perylene	171	U	0.545		163	ug/kg	4.90	95.6	(0%-30%)		
Benzo(k)fluoranthene	85.5	U	0.272		87.4	ug/kg	6.16	102	(0%-30%)		
Chrysene	171	U	0.545		160	ug/kg	5.26	93.6	(0%-30%)		
Dibenzo(a,h)anthracene	171	U	0.545		165	ug/kg	5.01	96.3	(0%-30%)		
Fluoranthene	171	U	0.545		157	ug/kg	5.85	91.9	(0%-30%)		

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QC Summary

Workorder: **366868** **Client SDG:** X0093 **Project Description:** RC-241 UPR-100-N-17 Archive

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
HPLC-PAH											
Batch 1459170											
Fluorene	1710	U	5.11		1560	ug/kg	1.29	91.4	(0%-30%)	CWW	02/25/15 13:53
Indeno(1,2,3-cd)pyrene	171	U	0.545		167	ug/kg	4.82	97.7	(0%-30%)		
Naphthalene	1710	U	5.11		1410	ug/kg	0.502	82.7	(0%-30%)		
Phenanthrene	1710	U	5.11		1570	ug/kg	4.11	92.1	(0%-30%)		
Pyrene	171	U	0.545		154	ug/kg	5.83	90.3	(0%-30%)		
**Decafluorobiphenyl	8550		6710		7170	ug/kg		83.8	(46%-101%)		

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 or %RPD not applicable.
^ 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 Data

Prep Logbook

Extraction of Semivolatile and Nonvolatile Organic Compounds from Soil, Sludge, and Other Miscellaneous Solid Samples

Batch ID: **1459169** **Verified by:** _____

Analyst: **Sirena White**

Method: **SW846 3550B**

Lab SOP: **GL-OA-E-010 REV# 24**

Instrument: **Semi-Volatiles Manual**

Sample ID	Run Date	Aliquot (g)	Prepped Aliquot (mL)	Prepped Factor (mL/g)
1203268562 MB	23-FEB-2015 14:20:00	30.05	1	0.03328
1203268563 LCS	23-FEB-2015 14:20:00	30.05	1	0.03328
366868005	23-FEB-2015 14:20:00	30.15	1	0.03317
1203268564 MS (366868005)	23-FEB-2015 14:20:00	30.03	1	0.0333
1203268565 MSD (366868005)	23-FEB-2015 14:20:00	30.01	1	0.03332
366868006	23-FEB-2015 14:20:00	30.04	1	0.03329
366868007	23-FEB-2015 14:20:00	30	1	0.03333
366868008	23-FEB-2015 14:20:00	31.9	1	0.03135

Type	Sample Id	Description	Serial Number	Spike Amt	Units
LCS	1203268563	8310 PAH SPIKE	UE150205-10	1	mL
MS	1203268564	8310 PAH SPIKE	UE150205-10	1	mL
MSD	1203268565	8310 PAH SPIKE	UE150205-10	1	mL
SURR	All	Decafluorobiphenyl 250 mg/L	UE150121-35	1	mL
REGNT	All	Methylene Chloride	2213026-D	300	mL
REGNT	All	Acetonitrile UV 4L	2219831	5	mL
SOURC	All	SODIUM SULFATE	2193342	30	g

Comments:

Sample 366868007 was dry and very dusty. Sample 366868008 was wet mud with rocks.

ACN - used 7mLs
Bath was 90 degrees

Verified By: MD

Final Solvent: ACN

Flame Ionization Detector Analysis

Case Narrative

FID Flame Ionization Detector
Technical Case Narrative
Eberline (WCHN)
SDG #: X0093
Work Order #: 366868

Method/Analysis Information

Procedure:	**Washington Method for the Determination of Extractable Petroleum Hydrocarbons**
Analytical Method:	WA EPH
Prep Method:	WA EPH
Analytical Batch Number:	1458653
Prep Batch Number:	1458652

Sample Analysis

The following samples were analyzed using the analytical protocol as established in WA EPH:

Sample ID	Client ID
366868005	B30C34
366868006	B30C36
366868007	B30C38
366868008	B30C40
1203267129	MB for batch 1458652
1203267130	Laboratory Control Sample (LCS)
1203267131	366868005(B30C34) Matrix Spike (MS)
1203267132	366868005(B30C34) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on a "dry weight" 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-075 REV# 0.

Raw data reports are processed and reviewed by the analyst using ChemStation software package. False positives have been removed from the quantitation reports per standard operating procedures (SOP) section 23.0.

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.

Quality Control (QC) Information

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

Surrogate Recoveries
The MSD 1203267132 (B30C34MSD) failed surrogate recovery limits. The MS and parent sample met surrogate recovery limits, and there were no target analytes detected above the RDL in the client sample. As the low recoveries are limited to the MSD, the data are reported.

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

QC Sample Designation
Sample 366868005 (B30C34) was selected for the matrix spike and matrix spike duplicate analysis.

Matrix Spike (MS) Recovery Statement
The MSD 1203267132 (B30C34MSD) did not meet spike recovery acceptance limits. The LCS and associated MS passed recovery limits and the target analytes were not detected in the sample above the RL.

MS/MSD Relative Percent Difference (RPD) Statement
The relative percent differences (RPD) between each MS and MSD 1203267131 (B30C34MS) and 1203267132 (B30C34MSD) were not within the required 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.

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

Data Exception (DER) Documentation
The following DER was generated for this SDG: 1384852. 1203267132 (B30C34MSD).

Manual Integrations
Certain standards and QC 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 GC-FID analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
FID5.I	Agilent Gas Chromatograph	Agilent 6890N GC/FID	J&W DB-5MS	30m x 0.25mm, 0.25um(J&W)
FID5.I	Agilent Gas Chromatograph	Agilent 6890N GC/FID	J&W DB-WAX	30m x 0.53 mm x 1um
FID5.I	Agilent Gas Chromatograph	Agilent 6890N GC/FID	J&W DB-624	30m x 0.53mm, 3.0um(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:
24-FEB-15	Industrial	Specifications	Process
Instrument Type:	**Test / Method:**	**Matrix Type:**	**Client Code:**
GC/FID	WA EPH	Solid	WCHN
Batch ID:	**Sample Numbers:**		
1458653	See Below		

Potentially affected work order(s)(SDG): 366868(X0093)

Application Issues:

Failed Recovery for MS/MSD, or PS/PSD

Failed RPD for MS/MSD, or PS/PSD

Failed Yield for Surrogates

Specification and Requirements Exception Description:	DER Disposition:
1. Failed RPD for MS/MSD, or PS/PSD: QC 1203267132MSD 2. Failed Recovery for MS/MSD, or PS/PSD: QC 1203267132MSD 3. Failed Yield for Surrogates: QC 1203267132MSD	1. The relative percent differences (RPD) between each MS and MSD were not within the required acceptance limits. 1203267132 (B30C34MSD). 2. MSD 1203267132 (B30C34MSD) failed spike recovery limits. The LCS and MS met spike recovery limits, and there were no target analytes detected above the RDL in any of the client samples. As the low recoveries are limited to the MSD, the data are reported. 3. MSD 1203267132 (B30C34MSD) failed surrogate recovery limits. The MS and parent sample met surrogate recovery limits, and there were no target analytes detected above the RDL in the client sample. As the low recoveries are limited to the MSD, the data are reported.

Originator's Name:

Josh Brooks 24-FEB-15

Data Validator/Group Leader:

Cameron Bearden 27-FEB-15

GEL LABORATORIES LLC

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Qualifier Definition Report
for

WCHN001 Eberline

Client SDG: X0093 GEL Work Order: 366868 Project: RC-241 UPR-100-N-17

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

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: Cameron Bearden **Name: Cameron Bearden**

Date: 27 FEB 2015 **Title: Group Leader**

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: February 25, 2015

Company :	WC-Hanford, Inc.		
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354		
Contact:	Joan Kessner	Client SDG:	X0093
Project:	RC-241 UPR-100-N-17 Archive		

Client Sample ID:	B30C34	Project:	WCHN0RC241
Sample ID:	366868005	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	09-FEB-15 09:00		
Receive Date:	11-FEB-15		
Collector:	Client		
Moisture:	2.55%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
GC-FID											
Washington EPH Solid "Dry Weight Corrected"											
Aliphatic Hydrocarbons >C10-C12	TU	684	684	1370	ug/Kg	1	JMB3	02/23/15	1702	1458653	1
Aliphatic Hydrocarbons >C12-C16	TU	684	684	1370	ug/Kg	1					
Aliphatic Hydrocarbons >C16-C21	TU	684	684	1370	ug/Kg	1					
Aliphatic Hydrocarbons >C21-C34	U	684	684	1370	ug/Kg	1					
Aliphatic Hydrocarbons C8-C10	BJT	1250	684	1370	ug/Kg	1					
Aromatic Hydrocarbons >C10-C12	TU	684	684	1370	ug/Kg	1	JMB3	02/23/15	1631	1458653	2
Aromatic Hydrocarbons >C12-C16	TU	684	684	1370	ug/Kg	1					
Aromatic Hydrocarbons >C16-C21	TU	684	684	1370	ug/Kg	1					
Aromatic Hydrocarbons >C21-C34	TU	684	684	1370	ug/Kg	1					
Aromatic Hydrocarbons C8-C10	U	684	684	1370	ug/Kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
WA EPH	Washington EPH Prep Solids	SJW1	02/19/15	1145	1458652

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	WA EPH	
2	WA EPH	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chlorooctadecane	Washington EPH Solid "Dry Weight Corrected"	1010 ug/Kg	1370	74.0	(60%-140%)
o-Terphenyl	Washington EPH Solid "Dry Weight Corrected"	1090 ug/Kg	1370	79.8	(60%-140%)

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: February 25, 2015

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-241 UPR-100-N-17 Archive

Client SDG: X0093

Client Sample ID:	B30C36	Project:	WCHN0RC241
Sample ID:	366868006	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	09-FEB-15 10:30		
Receive Date:	11-FEB-15		
Collector:	Client		
Moisture:	6.62%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
GC-FID											
Washington EPH Solid "Dry Weight Corrected"											
Aliphatic Hydrocarbons >C10-C12	TU	713	713	1430	ug/Kg	1	JMB3	02/23/15	2131	1458653	1
Aliphatic Hydrocarbons >C12-C16	TU	713	713	1430	ug/Kg	1					
Aliphatic Hydrocarbons >C16-C21	TU	713	713	1430	ug/Kg	1					
Aliphatic Hydrocarbons >C21-C34	U	713	713	1430	ug/Kg	1					
Aliphatic Hydrocarbons C8-C10	BJT	1370	713	1430	ug/Kg	1					
Aromatic Hydrocarbons >C10-C12	TU	713	713	1430	ug/Kg	1	JMB3	02/23/15	2101	1458653	2
Aromatic Hydrocarbons >C12-C16	TU	713	713	1430	ug/Kg	1					
Aromatic Hydrocarbons >C16-C21	TU	713	713	1430	ug/Kg	1					
Aromatic Hydrocarbons >C21-C34	TU	713	713	1430	ug/Kg	1					
Aromatic Hydrocarbons C8-C10	U	713	713	1430	ug/Kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
WA EPH	Washington EPH Prep Solids	SJW1	02/19/15	1145	1458652

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	WA EPH	
2	WA EPH	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chlorooctadecane	Washington EPH Solid "Dry Weight Corrected"	1110 ug/Kg	1430	77.7	(60%-140%)
o-Terphenyl	Washington EPH Solid "Dry Weight Corrected"	1070 ug/Kg	1430	74.9	(60%-140%)

Notes:

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Certificate of Analysis

Report Date: February 25, 2015

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-241 UPR-100-N-17 Archive

Client SDG: X0093

Client Sample ID:	B30C38	Project:	WCHN0RC241
Sample ID:	366868007	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	09-FEB-15 13:00		
Receive Date:	11-FEB-15		
Collector:	Client		
Moisture:	3.15%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
GC-FID											
Washington EPH Solid "Dry Weight Corrected"											
Aliphatic Hydrocarbons >C10-C12	TU	688	688	1380	ug/Kg	1	JMB3	02/23/15	2230	1458653	1
Aliphatic Hydrocarbons >C12-C16	TU	688	688	1380	ug/Kg	1					
Aliphatic Hydrocarbons >C16-C21	TU	688	688	1380	ug/Kg	1					
Aliphatic Hydrocarbons >C21-C34	U	688	688	1380	ug/Kg	1					
Aliphatic Hydrocarbons C8-C10	BJT	1070	688	1380	ug/Kg	1					
Aromatic Hydrocarbons >C10-C12	TU	688	688	1380	ug/Kg	1	JMB3	02/23/15	2201	1458653	2
Aromatic Hydrocarbons >C12-C16	TU	688	688	1380	ug/Kg	1					
Aromatic Hydrocarbons >C16-C21	TU	688	688	1380	ug/Kg	1					
Aromatic Hydrocarbons >C21-C34	TU	688	688	1380	ug/Kg	1					
Aromatic Hydrocarbons C8-C10	U	688	688	1380	ug/Kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
WA EPH	Washington EPH Prep Solids	SJW1	02/19/15	1145	1458652

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	WA EPH	
2	WA EPH	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chlorooctadecane	Washington EPH Solid "Dry Weight Corrected"	1040 ug/Kg	1380	75.5	(60%-140%)
o-Terphenyl	Washington EPH Solid "Dry Weight Corrected"	1100 ug/Kg	1380	79.9	(60%-140%)

Notes:

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Certificate of Analysis

Report Date: February 25, 2015

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-241 UPR-100-N-17 Archive

Client SDG: X0093

Client Sample ID:	B30C40	Project:	WCHN0RC241
Sample ID:	366868008	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	09-FEB-15 14:20		
Receive Date:	11-FEB-15		
Collector:	Client		
Moisture:	7.82%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
GC-FID											
Washington EPH Solid "Dry Weight Corrected"											
Aliphatic Hydrocarbons >C10-C12	TU	723	723	1450	ug/Kg	1	JMB3	02/23/15	2330	1458653	1
Aliphatic Hydrocarbons >C12-C16	TU	723	723	1450	ug/Kg	1					
Aliphatic Hydrocarbons >C16-C21	TU	723	723	1450	ug/Kg	1					
Aliphatic Hydrocarbons >C21-C34	U	723	723	1450	ug/Kg	1					
Aliphatic Hydrocarbons C8-C10	BJT	1330	723	1450	ug/Kg	1					
Aromatic Hydrocarbons >C10-C12	TU	723	723	1450	ug/Kg	1	JMB3	02/23/15	2300	1458653	2
Aromatic Hydrocarbons >C12-C16	TU	723	723	1450	ug/Kg	1					
Aromatic Hydrocarbons >C16-C21	TU	723	723	1450	ug/Kg	1					
Aromatic Hydrocarbons >C21-C34	TU	723	723	1450	ug/Kg	1					
Aromatic Hydrocarbons C8-C10	U	723	723	1450	ug/Kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
WA EPH	Washington EPH Prep Solids	SJW1	02/19/15	1145	1458652

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	WA EPH	
2	WA EPH	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
1-Chlorooctadecane	Washington EPH Solid "Dry Weight Corrected"	1200 ug/Kg	1450	82.7	(60%-140%)
o-Terphenyl	Washington EPH Solid "Dry Weight Corrected"	1020 ug/Kg	1450	70.4	(60%-140%)

Notes:

Quality Control Summary

GEL LABORATORIES LLC

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

QC Summary

Report Date: February 25, 2015

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

Contact: **Joan Kessner**

Workorder: **366868** **Client SDG:** X0093 **Project Description:** RC-241 UPR-100-N-17 Archive

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
GC-FID										
Batch 1458653										
QC1203267130 LCS										
Aliphatic Hydrocarbons >C10-C12	6670			5050	ug/Kg		75.8	(70%-130%)	JMB3	02/23/15 16:02
Aliphatic Hydrocarbons >C12-C16	6670			5480	ug/Kg		82.2	(70%-130%)		
Aliphatic Hydrocarbons >C16-C21	6670			5280	ug/Kg		79.2	(70%-130%)		
Aliphatic Hydrocarbons C8-C10	6670		B	5760	ug/Kg		86.5	(70%-130%)		
Aromatic Hydrocarbons >C10-C12	6670			5850	ug/Kg		87.8	(70%-130%)		02/23/15 23:59
Aromatic Hydrocarbons >C12-C16	6670			5830	ug/Kg		87.4	(70%-130%)		
Aromatic Hydrocarbons >C16-C21	13300			11500	ug/Kg		86.3	(70%-130%)		
Aromatic Hydrocarbons >C21-C34	13300			12500	ug/Kg		93.8	(70%-130%)		
**1-Chlorooctadecane	1330			960	ug/Kg		72	(60%-140%)		02/23/15 16:02
**o-Terphenyl	1330			1150	ug/Kg		86.6	(60%-140%)		02/23/15 23:59
QC1203267129 MB										
Aliphatic Hydrocarbons >C10-C12			U	666	ug/Kg					02/23/15 15:02
Aliphatic Hydrocarbons >C12-C16			U	666	ug/Kg					
Aliphatic Hydrocarbons >C16-C21			U	666	ug/Kg					
Aliphatic Hydrocarbons >C21-C34			U	666	ug/Kg					
Aliphatic Hydrocarbons C8-C10			J	1310	ug/Kg					
Aromatic Hydrocarbons >C10-C12			U	666	ug/Kg					02/23/15 14:32
Aromatic Hydrocarbons >C12-C16			U	666	ug/Kg					
Aromatic Hydrocarbons >C16-C21			U	666	ug/Kg					
Aromatic Hydrocarbons >C21-C34			U	666	ug/Kg					

QC Summary

Workorder: 366868 **Client SDG:** X0093 **Project Description:** RC-241 UPR-100-N-17 Archive

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
GC-FID											
Batch 1458653											
Aromatic Hydrocarbons C8-C10				U	666	ug/Kg					
**1-Chlorooctadecane	1330				1080	ug/Kg		80.9	(60%-140%)	JMB3	02/23/15 15:02
**o-Terphenyl	1330				993	ug/Kg		74.5	(60%-140%)		02/23/15 14:32
QC1203267131 366868005 MS											
Aliphatic Hydrocarbons >C10-C12	6830	TU	684		5530	ug/Kg		81	(70%-130%)		02/23/15 18:01
Aliphatic Hydrocarbons >C12-C16	6830	TU	684		6150	ug/Kg		90	(70%-130%)		
Aliphatic Hydrocarbons >C16-C21	6830	TU	684		6010	ug/Kg		88.1	(70%-130%)		
Aliphatic Hydrocarbons C8-C10	6830	BJT	1250	B	6320	ug/Kg		74.4	(70%-130%)		
Aromatic Hydrocarbons >C10-C12	6830	TU	684		5570	ug/Kg		81.6	(70%-130%)		02/23/15 17:32
Aromatic Hydrocarbons >C12-C16	6830	TU	684		5680	ug/Kg		83.2	(70%-130%)		
Aromatic Hydrocarbons >C16-C21	13700	TU	684		11400	ug/Kg		83.3	(70%-130%)		
Aromatic Hydrocarbons >C21-C34	13700	TU	684		12200	ug/Kg		89.3	(70%-130%)		
**1-Chlorooctadecane	1370		1010		1160	ug/Kg		85	(60%-140%)		02/23/15 18:01
**o-Terphenyl	1370		1090		1180	ug/Kg		86.3	(60%-140%)		02/23/15 17:32
QC1203267132 366868005 MSD											
Aliphatic Hydrocarbons >C10-C12	6840	TU	684	T	3900	ug/Kg	34.7*	57*	(0%-20%)		02/23/15 19:01
Aliphatic Hydrocarbons >C12-C16	6840	TU	684	T	4320	ug/Kg	35.0*	63.1*	(0%-20%)		
Aliphatic Hydrocarbons >C16-C21	6840	TU	684	T	4010	ug/Kg	39.9*	58.7*	(0%-20%)		
Aliphatic Hydrocarbons C8-C10	6840	BJT	1250	BT	4270	ug/Kg	38.7*	44.3*	(0%-20%)		
Aromatic Hydrocarbons >C10-C12	6840	TU	684	T	3410	ug/Kg	48.2*	49.8*	(0%-20%)		02/23/15 18:31
Aromatic Hydrocarbons >C12-C16	6840	TU	684	T	3420	ug/Kg	49.6*	50.1*	(0%-20%)		
Aromatic Hydrocarbons >C16-C21	13700	TU	684	T	6330	ug/Kg	57.0*	46.3*	(0%-20%)		
Aromatic Hydrocarbons >C21-C34	13700	TU	684	T	6590	ug/Kg	59.7*	48.2*	(0%-20%)		
**1-Chlorooctadecane	1370		1010		738	ug/Kg		54*	(60%-140%)		02/23/15 19:01

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QC Summary

Workorder: **366868** **Client SDG:** X0093 **Project Description:** RC-241 UPR-100-N-17 Archive

Parmname	NOM	Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date	Time
GC-FID											
Batch 1458653											
**o-Terphenyl	1370	1090		685	ug/Kg		50.1*	(60%-140%)	JMB3	02/23/15	18:31

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 or %RPD not applicable.
^ 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

Washington Method for the Determination of Extractable Petroleum Hydrocarbons

Batch ID: **1458652** **Verified by:** _____

Analyst: **Sirena White**

Method: **WA EPH**

Lab SOP: **GL-OA-E-075 REV# 0**

Instrument: **Semi-Volatiles Manual**

Sample ID	Run Date	Aliquot (g)	Prepped Aliquot (mL)	Prepped Factor (mL/g)
1203267129 MB	19-FEB-2015 11:45:00	30.04	2	0.06658
1203267130 LCS	19-FEB-2015 11:45:00	30	2	0.06667
366868005	19-FEB-2015 11:45:00	30.02	2	0.06662
1203267131 MS (366868005)	19-FEB-2015 11:45:00	30.06	2	0.06653
1203267132 MSD (366868005)	19-FEB-2015 11:45:00	30.02	2	0.06662
366868006	19-FEB-2015 11:45:00	30.02	2	0.06662
366868007	19-FEB-2015 11:45:00	30	2	0.06667
366868008	19-FEB-2015 11:45:00	30	2	0.06667

Type	Sample Id	Description	Serial Number	Spike Amt	Units
LCS	1203267130	WA LCS Spiking Solution, 200mg/L	UE140929-01	1	mL
MS	1203267131	WA LCS Spiking Solution, 200mg/L	UE140929-01	1	mL
MSD	1203267132	WA LCS Spiking Solution, 200mg/L	UE140929-01	1	mL
SURR	All	EPH Extraction Surrogates #1	UE150219-02	1	mL
REGNT	All	B&J Hexane for Trace GC, filtered through silica	150216EPH	50	mL
REGNT	All	Hexane	150218-B10	50	mL
REGNT	All	40:60 Pentane:Dichloromethane for WA EPH fractionation	150218WA	14	mL
REGNT	All	Acetone	2192351-B1	150	mL
REGNT	All	Methylene Chloride	2217490-D	200	mL
REGNT	All	Pentane 4L bottle	CI2163102	12	mL
REGNT	All	5g/25mL Isolute SPE Column for EPH Fractionation	EPH150203B	5	g
SOURC	All	SODIUM SULFATE	2193342	30	g

Comments:

Final Solvent: Hexane
Verified by: MD

Fractionation on 2/23/15 by Josh Brooks

FID Diesel Range Organics Analysis

Case Narrative

Diesel Range Organics
Technical Case Narrative
Eberline (WCHN)
SDG #: X0093
Work Order #: 366868

Method/Analysis Information

Procedure:	**Analysis of Diesel Range Organics by Flame Ionization Detector**
Analytical Method:	NWTPH-Dx in Soil
Prep Method:	SW846 3541
Analytical Batch Number:	1458362
Prep Batch Number:	1458361

Sample Analysis

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

Sample ID	Client ID
366868005	B30C34
366868006	B30C36
366868007	B30C38
366868008	B30C40
1203266323	MB for batch 1458361
1203266324	Laboratory Control Sample (LCS)
1203266325	366868005(B30C34) Matrix Spike (MS)
1203266326	366868005(B30C34) Matrix Spike Duplicate (MSD)

The samples in this SDG were analyzed on a "dry weight" 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# 25.

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
All surrogate recoveries were within the established acceptance criteria for this SDG.

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

QC Sample Designation
Sample 366868005 (B30C34) was selected for the MS and MSD analyses.

Matrix Spike (MS) Recovery Statement
The MS and MSD recoveries were 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. A DER was not required for this SDG in this batch. A data exception report (DER) was not generated for this SDG.

Manual Integrations
Samples required manual integration for surrogates.

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.

GEL LABORATORIES LLC

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

Qualifier Definition Report
for

WCHN001 Eberline

Client SDG: X0093 GEL Work Order: 366868 Project: RC−241 UPR−100−N−17

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: Cameron Bearden **Name: Cameron Bearden**

Date: 27 FEB 2015 **Title: Group Leader**

Sample Data Summary

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: February 27, 2015

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-241 UPR-100-N-17 Archive

Client SDG: X0093

Client Sample ID:	B30C34	Project:	WCHN0RC241
Sample ID:	366868005	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	09-FEB-15 09:00		
Receive Date:	11-FEB-15		
Collector:	Client		
Moisture:	2.55%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH-Dx in Soil + Motor oil "Dry Weight Corrected"											
Diesel Range Organics (C10-C20)	U	2220	2220	6840	ug/kg	1	BYT1	02/19/15	1703	1458362	1
Motor Oil (C20-C36)	U	2220	2220	6840	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	MXD2	02/13/15	1146	1457569
SW846 3541	3541 DRO IN SOIL PREP	VXS1	02/17/15	1725	1458361

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o-Terphenyl	SW 3541/NWTPH-Dx in Soil + Motor oil "Dry Weight Corrected"	460 ug/kg	684	67.3	(50%-150%)

Notes:

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: February 27, 2015

Company :	WC-Hanford, Inc.		
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354		
Contact:	Joan Kessner	Client SDG:	X0093
Project:	RC-241 UPR-100-N-17 Archive		

Client Sample ID:	B30C36	Project:	WCHN0RC241
Sample ID:	366868006	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	09-FEB-15 10:30		
Receive Date:	11-FEB-15		
Collector:	Client		
Moisture:	6.62%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH-Dx in Soil + Motor oil "Dry Weight Corrected"											
Diesel Range Organics (C10-C20)	U	2320	2320	7130	ug/kg	1	BYT1	02/19/15	1859	1458362	1
Motor Oil (C20-C36)	J	2580	2320	7130	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	MXD2	02/13/15	1146	1457569
SW846 3541	3541 DRO IN SOIL PREP	VXS1	02/17/15	1725	1458361

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o-Terphenyl	SW 3541/NWTPH-Dx in Soil + Motor oil "Dry Weight Corrected"	443 ug/kg	713	62.2	(50%-150%)

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: February 27, 2015

Company :	WC-Hanford, Inc.		
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354		
Contact:	Joan Kessner	Client SDG:	X0093
Project:	RC-241 UPR-100-N-17 Archive		

Client Sample ID:	B30C38	Project:	WCHN0RC241
Sample ID:	366868007	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	09-FEB-15 13:00		
Receive Date:	11-FEB-15		
Collector:	Client		
Moisture:	3.15%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH-Dx in Soil + Motor oil "Dry Weight Corrected"											
Diesel Range Organics (C10-C20)	U	2240	2240	6880	ug/kg	1	BYT1	02/20/15	1456	1458362	1
Motor Oil (C20-C36)	U	2240	2240	6880	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	MXD2	02/13/15	1146	1457569
SW846 3541	3541 DRO IN SOIL PREP	VXS1	02/17/15	1725	1458361

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o-Terphenyl	SW 3541/NWTPH-Dx in Soil + Motor oil "Dry Weight Corrected"	355 ug/kg	688	51.6	(50%-150%)

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: February 27, 2015

Company :	WC-Hanford, Inc.		
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354		
Contact:	Joan Kessner	Client SDG:	X0093
Project:	RC-241 UPR-100-N-17 Archive		

Client Sample ID:	B30C40	Project:	WCHN0RC241
Sample ID:	366868008	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	09-FEB-15 14:20		
Receive Date:	11-FEB-15		
Collector:	Client		
Moisture:	7.82%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Diesel Range Organics											
SW 3541/NWTPH-Dx in Soil + Motor oil "Dry Weight Corrected"											
Diesel Range Organics (C10-C20)	U	2350	2350	7230	ug/kg	1	BYT1	02/19/15	2016	1458362	1
Motor Oil (C20-C36)	U	2350	2350	7230	ug/kg	1					

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
SW846 3541	3541 DRO IN SOIL PREP	MXD2	02/13/15	1146	1457569
SW846 3541	3541 DRO IN SOIL PREP	VXS1	02/17/15	1725	1458361

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Dx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
o-Terphenyl	SW 3541/NWTPH-Dx in Soil + Motor oil "Dry Weight Corrected"	566 ug/kg	723	78.2	(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: February 27, 2015

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

Contact: **Joan Kessner**

Workorder: **366868** **Client SDG:** X0093 **Project Description:** RC-241 UPR-100-N-17 Archive

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Diesel Range Organics											
Batch 1458362											
QC1203266324 LCS											
Diesel Range Organics (C10-C20)	66600				53100	ug/kg		79.7	(70%-130%)	BYT1	02/19/15 16:25
Motor Oil (C20-C36)	66600				56400	ug/kg		84.6	(70%-130%)		
**o-Terphenyl	666				540	ug/kg		81.1	(50%-150%)		
QC1203266323 MB											
Diesel Range Organics (C10-C20)				U	2170	ug/kg					02/19/15 15:46
Motor Oil (C20-C36)				U	2170	ug/kg					
**o-Terphenyl	666				438	ug/kg		65.7	(50%-150%)		
QC1203266325 366868005 MS											
Diesel Range Organics (C10-C20)	68300	U	2220		48800	ug/kg		71.4	(70%-130%)		02/19/15 17:41
Motor Oil (C20-C36)	68300	U	2220		58100	ug/kg		85	(70%-130%)		
**o-Terphenyl	683		460		528	ug/kg		77.3	(50%-150%)		
QC1203266326 366868005 MSD											
Diesel Range Organics (C10-C20)	68300	U	2220		49200	ug/kg	0.961	72.1	(0%-20%)		02/19/15 18:20
Motor Oil (C20-C36)	68300	U	2220		57200	ug/kg	1.62	83.7	(0%-20%)		
**o-Terphenyl	683		460		511	ug/kg		74.9	(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: **366868** **Client SDG:** X0093 **Project Description:** RC-241 UPR-100-N-17 Archive

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 or %RPD not applicable.
^ 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 Soil, Sludge, and Other Miscellaneous Solid Samples

Batch ID: **1458361** **Verified by:** _____

Analyst: **Vince Sandifer**

Method: **SW846 3541**

Lab SOP: **GL-OA-E-010 REV# 24**

Instrument: **Semi-Volatiles Manual**

Sample ID	Run Date	Aliquot (g)	Prepped Aliquot (mL)	Prepped Factor (mL/g)
1203266323 MB	17-FEB-2015 17:25:00	30.01	1	0.03332
1203266324 LCS	17-FEB-2015 17:25:00	30.04	1	0.03329
366868005 - 2	17-FEB-2015 17:25:00	30.02	1	0.03331
1203266325 - 2 MS (366868005)	17-FEB-2015 17:25:00	30.03	1	0.0333
1203266326 - 2 MSD (366868005)	17-FEB-2015 17:25:00	30.04	1	0.03329
366868006 - 2	17-FEB-2015 17:25:00	30.04	1	0.03329
366868007 - 2	17-FEB-2015 17:25:00	30	1	0.03333
366868008 - 2	17-FEB-2015 17:25:00	30	1	0.03333

Type	Sample Id	Description	Serial Number	Spike Amt	Units
LCS	1203266324	AZDRO SPIKE LCS STD,4000ug/ml	WFI150212-62	1	mL
MS	1203266325	AZDRO SPIKE LCS STD,4000ug/ml	WFI150212-62	1	mL
MSD	1203266326	AZDRO SPIKE LCS STD,4000ug/ml	WFI150212-62	1	mL
SURR	All	20 ppm surrogate	WE150212-04	1	mL
REGNT	All	Methylene Chloride	2211177-D	120	mL
SOURC	All	SODIUM SULFATE	2193342	30	g

Comments:

final solvent CH2Cl2

verified by AW

GC Volatiles (GRO) Analysis

Case Narrative

GC Volatiles (GRO)
Technical Case Narrative
Eberline (WCHN)
SDG #: X0093
Work Order #: 366868

Method/Analysis Information

Procedure:	**Volatile Total Petroleum Hydrocarbons by Flame Ionization Detector**
Analytical Method:	NWTPH-Gx in Soil
Prep Method:	NWTPH-Gx in Soil
Analytical Batch Number:	1459472
Prep Batch Number:	1459471

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
366868005	B30C34
366868006	B30C36
366868007	B30C38
366868008	B30C40
1203269368	MB for batch 1459471
1203269370	Laboratory Control Sample (LCS)
1203269371	366868005(B30C34) Post Spike (PS)
1203269372	366868005(B30C34) Post Spike Duplicate (PSD)
1203269369	High Blank (HB)

The samples in this SDG were analyzed on a "dry weight" 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.

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# 25.

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 366868005 (B30C34) was selected for analysis as the matrix spike.

Spike 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
Samples 1203269369 (HB), 1203269371 (B30C34PS), 1203269372 (B30C34PSD), 366868005 (B30C34), 366868006 (B30C36), 366868007 (B30C38) and 366868008 (B30C40) were analyzed using a methanol extraction procedure at 1:50 dilutions. The samples were analyzed at the lowest dilution possible when using a methanol extraction procedure.

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

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.

GEL LABORATORIES LLC

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

Qualifier Definition Report
for

WCHN001 Eberline

Client SDG: X0093 GEL Work Order: 366868 Project: RC-241 UPR-100-N-17

The Qualifiers in this report are defined as follows:

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.

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: **02 MAR 2015** **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: February 26, 2015

Company :	WC-Hanford, Inc.		
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354		
Contact:	Joan Kessner	Client SDG:	X0093
Project:	RC-241 UPR-100-N-17 Archive		

Client Sample ID:	B30C34	Project:	WCHN0RC241
Sample ID:	366868005	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	09-FEB-15 09:00		
Receive Date:	11-FEB-15		
Collector:	Client		
Moisture:	2.55%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatiles GRO Organics											
NWTPH-Gx GRO in Soil "Dry Weight Corrected"											
Gasoline Range Organics (C6 - C10)	DU	1710	1710	5130	UG/KG	50	ACJ	02/18/15	1801	1459472	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
NWTPH-Gx in Soil	NWTPH-Gx Prep in Soil	ACJ	02/18/15	1615	1459471

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Gx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	NWTPH-Gx GRO in Soil "Dry Weight Corrected"	4550 UG/KG	50.0	88.7	(50%-150%)

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: February 26, 2015

Company :	WC-Hanford, Inc.
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354
Contact:	Joan Kessner
Project:	RC-241 UPR-100-N-17 Archive

Client SDG: X0093

Client Sample ID:	B30C36	Project:	WCHN0RC241
Sample ID:	366868006	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	09-FEB-15 10:30		
Receive Date:	11-FEB-15		
Collector:	Client		
Moisture:	6.62%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatiles GRO Organics											
NWTPH-Gx GRO in Soil "Dry Weight Corrected"											
Gasoline Range Organics (C6 - C10)	DU	1790	1790	5350	UG/KG	50	ACJ	02/18/15	1829	1459472	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
NWTPH-Gx in Soil	NWTPH-Gx Prep in Soil	ACJ	02/18/15	1616	1459471

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Gx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	NWTPH-Gx GRO in Soil "Dry Weight Corrected"	5020 UG/KG	50.0	93.8	(50%-150%)

Notes:

GEL LABORATORIES LLC

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

Certificate of Analysis

Report Date: February 26, 2015

Company :	WC-Hanford, Inc.		
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354		
Contact:	Joan Kessner	Client SDG:	X0093
Project:	RC-241 UPR-100-N-17 Archive		

Client Sample ID:	B30C38	Project:	WCHN0RC241
Sample ID:	366868007	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	09-FEB-15 13:00		
Receive Date:	11-FEB-15		
Collector:	Client		
Moisture:	3.15%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatiles GRO Organics											
NWTPH-Gx GRO in Soil "Dry Weight Corrected"											
Gasoline Range Organics (C6 - C10)	DU	1720	1720	5160	UG/KG	50	ACJ	02/18/15	1856	1459472	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
NWTPH-Gx in Soil	NWTPH-Gx Prep in Soil	ACJ	02/18/15	1617	1459471

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Gx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	NWTPH-Gx GRO in Soil "Dry Weight Corrected"	5070 UG/KG	50.0	98.1	(50%-150%)

Notes:

GEL LABORATORIES LLC

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Certificate of Analysis

Report Date: February 26, 2015

Company :	WC-Hanford, Inc.		
Address :	2620 Fermi Avenue MSIN H4-21 Richland, Washington 99354		
Contact:	Joan Kessner	Client SDG:	X0093
Project:	RC-241 UPR-100-N-17 Archive		

Client Sample ID:	B30C40	Project:	WCHN0RC241
Sample ID:	366868008	Client ID:	WCHN001
Matrix:	SOIL		
Collect Date:	09-FEB-15 14:20		
Receive Date:	11-FEB-15		
Collector:	Client		
Moisture:	7.82%		

Parameter	Qualifier	Result	DL	RL	Units	DF	Analyst	Date	Time	Batch	Method
Volatiles GRO Organics											
NWTPH-Gx GRO in Soil "Dry Weight Corrected"											
Gasoline Range Organics (C6 - C10)	DU	1810	1810	5420	UG/KG	50	ACJ	02/18/15	1924	1459472	1

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
NWTPH-Gx in Soil	NWTPH-Gx Prep in Soil	ACJ	02/18/15	1618	1459471

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	NWTPH-Gx in Soil	

Surrogate/Tracer Recovery	Test	Result	Nominal	Recovery%	Acceptable Limits
Bromofluorobenzene	NWTPH-Gx GRO in Soil "Dry Weight Corrected"	5070 UG/KG	50.0	93.4	(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: February 26, 2015

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

Contact: **Joan Kessner**

Workorder: **366868** **Client SDG:** X0093 **Project Description:** RC-241 UPR-100-N-17 Archive

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Volatiles GRO Organics											
Batch 1459472											
QC1203269369 HB											
Gasoline Range Organics (C6 - C10)				DU	1670	UG/KG				ACJ	02/18/15 14:18
**Bromofluorobenzene					4660	UG/KG		93.2	(50%-150%)		
QC1203269370 LCS											
Gasoline Range Organics (C6 - C10)	500				481	UG/KG		96.2	(70%-130%)		02/18/15 10:29
**Bromofluorobenzene					54.6	UG/KG		109	(50%-150%)		
QC1203269368 MB											
Gasoline Range Organics (C6 - C10)				U	16.7	UG/KG					02/18/15 10:57
**Bromofluorobenzene					52.1	UG/KG		104	(50%-150%)		
QC1203269371 366868005 PS											
Gasoline Range Organics (C6 - C10)	500	DU	0.00	D	483	ug/L		96.6	(70%-130%)		02/18/15 19:52
**Bromofluorobenzene	50.0		44.4		47.8	ug/L		95.6	(50%-150%)		
QC1203269372 366868005 PSD											
Gasoline Range Organics (C6 - C10)	500	DU	0.00	D	473	ug/L	2.11	94.6	(0%-20%)		02/18/15 20:19
**Bromofluorobenzene	50.0		44.4		48.2	ug/L		96.3	(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.

QC Summary

Workorder: **366868** **Client SDG:** X0093 **Project Description:** RC-241 UPR-100-N-17 Archive

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

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 or %RPD not applicable.
^ 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

Volatile Total Petroleum Hydrocarbons by Flame Ionization Detector

Batch ID: **1459471**
Analyst: Amy Jamison
Method: NWTPH-Gx in Soil
Lab SOP: GL-OA-E-004 REV# 25
Instrument: Sartorius Balance B-001

Type	Sample Id	Description	Serial Number	Spike Amount	Spike Units

Sample ID	Run Date	Matrix	Initial Weight (g)	Final Volume (mL)	Prep Factor (mL/g)	pH Check
1203269370 LCS	18-FEB-2015 08:00:00	Soil	5	5	1	
1203269368 MB	18-FEB-2015 08:30:00	Soil	5	5	1	
1203269369 HB	18-FEB-2015 13:45:00	Soil	5	10	2	
366868005	18-FEB-2015 16:15:00	Soil	5	10	2	
1203269371 PS (366868005)	18-FEB-2015 16:15:00	Soil	5	10	2	
1203269372 PSD (366868005)	18-FEB-2015 16:15:00	Soil	5	10	2	
366868006	18-FEB-2015 16:16:00	Soil	5	10	2	
366868007	18-FEB-2015 16:17:00	Soil	5	10	2	
366868008	18-FEB-2015 16:18:00	Soil	5	10	2	

Reagent/Solvent Lot ID	Description	Amount

Comments: