

The order of this data package is as follows:

1. Chain-of-Custody/Lab Request
2. Copies of field COCs
3. Validation Report
4. Laboratory analysis

Comments:

[illegible]

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

EVENT NAME: Water/CdV (TA16 260) Q4 MY2017

SAMPLE ID: CAWA-17-143059

WORK ORDER:

	AS PLANNED	AS COLLECTED		AS PLANNED	AS COLLECTED
Date Collected (MM/DD/YYYY):	09-06-2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	10:43		MEDIA:	UA	
PRS ID:	NA		SAMPLE TECH CODE:	GS	
LOCATION ID:	R-68		FIELD PREP:	UF	
LOCATION TYPE:	NA		FIELD QC TYPE:	REG	
TOP DEPTH:	↓		SAMPLE USAGE:	INV	↓
BOTTOM DEPTH:	↓	✓	EXCAVATED:		YES / NO / NA

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
NA	MSGP-Hg	1000 500 ML POLY 9/6/17	1	HNO3	Y	NA
↓	WSP-8082-PCB	1 LITER AMBER GLASS	3	ICE	↓	↓
↓	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	2	HCL	↓	↓
↓	WSP-8270C- SVOA	1 LITER AMBER GLASS	2	ICE	↓	↓
↓	WSP-8290-D/F	1 LITER AMBER GLASS	2	ICE	↓	↓
↓	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	3	ICE	↓	↓
↓	WSP-CN(T)	250 ML POLY	1	NAOH	↓	↓
↓	WSP-GrossA/B	1 LITER POLY	1	HNO3	↓	↓
↓	WSP-LL-H-3	1 LITER POLY	1	NONE	↓	↓
↓	WSP-RAD	1 GAL POLY	1	HNO3	↓	↓
↓	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4	↓	↓

SAMPLE COMMENTS:

Sampled 50' from running diesel generator

LOCATION COMMENTS:

None

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

EVENT NAME: Water/CdV (TA16 260) Q4 MY2017

SAMPLE ID: CAWA-17-143059

WORK ORDER:

FIELD PARAMETERS:

Sample Time 10:43 HH:MM
PH 7.42 SU DO 5.68 mg/L Q= 5.77 gpm
Temp 14.20C Turb 5.52 NTU
SpC 113.5 µs/cm ORP 120.0 mV

COLLECTED BY (PRINT):

K. Tow, T. Vander Vis, A. Vigil

RELINQUISHED BY (Printed Name) Tanya Vander Vis (Signature) <i>Tanya Vander Vis</i>	Date/Time 9-6-17 1145	RECEIVED BY (Printed Name) <i>MATI ENGERT</i> (Signature) <i>MATI ENGERT</i>	Date/Time 9-6-17 1145
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 08/24/2017

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

EVENT NAME: Water/CdV (TA16 260) Q4 MY2017

SAMPLE ID: CAWA-17-143061

WORK ORDER:

	<u>AS PLANNED</u>	<u>AS COLLECTED</u>		<u>AS PLANNED</u>	<u>AS COLLECTED</u>
Date Collected (MM/DD/YYYY):	09/06/2017	OK	FIELD MATRIX:	WG	OK
TIME COLLECTED (HH:MM):	0815		MEDIA:	UA	
PRS ID:	N/A		SAMPLE TECH CODE:	DC	
LOCATION ID:	R-68		FIELD PREP:	UF	
LOCATION TYPE:	N/A		FIELD QC TYPE:	PEB	
TOP DEPTH:			SAMPLE USAGE:	QC	
BOTTOM DEPTH:			EXCAVATED:		YES / NO / (NA)

PRIORITY	ORDER	CONTAINER	#	PRESERVATIVE	COLLECTED Y/N	SPECIAL INSTRUCTIONS
N/A	WSP-8082-PCB	1 LITER AMBER GLASS	2	ICE	Y	N/A
	WSP-8260B- VOA	40 ML SEPTUM AMBER GLASS	2	HCL		
	WSP-8270C- SVOA	1 LITER AMBER GLASS	2	ICE		
	WSP-8290-D/F	1 LITER AMBER GLASS	2	ICE		
	WSP-8330B-NMED HEXMOD	1 LITER AMBER GLASS	2	ICE		
	WSP-All Metals	1 LITER POLY	1	HNO3 ICE		
	WSP-CN(T)	250 ML POLY	1	NAOH		
	WSP- GENINORG+PerChlorat e	1 LITER POLY	1	ICE		
	WSP-GrossA/B	1 LITER POLY	1	HNO3		
	WSP-LL-H-3	1 LITER POLY	1	NONE		
	WSP- NH3+NO3/NO2+PO4	500 ML AMBER GLASS	1	H2SO4		
	WSP-RAD	1 GAL POLY	1	HNO3		
	WSP-TKN+TOC	500 ML AMBER GLASS	1	H2SO4		

SAMPLE COLLECTION LOG/FIELD CHAIN OF CUSTODY

EVENT ID: 11390

EVENT NAME: Water/CdV (TA16 260) Q4 MY2017

SAMPLE ID: CAWA-17-143061

WORK ORDER:

SAMPLE COMMENTS:

LOCATION COMMENTS:

FIELD PARAMETERS:

Sample Time

HH:MM

COLLECTED BY (PRINT): A VIGIL, D. HUGHES

RELINQUISHED BY (Printed Name) (Signature)	Date/Time 09-06-17 11:45	RECEIVED BY (Printed Name) (Signature)	Date/Time 9/6/17 11:45
RELINQUISHED BY (Printed Name) (Signature)	Date/Time	RECEIVED BY (Printed Name) (Signature)	Date/Time

Report Date: 08/28/2017

COC: 2017-2712

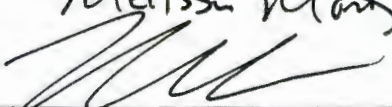
TEST - Field Screen		YES	NO	NA
The sample has field screening measurements of alpha activity and beta activity.			<input checked="" type="checkbox"/>	
Activity (dpm/100cm ²)	Sampled Location			
Alpha detectable and < 20,000	TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, TA-48, or TA-49			<input checked="" type="checkbox"/>
Alpha > 125 and < 20,000	other locations			
Beta > 1,500 and < 100,000	any location			
Alpha activity \geq 20,000 dpm/100cm ² and beta activity \geq 100,000 dpm/100cm ² and \geq 0.5 mR/hr on the external surface of the package.				
The sample is tentatively identified as DOT hazard Class 7 (Radioactive). The shipment is labeled <i>Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910</i> based on field screening measurements of alpha and beta activity.				

TEST - Location		YES	NO	NA
Prior analytical measurements of radioactive isotopes are available.			<input checked="" type="checkbox"/>	
Activity (pCi/g)	Sampled Location			
<ul style="list-style-type: none"> Am-241 > 27 and < 27,000 Cs-137 > 270 and < 270,000 Pu-238 > 27 and < 27,000 Pu-239/240 > 27 and < 27,000 Th-228 > 27 and < 27,000 U-238 > 270 and < 270,000 H-3 > 27,000,000 and < 27,000,000,000 	The sampling location is within TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, Sediment/Soil from Effluent Canyon, Mortandad Canyon from Effluent Canyon to the Soil Contamination Area near the sediment traps, Bayo Canyon at TA-10, TA-15, TA-35, TA-36, TA-39, TA-48 or TA-49.			<input checked="" type="checkbox"/>
<ul style="list-style-type: none"> Am-241, Pu-238, Pu-239/240, or Th-228 \geq 27,000 U-238 \geq 270,000 H-3 \geq 27,000,000,000 				
The sample is tentatively identified as DOT hazard Class 7 (Radioactive). The shipment is labeled <i>Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910</i> based on prior analytical measurements of radioactive isotopes.				

TEST - AK		YES	NO	NA
The shippers documented knowledge of the sample positively identifies appropriate labeling.				<input checked="" type="checkbox"/>
The sample is tentatively identified as DOT hazard Class 7 (Radioactive). The shipment is labeled <i>Radioactive Material, Excepted Package - Limited Quantity of Material - UN2910</i> , and the sample is submitted to ARS or RP for hazard classification analysis.				<input checked="" type="checkbox"/>

HOLD SAMPLES FOR ANALYSIS
The sampling location within TA-1 and adjacent hillsides, TA-21, Acid Canyon, MDA C at TA-50, Area G at TA-54, Sediment/Soil from Effluent Canyon, Mortandad Canyon from Effluent Canyon to the Soil Contamination Area near the sediment traps, Bayo Canyon at TA-10, TA-35, TA-15, TA-36, TA-39, TA-48 or TA-49 AND does not have usable field screening measurements of alpha and beta activity available AND the sampling location or related sampling location(s) do not have prior reliable analytical measurements of radioactive isotopes available AND knowledge of the sample is not acceptable to identify appropriate labeling.

These samples do not meet the criteria for classification in any hazard class according to regulation OSHA 29 CFR 1910.1200. The sample(s) contained in this shipment have been assigned a tentative proper DOT shipping name, hazard class, identification number, and packing group, based on the shipper's knowledge of the sample:

Hazard Assessment Completed By:	Date/Time
(Printed Name) <u>Melissa Marky</u>	<u>9/7/17 3:00</u>
(Signature) 	

DATA VALIDATION REPORT

Chain Of Custody No. 2017-2712

1. Distribution Of Samples In EDD.

SDG	Analytical Method	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks
11315	EPA:170.0	1				
11315	SW-846:8290A	1				

SDG	Analytical Method	Analysis Lot ID	Prep Lot ID	Regular Samples	Field Duplicates	Trip Blanks	Field Blanks	Equipment Blanks	Method Blanks	Matrix Spikes	Matrix Spike Dups	Analytical Spikes	Post-Digestion Spikes	Lab Control Samples	Lab Control Sample Dups	Blank Spike	Blank Spike Dups	Lab Duplicates	Storage Blanks	Preparation Blanks	Reagent Blanks
11315	EPA:170.0	NA	NA	1																	
11315	SW-846:8290A	35763	35760	1					1					1	1						

2. Distribution Of Analytes In EDD.

Analytical Method	Analytical Method Category	Field Sample ID	Lab Sample ID	Sample Purpose	Target Analytes	Surrogates	Spiked Compounds	TICS
EPA:170.0	VOC	CAWA-17-143059	11315001	REG	1	0	0	0
EPA:170.0	VOC	CAWA-17-143061	11315002	PEB	1	0	0	0
SW-846:8290A	DIOXINS FURANS	CAWA-17-143059	11315001	REG	25	9	0	0
SW-846:8290A	DIOXINS FURANS	CAWA-17-143061	11315002	PEB	25	9	0	0
SW-846:8290A	DIOXINS FURANS	LCS	12019659	LCS	0	9	17	0
SW-846:8290A	DIOXINS FURANS	LCSD	12019660	LCSD	0	9	17	0
SW-846:8290A	DIOXINS FURANS	MB	12019658	MB	25	9	0	0

3. Are any analytes missing?

No.

4. Were any holding times exceeded?

No.

DATA VALIDATION REPORT

5. Any contaminants in blanks?

No.

6. Any surrogate recoveries outside the control limits?

No.

7. Any MS/MSD recoveries or RPDs outside the control limits?

No.

8. Any LCS/LCSD or BS/BSD recoveries or RPDs outside the control limits?

No.

9. Any Field Duplicate RPDs outside the desired limits?

No.

10. Any Lab Duplicate RPDs outside the desired limits?

No.

11. Any required reporting limits exceeded?

No.

12. Additional Validator's Comments.

13. Display Flagged Data.

DATA VALIDATION REPORT

None.

Reason Code

Description

NQ

The analytical laboratory did not qualify the analyte as not detected and/or any other standard qualify. The analyte is detected in the sample.

U_LAB

The analytical laboratory qualified the analyte as not detected.

14. Usable Result Count.

Field Sample ID	Location ID	Sample Purpose	Analytical Method	No. Unuseable Records	Total Records
CAWA-17-143059	R-68	REG	EPA:170.0	0	1
CAWA-17-143059	R-68	REG	SW-846:8290A	0	25
CAWA-17-143061	R-68	PEB	EPA:170.0	0	1
CAWA-17-143061	R-68	PEB	SW-846:8290A	0	25

October 16, 2017

Ms. Nita Patel
Los Alamos National Laboratory
PO Box 1663
TA-03, SM271, Drop Pt. 02U, Rm111
Los Alamos, New Mexico 87545

Re: 2012 WQH with LOCUS EDD
Work Order: 11315
SDG: 2017-2712

Dear Ms. Patel:

Cape Fear Analytical LLC (CFA) appreciates the opportunity to provide the enclosed analytical results for the sample(s) we received on September 08, 2017. This original data report has been prepared and reviewed in accordance with CFA'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 910-795-0421.

Sincerely,



Cynde Larkins
Project Manager

Chain of Custody: 2017-2712
Enclosures

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Los Alamos National Laboratory
2012 WQH with LOCUS EDD
Workorder #: 11315
SDG # : 2017-2712

Case Narrative

**Receipt Narrative
for
Los Alamos National Laboratory
SDG: 2017-2712
Work Order: 11315**

Laboratory Identification

Cape Fear Analytical, LLC
3306 Kitty Hawk Road, Suite 120
Wilmington, North Carolina 28405
(910) 795-0421

Summary

Sample receipt: The samples arrived at Cape Fear Analytical LLC (CFA), Wilmington, North Carolina on September 08, 2017 for analysis. The samples were delivered with proper chain of custody documentation and signatures. Shipping container temperatures were checked, documented, and within specifications. All sample containers arrived without any visible signs of tampering or breakage. Appropriate sample containers were received. Sample containers were checked for pH, where appropriate, and matched the preservative as documented on the accompanying chain of custody. Sufficient sample was received for analysis. There are no additional comments concerning sample receipt.

Sample Identification: The laboratory received the following samples:

<u>Laboratory ID</u>	<u>Client ID</u>
11315001	CAWA-17-143059
11315002	CAWA-17-143061

Case Narrative

Sample analyses were conducted using methodology as outlined in Cape Fear Analytical'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.

Data Package

The enclosed data package contains the following sections: Case Narrative, Chain of Custody, Cooler Receipt Checklist and data from the following fractions: High Resolution Dioxins and Furans.

Sincerely,






Cynde Larkins
Project Manager

List of current CFA Certifications as of 12 September 2017

State	Certification
California (NELAC)	09270CA
New Jersey (NELAC)	NC013
North Carolina	NC01894
South Carolina	99063001
Utah (Primary NELAC)	CFAL

Chain of Custody and Supporting Documentation

[illegible]

Relinquished by: 	Print Name: <u>Cyndee Larkins</u>	Date/Time: <u>08 Sep 17</u>
Relinquished by: 	Print Name: <u>Cyndee Larkins</u>	Date/Time: <u>10/5</u>
Relinquished by: 	Print Name: <u>Cyndee Larkins</u>	Date/Time: <u>10/5</u>

SAMPLE RECEIPT CHECKLIST
Cape Fear Analytical

Client: <u>LANL</u>	Work Order: <u>11315</u>
Shipping Company: <u>FedEx</u>	Date/Time Received: <u>08 Sep 17 1015</u>

Suspected Hazard Information	Yes	NA	No
Shipped as DOT Hazardous?			<input checked="" type="checkbox"/>
Samples identified as Foreign Soil?			<input checked="" type="checkbox"/>

DOE Site Sample Packages	Yes	NA	No*
Screened <0.5 mR/hr?	<input checked="" type="checkbox"/>		
Samples < 2x background?	<input checked="" type="checkbox"/>		

* Notify RSO of any responses in this column immediately.

Air Sample Receipt Specifics	Yes	NA	No
Air sample in shipment?			<input checked="" type="checkbox"/>

Air Witness: _____

Sample Receipt Criteria	Yes	NA	No	Comments/Qualifiers (required for Non-Conforming Items)
1 Shipping containers received intact and sealed?	<input checked="" type="checkbox"/>			Circle Applicable: seals broken damaged container leaking container other(describe)
2 Chain of Custody documents included with shipment?	<input checked="" type="checkbox"/>			
3 Samples requiring cold preservation within 0-6°C?	<input checked="" type="checkbox"/>			Preservation Method: ice bags <u>blue ice</u> dry ice none other (describe) <u>6.8°-2.9-3.9°</u> <u>5.7°-2.9 = 2.8°</u>
4 Aqueous samples found to have visible solids?			<input checked="" type="checkbox"/>	Sample IDs, containers affected:
5 Samples requiring chemical preservation at proper pH?		<input checked="" type="checkbox"/>		Sample IDs, containers affected and pH observed: <u>pH=8 on CAWA-17-143061, pH=7 on 143059</u> If preservative added, Lot#:
6 Samples requiring preservation have no residual chlorine?		<input checked="" type="checkbox"/>		Sample IDs, containers affected: If preservative added, Lot#:
7 Samples received within holding time?	<input checked="" type="checkbox"/>			Sample IDs, tests affected:
8 Sample IDs on COC match IDs on containers?	<input checked="" type="checkbox"/>			Sample IDs, containers affected:
9 Date & time of COC match date & time on containers?	<input checked="" type="checkbox"/>			Sample IDs, containers affected:
10 Number of containers received match number indicated on COC?	<input checked="" type="checkbox"/>			List type and number of containers / Sample IDs, containers affected: <u>2-1 L WMA per sample</u>
11 COC form is properly signed in relinquished/received sections?	<input checked="" type="checkbox"/>			

Comments:

Checklist performed by: Initials: CJ

Date: 08 Sep 17

CF-UD-F-7

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03

LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 07SEP17
ACTWGT: 47.0 LB MAN
CAD: 0014176/CAFE2916

BILL SENDER

TO **CHRIS CORNWELL**
CAPE FEAR ANALYTICAL
3306 KITTY HAWK ROAD, SUITE 120
WILMINGTON NC 28405

(910) 796-0421

REF: 21PDOASRSW12CHWC00

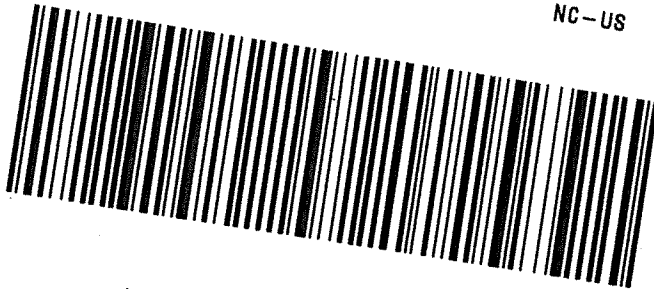


1 of 2
TRK# 5908 1782 6994
0201
MASTER

FRI - 08 SEP 10:30A
PRIORITY OVERNIGHT

XH ILMA

28405
NC-US GSO



Part # 156140V-434 RT2 EXP 02/18 ***

*Temp: 3.80
2.80 at 08SEP17*

538C1/FF19/329B

ORIGIN ID:SAFA (505) 665-9966
KEITH GREENE
LOS ALAMOS NATL LAB.
TA00 BLDG 1237 DPU 03
LOS ALAMOS, NM 87545
UNITED STATES US

SHIP DATE: 07SEP17
ACTWGT: 30.0 LB MAN
CAD: 0014176/CAFE2916

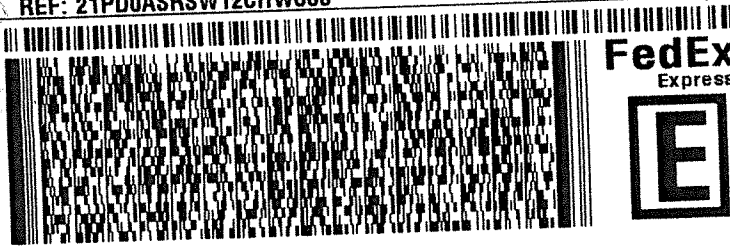
BILL SENDER

CHRIS CORNWELL
CAPE FEAR ANALYTICAL
3306 KITTY HAWK ROAD, SUITE 120

WILMINGTON NC 28405

(910) 796-0421

REF: 21PD0ASRSW12CHWC00



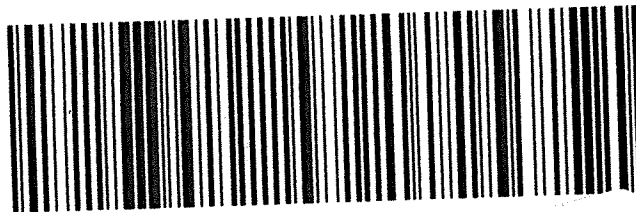
2 of 2
MPS# 5908 1782 7008
0263
Mstr# 5908 1782 6994

FRI - 08 SEP 10:30A
PRIORITY OVERNIGHT

XH ILMA

28405
NC-US GSO

Part # 156148V-434 R172 EXP 02/18



Temp = 39°

RT 357
FZ 359

1 10:30
A 7008
09.08

High Resolution Dioxins and Furans Analysis

Case Narrative

**HDOX LANL-FBWP Case Narrative
Los Alamos National Laboratory (LANL)
SDG 2017-2712
Work Order 11315**

Method/Analysis Information

Product: Dioxins/Furans by SW846 Method 8290A in Liquids
Analytical Method: SW846 8290A
Extraction Method: SW846 3520C
Analytical Batch Number: 35763
Clean Up Batch Number: 35761
Extraction Batch Number: 35760

Sample Analysis

The following samples were analyzed using the analytical protocol as established in SW846 8290A:

Sample ID	Client ID
11315001	CAWA-17-143059
11315002	CAWA-17-143061
12019658	Method Blank (MB)
12019659	Laboratory Control Sample (LCS)
12019660	Laboratory Control Sample Duplicate (LCSD)

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

SOP Reference

Procedure for preparation, analysis and reporting of analytical data are controlled by Cape Fear Analytical LLC (CFA) as Standard Operating Procedure (SOP). The data discussed in this narrative has been analyzed in accordance with CF-OA-E-002 REV# 14.

Raw data reports are processed and reviewed by the analyst using the TargetLynx software package.

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) (CCV) met the acceptance criteria.

Quality Control (QC) Information

Certification Statement

The test results presented in this document are certified to meet all requirements of the analytical method, the 2009 TNI Standard and the DoD/DOE QSM. (A2LA scope No. 3014-01)

Method Blank (MB) Statement

The MB(s) 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.

Laboratory Control Sample Duplicate (LCSD) Recovery

The LCSD spike recoveries met the acceptance limits.

LCS/LCSD Relative Percent Difference (RPD) Statement

The RPD(s) between the LCS and LCSD met the acceptance limits.

QC Sample Designation

A matrix spike and matrix spike duplicate analysis was not required for this SDG.

Technical Information

Holding Time Specifications

CFA assigns holding times based on the associated methodology, which assigns the date and time from sample collection. 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

Nonconformance (NCR) Documentation

A NCR was not required for this SDG.

Manual Integrations

Certain standards and QC samples required manual integrations to correctly position the baseline as set in the calibration standard injections. Where manual integrations were performed, copies of all manual integration peak profiles are included in the raw data section of this fraction. Manual integrations were required for data files in this SDG.

System Configuration

This analysis was performed on the following instrument configuration:

Instrument ID	Instrument	System Configuration	Column ID	Column Description
HRP750_2	Primary Dioxin Analysis	Dioxin Analysis	DB-5MS	60m x 0.25mm, 0.25um

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.

Sample Data Summary

Cape Fear Analytical, LLC

3306 Kitty Hawk Road Suite 120, Wilmington, NC 28405 - (910) 795-0421 - www.capefearanalytical.com

Qualifier Definition Report for

LANL001 Los Alamos National Laboratory

Client SDG: 2017-2712 CFA Work Order: 11315

The Qualifiers in this report are defined as follows:

- * A quality control analyte recovery is outside of specified acceptance criteria
- ** Analyte is a surrogate compound
- U Analyte was analyzed for , but not detected above the specified detection limit.
- 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

Cape Fear Analytical requires all analytical data to be verified by a qualified data reviewer.

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

Signature: 

Name: Heather Patterson

Date: 16 OCT 2017

Title: Group Leader

**Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary**

Page 1 of 1

SDG Number: 2017-2712
Lab Sample ID: 11315001
Client Sample: 8290 Water
Client ID: CAWA-17-143059
Batch ID: 35763
Run Date: 10/10/2017 13:02
Data File: A10OCT17A-3
Prep Batch: 35760
Prep Date: 02-OCT-17

Client: LANL001
Date Collected: 09/06/2017 10:43
Date Received: 09/08/2017 10:15

Method: SW846 8290A
Analyst: MJC

Prep Method: SW846 3520C
Prep Aliquot: 963.7 mL

Project: LANL00112
Matrix: WATER

Prep Basis: As Received

Instrument: HRP750
Dilution: 1

CAS No.	Parmname	Qual	Result	EMPC	Units	EDL	PQL
1746-01-6	2,3,7,8-TCDD	U	3.38		pg/L	3.38	10.4
40321-76-4	1,2,3,7,8-PeCDD	U	5.19		pg/L	5.19	51.9
39227-28-6	1,2,3,4,7,8-HxCDD	U	5.19		pg/L	5.19	51.9
57653-85-7	1,2,3,6,7,8-HxCDD	U	5.19		pg/L	5.19	51.9
19408-74-3	1,2,3,7,8,9-HxCDD	U	5.19		pg/L	5.19	51.9
35822-46-9	1,2,3,4,6,7,8-HpCDD	U	5.19		pg/L	5.19	51.9
3268-87-9	1,2,3,4,6,7,8,9-OCDD	U	10.4		pg/L	10.4	104
51207-31-9	2,3,7,8-TCDF	U	4.15		pg/L	4.15	10.4
57117-41-6	1,2,3,7,8-PeCDF	U	5.19		pg/L	5.19	51.9
57117-31-4	2,3,4,7,8-PeCDF	U	5.19		pg/L	5.19	51.9
70648-26-9	1,2,3,4,7,8-HxCDF	U	5.19		pg/L	5.19	51.9
57117-44-9	1,2,3,6,7,8-HxCDF	U	5.19		pg/L	5.19	51.9
60851-34-5	2,3,4,6,7,8-HxCDF	U	5.19		pg/L	5.19	51.9
72918-21-9	1,2,3,7,8,9-HxCDF	U	5.19		pg/L	5.19	51.9
67562-39-4	1,2,3,4,6,7,8-HpCDF	U	5.19		pg/L	5.19	51.9
55673-89-7	1,2,3,4,7,8,9-HpCDF	U	5.19		pg/L	5.19	51.9
39001-02-0	1,2,3,4,6,7,8,9-OCDF	U	10.4		pg/L	10.4	104
41903-57-5	Total TCDDs	U	0		pg/L		
36088-22-9	Total PeCDDs	U	0		pg/L		
34465-46-8	Total HxCDDs	U	0		pg/L		
37871-00-4	Total HpCDDs	U	0		pg/L		
55722-27-5	Total TCDFs	U	0		pg/L		
30402-15-4	Total PeCDFs	U	0		pg/L		
55684-94-1	Total HxCDFs	U	0		pg/L		
38998-75-3	Total HpCDFs	U	0		pg/L		
3333-30-0	TEQ WHO2005 ND=0		0.00	0.00	pg/L		
3333-30-1	TEQ WHO2005 ND=0.5		7.25	7.25	pg/L		

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		1780	2080	pg/L	85.8	(40%-135%)
13C-1,2,3,7,8-PeCDD		1800	2080	pg/L	86.5	(40%-135%)
13C-1,2,3,6,7,8-HxCDD		1550	2080	pg/L	74.8	(40%-135%)
13C-1,2,3,4,6,7,8-HpCDD		1800	2080	pg/L	86.9	(40%-135%)
13C-OCDD		3050	4150	pg/L	73.4	(40%-135%)
13C-2,3,7,8-TCDF		1740	2080	pg/L	83.9	(40%-135%)
13C-1,2,3,7,8-PeCDF		1900	2080	pg/L	91.6	(40%-135%)
13C-1,2,3,6,7,8-HxCDF		1510	2080	pg/L	72.8	(40%-135%)
13C-1,2,3,4,6,7,8-HpCDF		1720	2080	pg/L	82.8	(40%-135%)

Comments:

U Analyte was analyzed for , but not detected above the specified detection limit.

**Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary**

Page 1 of 1

SDG Number: 2017-2712
Lab Sample ID: 11315002
Client Sample: 8290 Water
Client ID: CAWA-17-143061
Batch ID: 35763
Run Date: 10/10/2017 13:49
Data File: A10OCT17A-4
Prep Batch: 35760
Prep Date: 02-OCT-17

Client: LANL001
Date Collected: 09/06/2017 08:15
Date Received: 09/08/2017 10:15

Method: SW846 8290A
Analyst: MJC

Prep Method: SW846 3520C
Prep Aliquot: 918.3 mL

Project: LANL00112
Matrix: WATER

Prep Basis: As Received

Instrument: HRP750
Dilution: 1

CAS No.	Parmname	Qual	Result	EMPC	Units	EDL	PQL
1746-01-6	2,3,7,8-TCDD	U	3.57		pg/L	3.57	10.9
40321-76-4	1,2,3,7,8-PeCDD	U	5.44		pg/L	5.44	54.4
39227-28-6	1,2,3,4,7,8-HxCDD	U	5.44		pg/L	5.44	54.4
57653-85-7	1,2,3,6,7,8-HxCDD	U	5.44		pg/L	5.44	54.4
19408-74-3	1,2,3,7,8,9-HxCDD	U	5.44		pg/L	5.44	54.4
35822-46-9	1,2,3,4,6,7,8-HpCDD	U	5.44		pg/L	5.44	54.4
3268-87-9	1,2,3,4,6,7,8,9-OCDD	U	10.9		pg/L	10.9	109
51207-31-9	2,3,7,8-TCDF	U	4.36		pg/L	4.36	10.9
57117-41-6	1,2,3,7,8-PeCDF	U	5.44		pg/L	5.44	54.4
57117-31-4	2,3,4,7,8-PeCDF	U	5.44		pg/L	5.44	54.4
70648-26-9	1,2,3,4,7,8-HxCDF	U	5.44		pg/L	5.44	54.4
57117-44-9	1,2,3,6,7,8-HxCDF	U	5.44		pg/L	5.44	54.4
60851-34-5	2,3,4,6,7,8-HxCDF	U	5.44		pg/L	5.44	54.4
72918-21-9	1,2,3,7,8,9-HxCDF	U	5.44		pg/L	5.44	54.4
67562-39-4	1,2,3,4,6,7,8-HpCDF	U	5.44		pg/L	5.44	54.4
55673-89-7	1,2,3,4,7,8,9-HpCDF	U	5.44		pg/L	5.44	54.4
39001-02-0	1,2,3,4,6,7,8,9-OCDF	U	10.9		pg/L	10.9	109
41903-57-5	Total TCDDs	U	0		pg/L		
36088-22-9	Total PeCDDs	U	0		pg/L		
34465-46-8	Total HxCDDs	U	0		pg/L		
37871-00-4	Total HpCDDs	U	0		pg/L		
55722-27-5	Total TCDFs	U	0		pg/L		
30402-15-4	Total PeCDFs	U	0		pg/L		
55684-94-1	Total HxCDFs	U	0		pg/L		
38998-75-3	Total HpCDFs	U	0		pg/L		
3333-30-0	TEQ WHO2005 ND=0		0.00	0.00	pg/L		
3333-30-1	TEQ WHO2005 ND=0.5		7.62	7.62	pg/L		

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		1950	2180	pg/L	89.6	(40%-135%)
13C-1,2,3,7,8-PeCDD		1970	2180	pg/L	90.7	(40%-135%)
13C-1,2,3,6,7,8-HxCDD		1730	2180	pg/L	79.2	(40%-135%)
13C-1,2,3,4,6,7,8-HpCDD		1980	2180	pg/L	91.0	(40%-135%)
13C-OCDD		3260	4360	pg/L	74.9	(40%-135%)
13C-2,3,7,8-TCDF		1910	2180	pg/L	87.8	(40%-135%)
13C-1,2,3,7,8-PeCDF		2050	2180	pg/L	94.0	(40%-135%)
13C-1,2,3,6,7,8-HxCDF		1700	2180	pg/L	77.9	(40%-135%)
13C-1,2,3,4,6,7,8-HpCDF		1870	2180	pg/L	85.9	(40%-135%)

Comments:

U Analyte was analyzed for , but not detected above the specified detection limit.

Quality Control Summary

Hi-Res Dioxins/Furans **Surrogate Recovery Report**

SDG Number: 2017-2712

Matrix Type: LIQUID

Sample ID	Client ID	Surrogate	QUAL	Recovery (%)	Acceptance Limits
12019659	LCS for batch 35760	13C-2,3,7,8-TCDD		87.6	(40%-135%)
		13C-1,2,3,7,8-PeCDD		98.8	(40%-135%)
		13C-1,2,3,6,7,8-HxCDD		80.0	(40%-135%)
		13C-1,2,3,4,6,7,8-HpCDD		77.8	(40%-135%)
		13C-OCDD		64.4	(40%-135%)
		13C-2,3,7,8-TCDF		92.8	(40%-135%)
		13C-1,2,3,7,8-PeCDF		107	(40%-135%)
		13C-1,2,3,6,7,8-HxCDF		75.9	(40%-135%)
		13C-1,2,3,4,6,7,8-HpCDF		83.3	(40%-135%)
12019660	LCSD for batch 35760	13C-2,3,7,8-TCDD		86.2	(40%-135%)
		13C-1,2,3,7,8-PeCDD		100	(40%-135%)
		13C-1,2,3,6,7,8-HxCDD		77.0	(40%-135%)
		13C-1,2,3,4,6,7,8-HpCDD		78.5	(40%-135%)
		13C-OCDD		66.5	(40%-135%)
		13C-2,3,7,8-TCDF		91.4	(40%-135%)
		13C-1,2,3,7,8-PeCDF		109	(40%-135%)
		13C-1,2,3,6,7,8-HxCDF		75.3	(40%-135%)
		13C-1,2,3,4,6,7,8-HpCDF		80.2	(40%-135%)
12019658	MB for batch 35760	13C-2,3,7,8-TCDD		84.5	(40%-135%)
		13C-1,2,3,7,8-PeCDD		100	(40%-135%)
		13C-1,2,3,6,7,8-HxCDD		78.5	(40%-135%)
		13C-1,2,3,4,6,7,8-HpCDD		80.4	(40%-135%)
		13C-OCDD		68.6	(40%-135%)
		13C-2,3,7,8-TCDF		93.4	(40%-135%)
		13C-1,2,3,7,8-PeCDF		109	(40%-135%)
		13C-1,2,3,6,7,8-HxCDF		76.2	(40%-135%)
		13C-1,2,3,4,6,7,8-HpCDF		83.5	(40%-135%)
11315001	CAWA-17-143059	13C-2,3,7,8-TCDD		85.8	(40%-135%)
		13C-1,2,3,7,8-PeCDD		86.5	(40%-135%)
		13C-1,2,3,6,7,8-HxCDD		74.8	(40%-135%)
		13C-1,2,3,4,6,7,8-HpCDD		86.9	(40%-135%)
		13C-OCDD		73.4	(40%-135%)
		13C-2,3,7,8-TCDF		83.9	(40%-135%)
		13C-1,2,3,7,8-PeCDF		91.6	(40%-135%)
		13C-1,2,3,6,7,8-HxCDF		72.8	(40%-135%)
		13C-1,2,3,4,6,7,8-HpCDF		82.8	(40%-135%)
11315002	CAWA-17-143061	13C-2,3,7,8-TCDD		89.6	(40%-135%)
		13C-1,2,3,7,8-PeCDD		90.7	(40%-135%)
		13C-1,2,3,6,7,8-HxCDD		79.2	(40%-135%)
		13C-1,2,3,4,6,7,8-HpCDD		91.0	(40%-135%)
		13C-OCDD		74.9	(40%-135%)
		13C-2,3,7,8-TCDF		87.8	(40%-135%)
		13C-1,2,3,7,8-PeCDF		94.0	(40%-135%)
		13C-1,2,3,6,7,8-HxCDF		77.9	(40%-135%)
		13C-1,2,3,4,6,7,8-HpCDF		85.9	(40%-135%)

* Recovery outside Acceptance Limits

Hi-Res Dioxins/Furans
Surrogate Recovery Report

Page 2 of 2

SDG Number: 2017-2712

Matrix Type: LIQUID

Sample ID	Client ID	Surrogate	QUAL	Recovery (%)	Acceptance Limits
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* Recovery outside Acceptance Limits

Column to be used to flag recovery values

D Sample Diluted

Hi-Res Dioxins/Furans
Quality Control Summary
Spike Recovery Report

Page 1 of 2

SDG Number: 2017-2712

Sample Type: Laboratory Control Sample

Client ID: LCS for batch 35760

Matrix: WATER

Lab Sample ID: 12019659

Instrument: HRP750

Analysis Date: 10/09/2017 14:45

Dilution: 1

Analyst: MJC

Prep Batch ID: 35760

Batch ID: 35763

CAS No.	Parmname	Amount Added pg/L	Spike Conc. pg/L	Recovery %	Acceptance Limits
1746-01-6	LCS 2,3,7,8-TCDD	200	240	120	70-130
40321-76-4	LCS 1,2,3,7,8-PeCDD	1000	1120	112	70-130
39227-28-6	LCS 1,2,3,4,7,8-HxCDD	1000	1080	108	70-130
57653-85-7	LCS 1,2,3,6,7,8-HxCDD	1000	1100	110	70-130
19408-74-3	LCS 1,2,3,7,8,9-HxCDD	1000	1120	112	70-130
35822-46-9	LCS 1,2,3,4,6,7,8-HpCDD	1000	1090	109	70-130
3268-87-9	LCS 1,2,3,4,6,7,8,9-OCDD	2000	2100	105	70-130
51207-31-9	LCS 2,3,7,8-TCDF	200	210	105	70-130
57117-41-6	LCS 1,2,3,7,8-PeCDF	1000	1100	110	70-130
57117-31-4	LCS 2,3,4,7,8-PeCDF	1000	1070	107	70-130
70648-26-9	LCS 1,2,3,4,7,8-HxCDF	1000	1180	118	70-130
57117-44-9	LCS 1,2,3,6,7,8-HxCDF	1000	1180	118	70-130
60851-34-5	LCS 2,3,4,6,7,8-HxCDF	1000	1210	121	70-130
72918-21-9	LCS 1,2,3,7,8,9-HxCDF	1000	1100	110	70-130
67562-39-4	LCS 1,2,3,4,6,7,8-HpCDF	1000	1020	102	70-130
55673-89-7	LCS 1,2,3,4,7,8,9-HpCDF	1000	934	93.4	70-130
39001-02-0	LCS 1,2,3,4,6,7,8,9-OCDF	2000	2070	104	70-130

Hi-Res Dioxins/Furans
Quality Control Summary
Spike Recovery Report

Page 2 of 2

SDG Number: 2017-2712

Sample Type: Laboratory Control Sample Duplicate

Client ID: LCSD for batch 35760

Matrix: WATER

Lab Sample ID: 12019660

Instrument: HRP750

Analysis Date: 10/09/2017 15:32

Dilution: 1

Analyst: MJC

Prep Batch ID: 35760

Batch ID: 35763

CAS No.	Parmname	Amount Added pg/L	Spike Conc. pg/L	Recovery %	Acceptance Limits	RPD %	Acceptance Limits
1746-01-6	LCSD 2,3,7,8-TCDD	200	238	119	70-130	0.477	0-20
40321-76-4	LCSD 1,2,3,7,8-PeCDD	1000	1140	114	70-130	1.81	0-20
39227-28-6	LCSD 1,2,3,4,7,8-HxCDD	1000	1110	111	70-130	3.17	0-20
57653-85-7	LCSD 1,2,3,6,7,8-HxCDD	1000	1130	113	70-130	2.63	0-20
19408-74-3	LCSD 1,2,3,7,8,9-HxCDD	1000	1170	117	70-130	4.31	0-20
35822-46-9	LCSD 1,2,3,4,6,7,8-HpCDD	1000	1050	105	70-130	3.03	0-20
3268-87-9	LCSD 1,2,3,4,6,7,8,9-OCDD	2000	2120	106	70-130	1.11	0-20
51207-31-9	LCSD 2,3,7,8-TCDF	200	215	107	70-130	2.33	0-20
57117-41-6	LCSD 1,2,3,7,8-PeCDF	1000	1090	109	70-130	0.084	0-20
57117-31-4	LCSD 2,3,4,7,8-PeCDF	1000	1040	104	70-130	2.64	0-20
70648-26-9	LCSD 1,2,3,4,7,8-HxCDF	1000	1220	122	70-130	3.45	0-20
57117-44-9	LCSD 1,2,3,6,7,8-HxCDF	1000	1180	118	70-130	0.122	0-20
60851-34-5	LCSD 2,3,4,6,7,8-HxCDF	1000	1190	119	70-130	1.26	0-20
72918-21-9	LCSD 1,2,3,7,8,9-HxCDF	1000	1090	109	70-130	0.972	0-20
67562-39-4	LCSD 1,2,3,4,6,7,8-HpCDF	1000	1060	106	70-130	3.87	0-20
55673-89-7	LCSD 1,2,3,4,7,8,9-HpCDF	1000	971	97.1	70-130	3.90	0-20
39001-02-0	LCSD 1,2,3,4,6,7,8,9-OCDF	2000	2050	103	70-130	1.03	0-20

Method Blank Summary

Page 1 of 1

SDG Number: 2017-2712
Client ID: MB for batch 35760
Lab Sample ID: 12019658
Column:

Client: LANL001
Instrument ID: HRP750
Prep Date: 02-OCT-17

Matrix: WATER
Data File: A09OCT17A-8
Analyzed: 10/09/17 16:20

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

Client Sample ID	Lab Sample ID	File ID	Date Analyzed	Time Analyzed
01 LCS for batch 35760	12019659	A09OCT17A-6	10/09/17	1445
02 LCSD for batch 35760	12019660	A09OCT17A-7	10/09/17	1532
03 CAWA-17-143059	11315001	A10OCT17A-3	10/10/17	1302
04 CAWA-17-143061	11315002	A10OCT17A-4	10/10/17	1349

**Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary**

Page 1 of 1

SDG Number: 2017-2712
Lab Sample ID: 12019658
Client Sample: QC for batch 35760
Client ID: MB for batch 35760
Batch ID: 35763
Run Date: 10/09/2017 16:20
Data File: A09OCT17A-8
Prep Batch: 35760
Prep Date: 02-OCT-17

Client: LANL001
Method: SW846 8290A
Analyst: MJC
Prep Method: SW846 3520C
Prep Aliquot: 1000 mL

Project: LANL00112
Matrix: WATER
Prep Basis: As Received
Instrument: HRP750
Dilution: 1

CAS No.	Parmname	Qual	Result	EMPC	Units	EDL	PQL
1746-01-6	2,3,7,8-TCDD	U	3.18		pg/L	3.18	10.0
40321-76-4	1,2,3,7,8-PeCDD	U	5		pg/L	5.00	50.0
39227-28-6	1,2,3,4,7,8-HxCDD	U	5		pg/L	5.00	50.0
57653-85-7	1,2,3,6,7,8-HxCDD	U	5		pg/L	5.00	50.0
19408-74-3	1,2,3,7,8,9-HxCDD	U	5		pg/L	5.00	50.0
35822-46-9	1,2,3,4,6,7,8-HpCDD	U	5		pg/L	5.00	50.0
3268-87-9	1,2,3,4,6,7,8,9-OCDD	U	10		pg/L	10.0	100
51207-31-9	2,3,7,8-TCDF	U	3.98		pg/L	3.98	10.0
57117-41-6	1,2,3,7,8-PeCDF	U	5		pg/L	5.00	50.0
57117-31-4	2,3,4,7,8-PeCDF	U	5		pg/L	5.00	50.0
70648-26-9	1,2,3,4,7,8-HxCDF	U	5		pg/L	5.00	50.0
57117-44-9	1,2,3,6,7,8-HxCDF	U	5		pg/L	5.00	50.0
60851-34-5	2,3,4,6,7,8-HxCDF	U	5		pg/L	5.00	50.0
72918-21-9	1,2,3,7,8,9-HxCDF	U	5		pg/L	5.00	50.0
67562-39-4	1,2,3,4,6,7,8-HpCDF	U	5		pg/L	5.00	50.0
55673-89-7	1,2,3,4,7,8,9-HpCDF	U	5		pg/L	5.00	50.0
39001-02-0	1,2,3,4,6,7,8,9-OCDF	U	10		pg/L	10.0	100
41903-57-5	Total TCDDs	U	0		pg/L		
36088-22-9	Total PeCDDs	U	0		pg/L		
34465-46-8	Total HxCDDs	U	0		pg/L		
37871-00-4	Total HpCDDs	U	0		pg/L		
55722-27-5	Total TCDFs	U	0		pg/L		
30402-15-4	Total PeCDFs	U	0		pg/L		
55684-94-1	Total HxCDFs	U	0		pg/L		
38998-75-3	Total HpCDFs	U	0		pg/L		
3333-30-0	TEQ WHO2005 ND=0		0.00	0.00	pg/L		
3333-30-1	TEQ WHO2005 ND=0.5		6.94	6.94	pg/L		

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		1690	2000	pg/L	84.5	(40%-135%)
13C-1,2,3,7,8-PeCDD		2010	2000	pg/L	100	(40%-135%)
13C-1,2,3,6,7,8-HxCDD		1570	2000	pg/L	78.5	(40%-135%)
13C-1,2,3,4,6,7,8-HpCDD		1610	2000	pg/L	80.4	(40%-135%)
13C-OCDD		2740	4000	pg/L	68.6	(40%-135%)
13C-2,3,7,8-TCDF		1870	2000	pg/L	93.4	(40%-135%)
13C-1,2,3,7,8-PeCDF		2190	2000	pg/L	109	(40%-135%)
13C-1,2,3,6,7,8-HxCDF		1520	2000	pg/L	76.2	(40%-135%)
13C-1,2,3,4,6,7,8-HpCDF		1670	2000	pg/L	83.5	(40%-135%)

Comments:

U Analyte was analyzed for , but not detected above the specified detection limit.

**Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary**

Page 1 of 1

SDG Number: 2017-2712
Lab Sample ID: 12019659
Client Sample: QC for batch 35760
Client ID: LCS for batch 35760
Batch ID: 35763
Run Date: 10/09/2017 14:45
Data File: A09OCT17A-6
Prep Batch: 35760
Prep Date: 02-OCT-17

Client: LANL001

Method: SW846 8290A
Analyst: MJC

Prep Method: SW846 3520C
Prep Aliquot: 1000 mL

Project: LANL00112
Matrix: WATER

Prep Basis: As Received

Instrument: HRP750
Dilution: 1

CAS No.	Parmname	Qual	Result	EMPC	Units	EDL	PQL
1746-01-6	2,3,7,8-TCDD		240		pg/L	3.74	10.0
40321-76-4	1,2,3,7,8-PeCDD		1120		pg/L	5.00	50.0
39227-28-6	1,2,3,4,7,8-HxCDD		1080		pg/L	7.74	50.0
57653-85-7	1,2,3,6,7,8-HxCDD		1100		pg/L	7.08	50.0
19408-74-3	1,2,3,7,8,9-HxCDD		1120		pg/L	7.58	50.0
35822-46-9	1,2,3,4,6,7,8-HpCDD		1090		pg/L	16.2	50.0
3268-87-9	1,2,3,4,6,7,8,9-OCDD		2100		pg/L	18.9	100
51207-31-9	2,3,7,8-TCDF		210		pg/L	3.78	10.0
57117-41-6	1,2,3,7,8-PeCDF		1100		pg/L	7.52	50.0
57117-31-4	2,3,4,7,8-PeCDF		1070		pg/L	6.80	50.0
70648-26-9	1,2,3,4,7,8-HxCDF		1180		pg/L	10.6	50.0
57117-44-9	1,2,3,6,7,8-HxCDF		1180		pg/L	9.72	50.0
60851-34-5	2,3,4,6,7,8-HxCDF		1210		pg/L	10.5	50.0
72918-21-9	1,2,3,7,8,9-HxCDF		1100		pg/L	12.3	50.0
67562-39-4	1,2,3,4,6,7,8-HpCDF		1020		pg/L	13.0	50.0
55673-89-7	1,2,3,4,7,8,9-HpCDF		934		pg/L	16.6	50.0
39001-02-0	1,2,3,4,6,7,8,9-OCDF		2070		pg/L	13.4	100

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		1750	2000	pg/L	87.6	(40%-135%)
13C-1,2,3,7,8-PeCDD		1980	2000	pg/L	98.8	(40%-135%)
13C-1,2,3,6,7,8-HxCDD		1600	2000	pg/L	80.0	(40%-135%)
13C-1,2,3,4,6,7,8-HpCDD		1560	2000	pg/L	77.8	(40%-135%)
13C-OCDD		2580	4000	pg/L	64.4	(40%-135%)
13C-2,3,7,8-TCDF		1860	2000	pg/L	92.8	(40%-135%)
13C-1,2,3,7,8-PeCDF		2140	2000	pg/L	107	(40%-135%)
13C-1,2,3,6,7,8-HxCDF		1520	2000	pg/L	75.9	(40%-135%)
13C-1,2,3,4,6,7,8-HpCDF		1670	2000	pg/L	83.3	(40%-135%)

Comments:

U Analyte was analyzed for , but not detected above the specified detection limit.

**Hi-Res Dioxins/Furans
Certificate of Analysis
Sample Summary**

Page 1 of 1

SDG Number: 2017-2712
Lab Sample ID: 12019660
Client Sample: QC for batch 35760
Client ID: LCSD for batch 35760
Batch ID: 35763
Run Date: 10/09/2017 15:32
Data File: A09OCT17A-7
Prep Batch: 35760
Prep Date: 02-OCT-17

Client: LANL001

Method: SW846 8290A
Analyst: MJC

Prep Method: SW846 3520C
Prep Aliquot: 1000 mL

Project: LANL00112
Matrix: WATER

Prep Basis: As Received

Instrument: HRP750
Dilution: 1

CAS No.	Parmname	Qual	Result	EMPC	Units	EDL	PQL
1746-01-6	2,3,7,8-TCDD		238		pg/L	4.20	10.0
40321-76-4	1,2,3,7,8-PeCDD		1140		pg/L	5.00	50.0
39227-28-6	1,2,3,4,7,8-HxCDD		1110		pg/L	7.80	50.0
57653-85-7	1,2,3,6,7,8-HxCDD		1130		pg/L	7.14	50.0
19408-74-3	1,2,3,7,8,9-HxCDD		1170		pg/L	7.64	50.0
35822-46-9	1,2,3,4,6,7,8-HpCDD		1050		pg/L	16.5	50.0
3268-87-9	1,2,3,4,6,7,8,9-OCDD		2120		pg/L	25.6	100
51207-31-9	2,3,7,8-TCDF		215		pg/L	5.32	10.0
57117-41-6	1,2,3,7,8-PeCDF		1090		pg/L	7.40	50.0
57117-31-4	2,3,4,7,8-PeCDF		1040		pg/L	6.70	50.0
70648-26-9	1,2,3,4,7,8-HxCDF		1220		pg/L	13.3	50.0
57117-44-9	1,2,3,6,7,8-HxCDF		1180		pg/L	12.2	50.0
60851-34-5	2,3,4,6,7,8-HxCDF		1190		pg/L	13.2	50.0
72918-21-9	1,2,3,7,8,9-HxCDF		1090		pg/L	15.5	50.0
67562-39-4	1,2,3,4,6,7,8-HpCDF		1060		pg/L	14.2	50.0
55673-89-7	1,2,3,4,7,8,9-HpCDF		971		pg/L	18.2	50.0
39001-02-0	1,2,3,4,6,7,8,9-OCDF		2050		pg/L	19.9	100

Surrogate/Tracer recovery	Qual	Result	Nominal	Units	Recovery%	Acceptable Limits
13C-2,3,7,8-TCDD		1720	2000	pg/L	86.2	(40%-135%)
13C-1,2,3,7,8-PeCDD		2000	2000	pg/L	100	(40%-135%)
13C-1,2,3,6,7,8-HxCDD		1540	2000	pg/L	77.0	(40%-135%)
13C-1,2,3,4,6,7,8-HpCDD		1570	2000	pg/L	78.5	(40%-135%)
13C-OCDD		2660	4000	pg/L	66.5	(40%-135%)
13C-2,3,7,8-TCDF		1830	2000	pg/L	91.4	(40%-135%)
13C-1,2,3,7,8-PeCDF		2170	2000	pg/L	109	(40%-135%)
13C-1,2,3,6,7,8-HxCDF		1510	2000	pg/L	75.3	(40%-135%)
13C-1,2,3,4,6,7,8-HpCDF		1600	2000	pg/L	80.2	(40%-135%)

Comments:

U Analyte was analyzed for , but not detected above the specified detection limit.