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September 24, 2019

Mr. Matt Thompson  
Wisconsin Department of Natural Resources  
1300 W. Clairemont Avenue  
Eau Claire, WI 54701

Subject: Wood Waste Burning Site Investigation Results Transmittal  
Wauleco, Inc., Wausau, Wisconsin  
BRRTS #02-37-000006

Dear Mr. Thompson:

On behalf of Wauleco, Inc. and pursuant to Chp. NR 716.14((2), Wis. Admn. Code, TRC is transmitting the analytical results of soil samples collected to implement the March 15, 2019 Wauleco Wood Burning Site Investigation Work Plan, and addenda 1 and 2 (Work Plans).

Thirty-six (36) surface soil samples were collected and analyzed for dioxins and furans. The 36 surface soil samples, see Figure 1, included:

- 10 samples, labeled as the O-series samples, collected within the area of maximum predicted historic aerial distribution from the Wauleco facility, and areas perpendicular thereto.
- 25 samples, labeled as the N-series samples, collected as background samples. These background samples are located to assess the effects of potential sources of dioxins and furans unrelated to wood burning at the former plant on the Wauleco property. Therefore, these background samples are located outside the area of maximum predicted aerial distribution from wood burning at the former plant on the Wauleco property and are collected near the following potential sources of dioxins and furans:
  - N1 – City Incinerator, the City of Wausau’s former municipal solid waste incinerator
  - N2 – Yard Waste Burning and Residential Burn Barrels
  - N3 – Former Marathon Rubber Facility
  - N4 – Railroad tracks/source
  - N5 – Vehicle Traffic

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– N6 – Urban Conditions

- One sample, labeled as N7-1, was collected at the request of WDNR in the area of 117/120 River Street.

This transmittal is organized to provide the information required by NR 716.14(2), as follows:

- **716.14(2).(a):**

- Preliminary Cause and Significance: The cause of the dioxins and furans in surface soils is assumed to be the ubiquitous nature of dioxins and furans in urban settings.

The significance of the dioxins and furans in surface soils is based on their relationship to the WDNR direct contact residual contaminant levels (RCLs), and the toxic equivalency (TEQ), as used by the Wisconsin Department of Health Services (WDHS).

A comparison of the dioxin and furan concentrations results to non-industrial (i.e., residential) direct contact RCLs reveals the following (see Table 1):

- O-Series Samples: The O-series surface soil samples (i.e., those within the area of maximum predicted historic aerial distribution from wood burning at the former plant on the Wauleco property) were all less than residential direct contact RCLs.
- N-Series Background Samples:
  - N1 – City Incinerator – all five samples were less than residential direct contact RCLs.
  - N2 – Yard Waste Burning and Residential Burn Barrels – one of five samples exceeded a residential direct contact RCL.
  - N3 – Former Marathon Rubber Facility – all four samples were less than residential direct contact RCLs.
  - N4 – Railroad tracks/source – all three samples exceeded a residential direct contact RCL.



- N5 – Vehicle Traffic – one of the four samples exceeded a residential direct contact RCL.
- N6 – Urban Conditions – all four samples were less than residential direct contact RCLs.
- N7-1 – 117/120 River St. The sample was less than residential direct contact RCLs.

The TEQ for dioxins and furans was calculated using the toxic equivalent factors (TEF) published by both the World Health Organization (2005) and the U.S. Environmental Protection Agency (2007). The TEQ values for the 36 surface soils collected for this sampling event are included in Table 1 and Attachment 1. The TEQ values for the background samples (N1 through N7 series samples) ranged from 0.27 ng/kg to 62.5 ng/kg. The TEQ values for the O-series samples ranged from 0.37 ng/kg to 17.45 ng/kg.

The TEQ values for the historical samples collected by others are as follows:

SAMPLE IDENTIFIER	TEQ VALUE (ng/kg)	SAMPLE IDENTIFIER	TEQ VALUE (ng/kg)
Culv. In.	105.65	B-103 – 120 E. Thomas St	2.37
Culv. Out.	87.70	B-104 – 110 E. Thomas St	3.27
122 River St.	11.72	B-1	0.00
1003 Emter	46.10	B-1	0.00
130 River St.	2.75	B-2	3.74
141 River St.	1.34	B-2	0.04
120 River St.	1.88	B-3	2.82
117 River St. 1	43.69	B-3	0.00
117 River St. 2	42.40	B-4	0.01
Fern Island	4.23	B-4	0.00
Oak Island	0.58	B-5	0.00
Weston	0.01	B-5	0.00
B-101 – 140 E. Thomas St.	15.44	B-6	0.00
B-102 – 138 E. Thomas St.	4.25	B-6	0.00

Note: these values were also calculated using the 2005 WHO/2007 EPA TEF values.



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The significance of the dioxin and furan results are that there are no WDNR residential direct contact RCL exceedances for the O-series samples (i.e., those within the area of maximum predicted historic aerial distribution from wood burning at the former plant on the Wauleco property).

- List of Names and Addresses of Those Receiving Notification:
  - Matt Thompson, Wisconsin Department of Natural Resources, 1300 W Clairemont Ave, Eau Claire, WI 54701
  - Eric Lindman, Director of Public Works & Utilities, City of Wausau, 407 Grant Street, Wausau, WI 54403-4783
- Date of Sampling Event and Mailing: The date of sampling was August 13 and 14, 2019, and sample results were received on September 10, 2019.
- **716.14(2)(b):** Additional information in accordance with 714.05(5) may be obtained by contacting Mr. Matt Thompson at (715) 839-3750.
- **716.14(2)(c):**
  1. Responsible party name, address, and phone number:  
Wauleco Inc.  
Attn: Evan Schreiner  
1800 North Point Drive  
Stevens Point, Wisconsin 54481  
(715) 346-8530
  2. Site Name and Property Address: Wauleco Inc., 125 Rosecrans St., Wausau, Wisconsin 54402
  3. Department BRRTS Number: 02-37-000006
  4. Department Contact Person: Mr. Matt Thompson, (715) 839-3750
  5. Reason for Sampling: In response to a request by the WDNR.
  6. Contaminant Type: Dioxin and furans
  7. Sample Type: Surface soils



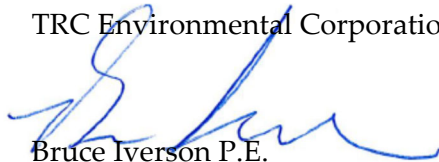
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8. Map Meeting the Requirements of NR 716.15(4): See Figure 1.
9. Collection Date, Specific Contaminant Levels per Location and Whether the Sample Results Attain or Exceed State Standards. See Table 1.
10. Copy of the Results from the Laboratory. See Attachment 1.

If you have any questions or comments regarding this information, please call me at (608) 826-3644.

Sincerely,

TRC Environmental Corporation



Bruce Iverson P.E.  
Project Manager

Enclosures: Table 1: Summary of 36 Surface Soil Sample Dioxin and Furan Results  
Figure 1: Soil Sample Locations  
Attachment 1: Laboratory Analytical Reports

cc: Eric Lindman – City of Wausau  
Evan Schreiner – Wauleco, Inc.  
David Crass – Michael Best & Friedrich, LLP  
Ken Quinn – TRC



Table 1  
Summary of 36 Surface Soil Sample Dioxin and Furan Results

ANALYTE	UNITS	NR 720 SOIL RCLs		SAMPLE AREA/TYPE, SAMPLE ID, DEPTH (inches) <sup>1)</sup> , SAMPLE DATE										
		NON-INDUSTRIAL DIRECT CONTACT	INDUSTRIAL DIRECT CONTACT	CITY INCINERATOR					YARD WASTE BURNING AND BURN BARRELS					MARATHON RUBBER
				N1-1	N1-2	N1-3	N1-4	N1-5	N2-1	N2-2	N2-3	N2-4	N2-5	N3-1
				0-6	0-6	0-6	0-6	0-6	0-6	0-5 <sup>(2)</sup>	0-6	0-6	0-6	0-6
8/13/2019	8/13/2019	8/13/2019	8/13/2019	8/13/2019	8/13/2019	8/13/2019	8/13/2019	8/13/2019	8/13/2019	8/13/2019	8/13/2019	8/13/2019		
<b>DIOXIN CONGENERS</b>														
2,3,7,8-TCDD	ng/Kg	4.82	21.8	< 0.22	0.26 J	< 0.12	< 0.21	< 0.22	< 0.24	< 0.36	16	< 0.32	< 0.37	< 0.13
1,2,3,7,8-PeCDD	ng/Kg	4.93	22.3	0.51 J	1 IJ EMPC	0.23 J	0.24 J	0.62 IJ EMPC	0.82 J	3 J	0.79 J	2.5 J	0.7 J	0.83 J
1,2,3,4,7,8-HxCDD	ng/Kg	49.3	223	0.77 J	1.4 J	0.43 J	0.41 J	1.3 J	0.92 BJ	7.2	1.8 J	3.4 J	1.4 J	1.2 IJ EMPC
1,2,3,6,7,8-HxCDD	ng/Kg	49.3	223	2.2 J	6.6	0.9 J	0.96 J	2.5 J	2 J	22	3.8 J	11	4.2 J	4.4 J
1,2,3,7,8,9-HxCDD	ng/Kg	49.3	223	1.5 J	2.8 J	0.71 J	0.86 J	2.3 J	1.6 J	13	3.3 J	4.1 J	0.91 IJ EMPC	3 J
1,2,3,4,6,7,8-HpCDD	ng/Kg	484	2190	54	180	20	16	71	34	400	72	210	100	58
OCDD	ng/Kg	16400	74400	600	1800	190	120	640	250	3000	520	1600	610	320
Total HpCDD	ng/Kg	-	-	100	340	42	32	140	63	670	130	350	230	120
Total HxCDD	ng/Kg	-	-	19	61	9.2	13	31	20	130	36	71	44	77
Total PeCDD	ng/Kg	-	-	4.4 J	15	1.4 J	5	6.7	7.5	23	9	11	5.1	38
Total TCDD	ng/Kg	-	-	3.9	7.8	0.9 J	2.8	2.3	3.3	3.5	19	2.7	1.2	15
<b>FURAN CONGENERS</b>														
2,3,7,8-TCDF	ng/Kg	48.4	219	< 0.47	1.9 C	0.13 IJ EMPC	0.25 J	< 0.31	0.55 J	0.97 J	0.79 J	1.8 C	0.67 J	0.45 J
1,2,3,7,8-PeCDF	ng/Kg	164	744	0.35 J	0.95 J	0.1 J	< 0.31	< 0.41	0.6 J	2 J	1 J	1.9 J	0.88 J	1.2 J
2,3,4,7,8-PeCDF	ng/Kg	16.4	74.4	0.8 J	12	0.38 J	0.72 J	1.4 IJ EMPC	1.6 IJ EMPC	6.8	5.7	13	1.5 J	2.2 J
1,2,3,4,7,8-HxCDF	ng/Kg	48.5	220	0.85 J	4 J	0.32 J	0.71 IJ EMPC	1.1 J	0.91 IJ EMPC	12	1.9 J	6.1	1.2 IJ EMPC	5.3
1,2,3,6,7,8-HxCDF	ng/Kg	48.5	220	0.94 J	5.5	0.26 J	0.79 J	0.8 IJ EMPC	1.2 J	9.1 P EMPC	3 J	6	1.5 J	4.3 J
2,3,4,6,7,8-HxCDF	ng/Kg	49.3	223	0.77 J	2.6 J	0.34 J	1.3 J	0.58 IJ EMPC	1 J	5.6	3 J	6.1	1.5 J	6.1
1,2,3,7,8,9-HxCDF	ng/Kg	49.3	223	0.31 J	1.5 J	< 0.041	0.32 IJ EMPC	< 0.12	0.49 IJ EMPC	4.8 J	0.83 J	1.9 J	< 0.47	1.9 J
1,2,3,4,6,7,8-HpCDF	ng/Kg	490	2220	8.8	60	6.5	8.1	11	13	160	32	94	20	44
1,2,3,4,7,8,9-HpCDF	ng/Kg	490	2220	0.59 J	2 J	0.33 IJ EMPC	0.66 J	0.56 IJ EMPC	0.54 IJ EMPC	11	1.8 J	3.5 IJ EMPC	0.88 IJ EMPC	3.8 J
OCDF	ng/Kg	16400	74400	27	85	18	17	28	18	310	59	130	34	50
Total HpCDF	ng/Kg	-	-	27	140	14	16	26	27	420	71	210	43	76
Total HxCDF	ng/Kg	-	-	15	110	7.9	10	20	23	230	77	150	26	59
Total PeCDF	ng/Kg	-	-	14	180	6.2	11	24	33	140	110	160	23	36
Total TCDF	ng/Kg	-	-	5.3	58	1.3	4.2	7.2	16	46	39	56	10	15
Calculated TEQ	ng/Kg	-	-	2.32	10.5	0.99	1.3	2.92	2.74	19.3	21.6	14.1	3.72	5.36

Analyte Abbreviations:

DIOXIN CONGENERS:

- 2,3,7,8-TCDD = 2,3,7,8-Tetrachlorodibenzo-p-dioxin
- 1,2,3,7,8-PeCDD = 1,2,3,7,8-Pentachlorodibenzo-p-dioxin
- 1,2,3,4,7,8-HxCDD = 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin
- 1,2,3,6,7,8-HxCDD = 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin
- 1,2,3,7,8,9-HxCDD = 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin
- 1,2,3,4,6,7,8-HpCDD = 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin
- OCDD = Octachlorodibenzo-p-dioxin
- Total HpCDD = Total heptachlorodibenzo-p-dioxin
- Total HxCDD = Total hexachlorodibenzo-p-dioxin
- Total PeCDD = Total pentachlorodibenzo-p-dioxin
- Total TCDD = Total tetrachlorodibenzo-p-dioxin

FURAN CONGENERS:

- 2,3,7,8-TCDF = 2,3,7,8-Tetrachlorodibenzofuran
- 1,2,3,7,8-PeCDF = 1,2,3,7,8-Pentachlorodibenzofuran
- 2,3,4,7,8-PeCDF = 2,3,4,7,8-Pentachlorodibenzofuran
- 1,2,3,4,7,8-HxCDF = 1,2,3,4,7,8-Hexachlorodibenzofuran
- 1,2,3,6,7,8-HxCDF = 1,2,3,6,7,8-Hexachlorodibenzofuran
- 2,3,4,6,7,8-HxCDF = 2,3,4,6,7,8-Hexachlorodibenzofuran
- 1,2,3,7,8,9-HxCDF = 1,2,3,7,8,9-Hexachlorodibenzofuran
- 1,2,3,4,6,7,8-HpCDF = 1,2,3,4,6,7,8-Heptachlorodibenzofuran
- 1,2,3,4,7,8,9-HpCDF = 1,2,3,4,7,8,9-Heptachlorodibenzofuran
- OCDF = Octachlorodibenzofuran
- Total HpCDF = Total heptachlorodibenzofuran
- Total HxCDF = Total hexachlorodibenzofuran
- Total PeCDF = Total pentachlorodibenzofuran
- Total TCDF = Total tetrachlorodibenzofuran

Notes:

1. ng/kg = nanograms/kilogram on a dry weight basis
2. TEQ = Toxicity Equivalent Calculation
3. TEQ values calculated using the U.S. EPA 2007 values: <https://www.govinfo.gov/content/pkg/FR-2007-05-10/pdf/E7-9015.pdf>
4. - = standard not established/not applicable
5. RCLs = NR 720 Residual Contaminant Levels. Values are generic RCLs for exposure by direct contact.
6. Blue = exceedance of Non-Industrial Direct Contact RCL

Qualifiers:

- EMPC = Estimated Maximum Possible Concentration
- J = Estimated value
- I = Interference present
- C = Result obtained from confirmation analysis
- B = Less than 10x higher than method blank level
- DN2 = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- P = PCDE Interference

Footnotes:

1. Samples were collected to the depth noted in inches below ground surface (bgs), not including the vegetative layer at the surface.
2. Sample N2-2 collected to 5 inches bgs due to refusal from roots.
3. Sample N6-3 collected to 5.5 inches bgs due to refusal from stones.

Prepared by: P. Popp  
Checked by: L. Auner, 9/20/2019

Table 1  
Summary of 36 Surface Soil Sample Dioxin and Furan Results

ANALYTE	UNITS	NR 720 SOIL RCLs		SAMPLE AREA/TYPE, SAMPLE ID, DEPTH (inches) <sup>1)</sup> , SAMPLE DATE											
				MARATHON RUBBER (CONT.)			RAILROAD			VEHICLE TRAFFIC			URBAN CONDITIONS		
		NON-INDUSTRIAL DIRECT CONTACT	INDUSTRIAL DIRECT CONTACT	N3-2	N3-3	N3-4	N4-1	N4-2	N4-3	N5-1A	N5-2A	N5-3	N5-4	N6-1	N6-2
				0-6	0-6	0-6	0-6	0-6	0-6	0-6	0-6	0-6	0-6	0-6	0-6
		8/13/2019	8/13/2019	8/13/2019	8/14/2019	8/14/2019	8/14/2019	8/13/2019	8/13/2019	8/13/2019	8/13/2019	8/13/2019	8/13/2019	8/13/2019	
<b>DIOXIN CONGENERS</b>															
2,3,7,8-TCDD	ng/Kg	4.82	21.8	< 0.13	< 0.098	< 0.14	0.8 J	0.85 J	1	< 0.52	< 0.5	< 0.97	< 0.42	< 0.54	< 0.77
1,2,3,7,8-PeCDD	ng/Kg	4.93	22.3	0.46 J	0.16 J	< 0.26	2.5 J	5.2	5.9	0.46 IJ EMPC	0.94 J	2.4 J	2.2 J	0.6 J	1.2 J
1,2,3,4,7,8-HxCDD	ng/Kg	49.3	223	0.85 J	0.19 J	< 0.29	6.3	7.8 JDN2	9 JDN2	0.77 BJDN2	1.9 J	2.5 JDN2	3.6 J	0.77 BJDN2	1.7 JDN2
1,2,3,6,7,8-HxCDD	ng/Kg	49.3	223	2.9 J	0.73 J	0.44 IJ EMPC	24	39 DN2	44 DN2	1.7 IJDN2 EMPC	3.6 IJ EMPC	5.1 JDN2	38	1.5 JDN2	5.1 JDN2
1,2,3,7,8,9-HxCDD	ng/Kg	49.3	223	1.6 IJ EMPC	0.4 J	< 0.32	12	15 JDN2	15 JDN2	1.3 IJDN2 EMPC	3 J	5 JDN2	5.1	1.3 IJDN2 EMPC	1.9 JDN2
1,2,3,4,6,7,8-HpCDD	ng/Kg	484	2190	39	14	11	530	820 DN2	930 DN2	37 DN2	76	100 DN2	580	19 JDN2	96 DN2
OCDD	ng/Kg	16400	74400	220	110	90	5100	7300 DN2	9200 DN2	340 DN2	660	1200 DN2	4200 E	160 DN2	860 DN2
Total HpCDD	ng/Kg	-	-	79	28	21	1000	1600 DN2	1900 DN2	81 DN2	140	230 DN2	960	39 DN2	200 DN2
Total HxCDD	ng/Kg	-	-	47	6.1	3 J	170	260 DN2	310 DN2	8.3 JDN2	31	35 DN2	140	6.8 JDN2	39 DN2
Total PeCDD	ng/Kg	-	-	21	0.96 J	0.5 J	22	25	33	< 0.3	6.3	10	11	1.3 J	3.9 J
Total TCDD	ng/Kg	-	-	8.7	0.36 J	0.55 J	11	18	12	1.2	0.67 J	< 0.97	0.61 J	< 0.54	1.7
<b>FURAN CONGENERS</b>															
2,3,7,8-TCDF	ng/Kg	48.4	219	0.3 IJ EMPC	0.15 J	< 0.15	2.1 0	4.4 C	2.4 0	< 0.54	< 0.76	< 0.99	0.3 J	< 0.35	< 0.68
1,2,3,7,8-PeCDF	ng/Kg	164	744	0.77 J	0.14 J	< 0.14	2.1 J	270 P EMPC	3.4 J	< 0.46	1.2 IJ EMPC	< 0.48	1.2 J	< 0.45	< 0.53
2,3,4,7,8-PeCDF	ng/Kg	16.4	74.4	1.2 J	0.35 J	< 0.12	11	14	61	1.6 J	1.8 J	1.1 J	2.7 J	0.8 J	5
1,2,3,4,7,8-HxCDF	ng/Kg	48.5	220	3.2 J	0.29 J	0.22 J	8.2	16 JDN2	75 PDN2 EMPC	1.1 JDN2	2.8 J	2 JDN2	3.5 J	0.57 JDN2	2.8 JDN2
1,2,3,6,7,8-HxCDF	ng/Kg	48.5	220	2.4 J	0.33 IJ EMPC	0.21 IJ EMPC	8	20 JDN2	28 PDN2 EMPC	1.1 JDN2	1.7 IJ EMPC	1.2 JDN2	2.4 J	0.79 JDN2	2.2 JDN2
2,3,4,6,7,8-HxCDF	ng/Kg	49.3	223	3.6 J	0.23 IJ EMPC	0.22 J	6.5	16 JDN2	30 DN2	0.62 JDN2	0.98 IJ EMPC	0.78 IJDN2 EMPC	3.3 J	0.31 IJDN2 EMPC	2.5 JDN2
1,2,3,7,8,9-HxCDF	ng/Kg	49.3	223	0.98 IJ EMPC	< 0.075	< 0.15	3 J	6.7 JDN2	6.1 JDN2	0.43 JDN2	0.72 IJ EMPC	< 0.22 DN2	2.5 J	0.41 JDN2	0.57 IJDN2 EMPC
1,2,3,4,6,7,8-HpCDF	ng/Kg	490	2220	26	6.1	2.7 J	150	250 DN2	380 DN2	11 JDN2	27	23 JDN2	55	7 JDN2	34 DN2
1,2,3,4,7,8,9-HpCDF	ng/Kg	490	2220	2.4 J	0.29 J	< 0.36	9.4	14 JDN2	20 JDN2	0.8 IJDN2 EMPC	1.5 IJ EMPC	1.2 IJDN2 EMPC	2.8 J	< 0.35 DN2	1.5 JDN2
OCDF	ng/Kg	16400	74400	34	9.6 J	6.6 J	320	490 DN2	620 DN2	25 JDN2	65	47 JDN2	230	11 JDN2	73 DN2
Total HpCDF	ng/Kg	-	-	47	13	7	380	610 DN2	1100 DN2	11 JDN2	68	58 DN2	170	15 JDN2	90 DN2
Total HxCDF	ng/Kg	-	-	34	6.4	1.9 J	200	430 DN2	1200 DN2	23 JDN2	49	35 DN2	110	13 JDN2	69 DN2
Total PeCDF	ng/Kg	-	-	23	6.4	1.5 J	180	480	760	21	24	12	31	9.8	58
Total TCDF	ng/Kg	-	-	11	3.1	0.61 J	58	99	140 E	2.7	3.9	1.4	7	1.9	19
Calculated TEQ	ng/Kg	-	-	3.18	0.74	0.27	22.2	44.0	62.5	2.24	4.25	6.1	16.6	1.72	5.97

Analyte Abbreviations:

DIOXIN CONGENERS:

- 2,3,7,8-TCDD = 2,3,7,8-Tetrachlorodibenzo-p-dioxin
- 1,2,3,7,8-PeCDD = 1,2,3,7,8-Pentachlorodibenzo-p-dioxin
- 1,2,3,4,7,8-HxCDD = 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin
- 1,2,3,6,7,8-HxCDD = 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin
- 1,2,3,7,8,9-HxCDD = 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin
- 1,2,3,4,6,7,8-HpCDD = 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin
- OCDD = Octachlorodibenzo-p-dioxin
- Total HpCDD = Total heptachlorodibenzo-p-dioxin
- Total HxCDD = Total hexachlorodibenzo-p-dioxin
- Total PeCDD = Total pentachlorodibenzo-p-dioxin
- Total TCDD = Total tetrachlorodibenzo-p-dioxin

FURAN CONGENERS:

- 2,3,7,8-TCDF = 2,3,7,8-Tetrachlorodibenzofuran
- 1,2,3,7,8-PeCDF = 1,2,3,7,8-Pentachlorodibenzofuran
- 2,3,4,7,8-PeCDF = 2,3,4,7,8-Pentachlorodibenzofuran
- 1,2,3,4,7,8-HxCDF = 1,2,3,4,7,8-Hexachlorodibenzofuran
- 1,2,3,6,7,8-HxCDF = 1,2,3,6,7,8-Hexachlorodibenzofuran
- 2,3,4,6,7,8-HxCDF = 2,3,4,6,7,8-Hexachlorodibenzofuran
- 1,2,3,7,8,9-HxCDF = 1,2,3,7,8,9-Hexachlorodibenzofuran
- 1,2,3,4,6,7,8-HpCDF = 1,2,3,4,6,7,8-Heptachlorodibenzofuran
- 1,2,3,4,7,8,9-HpCDF = 1,2,3,4,7,8,9-Heptachlorodibenzofuran
- OCDF = Octachlorodibenzofuran
- Total HpCDF = Total heptachlorodibenzofuran
- Total HxCDF = Total hexachlorodibenzofuran
- Total PeCDF = Total pentachlorodibenzofuran
- Total TCDF = Total tetrachlorodibenzofuran

Notes:

1. ng/kg = nanograms/kilogram on a dry weight basis
2. TEQ = Toxicity Equivalent Calculation
3. TEQ values calculated using the U.S. EPA 2007 values: <https://www.govinfo.gov/content/pkg/FR-2007-05-10/pdf/E7-9015.pdf>
4. - = standard not established/not applicable
5. RCLs = NR 720 Residual Contaminant Levels. Values are generic RCLs for exposure by direct contact.
6. Blue = exceedance of Non-Industrial Direct Contact RCL

Qualifiers:

- EMPC = Estimated Maximum Possible Concentration
- J = Estimated value
- I = Interference present
- C = Result obtained from confirmation analysis
- B = Less than 10x higher than method blank level
- DN2 = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- P = PCDE Interference

Footnotes:

1. Samples were collected to the depth noted below ground surface (bgs), not including the vegetative layer at the surface.
2. Sample N2-2 collected to 5 inches bgs due to refusal from roots.
3. Sample N6-3 collected to 5.5 inches bgs due to refusal from stones.

Prepared by: P. Popp  
Checked by: L. Auner, 9/20/2019

**Table 1  
Summary of 36 Surface Soil Sample Dioxin and Furan Results**

ANALYTE	UNITS	NR 720 SOIL RCLs		SAMPLE AREA/TYPE, SAMPLE ID, DEPTH (inches) <sup>1)</sup> , SAMPLE DATE												
		NON-INDUSTRIAL DIRECT CONTACT	INDUSTRIAL DIRECT CONTACT	URBAN CONDITIONS (CONT.)			WDNR REQUEST			DATA GAP SAMPLES						
				N6-3	N6-4	N7-1	O-01	O-02	O-03	O-04	O-05	O-06	O-07	O-08	O-09	O-10
				0-5.5 <sup>(3)</sup>	0-6	0-6	0-6	0-6	0-6	0-6	0-6	0-6	0-6	0-6	0-6	0-6
		8/13/2019	8/13/2019	8/14/2019	8/13/2019	8/14/2019	8/14/2019	8/13/2019	8/14/2019	8/14/2019	8/14/2019	8/14/2019	8/14/2019	8/13/2019	8/13/2019	
<b>DIOXIN CONGENERS</b>																
2,3,7,8-TCDD	ng/Kg	4.82	21.8	< 0.39	< 0.44	0.26 J	< 0.18	< 0.19	< 0.22	< 0.21	< 0.26	< 0.22	< 0.14	< 0.2	0.24 J	< 0.27
1,2,3,7,8-PeCDD	ng/Kg	4.93	22.3	0.51 J	0.47 IJ EMPC	0.91 J	0.27 IJ EMPC	< 0.26	0.38 J	0.34 IJ EMPC	1.1 J	0.38 IJ EMPC	< 0.16	0.5 J	2.3 J	0.61 J
1,2,3,4,7,8-HxCDD	ng/Kg	49.3	223	0.8 BJ	0.73 BJDN2	2.2 J	< 0.38	0.45 J	0.49 IJ EMPC	2 J	1.9 J	0.95 J	< 0.31	0.78 IJ EMPC	5.6	1.1 IJ EMPC
1,2,3,6,7,8-HxCDD	ng/Kg	49.3	223	2 IJ EMPC	2.4 JDN2	6.1	0.67 J	1.2 J	1.7 J	3 J	7.7	3.7 J	0.65 J	1.3 IJ EMPC	14	3 J
1,2,3,7,8,9-HxCDD	ng/Kg	49.3	223	1.6 IJ EMPC	1.6 JDN2	3.4 J	0.68 IJ EMPC	1.2 J	1.1 J	2.4 J	4.7 J	2.3 J	< 0.36	1.4 J	10	1.9 J
1,2,3,4,6,7,8-HpCDD	ng/Kg	484	2190	51	39 DN2	150	13	22	33	99	180	83	14	32	330	70
OCDD	ng/Kg	16400	74400	460	310 DN2	1300	110	160	260	580	1400	680	100	270	4000	570
Total HpCDD	ng/Kg	-	-	91	78 DN2	330	30	50	79	410	400	160	25	75	710	140
Total HxCDD	ng/Kg	-	-	14	21 JDN2	56	5.2	12	24	74	92	29	2.5 J	14	140	26
Total PeCDD	ng/Kg	-	-	2.1 J	2.6 J	7.6	0.27 J	0.69 J	6.6	5.3	11	3 J	< 0.16	1.8 J	14	4.4 J
Total TCDD	ng/Kg	-	-	0.73 J	3.1	2.3	0.79 J	< 0.19	3.2	0.63 J	1.7	0.82 J	0.36 J	0.81 J	4.4	2.9
<b>FURAN CONGENERS</b>																
2,3,7,8-TCDF	ng/Kg	48.4	219	< 0.53	0.56 J	0.55 IJ EMPC	< 0.26	< 0.27	< 0.32	< 0.38	0.5 J	< 0.5	< 0.28	< 0.31	1.6 C	0.8 J
1,2,3,7,8-PeCDF	ng/Kg	164	744	< 0.6	0.65 J	0.69 J	< 0.28	< 0.35	< 0.72	< 0.46	< 0.87	< 0.77	< 0.38	< 0.42	1.8 J	0.92 J
2,3,4,7,8-PeCDF	ng/Kg	16.4	74.4	0.46 IJ EMPC	1.9 J	4.1 J	0.39 J	0.89 J	2.9 J	0.78 J	1.7 J	1 J	< 0.19	0.42 IJ EMPC	12	1.7 J
1,2,3,4,7,8-HxCDF	ng/Kg	48.5	220	0.71 IJ EMPC	1.4 JDN2	3.6 PJ EMPC	0.53 J	0.97 J	1 IJ EMPC	1.1 J	2.8 J	2.3 J	0.35 J	0.63 IJ EMPC	7.3	2.1 J
1,2,3,6,7,8-HxCDF	ng/Kg	48.5	220	0.82 IJ EMPC	2 JDN2	2.7 J	0.5 J	0.89 IJ EMPC	0.7 J	1.2 J	2.5 J	2.3 PJ EMPC	0.31 IJ EMPC	0.97 PJ EMPC	5	2 J
2,3,4,6,7,8-HxCDF	ng/Kg	49.3	223	0.53 IJ EMPC	1.7 JDN2	2.4 J	0.61 J	1.5 J	2.7 J	1.1 IJ EMPC	3 J	1.9 IJ EMPC	0.28 IJ EMPC	0.62 J	7	1.2 J
1,2,3,7,8,9-HxCDF	ng/Kg	49.3	223	< 0.38	0.69 JDN2	0.8 J	0.28 J	< 0.23	< 0.15	< 0.28	< 0.45	< 0.4	< 0.31	< 0.14	1.8 J	0.43 J
1,2,3,4,6,7,8-HpCDF	ng/Kg	490	2220	12	17 JDN2	46	4.6 J	9.6	15	19	43	37	4.2 J	10	140	25
1,2,3,4,7,8,9-HpCDF	ng/Kg	490	2220	0.81 IJ EMPC	0.98 IJDN2 EMPC	2.3 J	0.47 J	0.48 IJ EMPC	0.56 IJ EMPC	0.96 J	2.2 J	1.7 IJ EMPC	< 0.22	0.67 J	6.4	1.4 J
OCDF	ng/Kg	16400	74400	43	40 JDN2	71	13	17	25	57	95	58	8.4 J	22	220	45
Total HpCDF	ng/Kg	-	-	33	43 DN2	100	11	19	31	53	92	80	9.6	27	250	56
Total HxCDF	ng/Kg	-	-	15	43 DN2	87	6.5	12	27	21	66	40	2.2 J	14	250	37
Total PeCDF	ng/Kg	-	-	7.3	51	50	3.8 J	20	72	19	46	27	2.1 J	9.2	310	37
Total TCDF	ng/Kg	-	-	2.5	26	21	1.2	2.9	16	3	11	6.3	0.61 J	1.7	53	13
Calculated TEQ	ng/Kg	-	-	2.08	2.84	6.99	0.93	1.26	2.59	3.03	6.62	3.46	0.37	1.71	17.45	3.55

**Analyte Abbreviations:**

**DIOXIN CONGENERS:**

- 2,3,7,8-TCDD = 2,3,7,8-Tetrachlorodibenzo-p-dioxin
- 1,2,3,7,8-PeCDD = 1,2,3,7,8-Pentachlorodibenzo-p-dioxin
- 1,2,3,4,7,8-HxCDD = 1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin
- 1,2,3,6,7,8-HxCDD = 1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin
- 1,2,3,7,8,9-HxCDD = 1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin
- 1,2,3,4,6,7,8-HpCDD = 1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin
- OCDD = Octachlorodibenzo-p-dioxin
- Total HpCDD = Total heptachlorodibenzo-p-dioxin
- Total HxCDD = Total hexachlorodibenzo-p-dioxin
- Total PeCDD = Total pentachlorodibenzo-p-dioxin
- Total TCDD = Total tetrachlorodibenzo-p-dioxin

**FURAN CONGENERS:**

- 2,3,7,8-TCDF = 2,3,7,8-Tetrachlorodibenzofuran
- 1,2,3,7,8-PeCDF = 1,2,3,7,8-Pentachlorodibenzofuran
- 2,3,4,7,8-PeCDF = 2,3,4,7,8-Pentachlorodibenzofuran
- 1,2,3,4,7,8-HxCDF = 1,2,3,4,7,8-Hexachlorodibenzofuran
- 1,2,3,6,7,8-HxCDF = 1,2,3,6,7,8-Hexachlorodibenzofuran
- 2,3,4,6,7,8-HxCDF = 2,3,4,6,7,8-Hexachlorodibenzofuran
- 1,2,3,7,8,9-HxCDF = 1,2,3,7,8,9-Hexachlorodibenzofuran
- 1,2,3,4,6,7,8-HpCDF = 1,2,3,4,6,7,8-Heptachlorodibenzofuran
- 1,2,3,4,7,8,9-HpCDF = 1,2,3,4,7,8,9-Heptachlorodibenzofuran
- OCDF = Octachlorodibenzofuran
- Total HpCDF = Total heptachlorodibenzofuran
- Total HxCDF = Total hexachlorodibenzofuran
- Total PeCDF = Total pentachlorodibenzofuran
- Total TCDF = Total tetrachlorodibenzofuran

**Notes:**

1. ng/kg = nanograms/kilogram on a dry weight basis
2. TEQ = Toxicity Equivalent Calculation
3. TEQ values calculated using the U.S. EPA 2007 values: <https://www.govinfo.gov/content/pkg/FR-2007-05-10/pdf/E7-9015.pdf>
4. - = standard not established/not applicable
5. RCLs = NR 720 Residual Contaminant Levels. Values are generic RCLs for exposure by direct contact.
6. Blue = exceedance of Non-Industrial Direct Contact RCL

**Qualifiers:**

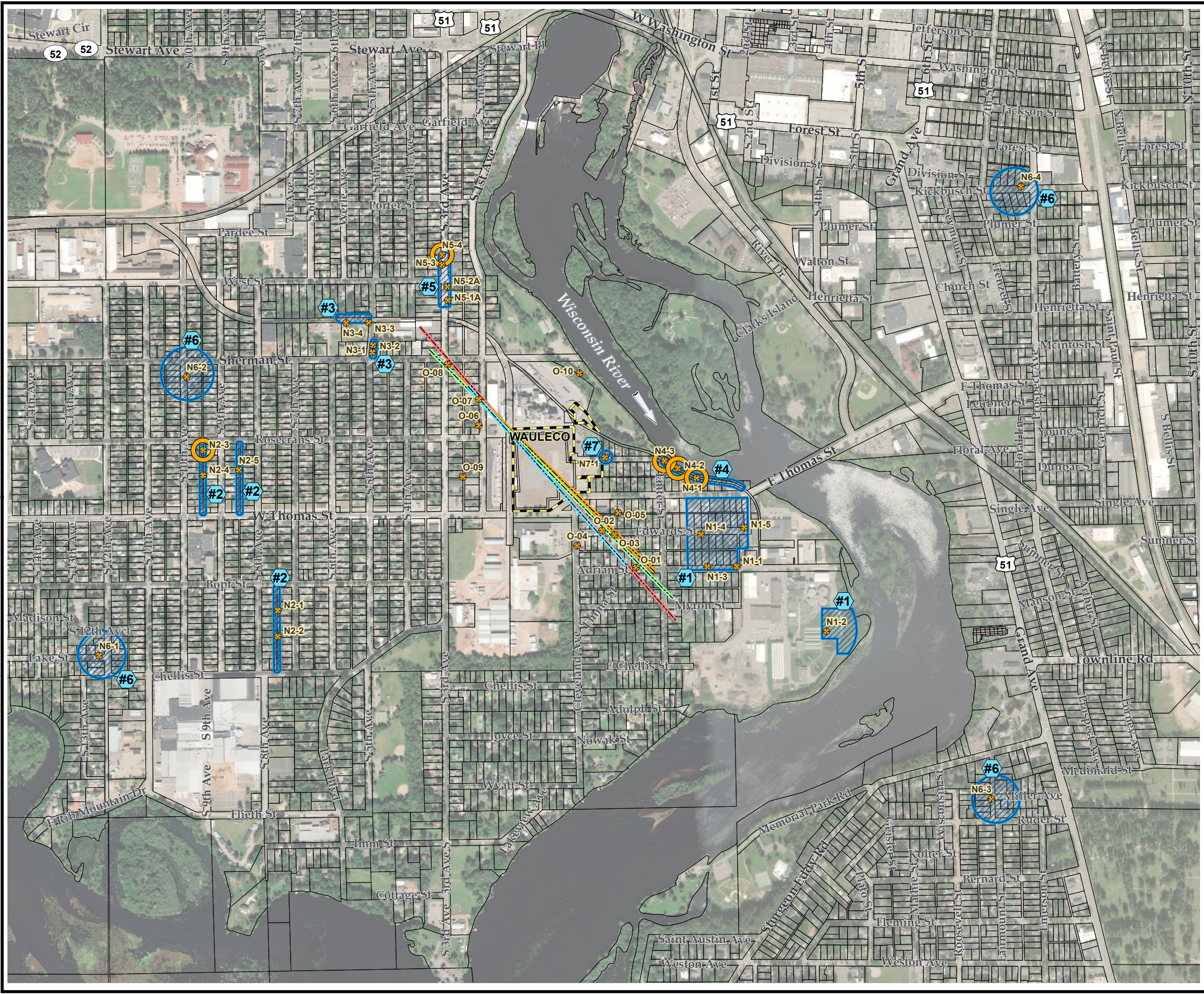
- EMPC = Estimated Maximum Possible Concentration
- J = Estimated value
- I = Interference present
- C = Result obtained from confirmation analysis
- B = Less than 10x higher than method blank level
- DN2 = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- P = PCDE Interference

**Footnotes:**

1. Samples were collected to the depth noted below ground surface (bgs), not including the vegetative layer at the surface.
2. Sample N2-2 collected to 5 inches bgs due to refusal from roots.
3. Sample N6-3 collected to 5.5 inches bgs due to refusal from stones.

Prepared by: P. Popp  
Checked by: L. Auner, 9/20/2019

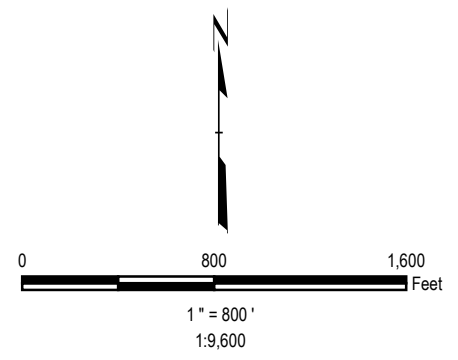




**LEGEND**

- APPROXIMATE WAULECO PROPERTY BOUNDARY
- FORMER HISTORICAL BUILDING FOOTPRINT
- PRIMARY AXES**
- SCENARIO #1
- SCENARIO #2
- SCENARIO #3
- SCENARIO #4
- APPROXIMATE BACKGROUND SAMPLING AREAS
- #1 - City Incinerator
- #2 - Yard Waste Burning and Burn Barrels
- #3 - Marathon Rubber
- #4 - Railroad
- #5 - Vehicle Traffic
- #6 - Urban Conditions
- #7 - WDNR Request Sample
- SURFACE SOIL SAMPLE LOCATION
- SAMPLE WITH NON-INDUSTRIAL DIRECT CONTACT RCL EXCEEDANCE

- NOTES**
- BASE MAP IMAGERY FROM ESRI, "WORLD IMAGERY", WEB BASEMAP SERVICE LAYER, 2018.
  - THE AXES SHOWN ON THIS MAP ARE THE PRIMARY AXES OF POTENTIAL MAXIMUM AERIAL DEPOSITION BASED ON AIR MODELING DESCRIBED IN THE MAY 16, 2019 SITE INVESTIGATION WORK PLAN ADDENDUM 2.



PROJECT:		<b>WAULECO, INC.</b> 125 ROSENCRANS STREET WAUSAU, WISCONSIN	
TITLE: <b>SOIL SAMPLE LOCATIONS</b>			
DRAWN BY:	J. PAPEZ	PROJ NO.:	189597.0003-T1
CHECKED BY:	K. QUINN	<b>FIGURE 1</b>	
APPROVED BY:	B. IVERSON		
DATE:	SEPTEMBER 2019	708 Heartland Trail, Suite 3000 Madison, WI 53717 Phone: 608.826.3600 www.trcsolutions.com	
FILE NO.:			189597-021.mxd

**Attachment 1**  
**Laboratory Analytical Reports**

**Report Prepared for:**

Bruce Iverson  
TRC-WI  
708 Heartland Trail  
Suite 3000  
Madison WI 53717

**REPORT OF  
LABORATORY  
ANALYSIS FOR  
PCDD/PCDF**

**Report Information:**

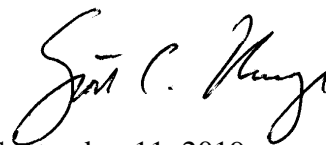
**Pace Project #: 10487441**  
**Sample Receipt Date: 08/15/2019**  
**Client Project #: 189597.0008 Phase 3**  
**Client Sub PO #: 140882**  
**State Cert #: 999407970**

**Invoicing & Reporting Options:**

The report provided has been invoiced as a Level 2 PCDD/PCDF Report. If an upgrade of this report package is requested, an additional charge may be applied.

Please review the attached invoice for accuracy and forward any questions to Carolynne Trout, your Pace Project Manager.

**This report has been reviewed by:**



September 11, 2019

Scott Unze, Project Manager  
(612) 607-6383  
(612) 607-6444 (fax)  
scott.unze@pacelabs.com



**Report of Laboratory Analysis**

This report should not be reproduced, except in full, without the written consent of Pace Analytical Services, Inc.

The results relate only to the samples included in this report.

**Report Prepared Date:**

September 11, 2019



## **DISCUSSION**

This report presents the results from the analyses performed on thirty-six samples submitted by a representative of TRC. The samples were analyzed for the presence or absence of polychlorodibenzo-p-dioxins (PCDDs) and polychlorodibenzofurans (PCDFs) using USEPA Method 1613B. The reporting limits were based on signal-to-noise measurements. Estimated Maximum Possible Concentration (EMPC) values were treated as positives in the toxic equivalence calculations. Method blank and field sample results presented with reporting limits corresponding to the lowest calibration points and a nominal 10-gram sample amount were included at the end of Appendix A. The quantitation limits, adjusted for sample extraction amount, may be somewhat higher or lower than the reporting limits provided in Appendix A. This report was revised to provide WHO 2005 TEQ results.

The recoveries of the isotopically-labeled PCDD/PCDF internal standards in the sample extracts ranged from 28-137%. All of the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1613B. Also, since the quantification of the native 2,3,7,8-substituted congeners was based on isotope dilution, the data were automatically corrected for recovery and accurate values were obtained.

Values were flagged "I" where incorrect isotope ratios were obtained or "P" where polychlorinated diphenyl ethers were present. Concentrations below the calibration range were flagged "J" and should be regarded as estimates. Concentrations above the calibration range were flagged "E" and should also be regarded as estimates. Values obtained from analyses of diluted extracts were flagged "D" and "N2". The values reported for 2,3,7,8-TCDF were obtained from (flagged "C") or verified by (flagged "V") second column confirmation analyses.

A laboratory method blank was prepared and analyzed with each sample batch as part of our routine quality control procedures. The results show the blanks to contain trace levels of selected congeners. These levels were below the calibration range of the method. Sample levels similar to the corresponding blank levels were flagged "B" on the results tables and may be, at least, partially, attributed to the background. It should be noted that levels less than ten times the background are not generally considered to be statistically different from the background.

Laboratory and matrix spike samples were also prepared using clean reference matrix that had been fortified with native standard materials. The results show that the spiked native compounds were recovered at 76-120% with relative percent differences of 0.0-12.0%. The background-subtracted recovery value obtained for OCDD in the primary matrix spike sample was below the target range, possibly due to sample inhomogeneity. Matrix spikes were prepared with the 08/27/2019 extraction batch using sample material from a separate project; results from these analyses will be provided upon request. Matrix spikes were not prepared with the remaining extraction batch.

## **REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full,  
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## Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Minnesota - Pet	1240
Alabama	40770	Mississippi	MN00064
Alaska - DW	MN00064	Missouri - DW	10100
Alaska - UST	17-009	Montana	CERT0092
Arizona	AZ0014	Nebraska	NE-OS-18-06
Arkansas - DW	MN00064	Nevada	MN00064
Arkansas - WW	88-0680	New Hampshire	2081
CNMI Saipan	MP0003	New Jersey (NE)	MN002
California	2929	New York	11647
Colorado	MN00064	North Carolina	27700
Connecticut	PH-0256	North Carolina -	27700
EPA Region 8+	via MN 027-053	North Carolina -	530
Florida (NELAP)	E87605	North Dakota	R-036
Georgia	959	Ohio - DW	41244
Guam	17-001r	Ohio - VAP	CL101
Hawaii	MN00064	Oklahoma	9507
Idaho	MN00064	Oregon - Primar	MN300001
Illinois	200011	Oregon - Secon	MN200001
Indiana	C-MN-01	Pennsylvania	68-00563
Iowa	368	Puerto Rico	MN00064
Kansas	E-10167	South Carolina	74003
Kentucky - DW	90062	South Dakota	NA
Kentucky - WW	90062	Tennessee	TN02818
Louisiana - DE	03086	Texas	T104704192
Louisiana - DW	MN00064	Utah (NELAP)	MN00064
Maine	MN00064	Virginia	460163
Maryland	322	Washington	C486
Massachusetts	M-MN064	West Virginia -	382
Michigan	9909	West Virginia -	9952C
Minnesota	027-053-137	Wisconsin	999407970
Minnesota - De	via MN 027-053	Wyoming - UST	2926.01

## REPORT OF LABORATORY ANALYSIS

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Report No.....10487441

# **Appendix A**

## Sample Management



**CHAIN-OF-CUSTODY / Analytical Request Document**  
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

**Section A**  
Required Client Information:  
Company: **TRC**  
Address: **708 Heavland Trl. A Suite 3000 Madison, WI 53717**  
Email: **biverson@trccompanies.com**  
Phone: **608-826-3644**  
Requested Due Date/TAT: **Standard 7-10**

**Section B**  
Required Project Information:  
Report To: **biverson@trccompanies.com**  
Copy To: **kquinn@trccompanies.com**  
**denright@trccompanies.com**  
Purchase Order No.: **140882**  
Project Name: **Dioxin Sampling**  
Project Number: **189577008 Phase 3**

**Section C**  
Invoice Information:  
Attention: **apmvoiceapproval@trccompanies.com**  
Company Name: **TRC**  
Address: \_\_\_\_\_  
Site Location: **WI**  
State: **WI**

Page: **1** of **3**  
Invoice Number: **2296847**

REGULATORY AGENCY: \_\_\_\_\_  
 NPDES  GROUND WATER  DRINKING WATER  
 UST  RCRA  OTHER

Site Location: \_\_\_\_\_  
 STATE: **WI**

ITEM #	Matrix Codes MATRIX / CODE Drinking Water Water Waste Water Product Soil/Solid Oil Wine Air Tissue Other	COLLECTED		SAMPLE TYPE (G-RAB C-COMP)	MATRIX CODE (see valid codes to left)	RELINQUISHED BY / AFFILIATION		ACCEPTED BY / AFFILIATION		DATE	TIME	DATE	TIME	Temp in °C	Received on Ice (Y/N)	Sealed Cooler (Y/N)	Samples Intact (Y/N)
		COMPOSITE START	COMPOSITE END/GRAB			DATE	TIME	DATE	TIME								
1	N6-1			SLG													
2	N6-2											8/13/19	11:35				
3	N6-4											8/14/19	15:30				
4	N6-3											8/15/19	15:30				
5	N2-1																
6	N2-2																
7	N2-4																
8	N2-3																
9	N2-5																
10	N5-2A																
11	N5-1A																
12	N5-3																

**WO#: 10487441**  
  
**10487441**

**ADDITIONAL COMMENTS**  
 \*Run undiluted to avoid elevated detection limits. If dilution is necessary, run the sample a second time at dilution to correct QA/QC problems.

SAMPLER NAME AND SIGNATURE  
 PRINT Name of SAMPLER:  
 SIGNATURE of SAMPLER:  
 DATE SIGNED (MM/DD/YYYY):

ORIGINAL

\*Important Note: By signing this form you are accepting Pace's NET 30-day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.







# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

**Section A**  
Required Client Information:

Company: TRC

Address: 708 Heartland Trail, #200  
Nadison, WI 53717

Email To: biverson@trccompanies.com  
quinn@trccompanies.com  
carbaugh@trccompanies.com

Phone: 608-816-3141

Requested Due Date/TAT: standard 7-10

**Section B**  
Required Project Information:

Report To: biverson@trccompanies.com

Copy To: biverson@trccompanies.com

Purchase Order #: 240882

Project Name: Toxin Sampling

Project Number: 18997.0008 Phase 3

**Section C**  
Invoice Information:

Company Name: TRC

Address: 2296849

REGULATORY AGENCY

Site Location: WI

STATE: WI

**Section D**  
Required Client Information:

Matrix Codes: DW, WT, WW, P, SL, OL, WP, AR, TS, OT

Matrix / CODE: Drinking Water, Waste Water, Product, Soil/Solid, Oil, Wipe, Air, Tissue, Other

**SAMPLE ID**  
(A-Z, 0-9 / -)

Sample IDs MUST BE UNIQUE

ITEM #	MATRIX CODE	COLLECTED		SAMPLE TYPE (G=GRAB C=COMP)	MATRIX CODE (see valid codes to left)	REQUISITIONED BY / AFFILIATION		REQUISITIONED BY / AFFILIATION		DATE	TIME	DATE	TIME	SAMPLE CONDITIONS
		COMPOSITE START	COMPOSITE END/GRAB			DATE	TIME	DATE	TIME					
1	0-01			G	SL G	8/13/19	16:00	Alia Grigitt/TRC	Waukegan cooler	8/13/19	16:40			
2	0-04			G	SL G	8/14/19	15:30	Waukegan cooler	Waukegan cooler	8/14/19	15:30			
3	0-05			G	SL G	8/14/19	15:30	Waukegan cooler	Waukegan cooler	8/14/19	15:30			
4	0-06			G	SL G	8/14/19	15:30	Waukegan cooler	Waukegan cooler	8/14/19	15:30			
5	0-08			G	SL G	8/14/19	15:30	Waukegan cooler	Waukegan cooler	8/14/19	15:30			
6	0-07			G	SL G	8/14/19	15:30	Waukegan cooler	Waukegan cooler	8/14/19	15:30			
7	0-03			G	SL G	8/14/19	15:30	Waukegan cooler	Waukegan cooler	8/14/19	15:30			
8	0-02			G	SL G	8/14/19	15:30	Waukegan cooler	Waukegan cooler	8/14/19	15:30			
9	N4-3			G	SL G	8/14/19	15:30	Waukegan cooler	Waukegan cooler	8/14/19	15:30			
10	N4-2			G	SL G	8/14/19	15:30	Waukegan cooler	Waukegan cooler	8/14/19	15:30			
11	N4-1			G	SL G	8/14/19	15:30	Waukegan cooler	Waukegan cooler	8/14/19	15:30			
12	N7-1			G	SL G	8/14/19	15:30	Waukegan cooler	Waukegan cooler	8/14/19	15:30			

**Section E**  
Requested Analysis Filtered (Y/N)

Analysis Test	Y/N
Residual Chlorine (Y/N)	

**Section F**  
Preservatives

Unpreserved	
H <sub>2</sub> SO <sub>4</sub>	
HNO <sub>3</sub>	
HCl	
NaOH	
Na <sub>2</sub> S <sub>2</sub> O <sub>8</sub>	
Methanol	
Other	

**Section G**  
Additional Comments

\*see comment on p.1

Waukegan cooler

W.D. Dush

**Section H**  
Signatures

SAMPLER NAME AND SIGNATURE: Alia Grigitt/TRC

PRINT Name of SAMPLER: Waukegan cooler

SIGNATURE of SAMPLER: W.D. Dush

DATE Signed (MM/DD/YYYY): 8/14/19

**Section I**  
Final Status

Temp in °C: 3.6

Received on Ice (Y/N): Y

Sealed Cooler (Y/N): Y

Custody (Y/N): Y

Samples Intact (Y/N): Y

\*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

**Sample Condition Upon Receipt**      **Client Name:** TRC      **Project #:** WO#: 10487441

**Courier:**  Fed Ex     UPS     USPS     Client  
 Pace     Speedee     Commercial     See Exception

**Tracking Number:** 4638 0199 1562

**Custody Seal on Cooler/Box Present?**  Yes     No      **Seals Intact?**  Yes     No      **Biological Tissue Frozen?**  Yes     No  N/A

**Packing Material:**  Bubble Wrap     Bubble Bags     None     Other: \_\_\_\_\_      **Temp Blank?**  Yes     No

**Thermometer:**  T1(0461)     T2(1336)     T3(0459)     T4(0254)     T5(0489)      **Type of Ice:**  Wet     Blue     None     Dry     Melted

**Note: Each West Virginia Sample must have temp taken (no temp blanks)**

Temp should be above freezing to 6°C	<b>Cooler Temp Read w/temp blank:</b> <u>3.5</u> °C	<b>Average Corrected Temp (no temp blank only):</b> _____ °C
<b>Correction Factor:</b> <u>+0.1</u>	<b>Cooler Temp Corrected w/temp blank:</b> <u>3.6</u> °C	<b>See Exceptions</b> <input type="checkbox"/>

**USDA Regulated Soil:** (  N/A, water sample/Other: \_\_\_\_\_ )      **Date/Initials of Person Examining Contents:** AUM 08.15.19

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)?  Yes     No      Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)?  Yes     No

**If Yes to either question, fill out a Regulated Soil Checklist (F-MN-Q-338) and include with SCUR/COC paperwork.**

		COMMENTS:
Chain of Custody Present and Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	1.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.
Sampler Name and/or Signature on COC?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	3.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	4.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	5. <input type="checkbox"/> Fecal Coliform <input type="checkbox"/> HPC <input type="checkbox"/> Total Coliform/E coli <input type="checkbox"/> BOD/cBOD <input type="checkbox"/> Hex Chrome <input type="checkbox"/> Turbidity <input type="checkbox"/> Nitrate <input type="checkbox"/> Nitrite <input type="checkbox"/> Orthophos <input type="checkbox"/> Other
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6.
Sufficient Volume?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	7.
Correct Containers Used? -Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	8.
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	9.
Field Filtered Volume Received for Dissolved Tests?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	10. Is sediment visible in the dissolved container? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is sufficient information available to reconcile the samples to the COC? Matrix: <input type="checkbox"/> Water <input checked="" type="checkbox"/> Soil <input type="checkbox"/> Oil <input type="checkbox"/> Other	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	11. If no, write ID/ Date/Time on Container Below: _____      See Exception <input type="checkbox"/>
All containers needing acid/base preservation have been checked?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12. Sample # _____ <input type="checkbox"/> NaOH <input type="checkbox"/> HNO <sub>3</sub> <input type="checkbox"/> H <sub>2</sub> SO <sub>4</sub> <input type="checkbox"/> Zinc Acetate
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO <sub>3</sub> , H <sub>2</sub> SO <sub>4</sub> , <2pH, NaOH >9 Sulfide, NaOH >12 Cyanide)	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Positive for Res. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No      See Exception <input type="checkbox"/>
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and <u>Dioxin</u> /PFAS	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Chlorine? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No      pH Paper Lot# _____ Res. Chlorine    0-6 Roll    0-6 Strip    0-14 Strip
Headspace in VOA Vials (greater than 6mm)?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	13. _____      See Exception <input type="checkbox"/>
Trip Blank Present? Trip Blank Custody Seals Present?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14. Pace Trip Blank Lot # (if purchased): _____

**CLIENT NOTIFICATION/RESOLUTION**

Person Contacted: \_\_\_\_\_      Date/Time: \_\_\_\_\_      Field Data Required?  Yes     No

Comments/Resolution: \_\_\_\_\_

**Project Manager Review:** Carolynne Trout      Date: 8/15/19

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers).

Labeled by: ST (2)

**Method 1613B Blank Analysis Results**

Lab Sample Name	DFBLKWU	Matrix	Solid
Lab Sample ID	BLANK-72962	Dilution	NA
Filename	F190829A_12	Extracted	08/27/2019 15:05
Total Amount Extracted	10.7 g	Analyzed	08/29/2019 16:25
ICAL ID	F190827	Injected By	SMT
CCal Filename(s)	F190829A_01		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	84
Total TCDF	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	81
				1,2,3,7,8-PeCDF-13C	2.00	79
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	82
Total TCDD	ND	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	79
				1,2,3,4,7,8-HxCDF-13C	2.00	78
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	87
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	86
Total PeCDF	ND	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	86
				1,2,3,4,7,8-HxCDD-13C	2.00	68
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	76
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	76
				1,2,3,4,7,8,9-HpCDF-13C	2.00	72
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	76
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	57
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	76
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	ND	----	5.0			
1,2,3,4,6,7,8-HpCDF	ND	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 0.00 ng/Kg		
Total HpCDF	ND	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	----	5.0			
Total HpCDD	ND	----	5.0			
OCDF	ND	----	10			
OCDD	ND	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

**Method 1613B Blank Analysis Results**

Lab Sample Name	DFBLKWZ	Matrix	Solid
Lab Sample ID	BLANK-72988	Dilution	NA
Filename	F190830A_06	Extracted	08/28/2019 15:05
Total Amount Extracted	10.1 g	Analyzed	08/30/2019 13:45
ICAL ID	F190827	Injected By	ZMS
CCal Filename(s)	F190830A_03		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.0	2,3,7,8-TCDF-13C	2.00	91
Total TCDF	ND	-----	1.0	2,3,7,8-TCDD-13C	2.00	88
				1,2,3,7,8-PeCDF-13C	2.00	89
2,3,7,8-TCDD	ND	-----	1.0	2,3,4,7,8-PeCDF-13C	2.00	87
Total TCDD	ND	-----	1.0	1,2,3,7,8-PeCDD-13C	2.00	89
				1,2,3,4,7,8-HxCDF-13C	2.00	92
1,2,3,7,8-PeCDF	ND	-----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	105
2,3,4,7,8-PeCDF	ND	-----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	102
Total PeCDF	ND	-----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	100
				1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,7,8-PeCDD	ND	-----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	84
Total PeCDD	ND	-----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	100
				1,2,3,4,7,8,9-HpCDF-13C	2.00	96
1,2,3,4,7,8-HxCDF	ND	-----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	98
1,2,3,6,7,8-HxCDF	ND	-----	5.0	OCDD-13C	4.00	84
2,3,4,6,7,8-HxCDF	ND	-----	5.0			
1,2,3,7,8,9-HxCDF	ND	-----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	5.0	2,3,7,8-TCDD-37Cl4	0.20	74
1,2,3,6,7,8-HxCDD	ND	-----	5.0			
1,2,3,7,8,9-HxCDD	ND	-----	5.0			
Total HxCDD	ND	-----	5.0			
1,2,3,4,6,7,8-HpCDF	ND	-----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	5.0	Equivalence: 0.00 ng/Kg		
Total HpCDF	ND	-----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	-----	5.0			
Total HpCDD	ND	-----	5.0			
OCDF	ND	-----	10			
OCDD	ND	-----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

### Method 1613B Blank Analysis Results

Lab Sample Name	DFBLKXD	Matrix	Solid
Lab Sample ID	BLANK-73004	Dilution	NA
Filename	F190830B_07	Extracted	08/28/2019 15:05
Total Amount Extracted	20.7 g	Analyzed	08/30/2019 21:33
ICAL ID	F190827	Injected By	JRH
CCal Filename(s)	F190830A_09		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.0	2,3,7,8-TCDF-13C	2.00	65
Total TCDF	ND	-----	1.0	2,3,7,8-TCDD-13C	2.00	75
				1,2,3,7,8-PeCDF-13C	2.00	71
2,3,7,8-TCDD	ND	-----	1.0	2,3,4,7,8-PeCDF-13C	2.00	75
Total TCDD	ND	-----	1.0	1,2,3,7,8-PeCDD-13C	2.00	82
				1,2,3,4,7,8-HxCDF-13C	2.00	73
1,2,3,7,8-PeCDF	ND	-----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	79
2,3,4,7,8-PeCDF	ND	-----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	77
Total PeCDF	ND	-----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	78
				1,2,3,4,7,8-HxCDD-13C	2.00	70
1,2,3,7,8-PeCDD	ND	-----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	69
Total PeCDD	ND	-----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	82
				1,2,3,4,7,8,9-HpCDF-13C	2.00	85
1,2,3,4,7,8-HxCDF	ND	-----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	90
1,2,3,6,7,8-HxCDF	ND	-----	5.0	OCDD-13C	4.00	79
2,3,4,6,7,8-HxCDF	ND	-----	5.0			
1,2,3,7,8,9-HxCDF	ND	-----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	5.0	2,3,7,8-TCDD-37Cl4	0.20	72
1,2,3,6,7,8-HxCDD	ND	-----	5.0			
1,2,3,7,8,9-HxCDD	ND	-----	5.0			
Total HxCDD	ND	-----	5.0			
1,2,3,4,6,7,8-HpCDF	ND	-----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	5.0	Equivalence: 0.00 ng/Kg		
Total HpCDF	ND	-----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	-----	5.0			
Total HpCDD	ND	-----	5.0			
OCDF	ND	-----	10			
OCDD	ND	-----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

## REPORT OF LABORATORY ANALYSIS

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Report No.....10487441



**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N6-1		
Lab Sample ID	10487441001		
Filename	U190830B_03		
Injected By	SMT		
Total Amount Extracted	12.8 g	Matrix	Solid
% Moisture	9.3	Dilution	NA
Dry Weight Extracted	11.6 g	Collected	08/13/2019 08:00
ICAL ID	U190730	Received	08/15/2019 08:40
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 11:41

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	91
Total TCDF	1.3	----	1.0	2,3,7,8-TCDD-13C	2.00	91
				1,2,3,7,8-PeCDF-13C	2.00	94
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	92
Total TCDD	ND	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	102
				1,2,3,4,7,8-HxCDF-13C	2.00	80 DN2
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	74 DN2
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	71 DN2
Total PeCDF	7.9	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	57 DN2
				1,2,3,4,7,8-HxCDD-13C	2.00	84 DN2
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	67 DN2
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	63 DN2
				1,2,3,4,7,8,9-HpCDF-13C	2.00	64 DN2
1,2,3,4,7,8-HxCDF	ND	----	5.0 DN2	1,2,3,4,6,7,8-HpCDD-13C	2.00	68 DN2
1,2,3,6,7,8-HxCDF	ND	----	5.0 DN2	OCDD-13C	4.00	48 DN2
2,3,4,6,7,8-HxCDF	ND	----	5.0 DN2			
1,2,3,7,8,9-HxCDF	ND	----	5.0 DN2	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	5.2	----	5.0 JDN2	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0 DN2	2,3,7,8-TCDD-37Cl4	0.20	87
1,2,3,6,7,8-HxCDD	ND	----	5.0 DN2			
1,2,3,7,8,9-HxCDD	ND	----	5.0 DN2			
Total HxCDD	ND	----	5.0 DN2			
1,2,3,4,6,7,8-HpCDF	7.0	----	5.0 JDN2	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0 DN2	Equivalence: 0.43 ng/Kg		
Total HpCDF	15	----	5.0 JDN2	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	19	----	5.0 JDN2			
Total HpCDD	39	----	5.0 DN2			
OCDF	11	----	10 JDN2			
OCDD	160	----	10 DN2			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit  
 ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
 J = Estimated value  
 D = Result obtained from analysis of diluted sample  
 Nn = Value obtained from additional analysis

**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N6-2		
Lab Sample ID	10487441002		
Filename	U190830B_04		
Injected By	SMT		
Total Amount Extracted	11.8 g	Matrix	Solid
% Moisture	11.4	Dilution	NA
Dry Weight Extracted	10.5 g	Collected	08/13/2019 08:16
ICAL ID	U190730	Received	08/15/2019 08:40
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 12:24

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	81
Total TCDF	19	----	1.0	2,3,7,8-TCDD-13C	2.00	83
				1,2,3,7,8-PeCDF-13C	2.00	85
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	85
Total TCDD	1.7	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	92
				1,2,3,4,7,8-HxCDF-13C	2.00	90 DN2
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	84 DN2
2,3,4,7,8-PeCDF	5.0	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	82 DN2
Total PeCDF	57	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	42 DN2
				1,2,3,4,7,8-HxCDD-13C	2.00	98 DN2
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	77 DN2
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	75 DN2
				1,2,3,4,7,8,9-HpCDF-13C	2.00	77 DN2
1,2,3,4,7,8-HxCDF	ND	----	5.0 DN2	1,2,3,4,6,7,8-HpCDD-13C	2.00	79 DN2
1,2,3,6,7,8-HxCDF	ND	----	5.0 DN2	OCDD-13C	4.00	68 DN2
2,3,4,6,7,8-HxCDF	ND	----	5.0 DN2			
1,2,3,7,8,9-HxCDF	ND	----	5.0 DN2	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	60	----	5.0 DN2	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0 DN2	2,3,7,8-TCDD-37Cl4	0.20	78
1,2,3,6,7,8-HxCDD	5.1	----	5.0 JDN2			
1,2,3,7,8,9-HxCDD	ND	----	5.0 DN2			
Total HxCDD	33	----	5.0 DN2			
1,2,3,4,6,7,8-HpCDF	34	----	5.0 DN2	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0 DN2	Equivalence: 5.3 ng/Kg		
Total HpCDF	89	----	5.0 DN2	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	96	----	5.0 DN2			
Total HpCDD	200	----	5.0 DN2			
OCDF	73	----	10 DN2			
OCDD	860	----	10 DN2			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).

EMPC = Estimated Maximum Possible Concentration

RL = Reporting Limit

ND = Not Detected

NA = Not Applicable

NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Estimated value

D = Result obtained from analysis of diluted sample

Nn = Value obtained from additional analysis

**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

## Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N6-4		
Lab Sample ID	10487441003		
Filename	U190830B_05		
Injected By	SMT		
Total Amount Extracted	11.4 g	Matrix	Solid
% Moisture	11.9	Dilution	NA
Dry Weight Extracted	10.0 g	Collected	08/13/2019 08:40
ICAL ID	U190730	Received	08/15/2019 08:40
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 13:08

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	83
Total TCDF	23	----	1.0	2,3,7,8-TCDD-13C	2.00	84
				1,2,3,7,8-PeCDF-13C	2.00	84
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	84
Total TCDD	3.1	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	92
				1,2,3,4,7,8-HxCDF-13C	2.00	74 DN2
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	66 DN2
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	66 DN2
Total PeCDF	39	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	52 DN2
				1,2,3,4,7,8-HxCDD-13C	2.00	79 DN2
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	61 DN2
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	61 DN2
				1,2,3,4,7,8,9-HpCDF-13C	2.00	64 DN2
1,2,3,4,7,8-HxCDF	ND	----	5.0 DN2	1,2,3,4,6,7,8-HpCDD-13C	2.00	67 DN2
1,2,3,6,7,8-HxCDF	ND	----	5.0 DN2	OCDD-13C	4.00	51 DN2
2,3,4,6,7,8-HxCDF	ND	----	5.0 DN2			
1,2,3,7,8,9-HxCDF	ND	----	5.0 DN2	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	37	----	5.0 DN2	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0 DN2	2,3,7,8-TCDD-37Cl4	0.20	76
1,2,3,6,7,8-HxCDD	ND	----	5.0 DN2			
1,2,3,7,8,9-HxCDD	ND	----	5.0 DN2			
Total HxCDD	14	----	5.0 JDN2			
1,2,3,4,6,7,8-HpCDF	17	----	5.0 JDN2	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0 DN2	Equivalence: 0.91 ng/Kg		
Total HpCDF	43	----	5.0 DN2	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	39	----	5.0 DN2			
Total HpCDD	78	----	5.0 DN2			
OCDF	40	----	10 JDN2			
OCDD	310	----	10 DN2			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Estimated value

D = Result obtained from analysis of diluted sample

Nn = Value obtained from additional analysis

## REPORT OF LABORATORY ANALYSIS

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Report No.....10487441



**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N6-3		
Lab Sample ID	10487441004		
Filename	U190830B_06		
Injected By	SMT		
Total Amount Extracted	11.6 g	Matrix	Solid
% Moisture	10.2	Dilution	NA
Dry Weight Extracted	10.4 g	Collected	08/13/2019 09:00
ICAL ID	U190730	Received	08/15/2019 08:40
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 13:51

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	79
Total TCDF	1.7	----	1.0	2,3,7,8-TCDD-13C	2.00	78
				1,2,3,7,8-PeCDF-13C	2.00	76
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	79
Total TCDD	ND	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	83
				1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	70
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	75
Total PeCDF	7.3	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	45
				1,2,3,4,7,8-HxCDD-13C	2.00	79
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	61
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	64
				1,2,3,4,7,8,9-HpCDF-13C	2.00	71
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	71
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	58
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	13	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	80
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	7.4	----	5.0			
1,2,3,4,6,7,8-HpCDF	12	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 1.1 ng/Kg		
Total HpCDF	33	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	51	----	5.0			
Total HpCDD	91	----	5.0			
OCDF	43	----	10			
OCDD	460	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit  
 ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N2-1		
Lab Sample ID	10487441005		
Filename	U190830B_07		
Injected By	SMT		
Total Amount Extracted	12.1 g	Matrix	Solid
% Moisture	17.6	Dilution	NA
Dry Weight Extracted	10.0 g	Collected	08/13/2019 09:35
ICAL ID	U190730	Received	08/15/2019 08:40
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 14:35

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	87
Total TCDF	14	----	1.0	2,3,7,8-TCDD-13C	2.00	87
				1,2,3,7,8-PeCDF-13C	2.00	88
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	91
Total TCDD	2.3	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	92
				1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	77
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	28	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	57
				1,2,3,4,7,8-HxCDD-13C	2.00	87
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	65
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	70
				1,2,3,4,7,8,9-HpCDF-13C	2.00	79
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	83
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	64
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	18	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	79
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	12	----	5.0			
1,2,3,4,6,7,8-HpCDF	13	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 0.74 ng/Kg		
Total HpCDF	27	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	34	----	5.0			
Total HpCDD	63	----	5.0			
OCDF	18	----	10			
OCDD	250	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N2-2		
Lab Sample ID	10487441006		
Filename	U190830B_08		
Injected By	SMT		
Total Amount Extracted	11.7 g	Matrix	Solid
% Moisture	14.4	Dilution	NA
Dry Weight Extracted	10.00 g	Collected	08/13/2019 09:45
ICAL ID	U190730	Received	08/15/2019 08:40
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 15:18

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	67
Total TCDF	44	----	1.0	2,3,7,8-TCDD-13C	2.00	67
				1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	72
Total TCDD	2.2	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	74
				1,2,3,4,7,8-HxCDF-13C	2.00	66
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	56
2,3,4,7,8-PeCDF	6.8	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	60
Total PeCDF	130	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	48
				1,2,3,4,7,8-HxCDD-13C	2.00	71
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	45
Total PeCDD	12	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	55
				1,2,3,4,7,8,9-HpCDF-13C	2.00	67
1,2,3,4,7,8-HxCDF	12	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	68
1,2,3,6,7,8-HxCDF	-----	9.1	5.0	OCDD-13C	4.00	63
2,3,4,6,7,8-HxCDF	5.6	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	230	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	7.2	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	63
1,2,3,6,7,8-HxCDD	22	----	5.0			
1,2,3,7,8,9-HxCDD	13	----	5.0			
Total HxCDD	130	----	5.0			
1,2,3,4,6,7,8-HpCDF	160	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	11	----	5.0	Equivalence: 19 ng/Kg		
Total HpCDF	420	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	400	----	5.0			
Total HpCDD	670	----	5.0			
OCDF	310	----	10			
OCDD	3000	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
 P = PCDE Interference

**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N2-4		
Lab Sample ID	10487441007		
Filename	U190830B_09		
Injected By	SMT		
Total Amount Extracted	12.0 g	Matrix	Solid
% Moisture	14.9	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	08/13/2019 10:05
ICAL ID	U190730	Received	08/15/2019 08:40
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 16:01

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	1.8	----	1.0 C	2,3,7,8-TCDF-13C	2.00	83
Total TCDF	55	----	1.0	2,3,7,8-TCDD-13C	2.00	84
				1,2,3,7,8-PeCDF-13C	2.00	89
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	76
Total TCDD	2.0	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	84
				1,2,3,4,7,8-HxCDF-13C	2.00	128
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	113
2,3,4,7,8-PeCDF	13	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	119
Total PeCDF	160	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	120
				1,2,3,4,7,8-HxCDD-13C	2.00	137
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	102
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	111
				1,2,3,4,7,8,9-HpCDF-13C	2.00	126
1,2,3,4,7,8-HxCDF	6.1	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	137
1,2,3,6,7,8-HxCDF	6.0	----	5.0	OCDD-13C	4.00	129
2,3,4,6,7,8-HxCDF	6.1	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	150	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,6,7,8-HxCDD	11	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	61	----	5.0			
1,2,3,4,6,7,8-HpCDF	94	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 15 ng/Kg		
Total HpCDF	210	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	210	----	5.0			
Total HpCDD	350	----	5.0			
OCDF	130	----	10			
OCDD	1600	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

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C = Result obtained from confirmation analysis

**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N2-3		
Lab Sample ID	10487441008		
Filename	U190830B_10		
Injected By	SMT		
Total Amount Extracted	11.6 g	Matrix	Solid
% Moisture	13.2	Dilution	NA
Dry Weight Extracted	10.0 g	Collected	08/13/2019 10:15
ICAL ID	U190730	Received	08/15/2019 08:40
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 16:44

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	82
Total TCDF	39	----	1.0	2,3,7,8-TCDD-13C	2.00	82
				1,2,3,7,8-PeCDF-13C	2.00	83
2,3,7,8-TCDD	16	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	84
Total TCDD	19	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	87
				1,2,3,4,7,8-HxCDF-13C	2.00	79
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	66
2,3,4,7,8-PeCDF	5.7	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	68
Total PeCDF	110	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	49
				1,2,3,4,7,8-HxCDD-13C	2.00	76
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	59
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	64
				1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	74
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	68
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	69	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	74
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	25	----	5.0			
1,2,3,4,6,7,8-HpCDF	32	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 20 ng/Kg		
Total HpCDF	69	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	72	----	5.0			
Total HpCDD	130	----	5.0			
OCDF	59	----	10			
OCDD	520	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N2-5		
Lab Sample ID	10487441009		
Filename	U190830B_11		
Injected By	SMT		
Total Amount Extracted	12.0 g	Matrix	Solid
% Moisture	14.6	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	08/13/2019 10:30
ICAL ID	U190730	Received	08/15/2019 08:40
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 17:28

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	85
Total TCDF	8.1	----	1.0	2,3,7,8-TCDD-13C	2.00	84
				1,2,3,7,8-PeCDF-13C	2.00	87
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	85
Total TCDD	1.2	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	91
				1,2,3,4,7,8-HxCDF-13C	2.00	129
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	114
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	124
Total PeCDF	13	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	59
				1,2,3,4,7,8-HxCDD-13C	2.00	132
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	104
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	117
				1,2,3,4,7,8,9-HpCDF-13C	2.00	131
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	134
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	124
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	20	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	35	----	5.0			
1,2,3,4,6,7,8-HpCDF	20	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 1.8 ng/Kg		
Total HpCDF	43	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	100	----	5.0			
Total HpCDD	230	----	5.0			
OCDF	34	----	10			
OCDD	610	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
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**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N5-2A		
Lab Sample ID	10487441010		
Filename	U190830B_12		
Injected By	SMT		
Total Amount Extracted	12.4 g	Matrix	Solid
% Moisture	16.9	Dilution	NA
Dry Weight Extracted	10.3 g	Collected	08/13/2019 11:05
ICAL ID	U190730	Received	08/15/2019 08:40
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 18:11

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	79
Total TCDF	3.9	----	1.0	2,3,7,8-TCDD-13C	2.00	79
				1,2,3,7,8-PeCDF-13C	2.00	77
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	78
Total TCDD	ND	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	82
				1,2,3,4,7,8-HxCDF-13C	2.00	113
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	99
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	106
Total PeCDF	16	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	50
				1,2,3,4,7,8-HxCDD-13C	2.00	115
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	86
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	93
				1,2,3,4,7,8,9-HpCDF-13C	2.00	107
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	109
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	90
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	46	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	24	----	5.0			
1,2,3,4,6,7,8-HpCDF	27	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 1.8 ng/Kg		
Total HpCDF	68	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	76	----	5.0			
Total HpCDD	140	----	5.0			
OCDF	65	----	10			
OCDD	660	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
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 NC = Not Calculated

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**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441



**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N5-1A		
Lab Sample ID	10487441011		
Filename	U190830B_13		
Injected By	SMT		
Total Amount Extracted	11.5 g	Matrix	Solid
% Moisture	12.7	Dilution	NA
Dry Weight Extracted	10.0 g	Collected	08/13/2019 11:15
ICAL ID	U190730	Received	08/15/2019 08:40
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 18:54

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	100
Total TCDF	1.9	----	1.0	2,3,7,8-TCDD-13C	2.00	100
				1,2,3,7,8-PeCDF-13C	2.00	96
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	98
Total TCDD	ND	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	106
				1,2,3,4,7,8-HxCDF-13C	2.00	80 DN2
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	78 DN2
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	74 DN2
Total PeCDF	13	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	76 DN2
				1,2,3,4,7,8-HxCDD-13C	2.00	86 DN2
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	73 DN2
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	67 DN2
				1,2,3,4,7,8,9-HpCDF-13C	2.00	68 DN2
1,2,3,4,7,8-HxCDF	ND	----	5.0 DN2	1,2,3,4,6,7,8-HpCDD-13C	2.00	75 DN2
1,2,3,6,7,8-HxCDF	ND	----	5.0 DN2	OCDD-13C	4.00	51 DN2
2,3,4,6,7,8-HxCDF	ND	----	5.0 DN2			
1,2,3,7,8,9-HxCDF	ND	----	5.0 DN2	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	17	----	5.0 JDN2	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0 DN2	2,3,7,8-TCDD-37Cl4	0.20	95
1,2,3,6,7,8-HxCDD	ND	----	5.0 DN2			
1,2,3,7,8,9-HxCDD	ND	----	5.0 DN2			
Total HxCDD	6.1	----	5.0 JDN2			
1,2,3,4,6,7,8-HpCDF	11	----	5.0 JDN2	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0 DN2	Equivalence: 0.84 ng/Kg		
Total HpCDF	11	----	5.0 JDN2	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	37	----	5.0 DN2			
Total HpCDD	81	----	5.0 DN2			
OCDF	25	----	10 JDN2			
OCDD	340	----	10 DN2			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
 J = Estimated value  
 D = Result obtained from analysis of diluted sample  
 Nn = Value obtained from additional analysis

**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441



**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N5-3		
Lab Sample ID	10487441012		
Filename	U190830B_14		
Injected By	SMT		
Total Amount Extracted	11.8 g	Matrix	Solid
% Moisture	13.6	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	08/13/2019 11:25
ICAL ID	U190730	Received	08/15/2019 08:40
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 19:38

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	80
Total TCDF	1.4	----	1.0	2,3,7,8-TCDD-13C	2.00	82
				1,2,3,7,8-PeCDF-13C	2.00	75
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	74
Total TCDD	ND	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	80
				1,2,3,4,7,8-HxCDF-13C	2.00	95 DN2
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	85 DN2
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	79 DN2
Total PeCDF	7.7	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	43 DN2
				1,2,3,4,7,8-HxCDD-13C	2.00	94 DN2
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	79 DN2
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	65 DN2
				1,2,3,4,7,8,9-HpCDF-13C	2.00	66 DN2
1,2,3,4,7,8-HxCDF	ND	----	5.0 DN2	1,2,3,4,6,7,8-HpCDD-13C	2.00	67 DN2
1,2,3,6,7,8-HxCDF	ND	----	5.0 DN2	OCDD-13C	4.00	48 DN2
2,3,4,6,7,8-HxCDF	ND	----	5.0 DN2			
1,2,3,7,8,9-HxCDF	ND	----	5.0 DN2	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	32	----	5.0 DN2	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0 DN2	2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,6,7,8-HxCDD	5.1	----	5.0 JDN2			
1,2,3,7,8,9-HxCDD	ND	----	5.0 DN2			
Total HxCDD	25	----	5.0 DN2			
1,2,3,4,6,7,8-HpCDF	23	----	5.0 JDN2	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0 DN2	Equivalence: 3.1 ng/Kg		
Total HpCDF	58	----	5.0 DN2	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	100	----	5.0 DN2			
Total HpCDD	230	----	5.0 DN2			
OCDF	47	----	10 JDN2			
OCDD	1200	----	10 DN2			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Estimated value

D = Result obtained from analysis of diluted sample

Nn = Value obtained from additional analysis

**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N5-4		
Lab Sample ID	10487441013		
Filename	U190830B_15		
Injected By	SMT		
Total Amount Extracted	12.1 g	Matrix	Solid
% Moisture	16.6	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	08/13/2019 11:35
ICAL ID	U190730	Received	08/15/2019 08:40
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 20:21

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	89
Total TCDF	4.8	----	1.0	2,3,7,8-TCDD-13C	2.00	89
				1,2,3,7,8-PeCDF-13C	2.00	86
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	89
Total TCDD	ND	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	94
				1,2,3,4,7,8-HxCDF-13C	2.00	125
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	108
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	114
Total PeCDF	21	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	66
				1,2,3,4,7,8-HxCDD-13C	2.00	120
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	96
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	106
				1,2,3,4,7,8,9-HpCDF-13C	2.00	116
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	120
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	105
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	95	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	79
1,2,3,6,7,8-HxCDD	38	----	5.0			
1,2,3,7,8,9-HxCDD	5.1	----	5.0			
Total HxCDD	130	----	5.0			
1,2,3,4,6,7,8-HpCDF	55	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 15 ng/Kg		
Total HpCDF	170	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	580	----	5.0			
Total HpCDD	960	----	5.0			
OCDF	230	----	10			
OCDD	4200	----	10 E			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
 E = Exceeds calibration range

**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N3-4		
Lab Sample ID	10487441014		
Filename	Y190830A_10		
Injected By	ZMS		
Total Amount Extracted	11.8 g	Matrix	Solid
% Moisture	14.5	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	08/13/2019 12:50
ICAL ID	Y190827	Received	08/15/2019 08:40
CCal Filename(s)	Y190830A_02	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-72988	Analyzed	08/30/2019 15:46

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	82
Total TCDF	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	77
				1,2,3,7,8-PeCDF-13C	2.00	70
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	68
Total TCDD	ND	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	69
				1,2,3,4,7,8-HxCDF-13C	2.00	82
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	82
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	84
Total PeCDF	ND	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	78
				1,2,3,4,7,8-HxCDD-13C	2.00	79
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	72
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	70
				1,2,3,4,7,8,9-HpCDF-13C	2.00	70
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	69
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	57
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	82
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	ND	----	5.0			
1,2,3,4,6,7,8-HpCDF	ND	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 0.20 ng/Kg		
Total HpCDF	ND	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	11	----	5.0			
Total HpCDD	21	----	5.0			
OCDF	ND	----	10			
OCDD	90	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N3-3		
Lab Sample ID	10487441015		
Filename	Y190830A_11		
Injected By	ZMS		
Total Amount Extracted	11.9 g	Matrix	Solid
% Moisture	12.9	Dilution	NA
Dry Weight Extracted	10.3 g	Collected	08/13/2019 13:00
ICAL ID	Y190827	Received	08/15/2019 08:40
CCal Filename(s)	Y190830A_02	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-72988	Analyzed	08/30/2019 16:31

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	84
Total TCDF	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	80
				1,2,3,7,8-PeCDF-13C	2.00	80
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	85
Total TCDD	ND	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	88
				1,2,3,4,7,8-HxCDF-13C	2.00	78
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	81
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	82
Total PeCDF	ND	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	64
				1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	67
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	68
				1,2,3,4,7,8-HpCDF-13C	2.00	69
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	67
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	62
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	82
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	ND	----	5.0			
1,2,3,4,6,7,8-HpCDF	6.1	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 0.31 ng/Kg		
Total HpCDF	13	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	14	----	5.0			
Total HpCDD	28	----	5.0			
OCDF	ND	----	10			
OCDD	110	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

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**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N3-2		
Lab Sample ID	10487441016		
Filename	Y190830A_12		
Injected By	ZMS		
Total Amount Extracted	11.3 g	Matrix	Solid
% Moisture	9.6	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	08/13/2019 13:10
ICAL ID	Y190827	Received	08/15/2019 08:40
CCal Filename(s)	Y190830A_02	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-72988	Analyzed	08/30/2019 17:17

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	75
Total TCDF	3.9	----	1.0	2,3,7,8-TCDD-13C	2.00	72
				1,2,3,7,8-PeCDF-13C	2.00	75
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	76
Total TCDD	8.1	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	77
				1,2,3,4,7,8-HxCDF-13C	2.00	77
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	75
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	6.4	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	76
				1,2,3,4,7,8-HxCDD-13C	2.00	72
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	67
Total PeCDD	16	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	67
				1,2,3,4,7,8,9-HpCDF-13C	2.00	68
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	67
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	64
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	17	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	77
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	43	----	5.0			
1,2,3,4,6,7,8-HpCDF	26	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 0.90 ng/Kg		
Total HpCDF	42	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	39	----	5.0			
Total HpCDD	79	----	5.0			
OCDF	34	----	10			
OCDD	220	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

**REPORT OF LABORATORY ANALYSIS**

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Report No..... 10487441



**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N3-1		
Lab Sample ID	10487441017		
Filename	Y190830A_13		
Injected By	ZMS		
Total Amount Extracted	10.9 g	Matrix	Solid
% Moisture	8.0	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	08/13/2019 13:20
ICAL ID	Y190827	Received	08/15/2019 08:40
CCal Filename(s)	Y190830A_02	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-72988	Analyzed	08/30/2019 18:03

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	80
Total TCDF	10	----	1.0	2,3,7,8-TCDD-13C	2.00	77
				1,2,3,7,8-PeCDF-13C	2.00	79
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	80
Total TCDD	14	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	82
				1,2,3,4,7,8-HxCDF-13C	2.00	74
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	77
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	21	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	66
				1,2,3,4,7,8-HxCDD-13C	2.00	76
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	65
Total PeCDD	34	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	65
				1,2,3,4,7,8,9-HpCDF-13C	2.00	66
1,2,3,4,7,8-HxCDF	5.3	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	64
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	73
2,3,4,6,7,8-HxCDF	6.1	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	46	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	79
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	70	----	5.0			
1,2,3,4,6,7,8-HpCDF	44	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 2.5 ng/Kg		
Total HpCDF	72	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	58	----	5.0			
Total HpCDD	120	----	5.0			
OCDF	50	----	10			
OCDD	320	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N1-2		
Lab Sample ID	10487441018		
Filename	Y190830A_14		
Injected By	ZMS		
Total Amount Extracted	11.8 g	Matrix	Solid
% Moisture	12.8	Dilution	NA
Dry Weight Extracted	10.3 g	Collected	08/13/2019 13:40
ICAL ID	Y190827	Received	08/15/2019 08:40
CCal Filename(s)	Y190830A_02	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-72988	Analyzed	08/30/2019 18:48

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	1.9	----	1.0 C	2,3,7,8-TCDF-13C	2.00	74
Total TCDF	57	----	1.0	2,3,7,8-TCDD-13C	2.00	71
				1,2,3,7,8-PeCDF-13C	2.00	75
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	74
Total TCDD	4.6	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	79
				1,2,3,4,7,8-HxCDF-13C	2.00	74
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	75
2,3,4,7,8-PeCDF	12	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	170	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	69
				1,2,3,4,7,8-HxCDD-13C	2.00	74
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	64
Total PeCDD	6.7	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	66
				1,2,3,4,7,8,9-HpCDF-13C	2.00	68
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	65
1,2,3,6,7,8-HxCDF	5.5	----	5.0	OCDD-13C	4.00	61
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	91	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,6,7,8-HxCDD	6.6	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	55	----	5.0			
1,2,3,4,6,7,8-HpCDF	60	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 11 ng/Kg		
Total HpCDF	130	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	180	----	5.0			
Total HpCDD	340	----	5.0			
OCDF	85	----	10			
OCDD	1800	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
 C = Result obtained from confirmation analysis

**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N1-3		
Lab Sample ID	10487441019		
Filename	Y190830A_15		
Injected By	ZMS		
Total Amount Extracted	11.6 g	Matrix	Solid
% Moisture	9.7	Dilution	NA
Dry Weight Extracted	10.4 g	Collected	08/13/2019 14:25
ICAL ID	Y190827	Received	08/15/2019 08:40
CCal Filename(s)	Y190830A_02	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-72988	Analyzed	08/30/2019 19:34

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	67
Total TCDF	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	65
				1,2,3,7,8-PeCDF-13C	2.00	69
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	68
Total TCDD	ND	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	72
				1,2,3,4,7,8-HxCDF-13C	2.00	72
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	63
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	64
Total PeCDF	ND	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	54
				1,2,3,4,7,8-HxCDD-13C	2.00	67
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	54
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	57
				1,2,3,4,7,8,9-HpCDF-13C	2.00	56
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	56
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	44
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	68
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	ND	----	5.0			
1,2,3,4,6,7,8-HpCDF	6.5	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 0.47 ng/Kg		
Total HpCDF	14	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	20	----	5.0			
Total HpCDD	42	----	5.0			
OCDF	18	----	10			
OCDD	190	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

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**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441



**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N1-1		
Lab Sample ID	10487441020		
Filename	F190831A_03		
Injected By	JRH		
Total Amount Extracted	12.0 g	Matrix	Solid
% Moisture	11.0	Dilution	NA
Dry Weight Extracted	10.6 g	Collected	08/13/2019 14:40
ICAL ID	F190827	Received	08/15/2019 08:40
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-72988	Analyzed	08/31/2019 06:00

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	69
Total TCDF	2.5	----	1.0	2,3,7,8-TCDD-13C	2.00	78
				1,2,3,7,8-PeCDF-13C	2.00	74
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	72
Total TCDD	1.4	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	83
				1,2,3,4,7,8-HxCDF-13C	2.00	66
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	71
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	69
Total PeCDF	10	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	72
				1,2,3,4,7,8-HxCDD-13C	2.00	65
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	69
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	77
				1,2,3,4,7,8,9-HpCDF-13C	2.00	84
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	93
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	74
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	5.9	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	72
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	7.8	----	5.0			
1,2,3,4,6,7,8-HpCDF	8.8	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 1.3 ng/Kg		
Total HpCDF	27	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	54	----	5.0			
Total HpCDD	100	----	5.0			
OCDF	27	----	10			
OCDD	600	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
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 NC = Not Calculated

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**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N1-5		
Lab Sample ID	10487441021		
Filename	F190831A_04		
Injected By	JRH		
Total Amount Extracted	11.4 g	Matrix	Solid
% Moisture	11.3	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	08/13/2019 14:45
ICAL ID	F190827	Received	08/15/2019 08:40
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-72988	Analyzed	08/31/2019 06:46

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	75
Total TCDF	6.4	----	1.0	2,3,7,8-TCDD-13C	2.00	87
				1,2,3,7,8-PeCDF-13C	2.00	79
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	79
Total TCDD	1.3	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	92
				1,2,3,4,7,8-HxCDF-13C	2.00	84
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	83
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	80
Total PeCDF	18	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	72
				1,2,3,4,7,8-HxCDD-13C	2.00	84
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	78
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	76
				1,2,3,4,7,8,9-HpCDF-13C	2.00	74
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	88
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	53
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	15	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	83
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	20	----	5.0			
1,2,3,4,6,7,8-HpCDF	11	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 1.5 ng/Kg		
Total HpCDF	26	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	71	----	5.0			
Total HpCDD	140	----	5.0			
OCDF	28	----	10			
OCDD	640	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
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 NC = Not Calculated

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**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N1-4		
Lab Sample ID	10487441022		
Filename	F190831A_05		
Injected By	JRH		
Total Amount Extracted	11.5 g	Matrix	Solid
% Moisture	10.5	Dilution	NA
Dry Weight Extracted	10.3 g	Collected	08/13/2019 15:00
ICAL ID	F190827	Received	08/15/2019 08:40
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-72988	Analyzed	08/31/2019 07:32

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	61
Total TCDF	1.4	----	1.0	2,3,7,8-TCDD-13C	2.00	71
				1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	66
Total TCDD	2.8	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	78
				1,2,3,4,7,8-HxCDF-13C	2.00	66
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	66
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	68
Total PeCDF	5.2	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	65
				1,2,3,4,7,8-HxCDD-13C	2.00	69
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	63
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	71
				1,2,3,4,7,8,9-HpCDF-13C	2.00	74
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	85
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	61
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	66
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	ND	----	5.0			
1,2,3,4,6,7,8-HpCDF	8.1	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 0.37 ng/Kg		
Total HpCDF	16	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	16	----	5.0			
Total HpCDD	32	----	5.0			
OCDF	17	----	10			
OCDD	120	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

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## REPORT OF LABORATORY ANALYSIS

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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	O-10		
Lab Sample ID	10487441023		
Filename	F190831A_06		
Injected By	JRH		
Total Amount Extracted	13.1 g	Matrix	Solid
% Moisture	21.7	Dilution	NA
Dry Weight Extracted	10.3 g	Collected	08/13/2019 15:30
ICAL ID	F190827	Received	08/15/2019 08:40
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-72988	Analyzed	08/31/2019 08:18

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	54
Total TCDF	7.8	----	1.0	2,3,7,8-TCDD-13C	2.00	63
				1,2,3,7,8-PeCDF-13C	2.00	56
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	58
Total TCDD	1.7	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	67
				1,2,3,4,7,8-HxCDF-13C	2.00	56
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	57
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	57
Total PeCDF	31	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	55
				1,2,3,4,7,8-HxCDD-13C	2.00	59
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	53
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	61
				1,2,3,4,7,8,9-HpCDF-13C	2.00	64
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	74
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	54
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	24	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	58
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	21	----	5.0			
1,2,3,4,6,7,8-HpCDF	25	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 1.6 ng/Kg		
Total HpCDF	55	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	70	----	5.0			
Total HpCDD	140	----	5.0			
OCDF	45	----	10			
OCDD	570	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

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**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	O-09		
Lab Sample ID	10487441024		
Filename	F190831A_07		
Injected By	JRH		
Total Amount Extracted	11.8 g	Matrix	Solid
% Moisture	11.3	Dilution	NA
Dry Weight Extracted	10.5 g	Collected	08/13/2019 15:45
ICAL ID	F190827	Received	08/15/2019 08:40
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-72988	Analyzed	08/31/2019 09:04

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	1.6	-----	1.0 C	2,3,7,8-TCDF-13C	2.00	67
Total TCDF	52	-----	1.0	2,3,7,8-TCDD-13C	2.00	78
				1,2,3,7,8-PeCDF-13C	2.00	71
2,3,7,8-TCDD	ND	-----	1.0	2,3,4,7,8-PeCDF-13C	2.00	69
Total TCDD	2.0	-----	1.0	1,2,3,7,8-PeCDD-13C	2.00	82
				1,2,3,4,7,8-HxCDF-13C	2.00	69
1,2,3,7,8-PeCDF	ND	-----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	72
2,3,4,7,8-PeCDF	12	-----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	69
Total PeCDF	300	-----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	70
				1,2,3,4,7,8-HxCDD-13C	2.00	72
1,2,3,7,8-PeCDD	ND	-----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	68
Total PeCDD	ND	-----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	68
				1,2,3,4,7,8,9-HpCDF-13C	2.00	66
1,2,3,4,7,8-HxCDF	7.3	-----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	81
1,2,3,6,7,8-HxCDF	ND	-----	5.0	OCDD-13C	4.00	49
2,3,4,6,7,8-HxCDF	7.0	-----	5.0			
1,2,3,7,8,9-HxCDF	ND	-----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	240	-----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	5.6	-----	5.0	2,3,7,8-TCDD-37Cl4	0.20	74
1,2,3,6,7,8-HxCDD	14	-----	5.0			
1,2,3,7,8,9-HxCDD	10	-----	5.0			
Total HxCDD	140	-----	5.0			
1,2,3,4,6,7,8-HpCDF	140	-----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	6.4	-----	5.0	Equivalence: 20 ng/Kg		
Total HpCDF	250	-----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	330	-----	5.0			
Total HpCDD	710	-----	5.0			
OCDF	220	-----	10			
OCDD	4000	-----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
 C = Result obtained from confirmation analysis

**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441



**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	O-01		
Lab Sample ID	10487441025		
Filename	F190831A_08		
Injected By	JRH		
Total Amount Extracted	11.0 g	Matrix	Solid
% Moisture	8.7	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	08/13/2019 16:00
ICAL ID	F190827	Received	08/15/2019 08:40
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-72988	Analyzed	08/31/2019 09:50

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	1.0	2,3,7,8-TCDF-13C	2.00	66
Total TCDF	ND	-----	1.0	2,3,7,8-TCDD-13C	2.00	76
				1,2,3,7,8-PeCDF-13C	2.00	72
2,3,7,8-TCDD	ND	-----	1.0	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	ND	-----	1.0	1,2,3,7,8-PeCDD-13C	2.00	85
				1,2,3,4,7,8-HxCDF-13C	2.00	70
1,2,3,7,8-PeCDF	ND	-----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	68
2,3,4,7,8-PeCDF	ND	-----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	68
Total PeCDF	ND	-----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	59
				1,2,3,4,7,8-HxCDD-13C	2.00	77
1,2,3,7,8-PeCDD	ND	-----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	68
Total PeCDD	ND	-----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	72
				1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	ND	-----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	84
1,2,3,6,7,8-HxCDF	ND	-----	5.0	OCDD-13C	4.00	59
2,3,4,6,7,8-HxCDF	ND	-----	5.0			
1,2,3,7,8,9-HxCDF	ND	-----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	5.0	2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,6,7,8-HxCDD	ND	-----	5.0			
1,2,3,7,8,9-HxCDD	ND	-----	5.0			
Total HxCDD	ND	-----	5.0			
1,2,3,4,6,7,8-HpCDF	ND	-----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	5.0	Equivalence: 0.25 ng/Kg		
Total HpCDF	5.7	-----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	13	-----	5.0			
Total HpCDD	30	-----	5.0			
OCDF	13	-----	10			
OCDD	110	-----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers). ND = Not Detected  
 EMPC = Estimated Maximum Possible Concentration NA = Not Applicable  
 RL = Reporting Limit NC = Not Calculated

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**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	O-04		
Lab Sample ID	10487441026		
Filename	F190831A_09		
Injected By	JRH		
Total Amount Extracted	11.2 g	Matrix	Solid
% Moisture	10.0	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	08/13/2019 16:15
ICAL ID	F190827	Received	08/15/2019 08:40
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-72988	Analyzed	08/31/2019 10:36

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	60
Total TCDF	1.5	----	1.0	2,3,7,8-TCDD-13C	2.00	69
				1,2,3,7,8-PeCDF-13C	2.00	61
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	61
Total TCDD	ND	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	72
				1,2,3,4,7,8-HxCDF-13C	2.00	61
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	64
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	62
Total PeCDF	14	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	58
				1,2,3,4,7,8-HxCDD-13C	2.00	66
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	62
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	65
				1,2,3,4,7,8,9-HpCDF-13C	2.00	66
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	78
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	53
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	16	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	64
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	67	----	5.0			
1,2,3,4,6,7,8-HpCDF	19	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 1.8 ng/Kg		
Total HpCDF	52	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	99	----	5.0			
Total HpCDD	410	----	5.0			
OCDF	57	----	10			
OCDD	580	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
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 NC = Not Calculated

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**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441



**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	O-05		
Lab Sample ID	10487441027		
Filename	F190831A_10		
Injected By	JRH		
Total Amount Extracted	12.1 g	Matrix	Solid
% Moisture	13.2	Dilution	NA
Dry Weight Extracted	10.5 g	Collected	08/13/2019 16:25
ICAL ID	F190827	Received	08/15/2019 08:40
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-72988	Analyzed	08/31/2019 11:22

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	60
Total TCDF	7.8	----	1.0	2,3,7,8-TCDD-13C	2.00	71
				1,2,3,7,8-PeCDF-13C	2.00	60
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	59
Total TCDD	1.2	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	73
				1,2,3,4,7,8-HxCDF-13C	2.00	79
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	72
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	69
Total PeCDF	41	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	59
				1,2,3,4,7,8-HxCDD-13C	2.00	76
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	57
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	53
				1,2,3,4,7,8,9-HpCDF-13C	2.00	47
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	59
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	31
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	57	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	64
1,2,3,6,7,8-HxCDD	7.7	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	84	----	5.0			
1,2,3,4,6,7,8-HpCDF	43	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 4.5 ng/Kg		
Total HpCDF	90	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	180	----	5.0			
Total HpCDD	400	----	5.0			
OCDF	95	----	10			
OCDD	1400	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit  
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 NC = Not Calculated

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**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441



**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	O-06		
Lab Sample ID	10487441028		
Filename	F190831A_11		
Injected By	JRH		
Total Amount Extracted	11.5 g	Matrix	Solid
% Moisture	11.8	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	08/14/2019 07:30
ICAL ID	F190827	Received	08/15/2019 08:40
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-72988	Analyzed	08/31/2019 12:08

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	70
Total TCDF	3.5	----	1.0	2,3,7,8-TCDD-13C	2.00	82
				1,2,3,7,8-PeCDF-13C	2.00	70
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	71
Total TCDD	ND	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	83
				1,2,3,4,7,8-HxCDF-13C	2.00	79
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	82
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	80
Total PeCDF	24	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	67
				1,2,3,4,7,8-HxCDD-13C	2.00	86
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	75
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	72
				1,2,3,4,7,8,9-HpCDF-13C	2.00	70
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	86
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	54
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	38	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	76
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	20	----	5.0			
1,2,3,4,6,7,8-HpCDF	37	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 1.9 ng/Kg		
Total HpCDF	80	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	83	----	5.0			
Total HpCDD	160	----	5.0			
OCDF	58	----	10			
OCDD	680	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

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**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	O-08		
Lab Sample ID	10487441029		
Filename	F190831A_12		
Injected By	JRH		
Total Amount Extracted	11.3 g	Matrix	Solid
% Moisture	11.2	Dilution	NA
Dry Weight Extracted	10.0 g	Collected	08/14/2019 07:45
ICAL ID	F190827	Received	08/15/2019 08:40
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-72988	Analyzed	08/31/2019 12:54

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	65
Total TCDF	1.1	----	1.0	2,3,7,8-TCDD-13C	2.00	78
				1,2,3,7,8-PeCDF-13C	2.00	67
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	67
Total TCDD	ND	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	79
				1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	69
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	67
Total PeCDF	6.8	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	55
				1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	66
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	73
				1,2,3,4,7,8,9-HpCDF-13C	2.00	70
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	86
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	54
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	7.3	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	72
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	12	----	5.0			
1,2,3,4,6,7,8-HpCDF	10	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 0.71 ng/Kg		
Total HpCDF	26	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	32	----	5.0			
Total HpCDD	75	----	5.0			
OCDF	22	----	10			
OCDD	270	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
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**REPORT OF LABORATORY ANALYSIS**

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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	O-07		
Lab Sample ID	10487441030		
Filename	F190831A_13		
Injected By	JRH		
Total Amount Extracted	11.3 g	Matrix	Solid
% Moisture	9.8	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	08/14/2019 08:00
ICAL ID	F190827	Received	08/15/2019 08:40
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-73004	Analyzed	08/31/2019 13:40

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	65
Total TCDF	ND	----	1.0	2,3,7,8-TCDD-13C	2.00	76
				1,2,3,7,8-PeCDF-13C	2.00	65
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	65
Total TCDD	ND	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	78
				1,2,3,4,7,8-HxCDF-13C	2.00	69
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	72
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	72
Total PeCDF	ND	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	69
				1,2,3,4,7,8-HxCDD-13C	2.00	73
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	70
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	75
				1,2,3,4,7,8,9-HpCDF-13C	2.00	75
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	88
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	58
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	71
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	ND	----	5.0			
1,2,3,4,6,7,8-HpCDF	ND	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 0.24 ng/Kg		
Total HpCDF	5.3	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	14	----	5.0			
Total HpCDD	25	----	5.0			
OCDF	ND	----	10			
OCDD	100	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
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 NC = Not Calculated

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**REPORT OF LABORATORY ANALYSIS**

Report No.....10487441

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**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	O-03		
Lab Sample ID	10487441031		
Filename	F190831A_14		
Injected By	JRH		
Total Amount Extracted	11.1 g	Matrix	Solid
% Moisture	8.8	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	08/14/2019 08:15
ICAL ID	F190827	Received	08/15/2019 08:40
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-73004	Analyzed	08/31/2019 14:26

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	68
Total TCDF	14	----	1.0	2,3,7,8-TCDD-13C	2.00	84
				1,2,3,7,8-PeCDF-13C	2.00	70
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	3.0	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	83
				1,2,3,4,7,8-HxCDF-13C	2.00	71
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	78
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	69
Total PeCDF	64	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	75
				1,2,3,4,7,8-HxCDD-13C	2.00	80
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	71
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	82
				1,2,3,4,7,8,9-HpCDF-13C	2.00	80
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	100
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	63
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	23	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	78
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	21	----	5.0			
1,2,3,4,6,7,8-HpCDF	15	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 0.77 ng/Kg		
Total HpCDF	31	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	33	----	5.0			
Total HpCDD	79	----	5.0			
OCDF	25	----	10			
OCDD	260	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit  
 ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

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**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	O-02		
Lab Sample ID	10487441032		
Filename	F190831A_15		
Injected By	JRH		
Total Amount Extracted	12.0 g	Matrix	Solid
% Moisture	11.1	Dilution	NA
Dry Weight Extracted	10.7 g	Collected	08/14/2019 08:25
ICAL ID	F190827	Received	08/15/2019 08:40
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-73004	Analyzed	08/31/2019 15:12

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	66
Total TCDF	1.0	----	1.0	2,3,7,8-TCDD-13C	2.00	79
				1,2,3,7,8-PeCDF-13C	2.00	65
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	64
Total TCDD	ND	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	76
				1,2,3,4,7,8-HxCDF-13C	2.00	72
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	71
Total PeCDF	12	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	69
				1,2,3,4,7,8-HxCDD-13C	2.00	74
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	74
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	76
				1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	93
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	61
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	5.8	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	72
1,2,3,6,7,8-HxCDD	ND	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	ND	----	5.0			
1,2,3,4,6,7,8-HpCDF	9.6	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 0.49 ng/Kg		
Total HpCDF	19	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	22	----	5.0			
Total HpCDD	50	----	5.0			
OCDF	17	----	10			
OCDD	160	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
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Report No.....10487441

**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N4-3		
Lab Sample ID	10487441033		
Filename	Y190830B_11		
Injected By	JRH		
Total Amount Extracted	11.2 g	Matrix	Solid
% Moisture	8.9	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	08/14/2019 09:00
ICAL ID	Y190827	Received	08/15/2019 08:40
CCal Filename(s)	Y190830A_18	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-73004	Analyzed	08/31/2019 06:12

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	2.4	----	1.0 V	2,3,7,8-TCDF-13C	2.00	63
Total TCDF	140	----	1.0	2,3,7,8-TCDD-13C	2.00	66
				1,2,3,7,8-PeCDF-13C	2.00	70
2,3,7,8-TCDD	1.0	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	12	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	76
				1,2,3,4,7,8-HxCDF-13C	2.00	88 DN2
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	83 DN2
2,3,4,7,8-PeCDF	61	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	81 DN2
Total PeCDF	750	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	41 DN2
				1,2,3,4,7,8-HxCDD-13C	2.00	90 DN2
1,2,3,7,8-PeCDD	5.9	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	74 DN2
Total PeCDD	18	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	70 DN2
				1,2,3,4,7,8,9-HpCDF-13C	2.00	79 DN2
1,2,3,4,7,8-HxCDF	----	75	5.0 PDN2	1,2,3,4,6,7,8-HpCDD-13C	2.00	81 DN2
1,2,3,6,7,8-HxCDF	----	28	5.0 PDN2	OCDD-13C	4.00	84 DN2
2,3,4,6,7,8-HxCDF	30	----	5.0 DN2			
1,2,3,7,8,9-HxCDF	6.1	----	5.0 JDN2	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	1200	----	5.0 DN2	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	9.0	----	5.0 JDN2	2,3,7,8-TCDD-37Cl4	0.20	77
1,2,3,6,7,8-HxCDD	44	----	5.0 DN2			
1,2,3,7,8,9-HxCDD	15	----	5.0 JDN2			
Total HxCDD	310	----	5.0 DN2			
1,2,3,4,6,7,8-HpCDF	380	----	5.0 DN2	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	20	----	5.0 JDN2	Equivalence: 78 ng/Kg		
Total HpCDF	1100	----	5.0 DN2	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	930	----	5.0 DN2			
Total HpCDD	1900	----	5.0 DN2			
OCDF	620	----	10 DN2			
OCDD	9200	----	10 DN2			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Estimated value

P = PCDE Interference

D = Result obtained from analysis of diluted sample

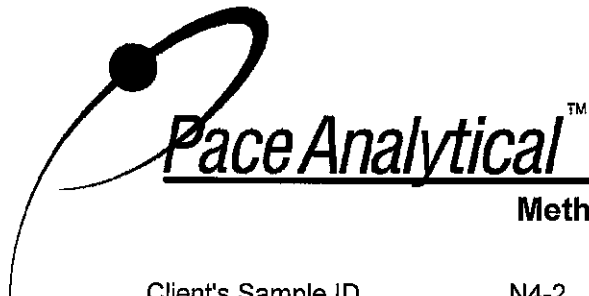
Nn = Value obtained from additional analysis

V = Result verified by confirmation analysis

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Report No.....10487441



**Method 1613B Sample Analysis Results**  
 Client - TRC-WI

Client's Sample ID	N4-2		
Lab Sample ID	10487441034		
Filename	Y190830B_12		
Injected By	JRH		
Total Amount Extracted	11.5 g	Matrix	Solid
% Moisture	12.0	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	08/14/2019 09:15
ICAL ID	Y190827	Received	08/15/2019 08:40
CCal Filename(s)	Y190830A_18	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-73004	Analyzed	08/31/2019 06:58

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	4.4	----	1.0 C	2,3,7,8-TCDF-13C	2.00	81
Total TCDF	98	----	1.0	2,3,7,8-TCDD-13C	2.00	87
				1,2,3,7,8-PeCDF-13C	2.00	89
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	99
Total TCDD	17	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	104
				1,2,3,4,7,8-HxCDF-13C	2.00	89 DN2
1,2,3,7,8-PeCDF	----	270	5.0 P	1,2,3,6,7,8-HxCDF-13C	2.00	80 DN2
2,3,4,7,8-PeCDF	14	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	84 DN2
Total PeCDF	480	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	46 DN2
				1,2,3,4,7,8-HxCDD-13C	2.00	86 DN2
1,2,3,7,8-PeCDD	5.2	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	68 DN2
Total PeCDD	11	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	64 DN2
				1,2,3,4,7,8,9-HpCDF-13C	2.00	70 DN2
1,2,3,4,7,8-HxCDF	16	----	5.0 JDN2	1,2,3,4,6,7,8-HpCDD-13C	2.00	70 DN2
1,2,3,6,7,8-HxCDF	20	----	5.0 JDN2	OCDD-13C	4.00	74 DN2
2,3,4,6,7,8-HxCDF	16	----	5.0 JDN2			
1,2,3,7,8,9-HxCDF	6.7	----	5.0 JDN2	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	430	----	5.0 DN2	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	7.8	----	5.0 JDN2	2,3,7,8-TCDD-37Cl4	0.20	101
1,2,3,6,7,8-HxCDD	39	----	5.0 DN2			
1,2,3,7,8,9-HxCDD	15	----	5.0 JDN2			
Total HxCDD	260	----	5.0 DN2			
1,2,3,4,6,7,8-HpCDF	250	----	5.0 DN2	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	14	----	5.0 JDN2	Equivalence: 54 ng/Kg		
Total HpCDF	610	----	5.0 DN2	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	820	----	5.0 DN2			
Total HpCDD	1600	----	5.0 DN2			
OCDF	490	----	10 DN2			
OCDD	7300	----	10 DN2			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 RL = Reporting Limit  
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 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
 J = Estimated value  
 P = PCDE interference  
 D = Result obtained from analysis of diluted sample  
 Nn = Value obtained from additional analysis  
 C = Result obtained from confirmation analysis

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**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N4-1		
Lab Sample ID	10487441035		
Filename	Y190830B_13		
Injected By	JRH		
Total Amount Extracted	11.5 g	Matrix	Solid
% Moisture	8.7	Dilution	NA
Dry Weight Extracted	10.5 g	Collected	08/14/2019 09:25
ICAL ID	Y190827	Received	08/15/2019 08:40
CCal Filename(s)	Y190830A_18	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-73004	Analyzed	08/31/2019 07:43

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	2.1	----	1.0 V	2,3,7,8-TCDF-13C	2.00	84
Total TCDF	58	----	1.0	2,3,7,8-TCDD-13C	2.00	82
				1,2,3,7,8-PeCDF-13C	2.00	84
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	85
Total TCDD	7.4	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	92
				1,2,3,4,7,8-HxCDF-13C	2.00	97
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	93
2,3,4,7,8-PeCDF	11	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	90
Total PeCDF	170	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	61
				1,2,3,4,7,8-HxCDD-13C	2.00	86
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	71
Total PeCDD	12	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	52
				1,2,3,4,7,8,9-HpCDF-13C	2.00	43
1,2,3,4,7,8-HxCDF	8.2	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	48
1,2,3,6,7,8-HxCDF	8.0	----	5.0	OCDD-13C	4.00	28
2,3,4,6,7,8-HxCDF	6.5	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	190	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	6.3	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	80
1,2,3,6,7,8-HxCDD	24	----	5.0			
1,2,3,7,8,9-HxCDD	12	----	5.0			
Total HxCDD	170	----	5.0			
1,2,3,4,6,7,8-HpCDF	150	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	9.4	----	5.0	Equivalence: 25 ng/Kg		
Total HpCDF	380	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	530	----	5.0			
Total HpCDD	1000	----	5.0			
OCDF	320	----	10			
OCDD	5100	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
V = Result verified by confirmation analysis

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**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N7-1		
Lab Sample ID	10487441036		
Filename	Y190830B_14		
Injected By	JRH		
Total Amount Extracted	11.1 g	Matrix	Solid
% Moisture	8.2	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	08/14/2019 08:45
ICAL ID	Y190827	Received	08/15/2019 08:40
CCal Filename(s)	Y190830A_18	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-73004	Analyzed	08/31/2019 08:29

Native Isomers	Conc ng/Kg	EMPC ng/Kg	RL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	1.0	2,3,7,8-TCDF-13C	2.00	83
Total TCDF	17	----	1.0	2,3,7,8-TCDD-13C	2.00	81
				1,2,3,7,8-PeCDF-13C	2.00	83
2,3,7,8-TCDD	ND	----	1.0	2,3,4,7,8-PeCDF-13C	2.00	85
Total TCDD	ND	----	1.0	1,2,3,7,8-PeCDD-13C	2.00	88
				1,2,3,4,7,8-HxCDF-13C	2.00	84
1,2,3,7,8-PeCDF	ND	----	5.0	1,2,3,6,7,8-HxCDF-13C	2.00	77
2,3,4,7,8-PeCDF	ND	----	5.0	2,3,4,6,7,8-HxCDF-13C	2.00	80
Total PeCDF	38	----	5.0	1,2,3,7,8,9-HxCDF-13C	2.00	50
				1,2,3,4,7,8-HxCDD-13C	2.00	82
1,2,3,7,8-PeCDD	ND	----	5.0	1,2,3,6,7,8-HxCDD-13C	2.00	68
Total PeCDD	ND	----	5.0	1,2,3,4,6,7,8-HpCDF-13C	2.00	63
				1,2,3,4,7,8,9-HpCDF-13C	2.00	59
1,2,3,4,7,8-HxCDF	ND	----	5.0	1,2,3,4,6,7,8-HpCDD-13C	2.00	58
1,2,3,6,7,8-HxCDF	ND	----	5.0	OCDD-13C	4.00	36
2,3,4,6,7,8-HxCDF	ND	----	5.0			
1,2,3,7,8,9-HxCDF	ND	----	5.0	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	75	----	5.0	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	5.0	2,3,7,8-TCDD-37Cl4	0.20	82
1,2,3,6,7,8-HxCDD	6.1	----	5.0			
1,2,3,7,8,9-HxCDD	ND	----	5.0			
Total HxCDD	40	----	5.0			
1,2,3,4,6,7,8-HpCDF	46	----	5.0	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	5.0	Equivalence: 4.0 ng/Kg		
Total HpCDF	100	----	5.0	(Lower-bound - Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	150	----	5.0			
Total HpCDD	330	----	5.0			
OCDF	71	----	10			
OCDD	1300	----	10			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
RL = Reporting Limit

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

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Report No.....10487441

## Reporting Flags

- A = Reporting Limit based on signal to noise
- B = Less than 10x higher than method blank level
- C = Result obtained from confirmation analysis
- D = Result obtained from analysis of diluted sample
- E = Exceeds calibration range
- I = Interference present
- J = Estimated value
- L = Suppressive interference, analyte may be biased low
- Nn = Value obtained from additional analysis
- P = PCDE Interference
- R = Recovery outside target range
- S = Peak saturated
- U = Analyte not detected
- V = Result verified by confirmation analysis
- X = %D Exceeds limits
- Y = Calculated using average of daily RFs
- \* = See Discussion

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Report No.....10487441

# Appendix B

## Sample Analysis Summary



### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N6-1				
Lab Sample ID	10487441001				
Filename	U190830B_03				
Injected By	SMT				
Total Amount Extracted	12.8 g	Matrix	Solid		
% Moisture	9.3	Dilution	NA		
Dry Weight Extracted	11.6 g	Collected	08/13/2019 08:00		
ICAL ID	U190730	Received	08/15/2019 08:40		
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05		
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 11:41		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	0.35	2,3,7,8-TCDF-13C	2.00	91
Total TCDF	1.9	----	0.35	2,3,7,8-TCDD-13C	2.00	91
				1,2,3,7,8-PeCDF-13C	2.00	94
2,3,7,8-TCDD	ND	----	0.54	2,3,4,7,8-PeCDF-13C	2.00	92
Total TCDD	ND	----	0.54	1,2,3,7,8-PeCDD-13C	2.00	102
				1,2,3,4,7,8-HxCDF-13C	2.00	80 DN2
1,2,3,7,8-PeCDF	ND	----	0.45	1,2,3,6,7,8-HxCDF-13C	2.00	74 DN2
2,3,4,7,8-PeCDF	0.80	----	0.34 J	2,3,4,6,7,8-HxCDF-13C	2.00	71 DN2
Total PeCDF	9.8	----	0.34	1,2,3,7,8,9-HxCDF-13C	2.00	57 DN2
				1,2,3,4,7,8-HxCDD-13C	2.00	84 DN2
1,2,3,7,8-PeCDD	0.60	----	0.42 J	1,2,3,6,7,8-HxCDD-13C	2.00	67 DN2
Total PeCDD	1.3	----	0.42 J	1,2,3,4,6,7,8-HpCDF-13C	2.00	63 DN2
				1,2,3,4,7,8,9-HpCDF-13C	2.00	64 DN2
1,2,3,4,7,8-HxCDF	0.57	----	0.30 JDN2	1,2,3,4,6,7,8-HpCDD-13C	2.00	68 DN2
1,2,3,6,7,8-HxCDF	0.79	----	0.32 JDN2	OCDD-13C	4.00	48 DN2
2,3,4,6,7,8-HxCDF	----	0.31	0.27 IJDN2			
1,2,3,7,8,9-HxCDF	0.41	----	0.13 JDN2	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	13	----	0.13 JDN2	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.77	----	0.29 BJDN2	2,3,7,8-TCDD-37Cl4	0.20	87
1,2,3,6,7,8-HxCDD	1.5	----	0.31 JDN2			
1,2,3,7,8,9-HxCDD	----	1.3	0.38 IJDN2			
Total HxCDD	6.8	----	0.29 JDN2			
1,2,3,4,6,7,8-HpCDF	7.0	----	0.40 JDN2	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	0.35 DN2	Equivalence: 1.7 ng/Kg		
Total HpCDF	15	----	0.35 JDN2	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	19	----	0.43 JDN2			
Total HpCDD	39	----	0.43 DN2			
OCDF	11	----	0.73 JDN2			
OCDD	160	----	0.85 DN2			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Estimated value  
 B = Less than 10x higher than method blank level  
 I = Interference present  
 D = Result obtained from analysis of diluted sample  
 Nn = Value obtained from additional analysis

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N6-2				
Lab Sample ID	10487441002				
Filename	U190830B_04				
Injected By	SMT				
Total Amount Extracted	11.8 g	Matrix	Solid		
% Moisture	11.4	Dilution	NA		
Dry Weight Extracted	10.5 g	Collected	08/13/2019 08:16		
ICAL ID	U190730	Received	08/15/2019 08:40		
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05		
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 12:24		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	0.68	2,3,7,8-TCDF-13C	2.00	81
Total TCDF	19	----	0.68	2,3,7,8-TCDD-13C	2.00	83
				1,2,3,7,8-PeCDF-13C	2.00	85
2,3,7,8-TCDD	ND	----	0.77	2,3,4,7,8-PeCDF-13C	2.00	85
Total TCDD	1.7	----	0.77	1,2,3,7,8-PeCDD-13C	2.00	92
				1,2,3,4,7,8-HxCDF-13C	2.00	90 DN2
1,2,3,7,8-PeCDF	ND	----	0.53	1,2,3,6,7,8-HxCDF-13C	2.00	84 DN2
2,3,4,7,8-PeCDF	5.0	----	0.42	2,3,4,6,7,8-HxCDF-13C	2.00	82 DN2
Total PeCDF	58	----	0.42	1,2,3,7,8,9-HxCDF-13C	2.00	42 DN2
				1,2,3,4,7,8-HxCDD-13C	2.00	98 DN2
1,2,3,7,8-PeCDD	1.2	----	0.60 J	1,2,3,6,7,8-HxCDD-13C	2.00	77 DN2
Total PeCDD	3.9	----	0.60 J	1,2,3,4,6,7,8-HpCDF-13C	2.00	75 DN2
				1,2,3,4,7,8,9-HpCDF-13C	2.00	77 DN2
1,2,3,4,7,8-HxCDF	2.8	----	0.32 JDN2	1,2,3,4,6,7,8-HpCDD-13C	2.00	79 DN2
1,2,3,6,7,8-HxCDF	2.2	----	0.34 JDN2	OCDD-13C	4.00	68 DN2
2,3,4,6,7,8-HxCDF	2.5	----	0.35 JDN2			
1,2,3,7,8,9-HxCDF	----	0.57	0.15 IJDN2	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	69	----	0.15 DN2	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.7	----	0.57 JDN2	2,3,7,8-TCDD-37Cl4	0.20	78
1,2,3,6,7,8-HxCDD	5.1	----	0.66 JDN2			
1,2,3,7,8,9-HxCDD	1.9	----	0.52 JDN2			
Total HxCDD	39	----	0.52 DN2			
1,2,3,4,6,7,8-HpCDF	34	----	0.41 DN2	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	1.5	----	0.40 JDN2	Equivalence: 6.0 ng/Kg		
Total HpCDF	90	----	0.40 DN2	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	96	----	0.41 DN2			
Total HpCDD	200	----	0.41 DN2			
OCDF	73	----	1.0 DN2			
OCDD	860	----	0.84 DN2			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Estimated value  
 I = Interference present  
 D = Result obtained from analysis of diluted sample  
 Nn = Value obtained from additional analysis

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N6-4				
Lab Sample ID	10487441003				
Filename	U190830B_05				
Injected By	SMT				
Total Amount Extracted	11.4 g	Matrix	Solid		
% Moisture	11.9	Dilution	NA		
Dry Weight Extracted	10.0 g	Collected	08/13/2019 08:40		
ICAL ID	U190730	Received	08/15/2019 08:40		
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05		
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 13:08		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.56	----	0.36	J	2,3,7,8-TCDF-13C	2.00	83
Total TCDF	26	----	0.36		2,3,7,8-TCDD-13C	2.00	84
					1,2,3,7,8-PeCDF-13C	2.00	84
2,3,7,8-TCDD	ND	----	0.44		2,3,4,7,8-PeCDF-13C	2.00	84
Total TCDD	3.1	----	0.44		1,2,3,7,8-PeCDD-13C	2.00	92
					1,2,3,4,7,8-HxCDF-13C	2.00	74 DN2
1,2,3,7,8-PeCDF	0.65	----	0.42	J	1,2,3,6,7,8-HxCDF-13C	2.00	66 DN2
2,3,4,7,8-PeCDF	1.9	----	0.48	J	2,3,4,6,7,8-HxCDF-13C	2.00	66 DN2
Total PeCDF	51	----	0.42		1,2,3,7,8,9-HxCDF-13C	2.00	52 DN2
					1,2,3,4,7,8-HxCDD-13C	2.00	79 DN2
1,2,3,7,8-PeCDD	----	0.47	0.40	IJ	1,2,3,6,7,8-HxCDD-13C	2.00	61 DN2
Total PeCDD	2.6	----	0.40	J	1,2,3,4,6,7,8-HpCDF-13C	2.00	61 DN2
					1,2,3,4,7,8,9-HpCDF-13C	2.00	64 DN2
1,2,3,4,7,8-HxCDF	1.4	----	0.44	JDN2	1,2,3,4,6,7,8-HpCDD-13C	2.00	67 DN2
1,2,3,6,7,8-HxCDF	2.0	----	0.31	JDN2	OCDD-13C	4.00	51 DN2
2,3,4,6,7,8-HxCDF	1.7	----	0.16	JDN2			
1,2,3,7,8,9-HxCDF	0.69	----	0.16	JDN2	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	43	----	0.16	DN2	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.73	----	0.50	BJDN2	2,3,7,8-TCDD-37Cl4	0.20	76
1,2,3,6,7,8-HxCDD	2.4	----	0.51	JDN2			
1,2,3,7,8,9-HxCDD	1.6	----	0.25	JDN2			
Total HxCDD	21	----	0.25	JDN2			
1,2,3,4,6,7,8-HpCDF	17	----	0.37	JDN2	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	----	0.98	0.39	IJDN2	Equivalence: 2.8 ng/Kg		
Total HpCDF	43	----	0.37	DN2	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	39	----	0.90	DN2			
Total HpCDD	78	----	0.90	DN2			
OCDF	40	----	0.76	JDN2			
OCDD	310	----	0.46	DN2			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
EDL = Estimated Detection Limit

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Estimated value  
B = Less than 10x higher than method blank level  
I = Interference present  
D = Result obtained from analysis of diluted sample  
Nn = Value obtained from additional analysis

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N6-3				
Lab Sample ID	10487441004				
Filename	U190830B_06				
Injected By	SMT				
Total Amount Extracted	11.6 g	Matrix	Solid		
% Moisture	10.2	Dilution	NA		
Dry Weight Extracted	10.4 g	Collected	08/13/2019 09:00		
ICAL ID	U190730	Received	08/15/2019 08:40		
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05		
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 13:51		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	0.53		2,3,7,8-TCDF-13C	2.00	79
Total TCDF	2.5	----	0.53		2,3,7,8-TCDD-13C	2.00	78
					1,2,3,7,8-PeCDF-13C	2.00	76
2,3,7,8-TCDD	ND	----	0.39		2,3,4,7,8-PeCDF-13C	2.00	79
Total TCDD	0.73	----	0.39	J	1,2,3,7,8-PeCDD-13C	2.00	83
					1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	ND	----	0.60		1,2,3,6,7,8-HxCDF-13C	2.00	70
2,3,4,7,8-PeCDF	----	0.46	0.43	U	2,3,4,6,7,8-HxCDF-13C	2.00	75
Total PeCDF	7.3	----	0.43		1,2,3,7,8,9-HxCDF-13C	2.00	45
					1,2,3,4,7,8-HxCDD-13C	2.00	79
1,2,3,7,8-PeCDD	0.51	----	0.37	J	1,2,3,6,7,8-HxCDD-13C	2.00	61
Total PeCDD	2.1	----	0.37	J	1,2,3,4,6,7,8-HpCDF-13C	2.00	64
					1,2,3,4,7,8,9-HpCDF-13C	2.00	71
1,2,3,4,7,8-HxCDF	----	0.71	0.39	U	1,2,3,4,6,7,8-HpCDD-13C	2.00	71
1,2,3,6,7,8-HxCDF	----	0.82	0.33	U	OCDD-13C	4.00	58
2,3,4,6,7,8-HxCDF	----	0.53	0.27	U			
1,2,3,7,8,9-HxCDF	ND	----	0.38		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	15	----	0.27		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.80	----	0.27	BJ	2,3,7,8-TCDD-37Cl4	0.20	80
1,2,3,6,7,8-HxCDD	----	2.0	0.36	U			
1,2,3,7,8,9-HxCDD	----	1.6	0.29	U			
Total HxCDD	14	----	0.27				
1,2,3,4,6,7,8-HpCDF	12	----	0.27		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	----	0.81	0.34	U	Equivalence: 2.1 ng/Kg		
Total HpCDF	33	----	0.27		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	51	----	0.48				
Total HpCDD	91	----	0.48				
OCDF	43	----	0.41				
OCDD	460	----	0.45				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
 J = Estimated value  
 B = Less than 10x higher than method blank level  
 I = Interference present

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N2-1				
Lab Sample ID	10487441005				
Filename	U190830B_07				
Injected By	SMT				
Total Amount Extracted	12.1 g	Matrix	Solid		
% Moisture	17.6	Dilution	NA		
Dry Weight Extracted	10.0 g	Collected	08/13/2019 09:35		
ICAL ID	U190730	Received	08/15/2019 08:40		
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05		
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 14:35		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.55	----	0.21	J	2,3,7,8-TCDF-13C	2.00	87
Total TCDF	16	----	0.21		2,3,7,8-TCDD-13C	2.00	87
					1,2,3,7,8-PeCDF-13C	2.00	88
2,3,7,8-TCDD	ND	----	0.24		2,3,4,7,8-PeCDF-13C	2.00	91
Total TCDD	3.3	----	0.24		1,2,3,7,8-PeCDD-13C	2.00	92
					1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	0.60	----	0.37	J	1,2,3,6,7,8-HxCDF-13C	2.00	77
2,3,4,7,8-PeCDF	----	1.6	0.39	I	2,3,4,6,7,8-HxCDF-13C	2.00	79
Total PeCDF	33	----	0.37		1,2,3,7,8,9-HxCDF-13C	2.00	57
					1,2,3,4,7,8-HxCDD-13C	2.00	87
1,2,3,7,8-PeCDD	0.82	----	0.35	J	1,2,3,6,7,8-HxCDD-13C	2.00	65
Total PeCDD	7.5	----	0.35		1,2,3,4,6,7,8-HpCDF-13C	2.00	70
					1,2,3,4,7,8,9-HpCDF-13C	2.00	79
1,2,3,4,7,8-HxCDF	----	0.91	0.51	I	1,2,3,4,6,7,8-HpCDD-13C	2.00	83
1,2,3,6,7,8-HxCDF	1.2	----	0.48	J	OCDD-13C	4.00	64
2,3,4,6,7,8-HxCDF	1.0	----	0.44	J			
1,2,3,7,8,9-HxCDF	----	0.49	0.28	I	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	23	----	0.28		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.92	----	0.34	BJ	2,3,7,8-TCDD-37Cl4	0.20	79
1,2,3,6,7,8-HxCDD	2.0	----	0.23	J			
1,2,3,7,8,9-HxCDD	1.6	----	0.21	J			
Total HxCDD	20	----	0.21				
1,2,3,4,6,7,8-HpCDF	13	----	0.21		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	----	0.54	0.18	I	Equivalence: 2.7 ng/Kg		
Total HpCDF	27	----	0.18		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	34	----	0.31				
Total HpCDD	63	----	0.31				
OCDF	18	----	0.49				
OCDD	250	----	0.59				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
EDL = Estimated Detection Limit

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
J = Estimated value  
B = Less than 10x higher than method blank level  
I = Interference present

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N2-2			
Lab Sample ID	10487441006			
Filename	U190830B_08			
Injected By	SMT			
Total Amount Extracted	11.7 g	Matrix	Solid	
% Moisture	14.4	Dilution	NA	
Dry Weight Extracted	10.00 g	Collected	08/13/2019 09:45	
ICAL ID	U190730	Received	08/15/2019 08:40	
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05	
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 15:18	

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.97	----	0.34	J	2,3,7,8-TCDF-13C	2.00	67
Total TCDF	46	----	0.34		2,3,7,8-TCDD-13C	2.00	67
					1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	----	0.36		2,3,4,7,8-PeCDF-13C	2.00	72
Total TCDD	3.5	----	0.36		1,2,3,7,8-PeCDD-13C	2.00	74
					1,2,3,4,7,8-HxCDF-13C	2.00	66
1,2,3,7,8-PeCDF	2.0	----	0.44	J	1,2,3,6,7,8-HxCDF-13C	2.00	56
2,3,4,7,8-PeCDF	6.8	----	0.30		2,3,4,6,7,8-HxCDF-13C	2.00	60
Total PeCDF	140	----	0.30		1,2,3,7,8,9-HxCDF-13C	2.00	48
					1,2,3,4,7,8-HxCDD-13C	2.00	71
1,2,3,7,8-PeCDD	3.0	----	0.52	J	1,2,3,6,7,8-HxCDD-13C	2.00	45
Total PeCDD	23	----	0.52		1,2,3,4,6,7,8-HpCDF-13C	2.00	55
					1,2,3,4,7,8,9-HpCDF-13C	2.00	67
1,2,3,4,7,8-HxCDF	12	----	0.41		1,2,3,4,6,7,8-HpCDD-13C	2.00	68
1,2,3,6,7,8-HxCDF	----	9.1	0.40	P	OCDD-13C	4.00	63
2,3,4,6,7,8-HxCDF	5.6	----	0.53				
1,2,3,7,8,9-HxCDF	4.8	----	0.35	J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	230	----	0.35		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	7.2	----	0.41		2,3,7,8-TCDD-37Cl4	0.20	63
1,2,3,6,7,8-HxCDD	22	----	0.53				
1,2,3,7,8,9-HxCDD	13	----	0.55				
Total HxCDD	130	----	0.41				
1,2,3,4,6,7,8-HpCDF	160	----	0.98		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	11	----	0.35		Equivalence: 19 ng/Kg		
Total HpCDF	420	----	0.35		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	400	----	0.46				
Total HpCDD	670	----	0.46				
OCDF	310	----	0.40				
OCDD	3000	----	0.36				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
 J = Estimated value  
 P = PCDE Interference

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N2-4				
Lab Sample ID	10487441007				
Filename	U190830B_09				
Injected By	SMT				
Total Amount Extracted	12.0 g	Matrix		Solid	
% Moisture	14.9	Dilution		NA	
Dry Weight Extracted	10.2 g	Collected		08/13/2019 10:05	
ICAL ID	U190730	Received		08/15/2019 08:40	
CCal Filename(s)	U190830B_01	Extracted		08/27/2019 15:05	
Method Blank ID	BLANK-72962	Analyzed		08/30/2019 16:01	

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	1.8	----	0.43	C	2,3,7,8-TCDF-13C	2.00	83
Total TCDF	56	----	0.53		2,3,7,8-TCDD-13C	2.00	84
					1,2,3,7,8-PeCDF-13C	2.00	89
2,3,7,8-TCDD	ND	----	0.32		2,3,4,7,8-PeCDF-13C	2.00	76
Total TCDD	2.7	----	0.32		1,2,3,7,8-PeCDD-13C	2.00	84
					1,2,3,4,7,8-HxCDF-13C	2.00	128
1,2,3,7,8-PeCDF	1.9	----	1.0	J	1,2,3,6,7,8-HxCDF-13C	2.00	113
2,3,4,7,8-PeCDF	13	----	0.48		2,3,4,6,7,8-HxCDF-13C	2.00	119
Total PeCDF	160	----	0.48		1,2,3,7,8,9-HxCDF-13C	2.00	120
					1,2,3,4,7,8-HxCDD-13C	2.00	137
1,2,3,7,8-PeCDD	2.5	----	0.32	J	1,2,3,6,7,8-HxCDD-13C	2.00	102
Total PeCDD	11	----	0.32		1,2,3,4,6,7,8-HpCDF-13C	2.00	111
					1,2,3,4,7,8,9-HpCDF-13C	2.00	126
1,2,3,4,7,8-HxCDF	6.1	----	0.24		1,2,3,4,6,7,8-HpCDD-13C	2.00	137
1,2,3,6,7,8-HxCDF	6.0	----	0.21		OCDD-13C	4.00	129
2,3,4,6,7,8-HxCDF	6.1	----	0.25				
1,2,3,7,8,9-HxCDF	1.9	----	0.30	J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	150	----	0.21		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	3.4	----	0.31	J	2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,6,7,8-HxCDD	11	----	0.16				
1,2,3,7,8,9-HxCDD	4.1	----	0.17	J			
Total HxCDD	71	----	0.16				
1,2,3,4,6,7,8-HpCDF	94	----	0.17		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	----	3.5	0.29	U	Equivalence: 14 ng/Kg		
Total HpCDF	210	----	0.17		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	210	----	0.33				
Total HpCDD	350	----	0.33				
OCDF	130	----	0.25				
OCDD	1600	----	0.27				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
 J = Estimated value  
 I = Interference present  
 C = Result obtained from confirmation analysis

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N2-3				
Lab Sample ID	10487441008				
Filename	U190830B_10				
Injected By	SMT				
Total Amount Extracted	11.6 g	Matrix	Solid		
% Moisture	13.2	Dilution	NA		
Dry Weight Extracted	10.0 g	Collected	08/13/2019 10:15		
ICAL ID	U190730	Received	08/15/2019 08:40		
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05		
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 16:44		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.79	----	0.43	J	2,3,7,8-TCDF-13C	2.00	82
Total TCDF	39	----	0.43		2,3,7,8-TCDD-13C	2.00	82
					1,2,3,7,8-PeCDF-13C	2.00	83
2,3,7,8-TCDD	16	----	0.66		2,3,4,7,8-PeCDF-13C	2.00	84
Total TCDD	19	----	0.66		1,2,3,7,8-PeCDD-13C	2.00	87
					1,2,3,4,7,8-HxCDF-13C	2.00	79
1,2,3,7,8-PeCDF	1.0	----	0.51	J	1,2,3,6,7,8-HxCDF-13C	2.00	66
2,3,4,7,8-PeCDF	5.7	----	0.40		2,3,4,6,7,8-HxCDF-13C	2.00	68
Total PeCDF	110	----	0.40		1,2,3,7,8,9-HxCDF-13C	2.00	49
					1,2,3,4,7,8-HxCDD-13C	2.00	76
1,2,3,7,8-PeCDD	0.79	----	0.33	J	1,2,3,6,7,8-HxCDD-13C	2.00	59
Total PeCDD	9.0	----	0.33		1,2,3,4,6,7,8-HpCDF-13C	2.00	64
					1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	1.9	----	0.41	J	1,2,3,4,6,7,8-HpCDD-13C	2.00	74
1,2,3,6,7,8-HxCDF	3.0	----	0.46	J	OCDD-13C	4.00	68
2,3,4,6,7,8-HxCDF	3.0	----	0.44	J			
1,2,3,7,8,9-HxCDF	0.83	----	0.54	J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	77	----	0.41		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.8	----	0.38	J	2,3,7,8-TCDD-37Cl4	0.20	74
1,2,3,6,7,8-HxCDD	3.8	----	0.38	J			
1,2,3,7,8,9-HxCDD	3.3	----	0.41	J			
Total HxCDD	36	----	0.38				
1,2,3,4,6,7,8-HpCDF	32	----	0.43		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	1.8	----	0.40	J	Equivalence: 21 ng/Kg		
Total HpCDF	71	----	0.40		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	72	----	0.27				
Total HpCDD	130	----	0.27				
OCDF	59	----	0.28				
OCDD	520	----	0.40				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
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 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
 J = Estimated value

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**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N2-5				
Lab Sample ID	10487441009				
Filename	U190830B_11				
Injected By	SMT				
Total Amount Extracted	12.0 g	Matrix	Solid		
% Moisture	14.6	Dilution	NA		
Dry Weight Extracted	10.2 g	Collected	08/13/2019 10:30		
ICAL ID	U190730	Received	08/15/2019 08:40		
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05		
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 17:28		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.67	----	0.48	J	2,3,7,8-TCDF-13C	2.00	85
Total TCDF	10	----	0.48		2,3,7,8-TCDD-13C	2.00	84
					1,2,3,7,8-PeCDF-13C	2.00	87
2,3,7,8-TCDD	ND	----	0.37		2,3,4,7,8-PeCDF-13C	2.00	85
Total TCDD	1.2	----	0.37		1,2,3,7,8-PeCDD-13C	2.00	91
					1,2,3,4,7,8-HxCDF-13C	2.00	129
1,2,3,7,8-PeCDF	0.88	----	0.86	J	1,2,3,6,7,8-HxCDF-13C	2.00	114
2,3,4,7,8-PeCDF	1.5	----	0.55	J	2,3,4,6,7,8-HxCDF-13C	2.00	124
Total PeCDF	23	----	0.55		1,2,3,7,8,9-HxCDF-13C	2.00	59
					1,2,3,4,7,8-HxCDD-13C	2.00	132
1,2,3,7,8-PeCDD	0.70	----	0.49	J	1,2,3,6,7,8-HxCDD-13C	2.00	104
Total PeCDD	5.1	----	0.49		1,2,3,4,6,7,8-HpCDF-13C	2.00	117
					1,2,3,4,7,8,9-HpCDF-13C	2.00	131
1,2,3,4,7,8-HxCDF	----	1.2	0.76	U	1,2,3,4,6,7,8-HpCDD-13C	2.00	134
1,2,3,6,7,8-HxCDF	1.5	----	0.43	J	OCDD-13C	4.00	124
2,3,4,6,7,8-HxCDF	1.5	----	0.47	J			
1,2,3,7,8,9-HxCDF	ND	----	0.47		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	26	----	0.43		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.4	----	0.44	J	2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,6,7,8-HxCDD	4.2	----	0.37	J			
1,2,3,7,8,9-HxCDD	----	0.91	0.41	U			
Total HxCDD	44	----	0.37				
1,2,3,4,6,7,8-HpCDF	20	----	0.43		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	----	0.88	0.22	U	Equivalence: 3.7 ng/Kg		
Total HpCDF	43	----	0.22		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	100	----	0.26				
Total HpCDD	230	----	0.26				
OCDF	34	----	0.45				
OCDD	610	----	0.47				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
EDL = Estimated Detection Limit

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Estimated value  
I = Interference present

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N5-2A				
Lab Sample ID	10487441010				
Filename	U190830B_12				
Injected By	SMT				
Total Amount Extracted	12.4 g	Matrix	Solid		
% Moisture	16.9	Dilution	NA		
Dry Weight Extracted	10.3 g	Collected	08/13/2019 11:05		
ICAL ID	U190730	Received	08/15/2019 08:40		
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05		
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 18:11		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	0.76		2,3,7,8-TCDF-13C	2.00	79
Total TCDF	3.9	----	0.76		2,3,7,8-TCDD-13C	2.00	79
					1,2,3,7,8-PeCDF-13C	2.00	77
2,3,7,8-TCDD	ND	----	0.50		2,3,4,7,8-PeCDF-13C	2.00	78
Total TCDD	0.67	----	0.50	J	1,2,3,7,8-PeCDD-13C	2.00	82
					1,2,3,4,7,8-HxCDF-13C	2.00	113
1,2,3,7,8-PeCDF	----	1.2	0.68	J	1,2,3,6,7,8-HxCDF-13C	2.00	99
2,3,4,7,8-PeCDF	1.8	----	0.58	J	2,3,4,6,7,8-HxCDF-13C	2.00	106
Total PeCDF	24	----	0.58		1,2,3,7,8,9-HxCDF-13C	2.00	50
					1,2,3,4,7,8-HxCDD-13C	2.00	115
1,2,3,7,8-PeCDD	0.94	----	0.43	J	1,2,3,6,7,8-HxCDD-13C	2.00	86
Total PeCDD	6.3	----	0.43		1,2,3,4,6,7,8-HpCDF-13C	2.00	93
					1,2,3,4,7,8,9-HpCDF-13C	2.00	107
1,2,3,4,7,8-HxCDF	2.8	----	0.73	J	1,2,3,4,6,7,8-HpCDD-13C	2.00	109
1,2,3,6,7,8-HxCDF	----	1.7	0.61	J	OCDD-13C	4.00	90
2,3,4,6,7,8-HxCDF	----	0.98	0.77	J			
1,2,3,7,8,9-HxCDF	----	0.72	0.37	J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	49	----	0.37		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.9	----	0.31	J	2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,6,7,8-HxCDD	----	3.6	0.24	J			
1,2,3,7,8,9-HxCDD	3.0	----	0.44	J			
Total HxCDD	31	----	0.24				
1,2,3,4,6,7,8-HpCDF	27	----	0.44		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	----	1.5	0.54	J	Equivalence: 4.3 ng/Kg		
Total HpCDF	68	----	0.44		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	76	----	0.46				
Total HpCDD	140	----	0.46				
OCDF	65	----	0.32				
OCDD	660	----	0.61				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
EDL = Estimated Detection Limit

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Estimated value  
I = Interference present

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**Method 1613B Sample Analysis Results**

Client - TRC-WI

Client's Sample ID	N5-1A				
Lab Sample ID	10487441011				
Filename	U190830B_13				
Injected By	SMT				
Total Amount Extracted	11.5 g	Matrix	Solid		
% Moisture	12.7	Dilution	NA		
Dry Weight Extracted	10.0 g	Collected	08/13/2019 11:15		
ICAL ID	U190730	Received	08/15/2019 08:40		
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05		
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 18:54		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	0.54	2,3,7,8-TCDF-13C	2.00	100
Total TCDF	2.7	----	0.54	2,3,7,8-TCDD-13C	2.00	100
				1,2,3,7,8-PeCDF-13C	2.00	96
2,3,7,8-TCDD	ND	----	0.52	2,3,4,7,8-PeCDF-13C	2.00	98
Total TCDD	1.2	----	0.52	1,2,3,7,8-PeCDD-13C	2.00	106
				1,2,3,4,7,8-HxCDF-13C	2.00	80 DN2
1,2,3,7,8-PeCDF	ND	----	0.46	1,2,3,6,7,8-HxCDF-13C	2.00	78 DN2
2,3,4,7,8-PeCDF	1.6	----	0.29 J	2,3,4,6,7,8-HxCDF-13C	2.00	74 DN2
Total PeCDF	21	----	0.29	1,2,3,7,8,9-HxCDF-13C	2.00	76 DN2
				1,2,3,4,7,8-HxCDD-13C	2.00	86 DN2
1,2,3,7,8-PeCDD	----	0.46	0.30 IJ	1,2,3,6,7,8-HxCDD-13C	2.00	73 DN2
Total PeCDD	ND	----	0.30	1,2,3,4,6,7,8-HpCDF-13C	2.00	67 DN2
				1,2,3,4,7,8,9-HpCDF-13C	2.00	68 DN2
1,2,3,4,7,8-HxCDF	1.1	----	0.28 JDN2	1,2,3,4,6,7,8-HpCDD-13C	2.00	75 DN2
1,2,3,6,7,8-HxCDF	1.1	----	0.27 JDN2	OCDD-13C	4.00	51 DN2
2,3,4,6,7,8-HxCDF	0.62	----	0.33 JDN2			
1,2,3,7,8,9-HxCDF	0.43	----	0.30 JDN2	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	23	----	0.27 JDN2	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.77	----	0.24 BJDN2	2,3,7,8-TCDD-37Cl4	0.20	95
1,2,3,6,7,8-HxCDD	----	1.7	0.30 IJDN2			
1,2,3,7,8,9-HxCDD	----	1.3	0.29 IJDN2			
Total HxCDD	8.3	----	0.24 JDN2			
1,2,3,4,6,7,8-HpCDF	11	----	0.49 JDN2	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	----	0.80	0.50 IJDN2	Equivalence: 2.2 ng/Kg		
Total HpCDF	11	----	0.49 JDN2	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	37	----	0.24 DN2			
Total HpCDD	81	----	0.24 DN2			
OCDF	25	----	0.54 JDN2			
OCDD	340	----	0.93 DN2			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
EDL = Estimated Detection Limit

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Estimated value  
B = Less than 10x higher than method blank level  
I = Interference present  
D = Result obtained from analysis of diluted sample  
Nn = Value obtained from additional analysis

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N5-3				
Lab Sample ID	10487441012				
Filename	U190830B_14				
Injected By	SMT				
Total Amount Extracted	11.8 g	Matrix	Solid		
% Moisture	13.6	Dilution	NA		
Dry Weight Extracted	10.2 g	Collected	08/13/2019 11:25		
ICAL ID	U190730	Received	08/15/2019 08:40		
CCal Filename(s)	U190830B_01	Extracted	08/27/2019 15:05		
Method Blank ID	BLANK-72962	Analyzed	08/30/2019 19:38		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	0.99	2,3,7,8-TCDF-13C	2.00	80
Total TCDF	1.4	----	0.99	2,3,7,8-TCDD-13C	2.00	82
				1,2,3,7,8-PeCDF-13C	2.00	75
2,3,7,8-TCDD	ND	----	0.97	2,3,4,7,8-PeCDF-13C	2.00	74
Total TCDD	ND	----	0.97	1,2,3,7,8-PeCDD-13C	2.00	80
				1,2,3,4,7,8-HxCDF-13C	2.00	95 DN2
1,2,3,7,8-PeCDF	ND	----	0.48	1,2,3,6,7,8-HxCDF-13C	2.00	85 DN2
2,3,4,7,8-PeCDF	1.1	----	0.86 J	2,3,4,6,7,8-HxCDF-13C	2.00	79 DN2
Total PeCDF	12	----	0.48	1,2,3,7,8,9-HxCDF-13C	2.00	43 DN2
				1,2,3,4,7,8-HxCDD-13C	2.00	94 DN2
1,2,3,7,8-PeCDD	2.4	----	0.88 J	1,2,3,6,7,8-HxCDD-13C	2.00	79 DN2
Total PeCDD	10	----	0.88	1,2,3,4,6,7,8-HpCDF-13C	2.00	65 DN2
				1,2,3,4,7,8,9-HpCDF-13C	2.00	66 DN2
1,2,3,4,7,8-HxCDF	2.0	----	0.42 JDN2	1,2,3,4,6,7,8-HpCDD-13C	2.00	67 DN2
1,2,3,6,7,8-HxCDF	1.2	----	0.41 JDN2	OCDD-13C	4.00	48 DN2
2,3,4,6,7,8-HxCDF	----	0.78	0.40 IJDN2			
1,2,3,7,8,9-HxCDF	ND	----	0.22 DN2	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	35	----	0.22 DN2	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	2.5	----	0.88 JDN2	2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,6,7,8-HxCDD	5.1	----	1.3 JDN2			
1,2,3,7,8,9-HxCDD	5.0	----	0.89 JDN2			
Total HxCDD	35	----	0.88 DN2			
1,2,3,4,6,7,8-HpCDF	23	----	0.53 JDN2	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	----	1.2	0.56 IJDN2	Equivalence: 6.1 ng/Kg		
Total HpCDF	58	----	0.53 DN2	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	100	----	1.1 DN2			
Total HpCDD	230	----	1.1 DN2			
OCDF	47	----	1.2 JDN2			
OCDD	1200	----	0.88 DN2			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
EDL = Estimated Detection Limit

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
J = Estimated value  
I = Interference present  
D = Result obtained from analysis of diluted sample  
Nn = Value obtained from additional analysis

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N5-4				
Lab Sample ID	10487441013				
Filename	U190830B_15				
Injected By	SMT				
Total Amount Extracted	12.1 g	Matrix		Solid	
% Moisture	16.6	Dilution		NA	
Dry Weight Extracted	10.1 g	Collected		08/13/2019 11:35	
ICAL ID	U190730	Received		08/15/2019 08:40	
CCal Filename(s)	U190830B_01	Extracted		08/27/2019 15:05	
Method Blank ID	BLANK-72962	Analyzed		08/30/2019 20:21	

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.30	----	0.24	J	2,3,7,8-TCDF-13C	2.00	89
Total TCDF	7.0	----	0.24		2,3,7,8-TCDD-13C	2.00	89
					1,2,3,7,8-PeCDF-13C	2.00	86
2,3,7,8-TCDD	ND	----	0.42		2,3,4,7,8-PeCDF-13C	2.00	89
Total TCDD	0.61	----	0.42	J	1,2,3,7,8-PeCDD-13C	2.00	94
					1,2,3,4,7,8-HxCDF-13C	2.00	125
1,2,3,7,8-PeCDF	1.2	----	0.32	J	1,2,3,6,7,8-HxCDF-13C	2.00	108
2,3,4,7,8-PeCDF	2.7	----	0.53	J	2,3,4,6,7,8-HxCDF-13C	2.00	114
Total PeCDF	31	----	0.32		1,2,3,7,8,9-HxCDF-13C	2.00	66
					1,2,3,4,7,8-HxCDD-13C	2.00	120
1,2,3,7,8-PeCDD	2.2	----	0.34	J	1,2,3,6,7,8-HxCDD-13C	2.00	96
Total PeCDD	11	----	0.34		1,2,3,4,6,7,8-HpCDF-13C	2.00	106
					1,2,3,4,7,8,9-HpCDF-13C	2.00	116
1,2,3,4,7,8-HxCDF	3.5	----	0.19	J	1,2,3,4,6,7,8-HpCDD-13C	2.00	120
1,2,3,6,7,8-HxCDF	2.4	----	0.33	J	OCDD-13C	4.00	105
2,3,4,6,7,8-HxCDF	3.3	----	0.12	J			
1,2,3,7,8,9-HxCDF	2.5	----	0.16	J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	110	----	0.12		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	3.6	----	0.34	J	2,3,7,8-TCDD-37Cl4	0.20	79
1,2,3,6,7,8-HxCDD	38	----	0.32				
1,2,3,7,8,9-HxCDD	5.1	----	0.17				
Total HxCDD	140	----	0.17				
1,2,3,4,6,7,8-HpCDF	55	----	0.31		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	2.8	----	0.27	J	Equivalence: 17 ng/Kg		
Total HpCDF	170	----	0.27		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	580	----	0.37				
Total HpCDD	960	----	0.37				
OCDF	230	----	0.30				
OCDD	4200	----	0.23	E			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
 J = Estimated value  
 E = Exceeds calibration range

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N3-4				
Lab Sample ID	10487441014				
Filename	Y190830A_10				
Injected By	ZMS				
Total Amount Extracted	11.8 g	Matrix	Solid		
% Moisture	14.5	Dilution	NA		
Dry Weight Extracted	10.1 g	Collected	08/13/2019 12:50		
ICAL ID	Y190827	Received	08/15/2019 08:40		
CCal Filename(s)	Y190830A_02	Extracted	08/28/2019 15:05		
Method Blank ID	BLANK-72988	Analyzed	08/30/2019 15:46		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	0.15	2,3,7,8-TCDF-13C	2.00	82
Total TCDF	0.61	----	0.15 J	2,3,7,8-TCDD-13C	2.00	77
				1,2,3,7,8-PeCDF-13C	2.00	70
2,3,7,8-TCDD	ND	----	0.14	2,3,4,7,8-PeCDF-13C	2.00	68
Total TCDD	0.55	----	0.14 J	1,2,3,7,8-PeCDD-13C	2.00	69
				1,2,3,4,7,8-HxCDF-13C	2.00	82
1,2,3,7,8-PeCDF	ND	----	0.14	1,2,3,6,7,8-HxCDF-13C	2.00	82
2,3,4,7,8-PeCDF	ND	----	0.12	2,3,4,6,7,8-HxCDF-13C	2.00	84
Total PeCDF	1.5	----	0.12 J	1,2,3,7,8,9-HxCDF-13C	2.00	78
				1,2,3,4,7,8-HxCDD-13C	2.00	79
1,2,3,7,8-PeCDD	ND	----	0.26	1,2,3,6,7,8-HxCDD-13C	2.00	72
Total PeCDD	0.50	----	0.26 J	1,2,3,4,6,7,8-HpCDF-13C	2.00	70
				1,2,3,4,7,8,9-HpCDF-13C	2.00	70
1,2,3,4,7,8-HxCDF	0.22	----	0.18 J	1,2,3,4,6,7,8-HpCDD-13C	2.00	69
1,2,3,6,7,8-HxCDF	----	0.21	0.16 U	OCDD-13C	4.00	57
2,3,4,6,7,8-HxCDF	0.22	----	0.13 J			
1,2,3,7,8,9-HxCDF	ND	----	0.15	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	1.9	----	0.13 J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	0.29	2,3,7,8-TCDD-37Cl4	0.20	82
1,2,3,6,7,8-HxCDD	----	0.44	0.30 U			
1,2,3,7,8,9-HxCDD	ND	----	0.32			
Total HxCDD	3.0	----	0.29 J			
1,2,3,4,6,7,8-HpCDF	2.7	----	0.43 J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	0.36	Equivalence: 0.27 ng/Kg		
Total HpCDF	7.0	----	0.36	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	11	----	0.14			
Total HpCDD	21	----	0.14			
OCDF	6.6	----	0.44 J			
OCDD	90	----	0.32			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

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 I = Interference present

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N3-3				
Lab Sample ID	10487441015				
Filename	Y190830A_11				
Injected By	ZMS				
Total Amount Extracted	11.9 g		Matrix		Solid
% Moisture	12.9		Dilution		NA
Dry Weight Extracted	10.3 g		Collected	08/13/2019	13:00
ICAL ID	Y190827		Received	08/15/2019	08:40
CCal Filename(s)	Y190830A_02		Extracted	08/28/2019	15:05
Method Blank ID	BLANK-72988		Analyzed	08/30/2019	16:31

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.15	----	0.10	J	2,3,7,8-TCDF-13C	2.00	84
Total TCDF	3.1	----	0.10		2,3,7,8-TCDD-13C	2.00	80
					1,2,3,7,8-PeCDF-13C	2.00	80
2,3,7,8-TCDD	ND	----	0.098		2,3,4,7,8-PeCDF-13C	2.00	85
Total TCDD	0.36	----	0.098	J	1,2,3,7,8-PeCDD-13C	2.00	88
					1,2,3,4,7,8-HxCDF-13C	2.00	78
1,2,3,7,8-PeCDF	0.14	----	0.080	J	1,2,3,6,7,8-HxCDF-13C	2.00	81
2,3,4,7,8-PeCDF	0.35	----	0.094	J	2,3,4,6,7,8-HxCDF-13C	2.00	82
Total PeCDF	6.4	----	0.080		1,2,3,7,8,9-HxCDF-13C	2.00	64
					1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,7,8-PeCDD	0.16	----	0.16	J	1,2,3,6,7,8-HxCDD-13C	2.00	67
Total PeCDD	0.96	----	0.16	J	1,2,3,4,6,7,8-HpCDF-13C	2.00	68
					1,2,3,4,7,8,9-HpCDF-13C	2.00	69
1,2,3,4,7,8-HxCDF	0.29	----	0.16	J	1,2,3,4,6,7,8-HpCDD-13C	2.00	67
1,2,3,6,7,8-HxCDF	----	0.33	0.11	I	OCDD-13C	4.00	62
2,3,4,6,7,8-HxCDF	----	0.23	0.15	I			
1,2,3,7,8,9-HxCDF	ND	----	0.075		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	6.4	----	0.075		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.19	----	0.091	J	2,3,7,8-TCDD-37Cl4	0.20	82
1,2,3,6,7,8-HxCDD	0.73	----	0.077	J			
1,2,3,7,8,9-HxCDD	0.40	----	0.075	J			
Total HxCDD	6.1	----	0.075				
1,2,3,4,6,7,8-HpCDF	6.1	----	0.12		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.29	----	0.10	J	Equivalence: 0.74 ng/Kg		
Total HpCDF	13	----	0.10		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	14	----	0.076				
Total HpCDD	28	----	0.076				
OCDF	9.6	----	0.24	J			
OCDD	110	----	0.39				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
EDL = Estimated Detection Limit

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
J = Estimated value  
I = Interference present

## REPORT OF LABORATORY ANALYSIS

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N3-2				
Lab Sample ID	10487441016				
Filename	Y190830A_12				
Injected By	ZMS				
Total Amount Extracted	11.3 g	Matrix	Solid		
% Moisture	9.6	Dilution	NA		
Dry Weight Extracted	10.2 g	Collected	08/13/2019 13:10		
ICAL ID	Y190827	Received	08/15/2019 08:40		
CCal Filename(s)	Y190830A_02	Extracted	08/28/2019 15:05		
Method Blank ID	BLANK-72988	Analyzed	08/30/2019 17:17		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	----	0.30	0.075	U	2,3,7,8-TCDF-13C	2.00	75
Total TCDF	11	----	0.075		2,3,7,8-TCDD-13C	2.00	72
					1,2,3,7,8-PeCDF-13C	2.00	75
2,3,7,8-TCDD	ND	----	0.13		2,3,4,7,8-PeCDF-13C	2.00	76
Total TCDD	8.7	----	0.13		1,2,3,7,8-PeCDD-13C	2.00	77
					1,2,3,4,7,8-HxCDF-13C	2.00	77
1,2,3,7,8-PeCDF	0.77	----	0.25	J	1,2,3,6,7,8-HxCDF-13C	2.00	75
2,3,4,7,8-PeCDF	1.2	----	0.18	J	2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	23	----	0.18		1,2,3,7,8,9-HxCDF-13C	2.00	76
					1,2,3,4,7,8-HxCDD-13C	2.00	72
1,2,3,7,8-PeCDD	0.46	----	0.34	J	1,2,3,6,7,8-HxCDD-13C	2.00	67
Total PeCDD	21	----	0.34		1,2,3,4,6,7,8-HpCDF-13C	2.00	67
					1,2,3,4,7,8,9-HpCDF-13C	2.00	68
1,2,3,4,7,8-HxCDF	3.2	----	0.15	J	1,2,3,4,6,7,8-HpCDD-13C	2.00	67
1,2,3,6,7,8-HxCDF	2.4	----	0.11	J	OCDD-13C	4.00	64
2,3,4,6,7,8-HxCDF	3.6	----	0.14	J			
1,2,3,7,8,9-HxCDF	----	0.98	0.095	U	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	34	----	0.095		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.85	----	0.26	J	2,3,7,8-TCDD-37Cl4	0.20	77
1,2,3,6,7,8-HxCDD	2.9	----	0.32	J			
1,2,3,7,8,9-HxCDD	----	1.6	0.39	U			
Total HxCDD	47	----	0.26				
1,2,3,4,6,7,8-HpCDF	26	----	0.17		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	2.4	----	0.37	J	Equivalence: 3.2 ng/Kg		
Total HpCDF	47	----	0.17		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	39	----	0.43				
Total HpCDD	79	----	0.43				
OCDF	34	----	0.56				
OCDD	220	----	0.94				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
EDL = Estimated Detection Limit

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Estimated value  
I = Interference present

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N3-1				
Lab Sample ID	10487441017				
Filename	Y190830A_13				
Injected By	ZMS				
Total Amount Extracted	10.9 g	Matrix		Solid	
% Moisture	8.0	Dilution		NA	
Dry Weight Extracted	10.1 g	Collected		08/13/2019 13:20	
ICAL ID	Y190827	Received		08/15/2019 08:40	
CCal Filename(s)	Y190830A_02	Extracted		08/28/2019 15:05	
Method Blank ID	BLANK-72988	Analyzed		08/30/2019 18:03	

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.45	----	0.054	J	2,3,7,8-TCDF-13C	2.00	80
Total TCDF	15	----	0.054		2,3,7,8-TCDD-13C	2.00	77
					1,2,3,7,8-PeCDF-13C	2.00	79
2,3,7,8-TCDD	ND	----	0.13		2,3,4,7,8-PeCDF-13C	2.00	80
Total TCDD	15	----	0.13		1,2,3,7,8-PeCDD-13C	2.00	82
					1,2,3,4,7,8-HxCDF-13C	2.00	74
1,2,3,7,8-PeCDF	1.2	----	0.14	J	1,2,3,6,7,8-HxCDF-13C	2.00	77
2,3,4,7,8-PeCDF	2.2	----	0.18	J	2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	36	----	0.14		1,2,3,7,8,9-HxCDF-13C	2.00	66
					1,2,3,4,7,8-HxCDD-13C	2.00	76
1,2,3,7,8-PeCDD	0.83	----	0.20	J	1,2,3,6,7,8-HxCDD-13C	2.00	65
Total PeCDD	38	----	0.20		1,2,3,4,6,7,8-HpCDF-13C	2.00	65
					1,2,3,4,7,8,9-HpCDF-13C	2.00	66
1,2,3,4,7,8-HxCDF	5.3	----	0.23		1,2,3,4,6,7,8-HpCDD-13C	2.00	64
1,2,3,6,7,8-HxCDF	4.3	----	0.23	J	OCDD-13C	4.00	73
2,3,4,6,7,8-HxCDF	6.1	----	0.18				
1,2,3,7,8,9-HxCDF	1.9	----	0.096	J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	59	----	0.096		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	----	1.2	0.51	I	2,3,7,8-TCDD-37Cl4	0.20	79
1,2,3,6,7,8-HxCDD	4.4	----	0.34	J			
1,2,3,7,8,9-HxCDD	3.0	----	0.091	J			
Total HxCDD	77	----	0.091				
1,2,3,4,6,7,8-HpCDF	44	----	0.12		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	3.8	----	0.51	J	Equivalence: 5.4 ng/Kg		
Total HpCDF	76	----	0.12		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	58	----	0.10				
Total HpCDD	120	----	0.10				
OCDF	50	----	0.21				
OCDD	320	----	0.44				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
EDL = Estimated Detection Limit

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
J = Estimated value  
I = Interference present

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N1-2			
Lab Sample ID	10487441018			
Filename	Y190830A_14			
Injected By	ZMS			
Total Amount Extracted	11.8 g	Matrix	Solid	
% Moisture	12.8	Dilution	NA	
Dry Weight Extracted	10.3 g	Collected	08/13/2019 13:40	
ICAL ID	Y190827	Received	08/15/2019 08:40	
CCal Filename(s)	Y190830A_02	Extracted	08/28/2019 15:05	
Method Blank ID	BLANK-72988	Analyzed	08/30/2019 18:48	

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	1.9	----	0.46	C	2,3,7,8-TCDF-13C	2.00	74
Total TCDF	58	----	0.12		2,3,7,8-TCDD-13C	2.00	71
					1,2,3,7,8-PeCDF-13C	2.00	75
2,3,7,8-TCDD	0.26	----	0.13	J	2,3,4,7,8-PeCDF-13C	2.00	74
Total TCDD	7.8	----	0.13		1,2,3,7,8-PeCDD-13C	2.00	79
					1,2,3,4,7,8-HxCDF-13C	2.00	74
1,2,3,7,8-PeCDF	0.95	----	0.15	J	1,2,3,6,7,8-HxCDF-13C	2.00	75
2,3,4,7,8-PeCDF	12	----	0.18		2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	180	----	0.15		1,2,3,7,8,9-HxCDF-13C	2.00	69
					1,2,3,4,7,8-HxCDD-13C	2.00	74
1,2,3,7,8-PeCDD	----	1.0	0.30	IJ	1,2,3,6,7,8-HxCDD-13C	2.00	64
Total PeCDD	15	----	0.30		1,2,3,4,6,7,8-HpCDF-13C	2.00	66
					1,2,3,4,7,8,9-HpCDF-13C	2.00	68
1,2,3,4,7,8-HxCDF	4.0	----	0.19	J	1,2,3,4,6,7,8-HpCDD-13C	2.00	65
1,2,3,6,7,8-HxCDF	5.5	----	0.16		OCDD-13C	4.00	61
2,3,4,6,7,8-HxCDF	2.6	----	0.12	J			
1,2,3,7,8,9-HxCDF	1.5	----	0.11	J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	110	----	0.11		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.4	----	0.32	J	2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,6,7,8-HxCDD	6.6	----	0.13				
1,2,3,7,8,9-HxCDD	2.8	----	0.098	J			
Total HxCDD	61	----	0.098				
1,2,3,4,6,7,8-HpCDF	60	----	0.071		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	2.0	----	0.12	J	Equivalence: 10 ng/Kg		
Total HpCDF	140	----	0.071		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	180	----	0.11				
Total HpCDD	340	----	0.11				
OCDF	85	----	0.24				
OCDD	1800	----	0.12				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
 J = Estimated value  
 I = Interference present  
 C = Result obtained from confirmation analysis

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N1-3				
Lab Sample ID	10487441019				
Filename	Y190830A_15				
Injected By	ZMS				
Total Amount Extracted	11.6 g	Matrix	Solid		
% Moisture	9.7	Dilution	NA		
Dry Weight Extracted	10.4 g	Collected	08/13/2019 14:25		
ICAL ID	Y190827	Received	08/15/2019 08:40		
CCal Filename(s)	Y190830A_02	Extracted	08/28/2019 15:05		
Method Blank ID	BLANK-72988	Analyzed	08/30/2019 19:34		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	----	0.13	0.093	J	2,3,7,8-TCDF-13C	2.00	67
Total TCDF	1.3	----	0.093		2,3,7,8-TCDD-13C	2.00	65
					1,2,3,7,8-PeCDF-13C	2.00	69
2,3,7,8-TCDD	ND	----	0.12		2,3,4,7,8-PeCDF-13C	2.00	68
Total TCDD	0.90	----	0.12	J	1,2,3,7,8-PeCDD-13C	2.00	72
					1,2,3,4,7,8-HxCDF-13C	2.00	72
1,2,3,7,8-PeCDF	0.10	----	0.077	J	1,2,3,6,7,8-HxCDF-13C	2.00	63
2,3,4,7,8-PeCDF	0.38	----	0.091	J	2,3,4,6,7,8-HxCDF-13C	2.00	64
Total PeCDF	6.2	----	0.077		1,2,3,7,8,9-HxCDF-13C	2.00	54
					1,2,3,4,7,8-HxCDD-13C	2.00	67
1,2,3,7,8-PeCDD	0.23	----	0.19	J	1,2,3,6,7,8-HxCDD-13C	2.00	54
Total PeCDD	1.4	----	0.19	J	1,2,3,4,6,7,8-HpCDF-13C	2.00	57
					1,2,3,4,7,8,9-HpCDF-13C	2.00	56
1,2,3,4,7,8-HxCDF	0.32	----	0.11	J	1,2,3,4,6,7,8-HpCDD-13C	2.00	56
1,2,3,6,7,8-HxCDF	0.26	----	0.11	J	OCDD-13C	4.00	44
2,3,4,6,7,8-HxCDF	0.34	----	0.063	J			
1,2,3,7,8,9-HxCDF	ND	----	0.041		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	7.9	----	0.041		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.43	----	0.11	J	2,3,7,8-TCDD-37Cl4	0.20	68
1,2,3,6,7,8-HxCDD	0.90	----	0.12	J			
1,2,3,7,8,9-HxCDD	0.71	----	0.066	J			
Total HxCDD	9.2	----	0.066				
1,2,3,4,6,7,8-HpCDF	6.5	----	0.14		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	----	0.33	0.082	J	Equivalence: 0.99 ng/Kg		
Total HpCDF	14	----	0.082		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	20	----	0.15				
Total HpCDD	42	----	0.15				
OCDF	18	----	0.20				
OCDD	190	----	0.15				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N1-1			
Lab Sample ID	10487441020			
Filename	F190831A_03			
Injected By	JRH			
Total Amount Extracted	12.0 g	Matrix	Solid	
% Moisture	11.0	Dilution	NA	
Dry Weight Extracted	10.6 g	Collected	08/13/2019 14:40	
ICAL ID	F190827	Received	08/15/2019 08:40	
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05	
Method Blank ID	BLANK-72988	Analyzed	08/31/2019 06:00	

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	0.47	2,3,7,8-TCDF-13C	2.00	69
Total TCDF	5.3	----	0.47	2,3,7,8-TCDD-13C	2.00	78
				1,2,3,7,8-PeCDF-13C	2.00	74
2,3,7,8-TCDD	ND	----	0.22	2,3,4,7,8-PeCDF-13C	2.00	72
Total TCDD	3.9	----	0.22	1,2,3,7,8-PeCDD-13C	2.00	83
				1,2,3,4,7,8-HxCDF-13C	2.00	66
1,2,3,7,8-PeCDF	0.35	----	0.33 J	1,2,3,6,7,8-HxCDF-13C	2.00	71
2,3,4,7,8-PeCDF	0.80	----	0.25 J	2,3,4,6,7,8-HxCDF-13C	2.00	69
Total PeCDF	14	----	0.25	1,2,3,7,8,9-HxCDF-13C	2.00	72
				1,2,3,4,7,8-HxCDD-13C	2.00	65
1,2,3,7,8-PeCDD	0.51	----	0.19 J	1,2,3,6,7,8-HxCDD-13C	2.00	69
Total PeCDD	4.4	----	0.19 J	1,2,3,4,6,7,8-HpCDF-13C	2.00	77
				1,2,3,4,7,8,9-HpCDF-13C	2.00	84
1,2,3,4,7,8-HxCDF	0.85	----	0.22 J	1,2,3,4,6,7,8-HpCDD-13C	2.00	93
1,2,3,6,7,8-HxCDF	0.94	----	0.16 J	OCDD-13C	4.00	74
2,3,4,6,7,8-HxCDF	0.77	----	0.17 J			
1,2,3,7,8,9-HxCDF	0.31	----	0.14 J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	15	----	0.14	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.77	----	0.43 J	2,3,7,8-TCDD-37Cl4	0.20	72
1,2,3,6,7,8-HxCDD	2.2	----	0.29 J			
1,2,3,7,8,9-HxCDD	1.5	----	0.21 J			
Total HxCDD	19	----	0.21			
1,2,3,4,6,7,8-HpCDF	8.8	----	0.41	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.59	----	0.37 J	Equivalence: 2.3 ng/Kg		
Total HpCDF	27	----	0.37	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	54	----	0.11			
Total HpCDD	100	----	0.11			
OCDF	27	----	0.74			
OCDD	600	----	0.30			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
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 NC = Not Calculated

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 J = Estimated value

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N1-5				
Lab Sample ID	10487441021				
Filename	F190831A_04				
Injected By	JRH				
Total Amount Extracted	11.4 g	Matrix	Solid		
% Moisture	11.3	Dilution	NA		
Dry Weight Extracted	10.1 g	Collected	08/13/2019 14:45		
ICAL ID	F190827	Received	08/15/2019 08:40		
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05		
Method Blank ID	BLANK-72988	Analyzed	08/31/2019 06:46		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	0.31		2,3,7,8-TCDF-13C	2.00	75
Total TCDF	7.2	----	0.31		2,3,7,8-TCDD-13C	2.00	87
					1,2,3,7,8-PeCDF-13C	2.00	79
2,3,7,8-TCDD	ND	----	0.22		2,3,4,7,8-PeCDF-13C	2.00	79
Total TCDD	2.3	----	0.22		1,2,3,7,8-PeCDD-13C	2.00	92
					1,2,3,4,7,8-HxCDF-13C	2.00	84
1,2,3,7,8-PeCDF	ND	----	0.41		1,2,3,6,7,8-HxCDF-13C	2.00	83
2,3,4,7,8-PeCDF	----	1.4	0.24	J	2,3,4,6,7,8-HxCDF-13C	2.00	80
Total PeCDF	24	----	0.24		1,2,3,7,8,9-HxCDF-13C	2.00	72
					1,2,3,4,7,8-HxCDD-13C	2.00	84
1,2,3,7,8-PeCDD	----	0.62	0.28	J	1,2,3,6,7,8-HxCDD-13C	2.00	78
Total PeCDD	6.7	----	0.28		1,2,3,4,6,7,8-HpCDF-13C	2.00	76
					1,2,3,4,7,8,9-HpCDF-13C	2.00	74
1,2,3,4,7,8-HxCDF	1.1	----	0.20	J	1,2,3,4,6,7,8-HpCDD-13C	2.00	88
1,2,3,6,7,8-HxCDF	----	0.80	0.14	J	OCDD-13C	4.00	53
2,3,4,6,7,8-HxCDF	----	0.58	0.15	J			
1,2,3,7,8,9-HxCDF	ND	----	0.12		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	20	----	0.12		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.3	----	0.39	J	2,3,7,8-TCDD-37Cl4	0.20	83
1,2,3,6,7,8-HxCDD	2.5	----	0.43	J			
1,2,3,7,8,9-HxCDD	2.3	----	0.20	J			
Total HxCDD	31	----	0.20				
1,2,3,4,6,7,8-HpCDF	11	----	0.26		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	----	0.56	0.34	J	Equivalence: 2.9 ng/Kg		
Total HpCDF	26	----	0.26		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	71	----	0.66				
Total HpCDD	140	----	0.66				
OCDF	28	----	1.7				
OCDD	640	----	0.41				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
EDL = Estimated Detection Limit

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

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J = Estimated value  
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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N1-4				
Lab Sample ID	10487441022				
Filename	F190831A_05				
Injected By	JRH				
Total Amount Extracted	11.5 g	Matrix		Solid	
% Moisture	10.5	Dilution		NA	
Dry Weight Extracted	10.3 g	Collected		08/13/2019 15:00	
ICAL ID	F190827	Received		08/15/2019 08:40	
CCal Filename(s)	F190831A_01	Extracted		08/28/2019 15:05	
Method Blank ID	BLANK-72988	Analyzed		08/31/2019 07:32	

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.25	----	0.18	J	2,3,7,8-TCDF-13C	2.00	61
Total TCDF	4.2	----	0.18		2,3,7,8-TCDD-13C	2.00	71
					1,2,3,7,8-PeCDF-13C	2.00	68
2,3,7,8-TCDD	ND	----	0.21		2,3,4,7,8-PeCDF-13C	2.00	66
Total TCDD	2.8	----	0.21		1,2,3,7,8-PeCDD-13C	2.00	78
					1,2,3,4,7,8-HxCDF-13C	2.00	66
1,2,3,7,8-PeCDF	ND	----	0.31		1,2,3,6,7,8-HxCDF-13C	2.00	66
2,3,4,7,8-PeCDF	0.72	----	0.20	J	2,3,4,6,7,8-HxCDF-13C	2.00	68
Total PeCDF	11	----	0.20		1,2,3,7,8,9-HxCDF-13C	2.00	65
					1,2,3,4,7,8-HxCDD-13C	2.00	69
1,2,3,7,8-PeCDD	0.24	----	0.24	J	1,2,3,6,7,8-HxCDD-13C	2.00	63
Total PeCDD	5.0	----	0.24		1,2,3,4,6,7,8-HpCDF-13C	2.00	71
					1,2,3,4,7,8,9-HpCDF-13C	2.00	74
1,2,3,4,7,8-HxCDF	----	0.71	0.33	IJ	1,2,3,4,6,7,8-HpCDD-13C	2.00	85
1,2,3,6,7,8-HxCDF	0.79	----	0.29	J	OCDD-13C	4.00	61
2,3,4,6,7,8-HxCDF	1.3	----	0.26	J			
1,2,3,7,8,9-HxCDF	----	0.32	0.26	IJ	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	10	----	0.26		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.41	----	0.25	J	2,3,7,8-TCDD-37Cl4	0.20	66
1,2,3,6,7,8-HxCDD	0.96	----	0.42	J			
1,2,3,7,8,9-HxCDD	0.86	----	0.42	J			
Total HxCDD	13	----	0.25				
1,2,3,4,6,7,8-HpCDF	8.1	----	0.23		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.66	----	0.20	J	Equivalence: 1.3 ng/Kg		
Total HpCDF	16	----	0.20		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	16	----	0.23				
Total HpCDD	32	----	0.23				
OCDF	17	----	0.34				
OCDD	120	----	0.60				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
 J = Estimated value  
 I = Interference present

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	O-10		
Lab Sample ID	10487441023		
Filename	F190831A_06		
Injected By	JRH		
Total Amount Extracted	13.1 g	Matrix	Solid
% Moisture	21.7	Dilution	NA
Dry Weight Extracted	10.3 g	Collected	08/13/2019 15:30
ICAL ID	F190827	Received	08/15/2019 08:40
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-72988	Analyzed	08/31/2019 08:18

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.80	----	0.39	J	2,3,7,8-TCDF-13C	2.00	54
Total TCDF	13	----	0.39		2,3,7,8-TCDD-13C	2.00	63
					1,2,3,7,8-PeCDF-13C	2.00	56
2,3,7,8-TCDD	ND	----	0.27		2,3,4,7,8-PeCDF-13C	2.00	58
Total TCDD	2.9	----	0.27		1,2,3,7,8-PeCDD-13C	2.00	67
					1,2,3,4,7,8-HxCDF-13C	2.00	56
1,2,3,7,8-PeCDF	0.92	----	0.62	J	1,2,3,6,7,8-HxCDF-13C	2.00	57
2,3,4,7,8-PeCDF	1.7	----	0.27	J	2,3,4,6,7,8-HxCDF-13C	2.00	57
Total PeCDF	37	----	0.27		1,2,3,7,8,9-HxCDF-13C	2.00	55
					1,2,3,4,7,8-HxCDD-13C	2.00	59
1,2,3,7,8-PeCDD	0.61	----	0.31	J	1,2,3,6,7,8-HxCDD-13C	2.00	53
Total PeCDD	4.4	----	0.31	J	1,2,3,4,6,7,8-HpCDF-13C	2.00	61
					1,2,3,4,7,8,9-HpCDF-13C	2.00	64
1,2,3,4,7,8-HxCDF	2.1	----	0.35	J	1,2,3,4,6,7,8-HpCDD-13C	2.00	74
1,2,3,6,7,8-HxCDF	2.0	----	0.21	J	OCDD-13C	4.00	54
2,3,4,6,7,8-HxCDF	1.2	----	0.31	J			
1,2,3,7,8,9-HxCDF	0.43	----	0.22	J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	37	----	0.21		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	----	1.1	0.32	I	2,3,7,8-TCDD-37Cl4	0.20	58
1,2,3,6,7,8-HxCDD	3.0	----	0.32	J			
1,2,3,7,8,9-HxCDD	1.9	----	0.33	J			
Total HxCDD	26	----	0.32				
1,2,3,4,6,7,8-HpCDF	25	----	0.38		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	1.4	----	0.43	J	Equivalence: 3.6 ng/Kg		
Total HpCDF	56	----	0.38		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	70	----	0.20				
Total HpCDD	140	----	0.20				
OCDF	45	----	0.26				
OCDD	570	----	0.35				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
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 NC = Not Calculated

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	O-09			
Lab Sample ID	10487441024			
Filename	F190831A_07			
Injected By	JRH			
Total Amount Extracted	11.8 g	Matrix	Solid	
% Moisture	11.3	Dilution	NA	
Dry Weight Extracted	10.5 g	Collected	08/13/2019 15:45	
ICAL ID	F190827	Received	08/15/2019 08:40	
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05	
Method Blank ID	BLANK-72988	Analyzed	08/31/2019 09:04	

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	1.6	----	0.88	C	2,3,7,8-TCDF-13C	2.00	67
Total TCDF	53	----	0.11		2,3,7,8-TCDD-13C	2.00	78
					1,2,3,7,8-PeCDF-13C	2.00	71
2,3,7,8-TCDD	0.24	----	0.16	J	2,3,4,7,8-PeCDF-13C	2.00	69
Total TCDD	4.4	----	0.16		1,2,3,7,8-PeCDD-13C	2.00	82
					1,2,3,4,7,8-HxCDF-13C	2.00	69
1,2,3,7,8-PeCDF	1.8	----	0.22	J	1,2,3,6,7,8-HxCDF-13C	2.00	72
2,3,4,7,8-PeCDF	12	----	0.28		2,3,4,6,7,8-HxCDF-13C	2.00	69
Total PeCDF	310	----	0.22		1,2,3,7,8,9-HxCDF-13C	2.00	70
					1,2,3,4,7,8-HxCDD-13C	2.00	72
1,2,3,7,8-PeCDD	2.3	----	0.50	J	1,2,3,6,7,8-HxCDD-13C	2.00	68
Total PeCDD	14	----	0.50		1,2,3,4,6,7,8-HpCDF-13C	2.00	68
					1,2,3,4,7,8,9-HpCDF-13C	2.00	66
1,2,3,4,7,8-HxCDF	7.3	----	0.40		1,2,3,4,6,7,8-HpCDD-13C	2.00	81
1,2,3,6,7,8-HxCDF	5.0	----	0.46		OCDD-13C	4.00	49
2,3,4,6,7,8-HxCDF	7.0	----	0.32				
1,2,3,7,8,9-HxCDF	1.8	----	0.34	J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	250	----	0.32		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	5.6	----	0.43		2,3,7,8-TCDD-37Cl4	0.20	74
1,2,3,6,7,8-HxCDD	14	----	0.23				
1,2,3,7,8,9-HxCDD	10	----	0.23				
Total HxCDD	140	----	0.23				
1,2,3,4,6,7,8-HpCDF	140	----	0.89		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	6.4	----	1.7		Equivalence: 18 ng/Kg		
Total HpCDF	250	----	0.89		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	330	----	0.16				
Total HpCDD	710	----	0.16				
OCDF	220	----	0.32				
OCDD	4000	----	0.51				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
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 NC = Not Calculated

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 J = Estimated value  
 C = Result obtained from confirmation analysis

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	O-01			
Lab Sample ID	10487441025			
Filename	F190831A_08			
Injected By	JRH			
Total Amount Extracted	11.0 g	Matrix	Solid	
% Moisture	8.7	Dilution	NA	
Dry Weight Extracted	10.1 g	Collected	08/13/2019 16:00	
ICAL ID	F190827	Received	08/15/2019 08:40	
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05	
Method Blank ID	BLANK-72988	Analyzed	08/31/2019 09:50	

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	0.26	2,3,7,8-TCDF-13C	2.00	66
Total TCDF	1.2	----	0.26	2,3,7,8-TCDD-13C	2.00	76
				1,2,3,7,8-PeCDF-13C	2.00	72
2,3,7,8-TCDD	ND	----	0.18	2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	0.79	----	0.18 J	1,2,3,7,8-PeCDD-13C	2.00	85
				1,2,3,4,7,8-HxCDF-13C	2.00	70
1,2,3,7,8-PeCDF	ND	----	0.28	1,2,3,6,7,8-HxCDF-13C	2.00	68
2,3,4,7,8-PeCDF	0.39	----	0.18 J	2,3,4,6,7,8-HxCDF-13C	2.00	68
Total PeCDF	3.8	----	0.18 J	1,2,3,7,8,9-HxCDF-13C	2.00	59
				1,2,3,4,7,8-HxCDD-13C	2.00	77
1,2,3,7,8-PeCDD	----	0.27	0.20 IJ	1,2,3,6,7,8-HxCDD-13C	2.00	68
Total PeCDD	0.27	----	0.20 J	1,2,3,4,6,7,8-HpCDF-13C	2.00	72
				1,2,3,4,7,8,9-HpCDF-13C	2.00	73
1,2,3,4,7,8-HxCDF	0.53	----	0.31 J	1,2,3,4,6,7,8-HpCDD-13C	2.00	84
1,2,3,6,7,8-HxCDF	0.50	----	0.31 J	OCDD-13C	4.00	59
2,3,4,6,7,8-HxCDF	0.61	----	0.26 J			
1,2,3,7,8,9-HxCDF	0.28	----	0.17 J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	6.5	----	0.17	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	0.38	2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,6,7,8-HxCDD	0.67	----	0.41 J			
1,2,3,7,8,9-HxCDD	----	0.68	0.38 IJ			
Total HxCDD	5.2	----	0.38			
1,2,3,4,6,7,8-HpCDF	4.6	----	0.32 J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.47	----	0.34 J	Equivalence: 0.93 ng/Kg		
Total HpCDF	11	----	0.32	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	13	----	0.21			
Total HpCDD	30	----	0.21			
OCDF	13	----	0.38			
OCDD	110	----	0.29			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
EDL = Estimated Detection Limit

ND = Not Detected  
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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	O-04				
Lab Sample ID	10487441026				
Filename	F190831A_09				
Injected By	JRH				
Total Amount Extracted	11.2 g	Matrix		Solid	
% Moisture	10.0	Dilution		NA	
Dry Weight Extracted	10.1 g	Collected		08/13/2019 16:15	
ICAL ID	F190827	Received		08/15/2019 08:40	
CCal Filename(s)	F190831A_01	Extracted		08/28/2019 15:05	
Method Blank ID	BLANK-72988	Analyzed		08/31/2019 10:36	

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	0.38	2,3,7,8-TCDF-13C	2.00	60
Total TCDF	3.0	----	0.38	2,3,7,8-TCDD-13C	2.00	69
				1,2,3,7,8-PeCDF-13C	2.00	61
2,3,7,8-TCDD	ND	----	0.21	2,3,4,7,8-PeCDF-13C	2.00	61
Total TCDD	0.63	----	0.21 J	1,2,3,7,8-PeCDD-13C	2.00	72
				1,2,3,4,7,8-HxCDF-13C	2.00	61
1,2,3,7,8-PeCDF	ND	----	0.46	1,2,3,6,7,8-HxCDF-13C	2.00	64
2,3,4,7,8-PeCDF	0.78	----	0.27 J	2,3,4,6,7,8-HxCDF-13C	2.00	62
Total PeCDF	19	----	0.27	1,2,3,7,8,9-HxCDF-13C	2.00	58
				1,2,3,4,7,8-HxCDD-13C	2.00	66
1,2,3,7,8-PeCDD	----	0.34	0.23 IJ	1,2,3,6,7,8-HxCDD-13C	2.00	62
Total PeCDD	5.3	----	0.23	1,2,3,4,6,7,8-HpCDF-13C	2.00	65
				1,2,3,4,7,8,9-HpCDF-13C	2.00	66
1,2,3,4,7,8-HxCDF	1.1	----	0.60 J	1,2,3,4,6,7,8-HpCDD-13C	2.00	78
1,2,3,6,7,8-HxCDF	1.2	----	0.73 J	OCDD-13C	4.00	53
2,3,4,6,7,8-HxCDF	----	1.1	0.58 IJ			
1,2,3,7,8,9-HxCDF	ND	----	0.28	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	21	----	0.28	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	2.0	----	0.57 J	2,3,7,8-TCDD-37Cl4	0.20	64
1,2,3,6,7,8-HxCDD	3.0	----	0.61 J			
1,2,3,7,8,9-HxCDD	2.4	----	0.61 J			
Total HxCDD	74	----	0.57			
1,2,3,4,6,7,8-HpCDF	19	----	0.63	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.96	----	0.79 J	Equivalence: 3.0 ng/Kg		
Total HpCDF	53	----	0.63	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	99	----	0.21			
Total HpCDD	410	----	0.21			
OCDF	57	----	0.67			
OCDD	580	----	0.62			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	O-05			
Lab Sample ID	10487441027			
Filename	F190831A_10			
Injected By	JRH			
Total Amount Extracted	12.1 g	Matrix	Solid	
% Moisture	13.2	Dilution	NA	
Dry Weight Extracted	10.5 g	Collected	08/13/2019 16:25	
ICAL ID	F190827	Received	08/15/2019 08:40	
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05	
Method Blank ID	BLANK-72988	Analyzed	08/31/2019 11:22	

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.50	----	0.21	J	2,3,7,8-TCDF-13C	2.00	60
Total TCDF	11	----	0.21		2,3,7,8-TCDD-13C	2.00	71
					1,2,3,7,8-PeCDF-13C	2.00	60
2,3,7,8-TCDD	ND	----	0.26		2,3,4,7,8-PeCDF-13C	2.00	59
Total TCDD	1.7	----	0.26		1,2,3,7,8-PeCDD-13C	2.00	73
					1,2,3,4,7,8-HxCDF-13C	2.00	79
1,2,3,7,8-PeCDF	ND	----	0.87		1,2,3,6,7,8-HxCDF-13C	2.00	72
2,3,4,7,8-PeCDF	1.7	----	0.45	J	2,3,4,6,7,8-HxCDF-13C	2.00	69
Total PeCDF	46	----	0.45		1,2,3,7,8,9-HxCDF-13C	2.00	59
					1,2,3,4,7,8-HxCDD-13C	2.00	76
1,2,3,7,8-PeCDD	1.1	----	0.50	J	1,2,3,6,7,8-HxCDD-13C	2.00	57
Total PeCDD	11	----	0.50		1,2,3,4,6,7,8-HpCDF-13C	2.00	53
					1,2,3,4,7,8,9-HpCDF-13C	2.00	47
1,2,3,4,7,8-HxCDF	2.8	----	0.37	J	1,2,3,4,6,7,8-HpCDD-13C	2.00	59
1,2,3,6,7,8-HxCDF	2.5	----	0.32	J	OCDD-13C	4.00	31
2,3,4,6,7,8-HxCDF	3.0	----	0.31	J			
1,2,3,7,8,9-HxCDF	ND	----	0.45		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	66	----	0.31		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.9	----	0.68	J	2,3,7,8-TCDD-37Cl4	0.20	64
1,2,3,6,7,8-HxCDD	7.7	----	0.52				
1,2,3,7,8,9-HxCDD	4.7	----	0.67	J			
Total HxCDD	92	----	0.52				
1,2,3,4,6,7,8-HpCDF	43	----	0.90		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	2.2	----	0.67	J	Equivalence: 6.6 ng/Kg		
Total HpCDF	92	----	0.67		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	180	----	0.30				
Total HpCDD	400	----	0.30				
OCDF	95	----	0.83				
OCDD	1400	----	0.73				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
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 EDL = Estimated Detection Limit

ND = Not Detected  
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 NC = Not Calculated

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	O-06			
Lab Sample ID	10487441028			
Filename	F190831A_11			
Injected By	JRH			
Total Amount Extracted	11.5 g	Matrix	Solid	
% Moisture	11.8	Dilution	NA	
Dry Weight Extracted	10.1 g	Collected	08/14/2019 07:30	
ICAL ID	F190827	Received	08/15/2019 08:40	
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05	
Method Blank ID	BLANK-72988	Analyzed	08/31/2019 12:08	

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	0.50	2,3,7,8-TCDF-13C	2.00	70
Total TCDF	6.3	----	0.50	2,3,7,8-TCDD-13C	2.00	82
				1,2,3,7,8-PeCDF-13C	2.00	70
2,3,7,8-TCDD	ND	----	0.22	2,3,4,7,8-PeCDF-13C	2.00	71
Total TCDD	0.82	----	0.22 J	1,2,3,7,8-PeCDD-13C	2.00	83
				1,2,3,4,7,8-HxCDF-13C	2.00	79
1,2,3,7,8-PeCDF	ND	----	0.77	1,2,3,6,7,8-HxCDF-13C	2.00	82
2,3,4,7,8-PeCDF	1.0	----	0.51 J	2,3,4,6,7,8-HxCDF-13C	2.00	80
Total PeCDF	27	----	0.51	1,2,3,7,8,9-HxCDF-13C	2.00	67
				1,2,3,4,7,8-HxCDD-13C	2.00	86
1,2,3,7,8-PeCDD	----	0.38	0.31 U	1,2,3,6,7,8-HxCDD-13C	2.00	75
Total PeCDD	3.0	----	0.31 J	1,2,3,4,6,7,8-HpCDF-13C	2.00	72
				1,2,3,4,7,8,9-HpCDF-13C	2.00	70
1,2,3,4,7,8-HxCDF	2.3	----	0.54 J	1,2,3,4,6,7,8-HpCDD-13C	2.00	86
1,2,3,6,7,8-HxCDF	----	2.3	0.52 PJ	OCDD-13C	4.00	54
2,3,4,6,7,8-HxCDF	----	1.9	0.34 U			
1,2,3,7,8,9-HxCDF	ND	----	0.40	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	40	----	0.34	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.95	----	0.66 J	2,3,7,8-TCDD-37Cl4	0.20	76
1,2,3,6,7,8-HxCDD	3.7	----	0.68 J			
1,2,3,7,8,9-HxCDD	2.3	----	0.32 J			
Total HxCDD	29	----	0.32			
1,2,3,4,6,7,8-HpCDF	37	----	0.38	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	----	1.7	0.33 U	Equivalence: 3.5 ng/Kg		
Total HpCDF	80	----	0.33	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	83	----	0.39			
Total HpCDD	160	----	0.39			
OCDF	58	----	0.99			
OCDD	680	----	0.86			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
 J = Estimated value  
 P = PCDE Interference  
 I = Interference present

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	O-08		
Lab Sample ID	10487441029		
Filename	F190831A_12		
Injected By	JRH		
Total Amount Extracted	11.3 g	Matrix	Solid
% Moisture	11.2	Dilution	NA
Dry Weight Extracted	10.0 g	Collected	08/14/2019 07:45
ICAL ID	F190827	Received	08/15/2019 08:40
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-72988	Analyzed	08/31/2019 12:54

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	0.31	2,3,7,8-TCDF-13C	2.00	65
Total TCDF	1.7	----	0.31	2,3,7,8-TCDD-13C	2.00	78
				1,2,3,7,8-PeCDF-13C	2.00	67
2,3,7,8-TCDD	ND	----	0.20	2,3,4,7,8-PeCDF-13C	2.00	67
Total TCDD	0.81	----	0.20 J	1,2,3,7,8-PeCDD-13C	2.00	79
				1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	----	0.42	1,2,3,6,7,8-HxCDF-13C	2.00	69
2,3,4,7,8-PeCDF	----	0.42	0.26 IJ	2,3,4,6,7,8-HxCDF-13C	2.00	67
Total PeCDF	9.2	----	0.26	1,2,3,7,8,9-HxCDF-13C	2.00	55
				1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,7,8-PeCDD	0.50	----	0.21 J	1,2,3,6,7,8-HxCDD-13C	2.00	66
Total PeCDD	1.8	----	0.21 J	1,2,3,4,6,7,8-HpCDF-13C	2.00	73
				1,2,3,4,7,8,9-HpCDF-13C	2.00	70
1,2,3,4,7,8-HxCDF	----	0.63	0.37 IJ	1,2,3,4,6,7,8-HpCDD-13C	2.00	86
1,2,3,6,7,8-HxCDF	----	0.97	0.33 PJ	OCDD-13C	4.00	54
2,3,4,6,7,8-HxCDF	0.62	----	0.40 J			
1,2,3,7,8,9-HxCDF	ND	----	0.14	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	14	----	0.14	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	----	0.78	0.26 IJ	2,3,7,8-TCDD-37Cl4	0.20	72
1,2,3,6,7,8-HxCDD	----	1.3	0.24 IJ			
1,2,3,7,8,9-HxCDD	1.4	----	0.40 J			
Total HxCDD	14	----	0.24			
1,2,3,4,6,7,8-HpCDF	10	----	0.21	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.67	----	0.38 J	Equivalence: 1.7 ng/Kg		
Total HpCDF	27	----	0.21	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	32	----	0.15			
Total HpCDD	75	----	0.15			
OCDF	22	----	0.57			
OCDD	270	----	0.50			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
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 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
 J = Estimated value  
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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	O-07				
Lab Sample ID	10487441030				
Filename	F190831A_13				
Injected By	JRH				
Total Amount Extracted	11.3 g	Matrix		Solid	
% Moisture	9.8	Dilution		NA	
Dry Weight Extracted	10.2 g	Collected		08/14/2019 08:00	
ICAL ID	F190827	Received		08/15/2019 08:40	
CCal Filename(s)	F190831A_01	Extracted		08/28/2019 15:05	
Method Blank ID	BLANK-73004	Analyzed		08/31/2019 13:40	

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	0.28	2,3,7,8-TCDF-13C	2.00	65
Total TCDF	0.61	----	0.28 J	2,3,7,8-TCDD-13C	2.00	76
				1,2,3,7,8-PeCDF-13C	2.00	65
2,3,7,8-TCDD	ND	----	0.14	2,3,4,7,8-PeCDF-13C	2.00	65
Total TCDD	0.36	----	0.14 J	1,2,3,7,8-PeCDD-13C	2.00	78
				1,2,3,4,7,8-HxCDF-13C	2.00	69
1,2,3,7,8-PeCDF	ND	----	0.38	1,2,3,6,7,8-HxCDF-13C	2.00	72
2,3,4,7,8-PeCDF	ND	----	0.19	2,3,4,6,7,8-HxCDF-13C	2.00	72
Total PeCDF	2.1	----	0.19 J	1,2,3,7,8,9-HxCDF-13C	2.00	69
				1,2,3,4,7,8-HxCDD-13C	2.00	73
1,2,3,7,8-PeCDD	ND	----	0.16	1,2,3,6,7,8-HxCDD-13C	2.00	70
Total PeCDD	ND	----	0.16	1,2,3,4,6,7,8-HpCDF-13C	2.00	75
				1,2,3,4,7,8,9-HpCDF-13C	2.00	75
1,2,3,4,7,8-HxCDF	0.35	----	0.29 J	1,2,3,4,6,7,8-HpCDD-13C	2.00	88
1,2,3,6,7,8-HxCDF	----	0.31	0.29 U	OCDD-13C	4.00	58
2,3,4,6,7,8-HxCDF	----	0.28	0.25 U			
1,2,3,7,8,9-HxCDF	ND	----	0.31	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	2.2	----	0.25 J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	0.31	2,3,7,8-TCDD-37Cl4	0.20	71
1,2,3,6,7,8-HxCDD	0.65	----	0.42 J			
1,2,3,7,8,9-HxCDD	ND	----	0.36			
Total HxCDD	2.5	----	0.31 J			
1,2,3,4,6,7,8-HpCDF	4.2	----	0.25 J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	0.22	Equivalence: 0.37 ng/Kg		
Total HpCDF	9.6	----	0.22	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	14	----	0.19			
Total HpCDD	25	----	0.19			
OCDF	8.4	----	0.53 J			
OCDD	100	----	0.51			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
 NA = Not Applicable  
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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	O-03				
Lab Sample ID	10487441031				
Filename	F190831A_14				
Injected By	JRH				
Total Amount Extracted	11.1 g	Matrix	Solid		
% Moisture	8.8	Dilution	NA		
Dry Weight Extracted	10.1 g	Collected	08/14/2019 08:15		
ICAL ID	F190827	Received	08/15/2019 08:40		
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05		
Method Blank ID	BLANK-73004	Analyzed	08/31/2019 14:26		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	0.32		2,3,7,8-TCDF-13C	2.00	68
Total TCDF	16	----	0.32		2,3,7,8-TCDD-13C	2.00	84
					1,2,3,7,8-PeCDF-13C	2.00	70
2,3,7,8-TCDD	ND	----	0.22		2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	3.2	----	0.22		1,2,3,7,8-PeCDD-13C	2.00	83
					1,2,3,4,7,8-HxCDF-13C	2.00	71
1,2,3,7,8-PeCDF	ND	----	0.72		1,2,3,6,7,8-HxCDF-13C	2.00	78
2,3,4,7,8-PeCDF	2.9	----	0.25 J		2,3,4,6,7,8-HxCDF-13C	2.00	69
Total PeCDF	72	----	0.25		1,2,3,7,8,9-HxCDF-13C	2.00	75
					1,2,3,4,7,8-HxCDD-13C	2.00	80
1,2,3,7,8-PeCDD	0.38	----	0.23 J		1,2,3,6,7,8-HxCDD-13C	2.00	71
Total PeCDD	6.6	----	0.23		1,2,3,4,6,7,8-HpCDF-13C	2.00	82
					1,2,3,4,7,8,9-HpCDF-13C	2.00	80
1,2,3,4,7,8-HxCDF	----	1.0	0.27 U		1,2,3,4,6,7,8-HpCDD-13C	2.00	100
1,2,3,6,7,8-HxCDF	0.70	----	0.18 J		OCDD-13C	4.00	63
2,3,4,6,7,8-HxCDF	2.7	----	0.17 J				
1,2,3,7,8,9-HxCDF	ND	----	0.15		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	27	----	0.15		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	----	0.49	0.25 U		2,3,7,8-TCDD-37Cl4	0.20	78
1,2,3,6,7,8-HxCDD	1.7	----	0.21 J				
1,2,3,7,8,9-HxCDD	1.1	----	0.28 J				
Total HxCDD	24	----	0.21				
1,2,3,4,6,7,8-HpCDF	15	----	0.091		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	----	0.56	0.26 U		Equivalence: 2.6 ng/Kg		
Total HpCDF	31	----	0.091		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	33	----	0.053				
Total HpCDD	79	----	0.053				
OCDF	25	----	0.31				
OCDD	260	----	0.30				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
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 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	O-02		
Lab Sample ID	10487441032		
Filename	F190831A_15		
Injected By	JRH		
Total Amount Extracted	12.0 g	Matrix	Solid
% Moisture	11.1	Dilution	NA
Dry Weight Extracted	10.7 g	Collected	08/14/2019 08:25
ICAL ID	F190827	Received	08/15/2019 08:40
CCal Filename(s)	F190831A_01	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-73004	Analyzed	08/31/2019 15:12

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	0.27	2,3,7,8-TCDF-13C	2.00	66
Total TCDF	2.9	----	0.27	2,3,7,8-TCDD-13C	2.00	79
				1,2,3,7,8-PeCDF-13C	2.00	65
2,3,7,8-TCDD	ND	----	0.19	2,3,4,7,8-PeCDF-13C	2.00	64
Total TCDD	ND	----	0.19	1,2,3,7,8-PeCDD-13C	2.00	76
				1,2,3,4,7,8-HxCDF-13C	2.00	72
1,2,3,7,8-PeCDF	ND	----	0.35	1,2,3,6,7,8-HxCDF-13C	2.00	76
2,3,4,7,8-PeCDF	0.89	----	0.16 J	2,3,4,6,7,8-HxCDF-13C	2.00	71
Total PeCDF	20	----	0.16	1,2,3,7,8,9-HxCDF-13C	2.00	69
				1,2,3,4,7,8-HxCDD-13C	2.00	74
1,2,3,7,8-PeCDD	ND	----	0.26	1,2,3,6,7,8-HxCDD-13C	2.00	74
Total PeCDD	0.69	----	0.26 J	1,2,3,4,6,7,8-HpCDF-13C	2.00	76
				1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	0.97	----	0.28 J	1,2,3,4,6,7,8-HpCDD-13C	2.00	93
1,2,3,6,7,8-HxCDF	----	0.89	0.37 U	OCDD-13C	4.00	61
2,3,4,6,7,8-HxCDF	1.5	----	0.31 J			
1,2,3,7,8,9-HxCDF	ND	----	0.23	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	12	----	0.23	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.45	----	0.40 J	2,3,7,8-TCDD-37Cl4	0.20	72
1,2,3,6,7,8-HxCDD	1.2	----	0.34 J			
1,2,3,7,8,9-HxCDD	1.2	----	0.42 J			
Total HxCDD	12	----	0.34			
1,2,3,4,6,7,8-HpCDF	9.6	----	0.21	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	----	0.48	0.26 U	Equivalence: 1.3 ng/Kg		
Total HpCDF	19	----	0.21	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	22	----	0.100			
Total HpCDD	50	----	0.100			
OCDF	17	----	0.41			
OCDD	160	----	0.23			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
EDL = Estimated Detection Limit

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.  
J = Estimated value  
I = Interference present

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N4-3				
Lab Sample ID	10487441033				
Filename	Y190830B_11				
Injected By	JRH				
Total Amount Extracted	11.2 g	Matrix	Solid		
% Moisture	8.9	Dilution	NA		
Dry Weight Extracted	10.2 g	Collected	08/14/2019 09:00		
ICAL ID	Y190827	Received	08/15/2019 08:40		
CCal Filename(s)	Y190830A_18	Extracted	08/28/2019 15:05		
Method Blank ID	BLANK-73004	Analyzed	08/31/2019 06:12		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	2.4	----	0.13		2,3,7,8-TCDF-13C	2.00	63
Total TCDF	140	----	0.13	E	2,3,7,8-TCDD-13C	2.00	66
					1,2,3,7,8-PeCDF-13C	2.00	70
2,3,7,8-TCDD	1.0	----	0.15		2,3,4,7,8-PeCDF-13C	2.00	70
Total TCDD	12	----	0.15		1,2,3,7,8-PeCDD-13C	2.00	76
					1,2,3,4,7,8-HxCDF-13C	2.00	88 DN2
1,2,3,7,8-PeCDF	3.4	----	0.32	J	1,2,3,6,7,8-HxCDF-13C	2.00	83 DN2
2,3,4,7,8-PeCDF	61	----	1.0		2,3,4,6,7,8-HxCDF-13C	2.00	81 DN2
Total PeCDF	760	----	0.32		1,2,3,7,8,9-HxCDF-13C	2.00	41 DN2
					1,2,3,4,7,8-HxCDD-13C	2.00	90 DN2
1,2,3,7,8-PeCDD	5.9	----	0.13		1,2,3,6,7,8-HxCDD-13C	2.00	74 DN2
Total PeCDD	33	----	0.13		1,2,3,4,6,7,8-HpCDF-13C	2.00	70 DN2
					1,2,3,4,7,8,9-HpCDF-13C	2.00	79 DN2
1,2,3,4,7,8-HxCDF	----	75	0.73	PDN2	1,2,3,4,6,7,8-HpCDD-13C	2.00	81 DN2
1,2,3,6,7,8-HxCDF	----	28	0.91	PDN2	OCDD-13C	4.00	84 DN2
2,3,4,6,7,8-HxCDF	30	----	0.77	DN2			
1,2,3,7,8,9-HxCDF	6.1	----	0.65	JDN2	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	1200	----	0.65	DN2	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	9.0	----	1.1	JDN2	2,3,7,8-TCDD-37Cl4	0.20	77
1,2,3,6,7,8-HxCDD	44	----	1.2	DN2			
1,2,3,7,8,9-HxCDD	15	----	1.1	JDN2			
Total HxCDD	310	----	1.1	DN2			
1,2,3,4,6,7,8-HpCDF	380	----	0.72	DN2	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	20	----	0.55	JDN2	Equivalence: 62 ng/Kg		
Total HpCDF	1100	----	0.55	DN2	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	930	----	1.7	DN2			
Total HpCDD	1900	----	1.7	DN2			
OCDF	620	----	0.40	DN2			
OCDD	9200	----	0.48	DN2			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
 NA = Not Applicable  
 NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Estimated value  
 P = PCDE Interference  
 E = Exceeds calibration range  
 D = Result obtained from analysis of diluted sample  
 Nn = Value obtained from additional analysis

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N4-2				
Lab Sample ID	10487441034				
Filename	Y190830B_12				
Injected By	JRH				
Total Amount Extracted	11.5 g		Matrix	Solid	
% Moisture	12.0		Dilution	NA	
Dry Weight Extracted	10.1 g		Collected	08/14/2019 09:15	
ICAL ID	Y190827		Received	08/15/2019 08:40	
CCal Filename(s)	Y190830A_18		Extracted	08/28/2019 15:05	
Method Blank ID	BLANK-73004		Analyzed	08/31/2019 06:58	

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	4.4	----	0.98	C	2,3,7,8-TCDF-13C	2.00	81
Total TCDF	99	----	0.66		2,3,7,8-TCDD-13C	2.00	87
					1,2,3,7,8-PeCDF-13C	2.00	89
2,3,7,8-TCDD	0.85	----	0.59	J	2,3,4,7,8-PeCDF-13C	2.00	99
Total TCDD	18	----	0.59		1,2,3,7,8-PeCDD-13C	2.00	104
					1,2,3,4,7,8-HxCDF-13C	2.00	89 DN2
1,2,3,7,8-PeCDF	----	270	0.85	P	1,2,3,6,7,8-HxCDF-13C	2.00	80 DN2
2,3,4,7,8-PeCDF	14	----	0.56		2,3,4,6,7,8-HxCDF-13C	2.00	84 DN2
Total PeCDF	480	----	0.56		1,2,3,7,8,9-HxCDF-13C	2.00	46 DN2
					1,2,3,4,7,8-HxCDD-13C	2.00	86 DN2
1,2,3,7,8-PeCDD	5.2	----	0.51		1,2,3,6,7,8-HxCDD-13C	2.00	68 DN2
Total PeCDD	25	----	0.51		1,2,3,4,6,7,8-HpCDF-13C	2.00	64 DN2
					1,2,3,4,7,8,9-HpCDF-13C	2.00	70 DN2
1,2,3,4,7,8-HxCDF	16	----	0.68	JDN2	1,2,3,4,6,7,8-HpCDD-13C	2.00	70 DN2
1,2,3,6,7,8-HxCDF	20	----	0.49	JDN2	OCDD-13C	4.00	74 DN2
2,3,4,6,7,8-HxCDF	16	----	0.45	JDN2			
1,2,3,7,8,9-HxCDF	6.7	----	0.91	JDN2	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	430	----	0.45	DN2	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	7.8	----	0.71	JDN2	2,3,7,8-TCDD-37Cl4	0.20	101
1,2,3,6,7,8-HxCDD	39	----	0.61	DN2			
1,2,3,7,8,9-HxCDD	15	----	0.70	JDN2			
Total HxCDD	260	----	0.61	DN2			
1,2,3,4,6,7,8-HpCDF	250	----	0.57	DN2	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	14	----	0.67	JDN2	Equivalence: 44 ng/Kg		
Total HpCDF	610	----	0.57	DN2	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	820	----	1.3	DN2			
Total HpCDD	1600	----	1.3	DN2			
OCDF	490	----	0.53	DN2			
OCDD	7300	----	0.57	DN2			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
EDL = Estimated Detection Limit

ND = Not Detected  
NA = Not Applicable  
NC = Not Calculated

Results reported on a dry weight basis and are valid to no more than 2 significant figures.

J = Estimated value  
P = PCDE Interference  
D = Result obtained from analysis of diluted sample  
Nn = Value obtained from additional analysis  
C = Result obtained from confirmation analysis

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N4-1		
Lab Sample ID	10487441035		
Filename	Y190830B_13		
Injected By	JRH		
Total Amount Extracted	11.5 g	Matrix	Solid
% Moisture	8.7	Dilution	NA
Dry Weight Extracted	10.5 g	Collected	08/14/2019 09:25
ICAL ID	Y190827	Received	08/15/2019 08:40
CCal Filename(s)	Y190830A_18	Extracted	08/28/2019 15:05
Method Blank ID	BLANK-73004	Analyzed	08/31/2019 07:43

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	2.1	----	0.31	2,3,7,8-TCDF-13C	2.00	84
Total TCDF	58	----	0.31	2,3,7,8-TCDD-13C	2.00	82
				1,2,3,7,8-PeCDF-13C	2.00	84
2,3,7,8-TCDD	0.80	----	0.37 J	2,3,4,7,8-PeCDF-13C	2.00	85
Total TCDD	11	----	0.37	1,2,3,7,8-PeCDD-13C	2.00	92
				1,2,3,4,7,8-HxCDF-13C	2.00	97
1,2,3,7,8-PeCDF	2.1	----	0.26 J	1,2,3,6,7,8-HxCDF-13C	2.00	93
2,3,4,7,8-PeCDF	11	----	0.34	2,3,4,6,7,8-HxCDF-13C	2.00	90
Total PeCDF	180	----	0.26	1,2,3,7,8,9-HxCDF-13C	2.00	61
				1,2,3,4,7,8-HxCDD-13C	2.00	86
1,2,3,7,8-PeCDD	2.5	----	0.34 J	1,2,3,6,7,8-HxCDD-13C	2.00	71
Total PeCDD	22	----	0.34	1,2,3,4,6,7,8-HpCDF-13C	2.00	52
				1,2,3,4,7,8,9-HpCDF-13C	2.00	43
1,2,3,4,7,8-HxCDF	8.2	----	0.16	1,2,3,4,6,7,8-HpCDD-13C	2.00	48
1,2,3,6,7,8-HxCDF	8.0	----	0.21	OCDD-13C	4.00	28
2,3,4,6,7,8-HxCDF	6.5	----	0.13			
1,2,3,7,8,9-HxCDF	3.0	----	0.11 J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	200	----	0.11	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	6.3	----	0.38	2,3,7,8-TCDD-37Cl4	0.20	80
1,2,3,6,7,8-HxCDD	24	----	0.14			
1,2,3,7,8,9-HxCDD	12	----	0.12			
Total HxCDD	170	----	0.12			
1,2,3,4,6,7,8-HpCDF	150	----	0.39	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	9.4	----	0.38	Equivalence: 22 ng/Kg		
Total HpCDF	380	----	0.38	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	530	----	0.31			
Total HpCDD	1000	----	0.31			
OCDF	320	----	0.68			
OCDD	5100	----	0.91			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

ND = Not Detected  
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 NC = Not Calculated

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 J = Estimated value

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### Method 1613B Sample Analysis Results

Client - TRC-WI

Client's Sample ID	N7-1				
Lab Sample ID	10487441036				
Filename	Y190830B_14				
Injected By	JRH				
Total Amount Extracted	11.1 g	Matrix	Solid		
% Moisture	8.2	Dilution	NA		
Dry Weight Extracted	10.2 g	Collected	08/14/2019 08:45		
ICAL ID	Y190827	Received	08/15/2019 08:40		
CCal Filename(s)	Y190830A_18	Extracted	08/28/2019 15:05		
Method Blank ID	BLANK-73004	Analyzed	08/31/2019 08:29		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	----	0.55	0.16	U	2,3,7,8-TCDF-13C	2.00	83
Total TCDF	21	----	0.16		2,3,7,8-TCDD-13C	2.00	81
					1,2,3,7,8-PeCDF-13C	2.00	83
2,3,7,8-TCDD	0.26	----	0.23	J	2,3,4,7,8-PeCDF-13C	2.00	85
Total TCDD	2.3	----	0.23		1,2,3,7,8-PeCDD-13C	2.00	88
					1,2,3,4,7,8-HxCDF-13C	2.00	84
1,2,3,7,8-PeCDF	0.69	----	0.11	J	1,2,3,6,7,8-HxCDF-13C	2.00	77
2,3,4,7,8-PeCDF	4.1	----	0.15	J	2,3,4,6,7,8-HxCDF-13C	2.00	80
Total PeCDF	50	----	0.11		1,2,3,7,8,9-HxCDF-13C	2.00	50
					1,2,3,4,7,8-HxCDD-13C	2.00	82
1,2,3,7,8-PeCDD	0.91	----	0.25	J	1,2,3,6,7,8-HxCDD-13C	2.00	68
Total PeCDD	7.6	----	0.25		1,2,3,4,6,7,8-HpCDF-13C	2.00	63
					1,2,3,4,7,8,9-HpCDF-13C	2.00	59
1,2,3,4,7,8-HxCDF	----	3.6	0.12	PJ	1,2,3,4,6,7,8-HpCDD-13C	2.00	58
1,2,3,6,7,8-HxCDF	2.7	----	0.14	J	OCDD-13C	4.00	36
2,3,4,6,7,8-HxCDF	2.4	----	0.12	J			
1,2,3,7,8,9-HxCDF	0.80	----	0.100	J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	87	----	0.100		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	2.2	----	0.077	J	2,3,7,8-TCDD-37Cl4	0.20	82
1,2,3,6,7,8-HxCDD	6.1	----	0.078				
1,2,3,7,8,9-HxCDD	3.4	----	0.077	J			
Total HxCDD	56	----	0.077				
1,2,3,4,6,7,8-HpCDF	46	----	0.14		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	2.3	----	0.23	J	Equivalence: 7.0 ng/Kg		
Total HpCDF	100	----	0.14		(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	150	----	0.10				
Total HpCDD	330	----	0.10				
OCDF	71	----	0.36				
OCDD	1300	----	0.22				

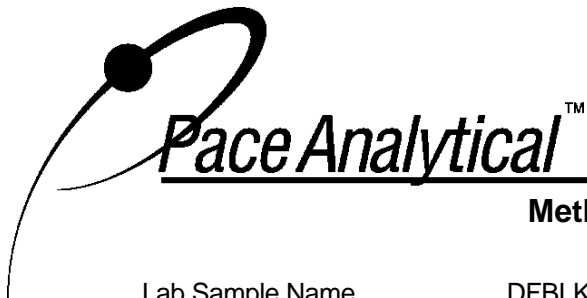
Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
EDL = Estimated Detection Limit

ND = Not Detected  
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NC = Not Calculated

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J = Estimated value  
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I = Interference present

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### Method 1613B Blank Analysis Results

Lab Sample Name	DFBLKWU	Matrix	Solid
Lab Sample ID	BLANK-72962	Dilution	NA
Filename	F190829A_12	Extracted	08/27/2019 15:05
Total Amount Extracted	10.7 g	Analyzed	08/29/2019 16:25
ICAL ID	F190827	Injected By	SMT
CCal Filename(s)	F190829A_01		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	0.072	2,3,7,8-TCDF-13C	2.00	84
Total TCDF	ND	----	0.072	2,3,7,8-TCDD-13C	2.00	81
				1,2,3,7,8-PeCDF-13C	2.00	79
2,3,7,8-TCDD	ND	----	0.079	2,3,4,7,8-PeCDF-13C	2.00	82
Total TCDD	ND	----	0.079	1,2,3,7,8-PeCDD-13C	2.00	79
				1,2,3,4,7,8-HxCDF-13C	2.00	78
1,2,3,7,8-PeCDF	ND	----	0.10	1,2,3,6,7,8-HxCDF-13C	2.00	87
2,3,4,7,8-PeCDF	ND	----	0.061	2,3,4,6,7,8-HxCDF-13C	2.00	86
Total PeCDF	ND	----	0.061	1,2,3,7,8,9-HxCDF-13C	2.00	86
				1,2,3,4,7,8-HxCDD-13C	2.00	68
1,2,3,7,8-PeCDD	ND	----	0.10	1,2,3,6,7,8-HxCDD-13C	2.00	76
Total PeCDD	ND	----	0.10	1,2,3,4,6,7,8-HpCDF-13C	2.00	76
				1,2,3,4,7,8,9-HpCDF-13C	2.00	72
1,2,3,4,7,8-HxCDF	ND	----	0.079	1,2,3,4,6,7,8-HpCDD-13C	2.00	76
1,2,3,6,7,8-HxCDF	ND	----	0.070	OCDD-13C	4.00	57
2,3,4,6,7,8-HxCDF	ND	----	0.065			
1,2,3,7,8,9-HxCDF	ND	----	0.060	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	----	0.060	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.093	----	0.076 J	2,3,7,8-TCDD-37Cl4	0.20	76
1,2,3,6,7,8-HxCDD	ND	----	0.086			
1,2,3,7,8,9-HxCDD	ND	----	0.096			
Total HxCDD	0.093	----	0.076 J			
1,2,3,4,6,7,8-HpCDF	ND	----	0.084	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	0.097	Equivalence: 0.010 ng/Kg		
Total HpCDF	ND	----	0.084	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	ND	----	0.13			
Total HpCDD	0.28	----	0.13 J			
OCDF	----	0.27	0.15 J			
OCDD	2.3	----	0.11 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
 EMPC = Estimated Maximum Possible Concentration  
 EDL = Estimated Detection Limit

Results reported on a total weight basis and are valid to no more than 2 significant figures.

J = Estimated value  
 I = Interference present

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**Method 1613B Blank Analysis Results**

Lab Sample Name	DFBLKWZ	Matrix	Solid
Lab Sample ID	BLANK-72988	Dilution	NA
Filename	F190830A_06	Extracted	08/28/2019 15:05
Total Amount Extracted	10.1 g	Analyzed	08/30/2019 13:45
ICAL ID	F190827	Injected By	ZMS
CCal Filename(s)	F190830A_03		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	0.065	2,3,7,8-TCDF-13C	2.00	91
Total TCDF	ND	----	0.065	2,3,7,8-TCDD-13C	2.00	88
				1,2,3,7,8-PeCDF-13C	2.00	89
2,3,7,8-TCDD	ND	----	0.10	2,3,4,7,8-PeCDF-13C	2.00	87
Total TCDD	0.13	----	0.10 J	1,2,3,7,8-PeCDD-13C	2.00	89
				1,2,3,4,7,8-HxCDF-13C	2.00	92
1,2,3,7,8-PeCDF	ND	----	0.14	1,2,3,6,7,8-HxCDF-13C	2.00	105
2,3,4,7,8-PeCDF	0.11	----	0.089 J	2,3,4,6,7,8-HxCDF-13C	2.00	102
Total PeCDF	0.11	----	0.089 J	1,2,3,7,8,9-HxCDF-13C	2.00	100
				1,2,3,4,7,8-HxCDD-13C	2.00	83
1,2,3,7,8-PeCDD	ND	----	0.079	1,2,3,6,7,8-HxCDD-13C	2.00	84
Total PeCDD	ND	----	0.079	1,2,3,4,6,7,8-HpCDF-13C	2.00	100
				1,2,3,4,7,8,9-HpCDF-13C	2.00	96
1,2,3,4,7,8-HxCDF	0.077	----	0.066 J	1,2,3,4,6,7,8-HpCDD-13C	2.00	98
1,2,3,6,7,8-HxCDF	0.076	----	0.057 J	OCDD-13C	4.00	84
2,3,4,6,7,8-HxCDF	----	0.059	0.054 U			
1,2,3,7,8,9-HxCDF	0.10	----	0.076 J	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.25	----	0.054 J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	0.11	2,3,7,8-TCDD-37Cl4	0.20	74
1,2,3,6,7,8-HxCDD	ND	----	0.12			
1,2,3,7,8,9-HxCDD	ND	----	0.15			
Total HxCDD	ND	----	0.11			
1,2,3,4,6,7,8-HpCDF	----	0.069	0.054 U	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	0.095	----	0.067 J	Equivalence: 0.070 ng/Kg		
Total HpCDF	0.095	----	0.054 J	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	0.25	----	0.12 J			
Total HpCDD	0.53	----	0.12 J			
OCDF	0.20	----	0.10 J			
OCDD	1.3	----	0.17 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
EDL = Estimated Detection Limit

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J = Estimated value

I = Interference present

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**Method 1613B Blank Analysis Results**

Lab Sample Name	DFBLKXD	Matrix	Solid
Lab Sample ID	BLANK-73004	Dilution	NA
Filename	F190830B_07	Extracted	08/28/2019 15:05
Total Amount Extracted	20.7 g	Analyzed	08/30/2019 21:33
ICAL ID	F190827	Injected By	JRH
CCal Filename(s)	F190830A_09		

Native Isomers	Conc ng/Kg	EMPC ng/Kg	EDL ng/Kg	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	----	0.048	2,3,7,8-TCDF-13C	2.00	65
Total TCDF	ND	----	0.048	2,3,7,8-TCDD-13C	2.00	75
				1,2,3,7,8-PeCDF-13C	2.00	71
2,3,7,8-TCDD	ND	----	0.054	2,3,4,7,8-PeCDF-13C	2.00	75
Total TCDD	ND	----	0.054	1,2,3,7,8-PeCDD-13C	2.00	82
				1,2,3,4,7,8-HxCDF-13C	2.00	73
1,2,3,7,8-PeCDF	ND	----	0.079	1,2,3,6,7,8-HxCDF-13C	2.00	79
2,3,4,7,8-PeCDF	ND	----	0.049	2,3,4,6,7,8-HxCDF-13C	2.00	77
Total PeCDF	ND	----	0.049	1,2,3,7,8,9-HxCDF-13C	2.00	78
				1,2,3,4,7,8-HxCDD-13C	2.00	70
1,2,3,7,8-PeCDD	ND	----	0.060	1,2,3,6,7,8-HxCDD-13C	2.00	69
Total PeCDD	ND	----	0.060	1,2,3,4,6,7,8-HpCDF-13C	2.00	82
				1,2,3,4,7,8,9-HpCDF-13C	2.00	85
1,2,3,4,7,8-HxCDF	ND	----	0.036	1,2,3,4,6,7,8-HpCDD-13C	2.00	90
1,2,3,6,7,8-HxCDF	ND	----	0.033	OCDD-13C	4.00	79
2,3,4,6,7,8-HxCDF	ND	----	0.039			
1,2,3,7,8,9-HxCDF	ND	----	0.047	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	----	0.033	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	----	0.069	2,3,7,8-TCDD-37Cl4	0.20	72
1,2,3,6,7,8-HxCDD	ND	----	0.074			
1,2,3,7,8,9-HxCDD	ND	----	0.063			
Total HxCDD	ND	----	0.063			
1,2,3,4,6,7,8-HpCDF	----	0.026	0.026 U	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	----	0.029	Equivalence: 0.0015 ng/Kg		
Total HpCDF	0.052	----	0.026 J	(Lower-bound - Using 2005 WHO Factors)		
1,2,3,4,6,7,8-HpCDD	0.098	----	0.043 J			
Total HpCDD	0.098	----	0.043 J			
OCDF	----	0.098	0.063 U			
OCDD	0.62	----	0.095 J			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).  
EMPC = Estimated Maximum Possible Concentration  
EDL = Estimated Detection Limit

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J = Estimated value  
I = Interference present

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### Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-72963	Matrix	Solid
Filename	F190829A_10	Dilution	NA
Total Amount Extracted	10.8 g	Extracted	08/27/2019 15:05
ICAL ID	F190827	Analyzed	08/29/2019 14:53
CCal Filename	F190829A_01	Injected By	SMT
Method Blank ID	BLANK-72962		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	11	7.5	15.8	106
2,3,7,8-TCDD	10	11	6.7	15.8	106
1,2,3,7,8-PeCDF	50	52	40.0	67.0	104
2,3,4,7,8-PeCDF	50	52	34.0	80.0	105
1,2,3,7,8-PeCDD	50	46	35.0	71.0	92
1,2,3,4,7,8-HxCDF	50	55	36.0	67.0	110
1,2,3,6,7,8-HxCDF	50	52	42.0	65.0	104
2,3,4,6,7,8-HxCDF	50	52	35.0	78.0	105
1,2,3,7,8,9-HxCDF	50	50	39.0	65.0	100
1,2,3,4,7,8-HxCDD	50	54	35.0	82.0	108
1,2,3,6,7,8-HxCDD	50	54	38.0	67.0	109
1,2,3,7,8,9-HxCDD	50	57	32.0	81.0	113
1,2,3,4,6,7,8-HpCDF	50	53	41.0	61.0	106
1,2,3,4,7,8,9-HpCDF	50	47	39.0	69.0	94
1,2,3,4,6,7,8-HpCDD	50	48	35.0	70.0	97
OCDF	100	120	63.0	170.0	116
OCDD	100	110	78.0	144.0	107
2,3,7,8-TCDD-37Cl4	10	8.9	3.1	19.1	89
2,3,7,8-TCDF-13C	100	96	22.0	152.0	96
2,3,7,8-TCDD-13C	100	92	20.0	175.0	92
1,2,3,7,8-PeCDF-13C	100	90	21.0	192.0	90
2,3,4,7,8-PeCDF-13C	100	94	13.0	328.0	94
1,2,3,7,8-PeCDD-13C	100	93	21.0	227.0	93
1,2,3,4,7,8-HxCDF-13C	100	91	19.0	202.0	91
1,2,3,6,7,8-HxCDF-13C	100	110	21.0	159.0	105
2,3,4,6,7,8-HxCDF-13C	100	92	22.0	176.0	92
1,2,3,7,8,9-HxCDF-13C	100	94	17.0	205.0	94
1,2,3,4,7,8-HxCDD-13C	100	76	21.0	193.0	76
1,2,3,6,7,8-HxCDD-13C	100	84	25.0	163.0	84
1,2,3,4,6,7,8-HpCDF-13C	100	85	21.0	158.0	85
1,2,3,4,7,8,9-HpCDF-13C	100	86	20.0	186.0	86
1,2,3,4,6,7,8-HpCDD-13C	100	88	26.0	166.0	88
OCDD-13C	200	150	26.0	397.0	73

Cs = Concentration Spiked (ng/mL)  
 Cr = Concentration Recovered (ng/mL)  
 Rec. = Recovery (Expressed as Percent)  
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision  
 R = Recovery outside of control limits  
 Nn = Value obtained from additional analysis  
 \* = See Discussion

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### Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-72989	Matrix	Solid
Filename	F190830A_04	Dilution	NA
Total Amount Extracted	10.4 g	Extracted	08/28/2019 15:05
ICAL ID	F190827	Analyzed	08/30/2019 12:14
CCal Filename	F190830A_03	Injected By	ZMS
Method Blank ID	BLANK-72988		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	9.6	7.5	15.8	96
2,3,7,8-TCDD	10	10	6.7	15.8	101
1,2,3,7,8-PeCDF	50	48	40.0	67.0	96
2,3,4,7,8-PeCDF	50	49	34.0	80.0	98
1,2,3,7,8-PeCDD	50	43	35.0	71.0	86
1,2,3,4,7,8-HxCDF	50	51	36.0	67.0	102
1,2,3,6,7,8-HxCDF	50	49	42.0	65.0	99
2,3,4,6,7,8-HxCDF	50	49	35.0	78.0	98
1,2,3,7,8,9-HxCDF	50	48	39.0	65.0	96
1,2,3,4,7,8-HxCDD	50	50	35.0	82.0	99
1,2,3,6,7,8-HxCDD	50	52	38.0	67.0	103
1,2,3,7,8,9-HxCDD	50	51	32.0	81.0	103
1,2,3,4,6,7,8-HpCDF	50	47	41.0	61.0	93
1,2,3,4,7,8,9-HpCDF	50	44	39.0	69.0	89
1,2,3,4,6,7,8-HpCDD	50	43	35.0	70.0	86
OCDF	100	100	63.0	170.0	102
OCDD	100	97	78.0	144.0	97
2,3,7,8-TCDD-37Cl4	10	7.9	3.1	19.1	79
2,3,7,8-TCDF-13C	100	90	22.0	152.0	90
2,3,7,8-TCDD-13C	100	90	20.0	175.0	90
1,2,3,7,8-PeCDF-13C	100	86	21.0	192.0	86
2,3,4,7,8-PeCDF-13C	100	87	13.0	328.0	87
1,2,3,7,8-PeCDD-13C	100	88	21.0	227.0	88
1,2,3,4,7,8-HxCDF-13C	100	92	19.0	202.0	92
1,2,3,6,7,8-HxCDF-13C	100	99	21.0	159.0	99
2,3,4,6,7,8-HxCDF-13C	100	96	22.0	176.0	96
1,2,3,7,8,9-HxCDF-13C	100	92	17.0	205.0	92
1,2,3,4,7,8-HxCDD-13C	100	83	21.0	193.0	83
1,2,3,6,7,8-HxCDD-13C	100	84	25.0	163.0	84
1,2,3,4,6,7,8-HpCDF-13C	100	95	21.0	158.0	95
1,2,3,4,7,8,9-HpCDF-13C	100	96	20.0	186.0	96
1,2,3,4,6,7,8-HpCDD-13C	100	97	26.0	166.0	97
OCDD-13C	200	170	26.0	397.0	84

Cs = Concentration Spiked (ng/mL)  
 Cr = Concentration Recovered (ng/mL)  
 Rec. = Recovery (Expressed as Percent)  
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision  
 R = Recovery outside of control limits  
 Nn = Value obtained from additional analysis  
 \* = See Discussion

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### Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCS-73005	Matrix	Solid
Filename	F190830B_03	Dilution	NA
Total Amount Extracted	20.4 g	Extracted	08/28/2019 15:05
ICAL ID	F190827	Analyzed	08/30/2019 18:29
CCal Filename	F190830A_09	Injected By	JRH
Method Blank ID	BLANK-73004		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	10	7.5	15.8	103
2,3,7,8-TCDD	10	11	6.7	15.8	110
1,2,3,7,8-PeCDF	50	53	40.0	67.0	107
2,3,4,7,8-PeCDF	50	56	34.0	80.0	112
1,2,3,7,8-PeCDD	50	50	35.0	71.0	100
1,2,3,4,7,8-HxCDF	50	59	36.0	67.0	119
1,2,3,6,7,8-HxCDF	50	54	42.0	65.0	108
2,3,4,6,7,8-HxCDF	50	53	35.0	78.0	106
1,2,3,7,8,9-HxCDF	50	52	39.0	65.0	104
1,2,3,4,7,8-HxCDD	50	57	35.0	82.0	115
1,2,3,6,7,8-HxCDD	50	59	38.0	67.0	117
1,2,3,7,8,9-HxCDD	50	60	32.0	81.0	120
1,2,3,4,6,7,8-HpCDF	50	54	41.0	61.0	109
1,2,3,4,7,8,9-HpCDF	50	51	39.0	69.0	103
1,2,3,4,6,7,8-HpCDD	50	52	35.0	70.0	104
OCDF	100	110	63.0	170.0	115
OCDD	100	110	78.0	144.0	113
2,3,7,8-TCDD-37CI4	10	8.7	3.1	19.1	87
2,3,7,8-TCDF-13C	100	83	22.0	152.0	83
2,3,7,8-TCDD-13C	100	84	20.0	175.0	84
1,2,3,7,8-PeCDF-13C	100	83	21.0	192.0	83
2,3,4,7,8-PeCDF-13C	100	82	13.0	328.0	82
1,2,3,7,8-PeCDD-13C	100	85	21.0	227.0	85
1,2,3,4,7,8-HxCDF-13C	100	82	19.0	202.0	82
1,2,3,6,7,8-HxCDF-13C	100	90	21.0	159.0	90
2,3,4,6,7,8-HxCDF-13C	100	87	22.0	176.0	87
1,2,3,7,8,9-HxCDF-13C	100	89	17.0	205.0	89
1,2,3,4,7,8-HxCDD-13C	100	75	21.0	193.0	75
1,2,3,6,7,8-HxCDD-13C	100	77	25.0	163.0	77
1,2,3,4,6,7,8-HpCDF-13C	100	88	21.0	158.0	88
1,2,3,4,7,8,9-HpCDF-13C	100	91	20.0	186.0	91
1,2,3,4,6,7,8-HpCDD-13C	100	94	26.0	166.0	94
OCDD-13C	200	170	26.0	397.0	86

Cs = Concentration Spiked (ng/mL)  
 Cr = Concentration Recovered (ng/mL)  
 Rec. = Recovery (Expressed as Percent)  
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision  
 R = Recovery outside of control limits  
 Nn = Value obtained from additional analysis  
 \* = See Discussion

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### Method 1613B Laboratory Control Spike Results

Lab Sample ID	LCSD-73008	Matrix	Solid
Filename	F190830B_04	Dilution	NA
Total Amount Extracted	20.1 g	Extracted	08/28/2019 15:05
ICAL ID	F190827	Analyzed	08/30/2019 19:15
CCal Filename	F190830A_09	Injected By	JRH
Method Blank ID	BLANK-73004		

Compound	Cs	Cr	Lower Limit	Upper Limit	% Rec.
2,3,7,8-TCDF	10	11	7.5	15.8	109
2,3,7,8-TCDD	10	11	6.7	15.8	109
1,2,3,7,8-PeCDF	50	52	40.0	67.0	104
2,3,4,7,8-PeCDF	50	55	34.0	80.0	109
1,2,3,7,8-PeCDD	50	48	35.0	71.0	96
1,2,3,4,7,8-HxCDF	50	60	36.0	67.0	119
1,2,3,6,7,8-HxCDF	50	53	42.0	65.0	107
2,3,4,6,7,8-HxCDF	50	52	35.0	78.0	104
1,2,3,7,8,9-HxCDF	50	52	39.0	65.0	103
1,2,3,4,7,8-HxCDD	50	57	35.0	82.0	113
1,2,3,6,7,8-HxCDD	50	58	38.0	67.0	116
1,2,3,7,8,9-HxCDD	50	59	32.0	81.0	119
1,2,3,4,6,7,8-HpCDF	50	55	41.0	61.0	110
1,2,3,4,7,8,9-HpCDF	50	50	39.0	69.0	101
1,2,3,4,6,7,8-HpCDD	50	51	35.0	70.0	102
OCDF	100	120	63.0	170.0	117
OCDD	100	120	78.0	144.0	119
2,3,7,8-TCDD-37Cl4	10	7.7	3.1	19.1	77
2,3,7,8-TCDF-13C	100	74	22.0	152.0	74
2,3,7,8-TCDD-13C	100	80	20.0	175.0	80
1,2,3,7,8-PeCDF-13C	100	75	21.0	192.0	75
2,3,4,7,8-PeCDF-13C	100	77	13.0	328.0	77
1,2,3,7,8-PeCDD-13C	100	83	21.0	227.0	83
1,2,3,4,7,8-HxCDF-13C	100	78	19.0	202.0	78
1,2,3,6,7,8-HxCDF-13C	100	84	21.0	159.0	84
2,3,4,6,7,8-HxCDF-13C	100	80	22.0	176.0	80
1,2,3,7,8,9-HxCDF-13C	100	79	17.0	205.0	79
1,2,3,4,7,8-HxCDD-13C	100	73	21.0	193.0	73
1,2,3,6,7,8-HxCDD-13C	100	71	25.0	163.0	71
1,2,3,4,6,7,8-HpCDF-13C	100	84	21.0	158.0	84
1,2,3,4,7,8,9-HpCDF-13C	100	89	20.0	186.0	89
1,2,3,4,6,7,8-HpCDD-13C	100	92	26.0	166.0	92
OCDD-13C	200	150	26.0	397.0	77

Cs = Concentration Spiked (ng/mL)  
 Cr = Concentration Recovered (ng/mL)  
 Rec. = Recovery (Expressed as Percent)  
 Control Limit Reference: Method 1613, Table 6, 10/94 Revision  
 R = Recovery outside of control limits  
 Nn = Value obtained from additional analysis  
 \* = See Discussion

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**Method 1613B**

**Spike Recovery Relative Percent Difference (RPD) Results**

Client TRC-WI

Spike 1 ID LCS-73005  
 Spike 1 Filename F190830B\_03

Spike 2 ID LCSD-73008  
 Spike 2 Filename F190830B\_04

Compound	Spike 1 %REC	Spike 2 %REC	%RPD
2,3,7,8-TCDF	103	109	5.7
2,3,7,8-TCDD	110	109	0.9
1,2,3,7,8-PeCDF	107	104	2.8
2,3,4,7,8-PeCDF	112	109	2.7
1,2,3,7,8-PeCDD	100	96	4.1
1,2,3,4,7,8-HxCDF	119	119	0.0
1,2,3,6,7,8-HxCDF	108	107	0.9
2,3,4,6,7,8-HxCDF	106	104	1.9
1,2,3,7,8,9-HxCDF	104	103	1.0
1,2,3,4,7,8-HxCDD	115	113	1.8
1,2,3,6,7,8-HxCDD	117	116	0.9
1,2,3,7,8,9-HxCDD	120	119	0.8
1,2,3,4,6,7,8-HpCDF	109	110	0.9
1,2,3,4,7,8,9-HpCDF	103	101	2.0
1,2,3,4,6,7,8-HpCDD	104	102	1.9
OCDF	115	117	1.7
OCDD	113	119	5.2

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

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### Method 1613B Spiked Sample Report

Client - TRC-WI

Client's Sample ID	N3-1-MS	Matrix	Solid
Lab Sample ID	10487441017-MS	Dilution	NA
Filename	Y190830A_16	Extracted	08/28/2019 15:05
Total Amount Extracted	11.0 g	Analyzed	08/30/2019 20:19
ICAL ID	Y190827	Injected By	ZMS
CCal Filename(s)	Y190830A_02		
Method Blank ID	BLANK-72988		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.20	0.21	104	2,3,7,8-TCDF-13C	2.00	83
Total TCDF				2,3,7,8-TCDD-13C	2.00	82
				1,2,3,7,8-PeCDF-13C	2.00	86
2,3,7,8-TCDD	0.20	0.22	108	2,3,4,7,8-PeCDF-13C	2.00	86
Total TCDD				1,2,3,7,8-PeCDD-13C	2.00	91
				1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	1.00	0.96	96	1,2,3,6,7,8-HxCDF-13C	2.00	82
2,3,4,7,8-PeCDF	1.00	1.01	101	2,3,4,6,7,8-HxCDF-13C	2.00	81
Total PeCDF				1,2,3,7,8,9-HxCDF-13C	2.00	85
				1,2,3,4,7,8-HxCDD-13C	2.00	80
1,2,3,7,8-PeCDD	1.00	0.93	93	1,2,3,6,7,8-HxCDD-13C	2.00	72
Total PeCDD				1,2,3,4,6,7,8-HpCDF-13C	2.00	73
				1,2,3,4,7,8,9-HpCDF-13C	2.00	71
1,2,3,4,7,8-HxCDF	1.00	1.08	108	1,2,3,4,6,7,8-HpCDD-13C	2.00	71
1,2,3,6,7,8-HxCDF	1.00	1.03	103	OCDD-13C	4.00	63
2,3,4,6,7,8-HxCDF	1.00	1.04	104			
1,2,3,7,8,9-HxCDF	1.00	0.97	97	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF				1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.00	1.09	109	2,3,7,8-TCDD-37Cl4	0.20	75 R
1,2,3,6,7,8-HxCDD	1.00	1.12	112			
1,2,3,7,8,9-HxCDD	1.00	1.04	104			
Total HxCDD						
1,2,3,4,6,7,8-HpCDF	1.00	1.43	143			
1,2,3,4,7,8,9-HpCDF	1.00	1.04	104			
Total HpCDF						
1,2,3,4,6,7,8-HpCDD	1.00	1.51	151			
Total HpCDD						
OCDF	2.00	2.43	122			
OCDD	2.00	4.73	237			

Qs = Quantity Spiked                      Qm = Quantity Measured                      Rec. = Recovery (Expressed as Percent)

%REC = Percent Recovered

RPD = The difference between the two values divided by the mean value

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### Method 1613B Spiked Sample Report

Client - TRC-WI

Client's Sample ID	N3-1-MSD	Matrix	Solid
Lab Sample ID	10487441017-MSD	Dilution	NA
Filename	Y190830A_17	Extracted	08/28/2019 15:05
Total Amount Extracted	11.0 g	Analyzed	08/30/2019 21:05
ICAL ID	Y190827	Injected By	ZMS
CCal Filename(s)	Y190830A_02		
Method Blank ID	BLANK-72988		

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.20	0.19	93	2,3,7,8-TCDF-13C	2.00	85
Total TCDF				2,3,7,8-TCDD-13C	2.00	81
				1,2,3,7,8-PeCDF-13C	2.00	91
2,3,7,8-TCDD	0.20	0.21	105	2,3,4,7,8-PeCDF-13C	2.00	87
Total TCDD				1,2,3,7,8-PeCDD-13C	2.00	93
				1,2,3,4,7,8-HxCDF-13C	2.00	81
1,2,3,7,8-PeCDF	1.00	0.96	96	1,2,3,6,7,8-HxCDF-13C	2.00	81
2,3,4,7,8-PeCDF	1.00	1.01	101	2,3,4,6,7,8-HxCDF-13C	2.00	81
Total PeCDF				1,2,3,7,8,9-HxCDF-13C	2.00	83
				1,2,3,4,7,8-HxCDD-13C	2.00	78
1,2,3,7,8-PeCDD	1.00	0.93	93	1,2,3,6,7,8-HxCDD-13C	2.00	74
Total PeCDD				1,2,3,4,6,7,8-HpCDF-13C	2.00	73
				1,2,3,4,7,8,9-HpCDF-13C	2.00	69
1,2,3,4,7,8-HxCDF	1.00	1.08	108	1,2,3,4,6,7,8-HpCDD-13C	2.00	71
1,2,3,6,7,8-HxCDF	1.00	1.04	104	OCDD-13C	4.00	59
2,3,4,6,7,8-HxCDF	1.00	1.02	102			
1,2,3,7,8,9-HxCDF	1.00	0.99	99	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF				1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.00	1.08	108	2,3,7,8-TCDD-37Cl4	0.20	75 R
1,2,3,6,7,8-HxCDD	1.00	1.15	115			
1,2,3,7,8,9-HxCDD	1.00	1.06	106			
Total HxCDD						
1,2,3,4,6,7,8-HpCDF	1.00	1.43	143			
1,2,3,4,7,8,9-HpCDF	1.00	1.02	102			
Total HpCDF						
1,2,3,4,6,7,8-HpCDD	1.00	1.54	154			
Total HpCDD						
OCDF	2.00	2.66	133			
OCDD	2.00	5.01	250			

Qs = Quantity Spiked                      Qm = Quantity Measured                      Rec. = Recovery (Expressed as Percent)  
 %REC = Percent Recovered  
 RPD = The difference between the two values divided by the mean value

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### Method 1613 Spike Sample Results

Client - TRC-WI

Client Sample ID	N3-1			<u>Dry Weights</u>	
Lab Sample ID	10487441017	Sample Filename	Y190830A_13	Sample Amount	10.1 g
MS ID	10487441017-MS	MS Filename	Y190830A_16	MS Amount	10.1 g
MSD ID	10487441017-MSD	MSD Filename	Y190830A_17	MSD Amount	10.1 g

Analyte	Sample Conc. ng/Kg	MS/MSD Qs (ng)	MS Qm (ng)	MSD Qm (ng)	RPD	Background Subtracted		
						MS % Rec.	MSD % Rec.	RPD
2,3,7,8-TCDF	0.446	0.20	0.21	0.19	12.0	102	90	12.2
2,3,7,8-TCDD	0.000	0.20	0.22	0.21	2.8	108	105	2.8
1,2,3,7,8-PeCDF	1.183	1.00	0.96	0.96	0.5	95	95	0.5
2,3,4,7,8-PeCDF	2.182	1.00	1.01	1.01	0.7	99	99	0.7
1,2,3,7,8-PeCDD	0.827	1.00	0.93	0.93	0.3	93	92	0.3
1,2,3,4,7,8-HxCDF	5.293	1.00	1.08	1.08	0.6	103	102	0.7
1,2,3,6,7,8-HxCDF	4.252	1.00	1.03	1.04	1.7	98	100	1.8
2,3,4,6,7,8-HxCDF	6.105	1.00	1.04	1.02	1.8	97	96	1.9
1,2,3,7,8,9-HxCDF	1.925	1.00	0.97	0.99	1.8	95	97	1.9
1,2,3,4,7,8-HxCDD	0.000	1.00	1.09	1.08	0.5	107	107	0.5
1,2,3,6,7,8-HxCDD	4.433	1.00	1.12	1.15	2.5	108	110	2.6
1,2,3,7,8,9-HxCDD	3.041	1.00	1.04	1.06	1.8	101	103	1.9
1,2,3,4,6,7,8-HpCDF	43.724	1.00	1.43	1.43	0.2	99	99	0.2
1,2,3,4,7,8,9-HpCDF	3.838	1.00	1.04	1.02	1.9	100	99	1.9
1,2,3,4,6,7,8-HpCDD	57.861	1.00	1.51	1.54	2.4	92	96	3.9
OCDF	49.814	2.00	2.43	2.66	9.0	96	108	11.3
OCDD	316.107	2.00	4.73	5.01	5.7	76	90	16.9

#### Definitions

MS = Matrix Spike	CDD = Chlorinated dibenzo-p-dioxin
MSD = Matrix Spike Duplicate	CDF = Chlorinated dibenzo-p-furan
Qm = Quantity Measured	T = Tetra
Qs = Quantity Spiked	Pe = Penta
% Rec. = Percent Recovery	Hx = Hexa
RPD = Relative Percent Difference	Hp = Hepta
NA = Not Applicable	O = Octa
NC = Not Calculated	