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REPORT OF: CHEMICAL ANALYSES

Pace Analytical Services, Inc.
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PROJECT: **PCDD/PCDF ANALYSES** **DATE:** January 9, 2002

ISSUED TO: ATC Associates
Attn: Mr. Jim Cohn
104 East 25th Street, 10th Floor
New York, NY 10010

REPORT NO:01-1052540

INTRODUCTION

This report presents the results from the analyses performed on eleven samples which were submitted by a representative of ATC Associates. The samples were analyzed for the presence or absence of polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs) using a modified version of USEPA Method 8290 as described below.

SAMPLE IDENTIFICATION

Client ID	Sample Type	Date Received	Pace ID
ATC-1220-89M-DX1	Wipe	12/21/01	103233896
ATC-1220-89M-DX2	Wipe	12/21/01	103233904
ATC-1220-89M-DX3	Wipe	12/21/01	103233912
ATC-1220-89M-DX4	Wipe	12/21/01	103233920
ATC-1220-89M-DX5	Wipe	12/21/01	103233938
ATC-1220-89M-DX6	Wipe	12/21/01	103233946
ATC-1220-89M-DX7	Wipe	12/21/01	103233953
ATC-1220-89M-DX8	Wipe	12/21/01	103233961
ATC-1220-89M-DX9	Wipe	12/21/01	103233979
ATC-1220-89M-DX10	Wipe	12/21/01	103233987
ATC-1220-89M-DX11	Wipe	12/21/01	103122995

METHODOLOGY

Sample Extraction

Each sample was spiked with $^{13}C_{12}$-labeled PCDD/PCDF internal standards (Table 1) and extracted with toluene in a Soxhlet extractor. The extract was quantitatively transferred to a Kuderna-Danish concentrator, concentrated, and solvent exchanged to hexane. The hexane extract was then spiked with 2,3,7,8-TCDD-$^{37}Cl_4$ enrichment efficiency standard (Table 1) and processed through the analyte enrichment procedures described below.

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PCDD/PCDF Analyte Enrichment

The extraction procedure often removes a variety of compounds, in addition to the PCDDs and PCDFs, from the sample matrix. Some of these compounds can directly interfere with the analyses while others can overload the capillary column causing degradation in chromatographic resolution or sensitivity. The analyte enrichment steps described below are used to remove interferences from the extracts.

Each extract was diluted to 100 mL with hexane, transferred to a separatory funnel, and washed with 1N sodium hydroxide, concentrated sulfuric acid, and aqueous sodium chloride (5% w/v) as needed. The hexane extract was quantitatively transferred to a liquid chromatography column containing alternating layers of silica gel, 40% concentrated sulfuric acid on silica gel, and 33% 1 N sodium hydroxide on silica gel. The column was eluted with 90 mL of hexane and the entire eluate was collected and concentrated, under ambient conditions, to a volume of 1 mL.

Each extract was then fractionated on a liquid chromatography column containing 4 g of activated alumina. The column was eluted with 20 mL of hexane followed by 15 mL of 60% methylene chloride/hexane. The 60% methylene chloride/hexane fraction was concentrated to 1 mL under a stream of dry nitrogen and applied to the top of a chromatography column containing 1 g of 5% AX-21 activated carbon in silica gel. The column was eluted with two 2-mL portions of hexane, 2 mL of cyclohexane/methylene chloride (50:50 v/v) and cyclohexane/methanol/toluene (75:20:5 v/v) in the forward direction, and then with toluene in the reverse direction. The toluene fraction was collected, concentrated, spiked with recovery standards (1,2,3,4-TCDD-$^{13}C_{12}$ and 1,2,3,7,8,9-HxCDD-$^{13}C_{12}$) and taken to a final volume of 20 uL.

PCDD/PCDF Analyses

Each sample extract was analyzed for the presence of PCDDs and PCDFs using combined capillary column gas chromatography/high resolution mass spectrometry (HRGC/HRMS). The instrumentation consisted of a Hewlett Packard Model 6890 gas chromatograph interfaced to a Micromass Ultima high-resolution mass spectrometer. The capillary column was interfaced directly into the ion source of the mass spectrometer, thus providing the highest possible sensitivity while minimizing degradation of the chromatographic resolution.

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PCDD/PCDF Analyses (Cont.)

The mass spectrometer was operated in the electron impact ionization mode at a mass resolution of 10,000-11,000 (M/ΔM, 10 percent valley definition). This resolution is sufficient to resolve most interferences, such as PCBs, thus providing the highest level of confidence that the detected levels of PCDD/PCDF were not false positives resulting from interferences. Typical operating parameters for the HRGC/HRMS analyses are summarized in Table 2.

The data were acquired by selected-ion-recording (SIR) using groups of ion masses similar to those described in USEPA Method 8290. The five groups corresponded to the tetrachlorinated through octachlorinated congener classes. Each group contained two ion masses for the PCDDs, two ion masses for the PCDFs, the corresponding ion masses from the two isotopically labeled internal standards, and the ion mass characteristic of the polychlorinated diphenylether (PCDE) which, if present, could cause false responses in the dibenzofuran channels.

Each group of ion masses also contained a lock mass which was used by the data system to automatically correct the mass focus of the instrument. The data system determined the centroid of the lock mass during each data acquisition cycle and corrected the mass focus of the analyte and internal standard ion masses to assure that the centers of the mass peaks were being monitored.

The criteria used to judge positive responses for a PCDD/PCDF isomer included:

* Simultaneous response at both ion masses of the PCDD or PCDF
* Signal-to-noise ratio equal to or greater than 2.5:1.0 for both ion masses
* Chlorine isotope ratio within 15% of the theoretical value
* Chromatographic retention time within +/- 2 seconds of the expected retention time
* Chromatographic retention times within elution windows determined from analyses of standard mixtures
* Absence of simultaneous response in the PCDF and PCDPE ion traces

A list of the exact ion masses monitored for the determination of PCDD/PCDF isomers and the PCDE interferences is presented in Table 3. Also included are the theoretical chlorine isotope ratios for the ten congener classes.

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PCDD/PCDF Quantification and Calculations

The PCDD/PCDF isomers were quantified by comparison of their responses to the responses of the labeled internal standards. Relative response factors were calculated from analyses of standard mixtures containing representatives of each of the PCDD/PCDF congener classes at five concentration levels, and each of the internal standards at one concentration level, as shown in Table 4. The PCDD/PCDF response factors were calculated by comparing the sum of the responses from the two ion masses monitored for each chlorine congener class to the sum of the responses from the two ion masses of the corresponding isotopically labeled internal standard. The formula for the response factor calculation is:

$$Rf = \frac{An \times Qis}{Ais \times Qn}$$

where:

Rf = Response factor
An = Sum of integrated areas for native isomer
Qis = Quantity of labeled internal standard
Ais = Sum of integrated areas for labeled internal standard
Qn = Quantity of native isomer

The levels of PCDD/PCDF in each sample were quantified using the following equation:

$$C = \frac{An \times Qis}{Ais \times W \times Rf}$$

where:

C = Concentration of target isomer or congener class
An = Sum of integrated areas for the target isomer or congener class
Qis = Quantity of labeled internal standard added to the sample
Ais = Sum of integrated areas for the labeled internal standard
W = Sample amount
Rf = Response factor

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PCDD/PCDF Quantification and Calculations (Cont.)

Each pair of ion mass peaks in the selected-ion-current chromatograms was evaluated manually to determine if it met the criteria for a PCDD or PCDF isomer. Areas of all peaks exhibiting correct ion ratios, having retention times within the correct windows, and having areas corresponding to concentrations in the range covered by the initial calibration were then summed for calculations of total congener concentrations. The toxic equivalence of each sample was calculated using the factors listed in Table 5.

A limit of detection (LOD) based on producing a signal that is 2.5 times the noise level, was calculated for each undetected 2,3,7,8-substituted isomer of any tetra through octa chlorinated congener class. The noise heights used to calculate the detection limits were measured at the retention time of the specific isomer. The formula used for calculating the LOD is:

$$LOD = \frac{Hn \times Qis \times 2.5}{His \times W \times Rf}$$

where:

LOD = Single isomer limit of detection
Hn = Sum of noise heights at native isomer retention time
Qis = Quantity of labeled internal standard
His = Sum of peak heights for labeled internal standard
W = Sample amount
Rf = Response factor

The recovery of the 2,3,7,8-TCDD-$^{37}Cl_4$ enrichment efficiency standard and each $^{13}C_{12}$-labeled internal standard, relative to either 1,2,3,4-TCDD-$^{13}C_{12}$ or 1,2,3,7,8,9-HxCDD-$^{13}C_{12}$, was calculated using the following equation:

$$\%R = \frac{Ais \times Qrs \times 100\%}{Rfr \times Ars \times Qis}$$

where:

%R = Percent recovery of labeled internal standard
Ais = Sum of integrated areas of labeled internal standard
Qrs = Quantity of recovery standard
Ars = Sum of integrated areas of recovery standard
Rfr = Response factor of the specific labeled internal standard relative to the recovery standard
Qis = Quantity of the labeled internal standard congener added to the sample

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Quality Control for PCDD/PCDF Analyses

The performance of the sample processing steps and the instrumentation are monitored on a routine basis. The procedures and criteria are summarized below.

One method blank and one laboratory spike sample are typically prepared with each ten samples of any given matrix. Recoveries of the native PCDD/PCDF analytes in the laboratory spike samples generally range from 70 to 130%. Recoveries of selected analytes outside this range do not invalidate the data but provide information, which is used by the laboratory to monitor recovery trends and to assure optimization of the method.

Internal standards are spiked into each sample prior to extraction in order to monitor the level of recovery, which is achieved for each individual sample. Acceptable recoveries range from 40 to 135 percent for the internal standards unless a deviation is due to variation in instrument response as a result of analytical interferences.

The resolution of the mass spectrometer is verified prior to each analysis to be 10,000 or greater. Hardcopies of the reference peaks are printed at the beginning and end of each analysis day. The resolving power of the DB-5MS chromatographic column is checked daily by analyzing a standard solution containing 2,3,7,8-TCDD and the adjacent TCDD isomers. The DB-225 column resolution is checked daily by analyzing a standard solution containing 2,3,7,8-TCDF and the adjacent TCDF isomers. Acceptable performance is achieved when 2,3,7,8-TCDD or 2,3,7,8-TCDF is resolved from the adjacent isomers by a valley of 25% or less. The group times for the selected-ion-monitoring data acquisitions are also checked daily by analyzing the column performance mix which has been modified to contain the first and last eluting isomers of each congener class. In this way one is assured of collecting data representative of the total PCDD/PCDF content and that the 2,3,7,8-substituted isomers are suitably resolved.

Initial calibrations are generated by analyzing standard solutions (see Table 4) containing target native and labeled PCDD/PCDF compounds. Response factors are calculated and averaged for each compound. These averages are used for quantification and for comparison to the daily continuing calibration. The relative standard deviation for each native compound must be 20% or less (30% or less for the labeled compounds) as specified in Method 8290. A continuing calibration standard is analyzed at the beginning and end of each 12-hour shift on days when initial calibrations are not performed. The initial calibration is considered to be valid when the response factors from the continuing calibration analysis fall to within the ranges specified in Method 8290.

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RESULTS

The results from the analyses are presented in the following:

Appendix A - Documentation
Appendix B - PCDD/PCDF Analysis Results

DISCUSSION

The recoveries of the isotopically-labeled PCDD/PCDF internal standards in the sample extracts ranged from 56-125% and indicate a level of efficiency through the extraction and enrichment steps that is considered typical for this matrix. All of the internal standard recoveries for the field samples were within the target limits for this method. Also, since the quantifications of the native 2,3,7,8-substituted isomers were based on isotope dilution, the data were automatically corrected for variation in recovery and accurate values were obtained.

A laboratory method blank was prepared and analyzed with the sample batch as part of our routine quality control procedures. The results, found at the beginning of Appendix B, show the blank to be free of PCDDs and PCDFs. This suggests that the sample processing steps did not impact the results of the analyses.

A laboratory spike sample was also prepared with the sample batch by extracting a clean wipe that had been fortified with native standard materials. The results, found at the end of Appendix B, show that the spiked native compounds were recovered at 108-115%. This indicates a high degree of accuracy for these determinations.

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REMARKS

The sample extracts will be retained for a period of 30 days from the date of this report and then discarded unless other arrangements are made. The raw mass spectral data will be archived on magnetic tape for a period of not less than one year. Questions regarding the data contained in this report may be directed to the authors at the numbers provided below.

Pace Analytical Services, Inc.

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TABLE 1. Spike Levels of PCDD/PCDF Standards

Internal Standards	Spike Level (ng)
2,3,7,8-TCDF-$^{13}C_{12}$	2.0
2,3,7,8-TCDD-$^{13}C_{12}$	2.0
1,2,3,7,8-PeCDF-$^{13}C_{12}$	2.0
2,3,4,7,8-PeCDF-$^{13}C_{12}$	2.0
1,2,3,7,8-PeCDD-$^{13}C_{12}$	2.0
1,2,3,4,7,8-HxCDF-$^{13}C_{12}$	2.0
1,2,3,6,7,8-HxCDF-$^{13}C_{12}$	2.0
1,2,3,7,8,9-HxCDF-$^{13}C_{12}$	2.0
2,3,4,6,7,8-HxCDF-$^{13}C_{12}$	2.0
1,2,3,4,7,8-HxCDD-$^{13}C_{12}$	2.0
1,2,3,6,7,8-HxCDD-$^{13}C_{12}$	2.0
1,2,3,4,6,7,8-HpCDF-$^{13}C_{12}$	2.0
1,2,3,4,7,8,9-HpCDF-$^{13}C_{12}$	2.0
1,2,3,4,6,7,8-HpCDD-$^{13}C_{12}$	2.0
OCDD-$^{13}C_{12}$	4.0
Recovery Standards	
1,2,3,4-TCDD-$^{13}C_{12}$	2.0
1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	2.0
Enrichment Efficiency Standard	
2,3,7,8-TCDD-$^{37}Cl_4$	0.2

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TABLE 2. High Resolution PCDD/PCDF Analyses
HRGC/HRMS Operating Parameters

Mass Resolution	10,000-11,000 (M/ΔM, 10% valley)
Electron Energy	32 electron volts
Accelerating Voltage	8,000 volts
Source Temperature	275°C
Preamplifier Gain	10^{-6} amp/volt
Multiplier Gain	~10^{5}
Chromatographic Column	60 M DB-5MS
Transfer Line Temperature	260°C
Injection Mode	Splitless
Carrier Gas	Helium
Carrier Flow Velocity	~30 cm/sec

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TABLE 3. Exact Ion Masses Monitored for the Determination of PCDDs, PCDFs, and PCDEs

Compound	Accurate Mass Mass 1	Mass 2	Theoretical Ratio Mass 1/Mass 2
Tetra-CDDs	319.8965	321.8936	0.77
Tetra-CDFs	303.9016	305.8987	0.77
Hexa-CDPEs	375.8364		
Penta-CDDs	355.8546	357.8517	1.54
Penta-CDFs	339.8597	341.8567	1.54
Hepta-CDPEs	409.7974		
Hexa-CDDs	389.8156	391.8127	1.23
Hexa-CDFs	373.8207	375.8178	1.23
Octa-CDPEs	445.7555		
Hepta-CDDs	423.7766	425.7737	1.03
Hepta-CDFs	407.7817	409.7788	1.03
Nona-CDPEs	479.7165		
Octa-CDD	457.7377	459.7347	0.88
Octa-CDF	441.7428	443.7398	0.88
Deca-CDPE	513.6775		

CDDs = Chlorinated Dibenzo-p-dioxins
CDFs = Chlorinated Dibenzofurans
CDPEs = Chlorinated Diphenylethers

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TABLE 4. High Resolution Calibration Solutions

	Concentration (pg/uL)				
Native CDDs/CDFs	**CS1**	**CS2**	**CS3**	**CS4**	**CS5**
2,3,7,8-TCDD	0.5	2	10	40	200
2,3,7,8 TCDF	0.5	2	10	40	200
1,2,3,7,8-PeCDD	2.5	10	50	200	1000
1,2,3,7,8-PeCDF	2.5	10	50	200	1000
2,3,4,7,8-PeCDF	2.5	10	50	200	1000
1,2,3,4,7,8-HxCDD	2.5	10	50	200	1000
1,2,3,6,7,8-HxCDD	2.5	10	50	200	1000
1,2,3,7,8,9-HxCDD	2.5	10	50	200	1000
1,2,3,4,7,8-HxCDF	2.5	10	50	200	1000
1,2,3,6,7,8-HxCDF	2.5	10	50	200	1000
1,2,3,7,8,9-HxCDF	2.5	10	50	200	1000
2,3,4,6,7,8-HxCDF	2.5	10	50	200	1000
1,2,3,4,6,7,8-HpCDD	2.5	10	50	200	1000
1,2,3,4,6,7,8-HpCDF	2.5	10	50	200	1000
1,2,3,4,7,8,9-HpCDF	2.5	10	50	200	1000
OCDD	5.0	20	100	400	2000
OCDF	5.0	20	100	400	2000
Internal Standards					
2,3,7,8-TCDD-$^{13}C_{12}$	100	100	100	100	100
2,3,7,8-TCDF-$^{13}C_{12}$	100	100	100	100	100
1,2,3,7,8-PeCDD-$^{13}C_{12}$	100	100	100	100	100
1,2,3,7,8-PeCDF-$^{13}C_{12}$	100	100	100	100	100
2,3,4,7,8-PeCDF-$^{13}C_{12}$	100	100	100	100	100
1,2,3,4,7,8-HxCDD-$^{13}C_{12}$	100	100	100	100	100
1,2,3,6,7,8-HxCDD-$^{13}C_{12}$	100	100	100	100	100
1,2,3,4,7,8-HxCDF-$^{13}C_{12}$	100	100	100	100	100
1,2,3,6,7,8-HxCDF-$^{13}C_{12}$	100	100	100	100	100
1,2,3,7,8,9-HxCDF-$^{13}C_{12}$	100	100	100	100	100
2,3,4,6,7,8-HxCDF-$^{13}C_{12}$	100	100	100	100	100
1,2,3,4,6,7,8-HpCDD-$^{13}C_{12}$	100	100	100	100	100
1,2,3,4,6,7,8-HpCDF-$^{13}C_{12}$	100	100	100	100	100
1,2,3,4,7,8,9-HpCDF-$^{13}C_{12}$	100	100	100	100	100
OCDD-$^{13}C_{12}$	200	200	200	200	200
Recovery Standards					
1,2,3,4-TCDD-$^{13}C_{12}$	100	100	100	100	100
1,2,3,7,8,9-HxCDD-$^{13}C_{12}$	100	100	100	100	100
Enrichment Efficiency Standard					
2,3,7,8-TCDD-$^{37}C1_4$	0.5	2	10	40	200

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TABLE 5. 2,3,7,8-TCDD Equivalency Factors (TEFs) for the Polychlorinated Dibenzo-p-dioxins and Dibenzofurans

Number	Compound(s)	TEF
1	2,3,7,8-TCDD	1.00
2	1,2,3,7,8-PeCDD	0.50
3	1,2,3,6,7,8-HxCDD	0.1
4	1,2,3,7,8,9-HxCDD	0.1
5	1,2,3,4,7,8-HxCDD	0.1
6	1,2,3,4,6,7,8-HpCDD	0.01
7	OCDD	0.001
8	* Total - TCDD	0.0
9	* Total - PeCDD	0.0
10	* Total - HxCDD	0.0
11	* Total - HpCDD	0.0
12	2,3,7,8-TCDF	0.10
13	1,2,3,7,8-PeCDF	0.05
14	2,3,4,7,8-PeCDF	0.5
15	1,2,3,6,7,8-HxCDF	0.1
16	1,2,3,7,8,9-HxCDF	0.1
17	1,2,3,4,7,8-HxCDF	0.1
18	2,3,4,6,7,8-HxCDF	0.1
19	1,2,3,4,6,7,8-HpCDF	0.01
20	1,2,3,4,7,8,9-HpCDF	0.01
21	OCDF	0.001
22	* Total - TCDF	0.0
23	* Total - PeCDF	0.0
24	* Total - HxCDF	0.0
25	* Total - HpCDF	0.0

*Excluding the 2,3,7,8-substituted congeners.

Reference: 1989 ITEFs

REPORT OF LABORATORY ANALYSIS

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SUBJECT TO PROTECTIVE ORDER NO. 2, SEPT. 2008

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Appendix A

REPORT OF LABORATORY ANALYSIS

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CHAIN-OF-CUSTODY / Analytical Request Document

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

611676

Page: 1 of 1

To Be Completed by Pace Analytical and Client

Section A — Required Client Information:

Company: ATC Associates Inc
Address: 104 E 25th street 10th floor
Phone: 212-353-8280 Fax: 212-353-8306

Section B — Required Client Information:

Report To: James Cohn
Copy To:
Invoice to:
P.O.
Project Name: PS 89 M
Project Number: 19125-0297

Client Information (Check quote/contract):
Requested Due Date: *TAT:

* Turn around times less than 14 days subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge.
Turn Around Time (TAT) in calendar days.

Section C

Quote Reference:
Project Manager: SCV
Project #: 1052540
Profile #: 9353

Section D — Required Client Information:

SAMPLE ID
One character per box.
(A–Z, 0–9 / .–)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

Requested Analysis: Dioxin

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED (mm/dd/yy)	TIME COLLECTED (hh:mm a/p)	# Containers	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Remarks / Lab ID
1	ATC-1220-89M-DX1	WP	12/20/01	area 1 m²		✓								Room 501 (Table) 3233896
2	ATC-1220-89M-DX2			1 m²		✓								517 Library (Table) 904
3	ATC-1220-89M-DX3			1 m²		✓								Room 526 (floor) 912
4	ATC-1220-89M-DX4			1 m²		✓								3rd floor Gym (floor) 920
5	ATC-1220-89M-DX5			1 m²		✓								Room 310 EAST (floor) 938
6	ATC-1220-89M-DX6			1 m²		✓								(floor) 2nd floor Hallway South 946
7	ATC-1220-89M-DX7			1 m²		✓								Auditorium (floor) 953
8	ATC-1220-89M-DX8			1 m²		✓								Cafeteria (floor) 961
9	ATC-1220-89M-DX9			1 m²		✓								Main Entrance Lobby Walnut street 979
10	ATC-1220-89M-DX10			1 m²		✓								Room 228 North 987
11	ATC-1220-89M-DX11			Blank		✓								Blank 995
12														

SHIPMENT METHOD	AIRBILL NO.	SHIPPING DATE	NO. OF COOLERS
Fed-ex			

ITEM NUMBER	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
				[signature]	12/21	1100

SAMPLE CONDITION

Temp in °C	18
Received on Ice	Y (N)
Sealed Cooler	Y (N)
Samples Intact	(Y) N

SAMPLE NOTES

Additional Comments:

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: WAGDI
SIGNATURE of SAMPLER: [signature] DATE Signed: (MM / DD / YY) 12/20/01

ORIGINAL

SEE REVERSE SIDE FOR INSTRUCTIONS

Form COC01 Rev 0601

NYC 9/11 Public Portal Document

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Appendix B

REPORT OF LABORATORY ANALYSIS

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Fax: 612-607-6444

Method 8290 Blank Analysis Results

Client - ATC

Lab Sample ID	BLANK-1389	Matrix	WIPE
Filename	F20103A_06	Dilution	NA
Total Amount Extracted	1 m2	Extracted	12/23/2001
ICAL Date	01/02/2002	Analyzed	01/03/2002 12:02
CCal Filename(s)	F20102A_22 & F20103B_01	Injected By	LMD

Native Isomers	Conc ng/m2	EMPC ng/m2	LRL ng/m2	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.00200	2,3,7,8-TCDF-13C	2.00	75
Total TCDF	ND	-----	0.00200	2,3,7,8-TCDD-13C	2.00	73
				1,2,3,7,8-PeCDF-13C	2.00	81
2,3,7,8-TCDD	ND	-----	0.00200	2,3,4,7,8-PeCDF-13C	2.00	80
Total TCDD	ND	-----	0.00200	1,2,3,7,8-PeCDD-13C	2.00	83
				1,2,3,4,7,8-HxCDF-13C	2.00	89
1,2,3,7,8-PeCDF	ND	-----	0.01000	1,2,3,6,7,8-HxCDF-13C	2.00	77
2,3,4,7,8-PeCDF	ND	-----	0.01000	2,3,4,6,7,8-HxCDF-13C	2.00	85
Total PeCDF	ND	-----	0.01000	1,2,3,7,8,9-HxCDF-13C	2.00	92
				1,2,3,4,7,8-HxCDD-13C	2.00	111
1,2,3,7,8-PeCDD	ND	-----	0.01000	1,2,3,6,7,8-HxCDD-13C	2.00	77
Total PeCDD	ND	-----	0.01000	1,2,3,4,6,7,8-HpCDF-13C	2.00	95
				1,2,3,4,7,8,9-HpCDF-13C	2.00	95
1,2,3,4,7,8-HxCDF	ND	-----	0.01000	1,2,3,4,6,7,8-HpCDD-13C	2.00	104
1,2,3,6,7,8-HxCDF	ND	-----	0.01000	OCDD-13C	4.00	89
2,3,4,6,7,8-HxCDF	ND	-----	0.01000			
1,2,3,7,8,9-HxCDF	ND	-----	0.01000	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.01000	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.01000	2,3,7,8-TCDD-37Cl4	0.20	76
1,2,3,6,7,8-HxCDD	ND	-----	0.01000			
1,2,3,7,8,9-HxCDD	ND	-----	0.01000			
Total HxCDD	ND	-----	0.01000			
1,2,3,4,6,7,8-HpCDF	ND	-----	0.01000	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.01000	Equivalence: 0.00 ng/m2		
Total HpCDF	ND	-----	0.01000	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	-----	0.01000			
Total HpCDD	ND	-----	0.01000			
OCDF	ND	-----	0.02000			
OCDD	ND	-----	0.02000			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers).
EMPC = Estimated Maximum Possible Concentration
LRL = Lower Reporting Limit
J = Concentration detected is below the calibration range
P = Recovery outside of target range
A = Detection Limit based on signal-to-noise measurement

I = Interference
E = PCDE Interference
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....01-1052540

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
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Method 8290 Analysis Results

Client - ATC

Client's Sample ID	ATC-1220-89M-DX1		
Lab Sample ID	103233896		
Filename	F11228B_03		
Injected By	BAL		
Total Amount Extracted	1 m2	Matrix	WIPE
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	12/20/2001
ICAL Date	11/19/2001	Received	12/21/2001
CCal Filename(s)	F11228B_01 & F11228B_16	Extracted	12/23/2001
Method Blank ID	BLANK-1389	Analyzed	12/28/2001 23:01

Native Isomers	Conc ng/m2	EMPC ng/m2	LRL ng/m2		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.00200		2,3,7,8-TCDF-13C	2.00	62
Total TCDF	0.0034	-----	0.00200	J	2,3,7,8-TCDD-13C	2.00	74
					1,2,3,7,8-PeCDF-13C	2.00	65
2,3,7,8-TCDD	ND	-----	0.00200		2,3,4,7,8-PeCDF-13C	2.00	68
Total TCDD	0.0130	-----	0.00200		1,2,3,7,8-PeCDD-13C	2.00	83
					1,2,3,4,7,8-HxCDF-13C	2.00	73
1,2,3,7,8-PeCDF	ND	-----	0.01000		1,2,3,6,7,8-HxCDF-13C	2.00	78
2,3,4,7,8-PeCDF	ND	-----	0.01000		2,3,4,6,7,8-HxCDF-13C	2.00	76
Total PeCDF	ND	-----	0.01000		1,2,3,7,8,9-HxCDF-13C	2.00	76
					1,2,3,4,7,8-HxCDD-13C	2.00	101
1,2,3,7,8-PeCDD	ND	-----	0.01000		1,2,3,6,7,8-HxCDD-13C	2.00	84
Total PeCDD	0.0760	-----	0.01000		1,2,3,4,6,7,8-HpCDF-13C	2.00	89
					1,2,3,4,7,8,9-HpCDF-13C	2.00	82
1,2,3,4,7,8-HxCDF	ND	-----	0.01000		1,2,3,4,6,7,8-HpCDD-13C	2.00	100
1,2,3,6,7,8-HxCDF	ND	-----	0.01000		OCDD-13C	4.00	68
2,3,4,6,7,8-HxCDF	ND	-----	0.01000				
1,2,3,7,8,9-HxCDF	ND	-----	0.01000		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.0150	-----	0.01000	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.0220	-----	0.01000	J	2,3,7,8-TCDD-37Cl4	0.20	76
1,2,3,6,7,8-HxCDD	ND	-----	0.01000				
1,2,3,7,8,9-HxCDD	ND	-----	0.01000				
Total HxCDD	0.3100	-----	0.01000				
1,2,3,4,6,7,8-HpCDF	0.0250	-----	0.01000	J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.01000		Equivalence: 0.0038 ng/m2		
Total HpCDF	0.0250	-----	0.01000	J	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.1000	-----	0.01000				
Total HpCDD	0.3400	-----	0.01000				
OCDF	0.0280	-----	0.02000	J			
OCDD	0.3600	-----	0.02000				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers)
EMPC = Estimated Maximum Possible Concentration
A = Detection Limit based on signal-to-noise measurement
J = Concentration detected is below the calibration range
B = Less than 10 times higher than method blank level
P = Recovery outside of target range
Nn = Value obtained from additional analysis

LRL = Lower Reporting Limit
I = Interference
E = PCDE Interference
S = Saturated signal
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....01-1052540

REPORT OF LABORATORY ANALYSIS

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Minneapolis, MN 55414

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Fax: 612- 607-6444

Method 8290 Analysis Results

Client - ATC

Client's Sample ID	ATC-1220-89M-DX2		
Lab Sample ID	103233904		
Filename	F11228B_04		
Injected By	BAL		
Total Amount Extracted	1 m2	Matrix	WIPE
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	12/20/2001
ICAL Date	11/19/2001	Received	12/21/2001
CCal Filename(s)	F11228B_01 & F11228B_16	Extracted	12/23/2001
Method Blank ID	BLANK-1389	Analyzed	12/28/2001 23:51

Native Isomers	Conc ng/m2	EMPC ng/m2	LRL ng/m2		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.0028	A	2,3,7,8-TCDF-13C	2.00	61
Total TCDF	ND	-----	0.0020		2,3,7,8-TCDD-13C	2.00	74
					1,2,3,7,8-PeCDF-13C	2.00	65
2,3,7,8-TCDD	ND	-----	0.0021	A	2,3,4,7,8-PeCDF-13C	2.00	66
Total TCDD	0.0043	-----	0.0020	J	1,2,3,7,8-PeCDD-13C	2.00	81
					1,2,3,4,7,8-HxCDF-13C	2.00	73
1,2,3,7,8-PeCDF	ND	-----	0.0100		1,2,3,6,7,8-HxCDF-13C	2.00	77
2,3,4,7,8-PeCDF	ND	-----	0.0100		2,3,4,6,7,8-HxCDF-13C	2.00	74
Total PeCDF	ND	-----	0.0100		1,2,3,7,8,9-HxCDF-13C	2.00	74
					1,2,3,4,7,8-HxCDD-13C	2.00	89
1,2,3,7,8-PeCDD	ND	-----	0.0100		1,2,3,6,7,8-HxCDD-13C	2.00	91
Total PeCDD	ND	-----	0.0100		1,2,3,4,6,7,8-HpCDF-13C	2.00	80
					1,2,3,4,7,8,9-HpCDF-13C	2.00	78
1,2,3,4,7,8-HxCDF	ND	-----	0.0100		1,2,3,4,6,7,8-HpCDD-13C	2.00	94
1,2,3,6,7,8-HxCDF	ND	-----	0.0100		OCDD-13C	4.00	64
2,3,4,6,7,8-HxCDF	ND	-----	0.0100				
1,2,3,7,8,9-HxCDF	ND	-----	0.0100		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.0100		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.0100		2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,6,7,8-HxCDD	ND	-----	0.0100				
1,2,3,7,8,9-HxCDD	ND	-----	0.0100				
Total HxCDD	0.0320	-----	0.0100	J			
1,2,3,4,6,7,8-HpCDF	0.0150	-----	0.0100	J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.0100		Equivalence: 0.00070 ng/m2		
Total HpCDF	0.0150	-----	0.0100	J	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.0340	-----	0.0100	J			
Total HpCDD	0.0670	-----	0.0100	J			
OCDF	ND	-----	0.0200				
OCDD	0.2100	-----	0.0200				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers)
EMPC = Estimated Maximum Possible Concentration
A = Detection Limit based on signal-to-noise measurement
J = Concentration detected is below the calibration range
B = Less than 10 times higher than method blank level
P = Recovery outside of target range
Nn = Value obtained from additional analysis

LRL = Lower Reporting Limit
I = Interference
E = PCDE Interference
S = Saturated signal
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....01-1052540

REPORT OF LABORATORY ANALYSIS

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Method 8290 Analysis Results

Client - ATC

Client's Sample ID	ATC-1220-89M-DX3		
Lab Sample ID	103233912		
Filename	F11228B_05		
Injected By	BAL		
Total Amount Extracted	1 m2	Matrix	WIPE
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	12/20/2001
ICAL Date	11/19/2001	Received	12/21/2001
CCal Filename(s)	F11228B_01 & F11228B_16	Extracted	12/23/2001
Method Blank ID	BLANK-1389	Analyzed	12/29/2001 00:41

Native Isomers	Conc ng/m2	EMPC ng/m2	LRL ng/m2		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.0046	A	2,3,7,8-TCDF-13C	2.00	59
Total TCDF	0.0079	-----	0.0020	J	2,3,7,8-TCDD-13C	2.00	72
					1,2,3,7,8-PeCDF-13C	2.00	60
2,3,7,8-TCDD	ND	-----	0.0020		2,3,4,7,8-PeCDF-13C	2.00	61
Total TCDD	0.0360	-----	0.0020		1,2,3,7,8-PeCDD-13C	2.00	73
					1,2,3,4,7,8-HxCDF-13C	2.00	75
1,2,3,7,8-PeCDF	ND	-----	0.0100		1,2,3,6,7,8-HxCDF-13C	2.00	69
2,3,4,7,8-PeCDF	ND	-----	0.0100		2,3,4,6,7,8-HxCDF-13C	2.00	70
Total PeCDF	ND	-----	0.0100		1,2,3,7,8,9-HxCDF-13C	2.00	72
					1,2,3,4,7,8-HxCDD-13C	2.00	93
1,2,3,7,8-PeCDD	ND	-----	0.0100		1,2,3,6,7,8-HxCDD-13C	2.00	80
Total PeCDD	0.0200	-----	0.0100	J	1,2,3,4,6,7,8-HpCDF-13C	2.00	71
					1,2,3,4,7,8,9-HpCDF-13C	2.00	68
1,2,3,4,7,8-HxCDF	ND	-----	0.0100		1,2,3,4,6,7,8-HpCDD-13C	2.00	82
1,2,3,6,7,8-HxCDF	ND	-----	0.0100		OCDD-13C	4.00	56
2,3,4,6,7,8-HxCDF	ND	-----	0.0100				
1,2,3,7,8,9-HxCDF	ND	-----	0.0100		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.0140	-----	0.0100	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.0100		2,3,7,8-TCDD-37Cl4	0.20	73
1,2,3,6,7,8-HxCDD	ND	-----	0.0100				
1,2,3,7,8,9-HxCDD	ND	-----	0.0100				
Total HxCDD	0.0460	-----	0.0100	J			
1,2,3,4,6,7,8-HpCDF	0.0210	-----	0.0100	J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.0100		Equivalence: 0.0014 ng/m2		
Total HpCDF	0.0210	-----	0.0100	J	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.0610	-----	0.0100				
Total HpCDD	0.1100	-----	0.0100				
OCDF	0.0360	-----	0.0200	J			
OCDD	0.5900	-----	0.0200				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers)
EMPC = Estimated Maximum Possible Concentration
A = Detection Limit based on signal-to-noise measurement
J = Concentration detected is below the calibration range
B = Less than 10 times higher than method blank level
P = Recovery outside of target range
Nn = Value obtained from additional analysis

LRL = Lower Reporting Limit
I = Interference
E = PCDE Interference
S = Saturated signal
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....01-1052540

REPORT OF LABORATORY ANALYSIS

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Pace Analytical™

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Minneapolis, MN 55414

Tel: 612-607-1700
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Method 8290 Analysis Results

Client - ATC

Client's Sample ID	ATC-1220-89M-DX4		
Lab Sample ID	103233920		
Filename	F11228B_06		
Injected By	BAL		
Total Amount Extracted	1 m2	Matrix	WIPE
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	12/20/2001
ICAL Date	11/19/2001	Received	12/21/2001
CCal Filename(s)	F11228B_01 & F11228B_16	Extracted	12/23/2001
Method Blank ID	BLANK-1389	Analyzed	12/29/2001 01:30

Native Isomers	Conc ng/m2	EMPC ng/m2	LRL ng/m2		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.0026	-----	0.00200	J	2,3,7,8-TCDF-13C	2.00	58
Total TCDF	0.0540	-----	0.00200		2,3,7,8-TCDD-13C	2.00	72
					1,2,3,7,8-PeCDF-13C	2.00	59
2,3,7,8-TCDD	ND	-----	0.00200		2,3,4,7,8-PeCDF-13C	2.00	59
Total TCDD	0.0840	-----	0.00200		1,2,3,7,8-PeCDD-13C	2.00	71
					1,2,3,4,7,8-HxCDF-13C	2.00	73
1,2,3,7,8-PeCDF	ND	-----	0.01000		1,2,3,6,7,8-HxCDF-13C	2.00	73
2,3,4,7,8-PeCDF	ND	-----	0.01000		2,3,4,6,7,8-HxCDF-13C	2.00	74
Total PeCDF	0.0220	-----	0.01000	J	1,2,3,7,8,9-HxCDF-13C	2.00	71
					1,2,3,4,7,8-HxCDD-13C	2.00	98
1,2,3,7,8-PeCDD	ND	-----	0.01000		1,2,3,6,7,8-HxCDD-13C	2.00	78
Total PeCDD	0.1000	-----	0.01000		1,2,3,4,6,7,8-HpCDF-13C	2.00	72
					1,2,3,4,7,8,9-HpCDF-13C	2.00	67
1,2,3,4,7,8-HxCDF	ND	-----	0.01000		1,2,3,4,6,7,8-HpCDD-13C	2.00	81
1,2,3,6,7,8-HxCDF	ND	-----	0.01000		OCDD-13C	4.00	56
2,3,4,6,7,8-HxCDF	ND	-----	0.01000				
1,2,3,7,8,9-HxCDF	ND	-----	0.01000		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.0200	-----	0.01000	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.01000		2,3,7,8-TCDD-37Cl4	0.20	75
1,2,3,6,7,8-HxCDD	ND	-----	0.01000				
1,2,3,7,8,9-HxCDD	ND	-----	0.01000				
Total HxCDD	0.1600	-----	0.01000				
1,2,3,4,6,7,8-HpCDF	0.0210	-----	0.01000	J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.01000		Equivalence: 0.0013 ng/m2		
Total HpCDF	0.0210	-----	0.01000	J	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.0480	-----	0.01000	J			
Total HpCDD	0.0890	-----	0.01000	J			
OCDF	0.0230	-----	0.02000	J			
OCDD	0.3100	-----	0.02000				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers)
EMPC = Estimated Maximum Possible Concentration
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B = Less than 10 times higher than method blank level
P = Recovery outside of target range
Nn = Value obtained from additional analysis

LRL = Lower Reporting Limit
I = Interference
E = PCDE Interference
S = Saturated signal
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

Report No.....01-1052540

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Pace Analytical™

Pace Analytical Services, Inc.
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Method 8290 Analysis Results

Client - ATC

Client's Sample ID	ATC-1220-89M-DX5		
Lab Sample ID	103233938		
Filename	F11228B_07		
Injected By	BAL		
Total Amount Extracted	1 m2	Matrix	WIPE
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	12/20/2001
ICAL Date	11/19/2001	Received	12/21/2001
CCal Filename(s)	F11228B_01 & F11228B_16	Extracted	12/23/2001
Method Blank ID	BLANK-1389	Analyzed	12/29/2001 02:20

Native Isomers	Conc ng/m2	EMPC ng/m2	LRL ng/m2		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.0020		2,3,7,8-TCDF-13C	2.00	59
Total TCDF	0.026	-----	0.0020		2,3,7,8-TCDD-13C	2.00	72
					1,2,3,7,8-PeCDF-13C	2.00	58
2,3,7,8-TCDD	ND	-----	0.0020		2,3,4,7,8-PeCDF-13C	2.00	59
Total TCDD	0.047	-----	0.0020		1,2,3,7,8-PeCDD-13C	2.00	71
					1,2,3,4,7,8-HxCDF-13C	2.00	67
1,2,3,7,8-PeCDF	ND	-----	0.0100		1,2,3,6,7,8-HxCDF-13C	2.00	69
2,3,4,7,8-PeCDF	ND	-----	0.0100		2,3,4,6,7,8-HxCDF-13C	2.00	68
Total PeCDF	ND	-----	0.0100		1,2,3,7,8,9-HxCDF-13C	2.00	67
					1,2,3,4,7,8-HxCDD-13C	2.00	87
1,2,3,7,8-PeCDD	ND	-----	0.0100		1,2,3,6,7,8-HxCDD-13C	2.00	82
Total PeCDD	0.030	-----	0.0100	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	ND	-----	0.0100		1,2,3,4,6,7,8-HpCDD-13C	2.00	85
1,2,3,6,7,8-HxCDF	ND	-----	0.0100		OCDD-13C	4.00	63
2,3,4,6,7,8-HxCDF	ND	-----	0.0100				
1,2,3,7,8,9-HxCDF	ND	-----	0.0100		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.011	-----	0.0100	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.0100		2,3,7,8-TCDD-37Cl4	0.20	74
1,2,3,6,7,8-HxCDD	ND	-----	0.0100				
1,2,3,7,8,9-HxCDD	ND	-----	0.0100				
Total HxCDD	0.075	-----	0.0100				
1,2,3,4,6,7,8-HpCDF	0.016	-----	0.0100	J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.0100		Equivalence: 0.00085 ng/m2		
Total HpCDF	0.016	-----	0.0100	J	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.037	-----	0.0100	J			
Total HpCDD	0.074	-----	0.0100	J			
OCDF	0.022	-----	0.0200	J			
OCDD	0.300	-----	0.0200				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers)
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B = Less than 10 times higher than method blank level
P = Recovery outside of target range
Nn = Value obtained from additional analysis

LRL = Lower Reporting Limit
I = Interference
E = PCDE Interference
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Method 8290 Analysis Results

Client - ATC

Client's Sample ID	ATC-1220-89M-DX6		
Lab Sample ID	103233946		
Filename	F11228B_08		
Injected By	BAL		
Total Amount Extracted	1 m2	Matrix	WIPE
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	12/20/2001
ICAL Date	11/19/2001	Received	12/21/2001
CCal Filename(s)	F11228B_01 & F11228B_16	Extracted	12/23/2001
Method Blank ID	BLANK-1389	Analyzed	12/29/2001 03:10

Native Isomers	Conc ng/m2	EMPC ng/m2	LRL ng/m2		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.0038	-----	0.0020	J	2,3,7,8-TCDF-13C	2.00	59
Total TCDF	0.1100	-----	0.0020		2,3,7,8-TCDD-13C	2.00	69
					1,2,3,7,8-PeCDF-13C	2.00	58
2,3,7,8-TCDD	ND	-----	0.0025	A	2,3,4,7,8-PeCDF-13C	2.00	57
Total TCDD	0.1200	-----	0.0020		1,2,3,7,8-PeCDD-13C	2.00	70
					1,2,3,4,7,8-HxCDF-13C	2.00	70
1,2,3,7,8-PeCDF	ND	-----	0.0100		1,2,3,6,7,8-HxCDF-13C	2.00	68
2,3,4,7,8-PeCDF	ND	-----	0.0100		2,3,4,6,7,8-HxCDF-13C	2.00	69
Total PeCDF	0.0270	-----	0.0100	J	1,2,3,7,8,9-HxCDF-13C	2.00	69
					1,2,3,4,7,8-HxCDD-13C	2.00	95
1,2,3,7,8-PeCDD	ND	-----	0.0100		1,2,3,6,7,8-HxCDD-13C	2.00	74
Total PeCDD	0.0840	-----	0.0100		1,2,3,4,6,7,8-HpCDF-13C	2.00	72
					1,2,3,4,7,8,9-HpCDF-13C	2.00	71
1,2,3,4,7,8-HxCDF	ND	-----	0.0100		1,2,3,4,6,7,8-HpCDD-13C	2.00	85
1,2,3,6,7,8-HxCDF	ND	-----	0.0100		OCDD-13C	4.00	64
2,3,4,6,7,8-HxCDF	ND	-----	0.0100				
1,2,3,7,8,9-HxCDF	ND	-----	0.0100		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.0210	-----	0.0100	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.0100		2,3,7,8-TCDD-37Cl4	0.20	73
1,2,3,6,7,8-HxCDD	ND	-----	0.0100				
1,2,3,7,8,9-HxCDD	ND	-----	0.0100				
Total HxCDD	0.0970	-----	0.0100				
1,2,3,4,6,7,8-HpCDF	0.0260	-----	0.0100	J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.0100		Equivalence: 0.0018 ng/m2		
Total HpCDF	0.0390	-----	0.0100	J	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.0600	-----	0.0100				
Total HpCDD	0.1200	-----	0.0100				
OCDF	0.0390	-----	0.0200	J			
OCDD	0.4900	-----	0.0200				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers)
EMPC = Estimated Maximum Possible Concentration
A = Detection Limit based on signal-to-noise measurement
J = Concentration detected is below the calibration range
B = Less than 10 times higher than method blank level
P = Recovery outside of target range
Nn = Value obtained from additional analysis

LRL = Lower Reporting Limit
I = Interference
E = PCDE Interference
S = Saturated signal
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

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Pace Analytical Services, Inc.
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Method 8290 Analysis Results

Client - ATC

Client's Sample ID	ATC-1220-89M-DX7		
Lab Sample ID	103233953		
Filename	F11228B_09		
Injected By	BAL		
Total Amount Extracted	1 m2	Matrix	WIPE
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	12/20/2001
ICAL Date	11/19/2001	Received	12/21/2001
CCal Filename(s)	F11228B_01 & F11228B_16	Extracted	12/23/2001
Method Blank ID	BLANK-1389	Analyzed	12/29/2001 04:00

Native Isomers	Conc ng/m2	EMPC ng/m2	LRL ng/m2		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.0020		2,3,7,8-TCDF-13C	2.00	56
Total TCDF	0.0098	-----	0.0020	J	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	-----	0.0020		2,3,4,7,8-PeCDF-13C	2.00	60
Total TCDD	0.0310	-----	0.0020		1,2,3,7,8-PeCDD-13C	2.00	74
					1,2,3,4,7,8-HxCDF-13C	2.00	67
1,2,3,7,8-PeCDF	ND	-----	0.0100		1,2,3,6,7,8-HxCDF-13C	2.00	65
2,3,4,7,8-PeCDF	ND	-----	0.0100		2,3,4,6,7,8-HxCDF-13C	2.00	67
Total PeCDF	ND	-----	0.0100		1,2,3,7,8,9-HxCDF-13C	2.00	66
					1,2,3,4,7,8-HxCDD-13C	2.00	96
1,2,3,7,8-PeCDD	ND	-----	0.0100		1,2,3,6,7,8-HxCDD-13C	2.00	70
Total PeCDD	0.0160	-----	0.0100	J	1,2,3,4,6,7,8-HpCDF-13C	2.00	69
					1,2,3,4,7,8,9-HpCDF-13C	2.00	69
1,2,3,4,7,8-HxCDF	ND	-----	0.0100		1,2,3,4,6,7,8-HpCDD-13C	2.00	84
1,2,3,6,7,8-HxCDF	ND	-----	0.0100		OCDD-13C	4.00	64
2,3,4,6,7,8-HxCDF	ND	-----	0.0100				
1,2,3,7,8,9-HxCDF	ND	-----	0.0100		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.0100		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.0100		2,3,7,8-TCDD-37Cl4	0.20	70
1,2,3,6,7,8-HxCDD	ND	-----	0.0100				
1,2,3,7,8,9-HxCDD	ND	-----	0.0100				
Total HxCDD	0.0260	-----	0.0100	J			
1,2,3,4,6,7,8-HpCDF	ND	-----	0.0100		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.0100		Equivalence: 0.00038 ng/m2		
Total HpCDF	ND	-----	0.0100		(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.0220	-----	0.0100	J			
Total HpCDD	0.0410	-----	0.0100	J			
OCDF	ND	-----	0.0200				
OCDD	0.1600	-----	0.0200				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers)
EMPC = Estimated Maximum Possible Concentration
A = Detection Limit based on signal-to-noise measurement
J = Concentration detected is below the calibration range
B = Less than 10 times higher than method blank level
P = Recovery outside of target range
Nn = Value obtained from additional analysis

LRL = Lower Reporting Limit
I = Interference
E = PCDE Interference
S = Saturated signal
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NC = Not Calculated
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Method 8290 Analysis Results

Client - ATC

Client's Sample ID	ATC-1220-89M-DX8		
Lab Sample ID	103233961		
Filename	F11228B_10		
Injected By	BAL		
Total Amount Extracted	1 m2	Matrix	WIPE
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	12/20/2001
ICAL Date	11/19/2001	Received	12/21/2001
CCal Filename(s)	F11228B_01 & F11228B_16	Extracted	12/23/2001
Method Blank ID	BLANK-1389	Analyzed	12/29/2001 04:50

Native Isomers	Conc ng/m2	EMPC ng/m2	LRL ng/m2		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.0041	A	2,3,7,8-TCDF-13C	2.00	61
Total TCDF	0.038	-----	0.0020		2,3,7,8-TCDD-13C	2.00	74
					1,2,3,7,8-PeCDF-13C	2.00	64
2,3,7,8-TCDD	ND	-----	0.0023	A	2,3,4,7,8-PeCDF-13C	2.00	64
Total TCDD	0.048	-----	0.0020		1,2,3,7,8-PeCDD-13C	2.00	78
					1,2,3,4,7,8-HxCDF-13C	2.00	78
1,2,3,7,8-PeCDF	ND	-----	0.0100		1,2,3,6,7,8-HxCDF-13C	2.00	68
2,3,4,7,8-PeCDF	ND	-----	0.0100		2,3,4,6,7,8-HxCDF-13C	2.00	75
Total PeCDF	0.013	-----	0.0100	J	1,2,3,7,8,9-HxCDF-13C	2.00	73
					1,2,3,4,7,8-HxCDD-13C	2.00	104
1,2,3,7,8-PeCDD	ND	-----	0.0100		1,2,3,6,7,8-HxCDD-13C	2.00	80
Total PeCDD	0.026	-----	0.0100	J	1,2,3,4,6,7,8-HpCDF-13C	2.00	75
					1,2,3,4,7,8,9-HpCDF-13C	2.00	74
1,2,3,4,7,8-HxCDF	ND	-----	0.0100		1,2,3,4,6,7,8-HpCDD-13C	2.00	88
1,2,3,6,7,8-HxCDF	ND	-----	0.0100		OCDD-13C	4.00	69
2,3,4,6,7,8-HxCDF	ND	-----	0.0100				
1,2,3,7,8,9-HxCDF	ND	-----	0.0100		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.017	-----	0.0100	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.0100		2,3,7,8-TCDD-37Cl4	0.20	73
1,2,3,6,7,8-HxCDD	ND	-----	0.0100				
1,2,3,7,8,9-HxCDD	ND	-----	0.0100				
Total HxCDD	0.064	-----	0.0100				
1,2,3,4,6,7,8-HpCDF	0.017	-----	0.0100	J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.0100		Equivalence: 0.0011 ng/m2		
Total HpCDF	0.031	-----	0.0100	J	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.055	-----	0.0100				
Total HpCDD	0.100	-----	0.0100	J			
OCDF	0.026	-----	0.0200	J			
OCDD	0.390	-----	0.0200				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers)
EMPC = Estimated Maximum Possible Concentration
A = *Detection Limit based on signal-to-noise measurement*
J = Concentration detected is below the calibration range
B = Less than 10 times higher than method blank level
P = Recovery outside of target range
Nn = Value obtained from additional analysis

LRL = Lower Reporting Limit
I = Interference
E = PCDE Interference
S = *Saturated signal*
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
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Method 8290 Analysis Results

Client - ATC

Client's Sample ID	ATC-1220-89M-DX9		
Lab Sample ID	103233979		
Filename	F20103A_11		
Injected By	BAL		
Total Amount Extracted	1 m2	Matrix	WIPE
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	12/20/2001
ICAL Date	01/02/2002	Received	12/21/2001
CCal Filename(s)	F20102A_22 & F20103B_01	Extracted	12/23/2001
Method Blank ID	BLANK-1389	Analyzed	01/03/2002 16:25

Native Isomers	Conc ng/m2	EMPC ng/m2	LRL ng/m2		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.0096	-----	0.0020	J	2,3,7,8-TCDF-13C	2.00	75
Total TCDF	0.4800	-----	0.0020		2,3,7,8-TCDD-13C	2.00	79
					1,2,3,7,8-PeCDF-13C	2.00	73
2,3,7,8-TCDD	0.0026	-----	0.0020	J	2,3,4,7,8-PeCDF-13C	2.00	59
Total TCDD	0.6200	-----	0.0020		1,2,3,7,8-PeCDD-13C	2.00	74
					1,2,3,4,7,8-HxCDF-13C	2.00	124
1,2,3,7,8-PeCDF	ND	-----	0.0100		1,2,3,6,7,8-HxCDF-13C	2.00	77
2,3,4,7,8-PeCDF	0.0150	-----	0.0100	J	2,3,4,6,7,8-HxCDF-13C	2.00	90
Total PeCDF	0.1700	-----	0.0100		1,2,3,7,8,9-HxCDF-13C	2.00	106
					1,2,3,4,7,8-HxCDD-13C	2.00	125
1,2,3,7,8-PeCDD	0.0120	-----	0.0100	J	1,2,3,6,7,8-HxCDD-13C	2.00	80
Total PeCDD	0.3800	-----	0.0100		1,2,3,4,6,7,8-HpCDF-13C	2.00	102
					1,2,3,4,7,8,9-HpCDF-13C	2.00	114
1,2,3,4,7,8-HxCDF	0.0160	-----	0.0100	J	1,2,3,4,6,7,8-HpCDD-13C	2.00	114
1,2,3,6,7,8-HxCDF	0.0170	-----	0.0100	J	OCDD-13C	4.00	116
2,3,4,6,7,8-HxCDF	0.0220	-----	0.0100	J			
1,2,3,7,8,9-HxCDF	ND	-----	0.0100		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.1700	-----	0.0100		1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	0.0130	-----	0.0100	J	2,3,7,8-TCDD-37Cl4	0.20	85
1,2,3,6,7,8-HxCDD	0.0190	-----	0.0100	J			
1,2,3,7,8,9-HxCDD	0.0110	-----	0.0100	J			
Total HxCDD	0.5700	-----	0.0100				
1,2,3,4,6,7,8-HpCDF	0.0780	-----	0.0100		Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.0100		Equivalence: 0.032 ng/m2		
Total HpCDF	0.1100	-----	0.0100		(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.2100	-----	0.0100				
Total HpCDD	0.4300	-----	0.0100				
OCDF	0.1200	-----	0.0200				
OCDD	1.6000	-----	0.0200				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers)
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B = Less than 10 times higher than method blank level
P = Recovery outside of target range
Nn = Value obtained from additional analysis

LRL = Lower Reporting Limit
I = Interference
E = PCDE Interference
S = Saturated signal
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NA = Not Applicable
NC = Not Calculated
* = See Discussion

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Pace Analytical™

Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414

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Method 8290 Analysis Results

Client - ATC

Client's Sample ID	ATC-1220-89M-DX10		
Lab Sample ID	103233987		
Filename	F11228B_11		
Injected By	BAL		
Total Amount Extracted	1 m2	Matrix	WIPE
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	12/20/2001
ICAL Date	11/19/2001	Received	12/21/2001
CCal Filename(s)	F11228B_01 & F11228B_16	Extracted	12/23/2001
Method Blank ID	BLANK-1389	Analyzed	12/29/2001 05:40

Native Isomers	Conc ng/m2	EMPC ng/m2	LRL ng/m2		Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.0029	-----	0.00200	J	2,3,7,8-TCDF-13C	2.00	59
Total TCDF	0.0440	-----	0.00200		2,3,7,8-TCDD-13C	2.00	72
					1,2,3,7,8-PeCDF-13C	2.00	59
2,3,7,8-TCDD	ND	-----	0.00200		2,3,4,7,8-PeCDF-13C	2.00	59
Total TCDD	0.1100	-----	0.00200		1,2,3,7,8-PeCDD-13C	2.00	73
					1,2,3,4,7,8-HxCDF-13C	2.00	67
1,2,3,7,8-PeCDF	ND	-----	0.01000		1,2,3,6,7,8-HxCDF-13C	2.00	62
2,3,4,7,8-PeCDF	ND	-----	0.01000		2,3,4,6,7,8-HxCDF-13C	2.00	64
Total PeCDF	0.0400	-----	0.01000	J	1,2,3,7,8,9-HxCDF-13C	2.00	67
					1,2,3,4,7,8-HxCDD-13C	2.00	92
1,2,3,7,8-PeCDD	ND	-----	0.01000		1,2,3,6,7,8-HxCDD-13C	2.00	73
Total PeCDD	0.1300	-----	0.01000		1,2,3,4,6,7,8-HpCDF-13C	2.00	69
					1,2,3,4,7,8,9-HpCDF-13C	2.00	68
1,2,3,4,7,8-HxCDF	ND	-----	0.01000		1,2,3,4,6,7,8-HpCDD-13C	2.00	84
1,2,3,6,7,8-HxCDF	ND	-----	0.01000		OCDD-13C	4.00	63
2,3,4,6,7,8-HxCDF	ND	-----	0.01000				
1,2,3,7,8,9-HxCDF	ND	-----	0.01000		1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	0.0360	-----	0.01000	J	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.01000		2,3,7,8-TCDD-37Cl4	0.20	73
1,2,3,6,7,8-HxCDD	ND	-----	0.01000				
1,2,3,7,8,9-HxCDD	ND	-----	0.01000				
Total HxCDD	0.2000	-----	0.01000				
1,2,3,4,6,7,8-HpCDF	0.0290	-----	0.01000	J	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.01000		Equivalence: 0.0016 ng/m2		
Total HpCDF	0.0290	-----	0.01000	J	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	0.0620	-----	0.01000				
Total HpCDD	0.1200	-----	0.01000				
OCDF	0.0320	-----	0.02000	J			
OCDD	0.3700	-----	0.02000				

Conc = Concentration (Totals include 2,3,7,8-substituted isomers)
EMPC = Estimated Maximum Possible Concentration
A = Detection Limit based on signal-to-noise measurement
J = Concentration detected is below the calibration range
B = Less than 10 times higher than method blank level
P = Recovery outside of target range
Nn = Value obtained from additional analysis

LRL = Lower Reporting Limit
I = Interference
E = PCDE Interference
S = Saturated signal
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion

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Pace Analytical™

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Method 8290 Analysis Results

Client - ATC

Client's Sample ID	ATC-1220-89M-DX11		
Lab Sample ID	103233995		
Filename	F11228B_12		
Injected By	BAL		
Total Amount Extracted	1 m2	Matrix	WIPE
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	12/20/2001
ICAL Date	11/19/2001	Received	12/21/2001
CCal Filename(s)	F11228B_01 & F11228B_16	Extracted	12/23/2001
Method Blank ID	BLANK-1389	Analyzed	12/29/2001 06:30

Native Isomers	Conc ng/m2	EMPC ng/m2	LRL ng/m2	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	ND	-----	0.00200	2,3,7,8-TCDF-13C	2.00	63
Total TCDF	ND	-----	0.00200	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	-----	0.00200	2,3,4,7,8-PeCDF-13C	2.00	71
Total TCDD	ND	-----	0.00200	1,2,3,7,8-PeCDD-13C	2.00	88
				1,2,3,4,7,8-HxCDF-13C	2.00	71
1,2,3,7,8-PeCDF	ND	-----	0.01000	1,2,3,6,7,8-HxCDF-13C	2.00	74
2,3,4,7,8-PeCDF	ND	-----	0.01000	2,3,4,6,7,8-HxCDF-13C	2.00	75
Total PeCDF	ND	-----	0.01000	1,2,3,7,8,9-HxCDF-13C	2.00	77
				1,2,3,4,7,8-HxCDD-13C	2.00	101
1,2,3,7,8-PeCDD	ND	-----	0.01000	1,2,3,6,7,8-HxCDD-13C	2.00	80
Total PeCDD	ND	-----	0.01000	1,2,3,4,6,7,8-HpCDF-13C	2.00	80
				1,2,3,4,7,8,9-HpCDF-13C	2.00	81
1,2,3,4,7,8-HxCDF	ND	-----	0.01000	1,2,3,4,6,7,8-HpCDD-13C	2.00	96
1,2,3,6,7,8-HxCDF	ND	-----	0.01000	OCDD-13C	4.00	72
2,3,4,6,7,8-HxCDF	ND	-----	0.01000			
1,2,3,7,8,9-HxCDF	ND	-----	0.01000	1,2,3,4-TCDD-13C	2.00	NA
Total HxCDF	ND	-----	0.01000	1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	ND	-----	0.01000	2,3,7,8-TCDD-37Cl4	0.20	76
1,2,3,6,7,8-HxCDD	ND	-----	0.01000			
1,2,3,7,8,9-HxCDD	ND	-----	0.01000			
Total HxCDD	ND	-----	0.01000			
1,2,3,4,6,7,8-HpCDF	ND	-----	0.01000	Total 2,3,7,8-TCDD		
1,2,3,4,7,8,9-HpCDF	ND	-----	0.01000	Equivalence: 0.00 ng/m2		
Total HpCDF	ND	-----	0.01000	(Using ITE Factors)		
1,2,3,4,6,7,8-HpCDD	ND	-----	0.01000			
Total HpCDD	ND	-----	0.01000			
OCDF	ND	-----	0.02000			
OCDD	ND	-----	0.02000			

Conc = Concentration (Totals include 2,3,7,8-substituted isomers)
EMPC = Estimated Maximum Possible Concentration
A = Detection Limit based on signal-to-noise measurement
J = Concentration detected is below the calibration range
B = Less than 10 times higher than method blank level
P = Recovery outside of target range
Nn = Value obtained from additional analysis

LRL = Lower Reporting Limit
I = Interference
E = PCDE Interference
S = Saturated signal
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NA = Not Applicable
NC = Not Calculated
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Method 8290 Laboratory Control Spike Results

Client - ATC

Lab Sample ID	SPIKE-1394		
Filename	F20103A_03	Matrix	WIPE
Total Amount Extracted	1 Sample	Dilution	NA
ICAL Date	01/02/2002	Extracted	12/23/2001
CCal Filename(s)	F20102A_22 & F20103B_01	Analyzed	01/03/2002 09:05
Method Blank ID	BLANK-1389	Injected By	BAL

Native Isomers	Qs (ng)	Qm (ng)	% Rec.	Internal Standards	ng's Added	Percent Recovery
2,3,7,8-TCDF	0.20	0.22	110	2,3,7,8-TCDF-13C	2.00	71
				2,3,7,8-TCDD-13C	2.00	72
				1,2,3,7,8-PeCDF-13C	2.00	81
2,3,7,8-TCDD	0.20	0.22	110	2,3,4,7,8-PeCDF-13C	2.00	78
				1,2,3,7,8-PeCDD-13C	2.00	84
				1,2,3,4,7,8-HxCDF-13C	2.00	83
1,2,3,7,8-PeCDF	1.00	1.08	108	1,2,3,6,7,8-HxCDF-13C	2.00	77
2,3,4,7,8-PeCDF	1.00	1.08	108	2,3,4,6,7,8-HxCDF-13C	2.00	79
				1,2,3,7,8,9-HxCDF-13C	2.00	87
				1,2,3,4,7,8-HxCDD-13C	2.00	104
1,2,3,7,8-PeCDD	1.00	1.11	111	1,2,3,6,7,8-HxCDD-13C	2.00	79
				1,2,3,4,6,7,8-HpCDF-13C	2.00	89
				1,2,3,4,7,8,9-HpCDF-13C	2.00	90
1,2,3,4,7,8-HxCDF	1.00	1.08	108	1,2,3,4,6,7,8-HpCDD-13C	2.00	99
1,2,3,6,7,8-HxCDF	1.00	1.13	113	OCDD-13C	4.00	89
2,3,4,6,7,8-HxCDF	1.00	1.12	112			
1,2,3,7,8,9-HxCDF	1.00	1.10	110	1,2,3,4-TCDD-13C	2.00	NA
				1,2,3,7,8,9-HxCDD-13C	2.00	NA
1,2,3,4,7,8-HxCDD	1.00	1.15	115	2,3,7,8-TCDD-37Cl4	0.20	77
1,2,3,6,7,8-HxCDD	1.00	1.11	111			
1,2,3,7,8,9-HxCDD	1.00	1.09	109			
1,2,3,4,6,7,8-HpCDF	1.00	1.15	115			
1,2,3,4,7,8,9-HpCDF	1.00	1.13	113			
1,2,3,4,6,7,8-HpCDD	1.00	1.09	109			
OCDF	2.00	2.23	111			
OCDD	2.00	2.17	109			

Qs = Quantity Spiked
Qm = Quantity Measured
Rec. = Recovery (Expressed as Percent)
P = Recovery outside of target range
X = *Background subtracted value*
Nn = Value obtained from additional analysis
NA = Not Applicable
* = See Discussion

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