



1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6


SVOC DATA PACKAGE

Client Project Information

Project ID:
Project Description:
Contact: Emily Jones

ALSE Project Information

Project ID: FLS100
Contact: Breanne Dusureault
Submission ID(s): L2336381

Final Package Review by: 
Date Reviewed: 30-Sep-19



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SECTION 1: PROJECT NARRATIVE

ALSE Project Information

Project ID: FLS100

Contact: Breanne Dusureault

Submission ID(s): L2336381

Client Project Information

Project ID:

Project Description:

Contact: Emily Jones

Analytical Method: PCB Congeners by TO-10A via EPA 1668C

ALS Sample ID	Client Sample Descriptions	Matrix	Date Sampled	Date Received	Date Extracted	Date Analyzed
L2336381-1	HEISER-20190808-0815	Air	15-Aug-19	27-Aug-19	05-Sep-19	11-Sep-19
L2336381-2	CITY-20190808-0815	Air	15-Aug-19	27-Aug-19	05-Sep-19	11-Sep-19
L2336381-3	RESIDENTIAL-20190808-0815	Air	15-Aug-19	27-Aug-19	05-Sep-19	11-Sep-19
L2336381-4	HEISER-20190815-0823	Air	23-Aug-19	27-Aug-19	05-Sep-19	11-Sep-19
L2336381-5	CITY-20190815-0823	Air	23-Aug-19	27-Aug-19	05-Sep-19	11-Sep-19
L2336381-6	RESIDENTIAL-20190815-0823	Air	23-Aug-19	27-Aug-19	05-Sep-19	11-Sep-19
WG3136778-1	Method Blank	Media	n/a	n/a	05-Sep-19	11-Sep-19
WG3136778-4	Method Blank	Reagent	n/a	n/a	05-Sep-19	11-Sep-19
WG3136778-2	Laboratory Control Sample	QC	n/a	n/a	05-Sep-19	11-Sep-19

Comments and Notes:

a) Sample Integrity:

The samples were received in good condition at 4.5 degrees C.

b) Instrumental Analysis:

The responses for PCB-1, PCB-3 and PCB-15 have been omitted from the initial calibration due to instrument detector saturation. Four calibration levels have been used for these targets.

No criteria failures or exceedences.

I certify that this data package is in compliance with the terms and condition of the contract , both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this data package (hardcopy and/or electronic version) has been authorized by the Laboratory Manager or his designee, as verified by the following signature.

Steve Kennedy, Technical Supervisor

30-Sep-19

Date

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SECTION 2: DATA SUMMARY REPORT



1435 Norjohn Court, Unit 1, Burlington, ON, Canada L7L 0E6
Phone: 905-331-3111, FAX: 905-331-4567

Certificate of Analysis

ALS Project Contact:	Breanne Dusureault	Client Name:	Floyd Snider
ALS Project ID:	FLS100	Client Address:	601 Union Street, Suite 600
ALS WO#:	L2336381		Seattle, WA 98101
Date of Report	30-Sep-19		USA
Date of Sample Receipt	27-Aug-19	Client Contact:	Emily Jones
		Client Project ID:	

COMMENTS: PCB Congeners by TO-10A via EPA 1668C

PCB Congener Group Totals and Total PCB are a sum of detected values, including EMPC values, consistent with USEPA CLP SOW CBC1.2

Certified by:

A handwritten signature in black ink, appearing to read "Steve Kennedy", is written over a horizontal line.

Steve Kennedy
Technical Supervisor

Results in this certificate relate only to the samples as submitted to the laboratory.
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Sample Analysis Summary Report

Sample Name	HEISER-20190808-0815	CITY-20190808-0815	RESIDENTIAL-20190808-0815	HEISER-20190815-0823	CITY-20190815-0823	RESIDENTIAL-20190815-0823
ALS Sample ID	L2336381-1	L2336381-2	L2336381-3	L2336381-4	L2336381-5	L2336381-6
Sample Size	1	1	1	1	1	1
Sample size units	Sample	Sample	Sample	Sample	Sample	Sample
Percent Moisture	n/a	n/a	n/a	n/a	n/a	n/a
Sample Matrix	Air	Air	Air	Air	Air	Air
Sampling Date	15-Aug-19	15-Aug-19	15-Aug-19	23-Aug-19	23-Aug-19	23-Aug-19
Extraction Date	5-Sep-19	5-Sep-19	5-Sep-19	5-Sep-19	5-Sep-19	5-Sep-19
Target Analytes	pg	pg	pg	pg	pg	pg
PCB-001	46.0	60.5	100	31.8	35.4	52.0
PCB-002	<14	<14	22.0	15.8	<9.5	12.0
PCB-003	27.7	31.3	40.2	<24	21.5	26.1
PCB-004	136	183	321	<20	86.0	161
PCB-010	<14	<18	<26	<14	<9.4	<11
PCB-009	<14	<19	<27	<14	<9.4	<11
PCB-007	<14	<18	<25	<13	<9.0	<11
PCB-006	<13	<47	88.1	<13	<8.9	51.6
PCB-005	<17	<22	<31	<17	<11	<13
PCB-008	<130	185	327	<60	90.8	167
PCB-014	<10	<12	<18	<13	<9.7	<10
PCB-011	225	294	344	188	217	248
PCB-012/013	<11	<13	<19	<13	<10	<10
PCB-015	<14	40.5	<52	<17	<13	36.3
PCB-019	<27	<39	69.2	<7.5	<17	35.6
PCB-018/030	134	190	323	69.0	88.5	159
PCB-017	60.5	82.9	<130	28.3	<36	74.4
PCB-027	<9.4	<7.7	<16	<7.1	<4.0	11.6
PCB-024	<4.8	<6.2	<10	<7.6	<4.3	<4.4
PCB-016	62.6	73.6	131	<30	38.9	66.0
PCB-032	37.8	47.4	<67	18.4	20.4	38.5
PCB-034	<6.7	<6.4	<9.5	<7.3	<5.7	<4.6
PCB-023	<6.4	<6.2	<9.1	<7.0	<5.4	<4.4
PCB-026/029	28.1	31.0	62.5	13.3	17.6	28.2
PCB-025	11.7	12.1	<26	<6.6	<5.9	<4.1
PCB-031	99.1	131	222	54.6	57.6	110
PCB-020/028	110	146	263	57.9	71.2	125
PCB-021/033	63.1	91.9	160	40.4	42.7	77.0
PCB-022	36.0	49.3	88.1	25.5	20.0	<34
PCB-036	<5.7	<5.5	<8.1	<6.3	<4.9	<3.9
PCB-039	<6.3	<6.1	<8.9	<6.9	<5.3	<4.3
PCB-038	<6.7	<6.5	<9.6	<7.4	<5.7	<4.6
PCB-035	<6.7	<6.5	<9.5	<7.4	<5.7	<4.6
PCB-037	<16	<18	40.6	<9.6	<7.6	<16
PCB-054	<2.2	<2.7	<3.9	<2.8	<2.0	<2.0
PCB-050/053	16.3	21.7	<37	9.12	9.63	16.8
PCB-045/051	24.7	24.9	46.6	14.7	11.6	21.9
PCB-046	<6.7	6.16	15.7	<5.6	<4.4	6.21
PCB-052	139	169	273	85.8	95.2	125
PCB-073	<3.1	<3.4	<4.2	<3.6	<2.8	<2.0
PCB-043	<5.1	<5.7	12.7	<6.0	<4.7	<3.4
PCB-049/069	52.3	63.7	110	27.2	33.1	51.2
PCB-048	<14	20.0	44.3	8.86	<11	20.4
PCB-044/047/065	94.0	114	195	58.1	61.0	89.1
PCB-059/062/075	<7.3	<7.2	14.2	<3.7	<2.9	8.49
PCB-042	21.8	24.1	<36	12.9	12.9	21.0
PCB-040/041/071	36.3	46.5	81.7	24.3	<20	38.0
PCB-064	30.8	<36	73.0	<17	<16	33.9
PCB-072	<2.9	<3.6	<5.4	<2.8	<2.3	<2.6
PCB-068	<2.8	<3.4	<5.2	<2.6	<2.2	<2.5
PCB-057	<3.1	<3.8	<5.7	<2.9	<2.5	<2.7
PCB-058	<3.0	<3.7	<5.7	<2.9	<2.5	<2.7
PCB-067	<2.9	<3.5	<5.3	<2.7	<2.3	<2.5
PCB-063	<2.6	<3.2	<4.9	<2.5	<2.1	<2.3
PCB-061/070/074/076	89.3	108	181	66.6	54.9	82.8
PCB-066	30.3	36.9	55.4	25.1	17.9	31.9
PCB-055	<3.1	<3.8	<5.8	<2.9	<2.5	<2.7
PCB-056	<13	<15	30.2	<15	9.16	13.9
PCB-060	7.28	<10	12.8	<9.5	<2.5	<6.7
PCB-080	<2.5	<3.1	<4.7	<2.4	<2.0	<2.2
PCB-079	<2.7	<3.3	<5.1	<2.6	<2.2	<2.4
PCB-078	<3.1	<3.8	<5.7	<2.9	<2.5	<2.7
PCB-081	<3.5	<4.2	<7.0	<3.4	<2.9	<3.1
PCB-077	<3.8	<4.7	<7.6	<3.7	<3.2	<3.3
PCB-104	<2.6	<3.3	<5.1	<3.0	<2.6	<2.3
PCB-096	<2.5	<3.1	<5.6	<3.0	<2.7	<2.2
PCB-103	<3.8	<4.1	<8.0	<4.4	<3.6	<3.9
PCB-094	<4.6	<5.0	<9.7	<5.4	<4.3	<4.7
PCB-095	88.6	105	148	62.3	61.9	66.7
PCB-093/098/100/102	<4.3	<4.6	<9.0	<5.0	<4.0	<4.4

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Sample Analysis Summary Report

Sample Name	HEISER-20190808-0815	CITY-20190808-0815	RESIDENTIAL-20190808-0815	HEISER-20190815-0823	CITY-20190815-0823	RESIDENTIAL-20190815-0823
ALS Sample ID	L2336381-1	L2336381-2	L2336381-3	L2336381-4	L2336381-5	L2336381-6
Sample Size	1	1	1	1	1	1
Sample size units	Sample	Sample	Sample	Sample	Sample	Sample
Percent Moisture	n/a	n/a	n/a	n/a	n/a	n/a
Sample Matrix	Air	Air	Air	Air	Air	Air
Sampling Date	15-Aug-19	15-Aug-19	15-Aug-19	23-Aug-19	23-Aug-19	23-Aug-19
Extraction Date	5-Sep-19	5-Sep-19	5-Sep-19	5-Sep-19	5-Sep-19	5-Sep-19
Target Analytes	pg	pg	pg	pg	pg	pg
PCB-088/091	<14	<12	27.4	7.97	<9.8	<8.9
PCB-084	21.8	33.0	42.4	<13	<10	21.8
PCB-089	<4.6	<4.9	<9.6	<5.3	<4.3	<4.7
PCB-121	<3.1	<3.3	<6.5	<3.6	<2.9	<3.2
PCB-092	<14	<19	<13	<13	<8.6	<11
PCB-090/101/113	90.6	104	154	61.8	57.5	66.1
PCB-083/099	<33	52.8	72.9	27.6	25.3	<31
PCB-112	<3.0	<3.3	<6.4	<3.5	<2.8	<3.1
PCB-086/087/097/109/119/125	53.1	66.2	91.5	<36	<3.5	43.8
PCB-085/110/115/116/117	90.8	110	165	61.6	61.0	71.0
PCB-082	<8.3	<9.7	<11	<6.1	<4.9	<5.4
PCB-111	<3.1	<3.3	<6.5	<3.6	<2.9	<3.2
PCB-120	<2.8	<3.0	<5.9	<3.3	<2.6	<2.9
PCB-108/124	<3.8	<4.3	<6.8	<4.2	<3.6	<3.3
PCB-107	<3.6	<4.1	<6.5	<3.9	<3.4	<3.1
PCB-123	<4.1	<4.7	<7.8	<4.7	<4.0	<3.7
PCB-106	<3.8	<4.4	<7.0	<4.3	<3.6	<3.4
PCB-118	36.2	46.7	69.1	<25	28.7	28.1
PCB-122	<4.0	<4.6	<7.2	<4.4	<3.8	<3.5
PCB-114	<4.1	<4.6	<7.4	<4.6	<3.9	<3.6
PCB-105	<11	17.1	26.9	<9.4	9.45	10.7
PCB-127	<3.7	<4.2	<6.7	<4.1	<3.5	<3.2
PCB-126	<4.7	<5.4	<9.0	<5.6	<4.6	<4.3
PCB-155	<1.1	<1.0	<1.6	<1.3	<1.1	<0.98
PCB-152	<1.2	<1.1	<1.8	<1.4	<1.3	<1.1
PCB-150	<1.2	<1.1	<1.8	<1.4	<1.3	<1.1
PCB-136	13.2	12.4	<16	<18	<6.8	<6.6
PCB-145	<1.2	<1.2	<1.9	<1.5	<1.4	<1.1
PCB-148	<1.6	<1.5	<2.4	<1.9	<1.7	<1.5
PCB-135/151	33.8	27.6	37.1	49.6	<13	16.5
PCB-154	<1.3	<1.3	<2.0	<1.6	<1.4	<1.2
PCB-144	2.76	4.64	4.43	<5.8	<1.8	<1.9
PCB-147/149	55.2	51.8	69.0	79.3	28.3	34.0
PCB-134/143	<2.9	<3.5	<4.4	<2.5	<2.6	<2.2
PCB-139/140	<1.6	<2.3	<3.7	<2.1	<2.1	<1.8
PCB-131	<2.1	<2.9	<4.7	<2.6	<2.8	<2.4
PCB-142	<1.9	<2.7	<4.3	<2.4	<2.5	<2.2
PCB-132	<15	<21	32.7	<16	10.9	13.4
PCB-133	<1.7	<2.5	<4.0	<2.2	<2.3	<2.0
PCB-165	<1.4	<1.9	<3.1	<1.7	<1.8	<1.6
PCB-146	8.03	7.09	10.3	8.20	4.72	4.39
PCB-161	<1.3	<1.8	<3.0	<1.7	<1.7	<1.5
PCB-153/168	42.5	41.4	<51	59.2	22.5	28.5
PCB-141	<9.6	12.2	11.8	14.8	5.88	<7.9
PCB-130	2.78	<2.7	<4.4	<2.5	<2.6	<2.2
PCB-137/164	<1.4	6.25	<3.3	<1.8	<2.0	<1.6
PCB-129/138/163	45.3	59.5	73.5	46.4	31.2	33.2
PCB-160	<0.98	<1.4	<2.2	<1.3	<1.3	<1.1
PCB-158	3.43	5.76	<5.8	3.80	<1.5	<3.1
PCB-128/166	4.14	<4.7	9.66	<1.9	5.03	<1.7
PCB-159	<1.2	<1.7	<2.8	<1.6	<1.6	<1.4
PCB-162	<1.3	<1.9	<3.0	<1.7	<1.8	<1.5
PCB-167	<1.2	<1.7	<2.7	<1.5	<1.6	<1.4
PCB-156/157	<2.5	<2.6	4.72	<2.3	<2.4	<2.1
PCB-169	<1.4	<2.0	<3.2	<1.8	<1.9	<1.5
PCB-188	<2.2	<1.5	<2.2	<1.8	<1.4	<1.4
PCB-179	11.9	<6.4	<9.7	<20	3.70	4.42
PCB-184	<2.0	<1.4	<2.0	<1.7	<1.3	<1.4
PCB-176	<2.1	<1.4	<3.0	5.40	<1.4	<1.4
PCB-186	<2.3	<1.5	<2.2	<1.8	<1.4	<1.5
PCB-178	<3.0	<2.0	<4.0	5.49	<4.4	<6.2
PCB-175	<2.9	<1.9	<2.9	<2.3	<1.8	<1.9
PCB-187	23.3	15.1	19.8	34.5	<4.6	10.1
PCB-182	<2.8	<1.9	<2.8	<2.3	<1.8	<1.8
PCB-183	7.23	7.05	8.22	11.4	<2.2	<3.3
PCB-185	<3.1	<2.1	<3.1	<2.5	<2.0	<2.1
PCB-174	11.9	<8.7	<6.6	17.2	3.34	<1.8
PCB-177	6.18	<2.1	<6.7	10.6	<2.0	<2.0
PCB-181	<3.0	<2.0	<3.0	<2.4	<1.9	<2.0
PCB-171/173	<3.1	<2.1	<3.4	<2.6	<2.0	<2.1
PCB-172	<3.0	<2.0	<3.0	<2.5	<1.9	<2.0

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Sample Analysis Summary Report

Sample Name	HEISER-20190808-0815	CITY-20190808-0815	RESIDENTIAL-20190808-0815	HEISER-20190815-0823	CITY-20190815-0823	RESIDENTIAL-20190815-0823
ALS Sample ID	L2336381-1	L2336381-2	L2336381-3	L2336381-4	L2336381-5	L2336381-6
Sample Size	1	1	1	1	1	1
Sample size units	Sample	Sample	Sample	Sample	Sample	Sample
Percent Moisture	n/a	n/a	n/a	n/a	n/a	n/a
Sample Matrix	Air	Air	Air	Air	Air	Air
Sampling Date	15-Aug-19	15-Aug-19	15-Aug-19	23-Aug-19	23-Aug-19	23-Aug-19
Extraction Date	5-Sep-19	5-Sep-19	5-Sep-19	5-Sep-19	5-Sep-19	5-Sep-19
Target Analytes	pg	pg	pg	pg	pg	pg
PCB-192	<2.5	<1.7	<2.5	<2.1	<1.6	<1.7
PCB-180/193	16.5	14.9	19.8	21.6	<5.7	<8.2
PCB-191	<2.3	<1.5	<2.3	<1.9	<1.5	<1.5
PCB-170	3.63	5.00	<3.2	<4.0	<2.1	<2.2
PCB-190	<2.1	<1.4	<2.1	<1.7	<1.4	<1.4
PCB-189	<1.8	<1.6	<3.1	<2.0	<1.8	<1.7
PCB-202	<3.8	<4.3	<5.7	4.27	<1.4	3.32
PCB-201	<1.2	<1.1	<3.5	1.48	<1.3	<1.1
PCB-204	<1.2	<1.2	<2.7	<1.4	<1.3	<1.1
PCB-197	<1.2	<1.1	<2.7	<1.4	<1.3	<1.1
PCB-200	<1.2	<1.2	<2.7	<1.5	<1.3	<1.1
PCB-198/199	<4.6	<4.8	<11	6.99	<1.9	4.94
PCB-196	2.19	<1.6	<3.8	<2.8	<1.8	<1.5
PCB-203	2.92	<3.0	<3.6	5.20	<1.7	3.38
PCB-195	<1.5	<1.7	<3.1	<1.9	<1.7	<1.5
PCB-194	<2.2	4.45	6.17	<1.8	<2.5	3.25
PCB-205	<1.2	<1.3	<2.4	<1.4	<1.3	<1.1
PCB-208	<2.1	<2.4	<3.9	<2.4	<2.1	<1.7
PCB-207	<2.1	<2.4	<3.9	<2.4	<2.1	<1.7
PCB-206	<3.6	<4.2	<6.5	<4.2	<3.7	<2.8
PCB-209	<1.1	<1.1	<1.9	<1.3	<0.95	<1.2
Extraction Standards	% Rec	% Rec	% Rec	% Rec	% Rec	% Rec
13C12-PCB-001	38	34	42	40	47	49
13C12-PCB-003	38	35	41	40	47	48
13C12-PCB-004	50	48	57	51	60	64
13C12-PCB-015	43	44	48	43	50	55
13C12-PCB-019	56	55	70	57	65	71
13C12-PCB-037	57	57	60	52	60	67
13C12-PCB-054	66	65	78	63	73	79
13C12-PCB-081	66	64	69	59	64	76
13C12-PCB-077	65	64	67	60	64	78
13C12-PCB-104	75	74	84	72	78	89
13C12-PCB-123	76	77	79	69	74	87
13C12-PCB-118	78	80	82	71	74	89
13C12-PCB-114	76	78	80	70	75	86
13C12-PCB-105	76	77	80	69	74	86
13C12-PCB-126	76	77	78	68	71	85
13C12-PCB-155	85	86	92	78	84	96
13C12-PCB-167	90	87	93	79	80	97
13C12-PCB-156/157	88	86	91	78	80	96
13C12-PCB-169	95	91	99	84	86	106
13C12-PCB-188	88	89	92	82	83	99
13C12-PCB-189	87	86	90	79	78	95
13C12-PCB-202	96	96	104	88	88	105
13C12-PCB-205	100	100	103	88	93	109
13C12-PCB-208	96	99	98	84	89	105
13C12-PCB-206	101	102	107	90	93	110
13C12-PCB-209	112	114	117	98	102	119
Field Spike Standards						
4-chloro-4'-fluorobiphenyl	77	81	67	68	66	76
13C12-PCB-095	65	67	66	64	65	63
13C12-PCB-031	88	92	93	95	90	91
13C12-PCB-095	82	85	88	88	85	87
13C12-PCB-153	80	87	84	89	85	86
Cleanup Standards						
13C12-PCB-028	56	52	58	54	53	61
13C12-PCB-111	74	70	71	69	64	78
13C12-PCB-178	88	81	85	79	71	89

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Sample Analysis Summary Report

Sample Name	HEISER-20190808-0815	CITY-20190808-0815	RESIDENTIAL-20190808-0815	HEISER-20190815-0823	CITY-20190815-0823	RESIDENTIAL-20190815-0823
ALS Sample ID	L2336381-1	L2336381-2	L2336381-3	L2336381-4	L2336381-5	L2336381-6
Sample Size	1	1	1	1	1	1
Sample size units	Sample	Sample	Sample	Sample	Sample	Sample
Percent Moisture	n/a	n/a	n/a	n/a	n/a	n/a
Sample Matrix	Air	Air	Air	Air	Air	Air
Sampling Date	15-Aug-19	15-Aug-19	15-Aug-19	23-Aug-19	23-Aug-19	23-Aug-19
Extraction Date	5-Sep-19	5-Sep-19	5-Sep-19	5-Sep-19	5-Sep-19	5-Sep-19
Target Analytes	pg	pg	pg	pg	pg	pg
Homologue Group Totals						
Total MonoCB	87.7	106	162	71.6	66.4	90.1
Total DiCB	491	750	1130	248	394	664
Total TriCB	695	920	1600	337	416	775
Total TetraCB	583	703	1220	374	352	567
Total PentaCB	461	576	810	318	272	359
Total HexaCB	241	258	326	301	130	149
Total HeptaCB	80.6	57.2	81.2	130	23.9	32.2
Total OctaCB	15.7	16.6	26.4	20.7	2.50	14.9
Total NonaCB	<2.1	<2.4	<3.9	<2.4	<2.1	<1.7
DecaCB	<1.1	<1.1	<1.9	<1.3	<0.95	<1.2
Total PCB	2660	3390	5360	1800	1660	2650
Toxic Equivalency - (WHO 2005)						
Lower Bound PCB TEQ	0.00109	0.00191	0.00302	0.00	0.00114	0.00116
Mid Point PCB TEQ	0.258	0.303	0.503	0.309	0.260	0.239
Upper Bound PCB TEQ	0.515	0.604	1.00	0.617	0.520	0.478

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Quality Control Summary Report

Sample Name	Method Blank	Method Blank
ALS Sample ID	WG3136778-1	WG3136778-4
Sample Size	1	1
Sample size units	Blank	Blank
Percent Moisture	n/a	n/a
Sample Matrix	Media	Reagent
Sampling Date	n/a	n/a
Extraction Date	5-Sep-19	5-Sep-19
Target Analytes	pg	pg
PCB-001	<2.9	<5.3
PCB-002	<2.9	<5.8
PCB-003	<3.4	<7.7
PCB-004	<7.0	<18
PCB-010	<4.4	<14
PCB-009	<4.5	<14
PCB-007	20.1	<13
PCB-006	<4.2	<13
PCB-005	<5.3	<16
PCB-008	9.38	<11
PCB-014	<5.2	<17
PCB-011	117	<18
PCB-012/013	<5.4	<18
PCB-015	<6.7	<25
PCB-019	<4.1	<10
PCB-018/030	<7.0	<8.1
PCB-017	<4.4	<9.5
PCB-027	<3.2	<6.8
PCB-024	<3.4	<7.3
PCB-016	<5.2	<11
PCB-032	<2.9	<6.3
PCB-034	<4.0	<9.8
PCB-023	<3.8	<9.5
PCB-026/029	<3.7	<9.2
PCB-025	<3.6	<8.9
PCB-031	10.3	<8.7
PCB-020/028	14.1	<9.5
PCB-021/033	<7.7	<9.4
PCB-022	<3.9	<9.5
PCB-036	<3.4	<8.4
PCB-039	<3.8	<9.3
PCB-038	<4.0	<9.9
PCB-035	<4.0	<9.9
PCB-037	<4.9	<14
PCB-054	<1.4	<3.3
PCB-050/053	<2.4	<5.9
PCB-045/051	<2.5	<6.2
PCB-046	<2.7	<6.8
PCB-052	9.11	<6.0
PCB-073	<1.8	<4.4
PCB-043	<3.0	<7.3
PCB-049/069	<3.4	<5.3
PCB-048	<2.4	<5.9
PCB-044/047/065	15.7	<5.6
PCB-059/062/075	<1.8	<4.5
PCB-042	<3.1	<6.8
PCB-040/041/071	3.02	<6.0
PCB-064	4.24	<4.7
PCB-072	<2.3	<5.0
PCB-068	<2.2	<4.8
PCB-057	<2.4	<5.3
PCB-058	<2.4	<5.3
PCB-067	<2.3	<4.9
PCB-063	<2.1	<4.5
PCB-061/070/074/076	11.8	<5.3
PCB-066	7.21	<4.9
PCB-055	<2.4	<5.3
PCB-056	4.74	<5.5
PCB-060	<2.5	<5.4
PCB-080	<2.0	<4.4
PCB-079	<2.2	<4.7
PCB-078	<2.4	<5.3
PCB-081	<2.8	<6.3
PCB-077	<2.9	<6.7
PCB-104	<1.4	<3.8
PCB-096	<1.4	<3.8
PCB-103	<2.4	<5.0
PCB-094	<2.9	<6.0
PCB-095	<4.0	<5.5
PCB-093/098/100/102	<2.7	<5.6

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Quality Control Summary Report

Sample Name	Method Blank	Method Blank
ALS Sample ID	WG3136778-1	WG3136778-4
Sample Size	1	1
Sample size units	Blank	Blank
Percent Moisture	n/a	n/a
Sample Matrix	Media	Reagent
Sampling Date	n/a	n/a
Extraction Date	5-Sep-19	5-Sep-19
Target Analytes	pg	pg
PCB-088/091	<2.7	<5.6
PCB-084	<3.0	<6.2
PCB-089	<2.9	<6.0
PCB-121	<2.0	<4.1
PCB-092	<2.7	<5.6
PCB-090/101/113	<4.7	<4.8
PCB-083/099	<3.7	<5.7
PCB-112	<1.9	<3.9
PCB-086/087/097/109/119/125	<5.3	<4.9
PCB-085/110/115/116/117	9.52	<4.5
PCB-082	<3.3	<6.9
PCB-111	<2.0	<4.0
PCB-120	<1.8	<3.7
PCB-108/124	<1.8	<4.4
PCB-107	<1.7	<4.2
PCB-123	<2.0	<4.9
PCB-106	<1.8	<4.5
PCB-118	4.80	<4.5
PCB-122	<1.9	<4.7
PCB-114	<1.9	<4.8
PCB-105	<2.0	<4.6
PCB-127	<1.8	<4.3
PCB-126	<2.2	<5.4
PCB-155	<0.66	<1.5
PCB-152	<0.68	<1.5
PCB-150	<0.68	<1.5
PCB-136	<0.69	<1.6
PCB-145	<0.71	<1.6
PCB-148	<0.91	<2.1
PCB-135/151	<1.2	<2.2
PCB-154	<0.75	<1.7
PCB-144	<0.92	<2.1
PCB-147/149	<1.5	<2.5
PCB-134/143	<4.5	<3.1
PCB-139/140	<1.5	<2.5
PCB-131	<2.0	<3.2
PCB-142	<1.8	<3.0
PCB-132	<1.8	<2.9
PCB-133	<1.7	<2.7
PCB-165	<1.3	<2.1
PCB-146	<1.4	<2.3
PCB-161	<1.2	<2.0
PCB-153/168	4.34	<2.1
PCB-141	<1.6	<2.6
PCB-130	<1.9	<3.0
PCB-137/164	<1.4	<2.3
PCB-129/138/163	<6.5	<3.1
PCB-160	<0.95	<1.6
PCB-158	<1.1	<1.8
PCB-128/166	<1.4	<2.3
PCB-159	<1.2	<1.9
PCB-162	<1.3	<2.1
PCB-167	<1.1	<1.8
PCB-156/157	<1.7	<2.8
PCB-169	<1.3	<2.1
PCB-188	<0.87	<1.9
PCB-179	<0.84	<1.8
PCB-184	<0.81	<1.7
PCB-176	<0.85	<1.8
PCB-186	<0.89	<1.9
PCB-178	<1.2	<2.5
PCB-175	<1.1	<2.4
PCB-187	<1.1	<2.2
PCB-182	<1.1	<2.3
PCB-183	<1.1	<2.3
PCB-185	<1.2	<2.6
PCB-174	<1.1	<2.3
PCB-177	<1.2	<2.6
PCB-181	<1.2	<2.5
PCB-171/173	<1.2	<2.6
PCB-172	<1.2	<2.5

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Quality Control Summary Report

Sample Name	Method Blank	Method Blank
ALS Sample ID	WG3136778-1	WG3136778-4
Sample Size	1	1
Sample size units	Blank	Blank
Percent Moisture	n/a	n/a
Sample Matrix	Media	Reagent
Sampling Date	n/a	n/a
Extraction Date	5-Sep-19	5-Sep-19
Target Analytes	pg	pg
PCB-192	<1.0	<2.1
PCB-180/193	1.74	<2.2
PCB-191	<0.92	<1.9
PCB-170	<1.3	<2.7
PCB-190	<0.85	<1.8
PCB-189	<1.1	<1.9
PCB-202	<0.75	<1.5
PCB-201	<0.71	<1.4
PCB-204	<0.72	<1.4
PCB-197	<0.71	<1.4
PCB-200	<0.73	<1.4
PCB-198/199	<1.0	<2.0
PCB-196	<1.0	<2.0
PCB-203	<0.94	<1.9
PCB-195	<1.1	<2.6
PCB-194	<1.5	<3.5
PCB-205	<0.84	<2.0
PCB-208	<2.1	<4.1
PCB-207	<2.1	<4.0
PCB-206	<3.5	<6.6
PCB-209	<0.77	<1.8
Extraction Standards	% Rec	% Rec
13C12-PCB-001	26	32
13C12-PCB-003	30	30
13C12-PCB-004	41	43
13C12-PCB-015	38	33
13C12-PCB-019	48	50
13C12-PCB-037	54	42
13C12-PCB-054	62	56
13C12-PCB-081	72	55
13C12-PCB-077	74	56
13C12-PCB-104	82	67
13C12-PCB-123	83	69
13C12-PCB-118	87	73
13C12-PCB-114	86	69
13C12-PCB-105	86	72
13C12-PCB-126	86	73
13C12-PCB-155	88	79
13C12-PCB-167	92	89
13C12-PCB-156/157	91	90
13C12-PCB-169	100	99
13C12-PCB-188	92	85
13C12-PCB-189	90	93
13C12-PCB-202	100	102
13C12-PCB-205	105	105
13C12-PCB-208	100	97
13C12-PCB-206	107	109
13C12-PCB-209	114	119
Field Spike Standards		
13C12-PCB-031	NS	NS
13C12-PCB-095	NS	NS
13C12-PCB-153	NS	NS
Cleanup Standards		
13C12-PCB-028	44	43
13C12-PCB-111	70	68
13C12-PCB-178	78	84

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Quality Control Summary Report

Sample Name	Method Blank	Method Blank
ALS Sample ID	WG3136778-1	WG3136778-4
Sample Size	1	1
Sample size units	Blank	Blank
Percent Moisture	n/a	n/a
Sample Matrix	Media	Reagent
Sampling Date	n/a	n/a
Extraction Date	5-Sep-19	5-Sep-19
Target Analytes	pg	pg
Homologue Group Totals		
Total MonoCB	<2.9	<5.3
Total DiCB	146	<11
Total TriCB	39.1	<6.3
Total TetraCB	62.3	<3.3
Total PentaCB	32.0	<3.7
Total HexaCB	16.5	<1.5
Total HeptaCB	1.74	<1.7
Total OctaCB	1.50	3.50
Total NonaCB	<2.1	<4.0
DecaCB	<0.77	<1.8
Total PCB	300	3.50
Toxic Equivalency - (WHO 2005)		
Lower Bound PCB TEQ	0.000144	0.00
Mid Point PCB TEQ	0.130	0.303
Upper Bound PCB TEQ	0.261	0.606

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Sample Analysis Summary Report

Sample Name **Laboratory Control Sample**

ALS Sample ID WG3136778-2

Sample Size 1
 Sample size units n/a
 Percent Moisture n/a
 Sample Matrix QC
 Sampling Date n/a
 Extraction Date 5-Sep-19

Target Analytes	% Rec
PCB-001	110
PCB-003	106
PCB-004	100
PCB-015	108
PCB-019	111
PCB-037	106
PCB-054	105
PCB-081	103
PCB-077	106
PCB-104	93
PCB-123	101
PCB-118	99
PCB-114	101
PCB-105	96
PCB-126	97
PCB-155	98
PCB-167	94
PCB-156/157	97
PCB-169	96
PCB-188	98
PCB-189	106
PCB-202	106
PCB-205	87
PCB-208	102
PCB-206	103
PCB-209	113

Extraction Standards	% Rec
13C12-PCB-001	41
13C12-PCB-003	38
13C12-PCB-004	53
13C12-PCB-015	44
13C12-PCB-019	57
13C12-PCB-037	61
13C12-PCB-054	72
13C12-PCB-081	72
13C12-PCB-077	72
13C12-PCB-104	88
13C12-PCB-123	83
13C12-PCB-118	87
13C12-PCB-114	86
13C12-PCB-105	86
13C12-PCB-126	85
13C12-PCB-155	99
13C12-PCB-167	103
13C12-PCB-156/157	101
13C12-PCB-169	108
13C12-PCB-188	102
13C12-PCB-189	98
13C12-PCB-202	114
13C12-PCB-205	117
13C12-PCB-208	115
13C12-PCB-206	119
13C12-PCB-209	127

Field Spike Standards	
13C12-PCB-031	NS
13C12-PCB-095	NS
13C12-PCB-153	NS

Cleanup Standards	
13C12-PCB-028	53
13C12-PCB-111	74
13C12-PCB-178	94

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Sample Analysis summary Report

Sample Name	CCV	CCV	RS
ALS Sample ID	H5-19-CCV-758	H5-19-CCV-760	H5-19-RS1-005
Sample Size	1	1	1
Sample size units	n/a	n/a	n/a
Percent Moisture	n/a	n/a	n/a
Sample Matrix	QC	QC	QC
Sampling Date	n/a	n/a	n/a
Extraction Date	n/a	n/a	n/a

Target Analytes	% Rec	% Rec	% Rec
PCB-001	99	100	100
PCB-003	95	96	100
PCB-004	88	89	105
PCB-015	97	97	103
PCB-019	96	96	102
PCB-037	94	92	90
PCB-054	93	94	103
PCB-081	97	96	95
PCB-077	99	99	99
PCB-104	90	91	95
PCB-123	90	90	104
PCB-118	90	90	102
PCB-114	89	90	104
PCB-105	89	90	99
PCB-126	92	90	104
PCB-155	90	90	97
PCB-167	87	88	97
PCB-156/157	89	89	98
PCB-169	92	92	100
PCB-188	90	91	99
PCB-189	96	96	106
PCB-202	93	92	100
PCB-205	82	83	98
PCB-208	98	98	96
PCB-206	97	98	103
PCB-209	93	93	107

Extraction Standards	% Rec	% Rec	% Rec
13C12-PCB-001	73	73	101
13C12-PCB-003	77	77	99
13C12-PCB-004	95	93	100
13C12-PCB-015	74	77	100
13C12-PCB-019	98	97	103
13C12-PCB-037	82	85	97
13C12-PCB-054	116	114	100
13C12-PCB-081	81	81	97
13C12-PCB-077	83	82	96
13C12-PCB-104	114	112	100
13C12-PCB-123	87	88	96
13C12-PCB-118	90	90	98
13C12-PCB-114	89	89	97
13C12-PCB-105	88	87	97
13C12-PCB-126	86	86	94
13C12-PCB-155	116	113	100
13C12-PCB-167	99	98	100
13C12-PCB-156/157	97	97	98
13C12-PCB-169	98	99	96
13C12-PCB-188	106	105	102
13C12-PCB-189	94	96	98
13C12-PCB-202	113	111	101
13C12-PCB-205	100	101	102
13C12-PCB-208	97	96	102
13C12-PCB-206	103	104	103
13C12-PCB-209	109	113	103

Field Spike Standards	% Rec	% Rec	% Rec
13C12-PCB-031	88	88	101
13C12-PCB-095	92	91	105
13C12-PCB-153	86	86	101

Cleanup Standards	% Rec	% Rec	% Rec
13C12-PCB-028	87	87	101
13C12-PCB-111	88	87	101
13C12-PCB-178	96	95	103

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Sample Analysis Report

Sample Name HEISER-20190808-0815	Sampling Date	15-Aug-19	Approved: <i>E. Sabljic</i> --e-signature-- 13-Sep-2019
ALS Sample ID	Extraction Date	5-Sep-19	
Analysis Method	Sample Size	1 Sample	
Analysis Type	Percent Moisture	n/a	
Sample Matrix	Split Ratio	4	

Run Information	Run 1
Filename	5-190911A11
Run Date	11-Sep-19 16:52
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-001		8.95	46.0	2.6	J		100
PCB-002		10.35	<14	2.8	M,J,R	14	100
PCB-003		10.48	27.7	3.5	M,J		100
PCB-004		10.63	136	22	M		100
PCB-010		NotFnd	<14	14	U		100
PCB-009		NotFnd	<14	14	U		100
PCB-007		NotFnd	<14	14	U		100
PCB-006		NotFnd	<13	13	U		100
PCB-005		NotFnd	<17	17	U		100
PCB-008		12.44	<130	12	R	130	100
PCB-014		NotFnd	<10	10	U		100
PCB-011		13.92	225	11	B		100
PCB-012/013		NotFnd	<11	11	U		100
PCB-015		NotFnd	<14	14	U		100
PCB-019		12.64	<27	5.7	M,J,R	27	100
PCB-018/030		13.73	134	5.3			100
PCB-017		13.98	60.5	6.2	J		100
PCB-027		14.11	<9.4	4.5	M,J,R	9.4	100
PCB-024		NotFnd	<4.8	4.8	U		100
PCB-016		14.28	62.6	7.2	M,J		100
PCB-032		14.55	37.8	4.1	M,J		100
PCB-034		NotFnd	<6.7	6.7	U		100
PCB-023		NotFnd	<6.4	6.4	U		100
PCB-026/029		15.52	28.1	6.3	J		100
PCB-025		15.66	11.7	6.0	M,J		100
PCB-031		15.84	99.1	5.9	J,B		100
PCB-020/028		16.01	110	6.4	M,B		100
PCB-021/033		16.15	63.1	6.4	M,J		100
PCB-022		16.39	36.0	6.5	M,J		100
PCB-036		NotFnd	<5.7	5.7	U		100
PCB-039		NotFnd	<6.3	6.3	U		100
PCB-038		NotFnd	<6.7	6.7	U		100
PCB-035		NotFnd	<6.7	6.7	U		100
PCB-037		18.27	<16	8.3	M,J,R	16	100
PCB-054		NotFnd	<2.2	2.2	U		100
PCB-050/053		15.69	16.3	4.1	M,J		100
PCB-045/051		16.10	24.7	4.3	M,J		100
PCB-046		16.27	<6.7	4.8	J,R	6.7	100
PCB-052		17.00	139	4.2	M		100
PCB-073		NotFnd	<3.1	3.1	U		100
PCB-043		NotFnd	<5.1	5.1	U		100
PCB-049/069		17.28	52.3	3.7	J		100
PCB-048		17.43	<14	4.1	J,R	14	100
PCB-044/047/065		17.57	94.0	3.9	M,J,B		100
PCB-059/062/075		17.75	<7.3	3.1	J,R	7.3	100
PCB-042		17.87	21.8	4.7	J		100
PCB-040/041/071		18.13	36.3	4.2	J		100
PCB-064		18.25	30.8	3.3	J,B		100
PCB-072		NotFnd	<2.9	2.9	U		100
PCB-068		NotFnd	<2.8	2.8	U		100
PCB-057		NotFnd	<3.1	3.1	U		100
PCB-058		NotFnd	<3.0	3.0	U		100
PCB-067		NotFnd	<2.9	2.9	U		100
PCB-063		NotFnd	<2.6	2.6	U		100
PCB-061/070/074/076		19.60	89.3	3.1	J,B		100
PCB-066		19.78	30.3	2.9	M,J,B		100
PCB-055		NotFnd	<3.1	3.1	U		100
PCB-056		20.18	<13	3.2	J,R	13	100
PCB-060		20.28	7.28	3.1	J		100
PCB-080		NotFnd	<2.5	2.5	U		100
PCB-079		NotFnd	<2.7	2.7	U		100
PCB-078		NotFnd	<3.1	3.1	U		100
PCB-081	0.0003	NotFnd	<3.5	3.5	U		100
PCB-077	0.0001	NotFnd	<3.8	3.8	U		100
PCB-104		NotFnd	<2.6	2.6	U		100
PCB-096		NotFnd	<2.5	2.5	U		100
PCB-103		NotFnd	<3.8	3.8	U		100
PCB-094		NotFnd	<4.6	4.6	U		100
PCB-095		19.14	88.6	4.2	J		100
PCB-093/098/100/102		NotFnd	<4.3	4.3	U		100

ALS Life Sciences

Sample Analysis Report

Sample Name HEISER-20190808-0815
 ALS Sample ID L2336381-1
 Analysis Method EPA 1668C
 Analysis Type Sample
 Sample Matrix Air

Sampling Date 15-Aug-19
 Extraction Date 5-Sep-19
 Sample Size 1 Sample
 Percent Moisture n/a
 Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information

Run 1

Filename 5-190911A11
 Run Date 11-Sep-19 16:52
 Final Volume 25 ul
 Dilution Factor 1
 Analysis Units pg
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-088/091		19.59	<14	4.3	J,R	14	100
PCB-084		19.76	21.8	4.7	J		100
PCB-089		NotFnd	<4.6	4.6	U		100
PCB-121		NotFnd	<3.1	3.1	U		100
PCB-092		20.35	<14	4.3	J,R	14	100
PCB-090/101/113		20.66	90.6	3.7	J		100
PCB-083/099		20.96	<33	4.4	J,R	33	100
PCB-112		NotFnd	<3.0	3.0	U		100
PCB-086/087/097/109/119/125		21.32	53.1	3.7	M,J		100
PCB-085/110/115/116/117		21.74	90.8	3.4	M,J,B		100
PCB-082		21.94	<8.3	5.3	M,J,R	8.3	100
PCB-111		NotFnd	<3.1	3.1	U		100
PCB-120		NotFnd	<2.8	2.8	U		100
PCB-108/124		NotFnd	<3.8	3.8	U		100
PCB-107		NotFnd	<3.6	3.6	U		100
PCB-123	0.00003	NotFnd	<4.1	4.1	U		100
PCB-106		NotFnd	<3.8	3.8	U		100
PCB-118	0.00003	23.28	36.2	3.8	M,J,B		100
PCB-122		NotFnd	<4.0	4.0	U		100
PCB-114	0.00003	NotFnd	<4.1	4.1	U		100
PCB-105	0.00003	23.95	<11	4.1	M,J,R	11	100
PCB-127		NotFnd	<3.7	3.7	U		100
PCB-126	0.1	25.53	<4.7	4.7	U	3.0	100
PCB-155		NotFnd	<1.1	1.1	U		100
PCB-152		NotFnd	<1.2	1.2	U		100
PCB-150		NotFnd	<1.2	1.2	U		100
PCB-136		20.99	13.2	1.2	J		100
PCB-145		NotFnd	<1.2	1.2	U		100
PCB-148		NotFnd	<1.6	1.6	U		100
PCB-135/151		22.18	33.8	1.7	M,J		100
PCB-154		NotFnd	<1.3	1.3	U		100
PCB-144		22.50	2.76	1.6	M,J		100
PCB-147/149		22.68	55.2	1.6	J		100
PCB-134/143		22.81	<2.9	1.9	J,R	2.9	100
PCB-139/140		22.98	<1.6	1.6	U	0.69	100
PCB-131		NotFnd	<2.1	2.1	U		100
PCB-142		NotFnd	<1.9	1.9	U		100
PCB-132		23.38	<15	1.9	J,R	15	100
PCB-133		NotFnd	<1.7	1.7	U		100
PCB-165		NotFnd	<1.4	1.4	U		100
PCB-146		23.89	8.03	1.5	J		100
PCB-161		NotFnd	<1.3	1.3	U		100
PCB-153/168		24.20	42.5	1.3	J,B		100
PCB-141		24.33	<9.6	1.6	J,R	9.6	100
PCB-130		24.58	2.78	1.9	J		100
PCB-137/164		NotFnd	<1.4	1.4	U		100
PCB-129/138/163		24.90	45.3	1.9	J		100
PCB-160		NotFnd	<0.98	0.98	U		100
PCB-158		25.10	3.43	1.1	J		100
PCB-128/166		25.60	4.14	1.5	J		100
PCB-159		NotFnd	<1.2	1.2	U		100
PCB-162		NotFnd	<1.3	1.3	U		100
PCB-167	0.00003	26.42	<1.2	1.2	U	1.0	100
PCB-156/157	0.00003	27.04	<2.5	1.8	M,J,R	2.5	200
PCB-169	0.03	NotFnd	<1.4	1.4	U		100
PCB-188		NotFnd	<2.2	2.2	U		100
PCB-179		23.74	11.9	2.1	M,J		100
PCB-184		NotFnd	<2.0	2.0	U		100
PCB-176		NotFnd	<2.1	2.1	U		100
PCB-186		NotFnd	<2.3	2.3	U		100
PCB-178		25.08	<3.0	3.0	M,U	2.8	100
PCB-175		NotFnd	<2.9	2.9	U		100
PCB-187		25.55	23.3	2.7	J		100
PCB-182		NotFnd	<2.8	2.8	U		100
PCB-183		25.87	7.23	2.8	J		100
PCB-185		NotFnd	<3.1	3.1	U		100
PCB-174		26.03	11.9	2.8	M,J		100
PCB-177		26.27	6.18	3.1	J		100
PCB-181		NotFnd	<3.0	3.0	U		100
PCB-171/173		NotFnd	<3.1	3.1	U		100
PCB-172		NotFnd	<3.0	3.0	U		100

ALS Life Sciences

Sample Analysis Report

Sample Name HEISER-20190808-0815
 ALS Sample ID L2336381-1
 Analysis Method EPA 1668C
 Analysis Type Sample
 Sample Matrix Air

Sampling Date 15-Aug-19
 Extraction Date 5-Sep-19
 Sample Size 1 Sample
 Percent Moisture n/a
 Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information **Run 1**
 Filename 5-190911A11
 Run Date 11-Sep-19 16:52
 Final Volume 25 ul
 Dilution Factor 1
 Analysis Units pg
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-192		NotFnd	<2.5	2.5		U	100
PCB-180/193		27.72	16.5	2.6	J,B		100
PCB-191		NotFnd	<2.3	2.3		U	100
PCB-170		28.43	3.63	3.2	M,J		100
PCB-190		NotFnd	<2.1	2.1		U	100
PCB-189	0.00003	NotFnd	<1.8	1.8		U	100
PCB-202		26.29	<3.8	1.2	J,R	3.8	100
PCB-201		NotFnd	<1.2	1.2		U	100
PCB-204		NotFnd	<1.2	1.2		U	100
PCB-197		NotFnd	<1.2	1.2		U	100
PCB-200		NotFnd	<1.2	1.2		U	100
PCB-198/199		28.72	<4.6	1.7	M,J,R	4.6	100
PCB-196		29.06	2.19	1.7	M,J		100
PCB-203		29.17	2.92	1.6	M,J		100
PCB-195		NotFnd	<1.5	1.5		U	100
PCB-194		31.14	<2.2	1.4	M,J,R	2.2	100
PCB-205		NotFnd	<1.2	1.2		U	100
PCB-208		NotFnd	<2.1	2.1		U	100
PCB-207		NotFnd	<2.1	2.1		U	100
PCB-206		NotFnd	<3.6	3.6		U	100
PCB-209		NotFnd	<1.1	1.1		U	100

Extraction Standards	pg	Time	% Rec	Limits
13C12-PCB-001	4000	8.94	38	5-145
13C12-PCB-003	4000	10.47	38	5-145
13C12-PCB-004	4000	10.63	50	5-145
13C12-PCB-015	4000	14.31	43	5-145
13C12-PCB-019	4000	12.62	56	5-145
13C12-PCB-037	4000	18.25	57	5-145
13C12-PCB-054	4000	14.48	66	5-145
13C12-PCB-081	4000	21.82	66	10-145
13C12-PCB-077	4000	22.13	65	10-145
13C12-PCB-104	4000	17.51	75	10-145
13C12-PCB-123	4000	23.10	76	10-145
13C12-PCB-118	4000	23.27	78	10-145
13C12-PCB-114	4000	23.57	76	10-145
13C12-PCB-105	4000	23.94	76	10-145
13C12-PCB-126	4000	25.53	76	10-145
13C12-PCB-155	4000	20.48	85	10-145
13C12-PCB-167	4000	26.41	90	10-145
13C12-PCB-156/157	8000	27.05	88	10-145
13C12-PCB-169	4000	28.72	95	10-145
13C12-PCB-188	4000	23.49	88	10-145
13C12-PCB-189	4000	29.99	87	10-145
13C12-PCB-202	4000	26.28	96	10-145
13C12-PCB-205	4000	31.39	100	10-145
13C12-PCB-208	4000	29.70	96	10-145
13C12-PCB-206	4000	32.45	101	10-145
13C12-PCB-209	4000	33.58	112	10-145

Field Spike Standards	pg	Time	% Rec	Limits
4-chloro-4'-fluorobiphenyl	6000	15.82	77	70-130
13C12-PCB-095	6000	19.13	65	70-130
13C12-PCB-031	6000	15.82	88	70-130
13C12-PCB-095	6000	19.13	82	70-130
13C12-PCB-153	6000	24.19	80	70-130

Cleanup Standards	pg	Time	% Rec	Limits
13C12-PCB-028	4000	16.00	56	5-145
13C12-PCB-111	4000	22.02	74	10-145
13C12-PCB-178	4000	25.07	88	10-145

ALS Life Sciences

Sample Analysis Report

Sample Name HEISER-20190808-0815	Sampling Date	15-Aug-19	
ALS Sample ID L2336381-1	Extraction Date	5-Sep-19	
Analysis Method EPA 1668C	Sample Size	1	Sample
Analysis Type Sample	Percent Moisture	n/a	
Sample Matrix Air	Split Ratio	4	

Approved:
E. Sabljic
--e-signature--
13-Sep-2019

Run Information	Run 1
Filename	5-190911A11
Run Date	11-Sep-19 16:52
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
Homologue Group Totals							
Total MonoCB			87.7	2.6	J	400	
Total DiCB			491	10	J	800	
Total TriCB			695	4.1	J	800	
Total TetraCB			583	2.2	J	1600	
Total PentaCB			461	2.5	J	1600	
Total HexaCB			241	0.98	J	1600	
Total HeptaCB			80.6	1.8	J	800	
Total OctaCB			15.7	1.2	J	800	
Total NonaCB			<2.1	2.1	U	400	
Total DecaCB			<1.1	1.1	U	400	
Total PCB			2660		J	3200	

Toxic Equivalency - (WHO 2005)		
Lower Bound PCB TEQ		0.00109
Mid Point PCB TEQ		0.258
Upper Bound PCB TEQ		0.515

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identified. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name CITY-20190808-0815
ALS Sample ID L2336381-2
Analysis Method EPA 1668C
Analysis Type Sample
Sample Matrix Air

Sampling Date 15-Aug-19
Extraction Date 5-Sep-19
Sample Size 1 Sample
Percent Moisture n/a
Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information

Run 1

Filename 5-190911A12
Run Date 11-Sep-19 17:34
Final Volume 25 ul
Dilution Factor 1
Analysis Units pg
Instrument - Column HRM55 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-001		8.94	60.5	3.7	J		100
PCB-002		10.34	<14	3.7	M,J,R	14	100
PCB-003		10.47	31.3	4.5	M,J		100
PCB-004		10.63	183	28	M		100
PCB-010		NotFnd	<18	18	U		100
PCB-009		NotFnd	<19	19	U		100
PCB-007		NotFnd	<18	18	U		100
PCB-006		12.15	<47	18	M,J,R	47	100
PCB-005		NotFnd	<22	22	U		100
PCB-008		12.43	185	15			100
PCB-014		NotFnd	<12	12	U		100
PCB-011		13.91	294	13	M,B		100
PCB-012/013		NotFnd	<13	13	U		100
PCB-015		14.31	40.5	16	M,J		100
PCB-019		12.62	<39	6.2	J,R	39	100
PCB-018/030		13.73	190	6.9			100
PCB-017		13.97	82.9	8.1	J		100
PCB-027		14.10	<7.7	5.8	J,R	7.7	100
PCB-024		NotFnd	<6.2	6.2	U		100
PCB-016		14.27	73.6	9.5	J		100
PCB-032		14.55	47.4	5.4	J		100
PCB-034		NotFnd	<6.4	6.4	U		100
PCB-023		NotFnd	<6.2	6.2	U		100
PCB-026/029		15.51	31.0	6.0	J		100
PCB-025		15.64	12.1	5.8	J		100
PCB-031		15.82	131	5.7	M		100
PCB-020/028		16.00	146	6.2	M		100
PCB-021/033		16.14	91.9	6.1	M,J		100
PCB-022		16.38	49.3	6.2	M,J		100
PCB-036		NotFnd	<5.5	5.5	U		100
PCB-039		NotFnd	<6.1	6.1	U		100
PCB-038		NotFnd	<6.5	6.5	U		100
PCB-035		NotFnd	<6.5	6.5	U		100
PCB-037		18.24	<18	8.2	M,J,R	18	100
PCB-054		NotFnd	<2.7	2.7	U		100
PCB-050/053		15.67	21.7	4.6	J		100
PCB-045/051		16.09	24.9	4.8	J		100
PCB-046		16.26	6.16	5.3	J		100
PCB-052		16.99	169	4.7			100
PCB-073		NotFnd	<3.4	3.4	U		100
PCB-043		NotFnd	<5.7	5.7	U		100
PCB-049/069		17.26	63.7	4.2	J		100
PCB-048		17.41	20.0	4.6	J		100
PCB-044/047/065		17.56	114	4.4	B		100
PCB-059/062/075		17.73	<7.2	3.5	J,R	7.2	100
PCB-042		17.86	24.1	5.3	J		100
PCB-040/041/071		18.12	46.5	4.7	J		100
PCB-064		18.24	<36	3.7	J,R	36	100
PCB-072		NotFnd	<3.6	3.6	U		100
PCB-068		NotFnd	<3.4	3.4	U		100
PCB-057		NotFnd	<3.8	3.8	U		100
PCB-058		NotFnd	<3.7	3.7	U		100
PCB-067		NotFnd	<3.5	3.5	U		100
PCB-063		NotFnd	<3.2	3.2	U		100
PCB-061/070/074/076		19.59	108	3.8	B		100
PCB-066		19.77	36.9	3.5	J,B		100
PCB-055		NotFnd	<3.8	3.8	U		100
PCB-056		20.15	<15	3.9	J,R	15	100
PCB-060		20.27	<10	3.8	J,R	10	100
PCB-080		NotFnd	<3.1	3.1	U		100
PCB-079		NotFnd	<3.3	3.3	U		100
PCB-078		NotFnd	<3.8	3.8	U		100
PCB-081	0.0003	NotFnd	<4.2	4.2	U		100
PCB-077	0.0001	NotFnd	<4.7	4.7	U		100
PCB-104		NotFnd	<3.3	3.3	U		100
PCB-096		NotFnd	<3.1	3.1	U		100
PCB-103		NotFnd	<4.1	4.1	U		100
PCB-094		NotFnd	<5.0	5.0	U		100
PCB-095		19.13	105	4.6	M		100
PCB-093/098/100/102		NotFnd	<4.6	4.6	U		100

ALS Life Sciences

Sample Analysis Report

Sample Name CITY-20190808-0815
ALS Sample ID L2336381-2
Analysis Method EPA 1668C
Analysis Type Sample
Sample Matrix Air

Sampling Date 15-Aug-19
Extraction Date 5-Sep-19
Sample Size 1 Sample
Percent Moisture n/a
Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information

Run 1

Filename 5-190911A12
Run Date 11-Sep-19 17:34
Final Volume 25 ul
Dilution Factor 1
Analysis Units pg
Instrument - Column HRM55 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-088/091		19.59	<12	4.6	M,J,R	12	100
PCB-084		19.75	33.0	5.1	M,J		100
PCB-089		NotFnd	<4.9	4.9	U		100
PCB-121		NotFnd	<3.3	3.3	U		100
PCB-092		20.33	<19	4.6	J,R	19	100
PCB-090/101/113		20.64	104	4.0			100
PCB-083/099		20.95	52.8	4.7	M,J		100
PCB-112		NotFnd	<3.3	3.3	U		100
PCB-086/087/097/109/119/125		21.32	66.2	4.0	M,J		100
PCB-085/110/115/116/117		21.73	110	3.7	M		100
PCB-082		21.93	<9.7	5.7	M,J,R	9.7	100
PCB-111		NotFnd	<3.3	3.3	U		100
PCB-120		NotFnd	<3.0	3.0	U		100
PCB-108/124		NotFnd	<4.3	4.3	U		100
PCB-107		NotFnd	<4.1	4.1	U		100
PCB-123	0.00003	NotFnd	<4.7	4.7	U		100
PCB-106		NotFnd	<4.4	4.4	U		100
PCB-118	0.00003	23.27	46.7	4.4	J,B		100
PCB-122		NotFnd	<4.6	4.6	U		100
PCB-114	0.00003	NotFnd	<4.6	4.6	U		100
PCB-105	0.00003	23.94	17.1	4.6	J		100
PCB-127		NotFnd	<4.2	4.2	U		100
PCB-126	0.1	NotFnd	<5.4	5.4	U		100
PCB-155		NotFnd	<1.0	1.0	U		100
PCB-152		NotFnd	<1.1	1.1	U		100
PCB-150		NotFnd	<1.1	1.1	U		100
PCB-136		20.98	12.4	1.1	J		100
PCB-145		NotFnd	<1.2	1.2	U		100
PCB-148		NotFnd	<1.5	1.5	U		100
PCB-135/151		22.18	27.6	1.6	J		100
PCB-154		NotFnd	<1.3	1.3	U		100
PCB-144		22.47	4.64	1.5	M,J		100
PCB-147/149		22.67	51.8	2.3	J		100
PCB-134/143		22.80	<3.5	2.8	J,R	3.5	100
PCB-139/140		NotFnd	<2.3	2.3	M,U		100
PCB-131		NotFnd	<2.9	2.9	U		100
PCB-142		NotFnd	<2.7	2.7	U		100
PCB-132		23.37	<21	2.6	J,R	21	100
PCB-133		23.54	<2.5	2.5	U	2.3	100
PCB-165		NotFnd	<1.9	1.9	U		100
PCB-146		23.86	7.09	2.1	J		100
PCB-161		NotFnd	<1.8	1.8	U		100
PCB-153/168		24.19	41.4	1.9	M,J,B		100
PCB-141		24.32	12.2	2.3	J		100
PCB-130		24.54	<2.7	2.7	U	2.1	100
PCB-137/164		24.66	6.25	2.0	M,J		100
PCB-129/138/163		24.88	59.5	2.8	J		100
PCB-160		NotFnd	<1.4	1.4	U		100
PCB-158		25.08	5.76	1.6	J		100
PCB-128/166		25.60	<4.7	2.1	J,R	4.7	100
PCB-159		NotFnd	<1.7	1.7	U		100
PCB-162		NotFnd	<1.9	1.9	U		100
PCB-167	0.00003	NotFnd	<1.7	1.7	U		100
PCB-156/157	0.00003	27.03	<2.6	2.6	U		200
PCB-169	0.03	NotFnd	<2.0	2.0	M,U		100
PCB-188		NotFnd	<1.5	1.5	U		100
PCB-179		23.72	<6.4	1.4	M,J,R	6.4	100
PCB-184		NotFnd	<1.4	1.4	U		100
PCB-176		NotFnd	<1.4	1.4	U		100
PCB-186		NotFnd	<1.5	1.5	U		100
PCB-178		NotFnd	<2.0	2.0	U		100
PCB-175		NotFnd	<1.9	1.9	U		100
PCB-187		25.54	15.1	1.8	J		100
PCB-182		NotFnd	<1.9	1.9	U		100
PCB-183		25.84	7.05	1.8	M,J		100
PCB-185		NotFnd	<2.1	2.1	U		100
PCB-174		26.03	<8.7	1.9	M,J,R	8.7	100
PCB-177		NotFnd	<2.1	2.1	U		100
PCB-181		NotFnd	<2.0	2.0	U		100
PCB-171/173		NotFnd	<2.1	2.1	U		100
PCB-172		NotFnd	<2.0	2.0	U		100

ALS Life Sciences

Sample Analysis Report

Sample Name CITY-20190808-0815
ALS Sample ID L2336381-2
Analysis Method EPA 1668C
Analysis Type Sample
Sample Matrix Air

Sampling Date 15-Aug-19
Extraction Date 5-Sep-19
Sample Size 1 Sample
Percent Moisture n/a
Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information

Run 1

Filename 5-190911A12
Run Date 11-Sep-19 17:34
Final Volume 25 ul
Dilution Factor 1
Analysis Units pg
Instrument - Column HRM55 SPB0CTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-192		NotFnd	<1.7	1.7	U		100
PCB-180/193		27.69	14.9	1.7	M,J,B		100
PCB-191		NotFnd	<1.5	1.5	U		100
PCB-170		28.41	5.00	2.2	J		100
PCB-190		NotFnd	<1.4	1.4	U		100
PCB-189	0.00003	NotFnd	<1.6	1.6	U		100
PCB-202		26.27	<4.3	1.2	J,R	4.3	100
PCB-201		NotFnd	<1.1	1.1	U		100
PCB-204		NotFnd	<1.2	1.2	U		100
PCB-197		NotFnd	<1.1	1.1	U		100
PCB-200		NotFnd	<1.2	1.2	U		100
PCB-198/199		28.71	<4.8	1.6	J,R	4.8	100
PCB-196		29.06	<1.6	1.6	U	1.5	100
PCB-203		29.16	<3.0	1.5	M,J,R	3.0	100
PCB-195		NotFnd	<1.7	1.7	U		100
PCB-194		31.11	4.45	1.6	J		100
PCB-205		NotFnd	<1.3	1.3	U		100
PCB-208		NotFnd	<2.4	2.4	U		100
PCB-207		NotFnd	<2.4	2.4	U		100
PCB-206		NotFnd	<4.2	4.2	U		100
PCB-209		NotFnd	<1.1	1.1	U		100

Extraction Standards

	pg	Time	% Rec	Limits
13C12-PCB-001	4000	8.92	34	5-145
13C12-PCB-003	4000	10.47	35	5-145
13C12-PCB-004	4000	10.62	48	5-145
13C12-PCB-015	4000	14.30	44	5-145
13C12-PCB-019	4000	12.61	55	5-145
13C12-PCB-037	4000	18.24	57	5-145
13C12-PCB-054	4000	14.47	65	5-145
13C12-PCB-081	4000	21.81	64	10-145
13C12-PCB-077	4000	22.11	64	10-145
13C12-PCB-104	4000	17.50	74	10-145
13C12-PCB-123	4000	23.09	77	10-145
13C12-PCB-118	4000	23.26	80	10-145
13C12-PCB-114	4000	23.56	78	10-145
13C12-PCB-105	4000	23.92	77	10-145
13C12-PCB-126	4000	25.52	77	10-145
13C12-PCB-155	4000	20.47	86	10-145
13C12-PCB-167	4000	26.40	87	10-145
13C12-PCB-156/157	8000	27.04	86	10-145
13C12-PCB-169	4000	28.71	91	10-145
13C12-PCB-188	4000	23.48	89	10-145
13C12-PCB-189	4000	29.98	86	10-145
13C12-PCB-202	4000	26.27	96	10-145
13C12-PCB-205	4000	31.38	100	10-145
13C12-PCB-208	4000	29.69	99	10-145
13C12-PCB-206	4000	32.44	102	10-145
13C12-PCB-209	4000	33.56	114	10-145

Field Spike Standards

	pg	Time	% Rec	Limits
4-chloro-4'-fluorobiphenyl	6000	15.81	81	70-130
13C12-PCB-095	6000	19.11	67	70-130
13C12-PCB-031	6000	15.81	92	70-130
13C12-PCB-095	6000	19.11	85	70-130
13C12-PCB-153	6000	24.18	87	70-130

Cleanup Standards

	pg	Time	% Rec	Limits
13C12-PCB-028	4000	15.98	52	5-145
13C12-PCB-111	4000	22.01	70	10-145
13C12-PCB-178	4000	25.06	81	10-145

ALS Life Sciences

Sample Analysis Report

Sample Name	CITY-20190808-0815	Sampling Date	15-Aug-19	
ALS Sample ID	L2336381-2	Extraction Date	5-Sep-19	
Analysis Method	EPA 1668C	Sample Size	1	Sample
Analysis Type	Sample	Percent Moisture	n/a	
Sample Matrix	Air	Split Ratio	4	

Approved:
E. Sabljic
--e-signature--
13-Sep-2019

Run Information	Run 1
Filename	5-190911A12
Run Date	11-Sep-19 17:34
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRM55 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
Homologue Group Totals							
Total MonoCB			106	3.7	J	400	
Total DiCB			750	12	J	800	
Total TriCB			920	5.4	J	800	
Total TetraCB			703	2.7	J	1600	
Total PentaCB			576	3.0	J	1600	
Total HexaCB			258	1.0	J	1600	
Total HeptaCB			57.2	1.4	J	800	
Total OctaCB			16.6	1.1	J	800	
Total NonaCB			<2.4	2.4	U	400	
DecaCB			<1.1	1.1	U	400	
Total PCB			3390		J	3200	

Toxic Equivalency - (WHO 2005)		
Lower Bound PCB TEQ		0.00191
Mid Point PCB TEQ		0.303
Upper Bound PCB TEQ		0.604

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identified. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name RESIDENTIAL-20190808-0815
ALS Sample ID L2336381-3
Analysis Method EPA 1668C
Analysis Type Sample
Sample Matrix Air

Sampling Date 15-Aug-19
Extraction Date 5-Sep-19
Sample Size 1 Sample
Percent Moisture n/a
Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information **Run 1**
Filename 5-190911A13
Run Date 11-Sep-19 18:16
Final Volume 25 ul
Dilution Factor 1
Analysis Units pg
Instrument - Column HRM55 SPB0CTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-001		8.95	100	5.1			100
PCB-002		10.35	22.0	5.5	M,J		100
PCB-003		10.48	40.2	7.2	M,J		100
PCB-004		10.65	321	38	M		100
PCB-010		NotFnd	<26	26	U		100
PCB-009		NotFnd	<27	27	U		100
PCB-007		NotFnd	<25	25	U		100
PCB-006		12.16	88.1	25	M,J		100
PCB-005		NotFnd	<31	31	U		100
PCB-008		12.44	327	22			100
PCB-014		NotFnd	<18	18	U		100
PCB-011		13.93	344	20	M,B		100
PCB-012/013		NotFnd	<19	19	U		100
PCB-015		14.32	<52	26	M,J,R	52	100
PCB-019		12.64	69.2	9.1	J		100
PCB-018/030		13.73	323	11	M		100
PCB-017		13.97	<130	13	M,R	130	100
PCB-027		14.11	<16	9.6	M,J,R	16	100
PCB-024		NotFnd	<10	10	U		100
PCB-016		14.28	131	16			100
PCB-032		14.55	<67	8.9	J,R	67	100
PCB-034		NotFnd	<9.5	9.5	U		100
PCB-023		NotFnd	<9.1	9.1	U		100
PCB-026/029		15.52	62.5	8.9	J		100
PCB-025		15.65	<26	8.5	J,R	26	100
PCB-031		15.84	222	8.4			100
PCB-020/028		16.01	263	9.1			100
PCB-021/033		16.15	160	9.0			100
PCB-022		16.39	88.1	9.2	J		100
PCB-036		NotFnd	<8.1	8.1	U		100
PCB-039		NotFnd	<8.9	8.9	U		100
PCB-038		NotFnd	<9.6	9.6	U		100
PCB-035		NotFnd	<9.5	9.5	U		100
PCB-037		18.27	40.6	13	J		100
PCB-054		NotFnd	<3.9	3.9	U		100
PCB-050/053		15.69	<37	5.6	J,R	37	100
PCB-045/051		16.09	46.6	5.9	J		100
PCB-046		16.28	15.7	6.5	J		100
PCB-052		17.00	273	5.7			100
PCB-073		NotFnd	<4.2	4.2	U		100
PCB-043		17.13	12.7	7.0	J		100
PCB-049/069		17.27	110	5.1			100
PCB-048		17.44	44.3	5.6	J		100
PCB-044/047/065		17.57	195	5.3			100
PCB-059/062/075		17.74	14.2	4.3	J		100
PCB-042		17.87	<36	6.4	J,R	36	100
PCB-040/041/071		18.13	81.7	5.7	J		100
PCB-064		18.26	73.0	4.4	J		100
PCB-072		NotFnd	<5.4	5.4	U		100
PCB-068		NotFnd	<5.2	5.2	U		100
PCB-057		NotFnd	<5.7	5.7	U		100
PCB-058		NotFnd	<5.7	5.7	U		100
PCB-067		NotFnd	<5.3	5.3	U		100
PCB-063		NotFnd	<4.9	4.9	U		100
PCB-061/070/074/076		19.59	181	5.7			100
PCB-066		19.78	55.4	5.3	J,B		100
PCB-055		NotFnd	<5.8	5.8	U		100
PCB-056		20.17	30.2	5.9	J,B		100
PCB-060		20.29	12.8	5.8	M,J		100
PCB-080		NotFnd	<4.7	4.7	U		100
PCB-079		NotFnd	<5.1	5.1	U		100
PCB-078		NotFnd	<5.7	5.7	U		100
PCB-081	0.0003	NotFnd	<7.0	7.0	U		100
PCB-077	0.0001	NotFnd	<7.6	7.6	U		100
PCB-104		NotFnd	<5.1	5.1	U		100
PCB-096		NotFnd	<5.6	5.6	U		100
PCB-103		NotFnd	<8.0	8.0	U		100
PCB-094		NotFnd	<9.7	9.7	U		100
PCB-095		19.14	148	8.9			100
PCB-093/098/100/102		NotFnd	<9.0	9.0	U		100

ALS Life Sciences

Sample Analysis Report

Sample Name RESIDENTIAL-20190808-0815
ALS Sample ID L2336381-3
Analysis Method EPA 1668C
Analysis Type Sample
Sample Matrix Air

Sampling Date 15-Aug-19
Extraction Date 5-Sep-19
Sample Size 1 Sample
Percent Moisture n/a
Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information **Run 1**
Filename 5-190911A13
Run Date 11-Sep-19 18:16
Final Volume 25 ul
Dilution Factor 1
Analysis Units pg
Instrument - Column HRM55 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-088/091		19.60	27.4	9.1	J		100
PCB-084		19.76	42.4	10	M,J		100
PCB-089		NotFnd	<9.6	9.6	U		100
PCB-121		NotFnd	<6.5	6.5	U		100
PCB-092		20.34	<13	9.0	J,R	13	100
PCB-090/101/113		20.65	154	7.8			100
PCB-083/099		20.96	72.9	9.2	J		100
PCB-112		NotFnd	<6.4	6.4	U		100
PCB-086/087/097/109/119/125		21.32	91.5	7.9	M,J		100
PCB-085/110/115/116/117		21.74	165	7.2	M		100
PCB-082		NotFnd	<11	11	U		100
PCB-111		NotFnd	<6.5	6.5	U		100
PCB-120		NotFnd	<5.9	5.9	U		100
PCB-108/124		NotFnd	<6.8	6.8	U		100
PCB-107		NotFnd	<6.5	6.5	U		100
PCB-123	0.00003	NotFnd	<7.8	7.8	U		100
PCB-106		NotFnd	<7.0	7.0	U		100
PCB-118	0.00003	23.28	69.1	7.1	M,J		100
PCB-122		NotFnd	<7.2	7.2	U		100
PCB-114	0.00003	NotFnd	<7.4	7.4	U		100
PCB-105	0.00003	23.95	26.9	7.7	M,J		100
PCB-127		NotFnd	<6.7	6.7	U		100
PCB-126	0.1	25.58	<9.0	9.0	U	7.1	100
PCB-155		NotFnd	<1.6	1.6	U		100
PCB-152		NotFnd	<1.8	1.8	U		100
PCB-150		NotFnd	<1.8	1.8	U		100
PCB-136		21.00	<16	1.8	J,R	16	100
PCB-145		NotFnd	<1.9	1.9	U		100
PCB-148		NotFnd	<2.4	2.4	U		100
PCB-135/151		22.18	37.1	2.6	J		100
PCB-154		NotFnd	<2.0	2.0	U		100
PCB-144		22.49	4.43	2.5	J		100
PCB-147/149		22.68	69.0	3.6	J		100
PCB-134/143		NotFnd	<4.4	4.4	U		100
PCB-139/140		22.98	<3.7	3.7	U	3.2	100
PCB-131		NotFnd	<4.7	4.7	U		100
PCB-142		NotFnd	<4.3	4.3	U		100
PCB-132		23.38	32.7	4.3	J		100
PCB-133		NotFnd	<4.0	4.0	U		100
PCB-165		NotFnd	<3.1	3.1	U		100
PCB-146		23.89	10.3	3.3	J		100
PCB-161		NotFnd	<3.0	3.0	U		100
PCB-153/168		24.20	<51	3.0	J,R	51	100
PCB-141		24.33	11.8	3.8	J		100
PCB-130		NotFnd	<4.4	4.4	M,U		100
PCB-137/164		NotFnd	<3.3	3.3	U		100
PCB-129/138/163		24.90	73.5	4.5	J		100
PCB-160		NotFnd	<2.2	2.2	U		100
PCB-158		25.08	<5.8	2.6	J,R	5.8	100
PCB-128/166		25.60	9.66	3.4	M,J		100
PCB-159		NotFnd	<2.8	2.8	U		100
PCB-162		NotFnd	<3.0	3.0	U		100
PCB-167	0.00003	NotFnd	<2.7	2.7	U		100
PCB-156/157	0.00003	27.03	4.72	4.1	J		200
PCB-169	0.03	NotFnd	<3.2	3.2	U		100
PCB-188		NotFnd	<2.2	2.2	U		100
PCB-179		23.74	<9.7	2.1	J,R	9.7	100
PCB-184		NotFnd	<2.0	2.0	U		100
PCB-176		24.19	<3.0	2.1	M,J,R	3.0	100
PCB-186		NotFnd	<2.2	2.2	U		100
PCB-178		25.10	<4.0	3.0	J,R	4.0	100
PCB-175		NotFnd	<2.9	2.9	U		100
PCB-187		25.55	19.8	2.6	J		100
PCB-182		NotFnd	<2.8	2.8	U		100
PCB-183		25.87	8.22	2.7	M,J		100
PCB-185		NotFnd	<3.1	3.1	U		100
PCB-174		26.04	<6.6	2.8	M,J,R	6.6	100
PCB-177		26.26	<6.7	3.1	J,R	6.7	100
PCB-181		NotFnd	<3.0	3.0	U		100
PCB-171/173		26.58	<3.4	3.1	J,R	3.4	100
PCB-172		NotFnd	<3.0	3.0	U		100

ALS Life Sciences

Sample Analysis Report

Sample Name RESIDENTIAL-20190808-0815
ALS Sample ID L2336381-3
Analysis Method EPA 1668C
Analysis Type Sample
Sample Matrix Air

Sampling Date 15-Aug-19
Extraction Date 5-Sep-19
Sample Size 1 Sample
Percent Moisture n/a
Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information

Run 1

Filename 5-190911A13
Run Date 11-Sep-19 18:16
Final Volume 25 ul
Dilution Factor 1
Analysis Units pg
Instrument - Column HRM55 SPB0CTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-192		NotFnd	<2.5	2.5	U		100
PCB-180/193		27.72	19.8	2.6	J		100
PCB-191		NotFnd	<2.3	2.3	U		100
PCB-170		NotFnd	<3.2	3.2	U		100
PCB-190		NotFnd	<2.1	2.1	U		100
PCB-189	0.00003	NotFnd	<3.1	3.1	U		100
PCB-202		26.28	<5.7	2.8	M,J,R	5.7	100
PCB-201		26.76	<3.5	2.7	M,J,R	3.5	100
PCB-204		NotFnd	<2.7	2.7	U		100
PCB-197		NotFnd	<2.7	2.7	U		100
PCB-200		NotFnd	<2.7	2.7	U		100
PCB-198/199		28.72	<11	3.9	J,R	11	100
PCB-196		NotFnd	<3.8	3.8	U		100
PCB-203		29.16	<3.6	3.6	M,J,R	3.6	100
PCB-195		NotFnd	<3.1	3.1	U		100
PCB-194		31.12	6.17	2.9	J		100
PCB-205		NotFnd	<2.4	2.4	U		100
PCB-208		NotFnd	<3.9	3.9	U		100
PCB-207		NotFnd	<3.9	3.9	U		100
PCB-206		NotFnd	<6.5	6.5	U		100
PCB-209		NotFnd	<1.9	1.9	U		100

Extraction Standards

	pg	Time	% Rec	Limits
13C12-PCB-001	4000	8.94	42	5-145
13C12-PCB-003	4000	10.47	41	5-145
13C12-PCB-004	4000	10.63	57	5-145
13C12-PCB-015	4000	14.31	48	5-145
13C12-PCB-019	4000	12.62	70	5-145
13C12-PCB-037	4000	18.25	60	5-145
13C12-PCB-054	4000	14.48	78	5-145
13C12-PCB-081	4000	21.82	69	10-145
13C12-PCB-077	4000	22.13	67	10-145
13C12-PCB-104	4000	17.51	84	10-145
13C12-PCB-123	4000	23.10	79	10-145
13C12-PCB-118	4000	23.27	82	10-145
13C12-PCB-114	4000	23.57	80	10-145
13C12-PCB-105	4000	23.94	80	10-145
13C12-PCB-126	4000	25.53	78	10-145
13C12-PCB-155	4000	20.48	93	10-145
13C12-PCB-167	4000	26.40	92	10-145
13C12-PCB-156/157	8000	27.05	91	10-145
13C12-PCB-169	4000	28.72	99	10-145
13C12-PCB-188	4000	23.49	92	10-145
13C12-PCB-189	4000	29.99	90	10-145
13C12-PCB-202	4000	26.28	104	10-145
13C12-PCB-205	4000	31.38	103	10-145
13C12-PCB-208	4000	29.70	98	10-145
13C12-PCB-206	4000	32.45	107	10-145
13C12-PCB-209	4000	33.58	117	10-145

Field Spike Standards

	pg	Time	% Rec	Limits
4-chloro-4'-fluorobiphenyl	6000	15.82	67	70-130
13C12-PCB-095	6000	19.13	66	70-130
13C12-PCB-031	6000	15.82	93	70-130
13C12-PCB-095	6000	19.13	88	70-130
13C12-PCB-153	6000	24.19	84	70-130

Cleanup Standards

	pg	Time	% Rec	Limits
13C12-PCB-028	4000	16.00	58	5-145
13C12-PCB-111	4000	22.02	71	10-145
13C12-PCB-178	4000	25.07	85	10-145

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Sample Analysis Report

Sample Name RESIDENTIAL-20190808-0815
 ALS Sample ID L2336381-3
 Analysis Method EPA 1668C
 Analysis Type Sample
 Sample Matrix Air

Sampling Date 15-Aug-19
 Extraction Date 5-Sep-19
 Sample Size 1 Sample
 Percent Moisture n/a
 Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information **Run 1**
 Filename 5-190911A13
 Run Date 11-Sep-19 18:16
 Final Volume 25 ul
 Dilution Factor 1
 Analysis Units pg
 Instrument - Column HRM55 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
Homologue Group Totals							
Total MonoCB			162	5.1	J	400	
Total DiCB			1130	18	J	800	
Total TriCB			1600	8.1	J	800	
Total TetraCB			1220	3.9	J	1600	
Total PentaCB			810	5.1	J	1600	
Total HexaCB			326	1.6	J	1600	
Total HeptaCB			81.2	2.0	J	800	
Total OctaCB			26.4	2.4	J	800	
Total NonaCB			<3.9	3.9	U	400	
DecaCB			<1.9	1.9	U	400	
Total PCB			5360		J	3200	

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ	0.00302
Mid Point PCB TEQ	0.503
Upper Bound PCB TEQ	1.00

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
 M Indicates that a peak has been manually integrated.
 U Indicates that this compound was not detected above the EDL.
 J Indicates that the analyte was positively identified. The associated numerical result is an estimate.
 R Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
 B Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
 EMPC Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name	HEISER-20190815-0823	Sampling Date	23-Aug-19	Sample	Approved: E. Sabljic --e-signature-- 13-Sep-2019
ALS Sample ID	L2336381-4	Extraction Date	5-Sep-19		
Analysis Method	EPA 1668C	Sample Size	1		
Analysis Type	Sample	Percent Moisture	n/a		
Sample Matrix	Air	Split Ratio	4		

Run Information	Run 1
Filename	5-190911A14
Run Date	11-Sep-19 18:58
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRM55 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-001		8.94	31.8	3.0	J		100
PCB-002		10.34	15.8	3.1	M,J		100
PCB-003		10.47	<24	3.9	M,J,R	24	100
PCB-004		NotFnd	<20	20	U		100
PCB-010		NotFnd	<14	14	U		100
PCB-009		NotFnd	<14	14	U		100
PCB-007		NotFnd	<13	13	U		100
PCB-006		NotFnd	<13	13	U		100
PCB-005		NotFnd	<17	17	U		100
PCB-008		12.43	<60	12	J,R	60	100
PCB-014		NotFnd	<13	13	U		100
PCB-011		13.92	188	13	B		100
PCB-012/013		NotFnd	<13	13	U		100
PCB-015		NotFnd	<17	17	U		100
PCB-019		NotFnd	<7.5	7.5	U		100
PCB-018/030		13.73	69.0	8.4	J		100
PCB-017		13.97	28.3	10	J		100
PCB-027		NotFnd	<7.1	7.1	U		100
PCB-024		NotFnd	<7.6	7.6	U		100
PCB-016		14.27	<30	12	J,R	30	100
PCB-032		14.55	18.4	6.6	J		100
PCB-034		NotFnd	<7.3	7.3	U		100
PCB-023		NotFnd	<7.0	7.0	U		100
PCB-026/029		15.52	13.3	6.9	J		100
PCB-025		NotFnd	<6.6	6.6	U		100
PCB-031		15.83	54.6	6.5	J,B		100
PCB-020/028		16.00	57.9	7.1	J,B		100
PCB-021/033		16.14	40.4	7.0	J		100
PCB-022		16.38	25.5	7.1	J		100
PCB-036		NotFnd	<6.3	6.3	U		100
PCB-039		NotFnd	<6.9	6.9	U		100
PCB-038		NotFnd	<7.4	7.4	U		100
PCB-035		NotFnd	<7.4	7.4	U		100
PCB-037		NotFnd	<9.6	9.6	U		100
PCB-054		NotFnd	<2.8	2.8	U		100
PCB-050/053		15.67	9.12	4.8	J		100
PCB-045/051		16.09	14.7	5.1	J		100
PCB-046		NotFnd	<5.6	5.6	U		100
PCB-052		16.99	85.8	5.0	M,J,B		100
PCB-073		NotFnd	<3.6	3.6	U		100
PCB-043		NotFnd	<6.0	6.0	U		100
PCB-049/069		17.26	27.2	4.4	M,J		100
PCB-048		17.42	8.86	4.9	J		100
PCB-044/047/065		17.56	58.1	4.6	J,B		100
PCB-059/062/075		NotFnd	<3.7	3.7	U		100
PCB-042		17.85	12.9	5.5	J		100
PCB-040/041/071		18.12	24.3	4.9	M,J,B		100
PCB-064		18.24	<17	3.8	J,R	17	100
PCB-072		NotFnd	<2.8	2.8	U		100
PCB-068		NotFnd	<2.6	2.6	U		100
PCB-057		NotFnd	<2.9	2.9	U		100
PCB-058		NotFnd	<2.9	2.9	U		100
PCB-067		NotFnd	<2.7	2.7	U		100
PCB-063		NotFnd	<2.5	2.5	U		100
PCB-061/070/074/076		19.59	66.6	2.9	J,B		100
PCB-066		19.78	25.1	2.7	J,B		100
PCB-055		NotFnd	<2.9	2.9	U		100
PCB-056		20.17	<15	3.0	J,R	15	100
PCB-060		20.28	<9.5	3.0	J,R	9.5	100
PCB-080		NotFnd	<2.4	2.4	U		100
PCB-079		NotFnd	<2.6	2.6	U		100
PCB-078		NotFnd	<2.9	2.9	U		100
PCB-081	0.0003	NotFnd	<3.4	3.4	U		100
PCB-077	0.0001	NotFnd	<3.7	3.7	U		100
PCB-104		NotFnd	<3.0	3.0	U		100
PCB-096		NotFnd	<3.0	3.0	U		100
PCB-103		NotFnd	<4.4	4.4	U		100
PCB-094		NotFnd	<5.4	5.4	U		100
PCB-095		19.14	62.3	4.9	J		100
PCB-093/098/100/102		NotFnd	<5.0	5.0	U		100

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Sample Analysis Report

Sample Name	HEISER-20190815-0823	Sampling Date	23-Aug-19	
ALS Sample ID	L2336381-4	Extraction Date	5-Sep-19	Approved: <i>E. Sabljic</i> --e-signature-- 13-Sep-2019
Analysis Method	EPA 1668C	Sample Size	1 Sample	
Analysis Type	Sample	Percent Moisture	n/a	
Sample Matrix	Air	Split Ratio	4	

Run Information	Run 1
Filename	5-190911A14
Run Date	11-Sep-19 18:58
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRM55 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-088/091		19.60	7.97	5.0	J		100
PCB-084		19.75	<13	5.5	J,R	13	100
PCB-089		NotFnd	<5.3	5.3	U		100
PCB-121		NotFnd	<3.6	3.6	U		100
PCB-092		20.33	<13	5.0	J,R	13	100
PCB-090/101/113		20.65	61.8	4.3	J		100
PCB-083/099		20.95	27.6	5.1	J		100
PCB-112		NotFnd	<3.5	3.5	U		100
PCB-086/087/097/109/119/125		21.32	<36	4.4	M,J,R	36	100
PCB-085/110/115/116/117		21.73	61.6	4.0	M,J,B		100
PCB-082		NotFnd	<6.1	6.1	U		100
PCB-111		NotFnd	<3.6	3.6	U		100
PCB-120		NotFnd	<3.3	3.3	U		100
PCB-108/124		NotFnd	<4.2	4.2	U		100
PCB-107		NotFnd	<3.9	3.9	U		100
PCB-123	0.00003	NotFnd	<4.7	4.7	U		100
PCB-106		NotFnd	<4.3	4.3	U		100
PCB-118	0.00003	23.28	<25	4.4	M,J,R	25	100
PCB-122		NotFnd	<4.4	4.4	U		100
PCB-114	0.00003	NotFnd	<4.6	4.6	U		100
PCB-105	0.00003	23.94	<9.4	4.7	J,R	9.4	100
PCB-127		NotFnd	<4.1	4.1	U		100
PCB-126	0.1	NotFnd	<5.6	5.6	U		100
PCB-155		NotFnd	<1.3	1.3	U		100
PCB-152		NotFnd	<1.4	1.4	U		100
PCB-150		NotFnd	<1.4	1.4	U		100
PCB-136		20.98	<18	1.5	J,R	18	100
PCB-145		NotFnd	<1.5	1.5	U		100
PCB-148		NotFnd	<1.9	1.9	U		100
PCB-135/151		22.18	49.6	2.0	J		100
PCB-154		NotFnd	<1.6	1.6	U		100
PCB-144		22.47	<5.8	2.0	J,R	5.8	100
PCB-147/149		22.67	79.3	2.0	M,J		100
PCB-134/143		NotFnd	<2.5	2.5	U		100
PCB-139/140		NotFnd	<2.1	2.1	U		100
PCB-131		NotFnd	<2.6	2.6	U		100
PCB-142		NotFnd	<2.4	2.4	U		100
PCB-132		23.38	<16	2.4	J,R	16	100
PCB-133		NotFnd	<2.2	2.2	M,U		100
PCB-165		NotFnd	<1.7	1.7	U		100
PCB-146		23.88	8.20	1.9	M,J		100
PCB-161		NotFnd	<1.7	1.7	U		100
PCB-153/168		24.19	59.2	1.7	J		100
PCB-141		24.33	14.8	2.1	J		100
PCB-130		NotFnd	<2.5	2.5	U		100
PCB-137/164		NotFnd	<1.8	1.8	U		100
PCB-129/138/163		24.89	46.4	2.5	J		100
PCB-160		NotFnd	<1.3	1.3	U		100
PCB-158		25.10	3.80	1.4	J		100
PCB-128/166		NotFnd	<1.9	1.9	U		100
PCB-159		NotFnd	<1.6	1.6	U		100
PCB-162		NotFnd	<1.7	1.7	U		100
PCB-167	0.00003	NotFnd	<1.5	1.5	U		100
PCB-156/157	0.00003	NotFnd	<2.3	2.3	M,U		200
PCB-169	0.03	NotFnd	<1.8	1.8	U		100
PCB-188		NotFnd	<1.8	1.8	U		100
PCB-179		23.73	<20	1.7	M,J,R	20	100
PCB-184		NotFnd	<1.7	1.7	U		100
PCB-176		24.19	5.40	1.7	M,J		100
PCB-186		NotFnd	<1.8	1.8	U		100
PCB-178		25.08	5.49	2.4	J		100
PCB-175		NotFnd	<2.3	2.3	U		100
PCB-187		25.54	34.5	2.2	M,J		100
PCB-182		NotFnd	<2.3	2.3	U		100
PCB-183		25.86	11.4	2.3	M,J		100
PCB-185		NotFnd	<2.5	2.5	U		100
PCB-174		26.03	17.2	2.3	M,J		100
PCB-177		26.27	10.6	2.5	J		100
PCB-181		NotFnd	<2.4	2.4	U		100
PCB-171/173		26.58	<2.6	2.6	U	2.2	100
PCB-172		NotFnd	<2.5	2.5	U		100

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Sample Analysis Report

Sample Name HEISER-20190815-0823	Sampling Date	23-Aug-19	
ALS Sample ID L2336381-4	Extraction Date	5-Sep-19	
Analysis Method EPA 1668C	Sample Size	1	Sample
Analysis Type Sample	Percent Moisture	n/a	
Sample Matrix Air	Split Ratio	4	

Approved:
E. Sabljic
--e-signature--
13-Sep-2019

Run Information	Run 1
Filename	5-190911A14
Run Date	11-Sep-19 18:58
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRM55 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-192		NotFnd	<2.1	2.1	U		100
PCB-180/193		27.72	21.6	2.1	M,J		100
PCB-191		NotFnd	<1.9	1.9	U		100
PCB-170		28.41	<4.0	2.7	M,J,R	4.0	100
PCB-190		NotFnd	<1.7	1.7	U		100
PCB-189	0.00003	NotFnd	<2.0	2.0	U		100
PCB-202		26.28	4.27	1.5	J		100
PCB-201		26.75	1.48	1.4	M,J		100
PCB-204		NotFnd	<1.4	1.4	U		100
PCB-197		NotFnd	<1.4	1.4	U		100
PCB-200		NotFnd	<1.5	1.5	U		100
PCB-198/199		28.72	6.99	2.0	M,J		100
PCB-196		29.05	<2.8	2.0	M,J,R	2.8	100
PCB-203		29.14	5.20	1.9	M,J		100
PCB-195		NotFnd	<1.9	1.9	U		100
PCB-194		NotFnd	<1.8	1.8	U		100
PCB-205		NotFnd	<1.4	1.4	U		100
PCB-208		NotFnd	<2.4	2.4	U		100
PCB-207		NotFnd	<2.4	2.4	U		100
PCB-206		NotFnd	<4.2	4.2	U		100
PCB-209		NotFnd	<1.3	1.3	U		100

Extraction Standards

	pg	Time	% Rec	Limits
13C12-PCB-001	4000	8.94	40	5-145
13C12-PCB-003	4000	10.47	40	5-145
13C12-PCB-004	4000	10.62	51	5-145
13C12-PCB-015	4000	14.30	43	5-145
13C12-PCB-019	4000	12.62	57	5-145
13C12-PCB-037	4000	18.25	52	5-145
13C12-PCB-054	4000	14.47	63	5-145
13C12-PCB-081	4000	21.81	59	10-145
13C12-PCB-077	4000	22.12	60	10-145
13C12-PCB-104	4000	17.50	72	10-145
13C12-PCB-123	4000	23.09	69	10-145
13C12-PCB-118	4000	23.26	71	10-145
13C12-PCB-114	4000	23.56	70	10-145
13C12-PCB-105	4000	23.92	69	10-145
13C12-PCB-126	4000	25.52	68	10-145
13C12-PCB-155	4000	20.48	78	10-145
13C12-PCB-167	4000	26.40	79	10-145
13C12-PCB-156/157	8000	27.05	78	10-145
13C12-PCB-169	4000	28.71	84	10-145
13C12-PCB-188	4000	23.49	82	10-145
13C12-PCB-189	4000	29.99	79	10-145
13C12-PCB-202	4000	26.27	88	10-145
13C12-PCB-205	4000	31.38	88	10-145
13C12-PCB-208	4000	29.70	84	10-145
13C12-PCB-206	4000	32.45	90	10-145
13C12-PCB-209	4000	33.56	98	10-145

Field Spike Standards

	pg	Time	% Rec	Limits
4-chloro-4'-fluorobiphenyl	6000	15.82	68	70-130
13C12-PCB-095	6000	19.12	64	70-130
13C12-PCB-031	6000	15.82	95	70-130
13C12-PCB-095	6000	19.12	88	70-130
13C12-PCB-153	6000	24.18	89	70-130

Cleanup Standards

	pg	Time	% Rec	Limits
13C12-PCB-028	4000	15.99	54	5-145
13C12-PCB-111	4000	22.02	69	10-145
13C12-PCB-178	4000	25.07	79	10-145

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Sample Analysis Report

Sample Name	HEISER-20190815-0823	Sampling Date	23-Aug-19	
ALS Sample ID	L2336381-4	Extraction Date	5-Sep-19	Approved: <i>E. Sabljic</i> --e-signature-- 13-Sep-2019
Analysis Method	EPA 1668C	Sample Size	1 Sample	
Analysis Type	Sample	Percent Moisture	n/a	
Sample Matrix	Air	Split Ratio	4	

Run Information	Run 1
Filename	5-190911A14
Run Date	11-Sep-19 18:58
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRM55 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
Homologue Group Totals							
Total MonoCB			71.6	3.0	J	400	
Total DiCB			248	12	J	800	
Total TriCB			337	6.3	J	800	
Total TetraCB			374	2.4	J	1600	
Total PentaCB			318	3.0	J	1600	
Total HexaCB			301	1.3	J	1600	
Total HeptaCB			130	1.7	J	800	
Total OctaCB			20.7	1.4	J	800	
Total NonaCB			<2.4	2.4	U	400	
DecaCB			<1.3	1.3	U	400	
Total PCB			1800		J	3200	
Toxic Equivalency - (WHO 2005)							
Lower Bound PCB TEQ			0.00				
Mid Point PCB TEQ			0.309				
Upper Bound PCB TEQ			0.617				

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identified. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name CITY-20190815-0823
 ALS Sample ID L2336381-5
 Analysis Method EPA 1668C
 Analysis Type Sample
 Sample Matrix Air

Sampling Date 23-Aug-19
 Extraction Date 5-Sep-19
 Sample Size 1 Sample
 Percent Moisture n/a
 Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information

Run 1

Filename 5-190911A15
 Run Date 11-Sep-19 19:41
 Final Volume 25 ul
 Dilution Factor 1
 Analysis Units pg
 Instrument - Column HRM55 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-001		8.95	35.4	2.2	J		100
PCB-002		10.35	<9.5	2.3	J,R	9.5	100
PCB-003		10.48	21.5	3.0	J		100
PCB-004		10.65	86.0	14	J		100
PCB-010		NotFnd	<9.4	9.4	U		100
PCB-009		NotFnd	<9.4	9.4	U		100
PCB-007		NotFnd	<9.0	9.0	U		100
PCB-006		NotFnd	<8.9	8.9	U		100
PCB-005		NotFnd	<11	11	U		100
PCB-008		12.44	90.8	7.8	J,B		100
PCB-014		NotFnd	<9.7	9.7	U		100
PCB-011		13.92	217	10	B		100
PCB-012/013		NotFnd	<10	10	U		100
PCB-015		NotFnd	<13	13	U		100
PCB-019		12.64	<17	5.1	J,R	17	100
PCB-018/030		13.73	88.5	4.7	M,J		100
PCB-017		13.97	<36	5.6	J,R	36	100
PCB-027		NotFnd	<4.0	4.0	U		100
PCB-024		NotFnd	<4.3	4.3	U		100
PCB-016		14.28	38.9	6.5	J		100
PCB-032		14.55	20.4	3.7	J		100
PCB-034		NotFnd	<5.7	5.7	U		100
PCB-023		NotFnd	<5.4	5.4	U		100
PCB-026/029		15.51	17.6	5.3	J		100
PCB-025		15.64	<5.9	5.1	M,J,R	5.9	100
PCB-031		15.83	57.6	5.0	M,J,B		100
PCB-020/028		16.01	71.2	5.4	M,J,B		100
PCB-021/033		16.14	42.7	5.4	J		100
PCB-022		16.40	20.0	5.5	M,J		100
PCB-036		NotFnd	<4.9	4.9	U		100
PCB-039		NotFnd	<5.3	5.3	U		100
PCB-038		NotFnd	<5.7	5.7	U		100
PCB-035		NotFnd	<5.7	5.7	U		100
PCB-037		NotFnd	<7.6	7.6	U		100
PCB-054		NotFnd	<2.0	2.0	U		100
PCB-050/053		15.68	9.63	3.8	M,J		100
PCB-045/051		16.09	11.6	4.0	M,J		100
PCB-046		NotFnd	<4.4	4.4	U		100
PCB-052		17.00	95.2	3.9	J		100
PCB-073		17.11	<2.8	2.8	U	1.9	100
PCB-043		NotFnd	<4.7	4.7	U		100
PCB-049/069		17.26	33.1	3.4	M,J		100
PCB-048		17.43	<11	3.8	M,J,R	11	100
PCB-044/047/065		17.57	61.0	3.6	M,J,B		100
PCB-059/062/075		17.75	<2.9	2.9	U	1.9	100
PCB-042		17.86	12.9	4.3	M,J		100
PCB-040/041/071		18.13	<20	3.9	M,J,R	20	100
PCB-064		18.25	<16	3.0	J,R	16	100
PCB-072		NotFnd	<2.3	2.3	U		100
PCB-068		NotFnd	<2.2	2.2	U		100
PCB-057		NotFnd	<2.5	2.5	U		100
PCB-058		NotFnd	<2.5	2.5	U		100
PCB-067		NotFnd	<2.3	2.3	U		100
PCB-063		NotFnd	<2.1	2.1	U		100
PCB-061/070/074/076		19.59	54.9	2.5	J,B		100
PCB-066		19.78	17.9	2.3	M,J,B		100
PCB-055		NotFnd	<2.5	2.5	U		100
PCB-056		20.17	9.16	2.5	J,B		100
PCB-060		NotFnd	<2.5	2.5	U		100
PCB-080		NotFnd	<2.0	2.0	U		100
PCB-079		NotFnd	<2.2	2.2	U		100
PCB-078		NotFnd	<2.5	2.5	U		100
PCB-081	0.0003	NotFnd	<2.9	2.9	U		100
PCB-077	0.0001	NotFnd	<3.2	3.2	U		100
PCB-104		NotFnd	<2.6	2.6	U		100
PCB-096		NotFnd	<2.7	2.7	U		100
PCB-103		NotFnd	<3.6	3.6	U		100
PCB-094		NotFnd	<4.3	4.3	U		100
PCB-095		19.14	61.9	4.0	J		100
PCB-093/098/100/102		NotFnd	<4.0	4.0	U		100

ALS Life Sciences

Sample Analysis Report

Sample Name CITY-20190815-0823
ALS Sample ID L2336381-5
Analysis Method EPA 1668C
Analysis Type Sample
Sample Matrix Air

Sampling Date 23-Aug-19
Extraction Date 5-Sep-19
Sample Size 1 Sample
Percent Moisture n/a
Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information

Run 1

Filename 5-190911A15
Run Date 11-Sep-19 19:41
Final Volume 25 ul
Dilution Factor 1
Analysis Units pg
Instrument - Column HRM55 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-088/091		19.59	<9.8	4.0	J,R	9.8	100
PCB-084		19.75	<10	4.5	J,R	10	100
PCB-089		NotFnd	<4.3	4.3	U		100
PCB-121		NotFnd	<2.9	2.9	U		100
PCB-092		20.34	<8.6	4.0	J,R	8.6	100
PCB-090/101/113		20.65	57.5	3.5	J		100
PCB-083/099		20.96	25.3	4.1	J		100
PCB-112		NotFnd	<2.8	2.8	U		100
PCB-086/087/097/109/119/125		21.18	<3.5	3.5	M,U	0.015	100
PCB-085/110/115/116/117		21.74	61.0	3.2	M,J,B		100
PCB-082		NotFnd	<4.9	4.9	U		100
PCB-111		NotFnd	<2.9	2.9	U		100
PCB-120		NotFnd	<2.6	2.6	U		100
PCB-108/124		NotFnd	<3.6	3.6	U		100
PCB-107		NotFnd	<3.4	3.4	U		100
PCB-123	0.00003	NotFnd	<4.0	4.0	U		100
PCB-106		NotFnd	<3.6	3.6	U		100
PCB-118	0.00003	23.27	28.7	3.8	J,B		100
PCB-122		NotFnd	<3.8	3.8	U		100
PCB-114	0.00003	NotFnd	<3.9	3.9	U		100
PCB-105	0.00003	23.95	9.45	3.9	J		100
PCB-127		NotFnd	<3.5	3.5	U		100
PCB-126	0.1	NotFnd	<4.6	4.6	U		100
PCB-155		NotFnd	<1.1	1.1	U		100
PCB-152		NotFnd	<1.3	1.3	U		100
PCB-150		NotFnd	<1.3	1.3	U		100
PCB-136		20.98	<6.8	1.3	J,R	6.8	100
PCB-145		NotFnd	<1.4	1.4	U		100
PCB-148		NotFnd	<1.7	1.7	U		100
PCB-135/151		22.18	<13	1.8	M,J,R	13	100
PCB-154		NotFnd	<1.4	1.4	U		100
PCB-144		22.49	<1.8	1.8	U	1.0	100
PCB-147/149		22.67	28.3	2.1	J		100
PCB-134/143		22.80	<2.6	2.6	M,U	2.5	100
PCB-139/140		NotFnd	<2.1	2.1	U		100
PCB-131		NotFnd	<2.8	2.8	U		100
PCB-142		NotFnd	<2.5	2.5	U		100
PCB-132		23.37	10.9	2.5	J		100
PCB-133		NotFnd	<2.3	2.3	U		100
PCB-165		NotFnd	<1.8	1.8	U		100
PCB-146		23.89	4.72	2.0	J		100
PCB-161		NotFnd	<1.7	1.7	U		100
PCB-153/168		24.20	22.5	1.8	M,J,B		100
PCB-141		24.35	5.88	2.2	M,J		100
PCB-130		24.56	<2.6	2.6	M,U	1.6	100
PCB-137/164		24.75	<2.0	1.9	M,J,R	2.0	100
PCB-129/138/163		24.89	31.2	2.6	J		100
PCB-160		NotFnd	<1.3	1.3	U		100
PCB-158		NotFnd	<1.5	1.5	U		100
PCB-128/166		25.58	5.03	2.0	J		100
PCB-159		NotFnd	<1.6	1.6	U		100
PCB-162		NotFnd	<1.8	1.8	U		100
PCB-167	0.00003	NotFnd	<1.6	1.6	U		100
PCB-156/157	0.00003	NotFnd	<2.4	2.4	U		200
PCB-169	0.03	NotFnd	<1.9	1.9	U		100
PCB-188		NotFnd	<1.4	1.4	U		100
PCB-179		23.74	3.70	1.3	J		100
PCB-184		NotFnd	<1.3	1.3	U		100
PCB-176		NotFnd	<1.4	1.4	U		100
PCB-186		NotFnd	<1.4	1.4	U		100
PCB-178		25.02	<4.4	1.9	M,J,R	4.4	100
PCB-175		NotFnd	<1.8	1.8	U		100
PCB-187		25.55	<4.6	1.7	M,J,R	4.6	100
PCB-182		NotFnd	<1.8	1.8	U		100
PCB-183		25.86	<2.2	1.8	M,J,R	2.2	100
PCB-185		NotFnd	<2.0	2.0	U		100
PCB-174		26.04	3.34	1.8	M,J		100
PCB-177		NotFnd	<2.0	2.0	U		100
PCB-181		NotFnd	<1.9	1.9	U		100
PCB-171/173		NotFnd	<2.0	2.0	U		100
PCB-172		NotFnd	<1.9	1.9	U		100

ALS Life Sciences

Sample Analysis Report

Sample Name CITY-20190815-0823
ALS Sample ID L2336381-5
Analysis Method EPA 1668C
Analysis Type Sample
Sample Matrix Air

Sampling Date 23-Aug-19
Extraction Date 5-Sep-19
Sample Size 1 Sample
Percent Moisture n/a
Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information

Run 1

Filename 5-190911A15
Run Date 11-Sep-19 19:41
Final Volume 25 ul
Dilution Factor 1
Analysis Units pg
Instrument - Column HRM55 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-192		NotFnd	<1.6	1.6	U		100
PCB-180/193		27.72	<5.7	1.7	M,J,R	5.7	100
PCB-191		NotFnd	<1.5	1.5	U		100
PCB-170		NotFnd	<2.1	2.1	U		100
PCB-190		NotFnd	<1.4	1.4	U		100
PCB-189	0.00003	NotFnd	<1.8	1.8	U		100
PCB-202		26.28	<1.4	1.4	U	0.81	100
PCB-201		NotFnd	<1.3	1.3	U		100
PCB-204		NotFnd	<1.3	1.3	U		100
PCB-197		NotFnd	<1.3	1.3	U		100
PCB-200		NotFnd	<1.3	1.3	U		100
PCB-198/199		NotFnd	<1.9	1.9	U		100
PCB-196		NotFnd	<1.8	1.8	U		100
PCB-203		NotFnd	<1.7	1.7	U		100
PCB-195		NotFnd	<1.7	1.7	U		100
PCB-194		31.11	<2.5	1.6	M,J,R	2.5	100
PCB-205		NotFnd	<1.3	1.3	U		100
PCB-208		NotFnd	<2.1	2.1	U		100
PCB-207		NotFnd	<2.1	2.1	U		100
PCB-206		NotFnd	<3.7	3.7	U		100
PCB-209		NotFnd	<0.95	0.95	U		100

Extraction Standards

	pg	Time	% Rec	Limits
13C12-PCB-001	4000	8.95	47	5-145
13C12-PCB-003	4000	10.47	47	5-145
13C12-PCB-004	4000	10.63	60	5-145
13C12-PCB-015	4000	14.31	50	5-145
13C12-PCB-019	4000	12.62	65	5-145
13C12-PCB-037	4000	18.25	60	5-145
13C12-PCB-054	4000	14.48	73	5-145
13C12-PCB-081	4000	21.81	64	10-145
13C12-PCB-077	4000	22.13	64	10-145
13C12-PCB-104	4000	17.51	78	10-145
13C12-PCB-123	4000	23.09	74	10-145
13C12-PCB-118	4000	23.27	74	10-145
13C12-PCB-114	4000	23.57	75	10-145
13C12-PCB-105	4000	23.94	74	10-145
13C12-PCB-126	4000	25.53	71	10-145
13C12-PCB-155	4000	20.48	84	10-145
13C12-PCB-167	4000	26.41	80	10-145
13C12-PCB-156/157	8000	27.05	80	10-145
13C12-PCB-169	4000	28.72	86	10-145
13C12-PCB-188	4000	23.49	83	10-145
13C12-PCB-189	4000	29.99	78	10-145
13C12-PCB-202	4000	26.28	88	10-145
13C12-PCB-205	4000	31.38	93	10-145
13C12-PCB-208	4000	29.70	89	10-145
13C12-PCB-206	4000	32.45	93	10-145
13C12-PCB-209	4000	33.58	102	10-145

Field Spike Standards

	pg	Time	% Rec	Limits
4-chloro-4'-fluorobiphenyl	6000	15.82	66	70-130
13C12-PCB-095	6000	19.12	65	70-130
13C12-PCB-031	6000	15.82	90	70-130
13C12-PCB-095	6000	19.12	85	70-130
13C12-PCB-153	6000	24.19	85	70-130

Cleanup Standards

	pg	Time	% Rec	Limits
13C12-PCB-028	4000	15.99	53	5-145
13C12-PCB-111	4000	22.02	64	10-145
13C12-PCB-178	4000	25.07	71	10-145

ALS Life Sciences

Sample Analysis Report

Sample Name CITY-20190815-0823	Sampling Date	23-Aug-19	
ALS Sample ID L2336381-5	Extraction Date	5-Sep-19	
Analysis Method EPA 1668C	Sample Size	1	Sample
Analysis Type Sample	Percent Moisture	n/a	
Sample Matrix Air	Split Ratio	4	

Approved:
E. Sabljic
--e-signature--
13-Sep-2019

Run Information	Run 1
Filename	5-190911A15
Run Date	11-Sep-19 19:41
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRM55 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
Homologue Group Totals							
Total MonoCB			66.4	2.2	J	400	
Total DiCB			394	7.8	J	800	
Total TriCB			416	3.7	J	800	
Total TetraCB			352	2.0	J	1600	
Total PentaCB			272	2.6	J	1600	
Total HexaCB			130	1.1	J	1600	
Total HeptaCB			23.9	1.3	J	800	
Total OctaCB			2.50	1.3	J	800	
Total NonaCB			<2.1	2.1	U	400	
DecaCB			<0.95	0.95	U	400	
Total PCB			1660		J	3200	

Toxic Equivalency - (WHO 2005)							
Lower Bound PCB TEQ			0.00114				
Mid Point PCB TEQ			0.260				
Upper Bound PCB TEQ			0.520				

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identified. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Sample Analysis Report

Sample Name RESIDENTIAL-20190815-0823
ALS Sample ID L2336381-6
Analysis Method EPA 1668C
Analysis Type Sample
Sample Matrix Air

Sampling Date 23-Aug-19
Extraction Date 5-Sep-19
Sample Size 1 Sample
Percent Moisture n/a
Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information **Run 1**
Filename 5-190911A16
Run Date 11-Sep-19 20:23
Final Volume 25 ul
Dilution Factor 1
Analysis Units pg
Instrument - Column HRM55 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-001		8.94	52.0	2.0	J		100
PCB-002		10.34	12.0	2.2	J		100
PCB-003		10.47	26.1	2.8	J		100
PCB-004		10.62	161	16	M		100
PCB-010		NotFnd	<11	11	U		100
PCB-009		NotFnd	<11	11	U		100
PCB-007		NotFnd	<11	11	U		100
PCB-006		12.15	51.6	10	M,J		100
PCB-005		NotFnd	<13	13	U		100
PCB-008		12.43	167	9.1			100
PCB-014		NotFnd	<10	10	U		100
PCB-011		13.91	248	11	B		100
PCB-012/013		NotFnd	<10	10	U		100
PCB-015		14.30	36.3	13	J		100
PCB-019		12.62	35.6	5.0	M,J		100
PCB-018/030		13.73	159	4.9			100
PCB-017		13.97	74.4	5.8	M,J		100
PCB-027		14.09	11.6	4.1	M,J		100
PCB-024		NotFnd	<4.4	4.4	U		100
PCB-016		14.26	66.0	6.7	M,J		100
PCB-032		14.55	38.5	3.8	M,J		100
PCB-034		NotFnd	<4.6	4.6	U		100
PCB-023		NotFnd	<4.4	4.4	U		100
PCB-026/029		15.50	28.2	4.3	J		100
PCB-025		NotFnd	<4.1	4.1	U		100
PCB-031		15.82	110	4.1	M		100
PCB-020/028		16.00	125	4.4	M,B		100
PCB-021/033		16.14	77.0	4.4	M,J		100
PCB-022		16.38	<34	4.5	J,R	34	100
PCB-036		NotFnd	<3.9	3.9	U		100
PCB-039		NotFnd	<4.3	4.3	U		100
PCB-038		NotFnd	<4.6	4.6	U		100
PCB-035		NotFnd	<4.6	4.6	M,U		100
PCB-037		18.25	<16	5.9	J,R	16	100
PCB-054		NotFnd	<2.0	2.0	U		100
PCB-050/053		15.67	16.8	2.7	J		100
PCB-045/051		16.08	21.9	2.9	J		100
PCB-046		16.25	6.21	3.2	J		100
PCB-052		16.99	125	2.8			100
PCB-073		NotFnd	<2.0	2.0	U		100
PCB-043		NotFnd	<3.4	3.4	U		100
PCB-049/069		17.25	51.2	2.5	J		100
PCB-048		17.41	20.4	2.8	J		100
PCB-044/047/065		17.56	89.1	2.6	J,B		100
PCB-059/062/075		17.73	8.49	2.1	J		100
PCB-042		17.86	21.0	3.1	J		100
PCB-040/041/071		18.11	38.0	2.8	M,J		100
PCB-064		18.24	33.9	2.2	J,B		100
PCB-072		NotFnd	<2.6	2.6	U		100
PCB-068		NotFnd	<2.5	2.5	U		100
PCB-057		NotFnd	<2.7	2.7	U		100
PCB-058		NotFnd	<2.7	2.7	U		100
PCB-067		NotFnd	<2.5	2.5	U		100
PCB-063		NotFnd	<2.3	2.3	U		100
PCB-061/070/074/076		19.59	82.8	2.7	M,J,B		100
PCB-066		19.77	31.9	2.5	M,J,B		100
PCB-055		NotFnd	<2.7	2.7	U		100
PCB-056		20.16	13.9	2.8	J,B		100
PCB-060		20.27	<6.7	2.8	M,J,R	6.7	100
PCB-080		NotFnd	<2.2	2.2	U		100
PCB-079		NotFnd	<2.4	2.4	U		100
PCB-078		NotFnd	<2.7	2.7	U		100
PCB-081	0.0003	NotFnd	<3.1	3.1	U		100
PCB-077	0.0001	NotFnd	<3.3	3.3	U		100
PCB-104		NotFnd	<2.3	2.3	U		100
PCB-096		NotFnd	<2.2	2.2	U		100
PCB-103		NotFnd	<3.9	3.9	U		100
PCB-094		NotFnd	<4.7	4.7	U		100
PCB-095		19.13	66.7	4.4	J		100
PCB-093/098/100/102		NotFnd	<4.4	4.4	U		100

ALS Life Sciences

Sample Analysis Report

Sample Name RESIDENTIAL-20190815-0823
ALS Sample ID L2336381-6
Analysis Method EPA 1668C
Analysis Type Sample
Sample Matrix Air

Sampling Date 23-Aug-19
Extraction Date 5-Sep-19
Sample Size 1 Sample
Percent Moisture n/a
Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information

Run 1

Filename 5-190911A16
Run Date 11-Sep-19 20:23
Final Volume 25 ul
Dilution Factor 1
Analysis Units pg
Instrument - Column HRM55 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-088/091		19.59	<8.9	4.4	M,J,R	8.9	100
PCB-084		19.75	21.8	4.9	J		100
PCB-089		NotFnd	<4.7	4.7	U		100
PCB-121		NotFnd	<3.2	3.2	U		100
PCB-092		20.33	<11	4.4	J,R	11	100
PCB-090/101/113		20.64	66.1	3.8	J		100
PCB-083/099		20.95	<31	4.5	J,R	31	100
PCB-112		NotFnd	<3.1	3.1	U		100
PCB-086/087/097/109/119/125		21.32	43.8	3.8	M,J		100
PCB-085/110/115/116/117		21.73	71.0	3.5	M,J,B		100
PCB-082		NotFnd	<5.4	5.4	U		100
PCB-111		NotFnd	<3.2	3.2	U		100
PCB-120		NotFnd	<2.9	2.9	U		100
PCB-108/124		NotFnd	<3.3	3.3	U		100
PCB-107		NotFnd	<3.1	3.1	U		100
PCB-123	0.00003	NotFnd	<3.7	3.7	U		100
PCB-106		NotFnd	<3.4	3.4	U		100
PCB-118	0.00003	23.27	28.1	3.4	J,B		100
PCB-122		NotFnd	<3.5	3.5	U		100
PCB-114	0.00003	NotFnd	<3.6	3.6	U		100
PCB-105	0.00003	23.94	10.7	3.6	J		100
PCB-127		NotFnd	<3.2	3.2	U		100
PCB-126	0.1	25.55	<4.3	4.3	U	3.0	100
PCB-155		NotFnd	<0.98	0.98	U		100
PCB-152		NotFnd	<1.1	1.1	U		100
PCB-150		NotFnd	<1.1	1.1	U		100
PCB-136		20.98	<6.6	1.1	J,R	6.6	100
PCB-145		NotFnd	<1.1	1.1	U		100
PCB-148		NotFnd	<1.5	1.5	U		100
PCB-135/151		22.18	16.5	1.5	M,J		100
PCB-154		NotFnd	<1.2	1.2	U		100
PCB-144		22.45	<1.9	1.5	M,J,R	1.9	100
PCB-147/149		22.67	34.0	1.8	J		100
PCB-134/143		NotFnd	<2.2	2.2	U		100
PCB-139/140		NotFnd	<1.8	1.8	U		100
PCB-131		NotFnd	<2.4	2.4	U		100
PCB-142		NotFnd	<2.2	2.2	U		100
PCB-132		23.37	13.4	2.1	M,J		100
PCB-133		NotFnd	<2.0	2.0	U		100
PCB-165		NotFnd	<1.6	1.6	U		100
PCB-146		23.88	4.39	1.7	J		100
PCB-161		NotFnd	<1.5	1.5	U		100
PCB-153/168		24.19	28.5	1.5	J,B		100
PCB-141		24.32	<7.9	1.9	J,R	7.9	100
PCB-130		NotFnd	<2.2	2.2	U		100
PCB-137/164		NotFnd	<1.6	1.6	U		100
PCB-129/138/163		24.89	33.2	2.2	J		100
PCB-160		NotFnd	<1.1	1.1	U		100
PCB-158		25.07	<3.1	1.3	J,R	3.1	100
PCB-128/166		NotFnd	<1.7	1.7	U		100
PCB-159		NotFnd	<1.4	1.4	U		100
PCB-162		NotFnd	<1.5	1.5	U		100
PCB-167	0.00003	NotFnd	<1.4	1.4	U		100
PCB-156/157	0.00003	NotFnd	<2.1	2.1	U		200
PCB-169	0.03	NotFnd	<1.5	1.5	U		100
PCB-188		NotFnd	<1.4	1.4	U		100
PCB-179		23.73	4.42	1.4	J		100
PCB-184		NotFnd	<1.4	1.4	U		100
PCB-176		NotFnd	<1.4	1.4	U		100
PCB-186		NotFnd	<1.5	1.5	U		100
PCB-178		25.01	<6.2	2.0	M,J,R	6.2	100
PCB-175		NotFnd	<1.9	1.9	U		100
PCB-187		25.53	10.1	1.8	J		100
PCB-182		NotFnd	<1.8	1.8	U		100
PCB-183		25.84	<3.3	1.8	M,J,R	3.3	100
PCB-185		NotFnd	<2.1	2.1	U		100
PCB-174		NotFnd	<1.8	1.8	U		100
PCB-177		NotFnd	<2.0	2.0	U		100
PCB-181		NotFnd	<2.0	2.0	U		100
PCB-171/173		NotFnd	<2.1	2.1	U		100
PCB-172		NotFnd	<2.0	2.0	U		100

ALS Life Sciences

Sample Analysis Report

Sample Name RESIDENTIAL-20190815-0823
ALS Sample ID L2336381-6
Analysis Method EPA 1668C
Analysis Type Sample
Sample Matrix Air

Sampling Date 23-Aug-19
Extraction Date 5-Sep-19
Sample Size 1 Sample
Percent Moisture n/a
Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information

Run 1

Filename 5-190911A16
Run Date 11-Sep-19 20:23
Final Volume 25 ul
Dilution Factor 1
Analysis Units pg
Instrument - Column HRM55 SPB0CTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-192		NotFnd	<1.7	1.7	U		100
PCB-180/193		27.69	<8.2	1.7	M,J,R	8.2	100
PCB-191		NotFnd	<1.5	1.5	U		100
PCB-170		NotFnd	<2.2	2.2	U		100
PCB-190		NotFnd	<1.4	1.4	U		100
PCB-189	0.00003	NotFnd	<1.7	1.7	U		100
PCB-202		26.28	3.32	1.1	J		100
PCB-201		NotFnd	<1.1	1.1	U		100
PCB-204		NotFnd	<1.1	1.1	U		100
PCB-197		NotFnd	<1.1	1.1	U		100
PCB-200		NotFnd	<1.1	1.1	U		100
PCB-198/199		28.72	4.94	1.5	J		100
PCB-196		NotFnd	<1.5	1.5	U		100
PCB-203		29.16	3.38	1.4	J		100
PCB-195		NotFnd	<1.5	1.5	U		100
PCB-194		31.11	3.25	1.4	M,J		100
PCB-205		NotFnd	<1.1	1.1	U		100
PCB-208		NotFnd	<1.7	1.7	U		100
PCB-207		NotFnd	<1.7	1.7	U		100
PCB-206		NotFnd	<2.8	2.8	U		100
PCB-209		NotFnd	<1.2	1.2	U		100

Extraction Standards

	pg	Time	% Rec	Limits
13C12-PCB-001	4000	8.92	49	5-145
13C12-PCB-003	4000	10.45	48	5-145
13C12-PCB-004	4000	10.62	64	5-145
13C12-PCB-015	4000	14.29	55	5-145
13C12-PCB-019	4000	12.61	71	5-145
13C12-PCB-037	4000	18.24	67	5-145
13C12-PCB-054	4000	14.46	79	5-145
13C12-PCB-081	4000	21.81	76	10-145
13C12-PCB-077	4000	22.11	78	10-145
13C12-PCB-104	4000	17.49	89	10-145
13C12-PCB-123	4000	23.09	87	10-145
13C12-PCB-118	4000	23.26	89	10-145
13C12-PCB-114	4000	23.56	86	10-145
13C12-PCB-105	4000	23.92	86	10-145
13C12-PCB-126	4000	25.52	85	10-145
13C12-PCB-155	4000	20.47	96	10-145
13C12-PCB-167	4000	26.39	97	10-145
13C12-PCB-156/157	8000	27.04	96	10-145
13C12-PCB-169	4000	28.71	106	10-145
13C12-PCB-188	4000	23.48	99	10-145
13C12-PCB-189	4000	29.98	95	10-145
13C12-PCB-202	4000	26.27	105	10-145
13C12-PCB-205	4000	31.38	109	10-145
13C12-PCB-208	4000	29.69	105	10-145
13C12-PCB-206	4000	32.44	110	10-145
13C12-PCB-209	4000	33.56	119	10-145

Field Spike Standards

	pg	Time	% Rec	Limits
4-chloro-4'-fluorobiphenyl	6000	15.81	76	70-130
13C12-PCB-095	6000	19.11	63	70-130
13C12-PCB-031	6000	15.81	91	70-130
13C12-PCB-095	6000	19.11	87	70-130
13C12-PCB-153	6000	24.18	86	70-130

Cleanup Standards

	pg	Time	% Rec	Limits
13C12-PCB-028	4000	15.98	61	5-145
13C12-PCB-111	4000	22.01	78	10-145
13C12-PCB-178	4000	25.06	89	10-145

ALS Life Sciences

Sample Analysis Report

Sample Name	RESIDENTIAL-20190815-0823	Sampling Date	23-Aug-19	
ALS Sample ID	L2336381-6	Extraction Date	5-Sep-19	Approved: <i>E. Sabljic</i> --e-signature-- 13-Sep-2019
Analysis Method	EPA 1668C	Sample Size	1 Sample	
Analysis Type	Sample	Percent Moisture	n/a	
Sample Matrix	Air	Split Ratio	4	

Run Information	Run 1
Filename	5-190911A16
Run Date	11-Sep-19 20:23
Final Volume	25 ul
Dilution Factor	1
Analysis Units	pg
Instrument - Column	HRM55 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
Homologue Group Totals							
Total MonoCB			90.1	2.0	J	400	
Total DiCB			664	9.1	J	800	
Total TriCB			775	3.8	J	800	
Total TetraCB			567	2.0	J	1600	
Total PentaCB			359	2.2	J	1600	
Total HexaCB			149	0.98	J	1600	
Total HeptaCB			32.2	1.4	J	800	
Total OctaCB			14.9	1.1	J	800	
Total NonaCB			<1.7	1.7	U	400	
DecaCB			<1.2	1.2	U	400	
Total PCB			2650		J	3200	

Toxic Equivalency - (WHO 2005)	
Lower Bound PCB TEQ	0.00116
Mid Point PCB TEQ	0.239
Upper Bound PCB TEQ	0.478

EDL	Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
TEF	Indicates the Toxic Equivalency Factor
LQL	Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
M	Indicates that a peak has been manually integrated.
U	Indicates that this compound was not detected above the EDL.
J	Indicates that the analyte was positively identified. The associated numerical result is an estimate.
R	Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.
B	Indicates that this target was detected in the blank at greater than 10% of the sample concentration.
EMPC	Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

SVOC DATA PACKAGE

SECTION 3: METHOD SUMMARY

**PCB METHOD SUMMARY
Method 1668**

Introduction:

This summary is to provide ALSE Burlington PCB method details in order to provide persons reviewing or validating this data package sufficient information to re-construct the sample calculation, data verification and review. It incorporates the analysis of PCBs via the following reference methods:

US EPA Office of Water, Method 1668A
US EPA Office of Water, Method 1668C

Any deviations to what is listed herein would be listed in the project narrative.

To avoid the confusion and conflicting nomenclature within the methods, we have defined the labeled standards in terms relating to the time of addition to the sample or extract. Therefore;

The Field or Sampling Standards are added prior to field sampling
The Extraction Standards are added prior to extraction
The Clean-up Standards are added prior to extract clean-up
The Injection Standards are added prior to extract injection.

Calibration Standard Levels:

Six levels of standard are available for calibration as listed in Table 1. The low point (the CS0) is below method requirements and therefore is optional.

Table 1. Concentration of CB congeners in calibration and calibration verification standards

Solution concentration (ng/mL)

CB congener	IUPAC ¹	CS-0.2 (Hi sens)2	CS-1	CS-2	CS-3 (VER)	CS-4	CS-5
Native Toxics/LOC							
2-MoCB	1	0.2	1	5	50	400	2000
4-MoCB	3	0.2	1	5	50	400	2000
2,2'-DiCB	4	0.2	1	5	50	400	2000
4,4'-DiCB	15	0.2	1	5	50	400	2000
2,2',6'-TriCB	19	0.2	1	5	50	400	2000
3,4,4'-TriCB	37	0.2	1	5	50	400	2000
2,2',6,6'-TeCB	54	0.2	1	5	50	400	2000
3,3',4,4'-TeCB	77	0.2	1	5	50	400	2000
3,4,4',5'-TeCB	81	0.2	1	5	50	400	2000
2,2',4,6,6'-PeCB	104	0.2	1	5	50	400	2000
2,3,3',4,4'-PeCB	105	0.2	1	5	50	400	2000
2,3,4,4',5'-PeCB	114	0.2	1	5	50	400	2000
2,3',4,4',5'-PeCB	118	0.2	1	5	50	400	2000
2',3,4,4',5'-PeCB	123	0.2	1	5	50	400	2000
3,3',4,4',5'-PeCB	126	0.2	1	5	50	400	2000
2,2',4,4',6,6'-HxCB	155	0.2	1	5	50	400	2000
2,3,3',4,4',5'-HxCB	156	0.2	1	5	50	400	2000
2,3,3',4,4',5'-HxCB	157	0.2	1	5	50	400	2000
2,3',4,4',5,5'-HxCB	167	0.2	1	5	50	400	2000
3,3',4,4',5,5'-HxCB	169	0.2	1	5	50	400	2000
2,2',3,4',5,6,6'-HpCB	188	0.2	1	5	50	400	2000
2,3,3',4,4',5,5'-HpCB	189	0.2	1	5	50	400	2000
2,2',3,3',5,5',6,6'-OxCB	202	0.2	1	5	50	400	2000
2,3,3',4,4',5,5',6'-OxCB	205	0.2	1	5	50	400	2000
2,2',3,3',4,4',5,5',6'-NoCB	206	0.2	1	5	50	400	2000
2,2',3,3',4,4',5,5',6,6'-NoCB	208	0.2	1	5	50	400	2000
DeCB 209	209	0.2	1	5	50	400	2000
Labeled Toxics/LOC/window-defining							
13C12-2-MoCB	1L	100	100	100	100	100	100
13C12-4-MoCB	3L	100	100	100	100	100	100
13C12-2,2'-DiCB	4L	100	100	100	100	100	100
13C12-4,4'-DiCB	15L	100	100	100	100	100	100
13C12-2,2',6'-TriCB	19L	100	100	100	100	100	100
13C12-3,4,4'-TriCB	37L	100	100	100	100	100	100
13C12-2,2',6,6'-TeCB	54L	100	100	100	100	100	100
13C12-3,3',4,4'-TeCB	77L	100	100	100	100	100	100
13C12-3,4,4',5'-TeCB	81L	100	100	100	100	100	100
13C12-2,2',4,6,6'-PeCB	104L	100	100	100	100	100	100
13C12-2,3,3',4,4'-PeCB	105L	100	100	100	100	100	100
13C12-2,3,4,4',5'-PeCB	114L	100	100	100	100	100	100
13C12-2,3',4,4',5'-PeCB	118L	100	100	100	100	100	100
13C12-2',3,4,4',5'-PeCB	123L	100	100	100	100	100	100
13C12-3,3',4,4',5'-PeCB	126L	100	100	100	100	100	100
13C12-2,2',4,4',6,6'-HxCB	155L	100	100	100	100	100	100
13C12-2,3,3',4,4',5'-HxCB	156L	100	100	100	100	100	100
13C12-2,3,3',4,4',5'-HxCB	157L	100	100	100	100	100	100
13C12-2,3',4,4',5,5'-HxCB	167L	100	100	100	100	100	100
13C12-3,3',4,4',5,5'-HxCB	169L	100	100	100	100	100	100
13C12-2,2',3,4',5,6,6'-HpCB	188L	100	100	100	100	100	100
13C12-2,3,3',4,4',5,5'-HpCB	189L	100	100	100	100	100	100
13C12-2,2',3,3',5,5',6,6'-OxCB	202L	100	100	100	100	100	100
13C12-2,3,3',4,4',5,5',6'-OxCB	205L	100	100	100	100	100	100
13C12-2,2',3,3',4,4',5,5',6'-NoCB	206L	100	100	100	100	100	100
13C12-2,2',3,3',4,4',5,5',6,6'-NoCB	208L	100	100	100	100	100	100
13C12-DeCB 209L	209L	100	100	100	100	100	100
Labeled clean-up							
13C12-2,4,4'-TriCB	28L	100	100	100	100	100	100
13C12-2,3,3',5,5'-PeCB	111L	100	100	100	100	100	100
13C12-2,2',3,3',5,5',6'-HpCB	178L	100	100	100	100	100	100
Labeled injection internal							
13C12-2,5-DiCB	9L	100	100	100	100	100	100
13C12-2,2',5,5'-TeCB	52L	100	100	100	100	100	100
13C12-2,2',4,4',5,5'-PeCB	101L	100	100	100	100	100	100
13C12-2,2',3,3',4,4',5'-HxCB	138L	100	100	100	100	100	100
13C12-2,2',3,3',4,4',5,5'-OxCB	194L	100	100	100	100	100	100

Method Control Limits for 1668A

The initial and continuing calibration control limits for both methods are presented in Table 2 below. For the initial calibration CS1 and for each calibration verification CS3, the signal to noise ratio for each quantification ion for labelled and non-labelled analytes must be greater than or equal to 10:1

Table 2A. QC acceptance criteria for chlorinated biphenyls in VER, IPR, OPR, and samples ¹

Congener	IUPAC Number ²	Test conc (ng/mL)	VER (%)	IPR		OPR (%)	Labelled compound recovery in samples (%)
				RSD (%)	X (%)		
2-MoCB	1	50	70-130	40	60-140	50-150	
4-MoCB	3	50	70-130	40	60-140	50-150	
2,2'-DiCB	4	50	70-130	40	60-140	50-150	
4,4'-DiCB	15	50	70-130	40	60-140	50-150	
2,2',6-TrCB	19	50	70-130	40	60-140	50-150	
3,4,4'-TrCB	37	50	70-130	40	60-140	50-150	
2,2',6,6'-TeCB	54	50	70-130	40	60-140	50-150	
3,3',4,4'-TeCB	77	50	70-130	40	60-140	50-150	
3,4,4',5-TeCB	81	50	70-130	40	60-140	50-150	
2,2',4,6,6'-PeCB	104	50	70-130	40	60-140	50-150	
2,3,3',4,4'-PeCB	105	50	70-130	40	60-140	50-150	
2,3,4,4',5-PeCB	114	50	70-130	40	60-140	50-150	
2,3',4,4',5-PeCB	118	50	70-130	40	60-140	50-150	
2',3,4,4',5-PeCB	123	50	70-130	40	60-140	50-150	
3,3',4,4',5-PeCB	126	50	70-130	40	60-140	50-150	
2,2',4,4',6,6'-HxCB	155	50	70-130	40	60-140	50-150	
2,3,3',4,4',5-HxCB ³	156	50	70-130	40	60-140	50-150	
2,3,3',4,4',5'-HxCB ³	157	50	70-130	40	60-140	50-150	
2,3',4,4',5,5'-HxCB	167	50	70-130	40	60-140	50-150	
3,3',4,4',5,5'-HxCB	169	50	70-130	40	60-140	50-150	
2,2',3,4',5,6,6'-HpCB	188	50	70-130	40	60-140	50-150	
2,3,3',4,4',5,5'-HpCB	189	50	70-130	40	60-140	50-150	
2,2',3,3',5,5',6,6'-OcCB	202	50	70-130	40	60-140	50-150	
2,3,3',4,4',5,5',6-OcCB	205	50	70-130	40	60-140	50-150	
2,2',3,3',4,4',5,5',6-NoCB	206	50	70-130	40	60-140	50-150	
2,2',3,3',4,4',5,5',6,6'-NoCB	208	50	70-130	40	60-140	50-150	
DeCB	209	50	70-130	40	60-140	50-150	
13C12-2-MoCB	1L	100	50-150	50	35-135	30-140	25-150
13C12-4-MoCB	3L	100	50-150	50	35-135	30-140	25-150
13C12-2,2'-DiCB	4L	100	50-150	50	35-135	30-140	25-150
13C12-4,4'-DiCB	15L	100	50-150	50	35-135	30-140	25-150
13C12-2,2',6-TrCB	19L	100	50-150	50	35-135	30-140	25-150
13C12-3,4,4'-TrCB	37L	100	50-150	50	35-135	30-140	25-150
13C12-2,2',6,6'-TeCB	54L	100	50-150	50	35-135	30-140	25-150
13C12-3,3',4,4'-TCB	77L	100	50-150	50	35-135	30-140	25-150
13C12-3,4,4',5-TeCB	81L	100	50-150	50	35-135	30-140	25-150
13C12-2,2',4,6,6'-PeCB	104L	100	50-150	50	35-135	30-140	25-150
13C12-2,3,3',4,4'-PeCB	105L	100	50-150	50	35-135	30-140	25-150
13C12-2,3,4,4',5-PeCB	114L	100	50-150	50	35-135	30-140	25-150
13C12-2,3',4,4',5-PeCB	118L	100	50-150	50	35-135	30-140	25-150
13C12-2',3,4,4',5-PeCB	123L	100	50-150	50	35-135	30-140	25-150
13C12-3,3',4,4',5-PeCB	126L	100	50-150	50	35-135	30-140	25-150
13C12-2,2',4,4',6,6'-HxCB	155L	100	50-150	50	35-135	30-140	25-150
13C12-2,3,3',4,4',5-HxCB ³	156L	100	50-150	50	35-135	30-140	25-150
13C12-2,3,3',4,4',5'-HxCB ³	157L	100	50-150	50	35-135	30-140	25-150
13C12-2,3',4,4',5,5'-HxCB	167L	100	50-150	50	35-135	30-140	25-150
13C12-3,3',4,4',5,5'-HxCB	169L	100	50-150	50	35-135	30-140	25-150
13C12-2,2',3,4',5,6,6'-HpCB	188L	100	50-150	50	35-135	30-140	25-150
13C12-2',3,3',4,4',5,5'-HpCB	189L	100	50-150	50	35-135	30-140	25-150
13C12-2,2',3,3',5,5',6,6'-OcCB	202L	100	50-150	50	35-135	30-140	25-150
13C12-2,3,3',4,4',5,5',6-OcCB	205L	100	50-150	50	35-135	30-140	25-150
13C12-2,2',3,3',4,4',5,5',6-NoCB	206L	100	50-150	50	35-135	30-140	25-150
13C12-2,2',3,3',4,4',5,5',6,6'-NoCB	208L	100	50-150	50	35-135	30-140	25-150
13C12-2,2',3,3',4,4',5,5',6,6'-DeCB	209L	100	50-150	50	35-135	30-140	25-150
Cleanup standard							
13C12-2,4,4'-TrCB	28L	100	60-130	45	45-120	40-125	30-135
13C12-2,3,3',5,5'-PeCB	111L	100	60-130	45	45-120	40-125	30-135
13C12-2,2',3,3',5,5',6-HpCB	178L	100	60-130	45	45-120	40-125	30-135

1. QC acceptance criteria for IPR, OPR, and samples based on a 20 ul extract final volume

2. Suffix "L" indicates labelled compound.

3. PCBs 156 and 157 are tested as the sum of two concentrations

Method Control Limits for 1668C

The initial and continuing calibration control limits for both methods are presented in Table 2 below. For the initial calibration CS1 and for each calibration verification CS3, the signal to noise ratio for each quantification ion for labelled and non-labelled analytes must be greater than or equal to 10:1

Table 2A. QC acceptance criteria for chlorinated biphenyls in VER, IPR, OPR, and samples ¹

Congener	IUPAC Number ²	Test conc (ng/mL)	VER (%)	IPR		OPR (%)	Labelled compound recovery in samples (%)
				RSD (%)	X (%)		
2-MoCB	1	50	75 - 125	25	70 - 130	60 - 135	
4-MoCB	3	50	75 - 125	25	70 - 130	60 - 135	
2,2'-DiCB	4	50	75 - 125	25	70 - 130	60 - 135	
4,4'-DiCB	15	50	75 - 125	25	70 - 130	60 - 135	
2,2',6-TrCB	19	50	75 - 125	25	70 - 130	60 - 135	
3,4,4'-TrCB	37	50	75 - 125	25	70 - 130	60 - 135	
2,2',6,6'-TeCB	54	50	75 - 125	25	70 - 130	60 - 135	
3,3',4,4'-TeCB	77	50	75 - 125	25	70 - 130	60 - 135	
3,4,4',5'-TeCB	81	50	75 - 125	25	70 - 130	60 - 135	
2,2',4,6,6'-PeCB	104	50	75 - 125	25	70 - 130	60 - 135	
2,3,3',4,4'-PeCB	105	50	75 - 125	25	70 - 130	60 - 135	
2,3,4,4',5'-PeCB	114	50	75 - 125	25	70 - 130	60 - 135	
2,3',4,4',5'-PeCB	118	50	75 - 125	25	70 - 130	60 - 135	
2',3,4,4',5'-PeCB	123	50	75 - 125	25	70 - 130	60 - 135	
3,3',4,4',5'-PeCB	126	50	75 - 125	25	70 - 130	60 - 135	
2,2',4,4',6,6'-HxCB	155	50	75 - 125	25	70 - 130	60 - 135	
2,3,3',4,4',5'-HxCB ³	156	50	75 - 125	25	70 - 130	60 - 135	
2,3,3',4,4',5'-HxCB ³	157	50	75 - 125	25	70 - 130	60 - 135	
2,3',4,4',5,5'-HxCB	167	50	75 - 125	25	70 - 130	60 - 135	
3,3',4,4',5,5'-HxCB	169	50	75 - 125	25	70 - 130	60 - 135	
2,2',3,4',5,6,6'-HpCB	188	50	75 - 125	25	70 - 130	60 - 135	
2,3,3',4,4',5,5'-HpCB	189	50	75 - 125	25	70 - 130	60 - 135	
2,2',3,3',5,5',6,6'-OcCB	202	50	75 - 125	25	70 - 130	60 - 135	
2,3,3',4,4',5,5',6'-OcCB	205	50	75 - 125	25	70 - 130	60 - 135	
2,2',3,3',4,4',5,5',6'-NoCB	206	50	75 - 125	25	70 - 130	60 - 135	
2,2',3,3',4,5,5',6,6'-NoCB	208	50	75 - 125	25	70 - 130	60 - 135	
DeCB	209	50	75 - 125	25	70 - 130	60 - 135	
13C12-2-MoCB	1L	100	50 - 145	70	20 - 135	5 - 145	5 - 145
13C12-4-MoCB	3L	100	50 - 145	70	20 - 135	5 - 145	5 - 145
13C12-2,2'-DiCB	4L	100	50 - 145	70	20 - 135	5 - 145	5 - 145
13C12-4,4'-DiCB	15L	100	50 - 145	70	20 - 135	5 - 145	5 - 145
13C12-2,2',6-TrCB	19L	100	50 - 145	70	20 - 135	5 - 145	5 - 145
13C12-3,4,4'-TrCB	37L	100	50 - 145	70	20 - 135	5 - 145	5 - 145
13C12-2,2',6,6'-TeCB	54L	100	50 - 145	70	20 - 135	5 - 145	5 - 145
13C12-3,3',4,4'-TeCB	77L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-3,4,4',5'-TeCB	81L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,2',4,6,6'-PeCB	104L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,3,3',4,4'-PeCB	105L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,3,4,4',5'-PeCB	114L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,3',4,4',5'-PeCB	118L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2',3,4,4',5'-PeCB	123L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-3,3',4,4',5'-PeCB	126L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,2',4,4',6,6'-HxCB	155L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,3,3',4,4',5'-HxCB ³	156L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,3,3',4,4',5'-HxCB ³	157L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,3',4,4',5,5'-HxCB	167L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-3,3',4,4',5,5'-HxCB	169L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,2',3,4',5,6,6'-HpCB	188L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2',3,3',4,4',5,5'-HpCB	189L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,2',3,3',5,5',6,6'-OcCB	202L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,3,3',4,4',5,5',6'-OcCB	205L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,2',3,3',4,4',5,5',6'-NoCB	206L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,2',3,3',4,5,5',6,6'-NoCB	208L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
13C12-2,2',3,3',4,4',5,5',6,6'-DeCB	209L	100	50 - 145	50	45 - 135	10 - 145	10 - 145
Cleanup standards							
13C12-2,4,4'-TrCB	28L	100	65 - 135	70	20 - 135	5 - 145	5 - 145
13C12-2,3,3',5,5'-PeCB	111L	100	75 - 125	50	45 - 135	10 - 145	10 - 145
13C12-2,2',3,3',5,5',6'-HpCB	178L	100	75 - 125	50	45 - 135	10 - 145	10 - 145

1. QC acceptance criteria for IPR, OPR, and samples based on a 20-µL extract final volume
 2. Suffix "L" indicates labeled compound.
 3. CBs 156/157 and 156L/157L are tested as the sum of the two congeners

Reporting Limits:

Unless indicated in the otherwise, the PCB results are reported down to 2.5:1 signal to noise for each isomer grouping for each extract injection. This is consistent to SW846 8290 defined protocols (i.e. EDL or Estimated Detection Limit) and is commonly applied throughout the industry to any or all the HRMS performance based methods applicable to this method summary.

Method Blank:

The Method Blank must be below the EMLs published in the required method, 1668A or 1668C.

MS/MSD:

The % relative difference between the MS and MSD spike recoveries should be less than or equal to 20%.

Instrument/Run Performance Criteria:

- 1 Elution windows must be defined by a 'Window Performance Mix' at the beginning of each 12-hour run sequence
- 2 GC performance criteria of 40% maximum valley between PCB-34/PCB-23, and PCB-187/PCB-182 (Octyl Column).
- 3 At the beginning of and just following the end of each 12 hour run sequence, the instrument must be checked to demonstrate a resolution of 10,000 within each quantification window (8,000 minimum across the window).
- 4 The relative retention times (RRT) of the compounds in the daily 209 congener mix must fall into the ranges presented in Table 4.
- 5 The RT in the daily CS3 verification standards must be within 15 seconds of the CS3 in the initial calibration run.
- 6 The maximum time between scans within a descriptor is 1 second.
- 7 Lock mass deviations to the average response must be less than or equal 20%.

Laboratory Duplicates:

The % relative difference between duplicates should be less than or equal to 25% but only where the response is greater than the low calibration standard.

Analyte Identification Criteria:

- 1 Ion ratio must be within 15% of theoretical or within 10% of the most recent CS3.
- 2 The retention time (RT) of the peak maxima for each pair of quantification ions must be no more than 2 seconds (i.e. 2 scans) difference.
- 3 The retention time (RT) of the peak maxima of all native analytes for which a labeled analogue is used must be within -1 to +3 seconds of the RT of corresponding ¹³C₁₂-labelled isomer of that injection run.
- 4 For those native analytes without a corresponding labelled isomer, the relative retention time (RRT) must be within 0.005 of the relative retention time observed in the daily 209 congener run.

DEVIATIONS AND CLARIFICATIONS FROM THE PRIMARY REFERENCES

The reference methods applicable to this document are:

US EPA Office of Water, Method 1668A
US EPA Office of Water, Method 1668C

These methods are referred-to herein as Method 1668

The following changes and clarifications apply:

1) As stated in method 1668, alternate columns and column systems are allowable changes to the method. In the context of the method, it is clear that Table 2 of this method (including retention times, relative retention times, and quantitation references) is specific to the Octyl GC column if used exactly as suggested in the method.

As a performance based method, changes in the internal standard references could be considered an improvement even when using the SPB-Octyl column. However when using an alternate column system (which may or may not include use of the Octyl column), optimization of the quantitation references can be an important part of optimizing the method. Consider that the MS acquisition method must be divided into mass descriptors or 'functions', each one defining the masses that are monitored during that time range. When monitoring for all 209 PCB congeners, there are large chromatographic regions where elution of target compounds is nearly continuous with little separation between peaks. In addition, there is a slight acquisition "gap" that occurs at each function change (for Water's instruments 1-2 seconds, for Thermo instruments 6-8 seconds), and also the likelihood of slight retention time shifts from one run to another. Consequently, choosing the exact location of each function boundary can be challenging. For a 1668 method, there are typically between 5 and 8 functions dependent upon the column, the GC conditions, the instrument and the choice of the function boundaries by the laboratory. Each function can have 1 to as many as 4 chlorination levels. When optimizing the quantification model in the case where RT and elution patterns have changed – even slightly - the best choice of internal standard references can and should change dependent upon target retention times and placement of function boundaries. For example, the best quantification is achieved using an internal standard reference that elutes at close to the same retention time. Another consideration is that it is best practice where possible (i.e. generally allows for more accurate target determinations) to have the internal standard reference within the same function rather than quantify a target relative to an internal standard from an outside function.

The quantification references used in this analysis are detailed in Table 3.

2) The absolute retention time criterion for decachlorobiphenyl of 55 minutes is not generally followed and is an unnecessary restriction since method 1668 was developed without the use of electronic pressure control on the GC injection system, and there are GC performance criteria that can be met without this restriction. As a result, the RRT criteria of 1668 may not be applicable.

3) Although not clearly stated in method 1668, we maintain that each and every individual clean-up procedure is, by definition, performance-based and optional. There is not an expectation within the industry to follow exactly the descriptions of clean-ups in reference methods. Adaptations which meet or exceed the required performance criteria are therefore acceptable within the scope of each reference method. The reference method descriptions are intended as guidelines or templates available to help the laboratory to define effective in-house clean-up methods. The objective within the laboratory is to provide quality clean extracts to the instrument for analysis. Each individual clean-up is part of the laboratory's available tools in order to achieve this objective.

4) There are differences within the individual reference methods as to the precise spiking protocols for adding extraction standards and native spikes (for LCS, MS and MSD). To ensure consistency within the laboratory between HRMS methods, the PCB preparative method requires solid samples (including stack and ambient sorbants/filters) to be spiked in the soxhlet extractor from a nonane solution and waters are spiked before filtering from an acetone solution. .

5) Sub-sampling of solids and pre-extraction processing is done in a manner that minimizes potential for cross-contamination. These processes are designed around SW846 protocols rather than 1668 protocols. Solids are sub-sampled directly from the bottle as submitted to the laboratory wherever practical. If the sample is submitted such that homogenization in the bottle is impractical (eg. the bottle is too full or lumps cannot be broken down), then transferring the sample to a tray or another bottle maybe in order.

6) The concentration of labelled and native spiking solutions are not consistent with those listed in all of the reference methods. These concentrations are prepared at levels convenient and expedient for accurate laboratory processing.

7) Extraction and injection standard concentrations differ from 1668, in order to aid precise measurement and standardise volumes with other reference methods such as PCDD/F by 1613B.

8) Method 1668C recognizes the option to use the 209 congener mix as the daily calibration verification solution rather than the CS3. This document acknowledges and allows either calibration option for both 1668A and 1668C analytical approaches.

9) For method 1668C analysis, the OPR labelled recovery limits are the same as for the sample recovery limits in method 1668C. This represents a broader acceptance range for the OPR than is currently listed in method 1668C. However, the control of the native (i.e. non-labelled) recovery limits is the key item to demonstrate/monitor in the OPR. Furthermore, in the OPR performance, it is important to demonstrate these native controls are maintained within the same range of labelled recoveries as is observed in the sample data.

Table 3: Quantitation References for Native and Labeled CBs

CI No. ¹	Congener No. ^{2,3}	RT Ref ⁴	Quantitation Reference ⁵
Native Compounds			
1	1	1L	1L
1	2	3L	1L/3L
1	3	3L	3L
2	4	4L	4L
2	10	4L	4L/15L
2	9	4L	4L/15L
2	7	4L	4L/15L
2	6	4L	4L/15L
2	5	4L	4L/15L
2	8	4L	4L/15L
2	14	15L	4L/15L
2	11	15L	4L/15L
2	13/12	15L	4L/15L
2	15	15L	15L
3	19	19L	19L
3	30/18	19L	19L/37L
3	17	19L	19L/37L
3	27	19L	19L/37L
3	24	19L	19L/37L
3	16	19L	19L/37L
3	32	19L	19L/37L
3	34	19L	19L/37L
3	23	19L	19L/37L
3	26/29	19L	19L/37L
3	25	37L	19L/37L
3	31	37L	19L/37L
3	28/20	37L	19L/37L
3	21/33	37L	19L/37L
3	22	37L	19L/37L
3	36	37L	19L/37L
3	39	37L	19L/37L
3	38	37L	19L/37L
3	35	37L	19L/37L
3	37	37L	37L
4	54	54L	54L
4	50/53	54L	54L/81L/77L
4	45/51	54L	54L/81L/77L
4	46	54L	54L/81L/77L
4	52	54L	54L/81L/77L
4	73	54L	54L/81L/77L
4	43	54L	54L/81L/77L
4	69/49	54L	54L/81L/77L
4	48	54L	54L/81L/77L
4	44/47/65	54L	54L/81L/77L
4	59/62/75	54L	54L/81L/77L
4	42	54L	54L/81L/77L
4	41/40/71	54L	54L/81L/77L
4	64	54L	54L/81L/77L
4	72	81L	54L/81L/77L
4	68	81L	54L/81L/77L

CI No. ¹	Congener No. ^{2,3}	RT Ref ⁴	Quantitation Reference ⁵
4	57	81L	54L/81L/77L
4	58	81L	54L/81L/77L
4	67	81L	54L/81L/77L
4	63	81L	54L/81L/77L
4	61/70/74/76	81L	54L/81L/77L
4	66	81L	54L/81L/77L
4	55	81L	54L/81L/77L
4	56	81L	54L/81L/77L
4	60	81L	54L/81L/77L
4	80	81L	54L/81L/77L
4	79	81L	54L/81L/77L
4	78	81L	54L/81L/77L
4	81	81L	81L
4	77	77L	77L
5	104	104L	104L
5	96	104L	104L/123L/114L/118L
5	103	104L	104L/123L/114L/118L
5	94	104L	104L/123L/114L/118L
5	95	104L	104L/123L/114L/118L
5	95/100/93/102/98	104L	104L/123L/114L/118L
5	88/91	104L	104L/123L/114L/118L
5	84	104L	104L/123L/114L/118L
5	89	104L	104L/123L/114L/118L
5	121	104L	104L/123L/114L/118L
5	92	123L	104L/123L/114L/118L
5	113/90/101	104L	104L/123L/114L/118L
5	83/99	104L	104L/123L/114L/118L
5	112	104L	104L/123L/114L/118L
5	108/119/86/97/125/87	104L	104L/123L/114L/118L
5	117/116/85/110/115	104L	104L/123L/114L/118L
5	82	104L	104L/123L/114L/118L
5	111	104L	104L/123L/114L/118L
5	120	104L	104L/123L/114L/118L
5	107/124	104L	104L/123L/114L/118L
5	109	104L	104L/123L/114L/118L
5	123	123L	123L
5	106	123L	104L/123L/114L/118L
5	118	118L	118L
5	122	118L	104L/123L/114L/118L
5	114	114L	114L
5	105	105L	105L
5	127	105L	104L/123L/114L/118L
5	126	126L	126L
6	155	155L	155L
6	152	155L	155L/156L/157L/167L
6	150	155L	155L/156L/157L/167L
6	136	155L	155L/156L/157L/167L
6	145	155L	155L/156L/157L/167L
6	148	155L	155L/156L/157L/167L
6	151/135	135L	155L/156L/157L/167L
6	154	155L	155L/156L/157L/167L
6	144	155L	155L/156L/157L/167L
6	147/149	155L	155L/156L/157L/167L
6	134/143	155L	155L/156L/157L/167L

CI No. ¹	Congener No. ^{2,3}	RT Ref ⁴	Quantitation Reference ⁵
6	139/140	155L	155L/156L/157L/167L
6	131	155L	155L/156L/157L/167L
6	142	155L	155L/156L/157L/167L
6	132	155L	155L/156L/157L/167L
6	133	155L	155L/156L/157L/167L
6	165	167L	155L/156L/157L/167L
6	146	167L	155L/156L/157L/167L
6	161	167L	155L/156L/157L/167L
6	153/168	167L	155L/156L/157L/167L
6	141	167L	155L/156L/157L/167L
6	130	167L	155L/156L/157L/167L
6	137/164	167L	155L/156L/157L/167L
6	138/163/129	167L	155L/156L/157L/167L
6	160	167L	155L/156L/157L/167L
6	158	167L	155L/156L/157L/167L
6	128/166	167L	155L/156L/157L/167L
6	159	167L	155L/156L/157L/167L
6	162	167L	155L/156L/157L/167L
6	167	167L	155L/156L/157L/167L
6	156/157	156L/157L	156L/157L
6	169	169L	169L
7	188	188L	188L
7	179	188L	188L/189L
7	184	188L	188L/189L
7	176	188L	188L/189L
7	186	188L	188L/189L
7	178	188L	188L/189L
7	175	188L	188L/189L
7	187	188L	188L/189L
7	182	188L	188L/189L
7	183	188L	188L/189L
7	185	188L	188L/189L
7	174	188L	188L/189L
7	177	188L	188L/189L
7	181	188L	188L/189L
7	171/173	188L	188L/189L
7	172	189L	188L/189L
7	192	189L	188L/189L
7	180/193	189L	188L/189L
7	191	189L	188L/189L
7	170	189L	188L/189L
7	190	189L	188L/189L
7	189	189L	189L
8	202	202L	202L
8	201	202L	202L/205L
8	204	202L	202L/205L
8	197	202L	202L/205L
8	200	202L	202L/205L
8	198/199	202L	202L/205L
8	196	205L	202L/205L
8	203	205L	202L/205L
8	195	205L	202L/205L
8	194	205L	202L/205L
8	205	205L	205L
9	208	208L	208L
9	207	208L	208L/206L
9	206	206L	206L
10	209	209L	209L

CI No. ¹	Congener No. ^{2,3}	RT Ref ⁴	Quantitation Reference ⁵
Labelled Extraction Standards			
1	1L	9L	9L
1	3L	9L	9L
2	4L	9L	9L
2	15L	9L	9L
3	19L	9L	9L
3	37L	52L	52L
4	54L	52L	52L
4	81L	101L	101L
4	77L	101L	101L
5	104L	101L	101L
5	123L	101L	101L
5	118L	101L	101L
5	114L	101L	101L
5	105L	101L	101L
5	126L	101L	101L
6	155L	101L	101L
6	167L	138L	138L
6	156L/157L	157L	138L
6	169L	138L	138L
7	188L	138L	138L
7	189L	138L	138L
8	202L	138L	138L
8	205L	194L	194L
9	208L	194L	194L
9	206L	194L	194L
10	209L	194L	194L
Labelled clean-up standards			
3	28L	52L	52L
5	111L	101L	101L
7	178L	138L	138L
Labelled injection internal standards			
2	9L	138L	138L
4	52L	138L	138L
5	101L	138L	138L
6	138L	138L	138L
8	194L	138L	138L

1. Number of chlorines on congener.
2. Suffix "L" indicates labelled compound.
3. Multiple congeners in a box indicates a group of congeners that co-elute or may not be adequately resolved on a 30-m SPB-Octyl column. Congeners included in the group are listed as the last entry in the box.
4. Retention time reference that is used to locate target congener.
5. Labelled congeners that form the quantitation reference. Areas from the exact m/z's of the congeners listed in the quantitation

Table 5: HRMS Instrumental Descriptor Parameters

Function and chlorine level	m/z	m/z type	m/z formula	Substance
Fn-1; Cl-1	180.9888	QC	C4F7	PFK
	188.0393	M	12C12 H9 35Cl	Cl-1 CB
	190.0363	M+2	12C12 H9 37Cl	Cl-1 CB
	200.0795	M	13C12 H9 35Cl	13C12 Cl-1 CB
	202.0766	M+2	13C12 H9 37Cl	13C12 Cl-1 CB
	204.9983	QC	C6F7	PFK
	218.9856	lock	C4 F9	PFK
	230.9850	QC	C5F9	PFK
Fn-2; Cl-2,3	204.9883	QC	C6F7	PFK
	218.9856	QC	C4F9	PFK
	222.0003	M	12C12 H8 35Cl2	Cl-2 PCB
	223.9974	M+2	12C12 H8 35Cl 37Cl	Cl-2 PCB
	225.9944	M+4	12C12 H8 37Cl2	Cl-2 PCB
	234.0406	M	13C12 H8 35Cl2	13C12 Cl-2 PCB
	236.0376	M+2	13C12 H8 35Cl 37 Cl	13C12 Cl-2 PCB
	242.9856	lock	C6 F9	PFK
	255.9613	M	12C12 H7 35Cl3	Cl-3 PCB
	257.9584	M+2	12C12 H7 35Cl2 37Cl	Cl-3 PCB
	268.0016	M	13C12 H7 35Cl3	13C12 Cl-3 PCB
	269.9986	M+2	13C12 H7 35Cl2 37Cl 13C12	13C12 Cl-3 PCB
Fn-3 Cl-3,4,5	255.9613	M	12C12 H7 35Cl3	Cl-3 PCB
	257.9584	M+2	12C12 H7 35Cl2 37Cl	Cl-3 PCB
	268.0016	M	13C12 H7 35Cl3	13C12 Cl-3 PCB
	269.9986	M+2	13C12 H7 35Cl2 37Cl 13C12	13C12 Cl-3 PCB
	280.9825	lock	C6 F11	PFK
	289.9224	M	12C12 H6 35Cl4	Cl-4 PCB
	291.9194	M+2	12C12 H6 35Cl3 37Cl	Cl-4 PCB
	301.9626	M	13C12 H6 35Cl4	13C12 Cl-4 PCB
	303.9597	M+2	13C12 H6 35Cl3 37Cl	13C12 Cl-4 PCB
	323.8834	M	12C12 H5 35Cl5	Cl-5 PCB
	325.8804	M+2 1	2C12 H5 35Cl4 37Cl	Cl-5 PCB
	327.8775	M+4	12C12 H5 35Cl3 37Cl2	Cl-5 PCB
	337.9207	M+2	13C12 H5 35Cl4 37Cl	13C12 Cl-5 PCB
	339.9178	M+4	13C12 H5 35Cl3 37Cl2	13C12 Cl-5 PCB
	Fn-4 Cl-4,5,6	280.9824		C6 F11
289.9224		M	12C12 H6 35Cl4	Cl-4 PCB
291.9194		M+2	12C12 H6 35Cl3 37Cl	Cl-4 PCB
293.9165		M+4	12C12 H6 35Cl2 37Cl2	Cl-4 PCB
301.9626		M+2	13C12 H6 35Cl3 37Cl	13C12 Cl-4 PCB
303.9597		M+4	13C12 H6 35Cl2	13C12 Cl-4 PCB
323.8834		M	12C12 H5 35Cl5	Cl-5 PCB
325.8804		M+2	12C12 H5 35Cl4 37Cl	Cl-5 PCB
327.8775		M+4	12C12 H5 35Cl3 37Cl2	Cl-5 PCB
330.9792		lock	C7 F15	PFK
337.9207		M+2	13C12 H5 35Cl4 37Cl 13C12	Cl-5 PCB
339.9178		M+4	13C12 H5 35Cl3 37Cl2	13C12 Cl-5 PCB
359.8415		M+2	13C12 H4 35Cl5 37Cl	Cl-6 PCB
361.8385		M+4	13C12 H4 35Cl4 37Cl2	Cl-6 PCB
363.8356		M+6	13C12 H4 35Cl3 37Cl2	Cl-6 PCB
371.8817		M+2	13C12 H4 35Cl5 37Cl	13C12 Cl-6 PCB
373.8788		M+4	13C12 H4 35Cl4 37Cl2	13C12 Cl-6 PCB

Function and chlorine level	m/z	m/z type	m/z formula	Substance
Fn-5 Cl-5,6,7	323.8834	M	12C12 H5 35Cl5	Cl-5 PCB
	325.8804	M+2	12C12 H5 35Cl4 37Cl	Cl-5 PCB
	327.8775	M+4	12C12 H5 35Cl3 37Cl2	Cl-5 PCB
	337.9207	M+2	13C12 H5 35Cl4 37Cl	13C12 Cl-5 PCB
	339.9178	M+4	13C12 H5 35Cl3 37Cl2	13C12 Cl-5 PCB
	354.9792	lock	C9 F13	PFK
	359.8415	M+2	12C12 H4 35Cl5 37Cl	Cl-6 PCB
	361.8385	M+4	12C12 H4 35Cl4 37Cl2	Cl-6 PCB
	363.8356	M+6	12C12 H4 35Cl3 37Cl3	Cl-6 PCB
	371.8817	M+2	13C12 H4 35Cl5 37Cl	13C12 Cl-6 PCB
	373.8788	M+4	13C12 H4 35Cl4 37Cl2	13C12 Cl-6 PCB
	393.8025	M+2	12C12 H3 35Cl6 37Cl	Cl-7 PCB
	395.7995	M+4	12C12 H3 35Cl5 37Cl2	Cl-7 PCB
	397.7966	M+6	12C12 H3 35Cl4 37Cl3	Cl-7 PCB
	405.8428	M+2	13C12 H3 35Cl6 37Cl	13C12 Cl-7 PCB
	407.8398	M+4	13C12 H3 35Cl5 37Cl2	13C12 Cl-7 PCB
	427.7635	M+2	12C12 H2 35Cl7 37Cl	Cl-8 PCB
	429.7606	M+4	12C12 H2 35Cl6 37Cl2	Cl-8 PCB
	431.7576	M+6	12C12 H2 35Cl5 37Cl3	Cl-8 PCB
	439.8038	M+2	13C12 H2 35Cl7 37Cl	13C12 Cl-8 PCB
441.8008	M+4	13C12 H2 35Cl6 37Cl2	13C12 Cl-8 PCB	
Fn-6 Cl-7,8,9,10	393.8025	M+2	12C12 H3 35Cl6 37Cl	Cl-7 PCB
	395.7995	M+4	12C12 H3 35Cl5 37Cl2	Cl-7 PCB
	397.7966	M+6	12C12 H3 35Cl4 37Cl3	Cl-7 PCB
	405.8428	M+2	13C12 H3 35Cl6 37Cl 13C12	Cl-7 PCB
	407.8398	M+4	13C12 H3 35Cl5 37Cl2	13C12 Cl-7 PCB
	427.7635	M+2	12C12 H2 35Cl7 37Cl	Cl-8 PCB
	429.7606	M+4	12C12 H2 35Cl6 37Cl2	Cl-8 PCB
	431.7576	M+6	12C12 H2 35Cl5 37Cl3	Cl-8 PCB
	439.8038	M+2	13C12 H2 35Cl7 37Cl	13C12 Cl-8 PCB
	441.8008	M+4	13C12 H2 35Cl6 37Cl2	13C12 Cl-8 PCB
	442.9728	QC	C10 F13	PFK
	454.9728	lock	C11 F13	PFK
	461.7246	M+2	12C12 H1 35Cl8 37Cl	Cl-9 PCB
	463.7216	M+4	12C12 H1 35Cl7 37Cl2	Cl-9 PCB
	465.7187	M+6	12C12 H1 35Cl6 37Cl3	Cl-9 PCB
	473.7648	M+2	13C12 H1 35Cl8 37Cl	13C12 Cl-9 PCB
475.7619	M+4	13C12 H1 35Cl7 37Cl2	13C12 Cl-9 PCB	
495.6856	M+2	13C12 H4 35Cl9 37Cl	Cl-10 PCB	
Fn-7	497.6826	M+4	12C12 35Cl8 37Cl2	Cl-10 PCB
	499.6797	M+6	12C12 35Cl7 37Cl3	Cl-10 PCB
	509.7229	M+4	13C12 H4 35Cl8 37Cl2	13C12 Cl-10 PCB
	511.7199	M+6	13C12 H4 35Cl8 37Cl4	13C12 Cl-10 PCB
	516.9697	lock	C13F19	PFK

Data Calculations:

a) Analyte Concentrations:

The relative response factor of each target relative to the standard against which it is to be calculated is determined using the area responses of both quantification ions via equation 9.1.

In cases where a native target is calculated against an exact labelled analogue, the quantification will be considered to be by isotope dilution. In other cases, the quantification will be considered to be by internal standard.

$$\text{RRF} = \frac{(A_{1t} + A_{2t}) C_s}{(A_{1s} + A_{2s}) C_t} \quad \text{Equ. 9.1}$$

Where,

$A_{1t} + A_{2t}$ = The areas of the two quantification ions for the target analyte

$A_{1s} + A_{2s}$ = The areas of the two quantification ions for the labelled compound against which the target analyte will be calculated.

C_t = The concentration in the calibration standard of the target analyte.

C_s = The concentration in the calibration standard of the labelled compound against which the target will be calculated.

For all analytes to be quantified and from the initial calibration series of standard injections, a table of RRFs is prepared. The relative standard deviation (%RSD, or the coefficient of variance) is checked to confirm that the appropriate method criteria has been met as listed in Table 3. The average of the five or six levels of standard for each analyte, RRF_{av} is applied for quantification of samples according to Equations 9.2 and 9.3 below.

$$\text{Amount in sample (pg)} = \frac{(A_{1n} + A_{2n}) Q_i}{(A_{1t} + A_{2t}) (\text{RRF}_{av})} \quad \text{Equ. 9.2}$$

$$\text{Concentration in sample (pg/g or pg/l)} = \frac{(A_{1n} + A_{2n}) Q_i}{(A_{1t} + A_{2t}) (\text{RRF}_{av}) (W_s)} \quad \text{Equ. 9.3}$$

Where,

Q_i = The amount (pg) of labelled compound added to the sample

W_s = The weight (g) or volume (l) of sample

b) Extraction, Clean-up, and Sampling Standard Recovery Calculation:

The extraction, clean-up, and sampling standard recoveries are determined by Equation 9.4 below.

$$\% \text{ Recovery} = (\text{Amount in sample}) / (\text{Amount added to sample}) \times 100 \quad \text{Equ. 9.4}$$

c) Estimated Detection Limit

$$\text{EDL} = \frac{2.5 \times H_x \times Q_{es}}{H_{es} \times W \times \text{RRF}_{av}} \quad \text{Equ. 9.5}$$

Where,

EDL = estimated detection limit for homologous PCB

H_x = sum of the height of the noise level for each quantification ions for the unlabelled PCB.

H_{es} = Sum of the heights of responses of both quantification ions for the labelled extraction standard.

W = weight of volume of sample

RRF_{av} = average relative response factor

Q_{es} = Amount of extraction standard added

Chromatogram Annotation Codes

All manually integrated peaks are expanded and reprinted with the following annotations:

* Analyst Initials AA
 * Date YYMMDD
 * integration code CC

The Syntax is:

AAYYMMDDCC

Example:

SK111220MB

Code	Mnemonic	Description
MB	Manual Baseline	The peak was manually integrated because the initial baseline was determined incorrectly by the software
MS	Manual Split	The peak was manually integrated because the peak was incorrectly or not split by the software
MJ/MC	Manual Join/Manual Combine	The peak was manually integrated because the peak was split by the software and the peak should be integrated as a single peak
MA	Manual Add	The peak was manually integrated because the signal:noise ratio was judged to be >2.5
MD	Manual Delete	The peak was excluded because the signal:noise ratio was judged to be <2.5
MX	Manual Exclude	The peak was excluded due to an interference
NH	Noise Height	The noise height for Estimated Detection Limit calculation was chosen by the analyst (automated noise height not appropriate)
MT	Manual Time	The peak retention time was manually chosen

The following explanatory annotation codes may appear on the chromatograms of peaks that have been reviewed:

Code	Mnemonic	Description
+	Detected Peak	A peak was detected at this mass and retention time that was above 2.5:1 signal to noise
<	Below Detection Limit	The signal at this mass and retention time was below 2.5:1 signal to noise
EMPC	Estimated Maximum Possible Concentration	The signal at this mass and retention time is an interference such that the target compound could not be confirmed
X-RT	Not Detected due to Retention Time non-conformance	The signal at this retention time could not be used to positively identify the target compound because of retention time non-conformance (apex of quantification and confirmation ions do not maximize within the same two seconds, or the retention time of the peak does not fall within the expected range with respect to its labeled analogue)
X-LOC	Not Detected due to interference from a higher level of chlorination	The signal at this retention time is attributable to a fragment from a co-eluting compound at a higher level of chlorination, and cannot be used to positively identify the target. The result is expressed as an Estimated Maximum Possible Concentration (EMPC)
X-DPE	Not Detected due to diphenyl ether interference	The signal at this retention time is attributable to interference from a chlorinated diphenyl ether, and cannot be used to positively identify the target. The result is expressed as an Estimated Maximum Possible Concentration (EMPC)
X-IF	Not Detected due to interference	The signal at this retention time is attributable to a co-eluting interference, and cannot be used to positively identify the target. The result is expressed as an Estimated Maximum Possible Concentration (EMPC)

SVOC DATA PACKAGE

SECTION 4: CALIBRATION DATA

Including:

for Multi-Point Calibration(s)

- Multi-Point Calibration Tables
- Individual Quantitation Reports

for Continuing Calibration(s)

- Individual Quantitation Reports

ALS Life Sciences

Calibration Summary Report

Calibration Level	Filename	Run Date
CS-1	5-190502B01	02-May-2019 12:04
CS-2	5-190502B04	02-May-2019 14:13
CS-3	5-190502B03	02-May-2019 13:31
CS-4	5-190502B06	02-May-2019 15:38
CS-5	5-190502B05	02-May-2019 14:56

Approved:	<i>E. Sabljic</i> --e-signature-- 13-Sep-2019
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Target Analytes	Relative Response Factors					Mean	% RSD
	CS-1	CS-2	CS-3	CS-4	CS-5		
PCB-001	1.065	1.105	1.063	1.107		1.085	2%
PCB-003	1.124	1.134	1.117	1.153		1.132	1%
PCB-004	0.896	0.907	0.889	0.932	0.935	0.912	2%
PCB-015	0.987	1.060	1.025	1.084		1.039	4%
PCB-019	1.117	1.165	1.150	1.176	1.152	1.152	2%
PCB-037	1.025	1.074	1.024	1.073	1.075	1.054	3%
PCB-054	1.028	1.039	1.034	1.062	1.070	1.047	2%
PCB-081	1.278	1.195	1.141	1.187	1.172	1.195	4%
PCB-077	1.092	1.123	1.105	1.153	1.142	1.123	2%
PCB-104	1.116	1.175	1.138	1.166	1.156	1.150	2%
PCB-123	1.060	1.093	1.040	1.064	1.064	1.064	2%
PCB-118	1.112	1.167	1.137	1.175	1.162	1.151	2%
PCB-114	1.129	1.189	1.132	1.181	1.185	1.163	3%
PCB-105	1.240	1.174	1.104	1.163	1.163	1.169	4%
PCB-126	1.124	1.187	1.156	1.189	1.186	1.168	2%
PCB-155	1.065	1.075	1.039	1.069	1.065	1.063	1%
PCB-167	1.280	1.235	1.163	1.205	1.194	1.215	4%
PCB-156/157	1.259	1.252	1.182	1.215	1.206	1.223	3%
PCB-169	1.121	1.158	1.153	1.192	1.183	1.161	2%
PCB-188	0.959	1.046	0.981	1.013	1.003	1.000	3%
PCB-189	0.916	0.967	0.942	0.995	0.985	0.961	3%
PCB-202	1.069	1.106	1.067	1.094	1.086	1.084	2%
PCB-205	0.908	0.972	0.966	0.990	0.980	0.963	3%
PCB-208	1.104	1.113	1.078	1.110	1.110	1.103	1%
PCB-206	1.140	1.128	1.107	1.121	1.134	1.126	1%
PCB-209	0.886	0.917	0.892	0.912	0.905	0.902	1%
Extraction Standards							
13C12-PCB-001	0.999	0.986	0.986	1.000	1.024	0.999	2%
13C12-PCB-003	0.923	0.925	0.901	0.946	0.962	0.931	3%
13C12-PCB-004	0.628	0.634	0.636	0.631	0.640	0.634	1%
13C12-PCB-015	0.933	0.907	0.901	0.967	0.988	0.939	4%
13C12-PCB-019	0.484	0.488	0.485	0.492	0.502	0.490	1%
13C12-PCB-037	1.588	1.570	1.544	1.621	1.648	1.594	3%
13C12-PCB-054	1.339	1.351	1.348	1.344	1.349	1.346	0%
13C12-PCB-081	1.617	1.599	1.586	1.580	1.618	1.600	1%
13C12-PCB-077	1.643	1.623	1.603	1.599	1.627	1.619	1%
13C12-PCB-104	1.399	1.422	1.415	1.368	1.401	1.401	1%
13C12-PCB-123	1.453	1.412	1.445	1.429	1.456	1.439	1%
13C12-PCB-118	1.426	1.390	1.420	1.386	1.423	1.409	1%
13C12-PCB-114	1.375	1.330	1.349	1.336	1.348	1.348	1%
13C12-PCB-105	1.384	1.357	1.379	1.353	1.365	1.368	1%
13C12-PCB-126	1.320	1.295	1.291	1.285	1.297	1.298	1%
13C12-PCB-155	1.502	1.546	1.547	1.508	1.519	1.524	1%
13C12-PCB-167	1.182	1.202	1.185	1.184	1.189	1.188	1%
13C12-PCB-156/157	1.147	1.154	1.141	1.146	1.133	1.144	1%
13C12-PCB-169	1.078	1.082	1.068	1.096	1.076	1.080	1%
13C12-PCB-188	1.287	1.299	1.325	1.301	1.302	1.303	1%
13C12-PCB-189	1.074	1.114	1.107	1.077	1.091	1.093	2%
13C12-PCB-202	1.082	1.104	1.119	1.095	1.093	1.099	1%
13C12-PCB-205	1.234	1.241	1.246	1.245	1.260	1.245	1%
13C12-PCB-208	1.079	1.095	1.116	1.086	1.081	1.091	1%
13C12-PCB-206	0.683	0.698	0.709	0.721	0.717	0.706	2%
13C12-PCB-209	1.022	1.031	1.056	1.078	1.084	1.054	3%
Field Spike Standards							
13C12-PCB-031	1.467	1.457	1.315	1.435	1.426	1.420	4%
13C12-PCB-095	0.693	0.713	0.623	0.695	0.698	0.684	5%
13C12-PCB-153	1.042	1.013	0.924	1.025	1.032	1.007	5%
Cleanup Standards							
13C12-PCB-028	1.884	1.901	1.685	1.863	1.879	1.842	5%
13C12-PCB-111	1.337	1.338	1.211	1.325	1.343	1.311	4%
13C12-PCB-178	0.965	0.985	0.887	0.975	0.978	0.958	4%

ALS Life Sciences

Calibration Report

ALS Sample ID **H5-19-CS1-005**
 Analysis Method EPA 1668C
 Analysis Type Calibration

Filename 5-190502801 Inst # HRMS5 Column SPBOCTYL64948-03A Run Date 02-May-2019 12:04

Approved: *E. Sabljic*
 --e-signature--
 13-Sep-2019

Target Analytes	Ret. Time	Ion Ratio	Concentration ng/mL	Response	RRF
PCB-001	8.9	3.14	1.00	7.88E+04	1.065
PCB-003	10.44	3.32	1.00	7.69E+04	1.124
PCB-004	10.61	1.55	1.00	4.17E+04	0.896
PCB-015	14.3	1.57	1.00	6.82E+04	0.987
PCB-019	12.62	1.10	1.00	4.01E+04	1.117
PCB-037	18.25	1.07	1.00	6.12E+04	1.025
PCB-054	14.47	0.78	1.00	5.18E+04	1.028
PCB-081	21.82	0.81	1.00	6.69E+04	1.278
PCB-077	22.13	0.81	1.00	5.80E+04	1.092
PCB-104	17.55	1.62	1.00	5.05E+04	1.116
PCB-123	23.13	1.39	1.00	4.99E+04	1.060
PCB-118	23.3	1.59	1.00	5.13E+04	1.112
PCB-114	23.59	1.56	1.00	5.02E+04	1.129
PCB-105	23.94	1.56	1.00	5.55E+04	1.240
PCB-126	25.54	1.60	1.00	4.80E+04	1.124
PCB-155	20.55	1.31	1.00	5.18E+04	1.065
PCB-167	26.44	1.26	1.00	5.39E+04	1.280
PCB-156/157	27.07	1.23	2.00	1.03E+05	1.259
PCB-169	28.74	1.31	1.00	4.30E+04	1.121
PCB-188	23.54	1.00	1.00	4.39E+04	0.959
PCB-189	30.02	1.06	1.00	3.50E+04	0.916
PCB-202	26.32	0.89	1.00	4.12E+04	1.069
PCB-205	31.41	0.86	1.00	2.83E+04	0.908
PCB-208	29.76	0.80	1.00	3.01E+04	1.104
PCB-206	32.51	0.70	1.00	1.97E+04	1.140
PCB-209	33.64	1.20	1.00	2.29E+04	0.886

Extraction Standards

13C12-PCB-001	8.9	3.15	100.00	7.40E+06	0.999
13C12-PCB-003	10.44	3.12	100.00	6.84E+06	0.923
13C12-PCB-004	10.59	1.60	100.00	4.66E+06	0.628
13C12-PCB-015	14.29	1.58	100.00	6.92E+06	0.933
13C12-PCB-019	12.61	1.04	100.00	3.59E+06	0.484
13C12-PCB-037	18.24	1.06	100.00	5.97E+06	1.588
13C12-PCB-054	14.46	0.79	100.00	5.04E+06	1.339
13C12-PCB-081	21.81	0.79	100.00	5.23E+06	1.617
13C12-PCB-077	22.12	0.79	100.00	5.32E+06	1.643
13C12-PCB-104	17.53	1.58	100.00	4.53E+06	1.399
13C12-PCB-123	23.11	1.59	100.00	4.70E+06	1.453
13C12-PCB-118	23.29	1.58	100.00	4.61E+06	1.426
13C12-PCB-114	23.58	1.61	100.00	4.45E+06	1.375
13C12-PCB-105	23.93	1.60	100.00	4.48E+06	1.384
13C12-PCB-126	25.52	1.60	100.00	4.27E+06	1.320
13C12-PCB-155	20.54	1.26	100.00	4.86E+06	1.502
13C12-PCB-167	26.43	1.29	100.00	4.21E+06	1.182
13C12-PCB-156/157	27.06	1.31	200.00	8.17E+06	1.147
13C12-PCB-169	28.73	1.30	100.00	3.84E+06	1.078
13C12-PCB-188	23.53	1.07	100.00	4.58E+06	1.287
13C12-PCB-189	30.01	1.06	100.00	3.83E+06	1.074
13C12-PCB-202	26.31	0.90	100.00	3.85E+06	1.082
13C12-PCB-205	31.4	0.89	100.00	3.12E+06	1.234
13C12-PCB-208	29.75	0.78	100.00	2.73E+06	1.079
13C12-PCB-206	32.49	0.79	100.00	1.73E+06	0.683
13C12-PCB-209	33.63	1.20	100.00	2.59E+06	1.022

Field Spike Standards

13C12-PCB-031	15.82	1.06	100.00	7.02E+06	1.467
13C12-PCB-095	19.13	1.59	100.00	3.17E+06	0.693
13C12-PCB-153	24.22	1.31	100.00	4.43E+06	1.042

Cleanup Standards

13C12-PCB-028	16	1.06	100.00	7.09E+06	1.884
13C12-PCB-111	22.06	1.58	100.00	4.32E+06	1.337
13C12-PCB-178	25.1	1.05	100.00	3.44E+06	0.965

Injection Standards

13C12-PCB-9	11.87	1.58	100.00	7.41E+06	-
13C12-PCB-52	16.99	0.81	100.00	3.76E+06	-
13C12-PCB-101	20.67	1.58	100.00	3.24E+06	-
13C12-PCB-138	24.91	1.30	100.00	3.56E+06	-
13C12-PCB-194	31.13	0.90	100.00	2.53E+06	-

ALS Life Sciences

Calibration Report

ALS Sample ID **H5-19-CS2-005**
 Analysis Method EPA 1668C
 Analysis Type Calibration

Filename 5-190502804 Inst # HRMS5 Column SPBOCTYL64948-03A Run Date 02-May-2019 14:13

Approved: *E. Sabljic*
 --e-signature--
 13-Sep-2019

Target Analytes	Ret. Time	Ion Ratio	Concentration ng/mL	Response	RRF
PCB-001	8.88	3.21	5.00	3.39E+05	1.105
PCB-003	10.41	3.30	5.00	3.27E+05	1.134
PCB-004	10.58	1.55	5.00	1.79E+05	0.907
PCB-015	14.26	1.56	5.00	2.99E+05	1.060
PCB-019	12.58	1.06	5.00	1.77E+05	1.165
PCB-037	18.22	1.04	5.00	2.62E+05	1.074
PCB-054	14.44	0.79	5.00	2.18E+05	1.039
PCB-081	21.8	0.76	5.00	2.53E+05	1.195
PCB-077	22.1	0.77	5.00	2.41E+05	1.123
PCB-104	17.51	1.63	5.00	2.21E+05	1.175
PCB-123	23.1	1.61	5.00	2.04E+05	1.093
PCB-118	23.26	1.61	5.00	2.15E+05	1.167
PCB-114	23.57	1.57	5.00	2.09E+05	1.189
PCB-105	23.92	1.58	5.00	2.11E+05	1.174
PCB-126	25.51	1.57	5.00	2.03E+05	1.187
PCB-155	20.51	1.26	5.00	2.20E+05	1.075
PCB-167	26.42	1.25	5.00	2.11E+05	1.235
PCB-156/157	27.05	1.20	10.00	4.11E+05	1.252
PCB-169	28.71	1.23	5.00	1.78E+05	1.158
PCB-188	23.52	1.01	5.00	1.93E+05	1.046
PCB-189	29.99	1.01	5.00	1.53E+05	0.967
PCB-202	26.3	0.87	5.00	1.74E+05	1.106
PCB-205	31.39	0.90	5.00	1.23E+05	0.972
PCB-208	29.74	0.78	5.00	1.24E+05	1.113
PCB-206	32.47	0.80	5.00	8.01E+04	1.128
PCB-209	33.61	1.20	5.00	9.61E+04	0.917
Extraction Standards					
13C12-PCB-001	8.86	3.11	100.00	6.14E+06	0.986
13C12-PCB-003	10.4	3.06	100.00	5.76E+06	0.925
13C12-PCB-004	10.57	1.61	100.00	3.95E+06	0.634
13C12-PCB-015	14.25	1.57	100.00	5.64E+06	0.907
13C12-PCB-019	12.57	1.04	100.00	3.04E+06	0.488
13C12-PCB-037	18.2	1.04	100.00	4.87E+06	1.570
13C12-PCB-054	14.43	0.79	100.00	4.19E+06	1.351
13C12-PCB-081	21.79	0.79	100.00	4.23E+06	1.599
13C12-PCB-077	22.08	0.79	100.00	4.29E+06	1.623
13C12-PCB-104	17.5	1.60	100.00	3.76E+06	1.422
13C12-PCB-123	23.08	1.58	100.00	3.74E+06	1.412
13C12-PCB-118	23.25	1.59	100.00	3.68E+06	1.390
13C12-PCB-114	23.55	1.60	100.00	3.52E+06	1.330
13C12-PCB-105	23.9	1.60	100.00	3.59E+06	1.357
13C12-PCB-126	25.5	1.60	100.00	3.43E+06	1.295
13C12-PCB-155	20.5	1.26	100.00	4.09E+06	1.546
13C12-PCB-167	26.39	1.31	100.00	3.42E+06	1.202
13C12-PCB-156/157	27.03	1.30	200.00	6.57E+06	1.154
13C12-PCB-169	28.7	1.30	100.00	3.08E+06	1.082
13C12-PCB-188	23.51	1.06	100.00	3.70E+06	1.299
13C12-PCB-189	29.98	1.05	100.00	3.17E+06	1.114
13C12-PCB-202	26.29	0.91	100.00	3.14E+06	1.104
13C12-PCB-205	31.38	0.90	100.00	2.52E+06	1.241
13C12-PCB-208	29.71	0.79	100.00	2.23E+06	1.095
13C12-PCB-206	32.46	0.79	100.00	1.42E+06	0.698
13C12-PCB-209	33.6	1.20	100.00	2.10E+06	1.031
Field Spike Standards					
13C12-PCB-031	15.79	1.05	100.00	5.76E+06	1.457
13C12-PCB-095	19.1	1.60	100.00	2.62E+06	0.713
13C12-PCB-153	24.18	1.28	100.00	3.51E+06	1.013
Cleanup Standards					
13C12-PCB-028	15.96	1.05	100.00	5.90E+06	1.901
13C12-PCB-111	22.02	1.60	100.00	3.54E+06	1.338
13C12-PCB-178	25.08	1.06	100.00	2.80E+06	0.985
Injection Standards					
13C12-PCB-9	11.83	1.60	100.00	6.23E+06	-
13C12-PCB-52	16.96	0.81	100.00	3.10E+06	-
13C12-PCB-101	20.63	1.58	100.00	2.65E+06	-
13C12-PCB-138	24.87	1.29	100.00	2.85E+06	-
13C12-PCB-194	31.1	0.91	100.00	2.03E+06	-

ALS Life Sciences

Calibration Report

ALS Sample ID **H5-19-CS3-005**
 Analysis Method EPA 1668C
 Analysis Type Calibration

Filename 5-190502803	Inst # HRMS5	Column SPBOCTYL64948-03A	Run Date 02-May-2019 13:31	Approved: <i>E. Sabljic</i> --e-signature-- 13-Sep-2019
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Target Analytes	Ret. Time	Ion Ratio	Concentration ng/mL	Response	RRF
PCB-001	8.89	3.15	50.00	1.97E+06	1.063
PCB-003	10.43	3.21	50.00	1.89E+06	1.117
PCB-004	10.59	1.49	50.00	1.06E+06	0.889
PCB-015	14.27	1.56	50.00	1.74E+06	1.025
PCB-019	12.59	1.07	50.00	1.05E+06	1.150
PCB-037	18.23	1.04	50.00	1.52E+06	1.024
PCB-054	14.45	0.80	50.00	1.34E+06	1.034
PCB-081	21.81	0.77	50.00	1.49E+06	1.141
PCB-077	22.11	0.78	50.00	1.46E+06	1.105
PCB-104	17.52	1.58	50.00	1.33E+06	1.138
PCB-123	23.11	1.58	50.00	1.24E+06	1.040
PCB-118	23.28	1.57	50.00	1.33E+06	1.137
PCB-114	23.58	1.59	50.00	1.26E+06	1.132
PCB-105	23.92	1.57	50.00	1.25E+06	1.104
PCB-126	25.52	1.54	50.00	1.23E+06	1.156
PCB-155	20.53	1.26	50.00	1.32E+06	1.039
PCB-167	26.42	1.23	50.00	1.24E+06	1.163
PCB-156/157	27.05	1.23	100.00	2.42E+06	1.182
PCB-169	28.73	1.24	50.00	1.11E+06	1.153
PCB-188	23.53	1.04	50.00	1.17E+06	0.981
PCB-189	29.99	1.03	50.00	9.37E+05	0.942
PCB-202	26.3	0.89	50.00	1.07E+06	1.067
PCB-205	31.4	0.90	50.00	7.73E+05	0.966
PCB-208	29.74	0.80	50.00	7.72E+05	1.078
PCB-206	32.49	0.80	50.00	5.04E+05	1.107
PCB-209	33.63	1.17	50.00	6.05E+05	0.892

Extraction Standards

13C12-PCB-001	8.88	3.14	100.00	3.71E+06	0.986
13C12-PCB-003	10.41	3.13	100.00	3.39E+06	0.901
13C12-PCB-004	10.58	1.58	100.00	2.39E+06	0.636
13C12-PCB-015	14.26	1.58	100.00	3.39E+06	0.901
13C12-PCB-019	12.58	1.04	100.00	1.82E+06	0.485
13C12-PCB-037	18.21	1.05	100.00	2.96E+06	1.544
13C12-PCB-054	14.44	0.80	100.00	2.58E+06	1.348
13C12-PCB-081	21.8	0.79	100.00	2.61E+06	1.586
13C12-PCB-077	22.09	0.79	100.00	2.64E+06	1.603
13C12-PCB-104	17.51	1.58	100.00	2.33E+06	1.415
13C12-PCB-123	23.1	1.59	100.00	2.38E+06	1.445
13C12-PCB-118	23.26	1.59	100.00	2.34E+06	1.420
13C12-PCB-114	23.57	1.60	100.00	2.22E+06	1.349
13C12-PCB-105	23.91	1.61	100.00	2.27E+06	1.379
13C12-PCB-126	25.51	1.60	100.00	2.13E+06	1.291
13C12-PCB-155	20.51	1.26	100.00	2.55E+06	1.547
13C12-PCB-167	26.41	1.30	100.00	2.13E+06	1.185
13C12-PCB-156/157	27.03	1.30	200.00	4.10E+06	1.141
13C12-PCB-169	28.71	1.31	100.00	1.92E+06	1.068
13C12-PCB-188	23.51	1.05	100.00	2.38E+06	1.325
13C12-PCB-189	29.98	1.06	100.00	1.99E+06	1.107
13C12-PCB-202	26.29	0.91	100.00	2.01E+06	1.119
13C12-PCB-205	31.39	0.91	100.00	1.60E+06	1.246
13C12-PCB-208	29.72	0.78	100.00	1.43E+06	1.116
13C12-PCB-206	32.46	0.79	100.00	9.10E+05	0.709
13C12-PCB-209	33.6	1.19	100.00	1.36E+06	1.056

Field Spike Standards

13C12-PCB-031	15.8	1.05	100.00	3.14E+06	1.315
13C12-PCB-095	19.11	1.59	100.00	1.45E+06	0.623
13C12-PCB-153	24.19	1.29	100.00	2.00E+06	0.924

Cleanup Standards

13C12-PCB-028	15.97	1.05	100.00	3.23E+06	1.685
13C12-PCB-111	22.03	1.60	100.00	1.99E+06	1.211
13C12-PCB-178	25.09	1.05	100.00	1.59E+06	0.887

Injection Standards

13C12-PCB-9	11.84	1.59	100.00	3.76E+06	-
13C12-PCB-52	16.97	0.80	100.00	1.92E+06	-
13C12-PCB-101	20.64	1.57	100.00	1.65E+06	-
13C12-PCB-138	24.88	1.30	100.00	1.80E+06	-
13C12-PCB-194	31.1	0.91	100.00	1.28E+06	-

ALS Life Sciences

Calibration Report

ALS Sample ID **H5-19-CS4-005**
 Analysis Method EPA 1668C
 Analysis Type Calibration

Filename 5-190502806 Inst # HRMS5 Column SPBOCTYL64948-03A Run Date 02-May-2019 15:38

Approved: *E. Sabljic*
 --e-signature--
 13-Sep-2019

Target Analytes	Ret. Time	Ion Ratio	Concentration ng/mL	Response	RRF
PCB-001	8.86	3.17	400.00	2.92E+07	1.107
PCB-003	10.4	3.21	400.00	2.88E+07	1.153
PCB-004	10.57	1.50	400.00	1.55E+07	0.932
PCB-015	14.24	1.57	400.00	2.76E+07	1.084
PCB-019	12.57	1.07	400.00	1.52E+07	1.176
PCB-037	18.19	1.03	400.00	2.41E+07	1.073
PCB-054	14.43	0.79	400.00	1.98E+07	1.062
PCB-081	21.78	0.78	400.00	2.30E+07	1.187
PCB-077	22.07	0.78	400.00	2.27E+07	1.153
PCB-104	17.5	1.58	400.00	1.96E+07	1.166
PCB-123	23.08	1.56	400.00	1.87E+07	1.064
PCB-118	23.25	1.56	400.00	2.00E+07	1.175
PCB-114	23.54	1.58	400.00	1.94E+07	1.181
PCB-105	23.89	1.56	400.00	1.93E+07	1.163
PCB-126	25.49	1.58	400.00	1.88E+07	1.189
PCB-155	20.5	1.26	400.00	1.98E+07	1.069
PCB-167	26.39	1.23	400.00	1.85E+07	1.205
PCB-156/157	27.02	1.23	800.00	3.62E+07	1.215
PCB-169	28.69	1.24	400.00	1.70E+07	1.192
PCB-188	23.51	1.03	400.00	1.71E+07	1.013
PCB-189	29.97	1.02	400.00	1.39E+07	0.995
PCB-202	26.29	0.90	400.00	1.56E+07	1.094
PCB-205	31.38	0.90	400.00	1.14E+07	0.990
PCB-208	29.72	0.80	400.00	1.11E+07	1.110
PCB-206	32.46	0.80	400.00	7.46E+06	1.121
PCB-209	33.6	1.18	400.00	9.08E+06	0.912

Extraction Standards

13C12-PCB-001	8.86	3.12	100.00	6.59E+06	1.000
13C12-PCB-003	10.39	3.07	100.00	6.24E+06	0.946
13C12-PCB-004	10.55	1.58	100.00	4.16E+06	0.631
13C12-PCB-015	14.23	1.57	100.00	6.37E+06	0.967
13C12-PCB-019	12.55	1.03	100.00	3.24E+06	0.492
13C12-PCB-037	18.18	1.06	100.00	5.62E+06	1.621
13C12-PCB-054	14.42	0.79	100.00	4.66E+06	1.344
13C12-PCB-081	21.76	0.79	100.00	4.86E+06	1.580
13C12-PCB-077	22.06	0.78	100.00	4.91E+06	1.599
13C12-PCB-104	17.48	1.57	100.00	4.20E+06	1.368
13C12-PCB-123	23.06	1.57	100.00	4.39E+06	1.429
13C12-PCB-118	23.24	1.59	100.00	4.26E+06	1.386
13C12-PCB-114	23.53	1.62	100.00	4.11E+06	1.336
13C12-PCB-105	23.88	1.60	100.00	4.16E+06	1.353
13C12-PCB-126	25.48	1.60	100.00	3.95E+06	1.285
13C12-PCB-155	20.48	1.25	100.00	4.64E+06	1.508
13C12-PCB-167	26.38	1.29	100.00	3.84E+06	1.184
13C12-PCB-156/157	27.01	1.31	200.00	7.44E+06	1.146
13C12-PCB-169	28.68	1.31	100.00	3.56E+06	1.096
13C12-PCB-188	23.48	1.06	100.00	4.22E+06	1.301
13C12-PCB-189	29.96	1.05	100.00	3.49E+06	1.077
13C12-PCB-202	26.26	0.92	100.00	3.55E+06	1.095
13C12-PCB-205	31.36	0.89	100.00	2.87E+06	1.245
13C12-PCB-208	29.7	0.78	100.00	2.51E+06	1.086
13C12-PCB-206	32.45	0.79	100.00	1.67E+06	0.721
13C12-PCB-209	33.58	1.19	100.00	2.49E+06	1.078

Field Spike Standards

13C12-PCB-031	15.77	1.03	100.00	6.35E+06	1.435
13C12-PCB-095	19.09	1.56	100.00	2.95E+06	0.695
13C12-PCB-153	24.17	1.29	100.00	4.04E+06	1.025

Cleanup Standards

13C12-PCB-028	15.94	1.04	100.00	6.45E+06	1.863
13C12-PCB-111	22.01	1.60	100.00	4.07E+06	1.325
13C12-PCB-178	25.07	1.04	100.00	3.16E+06	0.975

Injection Standards

13C12-PCB-9	11.82	1.59	100.00	6.59E+06	-
13C12-PCB-52	16.94	0.80	100.00	3.46E+06	-
13C12-PCB-101	20.62	1.57	100.00	3.07E+06	-
13C12-PCB-138	24.86	1.31	100.00	3.25E+06	-
13C12-PCB-194	31.08	0.89	100.00	2.31E+06	-

ALS Life Sciences

Calibration Report

ALS Sample ID **H5-19-CS5-005**
 Analysis Method EPA 1668C
 Analysis Type Calibration

Filename 5-190502805	Inst # HRMS5	Column SPBOCTYL64948-03A	Run Date 02-May-2019 14:56	Approved: <i>E. Sabljic</i> --e-signature-- 13-Sep-2019
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Target Analytes	Ret. Time	Ion Ratio	Concentration ng/mL	Response	RRF
PCB-001					
PCB-003					
PCB-004					
PCB-015					
PCB-019					
PCB-037					
PCB-054					
PCB-081					
PCB-077					
PCB-104					
PCB-123					
PCB-118					
PCB-114					
PCB-105					
PCB-126					
PCB-155					
PCB-167					
PCB-156/157					
PCB-169					
PCB-188					
PCB-189					
PCB-202					
PCB-205					
PCB-208					
PCB-206					
PCB-209					
Extraction Standards					
13C12-PCB-001					
13C12-PCB-003					
13C12-PCB-004					
13C12-PCB-015					
13C12-PCB-019					
13C12-PCB-037					
13C12-PCB-054					
13C12-PCB-081					
13C12-PCB-077					
13C12-PCB-104					
13C12-PCB-123					
13C12-PCB-118					
13C12-PCB-114					
13C12-PCB-105					
13C12-PCB-126					
13C12-PCB-155					
13C12-PCB-167					
13C12-PCB-156/157					
13C12-PCB-169					
13C12-PCB-188					
13C12-PCB-189					
13C12-PCB-202					
13C12-PCB-205					
13C12-PCB-208					
13C12-PCB-206					
13C12-PCB-209					
Field Spike Standards					
13C12-PCB-031					
13C12-PCB-095					
13C12-PCB-153					
Cleanup Standards					
13C12-PCB-028					
13C12-PCB-111					
13C12-PCB-178					
Injection Standards					
13C12-PCB-9					
13C12-PCB-52					
13C12-PCB-101					
13C12-PCB-138					
13C12-PCB-194					

Sample Name	Sample ID	Target Analyte	#HOM	Respo	Ra	Fa	Yield	RT	Conc.	H/A	lcal	Rf	User	RF	#Rep	Mod	Date	Com	Comments	No.1	No.2	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
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ALS Life Sciences

Continuing Calibration Report

Sample Name CCV
 ALS Sample ID H5-19-CCV-758
 Analysis Method EPA 1668C
 Analysis Type CCV
 Sample Matrix QC

Sampling Date n/a
 Extraction Date n/a
 Sample Size 1 n/a
 Percent Moisture n/a
 Split Ratio 1

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information **Run 1**
 Filename 5-190910A29
 Run Date 11-Sep-19 08:41
 Final Volume 25 ul
 Dilution Factor 1
 Analysis Units %
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	pg/uL	Ret.		Limits	
		Time	% Rec		Flags
PCB-001	50	8.97	99	75-125	
PCB-003	50	10.48	95	75-125	
PCB-004	50	10.65	88	75-125	
PCB-015	50	14.31	97	75-125	
PCB-019	50	12.64	96	75-125	
PCB-037	50	18.26	94	75-125	
PCB-054	50	14.49	93	75-125	
PCB-081	50	21.82	97	75-125	
PCB-077	50	22.14	99	75-125	
PCB-104	50	17.52	90	75-125	
PCB-123	50	23.11	90	75-125	
PCB-118	50	23.28	90	75-125	
PCB-114	50	23.58	89	75-125	
PCB-105	50	23.95	89	75-125	
PCB-126	50	25.54	92	75-125	
PCB-155	50	20.50	90	75-125	
PCB-167	50	26.42	87	75-125	
PCB-156/157	100	27.07	89	75-125	
PCB-169	50	28.73	92	75-125	
PCB-188	50	23.50	90	75-125	
PCB-189	50	30.00	96	75-125	
PCB-202	50	26.29	93	75-125	
PCB-205	50	31.41	82	75-125	
PCB-208	50	29.72	98	75-125	
PCB-206	50	32.47	97	75-125	
PCB-209	50	33.59	93	75-125	

Extraction Standards		Time	% Rec	Limits
13C12-PCB-001	100	8.95	73	50-145
13C12-PCB-003	100	10.48	77	50-145
13C12-PCB-004	100	10.63	95	50-145
13C12-PCB-015	100	14.31	74	50-145
13C12-PCB-019	100	12.62	98	50-145
13C12-PCB-037	100	18.24	82	50-145
13C12-PCB-054	100	14.48	116	50-145
13C12-PCB-081	100	21.81	81	50-145
13C12-PCB-077	100	22.12	83	50-145
13C12-PCB-104	100	17.51	114	50-145
13C12-PCB-123	100	23.10	87	50-145
13C12-PCB-118	100	23.27	90	50-145
13C12-PCB-114	100	23.57	89	50-145
13C12-PCB-105	100	23.94	88	50-145
13C12-PCB-126	100	25.53	86	50-145
13C12-PCB-155	100	20.48	116	50-145
13C12-PCB-167	100	26.41	99	50-145
13C12-PCB-156/157	200	27.05	97	50-145
13C12-PCB-169	100	28.72	98	50-145
13C12-PCB-188	100	23.49	106	50-145
13C12-PCB-189	100	29.99	94	50-145
13C12-PCB-202	100	26.28	113	50-145
13C12-PCB-205	100	31.38	100	50-145
13C12-PCB-208	100	29.70	97	50-145
13C12-PCB-206	100	32.45	103	50-145
13C12-PCB-209	100	33.58	109	50-145

Field Spike Standards		Time	% Rec	Limits
13C12-PCB-031	100	15.82	88	70-130
13C12-PCB-095	100	19.13	92	70-130
13C12-PCB-153	100	24.19	86	70-130

Cleanup Standards		Time	% Rec	Limits
13C12-PCB-028	100	16.00	87	65-135
13C12-PCB-111	100	22.02	88	75-125
13C12-PCB-178	100	25.07	96	75-125

ALS Life Sciences

Continuing Calibration Report

Sample Name CCV
 ALS Sample ID H5-19-CCV-760
 Analysis Method EPA 1668C
 Analysis Type CCV
 Sample Matrix QC

Sampling Date n/a
 Extraction Date n/a
 Sample Size 1 n/a
 Percent Moisture n/a
 Split Ratio 1

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information **Run 1**
 Filename 5-190911A17
 Run Date 11-Sep-19 21:05
 Final Volume 25 ul
 Dilution Factor 1
 Analysis Units %
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	pg/uL	Ret. Limits		
		Time	% Rec	Flags
PCB-001	50	8.97	100	75-125
PCB-003	50	10.48	96	75-125
PCB-004	50	10.65	89	75-125
PCB-015	50	14.31	97	75-125
PCB-019	50	12.64	96	75-125
PCB-037	50	18.25	92	75-125
PCB-054	50	14.49	94	75-125
PCB-081	50	21.82	96	75-125
PCB-077	50	22.13	99	75-125
PCB-104	50	17.52	91	75-125
PCB-123	50	23.10	90	75-125
PCB-118	50	23.27	90	75-125
PCB-114	50	23.57	90	75-125
PCB-105	50	23.94	90	75-125
PCB-126	50	25.53	90	75-125
PCB-155	50	20.49	90	75-125
PCB-167	50	26.41	88	75-125
PCB-156/157	100	27.05	89	75-125
PCB-169	50	28.72	92	75-125
PCB-188	50	23.50	91	75-125
PCB-189	50	30.00	96	75-125
PCB-202	50	26.28	92	75-125
PCB-205	50	31.39	83	75-125
PCB-208	50	29.72	98	75-125
PCB-206	50	32.47	98	75-125
PCB-209	50	33.59	93	75-125

Extraction Standards		Time	% Rec	Limits
13C12-PCB-001	100	8.95	73	50-145
13C12-PCB-003	100	10.47	77	50-145
13C12-PCB-004	100	10.63	93	50-145
13C12-PCB-015	100	14.30	77	50-145
13C12-PCB-019	100	12.62	97	50-145
13C12-PCB-037	100	18.24	85	50-145
13C12-PCB-054	100	14.47	114	50-145
13C12-PCB-081	100	21.81	81	50-145
13C12-PCB-077	100	22.12	82	50-145
13C12-PCB-104	100	17.50	112	50-145
13C12-PCB-123	100	23.09	88	50-145
13C12-PCB-118	100	23.26	90	50-145
13C12-PCB-114	100	23.56	89	50-145
13C12-PCB-105	100	23.92	87	50-145
13C12-PCB-126	100	25.52	86	50-145
13C12-PCB-155	100	20.48	113	50-145
13C12-PCB-167	100	26.40	98	50-145
13C12-PCB-156/157	200	27.05	97	50-145
13C12-PCB-169	100	28.71	99	50-145
13C12-PCB-188	100	23.49	105	50-145
13C12-PCB-189	100	29.99	96	50-145
13C12-PCB-202	100	26.27	111	50-145
13C12-PCB-205	100	31.38	101	50-145
13C12-PCB-208	100	29.70	96	50-145
13C12-PCB-206	100	32.45	104	50-145
13C12-PCB-209	100	33.58	113	50-145

Field Spike Standards		Time	% Rec	Limits
13C12-PCB-031	100	15.81	88	70-130
13C12-PCB-095	100	19.12	91	70-130
13C12-PCB-153	100	24.18	86	70-130

Cleanup Standards		Time	% Rec	Limits
13C12-PCB-028	100	15.99	87	65-135
13C12-PCB-111	100	22.02	87	75-125
13C12-PCB-178	100	25.07	95	75-125

ALS Life Sciences

Second Source Calibration Verification Report

Sample Name CVS
 ALS Sample ID H5-19-RS1-005
 Analysis Method EPA 1668C
 Analysis Type CCV
 Sample Matrix QC

Sampling Date n/a
 Extraction Date n/a
 Sample Size 1 n/a
 Percent Moisture n/a
 Split Ratio 1

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information **Run 1**
 Filename 5-190502B07
 Run Date 02-May-19 16:20
 Final Volume 25 ul
 Dilution Factor 1
 Analysis Units %
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	pg/uL	Ret.		Limits	
		Time	% Rec		Flags
PCB-001	50	8.88	100	75-125	
PCB-003	50	10.41	100	75-125	
PCB-004	50	10.58	105	75-125	
PCB-015	50	14.26	103	75-125	
PCB-019	50	12.58	102	75-125	
PCB-037	50	18.21	90	75-125	
PCB-054	50	14.44	103	75-125	
PCB-081	50	21.79	95	75-125	
PCB-077	50	22.09	99	75-125	
PCB-104	50	17.51	95	75-125	
PCB-123	50	23.10	104	75-125	
PCB-118	50	23.26	102	75-125	
PCB-114	50	23.55	104	75-125	
PCB-105	50	23.90	99	75-125	
PCB-126	50	25.50	104	75-125	
PCB-155	50	20.51	97	75-125	
PCB-167	50	26.41	97	75-125	
PCB-156/157	100	27.03	98	75-125	
PCB-169	50	28.70	100	75-125	
PCB-188	50	23.51	99	75-125	
PCB-189	50	29.98	106	75-125	
PCB-202	50	26.29	100	75-125	
PCB-205	50	31.39	98	75-125	
PCB-208	50	29.72	96	75-125	
PCB-206	50	32.46	103	75-125	
PCB-209	50	33.60	107	75-125	

Extraction Standards		Time	% Rec	Limits
13C12-PCB-001	100	8.88	101	50-145
13C12-PCB-003	100	10.40	99	50-145
13C12-PCB-004	100	10.57	100	50-145
13C12-PCB-015	100	14.25	100	50-145
13C12-PCB-019	100	12.57	103	50-145
13C12-PCB-037	100	18.20	97	50-145
13C12-PCB-054	100	14.43	100	50-145
13C12-PCB-081	100	21.78	97	50-145
13C12-PCB-077	100	22.08	96	50-145
13C12-PCB-104	100	17.50	100	50-145
13C12-PCB-123	100	23.08	96	50-145
13C12-PCB-118	100	23.25	98	50-145
13C12-PCB-114	100	23.54	97	50-145
13C12-PCB-105	100	23.89	97	50-145
13C12-PCB-126	100	25.49	94	50-145
13C12-PCB-155	100	20.50	100	50-145
13C12-PCB-167	100	26.39	100	50-145
13C12-PCB-156/157	200	27.02	98	50-145
13C12-PCB-169	100	28.69	96	50-145
13C12-PCB-188	100	23.49	102	50-145
13C12-PCB-189	100	29.97	98	50-145
13C12-PCB-202	100	26.27	101	50-145
13C12-PCB-205	100	31.36	102	50-145
13C12-PCB-208	100	29.71	102	50-145
13C12-PCB-206	100	32.45	103	50-145
13C12-PCB-209	100	33.58	103	50-145

Field Spike Standards		Time	% Rec	Limits
13C12-PCB-031	100	15.79	101	70-130
13C12-PCB-095	100	19.10	105	70-130
13C12-PCB-153	100	24.18	101	70-130

Cleanup Standards		Time	% Rec	Limits
13C12-PCB-028	100	15.96	101	65-135
13C12-PCB-111	100	22.02	101	75-125
13C12-PCB-178	100	25.07	103	75-125

SVOC DATA PACKAGE

SECTION 5: QC SAMPLE DATA

Including:

- Laboratory Method Blank Analysis Reports
- Laboratory Control Sample Analysis Reports
- Matrix Spike Analysis Reports
- Other QC Sample Analysis Reports (where applicable)

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name Method Blank
 ALS Sample ID WG3136778-1
 Analysis Method EPA 1668C
 Analysis Type Blank
 Sample Matrix Media

Sampling Date n/a
 Extraction Date 5-Sep-19
 Sample Size 1 Blank
 Percent Moisture n/a
 Split Ratio 4

Approved:
 E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information

Run 1

Filename 5-190911A05
 Run Date 11-Sep-19 12:39
 Final Volume 25 ul
 Dilution Factor 1
 Analysis Units pg
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-001		NotFnd	<2.9	2.9	U		100
PCB-002		NotFnd	<2.9	2.9	U		100
PCB-003		NotFnd	<3.4	3.4	U		100
PCB-004		NotFnd	<7.0	7.0	U		100
PCB-010		NotFnd	<4.4	4.4	U		100
PCB-009		NotFnd	<4.5	4.5	U		100
PCB-007		11.99	20.1	4.3	M,J		100
PCB-006		NotFnd	<4.2	4.2	U		100
PCB-005		NotFnd	<5.3	5.3	U		100
PCB-008		12.44	9.38	3.7	J		100
PCB-014		NotFnd	<5.2	5.2	U		100
PCB-011		13.93	117	5.5			100
PCB-012/013		NotFnd	<5.4	5.4	U		100
PCB-015		NotFnd	<6.7	6.7	U		100
PCB-019		NotFnd	<4.1	4.1	U		100
PCB-018/030		13.73	<7.0	3.8	M,J,R	7.0	100
PCB-017		NotFnd	<4.4	4.4	U		100
PCB-027		NotFnd	<3.2	3.2	U		100
PCB-024		NotFnd	<3.4	3.4	U		100
PCB-016		NotFnd	<5.2	5.2	U		100
PCB-032		NotFnd	<2.9	2.9	U		100
PCB-034		NotFnd	<4.0	4.0	U		100
PCB-023		NotFnd	<3.8	3.8	U		100
PCB-026/029		NotFnd	<3.7	3.7	U		100
PCB-025		NotFnd	<3.6	3.6	U		100
PCB-031		15.84	10.3	3.5	M,J		100
PCB-020/028		16.01	14.1	3.8	J		100
PCB-021/033		16.15	<7.7	3.8	M,J,R	7.7	100
PCB-022		NotFnd	<3.9	3.9	U		100
PCB-036		NotFnd	<3.4	3.4	U		100
PCB-039		NotFnd	<3.8	3.8	U		100
PCB-038		NotFnd	<4.0	4.0	U		100
PCB-035		NotFnd	<4.0	4.0	U		100
PCB-037		NotFnd	<4.9	4.9	U		100
PCB-054		NotFnd	<1.4	1.4	U		100
PCB-050/053		NotFnd	<2.4	2.4	U		100
PCB-045/051		16.10	<2.5	2.5	M,U	2.1	100
PCB-046		NotFnd	<2.7	2.7	U		100
PCB-052		17.00	9.11	2.4	M,J		100
PCB-073		NotFnd	<1.8	1.8	U		100
PCB-043		NotFnd	<3.0	3.0	U		100
PCB-049/069		17.27	<3.4	2.1	M,J,R	3.4	100
PCB-048		17.42	<2.4	2.4	M,U	1.0	100
PCB-044/047/065		17.57	15.7	2.3	M,J		100
PCB-059/062/075		NotFnd	<1.8	1.8	U		100
PCB-042		17.85	<3.1	2.7	M,J,R	3.1	100
PCB-040/041/071		18.14	3.02	2.4	M,J		100
PCB-064		18.26	4.24	1.9	M,J		100
PCB-072		NotFnd	<2.3	2.3	U		100
PCB-068		NotFnd	<2.2	2.2	U		100
PCB-057		NotFnd	<2.4	2.4	U		100
PCB-058		NotFnd	<2.4	2.4	U		100
PCB-067		NotFnd	<2.3	2.3	U		100
PCB-063		NotFnd	<2.1	2.1	U		100
PCB-061/070/074/076		19.60	11.8	2.4	J		100
PCB-066		19.78	7.21	2.3	J		100
PCB-055		NotFnd	<2.4	2.4	U		100
PCB-056		20.20	4.74	2.5	M,J		100
PCB-060		NotFnd	<2.5	2.5	U		100
PCB-080		NotFnd	<2.0	2.0	U		100
PCB-079		NotFnd	<2.2	2.2	U		100
PCB-078		NotFnd	<2.4	2.4	U		100
PCB-081	0.0003	NotFnd	<2.8	2.8	U		100
PCB-077	0.0001	NotFnd	<2.9	2.9	U		100
PCB-104		NotFnd	<1.4	1.4	U		100
PCB-096		NotFnd	<1.4	1.4	U		100
PCB-103		NotFnd	<2.4	2.4	U		100
PCB-094		NotFnd	<2.9	2.9	U		100
PCB-095		19.14	<4.0	2.7	M,J,R	4.0	100
PCB-093/098/100/102		NotFnd	<2.7	2.7	U		100

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name **Method Blank**
 ALS Sample ID WG3136778-1
 Analysis Method EPA 1668C
 Analysis Type Blank
 Sample Matrix Media

Sampling Date n/a
 Extraction Date 5-Sep-19
 Sample Size 1 Blank
 Percent Moisture n/a
 Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information **Run 1**
 Filename 5-190911A05
 Run Date 11-Sep-19 12:39
 Final Volume 25 ul
 Dilution Factor 1
 Analysis Units pg
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-088/091		NotFnd	<2.7	2.7	U		100
PCB-084		19.77	<3.0	3.0	U		100
PCB-089		NotFnd	<2.9	2.9	U		100
PCB-121		NotFnd	<2.0	2.0	U		100
PCB-092		NotFnd	<2.7	2.7	U		100
PCB-090/101/113		20.66	<4.7	2.3	M,J,R	4.7	100
PCB-083/099		20.95	<3.7	2.8	M,J,R	3.7	100
PCB-112		NotFnd	<1.9	1.9	U		100
PCB-086/087/097/109/119/125		21.33	<5.3	2.4	M,J,R	5.3	100
PCB-085/110/115/116/117		21.73	9.52	2.2	M,J		100
PCB-082		NotFnd	<3.3	3.3	U		100
PCB-111		NotFnd	<2.0	2.0	U		100
PCB-120		NotFnd	<1.8	1.8	U		100
PCB-108/124		NotFnd	<1.8	1.8	U		100
PCB-107		NotFnd	<1.7	1.7	U		100
PCB-123	0.00003	NotFnd	<2.0	2.0	U		100
PCB-106		NotFnd	<1.8	1.8	U		100
PCB-118	0.00003	23.28	4.80	1.8	M,J		100
PCB-122		NotFnd	<1.9	1.9	U		100
PCB-114	0.00003	NotFnd	<1.9	1.9	U		100
PCB-105	0.00003	NotFnd	<2.0	2.0	U		100
PCB-127		NotFnd	<1.8	1.8	U		100
PCB-126	0.1	NotFnd	<2.2	2.2	U		100
PCB-155		NotFnd	<0.66	0.66	U		100
PCB-152		NotFnd	<0.68	0.68	U		100
PCB-150		NotFnd	<0.68	0.68	U		100
PCB-136		NotFnd	<0.69	0.69	U		100
PCB-145		NotFnd	<0.71	0.71	U		100
PCB-148		NotFnd	<0.91	0.91	U		100
PCB-135/151		22.19	<1.2	0.96	J,R	1.2	100
PCB-154		NotFnd	<0.75	0.75	U		100
PCB-144		NotFnd	<0.92	0.92	U		100
PCB-147/149		NotFnd	<1.5	1.5	U		100
PCB-134/143		22.70	<4.5	1.9	M,J,R	4.5	100
PCB-139/140		NotFnd	<1.5	1.5	U		100
PCB-131		NotFnd	<2.0	2.0	U		100
PCB-142		NotFnd	<1.8	1.8	U		100
PCB-132		NotFnd	<1.8	1.8	U		100
PCB-133		NotFnd	<1.7	1.7	U		100
PCB-165		NotFnd	<1.3	1.3	U		100
PCB-146		NotFnd	<1.4	1.4	U		100
PCB-161		NotFnd	<1.2	1.2	U		100
PCB-153/168		24.19	4.34	1.3	J		100
PCB-141		NotFnd	<1.6	1.6	U		100
PCB-130		NotFnd	<1.9	1.9	U		100
PCB-137/164		NotFnd	<1.4	1.4	U		100
PCB-129/138/163		24.90	<6.5	1.9	M,J,R	6.5	100
PCB-160		NotFnd	<0.95	0.95	U		100
PCB-158		NotFnd	<1.1	1.1	U		100
PCB-128/166		NotFnd	<1.4	1.4	U		100
PCB-159		NotFnd	<1.2	1.2	U		100
PCB-162		NotFnd	<1.3	1.3	U		100
PCB-167	0.00003	NotFnd	<1.1	1.1	U		100
PCB-156/157	0.00003	NotFnd	<1.7	1.7	U		200
PCB-169	0.03	NotFnd	<1.3	1.3	U		100
PCB-188		NotFnd	<0.87	0.87	U		100
PCB-179		NotFnd	<0.84	0.84	U		100
PCB-184		NotFnd	<0.81	0.81	U		100
PCB-176		NotFnd	<0.85	0.85	U		100
PCB-186		NotFnd	<0.89	0.89	U		100
PCB-178		NotFnd	<1.2	1.2	U		100
PCB-175		NotFnd	<1.1	1.1	U		100
PCB-187		NotFnd	<1.1	1.1	U		100
PCB-182		NotFnd	<1.1	1.1	U		100
PCB-183		NotFnd	<1.1	1.1	U		100
PCB-185		NotFnd	<1.2	1.2	U		100
PCB-174		NotFnd	<1.1	1.1	U		100
PCB-177		NotFnd	<1.2	1.2	U		100
PCB-181		NotFnd	<1.2	1.2	U		100
PCB-171/173		NotFnd	<1.2	1.2	U		100
PCB-172		NotFnd	<1.2	1.2	U		100

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name **Method Blank**
 ALS Sample ID WG3136778-1
 Analysis Method EPA 1668C
 Analysis Type Blank
 Sample Matrix Media

Sampling Date n/a
 Extraction Date 5-Sep-19
 Sample Size 1 Blank
 Percent Moisture n/a
 Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information

Run 1

Filename 5-190911A05
 Run Date 11-Sep-19 12:39
 Final Volume 25 ul
 Dilution Factor 1
 Analysis Units pg
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-192		NotFnd	<1.0	1.0		U	100
PCB-180/193		27.71	1.74	1.0		M,J	100
PCB-191		NotFnd	<0.92	0.92		U	100
PCB-170		NotFnd	<1.3	1.3		U	100
PCB-190		NotFnd	<0.85	0.85		U	100
PCB-189	0.00003	NotFnd	<1.1	1.1		U	100
PCB-202		NotFnd	<0.75	0.75		U	100
PCB-201		NotFnd	<0.71	0.71		U	100
PCB-204		NotFnd	<0.72	0.72		U	100
PCB-197		NotFnd	<0.71	0.71		U	100
PCB-200		NotFnd	<0.73	0.73		U	100
PCB-198/199		NotFnd	<1.0	1.0		U	100
PCB-196		NotFnd	<1.0	1.0		U	100
PCB-203		NotFnd	<0.94	0.94		U	100
PCB-195		NotFnd	<1.1	1.1		U	100
PCB-194		31.10	<1.5	1.0		J,R 1.5	100
PCB-205		NotFnd	<0.84	0.84		U	100
PCB-208		NotFnd	<2.1	2.1		U	100
PCB-207		NotFnd	<2.1	2.1		U	100
PCB-206		NotFnd	<3.5	3.5		U	100
PCB-209		NotFnd	<0.77	0.77		U	100

Extraction Standards pg Time % Rec Limits

13C12-PCB-001	4000	8.94	26	5-145
13C12-PCB-003	4000	10.47	30	5-145
13C12-PCB-004	4000	10.63	41	5-145
13C12-PCB-015	4000	14.31	38	5-145
13C12-PCB-019	4000	12.62	48	5-145
13C12-PCB-037	4000	18.25	54	5-145
13C12-PCB-054	4000	14.48	62	5-145
13C12-PCB-081	4000	21.82	72	10-145
13C12-PCB-077	4000	22.13	74	10-145
13C12-PCB-104	4000	17.51	82	10-145
13C12-PCB-123	4000	23.10	83	10-145
13C12-PCB-118	4000	23.27	87	10-145
13C12-PCB-114	4000	23.57	86	10-145
13C12-PCB-105	4000	23.94	86	10-145
13C12-PCB-126	4000	25.53	86	10-145
13C12-PCB-155	4000	20.48	88	10-145
13C12-PCB-167	4000	26.41	92	10-145
13C12-PCB-156/157	8000	27.05	91	10-145
13C12-PCB-169	4000	28.72	100	10-145
13C12-PCB-188	4000	23.49	92	10-145
13C12-PCB-189	4000	29.99	90	10-145
13C12-PCB-202	4000	26.28	100	10-145
13C12-PCB-205	4000	31.38	105	10-145
13C12-PCB-208	4000	29.70	100	10-145
13C12-PCB-206	4000	32.45	107	10-145
13C12-PCB-209	4000	33.58	114	10-145

Field Spike Standards

13C12-PCB-031	0		NS
13C12-PCB-095	0		NS
13C12-PCB-153	0		NS

Cleanup Standards

13C12-PCB-028	4000	16.00	44	5-145
13C12-PCB-111	4000	22.02	70	10-145
13C12-PCB-178	4000	25.07	78	10-145

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name **Method Blank**
 ALS Sample ID WG3136778-1
 Analysis Method EPA 1668C
 Analysis Type Blank
 Sample Matrix Media

Sampling Date n/a
 Extraction Date 5-Sep-19
 Sample Size 1 Blank
 Percent Moisture n/a
 Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information **Run 1**
 Filename 5-190911A05
 Run Date 11-Sep-19 12:39
 Final Volume 25 ul
 Dilution Factor 1
 Analysis Units pg
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
Homologue Group Totals							
Total MonoCB			<2.9	2.9	U	400	
Total DiCB			146	3.7	J	800	
Total TriCB			39.1	2.9	J	800	
Total TetraCB			62.3	1.4	J	1600	
Total PentaCB			32.0	1.4	J	1600	
Total HexaCB			16.5	0.66	J	1600	
Total HeptaCB			1.74	0.81	J	800	
Total OctaCB			1.50	0.71	J	800	
Total NonaCB			<2.1	2.1	U	400	
DecaCB			<0.77	0.77	U	400	
Total PCB			300		J	3200	

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ 0.000144
 Mid Point PCB TEQ 0.130
 Upper Bound PCB TEQ 0.261

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
 M Indicates that a peak has been manually integrated.
 U Indicates that this compound was not detected above the EDL.

 J Indicates that the analyte was positively identified. The associated numerical result is an estimate.
 R Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.

 NS Indicates that this standard has not been added.
 EMPC Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name **Method Blank**
 ALS Sample ID WG3136778-4
 Analysis Method EPA 1668C
 Analysis Type Blank
 Sample Matrix Reagent

Sampling Date n/a
 Extraction Date 5-Sep-19
 Sample Size 1 Blank
 Percent Moisture n/a
 Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information **Run 1**
 Filename 5-190911A06
 Run Date 11-Sep-19 13:21
 Final Volume 25 ul
 Dilution Factor 1
 Analysis Units pg
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-001		NotFnd	<5.3	5.3	U		100
PCB-002		NotFnd	<5.8	5.8	U		100
PCB-003		NotFnd	<7.7	7.7	U		100
PCB-004		NotFnd	<18	18	U		100
PCB-010		NotFnd	<14	14	U		100
PCB-009		NotFnd	<14	14	U		100
PCB-007		NotFnd	<13	13	U		100
PCB-006		NotFnd	<13	13	U		100
PCB-005		NotFnd	<16	16	U		100
PCB-008		NotFnd	<11	11	U		100
PCB-014		NotFnd	<17	17	U		100
PCB-011		NotFnd	<18	18	U		100
PCB-012/013		NotFnd	<18	18	U		100
PCB-015		NotFnd	<25	25	U		100
PCB-019		NotFnd	<10	10	U		100
PCB-018/030		NotFnd	<8.1	8.1	U		100
PCB-017		NotFnd	<9.5	9.5	U		100
PCB-027		NotFnd	<6.8	6.8	U		100
PCB-024		NotFnd	<7.3	7.3	U		100
PCB-016		NotFnd	<11	11	U		100
PCB-032		NotFnd	<6.3	6.3	U		100
PCB-034		NotFnd	<9.8	9.8	U		100
PCB-023		NotFnd	<9.5	9.5	U		100
PCB-026/029		NotFnd	<9.2	9.2	U		100
PCB-025		NotFnd	<8.9	8.9	U		100
PCB-031		NotFnd	<8.7	8.7	U		100
PCB-020/028		NotFnd	<9.5	9.5	U		100
PCB-021/033		NotFnd	<9.4	9.4	U		100
PCB-022		NotFnd	<9.5	9.5	U		100
PCB-036		NotFnd	<8.4	8.4	U		100
PCB-039		NotFnd	<9.3	9.3	U		100
PCB-038		NotFnd	<9.9	9.9	U		100
PCB-035		NotFnd	<9.9	9.9	U		100
PCB-037		NotFnd	<14	14	U		100
PCB-054		NotFnd	<3.3	3.3	U		100
PCB-050/053		NotFnd	<5.9	5.9	U		100
PCB-045/051		NotFnd	<6.2	6.2	U		100
PCB-046		NotFnd	<6.8	6.8	U		100
PCB-052		NotFnd	<6.0	6.0	U		100
PCB-073		NotFnd	<4.4	4.4	U		100
PCB-043		NotFnd	<7.3	7.3	U		100
PCB-049/069		NotFnd	<5.3	5.3	U		100
PCB-048		NotFnd	<5.9	5.9	U		100
PCB-044/047/065		NotFnd	<5.6	5.6	U		100
PCB-059/062/075		NotFnd	<4.5	4.5	U		100
PCB-042		NotFnd	<6.8	6.8	U		100
PCB-040/041/071		NotFnd	<6.0	6.0	U		100
PCB-064		NotFnd	<4.7	4.7	U		100
PCB-072		NotFnd	<5.0	5.0	U		100
PCB-068		NotFnd	<4.8	4.8	U		100
PCB-057		NotFnd	<5.3	5.3	U		100
PCB-058		NotFnd	<5.3	5.3	U		100
PCB-067		NotFnd	<4.9	4.9	U		100
PCB-063		NotFnd	<4.5	4.5	U		100
PCB-061/070/074/076		NotFnd	<5.3	5.3	U		100
PCB-066		NotFnd	<4.9	4.9	U		100
PCB-055		NotFnd	<5.3	5.3	U		100
PCB-056		NotFnd	<5.5	5.5	U		100
PCB-060		NotFnd	<5.4	5.4	U		100
PCB-080		NotFnd	<4.4	4.4	U		100
PCB-079		NotFnd	<4.7	4.7	U		100
PCB-078		NotFnd	<5.3	5.3	U		100
PCB-081	0.0003	NotFnd	<6.3	6.3	U		100
PCB-077	0.0001	NotFnd	<6.7	6.7	U		100
PCB-104		NotFnd	<3.8	3.8	U		100
PCB-096		NotFnd	<3.8	3.8	U		100
PCB-103		NotFnd	<5.0	5.0	U		100
PCB-094		NotFnd	<6.0	6.0	U		100
PCB-095		NotFnd	<5.5	5.5	U		100
PCB-093/098/100/102		NotFnd	<5.6	5.6	U		100

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name
ALS Sample ID
Analysis Method
Analysis Type
Sample Matrix

Method Blank
WG3136778-4
EPA 1668C
Blank
Reagent

Sampling Date
Extraction Date
Sample Size
Percent Moisture
Split Ratio

n/a
5-Sep-19
1
n/a
4

Blank

Approved:
E. Sabljic
--e-signature--
13-Sep-2019

Run Information

Run 1

Filename: 5-190911A06
Run Date: 11-Sep-19 13:21
Final Volume: 25 ul
Dilution Factor: 1
Analysis Units: pg
Instrument - Column: HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-088/091		NotFnd	<5.6	5.6	U		100
PCB-084		NotFnd	<6.2	6.2	U		100
PCB-089		NotFnd	<6.0	6.0	U		100
PCB-121		NotFnd	<4.1	4.1	U		100
PCB-092		NotFnd	<5.6	5.6	U		100
PCB-090/101/113		NotFnd	<4.8	4.8	U		100
PCB-083/099		NotFnd	<5.7	5.7	U		100
PCB-112		NotFnd	<3.9	3.9	U		100
PCB-086/087/097/109/119/125		NotFnd	<4.9	4.9	U		100
PCB-085/110/115/116/117		NotFnd	<4.5	4.5	U		100
PCB-082		NotFnd	<6.9	6.9	U		100
PCB-111		NotFnd	<4.0	4.0	U		100
PCB-120		NotFnd	<3.7	3.7	U		100
PCB-108/124		NotFnd	<4.4	4.4	U		100
PCB-107		NotFnd	<4.2	4.2	U		100
PCB-123	0.00003	NotFnd	<4.9	4.9	U		100
PCB-106		NotFnd	<4.5	4.5	U		100
PCB-118	0.00003	NotFnd	<4.5	4.5	U		100
PCB-122		NotFnd	<4.7	4.7	U		100
PCB-114	0.00003	NotFnd	<4.8	4.8	U		100
PCB-105	0.00003	NotFnd	<4.6	4.6	U		100
PCB-127		NotFnd	<4.3	4.3	U		100
PCB-126	0.1	NotFnd	<5.4	5.4	U		100
PCB-155		NotFnd	<1.5	1.5	U		100
PCB-152		NotFnd	<1.5	1.5	U		100
PCB-150		NotFnd	<1.5	1.5	U		100
PCB-136		NotFnd	<1.6	1.6	U		100
PCB-145		NotFnd	<1.6	1.6	U		100
PCB-148		NotFnd	<2.1	2.1	U		100
PCB-135/151		NotFnd	<2.2	2.2	U		100
PCB-154		NotFnd	<1.7	1.7	U		100
PCB-144		NotFnd	<2.1	2.1	U		100
PCB-147/149		NotFnd	<2.5	2.5	U		100
PCB-134/143		NotFnd	<3.1	3.1	U		100
PCB-139/140		NotFnd	<2.5	2.5	U		100
PCB-131		NotFnd	<3.2	3.2	U		100
PCB-142		NotFnd	<3.0	3.0	U		100
PCB-132		NotFnd	<2.9	2.9	U		100
PCB-133		NotFnd	<2.7	2.7	U		100
PCB-165		NotFnd	<2.1	2.1	U		100
PCB-146		NotFnd	<2.3	2.3	U		100
PCB-161		NotFnd	<2.0	2.0	U		100
PCB-153/168		NotFnd	<2.1	2.1	U		100
PCB-141		NotFnd	<2.6	2.6	U		100
PCB-130		NotFnd	<3.0	3.0	U		100
PCB-137/164		NotFnd	<2.3	2.3	U		100
PCB-129/138/163		NotFnd	<3.1	3.1	U		100
PCB-160		NotFnd	<1.6	1.6	U		100
PCB-158		NotFnd	<1.8	1.8	U		100
PCB-128/166		NotFnd	<2.3	2.3	U		100
PCB-159		NotFnd	<1.9	1.9	U		100
PCB-162		NotFnd	<2.1	2.1	U		100
PCB-167	0.00003	NotFnd	<1.8	1.8	U		100
PCB-156/157	0.00003	NotFnd	<2.8	2.8	U		200
PCB-169	0.03	NotFnd	<2.1	2.1	U		100
PCB-188		NotFnd	<1.9	1.9	U		100
PCB-179		NotFnd	<1.8	1.8	U		100
PCB-184		NotFnd	<1.7	1.7	U		100
PCB-176		NotFnd	<1.8	1.8	U		100
PCB-186		NotFnd	<1.9	1.9	U		100
PCB-178		NotFnd	<2.5	2.5	U		100
PCB-175		NotFnd	<2.4	2.4	U		100
PCB-187		NotFnd	<2.2	2.2	U		100
PCB-182		NotFnd	<2.3	2.3	U		100
PCB-183		NotFnd	<2.3	2.3	U		100
PCB-185		NotFnd	<2.6	2.6	U		100
PCB-174		NotFnd	<2.3	2.3	U		100
PCB-177		NotFnd	<2.6	2.6	U		100
PCB-181		NotFnd	<2.5	2.5	U		100
PCB-171/173		NotFnd	<2.6	2.6	U		100
PCB-172		NotFnd	<2.5	2.5	U		100

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name **Method Blank**
 ALS Sample ID WG3136778-4
 Analysis Method EPA 1668C
 Analysis Type Blank
 Sample Matrix Reagent

Sampling Date n/a
 Extraction Date 5-Sep-19
 Sample Size 1 Blank
 Percent Moisture n/a
 Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information

Run 1

Filename 5-190911A06
 Run Date 11-Sep-19 13:21
 Final Volume 25 ul
 Dilution Factor 1
 Analysis Units pg
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
PCB-192		NotFnd	<2.1	2.1	U		100
PCB-180/193		NotFnd	<2.2	2.2	U		100
PCB-191		NotFnd	<1.9	1.9	U		100
PCB-170		NotFnd	<2.7	2.7	U		100
PCB-190		NotFnd	<1.8	1.8	U		100
PCB-189	0.00003	NotFnd	<1.9	1.9	U		100
PCB-202		NotFnd	<1.5	1.5	U		100
PCB-201		NotFnd	<1.4	1.4	U		100
PCB-204		NotFnd	<1.4	1.4	U		100
PCB-197		NotFnd	<1.4	1.4	U		100
PCB-200		NotFnd	<1.4	1.4	U		100
PCB-198/199		NotFnd	<2.0	2.0	U		100
PCB-196		NotFnd	<2.0	2.0	U		100
PCB-203		NotFnd	<1.9	1.9	U		100
PCB-195		NotFnd	<2.6	2.6	U		100
PCB-194		31.11	<3.5	2.5	J,R	3.5	100
PCB-205		NotFnd	<2.0	2.0	U		100
PCB-208		NotFnd	<4.1	4.1	U		100
PCB-207		NotFnd	<4.0	4.0	U		100
PCB-206		NotFnd	<6.6	6.6	U		100
PCB-209		NotFnd	<1.8	1.8	U		100

Extraction Standards pg Time % Rec Limits

13C12-PCB-001	4000	8.92	32	5-145
13C12-PCB-003	4000	10.47	30	5-145
13C12-PCB-004	4000	10.62	43	5-145
13C12-PCB-015	4000	14.31	33	5-145
13C12-PCB-019	4000	12.61	50	5-145
13C12-PCB-037	4000	18.24	42	5-145
13C12-PCB-054	4000	14.47	56	5-145
13C12-PCB-081	4000	21.81	55	10-145
13C12-PCB-077	4000	22.12	56	10-145
13C12-PCB-104	4000	17.50	67	10-145
13C12-PCB-123	4000	23.09	69	10-145
13C12-PCB-118	4000	23.26	73	10-145
13C12-PCB-114	4000	23.56	69	10-145
13C12-PCB-105	4000	23.92	72	10-145
13C12-PCB-126	4000	25.52	73	10-145
13C12-PCB-155	4000	20.47	79	10-145
13C12-PCB-167	4000	26.40	89	10-145
13C12-PCB-156/157	8000	27.04	90	10-145
13C12-PCB-169	4000	28.71	99	10-145
13C12-PCB-188	4000	23.48	85	10-145
13C12-PCB-189	4000	29.98	93	10-145
13C12-PCB-202	4000	26.27	102	10-145
13C12-PCB-205	4000	31.37	105	10-145
13C12-PCB-208	4000	29.69	97	10-145
13C12-PCB-206	4000	32.44	109	10-145
13C12-PCB-209	4000	33.56	119	10-145

Field Spike Standards

13C12-PCB-031	0	NS
13C12-PCB-095	0	NS
13C12-PCB-153	0	NS

Cleanup Standards

13C12-PCB-028	4000	15.99	43	5-145
13C12-PCB-111	4000	22.01	68	10-145
13C12-PCB-178	4000	25.06	84	10-145

ALS Life Sciences

Laboratory Method Blank Analysis Report

Sample Name **Method Blank**
 ALS Sample ID WG3136778-4
 Analysis Method EPA 1668C
 Analysis Type Blank
 Sample Matrix Reagent

Sampling Date n/a
 Extraction Date 5-Sep-19
 Sample Size 1 Blank
 Percent Moisture n/a
 Split Ratio 4

Approved:
E. Sabljic
 --e-signature--
 13-Sep-2019

Run Information **Run 1**
 Filename 5-190911A06
 Run Date 11-Sep-19 13:21
 Final Volume 25 ul
 Dilution Factor 1
 Analysis Units pg
 Instrument - Column HRMS5 SPBOCTYL65972-01A

Target Analytes	TEF (WHO 2005)	Ret. Time	Conc. pg	EDL pg	Flags	EMPC pg	LQL
Homologue Group Totals							
Total MonoCB			<5.3	5.3	U		400
Total DiCB			<11	11	U		800
Total TriCB			<6.3	6.3	U		800
Total TetraCB			<3.3	3.3	U		1600
Total PentaCB			<3.7	3.7	U		1600
Total HexaCB			<1.5	1.5	U		1600
Total HeptaCB			<1.7	1.7	U		800
Total OctaCB			3.50	1.4	J		800
Total NonaCB			<4.0	4.0	U		400
DecaCB			<1.8	1.8	U		400
Total PCB			3.50		J		3200

Toxic Equivalency - (WHO 2005)

Lower Bound PCB TEQ 0.00
 Mid Point PCB TEQ 0.303
 Upper Bound PCB TEQ 0.606

EDL Indicates the Estimated Detection Limit, based on the measured background noise for this target in this sample.
 TEF Indicates the Toxic Equivalency Factor TEQ Indicates the Toxic Equivalency
 LQL Lower Quantification Limit, based on the lowest calibration level corrected for sample size, splits and dilutions.
 M Indicates that a peak has been manually integrated.
 U Indicates that this compound was not detected above the EDL.

 J Indicates that the analyte was positively identified. The associated numerical result is an estimate.
 R Indicates that the ion abundance ratio for this analyte did not meet the control limit. The reported value represents an estimated concentration.

 NS Indicates that this standard has not been added.
 EMPC Estimated Maximum Possible Concentration - elevated detection limit due to interference or positive id criterion failure

ALS Life Sciences

Laboratory Control Sample Analysis Report

Sample Name	Laboratory Control Sample	Sampling Date	n/a		
ALS Sample ID	WG3136778-2	Extraction Date	5-Sep-19		Approved: <i>E. Sabl/jc</i> --e-signature-- 13-Sep-2019
Analysis Method	EPA 1668C	Sample Size	1	n/a	
Analysis Type	LCS	Percent Moisture	n/a		
Sample Matrix	QC	Split Ratio	1		

Run Information		Run 1	
Filename		5-190911A03	
Run Date		11-Sep-19 11:15	
Final Volume		25 ul	
Dilution Factor		1	
Analysis Units		% Rec	
Instrument - Column		HRMS5 SPBOCTYL65972-01A	

Target Analytes	pg	Ret. Time	% Rec	Limits	Flags
PCB-001	2000	8.95	110	60-135	
PCB-003	2000	10.48	106	60-135	
PCB-004	2000	10.63	100	60-135	
PCB-015	2000	14.31	108	60-135	
PCB-019	2000	12.64	111	60-135	
PCB-037	2000	18.26	106	60-135	
PCB-054	2000	14.50	105	60-135	
PCB-081	2000	21.83	103	60-135	
PCB-077	2000	22.14	106	60-135	
PCB-104	2000	17.52	93	60-135	
PCB-123	2000	23.11	101	60-135	
PCB-118	2000	23.28	99	60-135	
PCB-114	2000	23.58	101	60-135	
PCB-105	2000	23.95	96	60-135	
PCB-126	2000	25.54	97	60-135	
PCB-155	2000	20.50	98	60-135	
PCB-167	2000	26.42	94	60-135	
PCB-156/157	4000	27.07	97	60-135	
PCB-169	2000	28.73	96	60-135	
PCB-188	2000	23.51	98	60-135	
PCB-189	2000	30.00	106	60-135	
PCB-202	2000	26.29	106	60-135	
PCB-205	2000	31.41	87	60-135	
PCB-208	2000	29.72	102	60-135	
PCB-206	2000	32.47	103	60-135	
PCB-209	2000	33.59	113	60-135	
Extraction Standards					
		Time	% Rec	Limits	
13C12-PCB-001	4000	8.94	41	15-145	
13C12-PCB-003	4000	10.47	38	15-145	
13C12-PCB-004	4000	10.63	53	15-145	
13C12-PCB-015	4000	14.31	44	15-145	
13C12-PCB-019	4000	12.62	57	15-145	
13C12-PCB-037	4000	18.25	61	15-145	
13C12-PCB-054	4000	14.48	72	15-145	
13C12-PCB-081	4000	21.82	72	40-145	
13C12-PCB-077	4000	22.13	72	40-145	
13C12-PCB-104	4000	17.51	88	40-145	
13C12-PCB-123	4000	23.10	83	40-145	
13C12-PCB-118	4000	23.27	87	40-145	
13C12-PCB-114	4000	23.57	86	40-145	
13C12-PCB-105	4000	23.94	86	40-145	
13C12-PCB-126	4000	25.53	85	40-145	
13C12-PCB-155	4000	20.49	99	40-145	
13C12-PCB-167	4000	26.41	103	40-145	
13C12-PCB-156/157	8000	27.05	101	40-145	
13C12-PCB-169	4000	28.72	108	40-145	
13C12-PCB-188	4000	23.49	102	40-145	
13C12-PCB-189	4000	29.99	98	40-145	
13C12-PCB-202	4000	26.28	114	40-145	
13C12-PCB-205	4000	31.38	117	40-145	
13C12-PCB-208	4000	29.70	115	40-145	
13C12-PCB-206	4000	32.45	119	40-145	
13C12-PCB-209	4000	33.58	127	40-145	
Field Spike Standards					
13C12-PCB-031	0		NS		
13C12-PCB-095	0		NS		
13C12-PCB-153	0		NS		
Cleanup Standards					
13C12-PCB-028	4000	16.00	53	15-145	
13C12-PCB-111	4000	22.03	74	40-145	
13C12-PCB-178	4000	25.07	94	40-145	

NS Indicates that this standard has not been added.



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SVOC DATA PACKAGE

SECTION 6: INTERNAL RECORDS

Including:

- Prep Logs
- Independent calculation checks
- Others as listed below:

13

Extraction Workup Sheet

Batch ID: WG3136778

Analysis: PUF5 - M23/1668A (HR)

WG3136778

Prep Procedure: BU-TM-1110 Overall HR Prep, BU-TP-1101 8270D Prep, BU-TP-2100 PAH Prep Method

Analyst: Jerico Ambraci

Date: 5-Sep-2019

SUBSAMPLING

Sample I.D.	Client I.D.	Media Prep L#
WG3136778-1	Method Blank	L2317508 -7
WG3136778-2	Laboratory Control Sample	L2317508 -8
WG3136778-3	Extraction and Injection STD.	—
WG3136778-4	Method Blank(Reagent)	Empty thimble

BATCH TRACKING

	Date/Time/Initials
Client Labels Checked:	JA2 5-Sep-19
Media transfer to soxhlet:	JA2 5-Sep-19
	—
	—
	—
Soxhlet Start Time:	JA2 5-Sep-19 2:30pm
Soxhlets Reflux Properly:	JA2
Soxhlet End Time:	6-Sept-2019 0715 BS
	—
	—
	—
Rotovap Reduction + verify temp:	9-Sept-2019 CJL



L2336381-1	HEISER-20190808-0815	L2322941 -3
L2336381-2	CITY-20190808-0815	L2317508 -6
L2336381-3	RESIDENTIAL-20190808-0815	L2317508 -1
L2336381-4	HEISER-20190815-0823	L2322941 -2
L2336381-5	CITY-20190815-0823	L2322941 -1
L2336381-6	RESIDENTIAL-20190815-0823	L2322941 -4

Extract split:	9-Sept-2019 CJL
Acid Silica Column:	9-Sept-2019 CJL
Solvent exchange:	10-Sep-19 NB
Alumina Column:	10-Sep-19 NB
Split:	10-Sep-19 NB
Carbon Column:	12-Sept-19 CJL BS
Micro/Robo Vial:	10-Sep-19 NB BS NB
Update to LIMS:	12-Sept-19 1500 BS

Batch ID: WG3136778

DX Extraction Standard:

(Checkmark)

Sample I.D.	Volume (ul)	Spiked
WG3136778-1	40	✓
WG3136778-2	40	✓
WG3136778-3	40	✓
WG3136778-4	40	✓
L2327284-1	40	✓
L2327284-2	40	✓
L2327284-3	40	✓
L2327284-4	40	✓
L2336381-1	40	✓
L2336381-2	40	✓
L2336381-3	40	✓
L2336381-4	40	✓
L2336381-5	40	✓
L2336381-6	40	✓
	40	
	40	

Syringe ID: 320

Standard: M23-ES#2-035A

Spike Date: 5-Sept-2019

Spike Witnessing

Chemist: Chemist's Initials
JAZ

Witness: Witness's Initials
SP

Correct Syringe Obtained: Witness's Initials
SP

Correct Standard Obtained: Witness's Initials
SP

Correct Technique Followed: Witness's Initials
SP

PCB Extraction Standard:

(Checkmark)

Sample I.D.	Volume (ul)	Spiked
WG3136778-1	40	✓
WG3136778-2	40	✓
WG3136778-3	40	✓
WG3136778-4	40	✓
L2327284-1	40	✓
L2327284-2	40	✓
L2327284-3	40	✓
L2327284-4	40	✓
L2336381-1	40	✓
L2336381-2	40	✓
L2336381-3	40	✓
L2336381-4	40	✓
L2336381-5	40	✓
L2336381-6	40	✓
	40	
	40	
WG3116369 PREP		

Syringe ID: 118

Standard: 1668A-ES#2-056A

Spike Date: 5-Sept-2019

Spike Witnessing

Chemist: Chemist's Initials
JAZ

Witness: Witness's Initials
SP

Correct Syringe Obtained: Witness's Initials
SP

Correct Standard Obtained: Witness's Initials
SP

Correct Technique Followed: Witness's Initials
SP

Batch ID:

WG3136778

Batch ID: WG3136778

DX Native Standard:

(Checkmark)
Spiked

Sample I.D.	Volume (ul)	Spiked
WG3136778-2	40	✓
WG3136778-3	40	✓

PCB Native Standard:

(Checkmark)
Spiked

Sample I.D.	Volume (ul)	Spiked
WG3136778-2	40	✓
WG3136778-3	40	✓

DX Cleanup Standard:

(Checkmark)
Spiked

Sample I.D.	Volume (ul)	Spiked
WG3136778-1	20	✓
WG3136778-2	20	✓
WG3136778-3	N/A	N/A
WG3136778-4	20	✓
L2327284-1	20	✓
L2327284-2	20	✓
L2327284-3	20	✓
L2327284-4	20	✓
L2336381-1	20	✓
L2336381-2	20	✓
L2336381-3	20	✓
L2336381-4	20	✓
L2336381-5	20	✓
L2336381-6	20	✓
	20	
	20	

PCB Cleanup Standard:

(Checkmark)
Spiked

Sample I.D.	Volume (ul)	Spiked
WG3136778-1	20	✓
WG3136778-2	20	✓
WG3136778-3	N/A	N/A
WG3136778-4	20	✓
L2327284-1	20	✓
L2327284-2	20	✓
L2327284-3	20	✓
L2327284-4	20	✓
L2336381-1	20	✓
L2336381-2	20	✓
L2336381-3	20	✓
L2336381-4	20	✓
L2336381-5	20	✓
L2336381-6	20	✓
	20	
	20	

Syringe ID: 322
 Standard: 1613B-NS#3-022C
 Date & Initials: 5-Sept-2019 J92

Syringe ID: 323
 Standard: 1668A-NS#1-36B
 Date & Initials: 5-Sept-2019 J92

Syringe ID: 357
 Standard: M23-CL#1-038A
 Date & Initials: 9-Sept-2019 CW

Correct Syringe Obtained: Chemist's Initials
 Correct Standard Obtained: Chemist's Initials
 Correct Technique Followed: Chemist's Initials

Syringe ID: 378
 Standard: 1668A-CL#2-32D
 Date & Initials: 9-Sept-2019 CW

Correct Syringe Obtained: Chemist's Initials
 Correct Standard Obtained: Chemist's Initials
 Correct Technique Followed: Chemist's Initials

Batch ID: WG3136778

DX Injection Standard: (Checkmark)

Sample I.D.	Volume (ul)	Spiked
WG3136778-1	10	✓
WG3136778-2	10	✓
WG3136778-3	10	✓
WG3136778-4	10	✓
L2327284-1	10	✓
L2327284-2	10	✓
L2327284-3	10	✓
L2327284-4	10	✓
L2336381-1	10	✓
L2336381-2	10	✓
L2336381-3	10	✓
L2336381-4	10	✓
L2336381-5	10	✓
L2336381-6	10	✓
	10	
	10	

Syringe ID: 335

Standard: 1613B-IS#1- 076E

Date & Initials: 12. Sept. 2019 VS

Correct Syringe Obtained: [VS] Chemist's Initials

Correct Standard Obtained: [VS] Chemist's Initials

Correct Technique Followed: [VS] Chemist's Initials

PCB Injection Standard: (Checkmark)

Sample I.D.	Volume (ul)	Spiked
WG3136778-1	5	✓
WG3136778-2	5	✓
WG3136778-3	5	✓
WG3136778-4	5	✓
L2327284-1	5	✓
L2327284-2	5	✓
L2327284-3	5	✓
L2327284-4	5	✓
L2336381-1	5	✓
L2336381-2	5	✓
L2336381-3	5	✓
L2336381-4	5	✓
L2336381-5	5	✓
L2336381-6	5	✓
	5	
	5	

Syringe ID: 365

Standard: 1668A-IS#2- 011A

Date & Initials: 10-Sep-19 NB

Correct Syringe Obtained: [NB] Chemist's Initials

Correct Standard Obtained: [NB] Chemist's Initials

Correct Technique Followed: [NB] Chemist's Initials

Batch ID: WG3136778

Reagent Lot Numbers:

Reagent	Lot#	Manufacturer
Acetone	104314	
Hexane	104314	
DCM	104314	
Toluene	104314	
Nonane	ORG-WAKONON-048	
1:1 DCM:HEX	ORG-DH2- 566	
Sodium Sulphate	ORG-SSU-2135	
Acid Silica	ORG-ASI- 8832/8834	
Neutral Silica	ORG-NSI-1910	
Alumina	ORG-ALU- 435/436	
1% Deactivated Silica	ORG-2%DAS- -	
Chromacarb	ORG-CC- 251	

Batch ID: WG3136778

Procedure:

This batchsheet is a guideline only. Please see test procedure for complete set of instructions.

Extraction:

- For MB and LCS you **must** use blank media - if not available see your Team Lead
- Place the PUF in to a pre-cleaned thimble and transfer to the Soxhlet body.
- Spike with Extraction Standard (plus Native for LCS and ENI).
- Soxhlet extract in DCM for 16 hours (check with team lead or supervisor)

Rotovap:

- Rotovap and reduce to ~5mL.
- Transfer to a calibrated c-tube (marked at 1ml, 2ml) with 3x2ml hexane
- Mix well then quantitatively spilt the extract **1/2 DX/PCB 1/2 Archive**

Batch ID: WG3136778

DX/PCB:

- Perform Acid Silica column
- Solvent Exchange (reduce to **~50ul**, bulk back up to 1ml Hexane, vortex well.
- Perform Alumina Column:
 - Pre-elute the Alumina Column with 7ml Hexane ✓
 - Place F1 c-tube under the column, then load the sample with 3x1ml Hexane rinses ✓
 - F1 (Archive) 1mL Hexane ✓
 - F2 (DX/PCB) 14mL 1:1 DCM:Hexane ✓

-Split Alumina F2 1/2 PCB 1/2 DX ✓ ✓

Micro-Vial:

PCB:

- Blow down to ~1/2ml
- Vortex **very** well. ✓
- Transfer every last drop to a micro-vial (Marked at 20uL with nonane).
- Blow down to the line
- Spike PCB Injection Standard. cap and vortex. **FV=25ul**

DX:
- Solvent Exchange to Hexane (Reduce to Just Dry then bulk back up to 1ml Hexane)
- ChromaCarb: - 4cm of well-packed chroma-carb.
- Pre-elute Carbon with 5ml Hexane
- Transfer with 3x1ml Hexane
- F1 = 10ml 1:1 DCM:Hexane (Archive)
- After dripping has stopped Invert Column.
- F2 = 14ml Toluene (DX and PCB)
- After the column has stopped dripping reduce the F2 portion down to ~1/2ml.
- Vortex well, then transfer to a micro-vial without rinses.
- Blow the micro-vial down to just-dry.
- Spike with Injection Standard, Cap the micro-vial, and Vortex. FV=10ul

Batch ID: WG3136778

Comments:

NOTE: Label and Save All Columns including Acid Silica Columns

W1 Carbon column had a small leak. Leveled it
w the other samples. KB 12 Sept 19

Approval of Deviation from Standard Method

Procedure does deviate from Standard Method.

(Batch Writer): _____

Approved (Supervisor/Manager): _____

WG3136778		Prep Analyst:			
PUFS - M23/1668A (HR)		Date:			
	Very Good	Meets Method Req	Some Outliers	Very Poor	Comments / Was spl/batch sent for rework? Why?
MB					
LCS					
DUP					
ES rec					

ALS Life Sciences

Sample Calculation Report

CS3 RRF Check

Approved:	<i>E. Sabljic</i> --e-signature-- 13-Sep-2019
-----------	---

$$\text{RRF} = \frac{\text{Response of PCB-118}}{\text{Response of 13C12-PCB-118}} \times \frac{\text{Concentration of 13C12-PCB-118}}{\text{Concentration of PCB-118}}$$

RRF	=	$\frac{1330559.20}{2340165.90} \times \frac{100}{50}$	=	1.14	Calculated Value Value from TargetLynx
				1.14	1.14

Calculation of PCB-118 amount in L2336381-1

$$\text{pg} = \frac{\text{Response of PCB-118}}{\text{Response of 13C12-PCB-118}} \times \frac{\text{pg of 13C12-PCB-118 spiked}}{\text{Mean RRF} * \text{Sample Size}}$$

pg	=	$\frac{6609}{634135} \times \frac{4000}{1.15 * 1.00}$	=	36.2	Calculated Value Value from TargetLynx
				36.2	36.2

Calculation of 13C12-PCB-118 Recovery in L2336381-1

$$\% \text{ Recovery} = \frac{\text{Response of 13C12-PCB-118}}{\text{Response of 13C12-PCB-101}} \times \frac{\text{pg of 13C12-PCB-101 spiked} * 100}{\text{Mean RRF} * \text{pg 13C12-PCB-118 Spiked}}$$

% Recovery	=	$\frac{634135}{1147925.4} \times \frac{8000 * 100}{1.41 * 4000}$	=	78	Calculated Value Value from TargetLynx
				78	78 %



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SVOC DATA PACKAGE

SECTION 7: SHIPPING/RECEIVING DOCUMENTS

Including:

- Airbills
- Chain-of-Custody Records
- Sample Log-in Sheet(s) - where applicable
- Others as listed below:

L2336381

[For lab use only]

ANALYTICAL REQUEST FORM



1. REGULAR Status

RUSH Status Requested - ADDITIONAL CHARGE
 RESULTS REQUIRED BY _____ DATE _____
 CONTACT ALS PRIOR TO SENDING SAMPLES

2. Date 8/26/19 Purchase Order No. _____ 4. Quote No. Email quote _____
 3. Company Name : Floyd Snider ALS Project Manager: Ron McLeod
 Address: 601 Union St Suite 600
Seattle WA 98101
 Person to Contact: Emily Jones
 Telephone (719) 292-2078
 Fax Telephone () _____
 E-mail Address: emily.jones@floydsnider.com
 Billing Address (if different from above) _____

5. Sample Collection
 Sampling Site Heiser; City; Residential
 Industrial Process: Background Industries
 Date of Collection see CDC below
 Time Collected see CDC below
 Date of Shipment 8/26/19
 Chain of Custody No.: _____

6. How did you first learn about ALS?
Referred to by SKC / T&B Systems


7. REQUEST FOR ANALYSES

Client Sample Number	Matrix*	Sample/Area Volume	ANALYSES REQUESTED - Use method number if known	Units**	Lab Comments
<u>Heiser-20190808-0815</u>	<u>Lo-Vol PUF tube</u>	<u>see below</u>	<u>PCBs by Method 1668; Dioxins by Method 8290A</u>	<u>1</u>	
<u>City-20190808-0815</u>	<u>Lo-Vol PUF tube</u>		<u>PCBs by Method 1668; Dioxins by Method 8290A</u>	<u>1</u>	
<u>Residential-20190808-0815</u>	<u>Lo-Vol PUF tube</u>		<u>PCBs by Method 1668; Dioxins by Method 8290A</u>	<u>1</u>	
<u>Heiser-20190815-0823</u>	<u>"</u>	<u>see below</u>	<u>"</u>	<u>1</u>	
<u>City-20190815-0823</u>	<u>"</u>		<u>"</u>	<u>1</u>	
<u>Residential-20190815-0823</u>	<u>"</u>		<u>"</u>	<u>1</u>	
SAMPLE ID	START	END (collected)	SAMPLE PERIOD	FLOW (LPM)	PUF ID
<u>Heiser-20190808-0815</u>	<u>8/8/19 13:17</u>	<u>8/15/19 15:08</u>	<u>9999 min</u>	<u>1.0</u>	<u>26183343</u>
<u>City-20190808-0815</u>	<u>8/8/19 13:09</u>	<u>8/15/19 15:55</u>	<u>9999 min</u>	<u>1.0</u>	<u>26106655</u>
<u>Residential-20190808-0815</u>	<u>8/8/19 13:50</u>	<u>8/15/19 16:23</u>	<u>9999 min</u>	<u>1.0</u>	<u>26106650</u>
<u>Heiser-20190815-0823</u>	<u>8/15/19 15:23</u>	<u>8/23/19 11:55</u>	<u>9999 min</u>	<u>1.0</u>	<u>26183342</u>
<u>City-20190815-0823</u>	<u>8/15/19 16:04</u>	<u>8/23/19 11:20</u>	<u>9999 min</u>	<u>0.7</u>	<u>26183341</u>
<u>Residential-20190815-0823</u>	<u>8/15/19 16:30</u>	<u>8/23/19 11:05</u>	<u>9999 min</u>	<u>1.0</u>	<u>26183344</u>

* Specify: Solid sorbent tube, e.g. Charcoal; Filter type; Impinger solution; Bulk sample; Blood; Urine; Tissue; Soil; Water; Other
 ** 1. µg/sample 2. mg/m³ 3. ppm 4. % 5. µg/m³ 6. _____ (other) Please indicate one or more units in the column entitled Units**
 Comments Includes 3 unused PUF Filters

Possible Contamination and/or Chemical Hazards

7. Chain of Custody (Optional)

Relinquished by		Date/Time	<u>8/26/19 0930</u>
Received by	<u>AARON PORTAN</u>	Date/Time	<u>27-Aug-2019 11:20</u>
Relinquished by	_____	Date/Time	_____
Received by	_____	Date/Time	_____

4.5°C

1435 Norjohn Court #1 / Burlington, ON Canada, L7L 0E6 800-356-9135 or 801-266-7700 / FAX: 801-268-9992
 ALS Environmental

Sample Receiving Log

Date/Time Received	Client ID	Number/Description of Containers	Temp. on Receipt*	Condition of Samples, Courier & Tracking Information	Receiver's Initials	Date/Time Login Completed	Submission ID	Sample ID Range
27-Aug-2019 11:20	Floyd Snider	6 x air samples	4.5°C	Good FedEx 7893 84102170	MS	27-Aug-2019 13:50	L2336381	-1-6

*Temperatures were recorded using: VWR Traceable dedicated I.R. gun (model 36934-178 SN 192108143)
 Other (specify): _____