ENVIRONEERING, INC.

INVESTIGATIVE REPORT FOR THE FORMER BALL FIELD AREA

BADIN BUSINESS PARK FACILITY BADIN, NORTH CAROLINA

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1.0 INTRODUCTION

The April 28, 2017 *Investigative Work Plan for the Phase 4 and 5 Corrective Measures Study, Alcoa/Badin Landfill, and Former Ball Field* (Work Plan) was developed as a guidance document in support of sampling and investigative activities at the Badin Business Park LLC, formerly known as the Alcoa Badin Works facility. The Work Plan was prepared following receipt of the North Carolina Department of Environmental Quality (NCDEQ) January 23, 2017 correspondence concerning the review of Phase 4 and 5 of the Corrective Measures Study (CMS), the Expanded Pre-CERCLIS Screening Assessment (EPSA) for the Former Ball Field, and the Site Inspection Report (SIR) for the Alcoa/Badin Landfill. NCDEQ determined that further evaluation was warranted and requested that a demonstration be made that identified items had been evaluated or prepare a work plan to evaluate those items. Select items were addressed in a March 3, 2017 written response and in a meeting with NCDEQ on March 28, 2017. On April 2, 2018, the Work Plan was revised incorporating requirements from the January 31, 2018 conditional approval letter and the instream monitoring study requirements of the September 29, 2017 Final NPDES Permit, Condition A. (8.). Implementation of the Work Plan began in April 2018.

The approach for investigative activities was developed based on information obtained from site reconnaissance, previous investigations, and remedial activities conducted at the facility. The Work Plan was organized by the tasks:

- Task 1 – Alcoa/Badin Landfill
- Task 2 – Main Plant Area
- Task 3 – Former Ball Field Area

The scope of work for each of the tasks was summarized in Section 2 of the Work Plan. The following report details activities in support of Task 3, investigations at the Former Ball Field Area.

1.1 Site Overview

The facility is located on State Highway 740 within the Town of Badin, North Carolina, and occupies approximately 123 acres of land. Production at the Badin Works facility began in 1916 and continued through 2002. Principal products once manufactured at the facility included carbon cathodes and anodes, continuous cast sheets, and specialty metals. The facility was permanently closed in 2010 and several buildings were razed in 2012. In 2016, the legal owner and operator of the facility transferred from Alcoa Inc. to the Badin Business Park LLC, a subsidiary Alcoa Corporation (Alcoa). The Former Ball Field Area is located across State Highway 740 east of the facility.

According to the September 25, 2015, EPSA as conducted by the NCDEQ, in 2014, a local citizen reported that brick and spent pot liner had been disposed within the parcel containing the Former Ball Field prior to use as a park. The citizen reported that a large (10-feet-wide, 6 feet deep) drainage ditch formerly crossed the Ball Field property and connected to Badin Lake via the storm water catch basin. The reported location of the older ditch roughly corresponded to the current alignment of the western drainage swale. The citizen alleged that the drainage ditch had been partially backfilled using pot liner, and that pot liner was likely to have been disposed at additional locations within the Ball Field parcel.

The prior understanding was that through most of the 20th century the Former Ball Field Area was either undeveloped or historically used as a recreational area. To confirm this understanding, ENVIRONEERING assembled a chronology of the site using historical topographic maps, historical photographs, and aerial imagery. Based on available data, the area was undeveloped prior to 1938, the Ball Field was installed between 1938 and 1950, and the area has been underutilized since the late 1990s. The chronology of the site was presented in the February 23, 2015 *Sampling Work Plan for the Alcoa Badin Landfill and Former Ball Field*.

To assess whether the Former Ball Field Area had been affected by historical industrial activity, surface and sub-surface soil, sediment, surface water, and groundwater samples were collected on July 27 through 29, 2015. Concentrations of constituents were detected in samples collected at the site, however concentrations of similar constituents were detected in background soil samples. Concentrations were believed to be either naturally occurring or anthropogenic as a result of urbanization of the area throughout the 20th and 21st century. Results were summarized in the September 15, 2015, *Alcoa Badin Landfill and Former Ball Field Sampling Activities* report.

On January 23, 2017, NCDEQ issued correspondence requesting further assessment of subsurface conditions at the Former Ball Field Area. To satisfy the NCDEQ request, the April 2, 2018, Work Plan outlined activities to meet NCDEQ's objective.

1.2 Scope of Work

In order to satisfy the objectives concerning the Former Ball Field and surrounding area, the scope of work was divided into three subtasks.

- Subtask 1 – Geophysical Survey: To address the objective of determining if a disposal area is present at the Former Ball Field Area, electromagnetic (EM) and ground penetrating radar (GPR) geophysical surveys were conducted.

- Subtask 2 – Surface Soil Sampling: To address the objective of assessing the western and eastern drainage swales for constituents in excess of screening levels found in the sediment obtained from the catch basin, six surface soil samples were collected from drainage swales.

- Subtask 3 – Sediment Sampling: To address the objective of corroborating that concentrations of constituents in Badin Lake sediments near the concrete culvert discharge are consistent with historical lake studies and assessments, one sediment sample was collected from Badin Lake between the concrete culvert and the barrier.

Results from the completion of the scope of work are detailed below.

2.0 GEOPHYSICAL SURVEY RESULTS

To address the objective of determining if a disposal area is present at the Former Ball Field, EM and GPR geophysical surveys were conducted. The results of the geophysical surveys were then compared to previous soil borings in and around the area, and finally applied to the previous understanding of the chronology established using historical topographic maps, historical photographs, and aerial imagery.

2.1 Geophysical Surveys

On April 18, 2018, Geo Solutions LLC conducted a survey to evaluate if a disposal area is present at the Former Ball Field. Geophysical activities at the site consisted of EM profile mapping of the site and the immediately surrounding area.

EM is used for the measurement of the electrical conductivity of subsurface soil, rock and groundwater. The electrical conductivity is a function of the subsurface material's porosity, permeability, and the fluids located within the pore spaces. In a typically fill area setting, the pore fluids dominate the measurements and aid in the delineation of areas that have been backfilled or potentially contain buried fill materials and metallic objects. EM surveys are typically limited to a measurable depth of 20 to 30 feet below grade, but generally can cover a greater surface area in a short amount of time. This survey technique is highly influenced by metal surface features such as fences, buildings, and tanks, or highly conductive features.

Following the completion of the EM survey, Geo Solutions completed a GPR survey. GPR utilizes radio frequency EM energy to detect various layers in the earth's shallow subsurface. GPR typically has higher resolutions for imaging the subsurface as compared to other geophysical methods; however, GPR is limited in its depth of detection. Two major factors limit depth of detection, soil composition and the presence of highly conductive material. For soil composition, increases in clay content decreases the depth of penetration of the radar signal and thus the decreases the depth of detection. Highly conductive material enhances the attenuation of the radar signal, thus reducing the depth of penetration.

The Geophysical Evaluation of the Former Ball Field Area as prepared by Geo Solutions is presented in **Appendix A**. Results from the geophysical surveys are summarized below.

2.2 EM and GPR Survey Findings

Geo Solutions conducted multiple profiles (survey grids) across the field area to provide sufficient coverage of the survey area. The EM profile spacing was approximately three (3) feet apart. The total area surveyed was approximately ten (10) acres. GPR profiles were run across the field area to provide both general coverage of the survey area and further evaluation of areas containing anomalous elevated conductivity values. The approximate depth of GPR penetration across the site was six (6) feet from land surface.

EM results indicated three (3) distinct areas containing atypical conductivity values. A 140-foot long linear feature was detected in the northern portion of the mapped area. This north-south linear feature bifurcates to the east and west. GPR identified it at a subsurface depth of approximately 1.5 feet below the

surface. Based on field observations, the detected item appears to be a buried utility line. The line was traced southward from a covered utility box where a water meter was observed to where the buried line bifurcates to the east and west.

The second noted area containing anomalous conductivity values was identified along the former railroad bed. Geo Solutions interpreted the elevated EM response as remnant gravel, wood, and metal related to the historic railroad bed. GPR reflectors were detected at approximately 0.5 feet below land surface, extended down to approximately 1 foot below the surface, and are representative of the track foundation which included railroad ties, gravel, and metal reinforcement. East of the gravel parking lot, the railroad bed is elevated in relation to the surrounding ground surface. Geo Solutions interpretation of the GPR data was that there is approximately four feet of railroad bedding material placed over native soils in this area. This is consistent with elevation differences in the area.

The third area containing elevated conductivity values was identified in the parking lot used for the public boat access. For this EM feature, GPR identified a disturbance in the upper one foot of soil which appeared to be very thin (less than 0.5 feet). As a result, this area was interpreted to be unlikely related to a past disposal area.

Both the EM and GPR geophysical surveys did not identify evidence of a disposal trench in the Former Ball Field Area or adjacent parking lot. No other areas of irregular EM or GPR readings were identified in the surveys.

3.0 SAMPLING RESULTS

To complete the objectives concerning the Former Ball Field and surrounding area, surface soil samples were collected from the Former Ball Field Area and a sediment sample was collected from Badin Lake. Surface soil sample and sediment sample locations are presented on Figure 3-1. Sample collection, shipment, and decontamination followed procedures outlined in the April 2, 2018 Work Plan. Laboratory reports and completed chain of custody forms are provided in Appendix B.

3.1 Surficial Soil Samples

To address the objective of assessing the drainage swales for constituents in excess of screening levels relative to the catch basin sediments, six surface soil samples (ABF-SB0052-F002 through ABF-SB057-F002 and ABF-SB055-D002) and were collected from the upper (six) 6 inches of soil of lowest point in the drainage swales. Laboratory analytical results were compared against their respective March 2018 EPA Superfund Chemical Data Matrix (SCDM) Hazard Ranking System (HRS) Benchmarks and the May 2018 EPA Regional Screening Level (RSL) values. Surficial soil analytical results are summarized in Tables 3-1 and 3-2.

3.1.1 Polycyclic Aromatic Hydrocarbons

Laboratory analytical results indicated two PAHs (benzo(a)pyrene and benzo(b)fluoranthene) were detected at concentrations above their respective SCDM HRS Benchmarks or EPA RSLs in two (ABF-SB054-F002 and ABF-SB056-F002) of the six soil samples. Benzo(a)anthracene and dibenz(a,h)anthracene were reported at estimated concentrations above regulatory levels, however all concentrations were flagged with a “J” qualifier. A “J” flagged notation means the result is less than the reporting limit but greater than or equal to the method detection limit, and the concentration is an approximate.

Benzo(a)anthracene was detected in one of the six surficial samples at a J-flagged, or estimated, concentration of 1.15 milligrams per kilogram (mg/kg). Benzo(a)pyrene was detected in six of the six surficial samples at a maximum, J-flagged, concentration (1.16 mg/kg). Benzo(b)fluoranthene was detected in two of the six surficial soil samples a maximum, J-flagged, concentration (1.74 mg/kg). Dibenz(a,h)anthracene was detected in four of the six surficial samples at a maximum, J-flagged, concentration (0.207 mg/kg). No other constituents were detected at or estimated at concentrations above their respective SCDM HRS Benchmarks or EPA RSLs

Concentrations of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene reported in this 2018 sampling event are consistent with prior reported results from surficial soil samples. As documented in the September 15, 2015, *Alcoa Badin Landfill and Former Ball Field Sampling Activities* report, the maximum concentrations of benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, dibenz(a,h)anthracene were 0.769 mg/kg, 1.24 mg/kg, 1.70 mg/kg, and 0.233 mg/kg, respectively. As previously presented, these reported low-level concentrations of a few PAHs appear to be background soil concentrations present in the area and not associated with off-site disposal activities.

3.1.2 PCB Aroclors

Laboratory analytical results indicated a concentration of one PCB Aroclor (PCB-1260) in one of the six samples at a concentration above the SCDM HRS Benchmark and EPA RSL. All other Aroclors for all other samples were below laboratory detection limits. As reported in the September 15, 2015, *Alcoa Badin Landfill and Former Ball Field Sampling Activities* report, PCB Aroclor 1260 was not detected in any historical surficial soil sample for the Former Ball Field Area at a concentration above laboratory detection limits, nor was the Aroclor detected in the catch basin inlet sample or the catch basin inlet duplicate at a concentration above laboratory detection limits. However, the EPSA reported PCB Aroclor 1260 at a concentration above laboratory detection limits in the catch basin inlet sample.

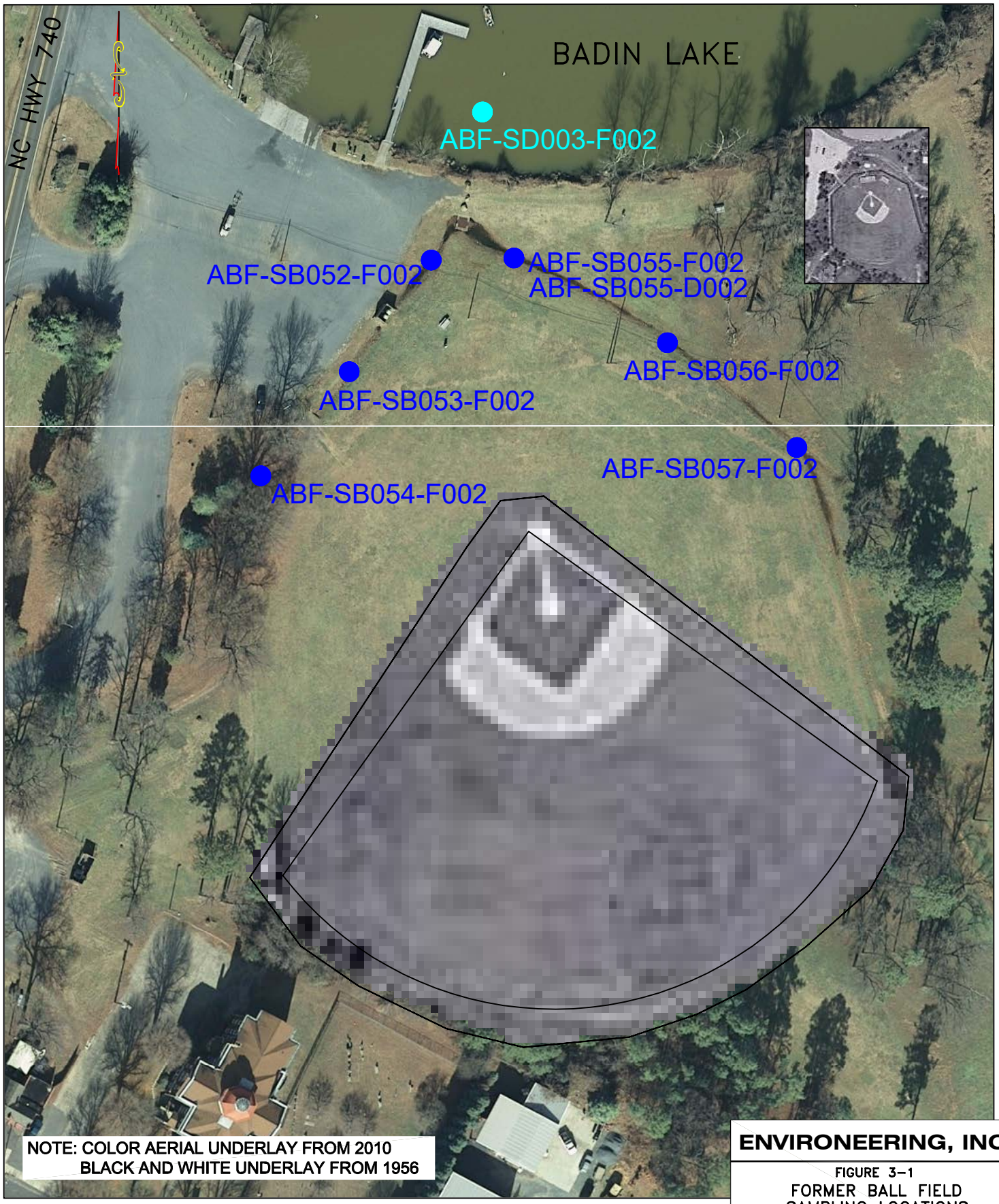
3.1.3 PCB Congeners

Laboratory analytical results indicated concentrations of PCB congeners in all samples at a concentration above laboratory detection limits, however all concentrations were below all applicable EPA RSL values. EPA RSL values are assigned for the 12 dioxin-like congeners (PCB-77, 81, 105, 114, 118, 123, 126, 156, 157, 167, 169, 1889). Risks associated with the remaining congeners are totaled as the "non-dioxin-like congeners". The RSL for "Polychlorinated Biphenyls (high risk)" was utilized for non-dioxin-like congeners.

3.2 Badin Lake Sediment Sample

To address the objective of verifying that concentrations of constituents in Badin Lake sediments near the concrete culvert discharge are consistent with historical lake studies and assessments, one a sediment sample was collected from Badin Lake between the concrete culvert and the sediment cap installed in 2013. Details of the sediment cap are presented in the November 2013 *Badin Lake Sediment Capping Project: Construction Completion Report*. Sediment sample analytical results are summarized in Table 3-3.

The laboratory reported one PAH, benzo(a)anthracene, at a J-flagged concentration (0.139 mg/kg). This reported concentration of benzo(a)anthracene is significantly less than the historical concentration (1.01 mg/kg) observed in the sediment sample as reported in the September 15, 2015, *Alcoa Badin Landfill and Former Ball Field Sampling Activities* report.



NOTE: COLOR AERIAL UNDERLAY FROM 2010
BLACK AND WHITE UNDERLAY FROM 1956

0 100 200
SCALE IN FEET

SEDIMENT SAMPLE LOCATION

SURFACE SOIL SAMPLE LOCATION

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FIGURE 3-1
FORMER BALL FIELD
SAMPLING LOCATIONS

BADIN BUSINESS PARK FACILITY
BADIN, NORTH CAROLINA

DRAWN BY:	DATE:	PROJ. NO.
MWW	07/03/2018	137-263

Table 3-1
Surface Soil Analytical Results
Former Ball Field Area
Badin Business Park Facility
Badin, North Carolina

Sample ID	Method	CAS	Units	ABF-SB052-F002	ABF-SB053-F002	ABF-SB054-F002	ABF-SB055-F002	ABF-SB055-D002	ABF-SB056-F002	ABF-SB057-F002	EPA SCDM HRS Benchmark - Soil Exposure	EPA RSL - Residential Soil
Location				**Stormwater Ditch**	**Stormwater Ditch**	**Stormwater Ditch**	**Stormwater Ditch**	**Stormwater Ditch**	**Stormwater Ditch**	**Stormwater Ditch**		
Depth				**0'-0.5'**	**0'-0.5'**	**0'-0.5'**	**0'-0.5'**	**0'-0.5'**	**0'-0.5'**	**0'-0.5'**		
Date				**5/9/2018**	**5/9/2018**	**5/9/2018**	**5/9/2018**	**5/9/2018**	**5/9/2018**	**5/9/2018**		
Time				**11:55**	**12:10**	**12:30**	**13:50**	**13:55**	**13:30**	**13:05**		
Percent Moisture	**ASTM D2974-87**		%	31.3	27.0	24.7	29.2	28.0	28.8	23.5		
PCB-1016 (Aroclor 1016)	**EPA 8082**	**12674-11-2**	*mg/kg*	ND $_{<0.109}$	ND $_{<0.0414}$	ND $_{<0.0996}$	ND $_{<0.106}$	ND $_{<0.106}$	ND $_{<0.416}$	ND $_{<0.0997}$	**NE**	**4.1**
PCB-1221 (Aroclor 1221)	**EPA 8082**	**11104-28-2**	*mg/kg*	ND $_{<0.109}$	ND $_{<0.0414}$	ND $_{<0.0996}$	ND $_{<0.106}$	ND $_{<0.106}$	ND $_{<0.416}$	ND $_{<0.0997}$	**NE**	**0.2**
PCB-1232 (Aroclor 1232)	**EPA 8082**	**11141-16-5**	*mg/kg*	ND $_{<0.109}$	ND $_{<0.0414}$	ND $_{<0.0996}$	ND $_{<0.106}$	ND $_{<0.106}$	ND $_{<0.416}$	ND $_{<0.0997}$	**NE**	**0.17**
PCB-1242 (Aroclor 1242)	**EPA 8082**	**53469-21-9**	*mg/kg*	ND $_{<0.109}$	ND $_{<0.0414}$	ND $_{<0.0996}$	ND $_{<0.106}$	ND $_{<0.106}$	ND $_{<0.416}$	ND $_{<0.0997}$	**NE**	**0.23**
PCB-1248 (Aroclor 1248)	**EPA 8082**	**12672-29-6**	*mg/kg*	ND $_{<0.109}$	ND $_{<0.0414}$	ND $_{<0.0996}$	ND $_{<0.106}$	ND $_{<0.106}$	ND $_{<0.416}$	ND $_{<0.0997}$	**NE**	**0.23**
PCB-1254 (Aroclor 1254)	**EPA 8082**	**11097-69-1**	*mg/kg*	ND $_{<0.109}$	ND $_{<0.0414}$	ND $_{<0.0996}$	ND $_{<0.106}$	ND $_{<0.106}$	ND $_{<0.416}$	ND $_{<0.0997}$	**NE**	**0.24**
PCB-1260 (Aroclor 1260)	**EPA 8082**	**11096-82-5**	*mg/kg*	ND $_{<0.109}$	0.458	ND $_{<0.0996}$	ND $_{<0.106}$	ND $_{<0.106}$	ND $_{<0.416}$	ND $_{<0.0997}$	**NE**	**0.24**
Total Polychlorinated Biphenyls			*mg/kg*	ND	0.458	ND	ND	ND	ND	ND	**0.3 C**	**0.23**
1-Methylnaphthalene	**EPA 8270**	**90-12-0**	*mg/kg*	ND $_{<0.125}$	ND $_{<0.117}$	ND $_{<0.114}$	ND $_{<0.120}$	ND $_{<0.121}$	ND $_{<0.121}$	ND $_{<0.564}$	**NE**	**18**
2-Methylnaphthalene	**EPA 8270**	**91-57-6**	*mg/kg*	ND $_{<0.103}$	ND $_{<0.0969}$	ND $_{<0.0939}$	ND $_{<0.0993}$	ND $_{<0.0996}$	ND $_{<0.0998}$	ND $_{<0.466}$	**300**	**240**
Acenaphthene	**EPA 8270**	**83-32-9**	*mg/kg*	ND $_{<0.111}$	ND $_{<0.104}$	ND $_{<0.101}$	ND $_{<0.106}$	ND $_{<0.107}$	ND $_{<0.107}$	ND $_{<0.499}$	**4000**	**3600**
Acenaphthylene	**EPA 8270**	**208-96-8**	*mg/kg*	ND $_{<0.114}$	ND $_{<0.106}$	ND $_{<0.103}$	ND $_{<0.109}$	ND $_{<0.109}$	ND $_{<0.110}$	ND $_{<0.512}$	**NE**	**NE**
Anthracene	**EPA 8270**	**120-12-7**	*mg/kg*	ND $_{<0.108}$	ND $_{<0.101}$	ND $_{<0.0979}$	ND $_{<0.103}$	ND $_{<0.104}$	ND $_{<0.104}$	ND $_{<0.485}$	**2000**	**18000**
Benzo(a)anthracene	**EPA 8270**	**56-55-3**	*mg/kg*	0.384 J	0.472	0.743	0.209 J	0.172 J	0.486	1.15 J	**1 C**	**1.1**
Benzo(a)pyrene	**EPA 8270**	**50-32-8**	*mg/kg*	0.360 J	0.420 J	0.775	0.165 J	0.161 J	0.539	1.16 J	**0.1 C**	**0.11**
Benzo(b)fluoranthene	**EPA 8270**	**205-99-2**	*mg/kg*	0.665	0.837	1.49	0.222 J	0.244 J	0.791	1.74 J	**NE**	**1.1**
Benzo(g,h,i)perylene	**EPA 8270**	**191-24-2**	*mg/kg*	0.346 J	0.428 J	0.807	0.129 J	0.137 J	0.474	0.945 J	**NE**	**NE**
Benzo(k)fluoranthene	**EPA 8270**	**207-08-9**	*mg/kg*	0.259 J	0.289 J	0.491	0.109 J	0.105 J	0.292 J	0.676 J	**10 C**	**11**
Chrysene	**EPA 8270**	**218-01-9**	*mg/kg*	0.436 J	0.473	0.971	0.189 J	0.174 J	0.584	1.09 J	**100 C**	**110**
Dibenz(a,h)anthracene	**EPA 8270**	**53-70-3**	*mg/kg*	0.119 J	0.128 J	0.207 J	ND $_{<0.0979}$	ND $_{<0.0982}$	0.170 J	ND $_{<0.459}$	**0.1 C**	**0.11**
Fluoranthene	**EPA 8270**	**206-44-0**	*mg/kg*	0.499	0.624	1.17	0.116 J	0.212 J	0.960	1.87 J	**3000**	**2400**
Fluorene	**EPA 8270**	**86-73-7**	*mg/kg*	ND $_{<0.0990}$	ND $_{<0.0928}$	ND $_{<0.0900}$	ND $_{<0.0951}$	ND $_{<0.0954}$	ND $_{<0.0956}$	ND $_{<0.446}$	**3000**	**2400**
Indeno(1,2,3-cd)pyrene	**EPA 8270**	**193-39-5**	*mg/kg*	0.273 J	0.334 J	0.647	ND $_{<0.0951}$	0.121 J	ND $_{<0.0956}$	0.850 J	**1 C**	**1.1**
Naphthalene	**EPA 8270**	**91-20-3**	*mg/kg*	ND $_{<0.118}$	ND $_{<0.111}$	ND $_{<0.107}$	ND $_{<0.113}$	ND $_{<0.114}$	ND $_{<0.114}$	ND $_{<0.531}$	**1000**	**3.8**
Phenanthrene	**EPA 8270**	**85-01-8**	*mg/kg*	0.135 J	0.210 J	0.313 J	ND $_{<0.0769}$	ND $_{<0.0772}$	0.363 J	0.817 J	**NE**	**NE**
Pyrene	**EPA 8270**	**129-00-0**	*mg/kg*	0.401 J	0.507	1.06	0.199 J	0.198 J	0.867	1.88 J	**2000**	**1800**

ND - The analyte was not detected above laboratory detection limits. Subscript indicates compound-specific MDL in mg/kg.
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
EPA Regional Screening Level (RSL) - May 2018 Update, Target Hazard Quotient (THQ) of 1.0
EPA Superfund Chemical Data Matrix (SCDM) Hazard Ranking System (HRS) Benchmark last updated March 2018. "C" indicates carcinogenic benchmark.
NE - Not established.

Table 3-2
Surface Soil Sample Analytical Results - Congener Analysis
Former Ball Field Area
Badin Business Park Facility
Badin, North Carolina

Sample ID	Congener Number	IUPAC Name	Method	CAS	Units	ABF-SB052-F002	ABF-SB053-F002	ABF-SB054-F002	ABF-SB055-F002	ABF-SB055-D002	ABF-SB056-F002	ABF-SB057-F002	EPA RSL - Residential Soil
Location						Stormwater Ditch	Stormwater Ditch	Stormwater Ditch	Stormwater Ditch	Stormwater Ditch	Stormwater Ditch	Stormwater Ditch	
Depth						0'-0.5'	0'-0.5'	0'-0.5'	0'-0.5'	0'-0.5'	0'-0.5'	0'-0.5'	
Date						5/9/2018	5/9/2018	5/9/2018	5/9/2018	5/9/2018	5/9/2018	5/9/2018	
Time						11:55	12:10	12:30	13:50	13:55	13:30	13:05	
2-MoCB	1	2-Chlorobiphenyl	EPA 1668A	2051-60-7	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
3-MoCB	2	3-Chlorobiphenyl	EPA 1668A	2051-61-8	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
4-MoCB	3	4-Chlorobiphenyl	EPA 1668A	2051-62-9	mg/kg	ND <0.0000246	0.0000263 <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	0.0000263 <0.0000247	0.0000324 <0.0000249	NE
2,2'-DiCB	4	2,2'-Dichlorobiphenyl	EPA 1668A	13029-08-8	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
2,6-DiCB	10	2,6-Dichlorobiphenyl	EPA 1668A	33146-45-1	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
2,5-DiCB	9	2,5-Dichlorobiphenyl	EPA 1668A	34883-39-1	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
2,4-DiCB	7	2,4-Dichlorobiphenyl	EPA 1668A	33284-50-3	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
2,3'-DiCB	6	2,3'-Dichlorobiphenyl	EPA 1668A	25569-80-6	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
2,3-DiCB	5	2,3-Dichlorobiphenyl	EPA 1668A	16605-91-7	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
2,4'-DiCB	8	2,4'-Dichlorobiphenyl	EPA 1668A	34883-43-7	mg/kg	0.0000312 I <0.0000246	0.0000307 <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	0.0000297 <0.0000249	NE
3,5-DiCB	14	3,5-Dichlorobiphenyl	EPA 1668A	34883-41-5	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
3,3'-DiCB	11	3,3'-Dichlorobiphenyl	EPA 1668A	2050-67-1	mg/kg	ND <0.000241	ND <0.000245	ND <0.000245	ND <0.000244	ND <0.000243	ND <0.000242	ND <0.000244	NE
(12/13)	12/13	NA (Co-elution)	EPA 1668A	E52450566	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
4,4'-DiCB	15	4,4'-Dichlorobiphenyl	EPA 1668A	2050-68-2	mg/kg	0.0000554 <0.0000325	0.000128 <0.000033	ND <0.000033	ND <0.0000328	ND <0.0000327	0.000193 <0.0000326	0.000156 <0.0000329	NE
2,2',6-TrCB	19	2,2',6-Trichlorobiphenyl	EPA 1668A	38444-73-4	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
(18/30)	18/30	NA (Co-elution)	EPA 1668A	E52450574	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,2',4-TrCB	17	2,2',4-Trichlorobiphenyl	EPA 1668A	37680-66-3	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
2,3',6-TrCB	27	2,3',6-Trichlorobiphenyl	EPA 1668A	38444-76-7	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
2,3,6-TrCB	24	2,3,6-Trichlorobiphenyl	EPA 1668A	55702-45-9	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
2,2',3-TrCB	16	2,2',3-Trichlorobiphenyl	EPA 1668A	38444-78-9	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
2,4',6-TrCB	32	2,4',6-Trichlorobiphenyl	EPA 1668A	38444-77-8	mg/kg	ND <0.0000246	ND <0.000025	0.0000261 <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
2,3',5'-TrCB	34	2,3',5'-Trichlorobiphenyl	EPA 1668A	37680-68-5	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
2,3,5-TrCB	23	2,3,5-Trichlorobiphenyl	EPA 1668A	55720-44-0	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
(26/29)	26/29	NA (Co-elution)	EPA 1668A	E52450608	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,3',4-TrCB	25	2,3',4-Trichlorobiphenyl	EPA 1668A	55712-37-3	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
2,4',5-TrCB	31	2,4',5-Trichlorobiphenyl	EPA 1668A	16606-02-3	mg/kg	ND <0.000128	ND <0.00013	ND <0.00013	ND <0.000129	ND <0.000129	ND <0.000129	ND <0.00013	NE
(20/28)	20/28	NA (Co-elution)	EPA 1668A	E52450582	mg/kg	ND <0.000127	ND <0.000129	ND <0.000129	ND <0.000128	ND <0.000128	ND <0.000128	ND <0.000129	NE
(21/33)	21/33	NA (Co-elution)	EPA 1668A	E52450590	mg/kg	ND <0.000133	ND <0.000135	ND <0.000135	ND <0.000134	ND <0.000134	ND <0.000134	ND <0.000135	NE
2,3,4'-TrCB	22	2,3,4'-Trichlorobiphenyl	EPA 1668A	38444-85-8	mg/kg	ND <0.0000934	ND <0.000095	ND <0.0000949	ND <0.0000945	ND <0.0000942	ND <0.000094	ND <0.0000948	NE
3,3',5-TrCB	36	3,3',5-Trichlorobiphenyl	EPA 1668A	38444-87-0	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
3,4',5-TrCB	39	3,4',5-Trichlorobiphenyl	EPA 1668A	38444-88-1	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
3,4,5-TrCB	38	3,4,5-Trichlorobiphenyl	EPA 1668A	53555-66-1	mg/kg	ND <0.0000246	ND <0.000025	0.0000262 <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
3,3',4-TrCB	35	3,3',4-Trichlorobiphenyl	EPA 1668A	37680-69-6	mg/kg	ND <0.0000246	ND <0.000025	ND <0.000025	ND <0.0000249	ND <0.0000248	ND <0.0000247	ND <0.0000249	NE
3,4,4'-TrCB	37	3,4,4'-Trichlorobiphenyl	EPA 1668A	38444-90-5	mg/kg	ND <0.0000521	0.000108 <0.000053	ND <0.0000529	ND <0.0000527	ND <0.0000526	0.000101 <0.0000524	0.000103 <0.0000529	NE
2,2',6,6'-TeCB	54	2,2',6,6'-Tetrachlorobiphenyl	EPA 1668A	15968-05-5	mg/kg	ND <0.0000492	ND <0.00005	0.0000592 <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
(50/53)	50/53	NA (Co-elution)	EPA 1668A	E52450657	mg/kg	ND <0.0000984	ND <0.0001	0.000152 <0.0000999	ND <0.0000995	ND <0.0000992	ND <0.0000989	ND <0.0000998	NE
(45/51)	45/51	NA (Co-elution)	EPA 1668A	E52450632	mg/kg	ND <0.0000984	ND <0.0001	0.000583 <0.0000999	ND <0.0000995	ND <0.0000992	ND <0.0000989	ND <0.0000998	NE
2,2',3,6'-TeCB	46	2,2',3,6'-Tetrachlorobiphenyl	EPA 1668A	41464-47-5	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,2',5,5'-TeCB	52	2,2',5,5'-Tetrachlorobiphenyl	EPA 1668A	35693-99-3	mg/kg	ND <0.000151	0.000233 <0.000154	ND <0.000154	ND <0.000153	ND <0.000153	ND <0.000152	ND <0.000154	NE
2,3',5',6-TeCB	73	2,3',5',6-Tetrachlorobiphenyl	EPA 1668A	74338-23-1	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
43/73	43/73	NA (Co-elution)	EPA 1668A		mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
(49/69)	49/69	NA (Co-elution)	EPA 1668A	E52450640	mg/kg	ND <0.0000984	ND <0.0001	0.000271 <0.0000999	ND <0.0000995	ND <0.0000992	ND <0.0000989	ND <0.0000998	NE
2,2',4,5-TeCB	48	2,2',4,5-Tetrachlorobiphenyl	EPA 1668A	70362-47-9	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
(44/47/65)	44/47/65	NA (Co-elution)	EPA 1668A	E52450624	mg/kg	ND <0.000148	ND <0.00015	0.00116 <0.00015	ND <0.000149	ND <0.000149	ND <0.000148	ND <0.00015	NE
(59/62/75)	59/62/75	NA (Co-elution)	EPA 1668A	E52450665	mg/kg	ND <0.000148	ND <0.00015	ND <0.00015	ND <0.000149	ND <0.000149	ND <0.000148	ND <0.00015	NE
2,2',3,4'-TeCB	42	2,2',3,4'-Tetrachlorobiphenyl	EPA 1668A	36559-22-5	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
(40/41/71)	40/41/71	NA (Co-elution)	EPA 1668A	E52450616	mg/kg	ND <0.000148	ND <0.00015	ND <0.00015	ND <0.000149	ND <0.000149	ND <0.000148	ND <0.00015	NE
2,3,4',6-TeCB	64	2,3,4',6-Tetrachlorobiphenyl	EPA 1668A	52663-58-8	mg/kg	ND <0.0000492	0.0000524 <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	0.0000647 <0.0000499	NE
2,3',5,5'-TeCB	72	2,3',5,5'-Tetrachlorobiphenyl	EPA 1668A	41464-42-0	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,3',4,5'-TeCB	68	2,3',4,5'-Tetrachlorobiphenyl	EPA 1668A	73575-52-7	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE

Table 3-2
Surface Soil Sample Analytical Results - Congener Analysis
Former Ball Field Area
Badin Business Park Facility
Badin, North Carolina

Sample ID	Congener Number	IUPAC Name	Method	CAS	Units	ABF-SB052-F002	ABF-SB053-F002	ABF-SB054-F002	ABF-SB055-F002	ABF-SB055-D002	ABF-SB056-F002	ABF-SB057-F002	EPA RSL - Residential Soil
Location						Stormwater Ditch	Stormwater Ditch	Stormwater Ditch	Stormwater Ditch	Stormwater Ditch	Stormwater Ditch	Stormwater Ditch	
Depth						0'-0.5'	0'-0.5'	0'-0.5'	0'-0.5'	0'-0.5'	0'-0.5'	0'-0.5'	
Date						5/9/2018	5/9/2018	5/9/2018	5/9/2018	5/9/2018	5/9/2018	5/9/2018	
Time						11:55	12:10	12:30	13:50	13:55	13:30	13:05	
2,3,3',5-TeCB	57	2,3,3',5-Tetrachlorobiphenyl	EPA 1668A	70424-67-8	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,3,3',5'-TeCB	58	2,3,3',5'-Tetrachlorobiphenyl	EPA 1668A	41464-49-7	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,3',4,5-TeCB	67	2,3',4,5-Tetrachlorobiphenyl	EPA 1668A	73575-53-8	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,3,4',5-TeCB	63	2,3,4',5-Tetrachlorobiphenyl	EPA 1668A	74472-34-7	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
(61/70/74/76)	60/70/74/76	NA (Co-elution)	EPA 1668A	E52450673	mg/kg	ND <0.000197	0.000366 <0.0002	0.000215 <0.0002	ND <0.000199	ND <0.000198	ND <0.000198	0.000275 <0.0002	NE
2,3',4,4'-TeCB	66	2,3',4,4'-Tetrachlorobiphenyl	EPA 1668A	32598-10-0	mg/kg	0.000104 <0.0000826	0.000187 <0.000084	0.000139 <0.0000839	ND <0.0000836	ND <0.0000833	0.0000967 <0.0000831	0.000142 <0.0000838	NE
2,3,3',4-TeCB	55	2,3,3',4-Tetrachlorobiphenyl	EPA 1668A	74338-24-2	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,3,3',4'-TeCB	56	2,3,3',4'-Tetrachlorobiphenyl	EPA 1668A	41464-43-1	mg/kg	0.0000558 <0.0000492	0.0000893 <0.00005	0.0000589 <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	0.0000606 <0.0000499	NE
2,3,4,4'-TeCB	60	2,3,4,4'-Tetrachlorobiphenyl	EPA 1668A	33025-41-1	mg/kg	ND <0.0000492	0.0000538 <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
3,3',5,5'-TeCB	80	3,3',5,5'-Tetrachlorobiphenyl	EPA 1668A	33284-52-5	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
3,3',4,5'-TeCB	79	3,3',4,5'-Tetrachlorobiphenyl	EPA 1668A	41464-48-6	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
3,3',4,5-TeCB	78	3,3',4,5-Tetrachlorobiphenyl	EPA 1668A	70362-49-1	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
3,4,4',5-TeCB	81	3,4,4',5-Tetrachlorobiphenyl	EPA 1668A	70362-50-4	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	0.012
3,3',4,4'-TeCB	77	3,3',4,4'-Tetrachlorobiphenyl	EPA 1668A	32598-13-3	mg/kg	ND <0.0000492	0.0000887 <0.00005	0.0000528 <0.0000499	ND <0.0000497	ND <0.0000496	0.0000737 <0.0000495	0.0000771 <0.0000499	0.038
2,2',4,6,6'-PeCB	104	2,2',4,6,6'-Pentachlorobiphenyl	EPA 1668A	56558-16-8	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,2',3,6,6'-PeCB	96	2,2',3,6,6'-Pentachlorobiphenyl	EPA 1668A	73575-54-9	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,2',4,5',6-PeCB	103	2,2',4,5',6-Pentachlorobiphenyl	EPA 1668A	60145-21-3	mg/kg	ND <0.0000492	ND <0.00005	0.0000512 <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,2',3,5,6'-PeCB	94	2,2',3,5,6'-Pentachlorobiphenyl	EPA 1668A	73575-55-0	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,2',3,5',6-PeCB	95	2,2',3,5',6-Pentachlorobiphenyl	EPA 1668A	38379-99-6	mg/kg	0.00014 <0.0000934	0.000353 <0.000095	0.000229 <0.0000949	ND <0.0000945	ND <0.0000942	0.000189 <0.000094	0.000451 <0.0000948	NE
(93/98/100/102)	93/98/100/102	NA (Co-elution)	EPA 1668A		mg/kg	ND <0.000197	ND <0.0002	0.000311 <0.0002	ND <0.000199	ND <0.000198	ND <0.000198	ND <0.0002	NE
(88/91)	88/91	NA (Co-elution)	EPA 1668A	E52450715	mg/kg	ND <0.0000984	0.000173 <0.0001	ND <0.0000999	ND <0.0000995	ND <0.0000992	ND <0.0000989	0.000171 <0.0000998	NE
2,2',3,3',6-PeCB	84	2,2',3,3',6-Pentachlorobiphenyl	EPA 1668A	52663-60-2	mg/kg	ND <0.0000492	0.000127 <0.00005	0.0000638 <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	0.0000902 <0.0000499	NE
2,2',3,4,6'-PeCB	89	2,2',3,4,6'-Pentachlorobiphenyl	EPA 1668A	73575-57-2	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,3',4,5',6-PeCB	121	2,3',4,5',6-Pentachlorobiphenyl	EPA 1668A	56558-18-0	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,2',3,5,5'-PeCB	92	2,2',3,5,5'-Pentachlorobiphenyl	EPA 1668A	52663-61-3	mg/kg	ND <0.0000492	0.000092 <0.00005	0.0000934 <0.0000499	ND <0.0000497	ND <0.0000496	0.0000608 <0.0000495	0.00013 <0.0000499	NE
(90/101/113)	90/101/113	NA (Co-elution)	EPA 1668A	E52450723	mg/kg	0.000183 <0.000148	0.000507 <0.00015	0.000519 <0.00015	ND <0.000149	ND <0.000149	0.000264 <0.000148	0.000536 <0.00015	NE
2,2',3,3',5-PeCB	83	2,2',3,3',5-Pentachlorobiphenyl	EPA 1668A	60145-20-2	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,2',4,4',5-PeCB	99	2,2',4,4',5-Pentachlorobiphenyl	EPA 1668A	38380-01-7	mg/kg	0.0000791 <0.0000492	0.000406 <0.00005	0.000345 <0.0000499	ND <0.0000497	ND <0.0000496	0.00023 <0.0000495	0.000402 <0.0000499	NE
2,3,3',5,6-PeCB	112	2,3,3',5,6-Pentachlorobiphenyl	EPA 1668A	74472-36-9	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
(86/87/97/108/119/125)	86/87/97/108/119'125	NA (Co-elution)	EPA 1668A	E52450707	mg/kg	ND <0.000295	0.000339 <0.0003	0.000329 <0.0003	ND <0.000298	ND <0.000298	ND <0.000297	0.000302 <0.000299	NE
(85/117/116)	85/117/116	NA (Co-elution)	EPA 1668A	E52450699	mg/kg	ND <0.000148	0.00157 <0.00015	0.00021 <0.00015	ND <0.000149	ND <0.000149	0.000494 <0.000148	0.000821 <0.00015	NE
(110/115)	110/115	NA (Co-elution)	EPA 1668A	E52450756	mg/kg	0.000294 <0.0000984	0.000994 <0.0001	0.000753 <0.0000999	ND <0.0000995	ND <0.0000992	0.000586 <0.0000989	0.00124 <0.0000998	NE
2,2',3,3',4-PeCB	82	2,2',3,3',4-Pentachlorobiphenyl	EPA 1668A	52663-62-4	mg/kg	ND <0.0000492	0.0000711 <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	0.0000549 <0.0000499	NE
2,3,3',5,5'-PeCB	111	2,3,3',5,5'-Pentachlorobiphenyl	EPA 1668A	39635-32-0	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,3',4,5,5'-PeCB	120	2,3',4,5,5'-Pentachlorobiphenyl	EPA 1668A	68194-12-7	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
(107/124)	107/124	NA (Co-elution)	EPA 1668A	E52450749	mg/kg	ND <0.0000984	ND <0.0001	ND <0.0000999	ND <0.0000995	ND <0.0000992	ND <0.0000989	ND <0.0000998	NE
2,3,3',4,6-PeCB	109	2,3,3',4,6-Pentachlorobiphenyl	EPA 1668A	74472-35-8	mg/kg	ND <0.0000492	0.000134 <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	0.0000591 <0.0000495	0.0000766 <0.0000499	NE
2,3',4,4',5'-PeCB	123	2,3',4,4',5'-Pentachlorobiphenyl	EPA 1668A	65510-44-3	mg/kg	ND <0.0000492	0.0000644 <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	0.0000531 <0.0000495	0.000069 <0.0000499	0.12
2,3,3',4,5-PeCB	106	2,3,3',4,5-Pentachlorobiphenyl	EPA 1668A	70424-69-0	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,3',4,4',5-PeCB	118	2,3',4,4',5-Pentachlorobiphenyl	EPA 1668A	31508-00-6	mg/kg	0.000357 <0.0000629	0.000966 <0.0000064	0.00039 <0.0000639	0.0000678 <0.0000637	ND <0.0000635	0.000477 <0.0000633	0.000717 <0.0000639	0.12
2,3,3',4',5'-PeCB	122	2,3,3',4',5'-Pentachlorobiphenyl	EPA 1668A	76842-07-4	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,3,4,4',5-PeCB	114	2,3,4,4',5-Pentachlorobiphenyl	EPA 1668A	74472-37-0	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	0.12
2,3,3',4,4'-PeCB	105	2,3,3',4,4'-Pentachlorobiphenyl	EPA 1668A	32598-14-4	mg/kg	0.000156 <0.0000492	0.000787 <0.00005	0.000182 <0.0000499	ND <0.0000497	ND <0.0000496	0.000306 <0.0000495	0.000436 <0.0000499	0.12
3,3',4,5,5'-PeCB	127	3,3',4,5,5'-Pentachlorobiphenyl	EPA 1668A	39635-33-1	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
3,3',4,4',5-PeCB	126	3,3',4,4',5-Pentachlorobiphenyl	EPA 1668A	57465-28-8	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	0.000036
2,2',4,4',6,6'-HxCB	155	2,2',4,4',6,6'-Hexachlorobiphenyl	EPA 1668A	33979-03-2	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,2',3,5,6,6'-HxCB	152	2,2',3,5,6,6'-Hexachlorobiphenyl	EPA 1668A	68194-09-2	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,2',3,4',6,6'-HxCB	150	2,2',3,4',6,6'-Hexachlorobiphenyl	EPA 1668A	68194-08-1	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE
2,2',3,3',6,6'-HxCB	136	2,2',3,3',6,6'-Hexachlorobiphenyl	EPA 1668A	38411-22-2	mg/kg	0.0000758 <0.0000492	0.000787 <0.00005	0.000103 <0.0000499	ND <0.0000497	ND <0.0000496	0.000132 <0.0000495	0.000321 <0.0000499	NE
2,2',3,4,6,6'-HxCB	145	2,2',3,4,6,6'-Hexachlorobiphenyl	EPA 1668A	74472-40-5	mg/kg	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	NE

Table 3-2
Surface Soil Sample Analytical Results - Congener Analysis
Former Ball Field Area
Badin Business Park Facility
Badin, North Carolina

Sample ID	Congener Number	IUPAC Name	Method	CAS	Units	ABF-SB052-F002	ABF-SB053-F002	ABF-SB054-F002	ABF-SB055-F002	ABF-SB055-D002	ABF-SB056-F002	ABF-SB057-F002	EPA RSL - Residential Soil
Location						**Stormwater Ditch**	**Stormwater Ditch**	**Stormwater Ditch**	**Stormwater Ditch**	**Stormwater Ditch**	**Stormwater Ditch**	**Stormwater Ditch**	
Depth						**0'-0.5'**	**0'-0.5'**	**0'-0.5'**	**0'-0.5'**	**0'-0.5'**	**0'-0.5'**	**0'-0.5'**	
Date						**5/9/2018**	**5/9/2018**	**5/9/2018**	**5/9/2018**	**5/9/2018**	**5/9/2018**	**5/9/2018**	
Time						**11:55**	**12:10**	**12:30**	**13:50**	**13:55**	**13:30**	**13:05**	
2,2',3,4',5,6'-HxCB	**148**	**2,2',3,4',5,6'-Hexachlorobiphenyl**	**EPA 1668A**	**74472-41-6**	*mg/kg*	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	**NE**
(135/151)	**135/151**	**NA (Co-elution)**	**EPA 1668A**		*mg/kg*	0.000491 <0.0000984	0.00474 <0.0001	0.000483 <0.0000999	0.000119 <0.0000995	ND <0.0000992	0.00151 <0.0000989	0.00279 <0.0000998	**NE**
2,2',4,4',5,6'-HxCB	**154**	**2,2',4,4',5,6'-Hexachlorobiphenyl**	**EPA 1668A**	**60145-22-4**	*mg/kg*	ND <0.0000492	0.000085 <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	**NE**
2,2',3,4,5',6-HxCB	**144**	**2,2',3,4,5',6-Hexachlorobiphenyl**	**EPA 1668A**	**68194-14-9**	*mg/kg*	ND <0.0000492	0.000314 <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	0.00011 <0.0000495	0.000238 <0.0000499	**NE**
(147/149)	**147/149**	**NA (Co-elution)**	**EPA 1668A**	**E52450814**	*mg/kg*	0.000725 <0.0000984	0.0063 <0.0001	0.00115 <0.0000999	0.000197 <0.0000995	0.000121 <0.0000992	0.00228 <0.0000989	0.00457 <0.0000998	**NE**
(134/143)	**134/143**	**NA (Co-elution)**	**EPA 1668A**	**E52450780**	*mg/kg*	ND <0.0000984	0.000294 <0.0001	ND <0.0000999	ND <0.0000995	ND <0.0000992	ND <0.0000989	0.000135 <0.0000998	**NE**
(139/140)	**139/140**	**NA (Co-elution)**	**EPA 1668A**	**E52450806**	*mg/kg*	ND <0.0000984	0.000126 <0.0001	ND <0.0000999	ND <0.0000995	ND <0.0000992	ND <0.0000989	ND <0.0000998	**NE**
2,2',3,3',4,6-HxCB	**131**	**2,2',3,3',4,6-Hexachlorobiphenyl**	**EPA 1668A**	**61798-70-7**	*mg/kg*	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	**NE**
2,2',3,4,5,6-HxCB	**142**	**2,2',3,4,5,6-Hexachlorobiphenyl**	**EPA 1668A**	**41411-61-4**	*mg/kg*	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	**NE**
2,2',3,3',4,6'-HxCB	**132**	**2,2',3,3',4,6'-Hexachlorobiphenyl**	**EPA 1668A**	**38380-05-1**	*mg/kg*	0.000232 <0.0000492	0.00216 <0.00005	0.000355 <0.0000499	0.0000581 <0.0000497	ND <0.0000496	0.00053 <0.0000495	0.00119 <0.0000499	**NE**
2,2',3,3',5,5'-HxCB	**133**	**2,2',3,3',5,5'-Hexachlorobiphenyl**	**EPA 1668A**	**35694-04-3**	*mg/kg*	ND <0.0000492	0.000242 <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	0.0000797 <0.0000495	0.000117 <0.0000499	**NE**
2,3,3',5,5',6-HxCB	**165**	**2,3,3',5,5',6-Hexachlorobiphenyl**	**EPA 1668A**	**74472-46-1**	*mg/kg*	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	**NE**
2,2',3,4',5,5'-HxCB	**146**	**2,2',3,4',5,5'-Hexachlorobiphenyl**	**EPA 1668A**	**51908-16-8**	*mg/kg*	0.000472 <0.0000492	0.00263 <0.00005	0.000328 <0.0000499	0.00019 <0.0000497	0.000142 <0.0000496	0.000979 <0.0000495	0.00148 <0.0000499	**NE**
2,3,3',4,5',6-HxCB	**161**	**2,3,3',4,5',6-Hexachlorobiphenyl**	**EPA 1668A**	**74472-43-8**	*mg/kg*	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	**NE**
(153/168)	**153/168**	**NA (Co-elution)**	**EPA 1668A**	**E52450822**	*mg/kg*	0.00239 <0.0000984	0.0155 <0.0001	0.00194 <0.0000999	0.00106 <0.0000995	0.00076 <0.0000992	0.00579 <0.0000989	0.00853 <0.0000998	**NE**
2,2',3,4,5,5'-HxCB	**141**	**2,2',3,4,5,5'-Hexachlorobiphenyl**	**EPA 1668A**	**52712-04-6**	*mg/kg*	0.000283 <0.0000492	0.00234 <0.00005	0.000337 <0.0000499	0.0000871 <0.0000497	0.000054 <0.0000496	0.000803 <0.0000495	0.00141 <0.0000499	**NE**
2,2',3,3',4,5'-HxCB	**130**	**2,2',3,3',4,5'-Hexachlorobiphenyl**	**EPA 1668A**	**52663-66-8**	*mg/kg*	0.0000959 <0.0000492	0.000655 <0.00005	0.000121 <0.0000499	ND <0.0000497	ND <0.0000496	0.000219 <0.0000495	0.000362 <0.0000499	**NE**
2,2',3,4,4',5-HxCB	**137**	**2,2',3,4,4',5-Hexachlorobiphenyl**	**EPA 1668A**	**35694-06-5**	*mg/kg*	0.0000593 <0.0000492	0.000322 <0.00005	0.0000963 <0.0000499	ND <0.0000497	ND <0.0000496	0.0000938 <0.0000495	0.00012 <0.0000499	**NE**
2,3,3',4',5',6-HxCB	**164**	**2,3,3',4',5',6-Hexachlorobiphenyl**	**EPA 1668A**	**74472-45-0**	*mg/kg*	0.000232 <0.0000492	0.00131 <0.00005	0.000172 <0.0000499	0.0000805 <0.0000497	ND <0.0000496	0.00044 <0.0000495	0.000773 <0.0000499	**NE**
(129/138/163)	**129/138/163**	**NA (Co-elution)**	**EPA 1668A**		*mg/kg*	0.00332 <0.000148	0.0196 <0.00015	0.00251 <0.00015	0.00136 <0.000149	0.001 <0.000149	0.00636 <0.000148	0.00917 <0.00015	**NE**
2,3,3',4,5,6-HxCB	**160**	**2,3,3',4,5,6-Hexachlorobiphenyl**	**EPA 1668A**	**41411-62-5**	*mg/kg*	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	**NE**
2,3,3',4,4',6-HxCB	**158**	**2,3,3',4,4',6-Hexachlorobiphenyl**	**EPA 1668A**	**74472-42-7**	*mg/kg*	0.000277 <0.0000492	0.00165 <0.00005	0.000221 <0.0000499	0.000102 <0.0000497	0.0000781 <0.0000496	0.000448 <0.0000495	0.00069 <0.0000499	**NE**
(128/166)	**128/166**	**NA (Co-elution)**	**EPA 1668A**	**E52450764**	*mg/kg*	0.000475 <0.0000984	0.0021 <0.0001	0.000377 <0.0000999	0.000166 <0.0000995	0.000152 <0.0000992	0.000754 <0.0000989	0.0011 <0.0000998	**NE**
2,3,3',4,5,5'-HxCB	**159**	**2,3,3',4,5,5'-Hexachlorobiphenyl**	**EPA 1668A**	**39635-35-3**	*mg/kg*	0.0000724 <0.0000492	0.000243 <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	0.000117 <0.0000495	0.000201 <0.0000499	**NE**
2,3,3',4',5,5'-HxCB	**162**	**2,3,3',4',5,5'-Hexachlorobiphenyl**	**EPA 1668A**	**39635-34-2**	*mg/kg*	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	**NE**
2,3',4,4',5,5'-HxCB	**167**	**2,3',4,4',5,5'-Hexachlorobiphenyl**	**EPA 1668A**	**52663-72-6**	*mg/kg*	0.000135 <0.0000492	0.000381 <0.00005	0.000123 <0.0000499	0.0000714 <0.0000497	0.0000601 <0.0000496	0.000255 <0.0000495	0.000339 <0.0000499	**0.12**
(156/157)	**156/157**	**NA (Co-elution)**	**EPA 1668A**	**E52450830**	*mg/kg*	0.000209 <0.0000984	0.000694 <0.0001	0.000209 <0.0000999	ND <0.0000995	ND <0.0000992	0.000314 <0.0000989	0.000427 <0.0000998	**0.12**
3,3',4,4',5,5'-HxCB	**169**	**3,3',4,4',5,5'-Hexachlorobiphenyl**	**EPA 1668A**	**32774-16-6**	*mg/kg*	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	**0.00012**
2,2',3,4',5,6,6'-HpCB	**188**	**2,2',3,4',5,6,6'-Heptachlorobiphenyl**	**EPA 1668A**	**74487-85-7**	*mg/kg*	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	**NE**
2,2',3,3',5,6,6'-HpCB	**179**	**2,2',3,3',5,6,6'-Heptachlorobiphenyl**	**EPA 1668A**	**52663-64-6**	*mg/kg*	0.000672 <0.0000492	0.00275 <0.00005	0.000268 <0.0000499	0.000182 <0.0000497	0.000124 <0.0000496	0.00102 <0.0000495	0.00187 <0.0000499	**NE**
2,2',3,4,4',6,6'-HpCB	**184**	**2,2',3,4,4',6,6'-Heptachlorobiphenyl**	**EPA 1668A**	**74472-48-3**	*mg/kg*	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	**NE**
2,2',3,3',4,6,6'-HpCB	**176**	**2,2',3,3',4,6,6'-Heptachlorobiphenyl**	**EPA 1668A**	**52663-65-7**	*mg/kg*	0.00014 <0.0000492	0.000721 <0.00005	0.0000606 <0.0000499	ND <0.0000497	ND <0.0000496	0.000241 <0.0000495	0.000462 <0.0000499	**NE**
2,2',3,4,5,6,6'-HpCB	**186**	**2,2',3,4,5,6,6'-Heptachlorobiphenyl**	**EPA 1668A**	**74472-49-4**	*mg/kg*	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	**NE**
2,2',3,3',5,5',6-HpCB	**178**	**2,2',3,3',5,5',6-Heptachlorobiphenyl**	**EPA 1668A**	**52663-67-9**	*mg/kg*	0.000416 <0.0000492	0.00156 <0.00005	0.000185 <0.0000499	0.000198 <0.0000497	0.000145 <0.0000496	0.000832 <0.0000495	0.00124 <0.0000499	**NE**
2,2',3,3',4,5',6-HpCB	**175**	**2,2',3,3',4,5',6-Heptachlorobiphenyl**	**EPA 1668A**	**40186-70-7**	*mg/kg*	0.0000663 <0.0000492	0.00025 <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	0.000127 <0.0000495	0.000197 <0.0000499	**NE**
2,2',3,4',5,5',6-HpCB	**187**	**2,2',3,4',5,5',6-Heptachlorobiphenyl**	**EPA 1668A**	**52663-68-0**	*mg/kg*	0.00249 <0.0000492	0.008 <0.00005	0.00106 <0.0000499	0.000999 <0.0000497	0.000923 <0.0000496	0.00456 <0.0000495	0.00686 <0.0000499	**NE**
2,2',3,4,4',5,6'-HpCB	**182**	**2,2',3,4,4',5,6'-Heptachlorobiphenyl**	**EPA 1668A**	**60145-23-5**	*mg/kg*	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	**NE**
(183/185)	**183/185**	**NA (Co-elution)**	**EPA 1668A**	**E52450863**	*mg/kg*	0.000999 <0.0000984	0.00307 <0.0001	0.000456 <0.0000999	0.000361 <0.0000995	0.00028 <0.0000992	0.00178 <0.0000989	0.0028 <0.0000998	**NE**
2,2',3,3',4,5,6'-HpCB	**174**	**2,2',3,3',4,5,6'-Heptachlorobiphenyl**	**EPA 1668A**	**38411-25-5**	*mg/kg*	0.00163 <0.0000492	0.00533 <0.00005	0.000742 <0.0000499	0.000502 <0.0000497	0.000336 <0.0000496	0.00297 <0.0000495	0.00522 <0.0000499	**NE**
2,2',3,3',4,5',6'-HpCB	**177**	**2,2',3,3',4,5',6'-Heptachlorobiphenyl**	**EPA 1668A**	**52663-70-4**	*mg/kg*	0.00106 <0.0000492	0.00249 <0.00005	0.000422 <0.0000499	0.000443 <0.0000497	0.000331 <0.0000496	0.00177 <0.0000495	0.0032 <0.0000499	**NE**
2,2',3,4,4',5,6-HpCB	**181**	**2,2',3,4,4',5,6-Heptachlorobiphenyl**	**EPA 1668A**	**74472-47-2**	*mg/kg*	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	**NE**
(171/173)	**171/173**	**NA (Co-elution)**	**EPA 1668A**	**E52450848**	*mg/kg*	0.000536 <0.0000984	0.00116 <0.0001	0.000224 <0.0000999	0.000246 <0.0000995	0.000201 <0.0000992	0.00096 <0.0000989	0.00149 <0.0000998	**NE**
2,2',3,3',4,5,5'-HpCB	**172**	**2,2',3,3',4,5,5'-Heptachlorobiphenyl**	**EPA 1668A**	**52663-74-8**	*mg/kg*	0.000364 <0.0000492	0.00128 <0.00005	0.000168 <0.0000499	0.000173 <0.0000497	0.000139 <0.0000496	0.000629 <0.0000495	0.000927 <0.0000499	**NE**
2,3,3',4,5,5',6-HpCB	**192**	**2,3,3',4,5,5',6-Heptachlorobiphenyl**	**EPA 1668A**	**74472-51-8**	*mg/kg*	ND <0.0000492	ND <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	ND <0.0000495	ND <0.0000499	**NE**
(180/193)	**180/193**	**NA (Co-elution)**	**EPA 1668A**	**E52450855**	*mg/kg*	0.00433 <0.0000984	0.0162 <0.0001	0.00207 <0.0000999	0.00237 <0.0000995	0.00193 <0.0000992	0.00807 <0.0000989	0.0121 <0.0000998	**NE**
2,3,3',4,4',5',6-HpCB	**191**	**2,3,3',4,4',5',6-Heptachlorobiphenyl**	**EPA 1668A**	**74472-50-7**	*mg/kg*	0.0000665 <0.0000492	0.000256 <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	0.000144 <0.0000495	0.000195 <0.0000499	**NE**
2,2',3,3',4,4',5-HpCB	**170**	**2,2',3,3',4,4',5-Heptachlorobiphenyl**	**EPA 1668A**	**35065-30-6**	*mg/kg*	0.00185 <0.0000492	0.00707 <0.00005	0.000841 <0.0000499	0.000997 <0.0000497	0.000799 <0.0000496	0.00338 <0.0000495	0.00505 <0.0000499	**NE**
2,3,3',4,4',5,6-HpCB	**190**	**2,3,3',4,4',5,6-Heptachlorobiphenyl**	**EPA 1668A**	**41411-64-7**	*mg/kg*	0.000446 <0.0000492	0.0014 <0.00005	0.000191 <0.0000499	0.000237 <0.0000497	0.000189 <0.0000496	0.000729 <0.0000495	0.00106 <0.0000499	**NE**
2,3,3',4,4',5,5'-HpCB	**189**	**2,3,3',4,4',5,5'-Heptachlorobiphenyl**	**EPA 1668A**	**39635-31-9**	*mg/kg*	0.0000762 <0.0000492	0.000275 <0.00005	ND <0.0000499	ND <0.0000497	ND <0.0000496	0.000132 <0.0000495	0.000201 <0.0000499	**0.13**
2,2',3,3',5,5',6,6'-OcCB	**202**	**2,2',3,3',5,5',6,6'-Octachlorobiphenyl**	**EPA 1668A**	**2136-99-4**	*mg/kg*	0.000291 <0.0000738	0.000898 <0.000075	0.000152 <0.0000749	0.000153 <0.0000746	0.000126 <0.0000744	0.00047 <0.0000742	0.000716 <0.0000748	**NE**

Table 3-2
Surface Soil Sample Analytical Results - Congener Analysis
Former Ball Field Area
Badin Business Park Facility
Badin, North Carolina

Sample ID	Congener Number	IUPAC Name	Method	CAS	Units	ABF-SB052-F002	ABF-SB053-F002	ABF-SB054-F002	ABF-SB055-F002	ABF-SB055-D002	ABF-SB056-F002	ABF-SB057-F002	EPA RSL - Residential Soil
Location						**Stormwater Ditch**	**Stormwater Ditch**	**Stormwater Ditch**	**Stormwater Ditch**	**Stormwater Ditch**	**Stormwater Ditch**	**Stormwater Ditch**	
Depth						**0'-0.5'**	**0'-0.5'**	**0'-0.5'**	**0'-0.5'**	**0'-0.5'**	**0'-0.5'**	**0'-0.5'**	
Date						**5/9/2018**	**5/9/2018**	**5/9/2018**	**5/9/2018**	**5/9/2018**	**5/9/2018**	**5/9/2018**	
Time						**11:55**	**12:10**	**12:30**	**13:50**	**13:55**	**13:30**	**13:05**	
2,2',3,3',4,5',6,6'-OcCB	**201**	**2,2',3,3',4,5',6,6'-Octachlorobiphenyl**	**EPA 1668A**	**40186-71-8**	*mg/kg*	0.000144 <0.0000738	0.000386 <0.000075	ND <0.0000749	ND <0.0000746	ND <0.0000744	0.000247 <0.0000742	0.000376 <0.0000748	**NE**
2,2',3,4,4',5,6,6'-OcCB	**204**	**2,2',3,4,4',5,6,6'-Octachlorobiphenyl**	**EPA 1668A**	**74472-52-9**	*mg/kg*	ND <0.0000738	ND <0.000075	ND <0.0000749	ND <0.0000746	ND <0.0000744	ND <0.0000742	ND <0.0000748	**NE**
(197/200)	**197/200**	**NA (Co-elution)**	**EPA 1668A**	**E52450871**	*mg/kg*	0.000193 <0.000148	0.00097 <0.00015	ND <0.00015	ND <0.000149	ND <0.000149	0.000358 <0.000148	0.000537 <0.00015	**NE**
(198/199)	**198/199**	**NA (Co-elution)**	**EPA 1668A**	**E52450889**	*mg/kg*	0.00154 <0.000148	0.00573 <0.00015	0.000727 <0.00015	0.000831 <0.000149	0.00065 <0.000149	0.00261 <0.000148	0.00364 <0.00015	**NE**
2,2',3,3',4,4',5,6'-OcCB	**196**	**2,2',3,3',4,4',5,6'-Octachlorobiphenyl**	**EPA 1668A**	**42740-50-1**	*mg/kg*	0.000543 <0.0000738	0.00261 <0.000075	0.000287 <0.0000749	0.00032 <0.0000746	0.000238 <0.0000744	0.00104 <0.0000742	0.00151 <0.0000748	**NE**
2,2',3,4,4',5,5',6-OcCB	**203**	**2,2',3,4,4',5,5',6-Octachlorobiphenyl**	**EPA 1668A**	**52663-76-0**	*mg/kg*	0.000903 <0.0000738	0.00395 <0.000075	0.000446 <0.0000749	0.000527 <0.0000746	0.000409 <0.0000744	0.00161 <0.0000742	0.00226 <0.0000748	**NE**
2,2',3,3',4,4',5,6-OcCB	**195**	**2,2',3,3',4,4',5,6-Octachlorobiphenyl**	**EPA 1668A**	**52663-78-2**	*mg/kg*	0.000516 <0.0000738	0.00243 <0.000075	0.000208 <0.0000749	0.000314 <0.0000746	0.000236 <0.0000744	0.000948 <0.0000742	0.0014 <0.0000748	**NE**
2,2',3,3',4,4',5,5'-OcCB	**194**	**2,2',3,3',4,4',5,5'-Octachlorobiphenyl**	**EPA 1668A**	**35694-08-7**	*mg/kg*	0.00122 <0.0000738	0.00258 <0.000075	0.000597 <0.0000749	0.000692 <0.0000746	0.00049 <0.0000744	0.00213 <0.0000742	0.00306 <0.0000748	**NE**
2,3,3',4,4',5,5',6-OcCB	**205**	**2,3,3',4,4',5,5',6-Octachlorobiphenyl**	**EPA 1668A**	**74472-53-0**	*mg/kg*	ND <0.0000738	0.000209 <0.000075	ND <0.0000749	ND <0.0000746	ND <0.0000744	0.000133 <0.0000742	0.000185 <0.0000748	**NE**
2,2',3,3',4,5,5',6,6'-NoCB	**208**	**2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl**	**EPA 1668A**	**52663-77-1**	*mg/kg*	0.00017 <0.0000738	0.000414 <0.000075	0.000145 <0.0000749	0.000125 <0.0000746	0.000087 <0.0000744	0.00029 <0.0000742	0.000399 <0.0000748	**NE**
2,2',3,3',4,4',5,6,6'-NoCB	**207**	**2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl**	**EPA 1668A**	**52663-79-3**	*mg/kg*	0.0000771 <0.0000738	0.000118 <0.000075	ND <0.0000749	ND <0.0000746	ND <0.0000744	0.000128 <0.0000742	0.000171 <0.0000748	**NE**
2,2',3,3',4,4',5,5',6-NoCB	**206**	**2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl**	**EPA 1668A**	**40186-72-9**	*mg/kg*	0.000707 <0.0000738	0.0017 <0.000075	0.000485 <0.0000749	0.000436 <0.0000746	0.000324 <0.0000744	0.00114 <0.0000742	0.00144 <0.0000748	**NE**
Decachlorobiphenyl	**209**	**Decachlorobiphenyl**	**EPA 1668A**	**2051-24-3**	*mg/kg*	0.000199 <0.0000738	0.000405 <0.000075	0.0003 <0.0000749	0.000249 <0.0000746	0.000213 <0.0000744	0.000745 <0.0000742	0.00104 <0.0000748	**NE**
--	**--**	**Total Non-dioxin-like Congeners**	**--**	**--**	*mg/kg*	0.0316806	0.1413756	0.0238227	0.0137747	0.0104771	0.0620064	0.0977401	**0.23**

ND - The analyte was not detected above laboratory detection limits. Subscript indicates compound-specific Method Specified Reporting Limit (EML) in mg/kg.
I - Interference present. Concentration indicated represents the Estimated Maximum Possible Concentration.
EPA Regional Screening Level (RSL) - May 2018 Update, Target Hazard Quotient (THQ) of 1.0. Human health risks are evaluated as the individual concentrations of the 12 dioxin-like congeners (PCB-77, 81, 105, 114, 118, 123, 126, 156, 157, 167, 169, 1889). Risks associated with the remaining congeners are totaled as the "non-dioxin-like congeners". The RSL for "Polychlorinated Biphenyls (high risk)" is utilized for non-dioxin-like congeners.
NE - Not established.

Table 3-3
Badin Lake Sediment Sample Analytical Results
Former Ball Field Area
Badin Business Park Facility
Badin, North Carolina

Sample ID	Method	CAS	Units	ABF-SD003-F002	EPA Freshwater Sediment Ecological Screening Value (ESV)
Location				**Badin Lake**	
Date				**5/9/2019**	
Time				**10:35**	
Percent Moisture	**ASTM D2974-87**		*%*	22.5	
1-Methylnaphthalene	**EPA 8270**	**90-12-0**	*mg/kg*	ND $_{<0.111}$	**0.141**
2-Methylnaphthalene	**EPA 8270**	**91-57-6**	*mg/kg*	ND $_{<0.0914}$	**0.0202**
Acenaphthene	**EPA 8270**	**83-32-9**	*mg/kg*	ND $_{<0.0978}$	**0.0067**
Acenaphthylene	**EPA 8270**	**208-96-8**	*mg/kg*	ND $_{<0.100}$	**0.0059**
Anthracene	**EPA 8270**	**120-12-7**	*mg/kg*	ND $_{<0.0952}$	**0.057**
Benzo(a)anthracene	**EPA 8270**	**56-55-3**	*mg/kg*	0.139 J	**0.108**
Benzo(a)pyrene	**EPA 8270**	**50-32-8**	*mg/kg*	0.112 J	**0.15**
Benzo(b)fluoranthene	**EPA 8270**	**205-99-2**	*mg/kg*	0.148 J	**0.19**
Benzo(g,h,i)perylene	**EPA 8270**	**191-24-2**	*mg/kg*	ND $_{<0.108}$	**0.17**
Benzo(k)fluoranthene	**EPA 8270**	**207-08-9**	*mg/kg*	ND $_{<0.0836}$	**0.24**
Chrysene	**EPA 8270**	**218-01-9**	*mg/kg*	0.108 J	**0.166**
Dibenz(a,h)anthracene	**EPA 8270**	**53-70-3**	*mg/kg*	ND $_{<0.0901}$	**0.033**
Fluoranthene	**EPA 8270**	**206-44-0**	*mg/kg*	ND $_{<0.0618}$	**0.423**
Fluorene	**EPA 8270**	**86-73-7**	*mg/kg*	ND $_{<0.0875}$	**0.077**
Indeno(1,2,3-cd)pyrene	**EPA 8270**	**193-39-5**	*mg/kg*	ND $_{<0.0875}$	**0.2**
Naphthalene	**EPA 8270**	**91-20-3**	*mg/kg*	ND $_{<0.104}$	**0.176**
Phenanthrene	**EPA 8270**	**85-01-8**	*mg/kg*	ND $_{<0.0708}$	**0.204**
Pyrene	**EPA 8270**	**129-00-0**	*mg/kg*	0.123 J	**0.195**
Total Polycyclic Aromatic Hydrocarbons			*mg/kg*	ND	**1.61**

ND - The analyte was not detected above laboratory detection limits.
Subscript indicates compound-specific MDL in mg/kg.
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
NE - Not established.
ESV derived from Region 4 Ecological Risk Assessment Supplemental Guidance - March 2018 Update

4.0 CONCLUSIONS

Based on available historic photographs, the Former Ball Field Area was undeveloped prior to 1938. The ball field was constructed sometime between 1938 and 1950, and its usage became underutilized in the late 1990s. The current understanding is that the Former Ball Field Area was either undeveloped or historically used as a recreational area through most of the 20th century.

Recent geophysical survey and laboratory analytical data support the current understanding of the Former Ball Field Area. The geophysical surveys did not identify any evidence of a disposal trench in the Former Ball Field Area or adjacent parking lot. Concentrations of PAHs are believed to be anthropogenic in nature. A concentration of one PCB Aroclor was detected in one sample collected at the site, however concentrations of all PCB Congeners were below regulatory limits.

Appendix A
Former Ball Field Geophysical Survey

GEOPHYSICAL EVALUATION AT THE ALCOA BALL FIELD, BADIN, NORTH CAROLINA

PREPARED FOR ENVIRONEERING, INC.

by

GEO SOLUTIONS LIMITED, INC.
CONWAY, NORTH CAROLINA

JULY 2018

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1.0 INTRODUCTION

Geo Solutions Limited, Inc. (Geo Solutions) is pleased to submit this report to ENVIRONEERING, Inc. (ENVIRONEERING) for a geophysical survey at the Former Ball Field Area, located in Badin, North Carolina.

1.1 Background

ENVIRONEERING requested Geo Solutions complete a geophysical evaluation of the Former Ball Field Area located in Badin, North Carolina. The Former Ball Field Area was once positioned west of the Badin Business Park facility across Highway 740 (Figure 1). The total area is approximately 10 acres in size with a suspected railroad track foundation and Badin Lake bordering the northern edge of the site. A public boat landing is present northeast of the Former Ball Field Area. Grass grows over the entire site with the exception of the gravel parking lot for the public boat landing.

According to the September 25, 2015, *Expanded Pre-CERCLIS Screening Assessment* as conducted by the North Carolina Department of Environmental Quality (NCDEQ), in 2014, a local citizen reported that loads of brick and spent pot liner had been disposed in the area of the Ball Field property before it was used as a park. The citizen reported that a large (10-feet-wide, 6 feet deep) drainage ditch formerly crossed the Ball Field property and connected to Badin Lake via the storm water catch basin. The reported location of the older ditch roughly corresponded to the current alignment of the western drainage swale. The citizen alleged that the drainage ditch had been partially backfilled using pot liner, and that pot liner was likely to have been disposed at additional locations within the Ball Field parcel.

To determine the morphology of the area, ENVIRONEERING assembled a chronology of the site using historical topographic maps, historical photographs, and aerial imagery. Based on available photographs, the area was undeveloped prior to 1938, the Ball Field was installed between 1938 and 1950, and the area has been underutilized since the late 1990s. The current understanding is that the former Ball Field was either undeveloped or historically used as a recreational area through almost all of the 20th century.

In January 2017, NCDEQ requested that a determination be made if a large ditch, backfilled with spent potliner, is present at the former Ball Field. As such, ENVIRONEERING requested a geophysical evaluation of the area for potential buried conductive material and, if present, to characterize its horizontal and vertical extents.

1.2 Scope of Work

The geophysical evaluation of the Former Ball Field Area consisted of an electromagnetic (EM) profile mapping of the entire 10-acre site. The purpose of the EM survey was to address the 2014 allegations through an evaluation of the area for potential buried conductive material. Following the completion of the EM survey, Geo Solutions completed a ground penetrating radar (GPR) survey over the entire 10-acre site. The purpose of this GPR investigation was to investigate the potential presence of a buried ditch that may contain waste materials.

2.0 GEOPHYSICAL TECHNIQUES

2.1 Multifrequency Electromagnetic Survey

2.1.1 Introduction

The EM Method is a non-contact (uncoupled) geophysical method that utilizes a multiple frequency electromagnetic detector (Geophex Model GEM-2). The EM instrument collects electromagnetic responses in the in-phase (metal detection or magnetic susceptibility mode) and quadrature (conductivity) mode. An object, made partly or wholly of metals or conductive materials, has a characteristic combination of electrical conductivity, magnetic permeability properties, and a geometrical shape and size. When the object is exposed to a low-frequency electromagnetic field, it produces a secondary magnetic field. By measuring the broadband spectrum of the secondary field, it is possible to obtain a distinct spectral signature that may uniquely identify the object. Thus, the response spectrum from buried material becomes a clue or a "fingerprint" of the material. This is the basic concept of electromagnetic induction spectroscopy ("EMIS") (Won, et. al. 1998).

EMIS technology is useful in characterizing buried material (either metal bearing or conductive). In this case, Geo Solutions was interested in evaluating the potential presence of waste materials from facility operations which would include spent pot liner and bricks. The presence of these waste materials would exhibit elevated apparent conductivity values Metal bearing materials (such as remnant steel in the waste materials) tend to have lower apparent conductivity responses and higher in-phase responses. As a result, a comparison of apparent conductivity values with the in-phase (metal detection mode) values provides insight as to the composition and extent of buried material with anomalous high in-phase and apparent conductivity values.

2.1.2 Field Activities

Geo Solutions completed all field work on April 18, 2018. The following is Geo Solutions' technical approach that was completed during the geophysical evaluation to assist ENVIRONEERING with the evaluation of the Former Ball Field Area.

- The GEM-2 was operated in remote control configuration while evaluating the site. In this mode the GEM-2 unit is mounted on PVC tubular sled positioned approximately 0.75 meters from the ground surface and towed with a Polaris Ranger all-terrain vehicle (ATV). The receiving coil (detector coil) is situated directly above the exposed ground surface.

- The EM in-phase and conductivity data were collected simultaneously at six varying frequencies (1,470 Hz, 4,110 Hz, 9,810 Hz, 32,190 Hz, 60,000 Hz, and 90,030 Hz).

Photograph showing typical deployment of EM unit mounted on sled, as configured for this evaluation.

- Data was collected at the rate of thirty samples per second. The position of each sample point was measured utilizing a Hemisphere Model A-325 GPS unit which is augmented by the Wide Area Augmentation System (WAAS) and is capable of submeter accuracy that provided real-time location data. The GEM-2 communicated to a handheld data collector on board the Polaris Ranger ATV via Bluetooth.

- Prior to beginning and before ending the EM survey a quality assurance and quality control (QA/QC) profile was completed to test the response of the GEM-2 EM profiler. The QA/QC profile was 50-feet long with a steel plate in the center. The results showed the expected EM response with the plate causing a low apparent conductivity response to occur at the center point of the profile line. The slight variability can be attributed to the high sensitivity of the GEM-2. Crossing the steel plate at a slightly different orientation can cause a small variation in response. The results of the QA/QC data indicate that the GEM-2 was functioning property during the survey.

- The EM profile spacing was approximately 3 feet apart. Geo Solutions extended the survey area slightly to include all the parking lot area. The total area surveyed was approximately 10-acres. The sample spacing along each profile is a function of rate of travel of the sled. Here, the average sample spacing along each profile was less than 1 foot. The locations of the EM profiles are presented on Figure 2.

- The EM data was transferred from the GEM-2 to a laptop computer using the WinGEM Version 3 software provided by the manufacturer. During the transfer process, the WinGEM software assigns UTM metric coordinates to each data collection station, and calculates the apparent conductivity, sum of conductivity, and magnetic susceptibility for each frequency collected using the system software. These data were then transferred to a Microsoft Excel Spread Sheet and reviewed for data anomalies such as poor GPS confidence levels that would likely result in poor coordinate assignments. These data were used to compile a series of maps illustrating various responses using a simple mapping program (Golden Software's Surfer Mapping System Version 15).

2.1.3 Data Quality

The EM data was consistent with the field observations made during the survey. Areas where utilities are visible at the surface correspond to linear features observed in the EM data as well as elevated EM responses from surface infrastructure noted across the site. Changes in the EM response over known subsurface features such as the abandoned railroad were detected. These consistencies would indicate that the data quality is of high integrity. Further, Figure 3 displays the results of the QA/QC profiles collected prior to beginning and after completed the survey. These results indicate that the GEM-2 was functioning properly during the survey with both profiles displaying a negative in-phase EM response at the center point of the profile line. The slight variability between profiles can be attributed to the high sensitivity of the GEM-2. Crossing the steel plate at a slightly different orientation can cause a small variation in response.

2.1.4 Limitations

The presence of vehicles and boat trailers in the gravel parking lot required a buffer to prevent inference in the EM data set. Therefore, in this area the survey profile density was greater than 3 feet.

2.2 Ground-Penetrating Radar

2.2.1 Introduction

GPR is an effective geophysical tool used to establish vertical and horizontal variations of certain electrical properties of soil. GPR is a noninvasive electromagnetic geophysical technique that utilizes radio frequency EM energy to detect various layers in the earth's shallow subsurface. It is widely used in environmental site characterization and landfill construction verification. It may be deployed from the surface by hand or vehicle (sled). Here, the GPR was mounted on a three wheeled hand pushed cart as shown in the photograph below.

Typical setup of GPR using a hand-pushed cart (left) and the Model 4000 display (right).

GPR has the highest resolution of any geophysical method for imaging the subsurface, with centimeter scale resolution sometimes possible. However, GPR investigations usually are affected by subsurface conditions:

- Soil composition affects the depth of detection (i.e. higher clay content generally equal lesser depths of penetration of the radar signal and thus the lesser depths of detection).

- Presence of highly conductive material (i.e., less resistive material) generally equals poorer quality of recovered data and shallower sounding depths. Conductive material enhances the attenuation of the radar signal, thus reducing the depth of penetration.

2.2.2 Field Activities

The GPR data was collected on the GSSI Model SIR 4000 GPR unit equipped with a 350 MHz antenna, and visually reviewed in the field for completeness and reliability. The GSSI Model SIR 4000 unit uses a digital survey wheel to determine the distance between each vertical survey GPR sounding. These data are also collected along with the time domain records of the GPR. The approximate depth of penetration across the site was 6 feet below land surface (bls).

Twelve (12) GPR profiles spaced approximately 100 feet apart were used to create a grid over the grassy area of the former ball field area. Four (4) additional profiles were completed in the gravel parking lot area. Figure 4 displays the location of each GPR profile collected. Each GPR profile was evaluated both in the field as the data was being collected and again in the office.

2.2.4 Data Quality

The quality of the GPR data was good with 6 feet penetration. Below 6 feet, the GPR signal was significantly degraded due to native clayey soils. Data below 6 feet bls was not used in the site evaluation.

2.2.5 Limitations

GPR data is limited by the type of soil and the presence or absence of groundwater. Here, a high quantity of clay in the upper units prevented detection of subsurface features below 6 feet bls. However, the potential presence of a trench would have been well within the range of the GPR detection limit.

3.0 EM INTERPRETATION

The EM evaluation indicated no evidence in the apparent conductivity or in-phase data sets of a trench filled with suspected buried waste materials within the EM survey area. A summary of both the in-phase and apparent conductivity results are outlined below.

3.1 Apparent Conductivity Survey

A map illustrating the results of the 32,190 Hz frequency response apparent conductivity values is presented as Figure 5. The 32,190 Hz frequency was chosen to display the results of the EM survey because it provided the most uniform representation of the overall database in comparison to the other six frequencies. Results from the EM apparent conductivity survey are as follows:

- A linear feature was detected during the EM survey which ran from the northern side of the site near Badin Lake. The linear feature is approximately 140 feet long. The feature ends abruptly where it tees in both directions east and west.

- The area along the abandoned railway was elevated in apparent conductivity. Here the railway appears to be approximately 25 feet wide. It is likely that the elevated EM response is related to remnants of the railroad bed including potential gravel and wood.

- An area of elevated apparent conductivity was detected in the parking lot used for the public boat access. This area is approximately 50 feet by 30 feet in dimensions. The high frequency apparent conductivity response is much greater than the lower frequency response which would suggest the source is limited to the shallow subsurface in this area.

- Other abandoned utilities can be observed in the apparent conductivity data. These abandoned utilities are likely buried power lines that ran to the stadium lights of the former ball field.

3.2 In-Phase Survey

Figure 6 displays the results of the 32,190 Hz in-phase data across the site. Here, the orange, red, and dark blue-purple hues indicate areas of surficial and buried metallic materials while the faint yellow and green hues indicate background site conditions. Results from the EM in-phase survey are as follows:

- Based on the in-phase response remnant metallic materials are present along the abandoned railroad however it does appear that the rails were removed.

- Other surficial features were detected during the EM survey which include manholes, a culvert, a trash can, and a metal picnic table.

4.0 GPR INTERPRETATION

Geo Solutions evaluated the GPR results from the profile data collected. The following is a summary of the results:

- The approximate depth of GPR penetration across the site was 6 feet from the land surface. Several examples along these profiles are presented on Figure 7.

- Geo Solutions utilized GPR to evaluate the linear feature detected during the EM survey. Here, a utility was detected with GPR at a depth of approximately 1.5 feet below the surface. The utility was traced from a covered box where a water meter was observed southward to a tee where the utility splits to the east and west. According to a representative from Badin Business Park, the abandoned water line formerly served several temporary trailers staged as part of a Badin community festival.

- Profile 12 was positioned along the alignment of the abandoned soil covered railway. An excerpt from Profile 12 is presented as Figure 8. Here, a reflector was detected at 0.5 ft bls which is consistent with remnants of the railroad bed and extend down to 1 foot below the surface. These remnants are likely the track foundation which include railroad ties, gravel, and metal reinforcement. The railroad bed is elevated east of the gravel parking lot. The GPR data suggests that there is approximately 4 feet of fill material placed over native soils in this area. This area is approximately 5 to 6 feet higher in elevation than the ball field.

- The area of elevated apparent conductivity detected in the parking lot was evaluated with GPR. Shown on an excerpt from Profile 16, a small feature was detected in the upper 1 foot of soil (Figure 9). Pointed out on Figure 9 is a ringing effect in the data which makes the object appear to extend deeper than it is actually positioned. This is caused due to the time travel of the radio waves being reflected numerous times off the same object. Along this GPR profile the buried feature appears to be very thin (less than 0.5 feet) and is unlikely related to a waste disposal area.

5.0 CONCLUSIONS

EM and GPR evaluations were conducted at the former ball field located west of the Badin Business Park facility. The following are the conclusions of the evaluations:

- There was no evidence of a disposal trench in the Former Ball Field Area or adjacent parking lot.

- The linear area of elevated apparent conductivity is related to a subsurface utility that was installed after the demolition of the Ball Field.

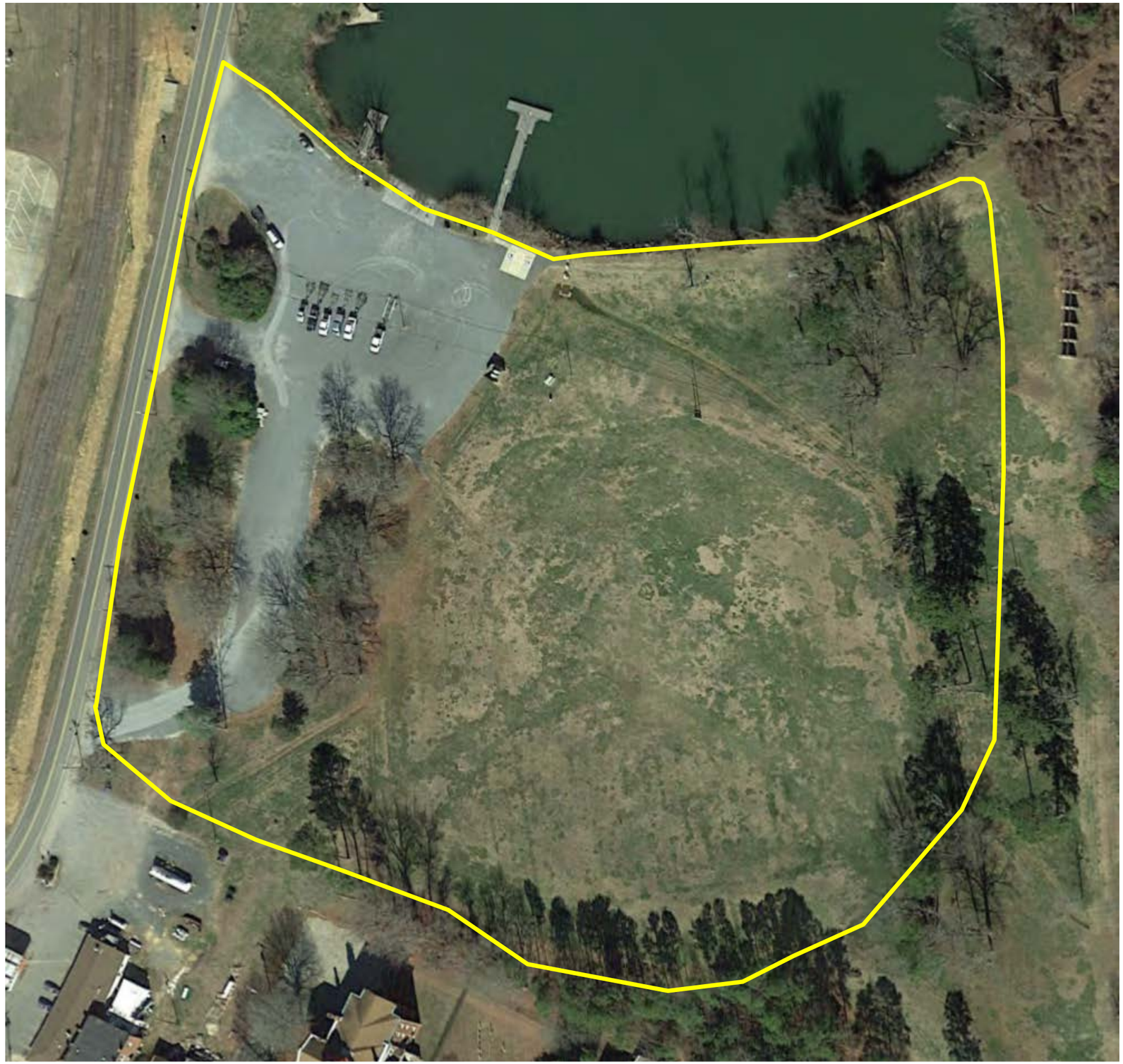
- An area of elevated apparent conductivity was detected in the parking lot area during the EM survey. There was very little in-phase response in this area which would suggest a non-metallic material. Additionally, GPR profiles in this area suggest the source of the elevated conductivity is in the upper 0.5 feet of soil.

- The former railway is elevated in apparent conductivity and in-phase data which is likely related to remnants of the former railway which may include gravel, wood, and metal. GPR profiles in the area suggest the area of remnant materials is approximately 1 foot thick. The total thickness of the railroad bed is approximately 4 feet.

6.0 REFERENCES

I.J. Won, D.A. Keiswetter, and E. Novikova, 1998, Electromagnetic induction spectroscopy, *Journal of Environmental and Engineering Geophysics,* v. 3, Issue 1, pp. 27-40.

Figure 1.



LEGEND

Geophysical Survey Boundary

Site Map
GEOPHYSICAL SURVEY
Alcoa Ball Field, Badin NC

Map Scale (ft)

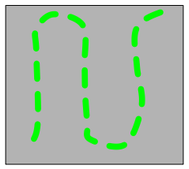
0 100 200 300

Geo Solutions Ltd.

Figure 2.

LEGEND

Indicates Location of MFEM Survey Point

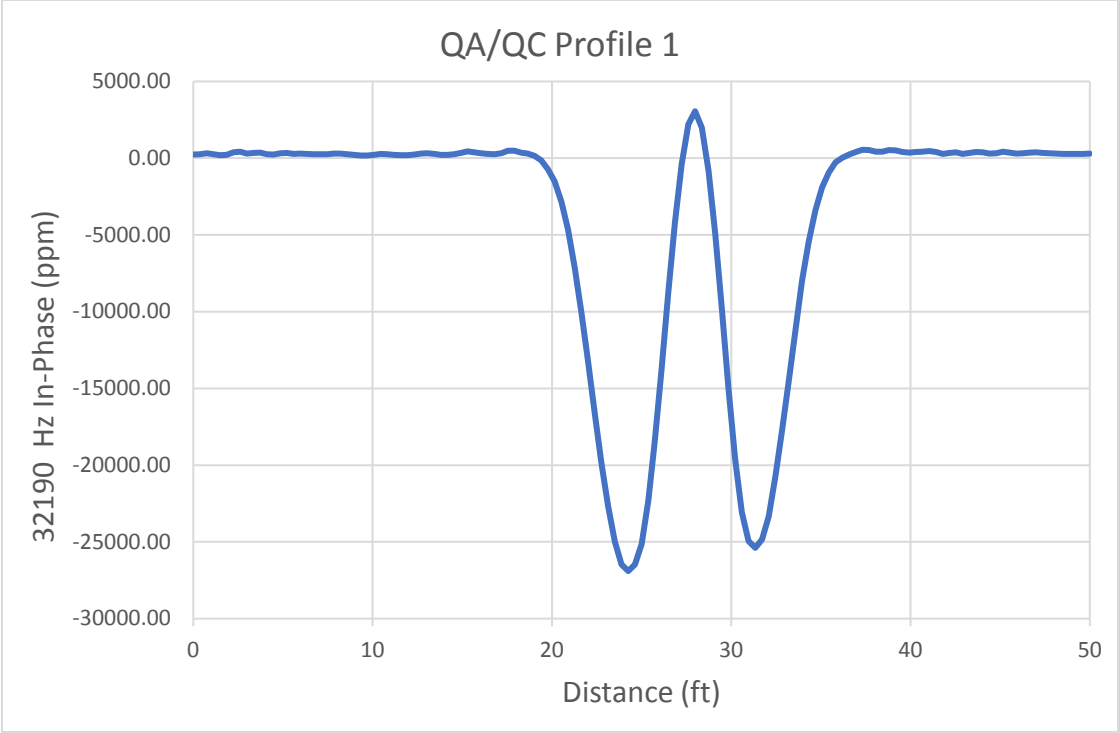


MULTIFREQUENCY EM GEOPHYSICAL SURVEY
Alcoa Ball Field, Badin NC

Map Scale (ft)

0 100 200 300

Geo Solutions Ltd.



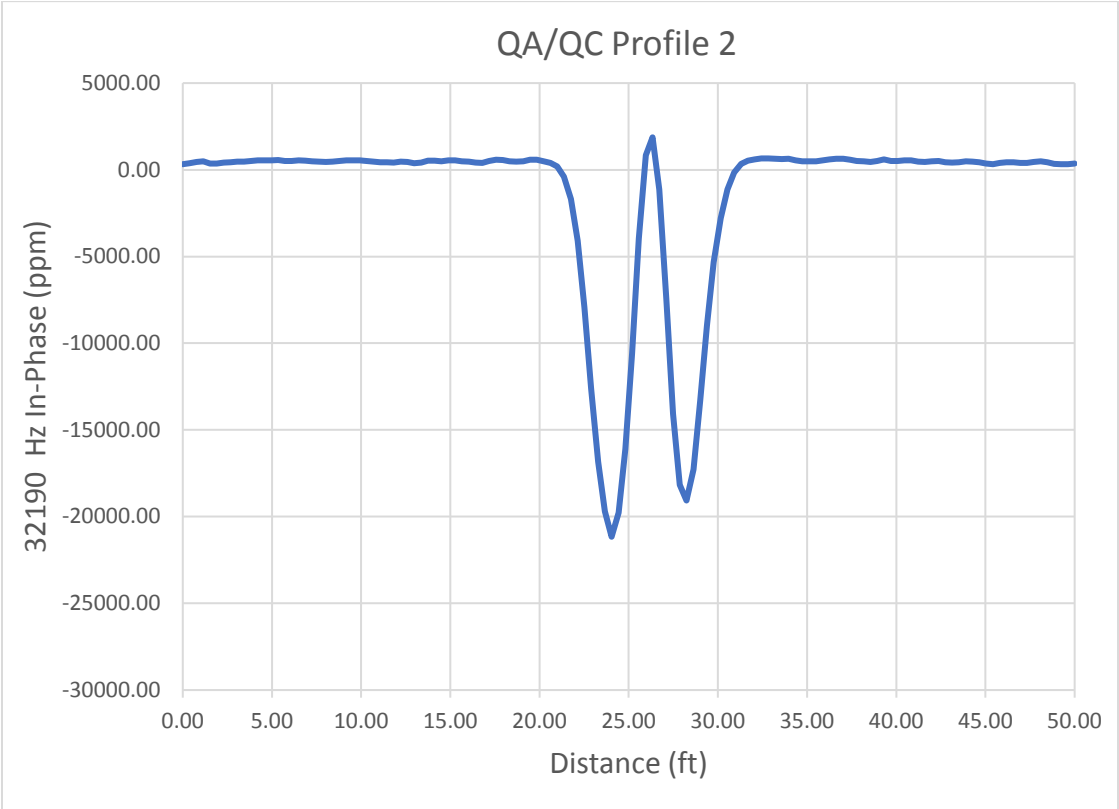
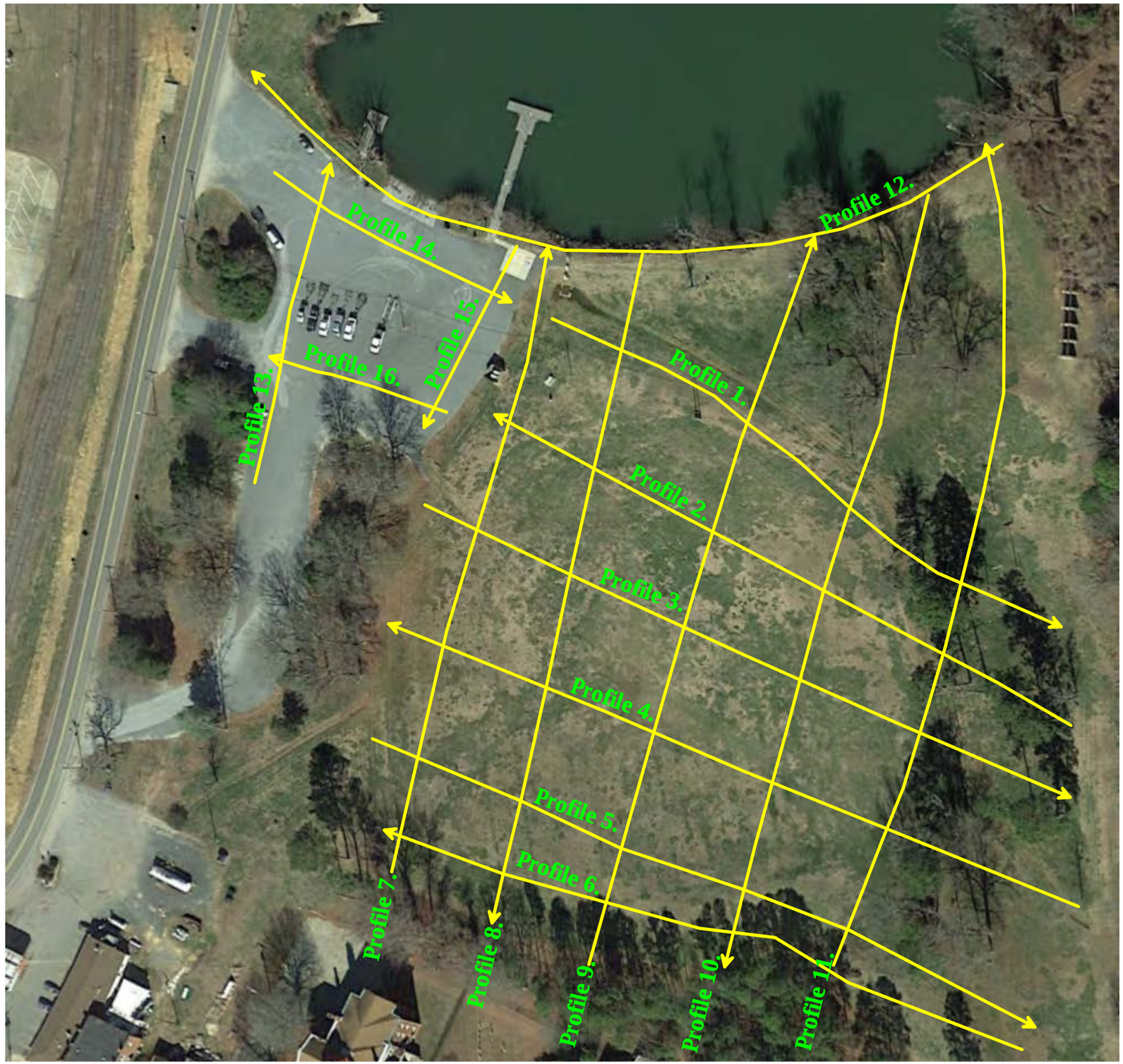


Figure 3. Quality assurance and quality control EM profiles.

Figure 4.



LEGEND

Ground-Pentrating Radar Profiles

Ground-Penetrating Radar Profiles
GEOPHYSICAL SURVEY
Alcoa Ball Field, Badin NC

Map Scale (ft)

0 100 200 300

Geo Solutions Ltd.

Figure 5.

LEGEND

Apparent Conductivity Data 32190 Hz

300
72
62
52
42
32
22
12
2
-8
-18
-28
-38
-48
-58
-68
-78

MULTIFREQUENCY EM GEOPHYSICAL SURVEY
Alcoa Ball Field, Badin NC

Map Scale (ft)

0 100 200 300

Geo Solutions Ltd.

Figure 6.

LEGEND

In-Phase Data 32190 Hz

4000
3500
3000
2500
2000
1500
1000
500
0
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000

MULTIFREQUENCY EM GEOPHYSICAL SURVEY
Alcoa Ball Field, Badin NC

Map Scale (ft)

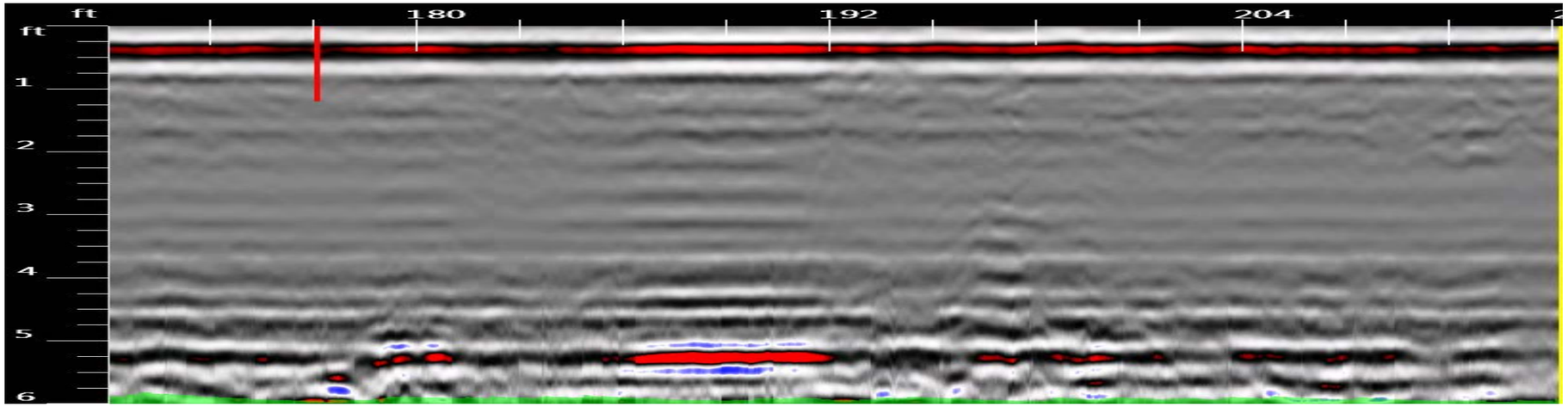
0 100 200 300

Geo Solutions Ltd.

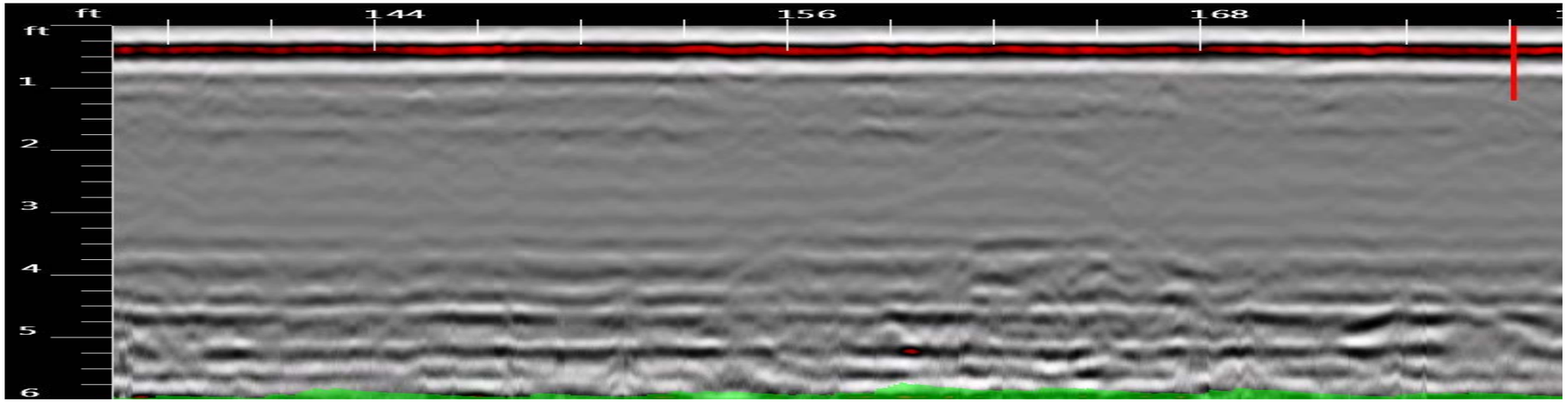
Figure 7.

Ground-Penetrating Radar Records
GEOPHYSICAL SURVEY
Alcoa Ball Field, Badin NC

Profile 1. 171'-213'



Profile 3. 136'-179'



Profile 5. 116'-159'

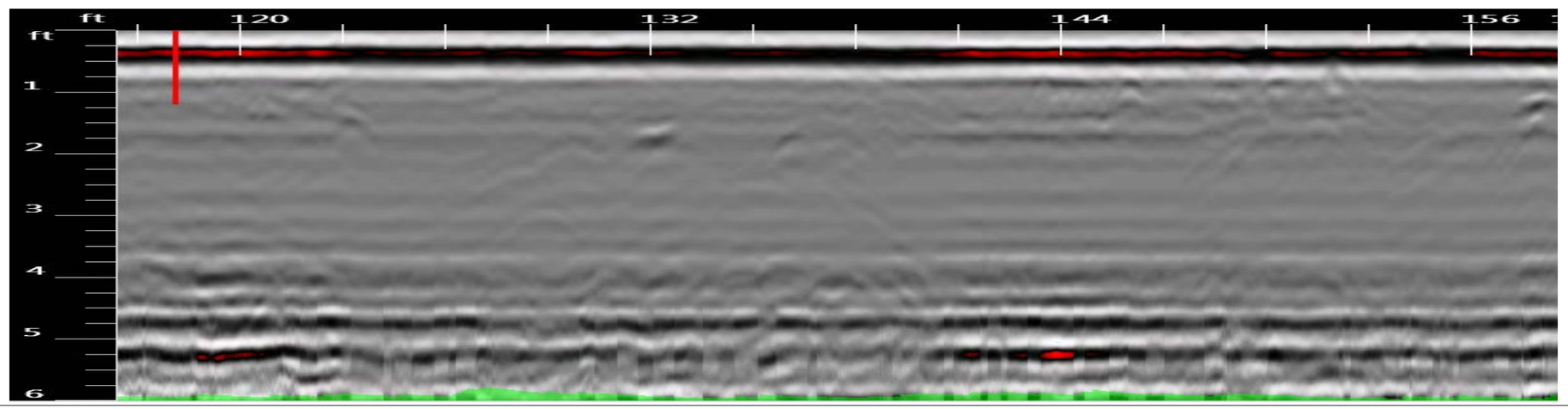


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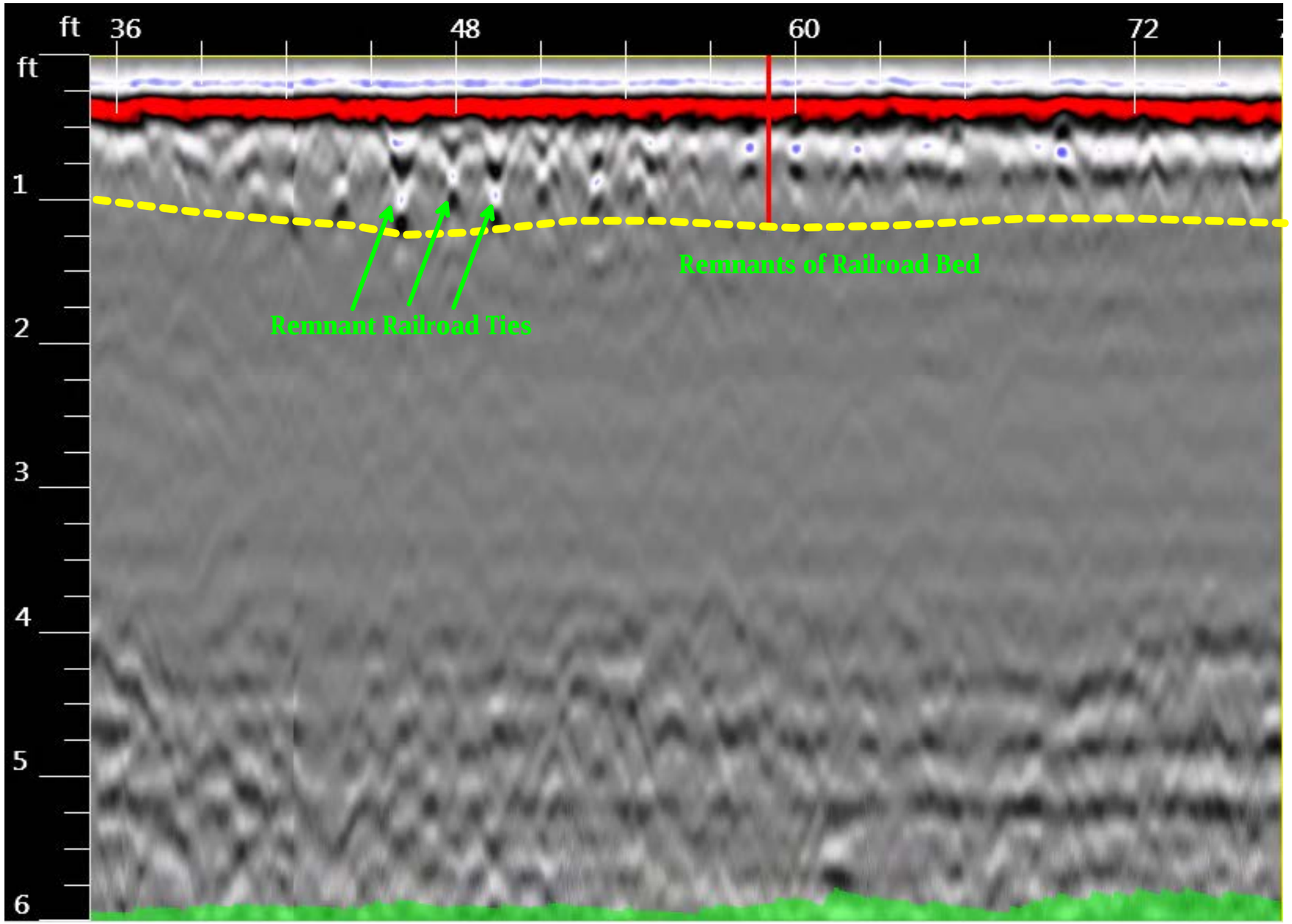
Figure 8.

Ground-Penetrating Radar Record
Along Railway
GEOPHYSICAL SURVEY
Alcoa Ball Field, Badin NC

Profile 12



Geo Solutions Ltd.

Profile 16

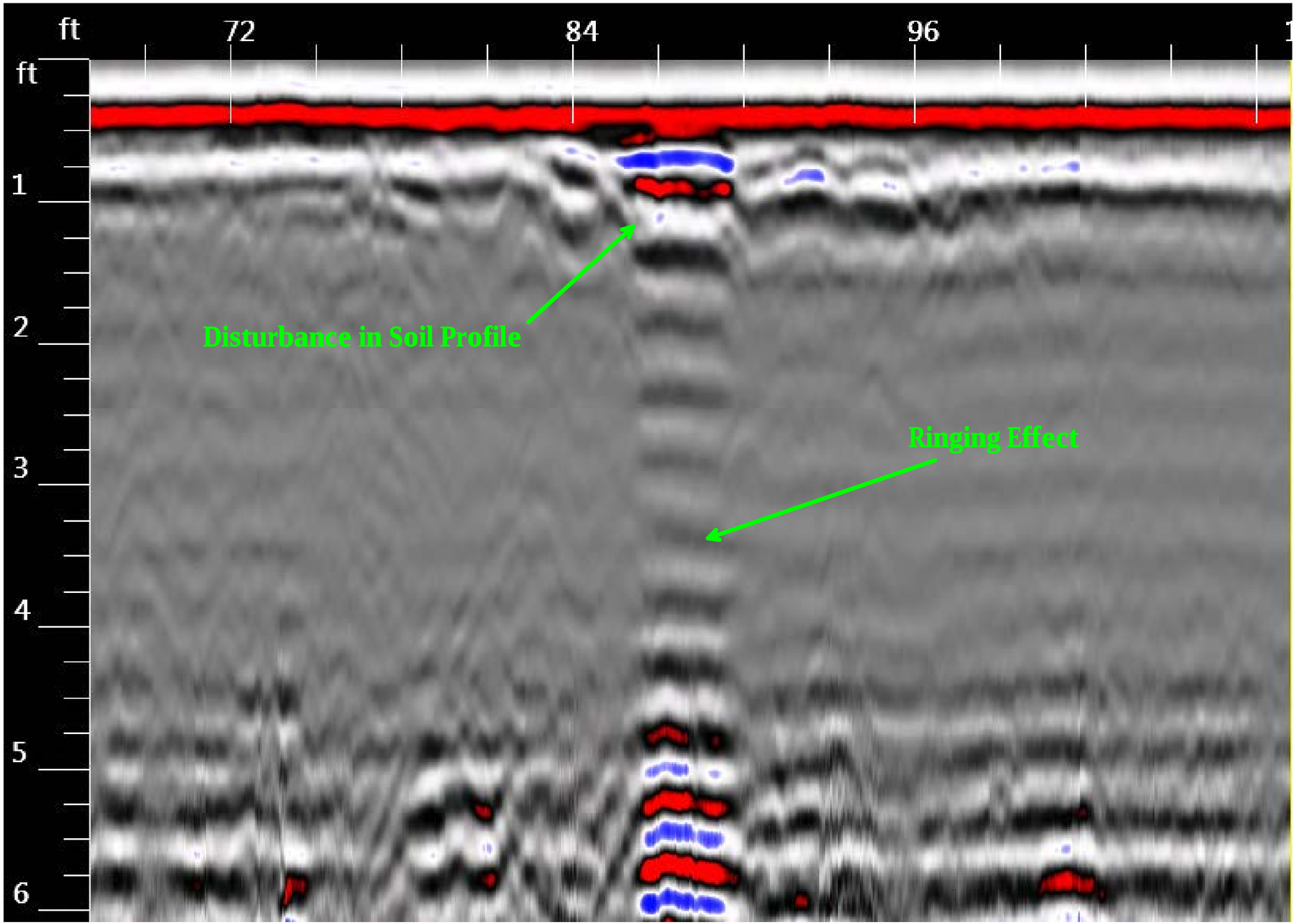


Figure 9.

Ground-Penetrating Radar Record
Gravel Parking Lot
GEOPHYSICAL SURVEY
Alcoa Ball Field, Badin NC

Geo Solutions Ltd.

Appendix B
Laboratory Reports and Chain of Custody Forms

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

July 03, 2018

Michael W. Worden
Environeering, Inc.
16100 Cairnway
Suite 320
Houston, TX 77084

RE: Project: Alcoa Badin
Pace Project No.: 92384453

Dear Michael Worden:
Enclosed are the analytical results for sample(s) received by the laboratory on May 10, 2018. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

This revision was issued on 7/3/18 to report results with J-flags to the MDL, per client request.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Nicole Gasiorowski

Nicole Gasiorowski
nicole.gasiorowski@pacelabs.com
(704)875-9092
Project Manager

Enclosures

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CERTIFICATIONS

Project:	Alcoa Badin
Pace Project No.:	92384453

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
Louisiana/NELAP Certification # LA170028
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

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SAMPLE SUMMARY

Project: Alcoa Badin
Pace Project No.: 92384453

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92384453001	**ABF-SD003-F002**	Solid	05/09/18 10:35	05/10/18 15:22
92384453002	**ABF-SB052-F002**	Solid	05/09/18 11:55	05/10/18 15:22
92384453003	**ABF-SB053-F002**	Solid	05/09/18 12:10	05/10/18 15:22
92384453004	**ABF-SB054-F002**	Solid	05/09/18 12:30	05/10/18 15:22
92384453005	**ABF-SB055-F002**	Solid	05/09/18 13:50	05/10/18 15:22
92384453006	**ABF-SB055-D002**	Solid	05/09/18 13:55	05/10/18 15:22
92384453007	**ABF-SB056-F002**	Solid	05/09/18 13:30	05/10/18 15:22
92384453008	**ABF-SB057-F002**	Solid	05/09/18 13:05	05/10/18 15:22
92384453009	**ABF-EB001-F002**	Water	05/09/18 14:30	05/10/18 15:22

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SAMPLE ANALYTE COUNT

Project: Alcoa Badin
Pace Project No.: 92384453

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92384453001	**ABF-SD003-F002**	EPA 8270	RES	21	PASI-C
		ASTM D2974-87	KDF	1	PASI-C
92384453002	**ABF-SB052-F002**	EPA 8082	NU1	8	PASI-C
		EPA 8270	RES	21	PASI-C
		ASTM D2974-87	KDF	1	PASI-C
92384453003	**ABF-SB053-F002**	EPA 8082	NU1	8	PASI-C
		EPA 8270	RES	21	PASI-C
		ASTM D2974-87	KDF	1	PASI-C
92384453004	**ABF-SB054-F002**	EPA 8082	NU1	8	PASI-C
		EPA 8270	RES	21	PASI-C
		ASTM D2974-87	KDF	1	PASI-C
92384453005	**ABF-SB055-F002**	EPA 8082	NU1	8	PASI-C
		EPA 8270	RES	21	PASI-C
		ASTM D2974-87	KDF	1	PASI-C
92384453006	**ABF-SB055-D002**	EPA 8082	NU1	8	PASI-C
		EPA 8270	RES	21	PASI-C
		ASTM D2974-87	KDF	1	PASI-C
92384453007	**ABF-SB056-F002**	EPA 8082	NU1	8	PASI-C
		EPA 8270	RES	21	PASI-C
		ASTM D2974-87	KDF	1	PASI-C
92384453008	**ABF-SB057-F002**	EPA 8082	NU1	8	PASI-C
		EPA 8270	RES	21	PASI-C
		ASTM D2974-87	KDF	1	PASI-C
92384453009	**ABF-EB001-F002**	EPA 8082	NU1	8	PASI-C
		EPA 8270	RES	21	PASI-C

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ANALYTICAL RESULTS

Project: Alcoa Badin
Pace Project No.: 92384453

Sample: ABF-SD003-F002 **Lab ID: 92384453001** Collected: 05/09/18 10:35 Received: 05/10/18 15:22 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8270 MSSV PAH Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546								
Acenaphthene	ND	ug/kg	425	97.8	1	05/21/18 06:13	05/21/18 12:54	83-32-9	
Acenaphthylene	ND	ug/kg	425	100	1	05/21/18 06:13	05/21/18 12:54	208-96-8	
Anthracene	ND	ug/kg	425	95.2	1	05/21/18 06:13	05/21/18 12:54	120-12-7	
Benzo(a)anthracene	**139J**	ug/kg	425	78.5	1	05/21/18 06:13	05/21/18 12:54	56-55-3	
Benzo(a)pyrene	**112J**	ug/kg	425	81.1	1	05/21/18 06:13	05/21/18 12:54	50-32-8	
Benzo(b)fluoranthene	**148J**	ug/kg	425	73.3	1	05/21/18 06:13	05/21/18 12:54	205-99-2	
Benzo(g,h,i)perylene	ND	ug/kg	425	108	1	05/21/18 06:13	05/21/18 12:54	191-24-2	
Benzo(k)fluoranthene	ND	ug/kg	425	83.6	1	05/21/18 06:13	05/21/18 12:54	207-08-9	
Chrysene	**108J**	ug/kg	425	56.6	1	05/21/18 06:13	05/21/18 12:54	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	425	90.1	1	05/21/18 06:13	05/21/18 12:54	53-70-3	
Fluoranthene	**118J**	ug/kg	425	61.8	1	05/21/18 06:13	05/21/18 12:54	206-44-0	
Fluorene	ND	ug/kg	425	87.5	1	05/21/18 06:13	05/21/18 12:54	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/kg	425	87.5	1	05/21/18 06:13	05/21/18 12:54	193-39-5	
1-Methylnaphthalene	ND	ug/kg	425	111	1	05/21/18 06:13	05/21/18 12:54	90-12-0	
2-Methylnaphthalene	ND	ug/kg	425	91.4	1	05/21/18 06:13	05/21/18 12:54	91-57-6	
Naphthalene	ND	ug/kg	425	104	1	05/21/18 06:13	05/21/18 12:54	91-20-3	
Phenanthrene	ND	ug/kg	425	70.8	1	05/21/18 06:13	05/21/18 12:54	85-01-8	
Pyrene	**123J**	ug/kg	425	72.1	1	05/21/18 06:13	05/21/18 12:54	129-00-0	
Surrogates									
Nitrobenzene-d5 (S)	47	%	23-110		1	05/21/18 06:13	05/21/18 12:54	4165-60-0	
2-Fluorobiphenyl (S)	41	%	30-110		1	05/21/18 06:13	05/21/18 12:54	321-60-8	
Terphenyl-d14 (S)	51	%	28-110		1	05/21/18 06:13	05/21/18 12:54	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**22.5**	%	0.10	0.10	1		05/14/18 09:53		

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ANALYTICAL RESULTS

Project: Alcoa Badin
Pace Project No.: 92384453

Sample: ABF-SB052-F002 **Lab ID: 92384453002** Collected: 05/09/18 11:55 Received: 05/10/18 15:22 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082 Preparation Method: EPA 3546								
PCB-1016 (Aroclor 1016)	ND	ug/kg	239	109	5	05/12/18 10:10	05/14/18 21:07	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	239	109	5	05/12/18 10:10	05/14/18 21:07	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	239	109	5	05/12/18 10:10	05/14/18 21:07	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	239	109	5	05/12/18 10:10	05/14/18 21:07	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	239	109	5	05/12/18 10:10	05/14/18 21:07	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	239	109	5	05/12/18 10:10	05/14/18 21:07	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	239	109	5	05/12/18 10:10	05/14/18 21:07	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	87	%	21-132		5	05/12/18 10:10	05/14/18 21:07	2051-24-3	D3
8270 MSSV PAH Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546								
Acenaphthene	ND	ug/kg	480	111	1	05/15/18 16:30	05/18/18 21:12	83-32-9	
Acenaphthylene	ND	ug/kg	480	114	1	05/15/18 16:30	05/18/18 21:12	208-96-8	
Anthracene	ND	ug/kg	480	108	1	05/15/18 16:30	05/18/18 21:12	120-12-7	
Benzo(a)anthracene	**384J**	ug/kg	480	88.8	1	05/15/18 16:30	05/18/18 21:12	56-55-3	
Benzo(a)pyrene	**360J**	ug/kg	480	91.7	1	05/15/18 16:30	05/18/18 21:12	50-32-8	
Benzo(b)fluoranthene	**665**	ug/kg	480	83.0	1	05/15/18 16:30	05/18/18 21:12	205-99-2	
Benzo(g,h,i)perylene	**346J**	ug/kg	480	122	1	05/15/18 16:30	05/18/18 21:12	191-24-2	
Benzo(k)fluoranthene	**259J**	ug/kg	480	94.6	1	05/15/18 16:30	05/18/18 21:12	207-08-9	
Chrysene	**436J**	ug/kg	480	64.0	1	05/15/18 16:30	05/18/18 21:12	218-01-9	
Dibenz(a,h)anthracene	**119J**	ug/kg	480	102	1	05/15/18 16:30	05/18/18 21:12	53-70-3	
Fluoranthene	**499**	ug/kg	480	69.9	1	05/15/18 16:30	05/18/18 21:12	206-44-0	
Fluorene	ND	ug/kg	480	99.0	1	05/15/18 16:30	05/18/18 21:12	86-73-7	
Indeno(1,2,3-cd)pyrene	**273J**	ug/kg	480	99.0	1	05/15/18 16:30	05/18/18 21:12	193-39-5	
1-Methylnaphthalene	ND	ug/kg	480	125	1	05/15/18 16:30	05/18/18 21:12	90-12-0	
2-Methylnaphthalene	ND	ug/kg	480	103	1	05/15/18 16:30	05/18/18 21:12	91-57-6	
Naphthalene	ND	ug/kg	480	118	1	05/15/18 16:30	05/18/18 21:12	91-20-3	
Phenanthrene	**135J**	ug/kg	480	80.0	1	05/15/18 16:30	05/18/18 21:12	85-01-8	
Pyrene	**401J**	ug/kg	480	81.5	1	05/15/18 16:30	05/18/18 21:12	129-00-0	
Surrogates									
Nitrobenzene-d5 (S)	66	%	23-110		1	05/15/18 16:30	05/18/18 21:12	4165-60-0	
2-Fluorobiphenyl (S)	59	%	30-110		1	05/15/18 16:30	05/18/18 21:12	321-60-8	
Terphenyl-d14 (S)	59	%	28-110		1	05/15/18 16:30	05/18/18 21:12	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**31.3**	%	0.10	0.10	1		05/14/18 09:53		

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ANALYTICAL RESULTS

Project: Alcoa Badin
Pace Project No.: 92384453

Sample: ABF-SB053-F002 **Lab ID: 92384453003** Collected: 05/09/18 12:10 Received: 05/10/18 15:22 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082 Preparation Method: EPA 3546								
PCB-1016 (Aroclor 1016)	ND	ug/kg	91.0	41.4	2	05/12/18 10:10	05/14/18 21:28	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	91.0	41.4	2	05/12/18 10:10	05/14/18 21:28	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	91.0	41.4	2	05/12/18 10:10	05/14/18 21:28	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	91.0	41.4	2	05/12/18 10:10	05/14/18 21:28	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	91.0	41.4	2	05/12/18 10:10	05/14/18 21:28	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	91.0	41.4	2	05/12/18 10:10	05/14/18 21:28	11097-69-1	
PCB-1260 (Aroclor 1260)	**458**	ug/kg	91.0	41.4	2	05/12/18 10:10	05/14/18 21:28	11096-82-5	D6
Surrogates									
Decachlorobiphenyl (S)	66	%	21-132		2	05/12/18 10:10	05/14/18 21:28	2051-24-3	D3
8270 MSSV PAH Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546								
Acenaphthene	ND	ug/kg	451	104	1	05/15/18 16:30	05/18/18 22:10	83-32-9	
Acenaphthylene	ND	ug/kg	451	106	1	05/15/18 16:30	05/18/18 22:10	208-96-8	
Anthracene	ND	ug/kg	451	101	1	05/15/18 16:30	05/18/18 22:10	120-12-7	
Benzo(a)anthracene	**472**	ug/kg	451	83.3	1	05/15/18 16:30	05/18/18 22:10	56-55-3	
Benzo(a)pyrene	**420J**	ug/kg	451	86.0	1	05/15/18 16:30	05/18/18 22:10	50-32-8	
Benzo(b)fluoranthene	**837**	ug/kg	451	77.8	1	05/15/18 16:30	05/18/18 22:10	205-99-2	
Benzo(g,h,i)perylene	**428J**	ug/kg	451	115	1	05/15/18 16:30	05/18/18 22:10	191-24-2	
Benzo(k)fluoranthene	**289J**	ug/kg	451	88.7	1	05/15/18 16:30	05/18/18 22:10	207-08-9	
Chrysene	**473**	ug/kg	451	60.1	1	05/15/18 16:30	05/18/18 22:10	218-01-9	
Dibenz(a,h)anthracene	**128J**	ug/kg	451	95.6	1	05/15/18 16:30	05/18/18 22:10	53-70-3	
Fluoranthene	**624**	ug/kg	451	65.5	1	05/15/18 16:30	05/18/18 22:10	206-44-0	
Fluorene	ND	ug/kg	451	92.8	1	05/15/18 16:30	05/18/18 22:10	86-73-7	
Indeno(1,2,3-cd)pyrene	**334J**	ug/kg	451	92.8	1	05/15/18 16:30	05/18/18 22:10	193-39-5	
1-Methylnaphthalene	ND	ug/kg	451	117	1	05/15/18 16:30	05/18/18 22:10	90-12-0	
2-Methylnaphthalene	ND	ug/kg	451	96.9	1	05/15/18 16:30	05/18/18 22:10	91-57-6	
Naphthalene	ND	ug/kg	451	111	1	05/15/18 16:30	05/18/18 22:10	91-20-3	
Phenanthrene	**210J**	ug/kg	451	75.1	1	05/15/18 16:30	05/18/18 22:10	85-01-8	
Pyrene	**507**	ug/kg	451	76.5	1	05/15/18 16:30	05/18/18 22:10	129-00-0	
Surrogates									
Nitrobenzene-d5 (S)	65	%	23-110		1	05/15/18 16:30	05/18/18 22:10	4165-60-0	
2-Fluorobiphenyl (S)	64	%	30-110		1	05/15/18 16:30	05/18/18 22:10	321-60-8	
Terphenyl-d14 (S)	71	%	28-110		1	05/15/18 16:30	05/18/18 22:10	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**27.0**	%	0.10	0.10	1		05/14/18 09:53		

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ANALYTICAL RESULTS

Project: Alcoa Badin
Pace Project No.: 92384453

Sample: ABF-SB054-F002 **Lab ID: 92384453004** Collected: 05/09/18 12:30 Received: 05/10/18 15:22 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082 Preparation Method: EPA 3546								
PCB-1016 (Aroclor 1016)	ND	ug/kg	219	99.6	5	05/12/18 10:10	05/14/18 22:10	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	219	99.6	5	05/12/18 10:10	05/14/18 22:10	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	219	99.6	5	05/12/18 10:10	05/14/18 22:10	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	219	99.6	5	05/12/18 10:10	05/14/18 22:10	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	219	99.6	5	05/12/18 10:10	05/14/18 22:10	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	219	99.6	5	05/12/18 10:10	05/14/18 22:10	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	219	99.6	5	05/12/18 10:10	05/14/18 22:10	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	59	%	21-132		5	05/12/18 10:10	05/14/18 22:10	2051-24-3	D3
8270 MSSV PAH Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546								
Acenaphthene	ND	ug/kg	437	101	1	05/15/18 16:30	05/21/18 09:02	83-32-9	
Acenaphthylene	ND	ug/kg	437	103	1	05/15/18 16:30	05/21/18 09:02	208-96-8	
Anthracene	ND	ug/kg	437	97.9	1	05/15/18 16:30	05/21/18 09:02	120-12-7	
Benzo(a)anthracene	**743**	ug/kg	437	80.7	1	05/15/18 16:30	05/21/18 09:02	56-55-3	
Benzo(a)pyrene	**775**	ug/kg	437	83.4	1	05/15/18 16:30	05/21/18 09:02	50-32-8	
Benzo(b)fluoranthene	**1490**	ug/kg	437	75.4	1	05/15/18 16:30	05/21/18 09:02	205-99-2	
Benzo(g,h,i)perylene	**807**	ug/kg	437	111	1	05/15/18 16:30	05/21/18 09:02	191-24-2	
Benzo(k)fluoranthene	**491**	ug/kg	437	86.0	1	05/15/18 16:30	05/21/18 09:02	207-08-9	
Chrysene	**971**	ug/kg	437	58.2	1	05/15/18 16:30	05/21/18 09:02	218-01-9	
Dibenz(a,h)anthracene	**207J**	ug/kg	437	92.6	1	05/15/18 16:30	05/21/18 09:02	53-70-3	
Fluoranthene	**1170**	ug/kg	437	63.5	1	05/15/18 16:30	05/21/18 09:02	206-44-0	
Fluorene	ND	ug/kg	437	90.0	1	05/15/18 16:30	05/21/18 09:02	86-73-7	
Indeno(1,2,3-cd)pyrene	**647**	ug/kg	437	90.0	1	05/15/18 16:30	05/21/18 09:02	193-39-5	
1-Methylnaphthalene	ND	ug/kg	437	114	1	05/15/18 16:30	05/21/18 09:02	90-12-0	
2-Methylnaphthalene	ND	ug/kg	437	93.9	1	05/15/18 16:30	05/21/18 09:02	91-57-6	
Naphthalene	ND	ug/kg	437	107	1	05/15/18 16:30	05/21/18 09:02	91-20-3	
Phenanthrene	**313J**	ug/kg	437	72.8	1	05/15/18 16:30	05/21/18 09:02	85-01-8	
Pyrene	**1060**	ug/kg	437	74.1	1	05/15/18 16:30	05/21/18 09:02	129-00-0	
Surrogates									
Nitrobenzene-d5 (S)	58	%	23-110		1	05/15/18 16:30	05/21/18 09:02	4165-60-0	
2-Fluorobiphenyl (S)	65	%	30-110		1	05/15/18 16:30	05/21/18 09:02	321-60-8	
Terphenyl-d14 (S)	72	%	28-110		1	05/15/18 16:30	05/21/18 09:02	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**24.7**	%	0.10	0.10	1		05/14/18 09:53		

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ANALYTICAL RESULTS

Project: Alcoa Badin
Pace Project No.: 92384453

Sample: ABF-SB055-F002 **Lab ID: 92384453005** Collected: 05/09/18 13:50 Received: 05/10/18 15:22 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082 Preparation Method: EPA 3546								
PCB-1016 (Aroclor 1016)	ND	ug/kg	234	106	5	05/12/18 10:10	05/14/18 22:31	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	234	106	5	05/12/18 10:10	05/14/18 22:31	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	234	106	5	05/12/18 10:10	05/14/18 22:31	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	234	106	5	05/12/18 10:10	05/14/18 22:31	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	234	106	5	05/12/18 10:10	05/14/18 22:31	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	234	106	5	05/12/18 10:10	05/14/18 22:31	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	234	106	5	05/12/18 10:10	05/14/18 22:31	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	58	%	21-132		5	05/12/18 10:10	05/14/18 22:31	2051-24-3	D3
8270 MSSV PAH Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546								
Acenaphthene	ND	ug/kg	462	106	1	05/15/18 16:30	05/19/18 10:12	83-32-9	
Acenaphthylene	ND	ug/kg	462	109	1	05/15/18 16:30	05/19/18 10:12	208-96-8	
Anthracene	ND	ug/kg	462	103	1	05/15/18 16:30	05/19/18 10:12	120-12-7	
Benzo(a)anthracene	**209J**	ug/kg	462	85.3	1	05/15/18 16:30	05/19/18 10:12	56-55-3	
Benzo(a)pyrene	**165J**	ug/kg	462	88.1	1	05/15/18 16:30	05/19/18 10:12	50-32-8	
Benzo(b)fluoranthene	**222J**	ug/kg	462	79.7	1	05/15/18 16:30	05/19/18 10:12	205-99-2	
Benzo(g,h,i)perylene	**129J**	ug/kg	462	117	1	05/15/18 16:30	05/19/18 10:12	191-24-2	
Benzo(k)fluoranthene	**109J**	ug/kg	462	90.9	1	05/15/18 16:30	05/19/18 10:12	207-08-9	
Chrysene	**189J**	ug/kg	462	61.5	1	05/15/18 16:30	05/19/18 10:12	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	462	97.9	1	05/15/18 16:30	05/19/18 10:12	53-70-3	
Fluoranthene	**203J**	ug/kg	462	67.1	1	05/15/18 16:30	05/19/18 10:12	206-44-0	
Fluorene	ND	ug/kg	462	95.1	1	05/15/18 16:30	05/19/18 10:12	86-73-7	
Indeno(1,2,3-cd)pyrene	**116J**	ug/kg	462	95.1	1	05/15/18 16:30	05/19/18 10:12	193-39-5	
1-Methylnaphthalene	ND	ug/kg	462	120	1	05/15/18 16:30	05/19/18 10:12	90-12-0	
2-Methylnaphthalene	ND	ug/kg	462	99.3	1	05/15/18 16:30	05/19/18 10:12	91-57-6	
Naphthalene	ND	ug/kg	462	113	1	05/15/18 16:30	05/19/18 10:12	91-20-3	
Phenanthrene	ND	ug/kg	462	76.9	1	05/15/18 16:30	05/19/18 10:12	85-01-8	
Pyrene	**199J**	ug/kg	462	78.3	1	05/15/18 16:30	05/19/18 10:12	129-00-0	
Surrogates									
Nitrobenzene-d5 (S)	58	%	23-110		1	05/15/18 16:30	05/19/18 10:12	4165-60-0	
2-Fluorobiphenyl (S)	49	%	30-110		1	05/15/18 16:30	05/19/18 10:12	321-60-8	
Terphenyl-d14 (S)	55	%	28-110		1	05/15/18 16:30	05/19/18 10:12	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**29.2**	%	0.10	0.10	1		05/14/18 09:53		

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ANALYTICAL RESULTS

Project: Alcoa Badin
Pace Project No.: 92384453

Sample: ABF-SB055-D002 **Lab ID: 92384453006** Collected: 05/09/18 13:55 Received: 05/10/18 15:22 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082 Preparation Method: EPA 3546								
PCB-1016 (Aroclor 1016)	ND	ug/kg	232	106	5	05/12/18 10:10	05/14/18 22:52	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	232	106	5	05/12/18 10:10	05/14/18 22:52	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	232	106	5	05/12/18 10:10	05/14/18 22:52	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	232	106	5	05/12/18 10:10	05/14/18 22:52	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	232	106	5	05/12/18 10:10	05/14/18 22:52	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	232	106	5	05/12/18 10:10	05/14/18 22:52	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	232	106	5	05/12/18 10:10	05/14/18 22:52	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	57	%	21-132		5	05/12/18 10:10	05/14/18 22:52	2051-24-3	D3
8270 MSSV PAH Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546								
Acenaphthene	ND	ug/kg	463	107	1	05/15/18 16:30	05/19/18 12:09	83-32-9	
Acenaphthylene	ND	ug/kg	463	109	1	05/15/18 16:30	05/19/18 12:09	208-96-8	
Anthracene	ND	ug/kg	463	104	1	05/15/18 16:30	05/19/18 12:09	120-12-7	
Benzo(a)anthracene	**172J**	ug/kg	463	85.6	1	05/15/18 16:30	05/19/18 12:09	56-55-3	
Benzo(a)pyrene	**161J**	ug/kg	463	88.4	1	05/15/18 16:30	05/19/18 12:09	50-32-8	
Benzo(b)fluoranthene	**244J**	ug/kg	463	80.0	1	05/15/18 16:30	05/19/18 12:09	205-99-2	
Benzo(g,h,i)perylene	**137J**	ug/kg	463	118	1	05/15/18 16:30	05/19/18 12:09	191-24-2	
Benzo(k)fluoranthene	**105J**	ug/kg	463	91.2	1	05/15/18 16:30	05/19/18 12:09	207-08-9	
Chrysene	**174J**	ug/kg	463	61.7	1	05/15/18 16:30	05/19/18 12:09	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	463	98.2	1	05/15/18 16:30	05/19/18 12:09	53-70-3	
Fluoranthene	**212J**	ug/kg	463	67.4	1	05/15/18 16:30	05/19/18 12:09	206-44-0	
Fluorene	ND	ug/kg	463	95.4	1	05/15/18 16:30	05/19/18 12:09	86-73-7	
Indeno(1,2,3-cd)pyrene	**121J**	ug/kg	463	95.4	1	05/15/18 16:30	05/19/18 12:09	193-39-5	
1-Methylnaphthalene	ND	ug/kg	463	121	1	05/15/18 16:30	05/19/18 12:09	90-12-0	
2-Methylnaphthalene	ND	ug/kg	463	99.6	1	05/15/18 16:30	05/19/18 12:09	91-57-6	
Naphthalene	ND	ug/kg	463	114	1	05/15/18 16:30	05/19/18 12:09	91-20-3	
Phenanthrene	ND	ug/kg	463	77.2	1	05/15/18 16:30	05/19/18 12:09	85-01-8	
Pyrene	**198J**	ug/kg	463	78.6	1	05/15/18 16:30	05/19/18 12:09	129-00-0	
Surrogates									
Nitrobenzene-d5 (S)	58	%	23-110		1	05/15/18 16:30	05/19/18 12:09	4165-60-0	
2-Fluorobiphenyl (S)	49	%	30-110		1	05/15/18 16:30	05/19/18 12:09	321-60-8	
Terphenyl-d14 (S)	60	%	28-110		1	05/15/18 16:30	05/19/18 12:09	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**28.0**	%	0.10	0.10	1		05/14/18 09:53		

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ANALYTICAL RESULTS

Project: Alcoa Badin
Pace Project No.: 92384453

Sample: ABF-SB056-F002 **Lab ID: 92384453007** Collected: 05/09/18 13:30 Received: 05/10/18 15:22 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082 Preparation Method: EPA 3546								
PCB-1016 (Aroclor 1016)	ND	ug/kg	915	416	20	05/12/18 10:10	05/15/18 02:41	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	915	416	20	05/12/18 10:10	05/15/18 02:41	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	915	416	20	05/12/18 10:10	05/15/18 02:41	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	915	416	20	05/12/18 10:10	05/15/18 02:41	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	915	416	20	05/12/18 10:10	05/15/18 02:41	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	915	416	20	05/12/18 10:10	05/15/18 02:41	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	915	416	20	05/12/18 10:10	05/15/18 02:41	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	0	%	21-132		20	05/12/18 10:10	05/15/18 02:41	2051-24-3	D3,S4
8270 MSSV PAH Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546								
Acenaphthene	ND	ug/kg	464	107	1	05/15/18 16:30	05/19/18 12:38	83-32-9	
Acenaphthylene	ND	ug/kg	464	110	1	05/15/18 16:30	05/19/18 12:38	208-96-8	
Anthracene	ND	ug/kg	464	104	1	05/15/18 16:30	05/19/18 12:38	120-12-7	
Benzo(a)anthracene	**486**	ug/kg	464	85.7	1	05/15/18 16:30	05/19/18 12:38	56-55-3	
Benzo(a)pyrene	**539**	ug/kg	464	88.5	1	05/15/18 16:30	05/19/18 12:38	50-32-8	
Benzo(b)fluoranthene	**791**	ug/kg	464	80.1	1	05/15/18 16:30	05/19/18 12:38	205-99-2	
Benzo(g,h,i)perylene	**474**	ug/kg	464	118	1	05/15/18 16:30	05/19/18 12:38	191-24-2	
Benzo(k)fluoranthene	**292J**	ug/kg	464	91.4	1	05/15/18 16:30	05/19/18 12:38	207-08-9	
Chrysene	**584**	ug/kg	464	61.8	1	05/15/18 16:30	05/19/18 12:38	218-01-9	
Dibenz(a,h)anthracene	**170J**	ug/kg	464	98.4	1	05/15/18 16:30	05/19/18 12:38	53-70-3	
Fluoranthene	**960**	ug/kg	464	67.5	1	05/15/18 16:30	05/19/18 12:38	206-44-0	
Fluorene	ND	ug/kg	464	95.6	1	05/15/18 16:30	05/19/18 12:38	86-73-7	
Indeno(1,2,3-cd)pyrene	**406J**	ug/kg	464	95.6	1	05/15/18 16:30	05/19/18 12:38	193-39-5	
1-Methylnaphthalene	ND	ug/kg	464	121	1	05/15/18 16:30	05/19/18 12:38	90-12-0	
2-Methylnaphthalene	ND	ug/kg	464	99.8	1	05/15/18 16:30	05/19/18 12:38	91-57-6	
Naphthalene	ND	ug/kg	464	114	1	05/15/18 16:30	05/19/18 12:38	91-20-3	
Phenanthrene	**363J**	ug/kg	464	77.3	1	05/15/18 16:30	05/19/18 12:38	85-01-8	
Pyrene	**867**	ug/kg	464	78.7	1	05/15/18 16:30	05/19/18 12:38	129-00-0	
Surrogates									
Nitrobenzene-d5 (S)	70	%	23-110		1	05/15/18 16:30	05/19/18 12:38	4165-60-0	
2-Fluorobiphenyl (S)	62	%	30-110		1	05/15/18 16:30	05/19/18 12:38	321-60-8	
Terphenyl-d14 (S)	71	%	28-110		1	05/15/18 16:30	05/19/18 12:38	1718-51-0	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**28.8**	%	0.10	0.10	1		05/15/18 11:54		

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ANALYTICAL RESULTS

Project: Alcoa Badin
Pace Project No.: 92384453

Sample: ABF-SB057-F002 **Lab ID: 92384453008** Collected: 05/09/18 13:05 Received: 05/10/18 15:22 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB	Analytical Method: EPA 8082 Preparation Method: EPA 3546								
PCB-1016 (Aroclor 1016)	ND	ug/kg	219	99.7	5	05/12/18 10:10	05/15/18 03:02	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/kg	219	99.7	5	05/12/18 10:10	05/15/18 03:02	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/kg	219	99.7	5	05/12/18 10:10	05/15/18 03:02	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/kg	219	99.7	5	05/12/18 10:10	05/15/18 03:02	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/kg	219	99.7	5	05/12/18 10:10	05/15/18 03:02	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/kg	219	99.7	5	05/12/18 10:10	05/15/18 03:02	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/kg	219	99.7	5	05/12/18 10:10	05/15/18 03:02	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	70	%	21-132		5	05/12/18 10:10	05/15/18 03:02	2051-24-3	D3
8270 MSSV PAH Microwave	Analytical Method: EPA 8270 Preparation Method: EPA 3546								
Acenaphthene	ND	ug/kg	2160	499	5	05/15/18 16:30	05/19/18 13:08	83-32-9	
Acenaphthylene	ND	ug/kg	2160	512	5	05/15/18 16:30	05/19/18 13:08	208-96-8	
Anthracene	ND	ug/kg	2160	485	5	05/15/18 16:30	05/19/18 13:08	120-12-7	
Benzo(a)anthracene	**1150J**	ug/kg	2160	400	5	05/15/18 16:30	05/19/18 13:08	56-55-3	
Benzo(a)pyrene	**1160J**	ug/kg	2160	413	5	05/15/18 16:30	05/19/18 13:08	50-32-8	
Benzo(b)fluoranthene	**1740J**	ug/kg	2160	374	5	05/15/18 16:30	05/19/18 13:08	205-99-2	
Benzo(g,h,i)perylene	**945J**	ug/kg	2160	551	5	05/15/18 16:30	05/19/18 13:08	191-24-2	
Benzo(k)fluoranthene	**676J**	ug/kg	2160	426	5	05/15/18 16:30	05/19/18 13:08	207-08-9	
Chrysene	**1090J**	ug/kg	2160	289	5	05/15/18 16:30	05/19/18 13:08	218-01-9	
Dibenz(a,h)anthracene	ND	ug/kg	2160	459	5	05/15/18 16:30	05/19/18 13:08	53-70-3	
Fluoranthene	**1870J**	ug/kg	2160	315	5	05/15/18 16:30	05/19/18 13:08	206-44-0	
Fluorene	ND	ug/kg	2160	446	5	05/15/18 16:30	05/19/18 13:08	86-73-7	
Indeno(1,2,3-cd)pyrene	**850J**	ug/kg	2160	446	5	05/15/18 16:30	05/19/18 13:08	193-39-5	
1-Methylnaphthalene	ND	ug/kg	2160	564	5	05/15/18 16:30	05/19/18 13:08	90-12-0	
2-Methylnaphthalene	ND	ug/kg	2160	466	5	05/15/18 16:30	05/19/18 13:08	91-57-6	
Naphthalene	ND	ug/kg	2160	531	5	05/15/18 16:30	05/19/18 13:08	91-20-3	
Phenanthrene	**817J**	ug/kg	2160	361	5	05/15/18 16:30	05/19/18 13:08	85-01-8	
Pyrene	**1880J**	ug/kg	2160	367	5	05/15/18 16:30	05/19/18 13:08	129-00-0	
Surrogates									
Nitrobenzene-d5 (S)	0	%	23-110		5	05/15/18 16:30	05/19/18 13:08	4165-60-0	D3,S5
2-Fluorobiphenyl (S)	0	%	30-110		5	05/15/18 16:30	05/19/18 13:08	321-60-8	S5
Terphenyl-d14 (S)	21	%	28-110		5	05/15/18 16:30	05/19/18 13:08	1718-51-0	S5
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**23.5**	%	0.10	0.10	1		05/15/18 11:54		

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ANALYTICAL RESULTS

Project: Alcoa Badin
Pace Project No.: 92384453

Sample: ABF-EB001-F002 **Lab ID: 92384453009** Collected: 05/09/18 14:30 Received: 05/10/18 15:22 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
8082 GCS PCB RVE	Analytical Method: EPA 8082 Preparation Method: EPA 3510								
PCB-1016 (Aroclor 1016)	ND	ug/L	0.50	0.50	1	05/16/18 00:45	05/16/18 19:30	12674-11-2	
PCB-1221 (Aroclor 1221)	ND	ug/L	0.50	0.50	1	05/16/18 00:45	05/16/18 19:30	11104-28-2	
PCB-1232 (Aroclor 1232)	ND	ug/L	0.50	0.50	1	05/16/18 00:45	05/16/18 19:30	11141-16-5	
PCB-1242 (Aroclor 1242)	ND	ug/L	0.50	0.50	1	05/16/18 00:45	05/16/18 19:30	53469-21-9	
PCB-1248 (Aroclor 1248)	ND	ug/L	0.50	0.50	1	05/16/18 00:45	05/16/18 19:30	12672-29-6	
PCB-1254 (Aroclor 1254)	ND	ug/L	0.50	0.50	1	05/16/18 00:45	05/16/18 19:30	11097-69-1	
PCB-1260 (Aroclor 1260)	ND	ug/L	0.50	0.50	1	05/16/18 00:45	05/16/18 19:30	11096-82-5	
Surrogates									
Decachlorobiphenyl (S)	44	%	10-132		1	05/16/18 00:45	05/16/18 19:30	2051-24-3	
8270 MSSV Semivol Organic RVE	Analytical Method: EPA 8270 Preparation Method: EPA 3510								
Acenaphthene	ND	ug/L	10.0	3.4	1	05/15/18 00:42	05/16/18 17:38	83-32-9	
Acenaphthylene	ND	ug/L	10.0	3.0	1	05/15/18 00:42	05/16/18 17:38	208-96-8	
Anthracene	ND	ug/L	10.0	2.0	1	05/15/18 00:42	05/16/18 17:38	120-12-7	
Benzo(a)anthracene	ND	ug/L	10.0	1.3	1	05/15/18 00:42	05/16/18 17:38	56-55-3	
Benzo(a)pyrene	ND	ug/L	10.0	1.3	1	05/15/18 00:42	05/16/18 17:38	50-32-8	
Benzo(b)fluoranthene	ND	ug/L	10.0	1.5	1	05/15/18 00:42	05/16/18 17:38	205-99-2	
Benzo(g,h,i)perylene	ND	ug/L	10.0	1.8	1	05/15/18 00:42	05/16/18 17:38	191-24-2	
Benzo(k)fluoranthene	ND	ug/L	10.0	1.8	1	05/15/18 00:42	05/16/18 17:38	207-08-9	
Chrysene	ND	ug/L	10.0	1.3	1	05/15/18 00:42	05/16/18 17:38	218-01-9	
Dibenz(a,h)anthracene	ND	ug/L	10.0	1.9	1	05/15/18 00:42	05/16/18 17:38	53-70-3	
Fluoranthene	ND	ug/L	10.0	1.7	1	05/15/18 00:42	05/16/18 17:38	206-44-0	
Fluorene	ND	ug/L	10.0	3.0	1	05/15/18 00:42	05/16/18 17:38	86-73-7	
Indeno(1,2,3-cd)pyrene	ND	ug/L	10.0	1.7	1	05/15/18 00:42	05/16/18 17:38	193-39-5	
1-Methylnaphthalene	ND	ug/L	10.0	2.8	1	05/15/18 00:42	05/16/18 17:38	90-12-0	
2-Methylnaphthalene	ND	ug/L	10.0	2.8	1	05/15/18 00:42	05/16/18 17:38	91-57-6	
Naphthalene	ND	ug/L	10.0	3.2	1	05/15/18 00:42	05/16/18 17:38	91-20-3	
Phenanthrene	ND	ug/L	10.0	2.4	1	05/15/18 00:42	05/16/18 17:38	85-01-8	
Pyrene	ND	ug/L	10.0	1.2	1	05/15/18 00:42	05/16/18 17:38	129-00-0	
Surrogates									
Nitrobenzene-d5 (S)	56	%	40-121		1	05/15/18 00:42	05/16/18 17:38	4165-60-0	
2-Fluorobiphenyl (S)	48	%	45-139		1	05/15/18 00:42	05/16/18 17:38	321-60-8	
Terphenyl-d14 (S)	52	%	48-146		1	05/15/18 00:42	05/16/18 17:38	1718-51-0	

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QUALITY CONTROL DATA

Project: Alcoa Badin
Pace Project No.: 92384453

QC Batch: 410871
QC Batch Method: EPA 3510
Analysis Method: EPA 8082
Analysis Description: 8082 GCS PCB
Associated Lab Samples: 92384453009

METHOD BLANK: 2279360
Matrix: Water
Associated Lab Samples: 92384453009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	ND	0.50	0.50	05/16/18 14:47	
PCB-1221 (Aroclor 1221)	ug/L	ND	0.50	0.50	05/16/18 14:47	
PCB-1232 (Aroclor 1232)	ug/L	ND	0.50	0.50	05/16/18 14:47	
PCB-1242 (Aroclor 1242)	ug/L	ND	0.50	0.50	05/16/18 14:47	
PCB-1248 (Aroclor 1248)	ug/L	ND	0.50	0.50	05/16/18 14:47	
PCB-1254 (Aroclor 1254)	ug/L	ND	0.50	0.50	05/16/18 14:47	
PCB-1260 (Aroclor 1260)	ug/L	ND	0.50	0.50	05/16/18 14:47	
Decachlorobiphenyl (S)	%	54	10-132		05/16/18 14:47	

LABORATORY CONTROL SAMPLE & LCSD: 2279361 2279362

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/L	5	2.8	3.0	56	61	50-150	7	30	
PCB-1260 (Aroclor 1260)	ug/L	5	2.8	3.0	56	59	50-150	6	30	
Decachlorobiphenyl (S)	%				59	43	10-132			

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: Alcoa Badin
Pace Project No.: 92384453

QC Batch: 410463 Analysis Method: EPA 8082
QC Batch Method: EPA 3546 Analysis Description: 8082 GCS PCB
Associated Lab Samples: 92384453002, 92384453003, 92384453004, 92384453005, 92384453006, 92384453007, 92384453008

METHOD BLANK: 2277334 Matrix: Solid
Associated Lab Samples: 92384453002, 92384453003, 92384453004, 92384453005, 92384453006, 92384453007, 92384453008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	33.3	15.2	05/14/18 23:33	
PCB-1221 (Aroclor 1221)	ug/kg	ND	33.3	15.2	05/14/18 23:33	
PCB-1232 (Aroclor 1232)	ug/kg	ND	33.3	15.2	05/14/18 23:33	
PCB-1242 (Aroclor 1242)	ug/kg	ND	33.3	15.2	05/14/18 23:33	
PCB-1248 (Aroclor 1248)	ug/kg	ND	33.3	15.2	05/14/18 23:33	
PCB-1254 (Aroclor 1254)	ug/kg	ND	33.3	15.2	05/14/18 23:33	
PCB-1260 (Aroclor 1260)	ug/kg	ND	33.3	15.2	05/14/18 23:33	
Decachlorobiphenyl (S)	%	80	21-132		05/14/18 23:33	

LABORATORY CONTROL SAMPLE: 2277335

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	169	98.5	58	31-120	
PCB-1260 (Aroclor 1260)	ug/kg	169	116	68	32-120	
Decachlorobiphenyl (S)	%			101	21-132	

SAMPLE DUPLICATE: 2277337

Parameter	Units	92384453003 Result	Dup Result	RPD	Max RPD	Qualifiers
PCB-1016 (Aroclor 1016)	ug/kg	ND	ND		30	
PCB-1221 (Aroclor 1221)	ug/kg	ND	ND		30	
PCB-1232 (Aroclor 1232)	ug/kg	ND	ND		30	
PCB-1242 (Aroclor 1242)	ug/kg	ND	ND		30	
PCB-1248 (Aroclor 1248)	ug/kg	ND	ND		30	
PCB-1254 (Aroclor 1254)	ug/kg	ND	ND		30	
PCB-1260 (Aroclor 1260)	ug/kg	458	104	126	30	D6
Decachlorobiphenyl (S)	%	66	75	13		D3

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QUALITY CONTROL DATA

Project: Alcoa Badin
Pace Project No.: 92384453

QC Batch: 410815 | Analysis Method: EPA 8270
QC Batch Method: EPA 3546 | Analysis Description: 8270 Solid MSSV Microwave PAH
Associated Lab Samples: 92384453002, 92384453003, 92384453004, 92384453005, 92384453006, 92384453007, 92384453008

METHOD BLANK: 2279168 | Matrix: Solid
Associated Lab Samples: 92384453002, 92384453003, 92384453004, 92384453005, 92384453006, 92384453007, 92384453008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1-Methylnaphthalene	ug/kg	ND	326	84.9	05/18/18 19:14	
2-Methylnaphthalene	ug/kg	ND	326	70.1	05/18/18 19:14	
Acenaphthene	ug/kg	ND	326	75.0	05/18/18 19:14	
Acenaphthylene	ug/kg	ND	326	77.0	05/18/18 19:14	
Anthracene	ug/kg	ND	326	73.0	05/18/18 19:14	
Benzo(a)anthracene	ug/kg	72.6J	326	60.2	05/18/18 19:14	
Benzo(a)pyrene	ug/kg	ND	326	62.2	05/18/18 19:14	
Benzo(b)fluoranthene	ug/kg	75.9J	326	56.2	05/18/18 19:14	
Benzo(g,h,i)perylene	ug/kg	ND	326	82.9	05/18/18 19:14	
Benzo(k)fluoranthene	ug/kg	ND	326	64.1	05/18/18 19:14	
Chrysene	ug/kg	56.3J	326	43.4	05/18/18 19:14	
Dibenz(a,h)anthracene	ug/kg	ND	326	69.1	05/18/18 19:14	
Fluoranthene	ug/kg	ND	326	47.4	05/18/18 19:14	
Fluorene	ug/kg	ND	326	67.1	05/18/18 19:14	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	326	67.1	05/18/18 19:14	
Naphthalene	ug/kg	ND	326	79.9	05/18/18 19:14	
Phenanthrene	ug/kg	ND	326	54.3	05/18/18 19:14	
Pyrene	ug/kg	ND	326	55.3	05/18/18 19:14	
2-Fluorobiphenyl (S)	%	73	30-110		05/18/18 19:14	
Nitrobenzene-d5 (S)	%	72	23-110		05/18/18 19:14	
Terphenyl-d14 (S)	%	80	28-110		05/18/18 19:14	

LABORATORY CONTROL SAMPLE: 2279169

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1-Methylnaphthalene	ug/kg	1640	1410	86	40-120	
2-Methylnaphthalene	ug/kg	1640	1440	88	26-120	
Acenaphthene	ug/kg	1640	1470	89	46-120	
Acenaphthylene	ug/kg	1640	1480	90	46-120	
Anthracene	ug/kg	1640	1450	89	63-120	
Benzo(a)anthracene	ug/kg	1640	1430	87	61-120	
Benzo(a)pyrene	ug/kg	1640	1330	81	59-120	
Benzo(b)fluoranthene	ug/kg	1640	1400	85	55-120	
Benzo(g,h,i)perylene	ug/kg	1640	1440	88	57-120	
Benzo(k)fluoranthene	ug/kg	1640	1240	76	56-120	
Chrysene	ug/kg	1640	1430	87	64-120	
Dibenz(a,h)anthracene	ug/kg	1640	1410	86	56-120	
Fluoranthene	ug/kg	1640	1470	89	61-120	
Fluorene	ug/kg	1640	1520	93	51-120	
Indeno(1,2,3-cd)pyrene	ug/kg	1640	1410	86	58-120	

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QUALITY CONTROL DATA

Project: Alcoa Badin
Pace Project No.: 92384453

LABORATORY CONTROL SAMPLE: 2279169

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Naphthalene	ug/kg	1640	1360	83	38-120	
Phenanthrene	ug/kg	1640	1440	88	62-120	
Pyrene	ug/kg	1640	1440	88	63-120	
2-Fluorobiphenyl (S)	%			84	30-110	
Nitrobenzene-d5 (S)	%			79	23-110	
Terphenyl-d14 (S)	%			82	28-110	

SAMPLE DUPLICATE: 2279171

Parameter	Units	92384453001 Result	Dup Result	RPD	Max RPD	Qualifiers
1-Methylnaphthalene	ug/kg	ND	ND			
2-Methylnaphthalene	ug/kg	ND	ND			
Acenaphthene	ug/kg	ND	ND			
Acenaphthylene	ug/kg	ND	ND			
Anthracene	ug/kg	ND	ND			
Benzo(a)anthracene	ug/kg	139J	281J			
Benzo(a)pyrene	ug/kg	112J	262J			
Benzo(b)fluoranthene	ug/kg	148J	518			
Benzo(g,h,i)perylene	ug/kg	ND	272J			
Benzo(k)fluoranthene	ug/kg	ND	191J			
Chrysene	ug/kg	108J	359J			
Dibenz(a,h)anthracene	ug/kg	ND	92.3J			
Fluoranthene	ug/kg	118J	334J			
Fluorene	ug/kg	ND	ND			
Indeno(1,2,3-cd)pyrene	ug/kg	ND	227J			
Naphthalene	ug/kg	ND	ND			
Phenanthrene	ug/kg	ND	96.4J			
Pyrene	ug/kg	123J	278J			
2-Fluorobiphenyl (S)	%		56			
Nitrobenzene-d5 (S)	%		58			
Terphenyl-d14 (S)	%		59			

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QUALITY CONTROL DATA

Project: Alcoa Badin
Pace Project No.: 92384453

QC Batch: 411539
QC Batch Method: EPA 3546
Associated Lab Samples: 92384453001

Analysis Method: EPA 8270
Analysis Description: 8270 Solid MSSV Microwave PAH

METHOD BLANK: 2283253
Matrix: Solid
Associated Lab Samples: 92384453001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1-Methylnaphthalene	ug/kg	ND	327	85.1	05/21/18 10:56	
2-Methylnaphthalene	ug/kg	ND	327	70.3	05/21/18 10:56	
Acenaphthene	ug/kg	ND	327	75.2	05/21/18 10:56	
Acenaphthylene	ug/kg	ND	327	77.2	05/21/18 10:56	
Anthracene	ug/kg	ND	327	73.3	05/21/18 10:56	
Benzo(a)anthracene	ug/kg	ND	327	60.4	05/21/18 10:56	
Benzo(a)pyrene	ug/kg	ND	327	62.4	05/21/18 10:56	
Benzo(b)fluoranthene	ug/kg	ND	327	56.4	05/21/18 10:56	
Benzo(g,h,i)perylene	ug/kg	ND	327	83.2	05/21/18 10:56	
Benzo(k)fluoranthene	ug/kg	ND	327	64.4	05/21/18 10:56	
Chrysene	ug/kg	ND	327	43.6	05/21/18 10:56	
Dibenz(a,h)anthracene	ug/kg	ND	327	69.3	05/21/18 10:56	
Fluoranthene	ug/kg	ND	327	47.5	05/21/18 10:56	
Fluorene	ug/kg	ND	327	67.3	05/21/18 10:56	
Indeno(1,2,3-cd)pyrene	ug/kg	ND	327	67.3	05/21/18 10:56	
Naphthalene	ug/kg	ND	327	80.2	05/21/18 10:56	
Phenanthrene	ug/kg	ND	327	54.5	05/21/18 10:56	
Pyrene	ug/kg	ND	327	55.4	05/21/18 10:56	
2-Fluorobiphenyl (S)	%	66	30-110		05/21/18 10:56	
Nitrobenzene-d5 (S)	%	67	23-110		05/21/18 10:56	
Terphenyl-d14 (S)	%	78	28-110		05/21/18 10:56	

LABORATORY CONTROL SAMPLE & LCSD: 2283254 2283255

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
1-Methylnaphthalene	ug/kg	825	659	733	80	89	40-120	11	30	
2-Methylnaphthalene	ug/kg	825	661	723	80	88	26-120	9	30	
Acenaphthene	ug/kg	825	648	690	78	84	46-120	6	30	
Acenaphthylene	ug/kg	825	667	677	81	82	46-120	2	30	
Anthracene	ug/kg	825	692	698	84	85	63-120	1	30	
Benzo(a)anthracene	ug/kg	825	610	713	74	86	61-120	16	30	
Benzo(a)pyrene	ug/kg	825	642	677	78	82	59-120	5	30	
Benzo(b)fluoranthene	ug/kg	825	597	681	72	83	55-120	13	30	
Benzo(g,h,i)perylene	ug/kg	825	706	734	86	89	57-120	4	30	
Benzo(k)fluoranthene	ug/kg	825	566	625	69	76	56-120	10	30	
Chrysene	ug/kg	825	588	670	71	81	64-120	13	30	
Dibenz(a,h)anthracene	ug/kg	825	775	746	94	90	56-120	4	30	
Fluoranthene	ug/kg	825	689	731	83	89	61-120	6	30	
Fluorene	ug/kg	825	680	716	82	87	51-120	5	30	
Indeno(1,2,3-cd)pyrene	ug/kg	825	689	742	84	90	58-120	7	30	

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Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: Alcoa Badin
Pace Project No.: 92384453

LABORATORY CONTROL SAMPLE & LCSD: 2283254 2283255

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Naphthalene	ug/kg	825	655	707	79	86	38-120	8	30	
Phenanthrene	ug/kg	825	674	692	82	84	62-120	3	30	
Pyrene	ug/kg	825	556	632	67	77	63-120	13	30	
2-Fluorobiphenyl (S)	%				74	75	30-110			
Nitrobenzene-d5 (S)	%				67	71	23-110			
Terphenyl-d14 (S)	%				69	77	28-110			

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QUALITY CONTROL DATA

Project: Alcoa Badin
Pace Project No.: 92384453

QC Batch: 410688
QC Batch Method: EPA 3510
Analysis Method: EPA 8270
Analysis Description: 8270 Water MSSV
Associated Lab Samples: 92384453009

METHOD BLANK: 2278329
Matrix: Water
Associated Lab Samples: 92384453009

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
1-Methylnaphthalene	ug/L	ND	10.0	2.8	05/16/18 14:26	
2-Methylnaphthalene	ug/L	ND	10.0	2.8	05/16/18 14:26	
Acenaphthene	ug/L	ND	10.0	3.4	05/16/18 14:26	
Acenaphthylene	ug/L	ND	10.0	3.0	05/16/18 14:26	
Anthracene	ug/L	ND	10.0	2.0	05/16/18 14:26	
Benzo(a)anthracene	ug/L	ND	10.0	1.3	05/16/18 14:26	
Benzo(a)pyrene	ug/L	ND	10.0	1.3	05/16/18 14:26	
Benzo(b)fluoranthene	ug/L	ND	10.0	1.5	05/16/18 14:26	
Benzo(g,h,i)perylene	ug/L	ND	10.0	1.8	05/16/18 14:26	
Benzo(k)fluoranthene	ug/L	ND	10.0	1.8	05/16/18 14:26	
Chrysene	ug/L	ND	10.0	1.3	05/16/18 14:26	
Dibenz(a,h)anthracene	ug/L	ND	10.0	1.9	05/16/18 14:26	
Fluoranthene	ug/L	ND	10.0	1.7	05/16/18 14:26	
Fluorene	ug/L	ND	10.0	3.0	05/16/18 14:26	
Indeno(1,2,3-cd)pyrene	ug/L	ND	10.0	1.7	05/16/18 14:26	
Naphthalene	ug/L	ND	10.0	3.2	05/16/18 14:26	
Phenanthrene	ug/L	ND	10.0	2.4	05/16/18 14:26	
Pyrene	ug/L	ND	10.0	1.2	05/16/18 14:26	
2-Fluorobiphenyl (S)	%	53	45-139		05/16/18 14:26	
Nitrobenzene-d5 (S)	%	66	40-121		05/16/18 14:26	
Terphenyl-d14 (S)	%	76	48-146		05/16/18 14:26	

LABORATORY CONTROL SAMPLE: 2278330

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1-Methylnaphthalene	ug/L	50	19.1	38	34-113	
2-Methylnaphthalene	ug/L	50	19.0	38	33-120	
Acenaphthene	ug/L	50	24.1	48	48-114	
Acenaphthylene	ug/L	50	24.1	48	48-112	
Anthracene	ug/L	50	34.7	69	57-118	
Benzo(a)anthracene	ug/L	50	33.4	67	56-121	
Benzo(a)pyrene	ug/L	50	33.8	68	55-127	
Benzo(b)fluoranthene	ug/L	50	35.6	71	53-128	
Benzo(g,h,i)perylene	ug/L	50	35.2	70	54-125	
Benzo(k)fluoranthene	ug/L	50	36.2	72	51-123	
Chrysene	ug/L	50	33.2	66	58-127	
Dibenz(a,h)anthracene	ug/L	50	36.0	72	53-129	
Fluoranthene	ug/L	50	36.2	72	57-125	
Fluorene	ug/L	50	27.9	56	53-118	
Indeno(1,2,3-cd)pyrene	ug/L	50	35.7	71	55-128	

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REPORT OF LABORATORY ANALYSIS

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(704)875-9092

QUALITY CONTROL DATA

Project: Alcoa Badin
Pace Project No.: 92384453

LABORATORY CONTROL SAMPLE: 2278330

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Naphthalene	ug/L	50	20.1	40	32-120	
Phenanthrene	ug/L	50	34.0	68	57-117	
Pyrene	ug/L	50	34.8	70	55-122	
2-Fluorobiphenyl (S)	%			52	45-139	
Nitrobenzene-d5 (S)	%			60	40-121	
Terphenyl-d14 (S)	%			70	48-146	

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QUALITY CONTROL DATA

Project: Alcoa Badin
Pace Project No.: 92384453

QC Batch: 410437 | Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 | Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 92384453001, 92384453002, 92384453003, 92384453004, 92384453005, 92384453006

SAMPLE DUPLICATE: 2277234

Parameter	Units	92384450001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	12.1	13.1	7	25	

SAMPLE DUPLICATE: 2277235

Parameter	Units	92384292043 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	4.9	4.9	2	25	

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QUALITY CONTROL DATA

Project: Alcoa Badin
Pace Project No.: 92384453

QC Batch: 410592
QC Batch Method: ASTM D2974-87
Analysis Method: ASTM D2974-87
Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 92384453007, 92384453008

SAMPLE DUPLICATE: 2277762

Parameter	Units	92384210001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	42.6	42.8	0	25	

SAMPLE DUPLICATE: 2277763

Parameter	Units	92384395002 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	14.0	14.3	2	25	

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Huntersville, NC 28078
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QUALIFIERS

Project: Alcoa Badin
Pace Project No.: 92384453

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-C	Pace Analytical Services - Charlotte

ANALYTE QUALIFIERS

D3	Sample was diluted due to the presence of high levels of non-target analytes or other matrix interference.
D6	The precision between the sample and sample duplicate exceeded laboratory control limits.
S4	Surrogate recovery not evaluated against control limits due to sample dilution.
S5	Surrogate recovery outside control limits due to matrix interferences (not confirmed by re-analysis).

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: Alcoa Badin
Pace Project No.: 92384453

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92384453009	**ABF-EB001-F002**	EPA 3510	410871	EPA 8082	411040
92384453002	**ABF-SB052-F002**	EPA 3546	410463	EPA 8082	410594
92384453003	**ABF-SB053-F002**	EPA 3546	410463	EPA 8082	410594
92384453004	**ABF-SB054-F002**	EPA 3546	410463	EPA 8082	410594
92384453005	**ABF-SB055-F002**	EPA 3546	410463	EPA 8082	410594
92384453006	**ABF-SB055-D002**	EPA 3546	410463	EPA 8082	410594
92384453007	**ABF-SB056-F002**	EPA 3546	410463	EPA 8082	410594
92384453008	**ABF-SB057-F002**	EPA 3546	410463	EPA 8082	410594
92384453001	**ABF-SD003-F002**	EPA 3546	411539	EPA 8270	411599
92384453002	**ABF-SB052-F002**	EPA 3546	410815	EPA 8270	411430
92384453003	**ABF-SB053-F002**	EPA 3546	410815	EPA 8270	411430
92384453004	**ABF-SB054-F002**	EPA 3546	410815	EPA 8270	411430
92384453005	**ABF-SB055-F002**	EPA 3546	410815	EPA 8270	411430
92384453006	**ABF-SB055-D002**	EPA 3546	410815	EPA 8270	411430
92384453007	**ABF-SB056-F002**	EPA 3546	410815	EPA 8270	411430
92384453008	**ABF-SB057-F002**	EPA 3546	410815	EPA 8270	411430
92384453009	**ABF-EB001-F002**	EPA 3510	410688	EPA 8270	410968
92384453001	**ABF-SD003-F002**	ASTM D2974-87	410437		
92384453002	**ABF-SB052-F002**	ASTM D2974-87	410437		
92384453003	**ABF-SB053-F002**	ASTM D2974-87	410437		
92384453004	**ABF-SB054-F002**	ASTM D2974-87	410437		
92384453005	**ABF-SB055-F002**	ASTM D2974-87	410437		
92384453006	**ABF-SB055-D002**	ASTM D2974-87	410437		
92384453007	**ABF-SB056-F002**	ASTM D2974-87	410592		
92384453008	**ABF-SB057-F002**	ASTM D2974-87	410592		

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Pace Analytical®	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: February 7, 2018 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.06	Issuing Authority: Pace Carolinas Quality Office

Laboratory receiving samples:
Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☑ Raleigh ☐ Mechanicsville ☐

Sample Condition Upon Receipt

Client Name: Environeering

Project #: WO# : 92384453

92384453

Courier: ☐ Commercial ☑ Pace ☐ Fed Ex ☐ UPS ☐ USPS ☐ Other:____ ☐ Client

Custody Seal Present? ☐ Yes ☑ No **Seals Intact?** ☐ Yes ☑ No

Date/Initials Person Examining Contents: 2105-1-18

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other

Biological Tissue Frozen? ☐ Yes ☐ No ☑ N/A

Thermometer: ☑ IR Gun ID: 92T040

Type of Ice: ☑ Wet ☐ Blue ☐ None

Cooler Temp (°C): 5.0 **Correction Factor:** Add/Subtract (°C) +0.4

Cooler Temp Corrected (°C): 5.4

Temp should be above freezing to 6°C
☐ Samples out of temp criteria. Samples on ice, cooling process has begun

USDA Regulated Soil (☑ N/A, water sample)
Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☑ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

				Comments/Discrepancy:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	4.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	7.
Dissolved analysis: Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8.
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	9.
-Includes Date/Time/ID/Analysis Matrix: WT				
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☑ N/A	10.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	11.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	

COMMENTS/SAMPLE DISCREPANCY

Field Data Required? ☐ Yes ☐ No

Lot ID of split containers:

CLIENT NOTIFICATION/RESOLUTION

Person contacted: _____ Date/Time: _____

Project Manager SCURF Review: ACP **Date:** 051418

Project Manager SRF Review: NMG **Date:** 5/14/18

Pace Analytical®	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: February 7, 2018 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.06	Issuing Authority: Pace Carolinas Quality Office

***Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.**

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

****Bottom half of box is to list number of bottle**

Project # **WO# : 92384453**

PM: NMG Due Date: 05/21/18

CLIENT: 92-Al-ba

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)		BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	AG0U-100 mL Amber Unpreserved vials (N/A)	VSGU-20 mL Scintillation vials (N/A)	DG9U-40 mL Amber Unpreserved vials (N/A)
1																													
2									3																				
3									3																				
4									3																				
5									3																				
6									3																				
7									3																				
8									3																				
9										2																4			
10																													
11																													
12																													

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

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

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CHAIN-OF-CUSTODY / Analytical Request Document

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

Page: | of |

2241649

Section A Required Client Information:

Company: ENVIRONCORP
Address: 16100 CARLWOOD STE 320
HOUSTON TX 77079
Email To: M.WORDEN
Phone: 832 674 5800 Fax:
Requested Due Date/TAT: STD

Section B Required Project Information:

Report To: M. WORDEN
Copy To:
Purchase Order No.:
Project Name: ALCOA BADIN
Project Number: 137-263

Section C Invoice Information:

Attention: M. WORDEN
Company Name: ENVIRONCORP
Address: HOUSTON TX
Pace Quote Reference:
Pace Project Manager: NICOLE GASPOWSKI
Pace Profile #: 7478-3,4

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☒ RCRA ☐ OTHER

Site Location STATE: NC

Section D Required Client Information

Matrix Codes MATRIX / CODE: Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED COMPOSITE START DATE	COLLECTED COMPOSITE START TIME	COLLECTED COMPOSITE END/GRAB DATE	COLLECTED COMPOSITE END/GRAB TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	Methanol	Other	Analysis Test (Y/N): 8260 SVOCs	8082 PCBs	1,4-D Compounds	8270 SVOCs	8082 PCBs	1,4-D Compounds	Residual Chlorine (Y/N)	Pace Project No./ Lab I.D. 92384453
1	ABF-SD003-F002	SL	G	5/9/18		5/9/18	1035		1	X								X							001
2	ABF-SB052-F002	SL	G				1155		3	X								X	X	X					002
3	ABF-SB053-F002	SL	G				1210		3	X								X	X	X					003
4	ABF-SB054-F002	SL	G				1230		3	X								X	X	X					004
5	ABF-SB055-F002	SL	G				1350		3	X								X	X	X					005
6	ABF-SB055-D002	SL	G				1355		3	X								X	X	X					006
7	ABF-SB056-F002	SL	G				1330		3	X								X	X	X					007
8	ABF-SB057-F002	SL	G				1385		3	X								X	X	X					008
9	ABF-EB001-F002	WT	G				1430		6	X											X	X	X		009
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
		5/10/18	1522		5.10.18	1522
		5/11/18			5/11/18	8:00
		5/11/18	1245		5-11-18	1245

SAMPLE CONDITIONS: Temp in °C: 5.4; Received on Ice (Y/N): Y; Custody Sealed Cooler (Y/N): N; Samples Intact (Y/N): Y

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: MICHAEL WORDEN

SIGNATURE of SAMPLER:

DATE Signed (MM/DD/YY): 5/9/18

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

Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

www.pacelabs.com

Report Prepared for:

Client - Charlotte
PACE Charlotte
9800 Kincey Ave.
Huntersville NC 28078

REPORT OF LABORATORY ANALYSIS FOR PCBs

Report Prepared Date:
May 31, 2018

Report Information:

Pace Project #: 10431169
Sample Receipt Date: 05/15/2018
Client Project #: 92384453 Alcoa-Badin Works (
Client Sub PO #: N/A
State Cert #: 27700

Invoicing & Reporting Options:

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

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

This report has been reviewed by:

May 31, 2018
Nathan Boberg, Project Manager

(612) 607-6444 (fax)
nathan.boberg@pacelabs.com

Report of Laboratory Analysis

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

Pace Analytical Services, Inc.
1700 Elm Street
Minneapolis, MN 55414
Phone: 612.607.1700
Fax: 612.607.6444

DISCUSSION

This report presents the results from the analyses performed on eight samples submitted by a representative of Pace Analytical - NC. The samples were analyzed for the presence or absence of polychlorinated biphenyl (PCB) congeners using USEPA Method 1668A. Reporting limits were set to 25-75 parts-per-trillion for solids and 0.25-0.75 parts-per-trillion for water. These results were adjusted for the amount of sample extracted. It should be noted that the Pace sample IDs written on the chain of custody form were off by one. The Pace sample IDs for this project were 10431169002-9 instead of 10431169001-8.

The dilution level noted on the data tables is being adjusted to allow the correct data flags to populate the electronic deliverables as well as the data tables. Samples and MDL extracts were analyzed at elevated volumes. That volume is being treated as a 1x dilution for calculation purposes, with larger dilutions being factored from that volume. The standard reporting limits were not adjusted since the limits remained within the calibration range even after dilutions were applied.

The recoveries of the isotopically-labeled PCB internal standards in the sample extracts ranged from 21-109%. With one exception, flagged "R", the labeled standard recoveries obtained for this project were within the target ranges specified in Method 1668A. Since the quantification of the native congeners was based on isotope dilution and internal standard methodology, the data were automatically corrected for variation in recovery and accurate values were obtained.

Incorrect isotope ratios were obtained for selected PCB congeners. The affected congeners were flagged "I" on the results table. Any associated target analyte detections were provided under the estimated maximum possible concentration (EMPC) column on the results table. If EMPCs were reported for congeners with WHO toxicity factors, the EMPC levels were included in the calculation of the toxic equivalence.

A laboratory method blank was prepared and analyzed with each sample batch as part of our routine quality control procedures. The results show the blanks to be free of PCB congeners at the reporting limits. This indicates that the sample preparation procedures did not significantly contribute to the PCB content of the sample material.

Laboratory spike samples were also prepared with the sample batch using reference material that had been fortified with native standards. The results show that the spiked native compounds were recovered at 83-133%, with relative percent differences of 0.0-31.3%. The RPD for congener #54 in one spike pair was above the 20% limit used

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Pace Analytical Services, Inc.
1700 Elm Street
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DISCUSSION

by Pace analytical. This could indicate a higher than normal variability in the Tetra-CB results from the associated sample extracts. However, these values were within method limits. Matrix spikes were not extracted with these sample batches.

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Minnesota Laboratory Certifications

Authority	Certificate #	Authority	Certificate #
A2LA	2926.01	Mississippi	MN00064
Alabama	40770	Montana	CERT0092
Alaska	MN00064	Nebraska	NE-OS-18-06
Alaska	UST-078	Nevada	MN00064
Arizona	AZ0014	New Jersey (NE	MN002
Arkansas	88-0680	New York (NEL	11647
CNMI Saipan	MP0003	New hampshire	2081
California	MN00064	North Carolina	27700
Colorado	MN00064	North Carolina	530
Connecticut	PH-0256	North Dakota	R-036
EPA Region 8	8TMS-L	Ohio	41244
Florida (NELAP	E87605	Ohio VAP	CL101
Georgia (EDP)	959	Oklahoma	9507
Guam EPA	959	Oregon (ELAP)	MN200001
Hawaii	MN00064	Oregon (OREL	MN300001
Idaho	MN00064	Pennsylvania	68-00563
Illinois	200011	Puerto Rico	MN00064
Indiana	C-MN-01	South Carolina	74003001
Iowa	368	Tennessee	TN02818
Kansas	E-10167	Texas	T104704192
Kentucky	90062	Utah (NELAP)	MN00064
Louisiana	03086	Virginia	460163
Louisiana	MN00064	Washington	C486
Maine	MN00064	West Virginia #	9952C
Maryland	322	West Virginia D	382
Michigan	9909	Wisconsin	999407970
Minnesota	027-053-137	Wyoming	8TMS-L

REPORT OF LABORATORY ANALYSIS

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Appendix A

Sample Management

WO# : 10431169

10431169

Subcontracting Laboratory.

State Of Origin: NC

Pace Analytical®
www.pacelabs.com

Workorder: 92384453 **Workorder Name:** Alcoa Badin

Owner Received Date: 5/10/2018 **Results Requested By:** 5/21/2018

Report To

Nicole Gasiorowski
Pace Analytical Charlotte
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
Phone (704)875-9092

Subcontract To

Pace Analytical Minnesota
1700 Elm Street SE
Suite 200
Minneapolis, MN 55414
Phone (612)607-1700

Requested Analysis

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers: Unpreserved	1668: PCB Congeners (209)	LAB USE ONLY
1	ABF-SB052-F002	PS	5/9/2018 11:55	92384453002	Solid	1	X	001
2	ABF-SB053-F002	PS	5/9/2018 12:10	92384453003	Solid	1	X	002
3	ABF-SB054-F002	PS	5/9/2018 12:30	92384453004	Solid	1	X	003
4	ABF-SB055-F002	PS	5/9/2018 13:50	92384453005	Solid	1	X	004
5	ABF-SB055-D002	PS	5/9/2018 13:55	92384453006	Solid	1	X	005
6	ABF-SB056-F002	PS	5/9/2018 13:30	92384453007	Solid	1	X	006
7	ABF-SB057-F002	PS	5/9/2018 13:05	92384453008	Solid	1	X	007
8	ABF-EB001-F002	PS	5/9/2018 14:30	92384453009	Water	2	X	008

Transfers	Released By	Date/Time	Received By	Date/Time
1	[illegible]	5/14/2018	[illegible] DACLS	5/15/18 930
2				
3				

Comments: Stanley County, NC

Cooler Temperature on Receipt 3.1 °C | **Custody Seal** Y or (N) | **Received on Ice** (Y) or N | **Samples Intact** (Y) or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC document. This chain of custody is considered complete as is since this information is available in the owner laboratory.*

Pace Analytical	Document Name: Sample Condition Upon Receipt Form	Document Revised: 02May2018 Page 1 of 2
	Document No.: F-MN-L-213-rev.23	Issuing Authority: Pace Minnesota Quality Office

Sample Condition Upon Receipt

Client Name: PACE CHARLOTTE

Project #: **WO#: 10431169**
PM: NB3 Due Date: 05/21/18
CLIENT: PASI-CHRLT

Courier: ☑ Fed Ex ☐ UPS ☐ USPS ☐ Client ☐ Commercial ☐ Pace ☐ SpeeDee ☐ Other:

Tracking Number: 4394 2201 6061

Custody Seal on Cooler/Box Present? ☐ Yes ☑ No Seals Intact? ☐ Yes ☑ No

Optional: Proj. Due Date: Proj. Name:

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other:

Temp Blank? ☑ Yes ☑ No

Thermometer Used: ☐ G87A9170600254 ☑ G87A9155100842

Type of Ice: ☑ Wet ☐ Blue ☐ None ☐ Dry ☐ Melted

Cooler Temp Read (°C): 3.1 Cooler Temp Corrected (°C): 3.1

Biological Tissue Frozen? ☐ Yes ☐ No ☑ N/A

Temp should be above freezing to 6°C Correction Factor: TRUE

Date and Initials of Person Examining Contents: BWP 5/19/18

USDA Regulated Soil (☐ N/A, water sample)

Did samples originate in a quarantine zone within the United States: AL, AR, CA, FL, GA, ID, LA, MS, NC, NM, NY, OK, OR, SC, TN, TX or VA (check maps)? ☑ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☑ No

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

				COMMENTS:
Chain of Custody Present?	☑ Yes	☐ No		1.
Chain of Custody Filled Out?	☑ Yes	☐ No		2.
Chain of Custody Relinquished?	☑ Yes	☐ No		3.
Sampler Name and/or Signature on COC?	☐ Yes	☐ No	☑ N/A	4.
Samples Arrived within Hold Time?	☑ Yes	☐ No		5.
Short Hold Time Analysis (<72 hr)?	☐ Yes	☑ No		6.
Rush Turn Around Time Requested?	☑ Yes	☐ No		7.
Sufficient Volume?	☑ Yes	☐ No		8.
Correct Containers Used?	☑ Yes	☐ No		9.
-Pace Containers Used?	☑ Yes	☐ No		
Containers Intact?	☑ Yes	☐ No		10.
Filtered Volume Received for Dissolved Tests?	☐ Yes	☐ No	☑ N/A	11. Note if sediment is visible in the dissolved container
Is sufficient information available to reconcile the samples to the COC? Matrix: SC/WT	☑ Yes	☐ No		12.
All containers needing acid/base preservation have been checked?	☐ Yes	☐ No	☑ N/A	13. ☐ HNO_3 ☐ H_2SO_4 ☐ NaOH Positive for Res. Chlorine? Y N Sample #
All containers needing preservation are found to be in compliance with EPA recommendation? (HNO_3, H_2SO_4, <2pH, NaOH >9 Sulfide, NaOH>12 Cyanide)	☐ Yes	☐ No	☑ N/A	
Exceptions: VOA, Coliform, TOC/DOC Oil and Grease, DRO/8015 (water) and Dioxin/PFAS	☐ Yes	☐ No	☑ N/A	Initial when completed: Lot # of added preservative:
Headspace in VOA Vials (>6mm)?	☐ Yes	☐ No	☑ N/A	14.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	15.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	
Pace Trip Blank Lot # (if purchased):				

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? ☐ Yes ☐ No

Person Contacted: Date/Time:

Comments/Resolution:

Project Manager Review: Nathan Boberg Date: 5/15/18

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

USDA REGULATED SOIL CHECKLIST

To Be Completed by SR Staff:

WO: 92384453/10431169 Date: 5/15/18 Initials: HWF

Sample Origin (circle one): DOMESTIC QUARANTINED FOREIGN

(Note: soil samples from Hawaii, Guam, Puerto Rico and the US Virgin Islands are considered to be of a Foreign Source)

If Domestic, circle State of Origin: AL AR CA FL GA LA MS NC NM NY OK OR SC TN TX VA

(Includes: IFA, SOD, Golden Nematode, Karnal Bunt and Witchweed) List County: STONLY

(USDA Permit/Compliance Agreement authorizes movement of samples from these domestic regulated zones)

If Quarantined, circle State of Origin: FL ID TX CA List County:

(Includes Fruit Fly, Giant African Snail and Pale Cyst Nematode)

(Movement is not authorized for Pale Cyst Nematode [ID or Giant African Snail [FL], remaining quarantines require additional paperwork)

If Foreign, list Country of Origin:

(Movement from some Canadian Providences is not allowed. Refer to CS-232 Regulated Soil Flow Chart)

REQUIREMENT	ACTION	COMPLETED
PPQ-530 Paperwork must be included for any samples from counties with a Fruit Fly Quarantine in TX. Refer to **MN-S063** through **MN-S065**	Scan PPQ-530 to the corresponding Project folder on the x drive. If PPQ-530 is not present, contact the Waste Coordinator and do not continue processing samples.	YES NO N/A
Samples from ID may not be moved from the quarantined region. Refer to **MN-S055**	If samples originated in a quarantined zone, contact the Waste Coordinator and do not continue processing samples.	YES NO N/A
Samples from Giant African Snail Quarantine in FL may not be moved from the quarantined region. Refer to **MN-S068**	If samples originated in a quarantined zone, contact the Waste Coordinator and do not continue processing samples.	YES NO N/A

REQUIREMENT	ACTION	COMPLETED
"Special Handling" stickers are to be placed on all samples.	Did "special handling" stickers get placed on all sample containers?	YES NO
Samples must be segregated and stored in designated bins, shelves and coolers.	Were samples placed in a designated cooler, containers and shelves?	YES NO
Samples must be double contained to prevent accidental release.	Were there any signs of breakage or leakage (check for broken glass and/or loose soil in the cooler)? *If NO, ice and melt water can be disposed of by normal process (down the drain).*	YES NO
	If **YES**, were ice and melt water separated from the cooler and disposed of properly? **Any broken glass and/or loose soil are to be bagged and placed in a USDA Regulated satellite container or active drum (see Waste Coordinator).** **Ice and melt water should be baked at a temperature range of 121-154°F for 2 hours and then cooled before going down the drain.**	YES NO N/A
Equipment and supplies that have come into contact samples must be decontaminated.	Was the cooler(s) and/or countertop(s) decontaminated using either a fresh 10% bleach solution or 70% ethanol? *(Gloves and other lab supplies will be bagged and placed in the USDA Regulated satellite container or active drum).*	YES NO

Comments:

To Be Completed by PM and/or PC:

Sample Analysis to be conducted (circle all that apply): MN Subcontract Lab

Name of Subcontract Lab (s): _____

REQUIREMENT	ACTION	COMPLETED
Permission to ship untreated soil must be on file prior to shipping to any subcontract lab, including IR Pace Labs.	Go to: J:\SHARE\PRJ_MGR\10_Client Services Department Documents\Regulated Soils Permits – if permission to ship letter is not there, contact the Waste Coordinator.	YES NO N/A
Shipment must include a valid copy of the receiving lab's permit as well as permission to ship letter.	Is a copy of all needed paperwork included with the COC? Do **NOT** ship samples until all necessary paperwork is compiled.	YES NO N/A

Comments: _____

Project Manager Signature: Nathan Boberg Date: 5/15/18

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

Tel: 612-607-1700
Fax: 612- 607-6444

Reporting Flags

A = Reporting Limit based on signal to noise

B = Less than 10x higher than method blank level

C = Result obtained from confirmation analysis

D = Result obtained from analysis of diluted sample

E = Exceeds calibration range

I = Interference present

J = Estimated value

Nn = Value obtained from additional analysis

P = PCDE Interference

R = Recovery outside target range

S = Peak saturated

U = Analyte not detected

V = Result verified by confirmation analysis

X = %D Exceeds limits

Y = Calculated using average of daily RFs

* = See Discussion

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Appendix B

Sample Analysis Summary

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

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl Sample Analysis Results

Client - PACE Charlotte

Client's Sample ID	ABF-SB052-F002		
Lab Sample ID	92384453002		
Filename	P180530A_07		
Injected By	CVS		
Total Amount Extracted	14.8 g	Matrix	Solid
% Moisture	31.3	Dilution	NA
Dry Weight Extracted	10.2 g	Collected	05/09/2018 11:55
ICAL ID	P180530A03	Received	05/15/2018 09:30
CCal Filename(s)	P180530A_04	Extracted	05/16/2018 15:10
Method Blank ID	BLANK-62337	Analyzed	05/30/2018 15:56

PCB Isomer	IUPAC	RT	Ratio	ng's Added	ng's Found	% Recovery
Labeled Analytes						
13C-2-MoCB	1	9.975	2.80	2.0	0.918	46
13C-4-MoCB	3	12.899	3.14	2.0	0.993	50
13C-2,2'-DiCB	4	13.210	1.49	2.0	0.934	47
13C-4,4'-DiCB	15	20.530	1.52	2.0	1.15	58
13C-2,2',6-TrCB	19	17.151	1.09	2.0	1.53	77
13C-3,4,4'-TrCB	37	28.322	1.13	2.0	1.52	76
13C-2,2',6,6'-TeCB	54	20.859	0.77	2.0	1.19	60
13C-3,4,4',5-TeCB	81	35.488	0.82	2.0	1.30	65
13C-3,3',4,4'-TeCB	77	36.092	0.83	2.0	1.53	76
13C-2,2',4,6,6'-PeCB	104	26.930	1.62	2.0	1.15	58
13C-2,3,3',4,4'-PeCB	105	39.686	1.60	2.0	1.43	72
13C-2,3,4,4',5-PeCB	114	39.015	1.59	2.0	1.43	71
13C-2,3',4,4',5-PeCB	118	38.445	1.49	2.0	1.40	70
13C-2,3',4,4',5'-PeCB	123	38.092	1.72	2.0	1.39	70
13C-3,3',4,4',5-PeCB	126	42.855	1.49	2.0	1.60	80
13C-2,2',4,4',6,6'-HxCB	155	32.989	1.26	2.0	1.06	53
13C-HxCB(156/157)	156/157	45.913	1.35	4.0	2.66	66
13C-2,3',4,4',5,5'-HxCB	167	44.722	1.27	2.0	1.38	69
13C-3,3',4,4',5,5'-HxCB	169	49.234	1.28	2.0	1.63	82
13C-2,2',3,4',5,6,6'-HpCB	188	38.914	1.09	2.0	1.05	53
13C-2,3,3',4,4',5,5'-HpCB	189	51.658	0.98	2.0	1.43	71
13C-2,2',3,3',5,5',6,6'-OcCB	202	44.420	0.91	2.0	1.02	51
13C-2,3,3',4,4',5,5',6-OcCB	205	53.685	0.91	2.0	1.36	68
13C-2,2',3,3',4,4',5,5',6-NoCB	206	55.194	0.79	2.0	1.19	59
13C-2,2',3,3',4,5,5',6,6'-NoCB	208	51.184	0.84	2.0	1.12	56
13C--DeCB	209	56.746	0.65	2.0	1.15	58
CleanupStandards						
13C-2,4,4'-TrCB	28	23.911	1.19	2.0	1.48	74
13C-2,3,3',5,5'-PeCB	111	36.058	1.64	2.0	1.25	62
13C-2,2',3,3',5,5',6-HpCB	178	42.067	1.03	2.0	1.16	58
Recovery Standards						
13C-2,5-DiCB	9	15.713	1.64	2.0	NA	NA
13C-2,2',5,5'-TeCB	52	25.924	0.86	2.0	NA	NA
13C-2,2',4,5,5'-PeCB	101	33.241	1.47	2.0	NA	NA
13C-2,2',3,4,4',5'-HxCB	138	41.631	1.24	2.0	NA	NA
13C-2,2',3,3',4,4',5,5'-OcCB	194	53.297	0.94	2.0	NA	NA

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
Nn = Value obtained from additional analyses

Results reported on a dry weight basis

ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion
X = Outside QC Limits
RT = Retention Time
I = Interference
ng's = Nanograms

REPORT OF LABORATORY ANALYSIS

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

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB052-F002
Lab Sample ID 92384453002
Filename P180530A_07

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
1		---	---	ND	---	24.6
2		---	---	ND	---	24.6
3		---	---	ND	---	24.6
4		---	---	ND	---	24.6
5		---	---	ND	---	24.6
6		---	---	ND	---	24.6
7		---	---	ND	---	24.6
8		16.779	1.31 I	---	31.2	24.6
9		---	---	ND	---	24.6
10		---	---	ND	---	24.6
11		---	---	ND	---	241
12	12/13	---	---	ND	---	49.2
13	12/13	---	---	ND	---	49.2
14		---	---	ND	---	24.6
15		20.554	1.45	55.4	---	32.5
16		---	---	ND	---	24.6
17		---	---	ND	---	24.6
18	18/30	---	---	ND	---	49.2
19		---	---	ND	---	24.6
20	20/28	---	---	ND	---	127
21	21/33	---	---	ND	---	133
22		---	---	ND	---	93.4
23		---	---	ND	---	24.6
24		---	---	ND	---	24.6
25		---	---	ND	---	24.6
26	26/29	---	---	ND	---	49.2
27		---	---	ND	---	24.6
28	20/28	---	---	ND	---	127
29	26/29	---	---	ND	---	49.2
30	18/30	---	---	ND	---	49.2
31		---	---	ND	---	128
32		---	---	ND	---	24.6
33	21/33	---	---	ND	---	133
34		---	---	ND	---	24.6
35		---	---	ND	---	24.6
36		---	---	ND	---	24.6
37		---	---	ND	---	52.1
38		---	---	ND	---	24.6
39		---	---	ND	---	24.6
40	40/41/71	---	---	ND	---	148
41	40/41/71	---	---	ND	---	148
42		---	---	ND	---	49.2
43	43/73	---	---	ND	---	49.2
44	44/47/65	---	---	ND	---	148
45	45/51	---	---	ND	---	98.4
46		---	---	ND	---	49.2
47	44/47/65	---	---	ND	---	148
48		---	---	ND	---	49.2

Conc = Concentration
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A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
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RT = Retention Time
I = Interference
ng's = Nanograms

REPORT OF LABORATORY ANALYSIS

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

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB052-F002
Lab Sample ID 92384453002
Filename P180530A_07

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
49	49/69	---	---	ND	---	98.4
50	50/53	---	---	ND	---	98.4
51	45/51	---	---	ND	---	98.4
52		---	---	ND	---	151
53	50/53	---	---	ND	---	98.4
54		---	---	ND	---	49.2
55		---	---	ND	---	49.2
56		32.167	0.71	55.8	---	49.2
57		---	---	ND	---	49.2
58		---	---	ND	---	49.2
59	59/62/75	---	---	ND	---	148
60		---	---	ND	---	49.2
61	61/70/74/76	---	---	ND	---	197
62	59/62/75	---	---	ND	---	148
63		---	---	ND	---	49.2
64		---	---	ND	---	49.2
65	44/47/65	---	---	ND	---	148
66		31.463	0.81	104	---	82.6
67		---	---	ND	---	49.2
68		---	---	ND	---	49.2
69	49/69	---	---	ND	---	98.4
70	61/70/74/76	---	---	ND	---	197
71	40/41/71	---	---	ND	---	148
72		---	---	ND	---	49.2
73	43/73	---	---	ND	---	49.2
74	61/70/74/76	---	---	ND	---	197
75	59/62/75	---	---	ND	---	148
76	61/70/74/76	---	---	ND	---	197
77		---	---	ND	---	49.2
78		---	---	ND	---	49.2
79		---	---	ND	---	49.2
80		---	---	ND	---	49.2
81		---	---	ND	---	49.2
82		---	---	ND	---	49.2
83		---	---	ND	---	49.2
84		---	---	ND	---	49.2
85	85/116/117	---	---	ND	---	148
86	86/87/97/108/119/125	---	---	ND	---	295
87	86/87/97/108/119/125	---	---	ND	---	295
88	88/91	---	---	ND	---	98.4
89		---	---	ND	---	49.2
90	90/101/113	33.274	1.48	183	---	148
91	88/91	---	---	ND	---	98.4
92		---	---	ND	---	49.2
93	93/98/100/102	---	---	ND	---	197
94		---	---	ND	---	49.2
95		30.188	1.55	140	---	93.4
96		---	---	ND	---	49.2

Conc = Concentration
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REPORT OF LABORATORY ANALYSIS

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

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB052-F002
Lab Sample ID 92384453002
Filename P180530A_07

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
97	86/87/97/108/119/125	---	---	ND	---	295
98	93/98/100/102	---	---	ND	---	197
99		33.895	1.46	79.1	---	49.2
100	93/98/100/102	---	---	ND	---	197
101	90/101/113	33.274	1.48	(183)	---	148
102	93/98/100/102	---	---	ND	---	197
103		---	---	ND	---	49.2
104		---	---	ND	---	49.2
105		39.719	1.42	156	---	49.2
106		---	---	ND	---	49.2
107	107/124	---	---	ND	---	98.4
108	86/87/97/108/119/125	---	---	ND	---	295
109		---	---	ND	---	49.2
110	110/115	35.354	1.52	294	---	98.4
111		---	---	ND	---	49.2
112		---	---	ND	---	49.2
113	90/101/113	33.274	1.48	(183)	---	148
114		---	---	ND	---	49.2
115	110/115	35.354	1.52	(294)	---	98.4
116	85/116/117	---	---	ND	---	148
117	85/116/117	---	---	ND	---	148
118		38.461	1.59	357	---	62.9
119	86/87/97/108/119/125	---	---	ND	---	295
120		---	---	ND	---	49.2
121		---	---	ND	---	49.2
122		---	---	ND	---	49.2
123		---	---	ND	---	49.2
124	107/124	---	---	ND	---	98.4
125	86/87/97/108/119/125	---	---	ND	---	295
126		---	---	ND	---	49.2
127		---	---	ND	---	49.2
128	128/166	43.006	1.21	475	---	98.4
129	129/138/163	41.665	1.23	3320	---	148
130		40.994	1.41	95.9	---	49.2
131		---	---	ND	---	49.2
132		38.579	1.16	232	---	49.2
133		---	---	ND	---	49.2
134	134/143	---	---	ND	---	98.4
135	135/151	36.293	1.21	491	---	98.4
136		33.828	1.26	75.8	---	49.2
137		41.212	1.24	59.3	---	49.2
138	129/138/163	41.665	1.23	(3320)	---	148
139	139/140	---	---	ND	---	98.4
140	139/140	---	---	ND	---	98.4
141		40.591	1.37	283	---	49.2
142		---	---	ND	---	49.2
143	134/143	---	---	ND	---	98.4
144		---	---	ND	---	49.2

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Tel: 612-607-1700
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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB052-F002
Lab Sample ID 92384453002
Filename P180530A_07

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
145		---	---	ND	---	49.2
146		39.736	1.24	472	---	49.2
147	147/149	37.254	1.19	725	---	98.4
148		---	---	ND	---	49.2
149	147/149	37.254	1.19	(725)	---	98.4
150		---	---	ND	---	49.2
151	135/151	36.293	1.21	(491)	---	98.4
152		---	---	ND	---	49.2
153	153/168	40.356	1.24	2390	---	98.4
154		---	---	ND	---	49.2
155		---	---	ND	---	49.2
156	156/157	45.930	1.22	209	---	98.4
157	156/157	45.930	1.22	(209)	---	98.4
158		42.067	1.19	277	---	49.2
159		43.917	1.30	72.4	---	49.2
160		---	---	ND	---	49.2
161		---	---	ND	---	49.2
162		---	---	ND	---	49.2
163	129/138/163	41.665	1.23	(3320)	---	148
164		41.346	1.24	232	---	49.2
165		---	---	ND	---	49.2
166	128/166	43.006	1.21	(475)	---	98.4
167		44.756	1.23	135	---	49.2
168	153/168	40.356	1.24	(2390)	---	98.4
169		---	---	ND	---	49.2
170		48.613	1.05	1850	---	49.2
171	171/173	45.007	1.01	536	---	98.4
172		46.634	0.97	364	---	49.2
173	171/173	45.007	1.01	(536)	---	98.4
174		43.917	1.05	1630	---	49.2
175		42.721	0.91	66.3	---	49.2
176		40.239	1.09	140	---	49.2
177		44.370	1.05	1060	---	49.2
178		42.084	1.01	416	---	49.2
179		39.317	1.06	672	---	49.2
180	180/193	47.305	1.04	4330	---	98.4
181		---	---	ND	---	49.2
182		---	---	ND	---	49.2
183	183/185	43.666	1.09	999	---	98.4
184		---	---	ND	---	49.2
185	183/185	43.666	1.09	(999)	---	98.4
186		---	---	ND	---	49.2
187		43.023	1.05	2490	---	49.2
188		---	---	ND	---	49.2
189		51.680	1.03	76.2	---	49.2
190		49.150	1.01	446	---	49.2
191		47.674	1.07	66.5	---	49.2
192		---	---	ND	---	49.2

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB052-F002
Lab Sample ID 92384453002
Filename P180530A_07

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
193	180/193	47.305	1.04	(4330)	---	98.4
194		53.318	0.88	1220	---	73.8
195		51.464	0.86	516	---	73.8
196		49.955	0.93	543	---	73.8
197	197/200	46.450	0.92	193	---	148
198	198/199	49.284	0.89	1540	---	148
199	198/199	49.284	0.89	(1540)	---	148
200	197/200	46.450	0.92	(193)	---	148
201		45.410	0.96	144	---	73.8
202		44.454	0.82	291	---	73.8
203		50.156	0.92	903	---	73.8
204		---	---	ND	---	73.8
205		---	---	ND	---	73.8
206		55.215	0.76	707	---	73.8
207		52.003	0.67	77.1	---	73.8
208		51.206	0.79	170	---	73.8
209		56.746	0.66	199	---	73.8

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID	ABF-SB052-F002
Lab Sample ID	92384453002
Filename	P180530A_07

Congener Group	Concentration ng/Kg
Total Monochloro Biphenyls	ND
Total Dichloro Biphenyls	55.4
Total Trichloro Biphenyls	ND
Total Tetrachloro Biphenyls	160
Total Pentachloro Biphenyls	1210
Total Hexachloro Biphenyls	9550
Total Heptachloro Biphenyls	15100
Total Octachloro Biphenyls	5350
Total Nonachloro Biphenyls	953
DecachloroBiphenyls	199
Total PCBs	32600

ND = Not Detected
Results reported on a dry weight basis

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Method 1668A Polychlorobiphenyl Sample Analysis Results

Client - PACE Charlotte

Client's Sample ID	ABF-SB053-F002		
Lab Sample ID	92384453003		
Filename	P180528B_08		
Injected By	BAL		
Total Amount Extracted	13.7 g	Matrix	Solid
% Moisture	27.0	Dilution	NA
Dry Weight Extracted	10.0 g	Collected	05/09/2018 12:10
ICAL ID	P180528B01	Received	05/15/2018 09:30
CCal Filename(s)	P180528B_02	Extracted	05/16/2018 15:10
Method Blank ID	BLANK-62337	Analyzed	05/29/2018 00:21

PCB Isomer	IUPAC	RT	Ratio	ng's Added	ng's Found	% Recovery	
Labeled Analytes							
13C-2-MoCB	1	10.131	3.43	2.0	0.846	42	
13C-4-MoCB	3	13.090	2.72	2.0	0.909	45	
13C-2,2'-DiCB	4	13.402	1.53	2.0	0.772	39	
13C-4,4'-DiCB	15	20.721	1.50	2.0	0.929	46	
13C-2,2',6-TrCB	19	17.330	1.00	2.0	0.846	42	
13C-3,4,4'-TrCB	37	28.527	1.16	2.0	1.13	56	
13C-2,2',6,6'-TeCB	54	21.047	0.83	2.0	0.884	44	
13C-3,4,4',5-TeCB	81	35.676	0.87	2.0	1.11	56	
13C-3,3',4,4'-TeCB	77	36.313	0.79	2.0	1.18	59	
13C-2,2',4,6,6'-PeCB	104	27.135	1.61	2.0	0.833	42	
13C-2,3,3',4,4'-PeCB	105	39.874	1.56	2.0	1.15	58	
13C-2,3,4,4',5-PeCB	114	39.203	1.70	2.0	1.22	61	
13C-2,3',4,4',5-PeCB	118	38.650	1.58	2.0	1.18	59	
13C-2,3',4,4',5'-PeCB	123	38.297	1.62	2.0	1.17	59	
13C-3,3',4,4',5-PeCB	126	43.060	1.66	2.0	1.18	59	
13C-2,2',4,4',6,6'-HxCB	155	33.177	1.25	2.0	0.907	45	
13C-HxCB(156/157)	156/157	46.101	1.23	4.0	0.846	21	R
13C-2,3',4,4',5,5'-HxCB	167	44.910	1.15	2.0	0.528	26	
13C-3,3',4,4',5,5'-HxCB	169	49.404	1.23	2.0	1.08	54	
13C-2,2',3,4',5,6,6'-HpCB	188	39.119	1.05	2.0	2.17	109	
13C-2,3,3',4,4',5,5'-HpCB	189	51.791	1.04	2.0	1.88	94	
13C-2,2',3,3',5,5',6,6'-OcCB	202	44.608	0.89	2.0	1.06	53	
13C-2,3,3',4,4',5,5',6-OcCB	205	53.795	0.97	2.0	1.77	88	
13C-2,2',3,3',4,4',5,5',6-NoCB	206	55.304	0.73	2.0	1.62	81	
13C-2,2',3,3',4,5,5',6,6'-NoCB	208	51.338	0.90	2.0	1.91	95	
13C--DeCB	209	56.877	0.71	2.0	1.69	85	
CleanupStandards							
13C-2,4,4'-TrCB	28	24.083	1.10	2.0	1.21	61	
13C-2,3,3',5,5'-PeCB	111	36.263	1.54	2.0	0.983	49	
13C-2,2',3,3',5,5',6-HpCB	178	42.255	1.06	2.0	0.908	45	
Recovery Standards							
13C-2,5-DiCB	9	16.012	1.58	2.0	NA	NA	
13C-2,2',5,5'-TeCB	52	26.112	0.82	2.0	NA	NA	
13C-2,2',4,5,5'-PeCB	101	33.445	1.49	2.0	NA	NA	
13C-2,2',3,4,4',5'-HxCB	138	41.836	1.23	2.0	NA	NA	
13C-2,2',3,3',4,4',5,5'-OcCB	194	53.407	0.91	2.0	NA	NA	

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB053-F002
Lab Sample ID 92384453003
Filename P180528B_08

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
1		---	---	ND	---	25.0
2		---	---	ND	---	25.0
3		13.126	2.74	26.3	---	25.0
4		---	---	ND	---	25.0
5		---	---	ND	---	25.0
6		---	---	ND	---	25.0
7		---	---	ND	---	25.0
8		17.018	1.43	30.7	---	25.0
9		---	---	ND	---	25.0
10		---	---	ND	---	25.0
11		---	---	ND	---	245
12	12/13	---	---	ND	---	50.0
13	12/13	---	---	ND	---	50.0
14		---	---	ND	---	25.0
15		20.721	1.56	128	---	33.0
16		---	---	ND	---	25.0
17		---	---	ND	---	25.0
18	18/30	---	---	ND	---	50.0
19		---	---	ND	---	25.0
20	20/28	---	---	ND	---	129
21	21/33	---	---	ND	---	135
22		---	---	ND	---	95.0
23		---	---	ND	---	25.0
24		---	---	ND	---	25.0
25		---	---	ND	---	25.0
26	26/29	---	---	ND	---	50.0
27		---	---	ND	---	25.0
28	20/28	---	---	ND	---	129
29	26/29	---	---	ND	---	50.0
30	18/30	---	---	ND	---	50.0
31		---	---	ND	---	130
32		---	---	ND	---	25.0
33	21/33	---	---	ND	---	135
34		---	---	ND	---	25.0
35		---	---	ND	---	25.0
36		---	---	ND	---	25.0
37		28.560	1.07	108	---	53.0
38		---	---	ND	---	25.0
39		---	---	ND	---	25.0
40	40/41/71	---	---	ND	---	150
41	40/41/71	---	---	ND	---	150
42		---	---	ND	---	50.0
43	43/73	---	---	ND	---	50.0
44	44/47/65	---	---	ND	---	150
45	45/51	---	---	ND	---	100.0
46		---	---	ND	---	50.0
47	44/47/65	---	---	ND	---	150
48		---	---	ND	---	50.0

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB053-F002
Lab Sample ID 92384453003
Filename P180528B_08

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
49	49/69	---	---	ND	---	100.0
50	50/53	---	---	ND	---	100.0
51	45/51	---	---	ND	---	100.0
52		26.128	0.84	233	---	154
53	50/53	---	---	ND	---	100.0
54		---	---	ND	---	50.0
55		---	---	ND	---	50.0
56		32.372	0.78	89.3	---	50.0
57		---	---	ND	---	50.0
58		---	---	ND	---	50.0
59	59/62/75	---	---	ND	---	150
60		32.607	0.79	53.8	---	50.0
61	61/70/74/76	31.299	0.82	366	---	200
62	59/62/75	---	---	ND	---	150
63		---	---	ND	---	50.0
64		28.577	0.87	52.4	---	50.0
65	44/47/65	---	---	ND	---	150
66		31.668	0.84	187	---	84.0
67		---	---	ND	---	50.0
68		---	---	ND	---	50.0
69	49/69	---	---	ND	---	100.0
70	61/70/74/76	31.299	0.82	(366)	---	200
71	40/41/71	---	---	ND	---	150
72		---	---	ND	---	50.0
73	43/73	---	---	ND	---	50.0
74	61/70/74/76	31.299	0.82	(366)	---	200
75	59/62/75	---	---	ND	---	150
76	61/70/74/76	31.299	0.82	(366)	---	200
77		36.330	0.85	88.7	---	50.0
78		---	---	ND	---	50.0
79		---	---	ND	---	50.0
80		---	---	ND	---	50.0
81		---	---	ND	---	50.0
82		35.928	1.55	71.1	---	50.0
83		---	---	ND	---	50.0
84		31.534	1.68	127	---	50.0
85	85/116/117	35.391	1.54	1570	---	150
86	86/87/97/108/119/125	34.720	1.60	339	---	300
87	86/87/97/108/119/125	34.720	1.60	(339)	---	300
88	88/91	31.299	1.49	173	---	100.0
89		---	---	ND	---	50.0
90	90/101/113	33.479	1.59	507	---	150
91	88/91	31.299	1.49	(173)	---	100.0
92		32.842	1.75	92.0	---	50.0
93	93/98/100/102	---	---	ND	---	200
94		---	---	ND	---	50.0
95		30.376	1.65	353	---	95.0
96		---	---	ND	---	50.0

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Sample Analysis Results

Client Sample ID ABF-SB053-F002
Lab Sample ID 92384453003
Filename P180528B_08

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
97	86/87/97/108/119/125	34.720	1.60	(339)	---	300
98	93/98/100/102	---	---	ND	---	200
99		34.083	1.62	406	---	50.0
100	93/98/100/102	---	---	ND	---	200
101	90/101/113	33.479	1.59	(507)	---	150
102	93/98/100/102	---	---	ND	---	200
103		---	---	ND	---	50.0
104		---	---	ND	---	50.0
105		39.907	1.51	787	---	50.0
106		---	---	ND	---	50.0
107	107/124	---	---	ND	---	100.0
108	86/87/97/108/119/125	34.720	1.60	(339)	---	300
109		38.214	1.60	134	---	50.0
110	110/115	35.558	1.51	994	---	100.0
111		---	---	ND	---	50.0
112		---	---	ND	---	50.0
113	90/101/113	33.479	1.59	(507)	---	150
114		---	---	ND	---	50.0
115	110/115	35.558	1.51	(994)	---	100.0
116	85/116/117	35.391	1.54	(1570)	---	150
117	85/116/117	35.391	1.54	(1570)	---	150
118		38.666	1.58	966	---	64.0
119	86/87/97/108/119/125	34.720	1.60	(339)	---	300
120		---	---	ND	---	50.0
121		---	---	ND	---	50.0
122		---	---	ND	---	50.0
123		38.314	1.62	64.4	---	50.0
124	107/124	---	---	ND	---	100.0
125	86/87/97/108/119/125	34.720	1.60	(339)	---	300
126		---	---	ND	---	50.0
127		---	---	ND	---	50.0
128	128/166	43.178	1.25	2100	---	100.0
129	129/138/163	41.869	1.25	19600	---	150
130		41.199	1.31	655	---	50.0
131		---	---	ND	---	50.0
132		38.784	1.25	2160	---	50.0
133		39.253	1.18	242	---	50.0
134	134/143	37.677	1.18	294	---	100.0
135	135/151	36.481	1.30	4740	---	100.0
136		33.999	1.22	787	---	50.0
137		41.417	1.20	322	---	50.0
138	129/138/163	41.869	1.25	(19600)	---	150
139	139/140	38.079	1.14	126	---	100.0
140	139/140	38.079	1.14	(126)	---	100.0
141		40.779	1.24	2340	---	50.0
142		---	---	ND	---	50.0
143	134/143	37.677	1.18	(294)	---	100.0
144		37.068	1.18	314	---	50.0

Conc = Concentration
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Pace Analytical Services, LLC
1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB053-F002
Lab Sample ID 92384453003
Filename P180528B_08

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
145		---	---	ND	---	50.0
146		39.924	1.21	2630	---	50.0
147	147/149	37.459	1.23	6300	---	100.0
148		---	---	ND	---	50.0
149	147/149	37.459	1.23	(6300)	---	100.0
150		---	---	ND	---	50.0
151	135/151	36.481	1.30	(4740)	---	100.0
152		---	---	ND	---	50.0
153	153/168	40.561	1.26	15500	---	100.0
154		36.732	1.25	85.0	---	50.0
155		---	---	ND	---	50.0
156	156/157	46.101	1.25	694	---	100.0
157	156/157	46.101	1.25	(694)	---	100.0
158		42.272	1.25	1650	---	50.0
159		44.088	1.12	243	---	50.0
160		---	---	ND	---	50.0
161		---	---	ND	---	50.0
162		---	---	ND	---	50.0
163	129/138/163	41.869	1.25	(19600)	---	150
164		41.534	1.22	1310	---	50.0
165		---	---	ND	---	50.0
166	128/166	43.178	1.25	(2100)	---	100.0
167		44.944	1.23	381	---	50.0
168	153/168	40.561	1.26	(15500)	---	100.0
169		---	---	ND	---	50.0
170		48.801	1.06	7070	---	50.0
171	171/173	45.212	1.02	1160	---	100.0
172		46.822	1.00	1280	---	50.0
173	171/173	45.212	1.02	(1160)	---	100.0
174		44.105	1.02	5330	---	50.0
175		42.926	1.07	250	---	50.0
176		40.427	1.11	721	---	50.0
177		44.558	1.05	2490	---	50.0
178		42.289	1.01	1560	---	50.0
179		39.522	1.06	2750	---	50.0
180	180/193	47.493	1.05	16200	---	100.0
181		---	---	ND	---	50.0
182		---	---	ND	---	50.0
183	183/185	43.837	1.06	3070	---	100.0
184		---	---	ND	---	50.0
185	183/185	43.837	1.06	(3070)	---	100.0
186		---	---	ND	---	50.0
187		43.211	1.05	8000	---	50.0
188		---	---	ND	---	50.0
189		51.812	1.09	275	---	50.0
190		49.337	1.08	1400	---	50.0
191		47.845	0.98	256	---	50.0
192		---	---	ND	---	50.0

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Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB053-F002
Lab Sample ID 92384453003
Filename P180528B_08

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
193	180/193	47.493	1.05	(16200)	---	100.0
194		53.429	0.88	2580	---	75.0
195		51.597	0.91	2430	---	75.0
196		50.125	0.94	2610	---	75.0
197	197/200	46.638	0.89	970	---	150
198	198/199	49.455	0.92	5730	---	150
199	198/199	49.455	0.92	(5730)	---	150
200	197/200	46.638	0.89	(970)	---	150
201		45.581	0.91	386	---	75.0
202		44.642	0.91	898	---	75.0
203		50.327	0.91	3950	---	75.0
204		---	---	ND	---	75.0
205		53.817	0.88	209	---	75.0
206		55.347	0.79	1700	---	75.0
207		52.114	0.77	118	---	75.0
208		51.360	0.79	414	---	75.0
209		56.899	0.67	405	---	75.0

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID	ABF-SB053-F002
Lab Sample ID	92384453003
Filename	P180528B_08

Congener Group	Concentration ng/Kg
Total Monochloro Biphenyls	26.3
Total Dichloro Biphenyls	159
Total Trichloro Biphenyls	108
Total Tetrachloro Biphenyls	1070
Total Pentachloro Biphenyls	6580
Total Hexachloro Biphenyls	62500
Total Heptachloro Biphenyls	51800
Total Octachloro Biphenyls	19800
Total Nonachloro Biphenyls	2230
DecachloroBiphenyls	405
Total PCBs	145000

ND = Not Detected
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Method 1668A Polychlorobiphenyl Sample Analysis Results

Client - PACE Charlotte

Client's Sample ID	ABF-SB054-F002		
Lab Sample ID	92384453004		
Filename	P180530A_06		
Injected By	CVS		
Total Amount Extracted	13.3 g	Matrix	Solid
% Moisture	24.7	Dilution	NA
Dry Weight Extracted	10.0 g	Collected	05/09/2018 12:30
ICAL ID	P180530A03	Received	05/15/2018 09:30
CCal Filename(s)	P180530A_04	Extracted	05/17/2018 15:20
Method Blank ID	BLANK-62395	Analyzed	05/30/2018 14:55

PCB Isomer	IUPAC	RT	Ratio	ng's Added	ng's Found	% Recovery
Labeled Analytes						
13C-2-MoCB	1	9.975	2.75	2.0	0.925	46
13C-4-MoCB	3	12.899	3.59	2.0	0.858	43
13C-2,2'-DiCB	4	13.198	1.44	2.0	0.952	48
13C-4,4'-DiCB	15	20.518	1.70	2.0	1.24	62
13C-2,2',6-TrCB	19	17.115	1.14	2.0	1.16	58
13C-3,4,4'-TrCB	37	28.322	1.13	2.0	1.57	79
13C-2,2',6,6'-TeCB	54	20.842	0.85	2.0	1.28	64
13C-3,4,4',5-TeCB	81	35.488	0.88	2.0	1.48	74
13C-3,3',4,4'-TeCB	77	36.075	0.81	2.0	1.49	75
13C-2,2',4,6,6'-PeCB	104	26.946	1.51	2.0	1.31	66
13C-2,3,3',4,4'-PeCB	105	39.686	1.71	2.0	1.65	82
13C-2,3,4,4',5-PeCB	114	39.015	1.60	2.0	1.63	82
13C-2,3',4,4',5-PeCB	118	38.445	1.57	2.0	1.52	76
13C-2,3',4,4',5'-PeCB	123	38.110	1.46	2.0	1.56	78
13C-3,3',4,4',5-PeCB	126	42.873	1.72	2.0	1.78	89
13C-2,2',4,4',6,6'-HxCB	155	32.989	1.24	2.0	1.24	62
13C-HxCB(156/157)	156/157	45.931	1.24	4.0	3.00	75
13C-2,3',4,4',5,5'-HxCB	167	44.723	1.31	2.0	1.58	79
13C-3,3',4,4',5,5'-HxCB	169	49.234	1.24	2.0	1.88	94
13C-2,2',3,4',5,6,6'-HpCB	188	38.931	1.06	2.0	1.18	59
13C-2,3,3',4,4',5,5'-HpCB	189	51.659	1.10	2.0	1.63	82
13C-2,2',3,3',5,5',6,6'-OcCB	202	44.454	0.91	2.0	1.17	58
13C-2,3,3',4,4',5,5',6-OcCB	205	53.707	0.96	2.0	1.57	78
13C-2,2',3,3',4,4',5,5',6-NoCB	206	55.194	0.73	2.0	1.35	68
13C-2,2',3,3',4,5,5',6,6'-NoCB	208	51.185	0.72	2.0	1.23	62
13C--DeCB	209	56.725	0.67	2.0	1.31	65
CleanupStandards						
13C-2,4,4'-TrCB	28	23.911	1.18	2.0	1.58	79
13C-2,3,3',5,5'-PeCB	111	36.058	1.61	2.0	1.41	71
13C-2,2',3,3',5,5',6-HpCB	178	42.068	0.97	2.0	1.31	65
Recovery Standards						
13C-2,5-DiCB	9	15.724	1.56	2.0	NA	NA
13C-2,2',5,5'-TeCB	52	25.923	0.88	2.0	NA	NA
13C-2,2',4,5,5'-PeCB	101	33.241	1.62	2.0	NA	NA
13C-2,2',3,4,4',5'-HxCB	138	41.648	1.24	2.0	NA	NA
13C-2,2',3,3',4,4',5,5'-OcCB	194	53.298	0.93	2.0	NA	NA

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB054-F002
Lab Sample ID 92384453004
Filename P180530A_06

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
1		---	---	ND	---	25.0
2		---	---	ND	---	25.0
3		---	---	ND	---	25.0
4		---	---	ND	---	25.0
5		---	---	ND	---	25.0
6		---	---	ND	---	25.0
7		---	---	ND	---	25.0
8		---	---	ND	---	25.0
9		---	---	ND	---	25.0
10		---	---	ND	---	25.0
11		---	---	ND	---	245
12	12/13	---	---	ND	---	49.9
13	12/13	---	---	ND	---	49.9
14		---	---	ND	---	25.0
15		---	---	ND	---	33.0
16		---	---	ND	---	25.0
17		---	---	ND	---	25.0
18	18/30	---	---	ND	---	49.9
19		---	---	ND	---	25.0
20	20/28	---	---	ND	---	129
21	21/33	---	---	ND	---	135
22		---	---	ND	---	94.9
23		---	---	ND	---	25.0
24		---	---	ND	---	25.0
25		---	---	ND	---	25.0
26	26/29	---	---	ND	---	49.9
27		---	---	ND	---	25.0
28	20/28	---	---	ND	---	129
29	26/29	---	---	ND	---	49.9
30	18/30	---	---	ND	---	49.9
31		---	---	ND	---	130
32		21.060	0.94	26.1	---	25.0
33	21/33	---	---	ND	---	135
34		---	---	ND	---	25.0
35		---	---	ND	---	25.0
36		---	---	ND	---	25.0
37		---	---	ND	---	52.9
38		27.064	1.07	26.2	---	25.0
39		---	---	ND	---	25.0
40	40/41/71	---	---	ND	---	150
41	40/41/71	---	---	ND	---	150
42		---	---	ND	---	49.9
43	43/73	---	---	ND	---	49.9
44	44/47/65	27.080	0.80	1160	---	150
45	45/51	24.112	0.77	583	---	99.9
46		---	---	ND	---	49.9
47	44/47/65	27.080	0.80	(1160)	---	150
48		---	---	ND	---	49.9

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB054-F002
Lab Sample ID 92384453004
Filename P180530A_06

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
49	49/69	26.477	0.77	271	---	99.9
50	50/53	23.274	0.72	152	---	99.9
51	45/51	24.112	0.77	(583)	---	99.9
52		---	---	ND	---	154
53	50/53	23.274	0.72	(152)	---	99.9
54		20.858	0.81	59.2	---	49.9
55		---	---	ND	---	49.9
56		32.184	0.84	58.9	---	49.9
57		---	---	ND	---	49.9
58		---	---	ND	---	49.9
59	59/62/75	---	---	ND	---	150
60		---	---	ND	---	49.9
61	61/70/74/76	31.111	0.79	215	---	200
62	59/62/75	---	---	ND	---	150
63		---	---	ND	---	49.9
64		---	---	ND	---	49.9
65	44/47/65	27.080	0.80	(1160)	---	150
66		31.480	0.79	139	---	83.9
67		---	---	ND	---	49.9
68		---	---	ND	---	49.9
69	49/69	26.477	0.77	(271)	---	99.9
70	61/70/74/76	31.111	0.79	(215)	---	200
71	40/41/71	---	---	ND	---	150
72		---	---	ND	---	49.9
73	43/73	---	---	ND	---	49.9
74	61/70/74/76	31.111	0.79	(215)	---	200
75	59/62/75	---	---	ND	---	150
76	61/70/74/76	31.111	0.79	(215)	---	200
77		36.109	0.81	52.8	---	49.9
78		---	---	ND	---	49.9
79		---	---	ND	---	49.9
80		---	---	ND	---	49.9
81		---	---	ND	---	49.9
82		---	---	ND	---	49.9
83		---	---	ND	---	49.9
84		31.346	1.48	63.8	---	49.9
85	85/116/117	35.203	1.58	210	---	150
86	86/87/97/108/119/125	34.415	1.61	329	---	300
87	86/87/97/108/119/125	34.415	1.61	(329)	---	300
88	88/91	---	---	ND	---	99.9
89		---	---	ND	---	49.9
90	90/101/113	33.274	1.53	519	---	150
91	88/91	---	---	ND	---	99.9
92		32.654	1.68	93.4	---	49.9
93	93/98/100/102	30.390	1.47	311	---	200
94		---	---	ND	---	49.9
95		30.188	1.59	229	---	94.9
96		---	---	ND	---	49.9

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB054-F002
Lab Sample ID 92384453004
Filename P180530A_06

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
97	86/87/97/108/119/125	34.415	1.61	(329)	---	300
98	93/98/100/102	30.390	1.47	(311)	---	200
99		33.895	1.60	345	---	49.9
100	93/98/100/102	30.390	1.47	(311)	---	200
101	90/101/113	33.274	1.53	(519)	---	150
102	93/98/100/102	30.390	1.47	(311)	---	200
103		29.434	1.48	51.2	---	49.9
104		---	---	ND	---	49.9
105		39.720	1.58	182	---	49.9
106		---	---	ND	---	49.9
107	107/124	---	---	ND	---	99.9
108	86/87/97/108/119/125	34.415	1.61	(329)	---	300
109		---	---	ND	---	49.9
110	110/115	35.354	1.60	753	---	99.9
111		---	---	ND	---	49.9
112		---	---	ND	---	49.9
113	90/101/113	33.274	1.53	(519)	---	150
114		---	---	ND	---	49.9
115	110/115	35.354	1.60	(753)	---	99.9
116	85/116/117	35.203	1.58	(210)	---	150
117	85/116/117	35.203	1.58	(210)	---	150
118		38.479	1.58	390	---	63.9
119	86/87/97/108/119/125	34.415	1.61	(329)	---	300
120		---	---	ND	---	49.9
121		---	---	ND	---	49.9
122		---	---	ND	---	49.9
123		---	---	ND	---	49.9
124	107/124	---	---	ND	---	99.9
125	86/87/97/108/119/125	34.415	1.61	(329)	---	300
126		---	---	ND	---	49.9
127		---	---	ND	---	49.9
128	128/166	43.007	1.18	377	---	99.9
129	129/138/163	41.682	1.25	2510	---	150
130		41.011	1.26	121	---	49.9
131		---	---	ND	---	49.9
132		38.579	1.22	355	---	49.9
133		---	---	ND	---	49.9
134	134/143	---	---	ND	---	99.9
135	135/151	36.276	1.21	483	---	99.9
136		33.811	1.37	103	---	49.9
137		41.229	1.09	96.3	---	49.9
138	129/138/163	41.682	1.25	(2510)	---	150
139	139/140	---	---	ND	---	99.9
140	139/140	---	---	ND	---	99.9
141		40.592	1.19	337	---	49.9
142		---	---	ND	---	49.9
143	134/143	---	---	ND	---	99.9
144		---	---	ND	---	49.9

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REPORT OF LABORATORY ANALYSIS

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

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB054-F002
Lab Sample ID 92384453004
Filename P180530A_06

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
145		---	---	ND	---	49.9
146		39.720	1.25	328	---	49.9
147	147/149	37.271	1.26	1150	---	99.9
148		---	---	ND	---	49.9
149	147/149	37.271	1.26	(1150)	---	99.9
150		---	---	ND	---	49.9
151	135/151	36.276	1.21	(483)	---	99.9
152		---	---	ND	---	49.9
153	153/168	40.374	1.24	1940	---	99.9
154		---	---	ND	---	49.9
155		---	---	ND	---	49.9
156	156/157	45.931	1.29	209	---	99.9
157	156/157	45.931	1.29	(209)	---	99.9
158		42.084	1.22	221	---	49.9
159		---	---	ND	---	49.9
160		---	---	ND	---	49.9
161		---	---	ND	---	49.9
162		---	---	ND	---	49.9
163	129/138/163	41.682	1.25	(2510)	---	150
164		41.347	1.29	172	---	49.9
165		---	---	ND	---	49.9
166	128/166	43.007	1.18	(377)	---	99.9
167		44.756	1.30	123	---	49.9
168	153/168	40.374	1.24	(1940)	---	99.9
169		---	---	ND	---	49.9
170		48.614	1.03	841	---	49.9
171	171/173	45.025	1.03	224	---	99.9
172		46.652	1.16	168	---	49.9
173	171/173	45.025	1.03	(224)	---	99.9
174		43.918	0.98	742	---	49.9
175		---	---	ND	---	49.9
176		40.239	0.98	60.6	---	49.9
177		44.370	1.03	422	---	49.9
178		42.101	1.09	185	---	49.9
179		39.334	1.03	268	---	49.9
180	180/193	47.322	1.05	2070	---	99.9
181		---	---	ND	---	49.9
182		---	---	ND	---	49.9
183	183/185	43.649	1.10	456	---	99.9
184		---	---	ND	---	49.9
185	183/185	43.649	1.10	(456)	---	99.9
186		---	---	ND	---	49.9
187		43.024	1.05	1060	---	49.9
188		---	---	ND	---	49.9
189		---	---	ND	---	49.9
190		49.167	0.89	191	---	49.9
191		---	---	ND	---	49.9
192		---	---	ND	---	49.9

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Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB054-F002
Lab Sample ID 92384453004
Filename P180530A_06

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
193	180/193	47.322	1.05	(2070)	---	99.9
194		53.319	0.93	597	---	74.9
195		51.465	0.90	208	---	74.9
196		49.955	0.91	287	---	74.9
197	197/200	---	---	ND	---	150
198	198/199	49.301	0.91	727	---	150
199	198/199	49.301	0.91	(727)	---	150
200	197/200	---	---	ND	---	150
201		---	---	ND	---	74.9
202		44.471	0.88	152	---	74.9
203		50.173	0.92	446	---	74.9
204		---	---	ND	---	74.9
205		---	---	ND	---	74.9
206		55.216	0.87	485	---	74.9
207		---	---	ND	---	74.9
208		51.207	0.89	145	---	74.9
209		56.768	0.74	300	---	74.9

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID	ABF-SB054-F002
Lab Sample ID	92384453004
Filename	P180530A_06

Congener Group	Concentration ng/Kg
Total Monochloro Biphenyls	ND
Total Dichloro Biphenyls	ND
Total Trichloro Biphenyls	52.3
Total Tetrachloro Biphenyls	2690
Total Pentachloro Biphenyls	3480
Total Hexachloro Biphenyls	8530
Total Heptachloro Biphenyls	6690
Total Octachloro Biphenyls	2420
Total Nonachloro Biphenyls	630
DecachloroBiphenyls	300
Total PCBs	24800

ND = Not Detected
Results reported on a dry weight basis

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Method 1668A Polychlorobiphenyl Sample Analysis Results

Client - PACE Charlotte

Client's Sample ID	ABF-SB055-F002		
Lab Sample ID	92384453005		
Filename	P180528B_09		
Injected By	BAL		
Total Amount Extracted	14.2 g	Matrix	Solid
% Moisture	29.2	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	05/09/2018 13:50
ICAL ID	P180528B01	Received	05/15/2018 09:30
CCal Filename(s)	P180528B_02	Extracted	05/16/2018 15:10
Method Blank ID	BLANK-62337	Analyzed	05/29/2018 01:21

PCB Isomer	IUPAC	RT	Ratio	ng's Added	ng's Found	% Recovery
Labeled Analytes						
13C-2-MoCB	1	10.095	3.47	2.0	0.815	41
13C-4-MoCB	3	13.031	3.04	2.0	0.888	44
13C-2,2'-DiCB	4	13.330	1.55	2.0	0.883	44
13C-4,4'-DiCB	15	20.721	1.65	2.0	1.02	51
13C-2,2',6-TrCB	19	17.270	1.18	2.0	1.05	52
13C-3,4,4'-TrCB	37	28.493	1.11	2.0	1.26	63
13C-2,2',6,6'-TeCB	54	21.030	0.81	2.0	0.962	48
13C-3,4,4',5-TeCB	81	35.642	0.79	2.0	1.34	67
13C-3,3',4,4'-TeCB	77	36.229	0.76	2.0	1.33	67
13C-2,2',4,6,6'-PeCB	104	27.101	1.67	2.0	1.02	51
13C-2,3,3',4,4'-PeCB	105	39.823	1.68	2.0	1.32	66
13C-2,3,4,4',5-PeCB	114	39.152	1.65	2.0	1.28	64
13C-2,3',4,4',5-PeCB	118	38.599	1.55	2.0	1.30	65
13C-2,3',4,4',5'-PeCB	123	38.247	1.58	2.0	1.29	64
13C-3,3',4,4',5-PeCB	126	43.010	1.62	2.0	1.36	68
13C-2,2',4,4',6,6'-HxCB	155	33.143	1.26	2.0	1.04	52
13C-HxCB(156/157)	156/157	46.067	1.26	4.0	2.48	62
13C-2,3',4,4',5,5'-HxCB	167	44.860	1.26	2.0	1.28	64
13C-3,3',4,4',5,5'-HxCB	169	49.371	1.32	2.0	1.40	70
13C-2,2',3,4',5,6,6'-HpCB	188	39.068	1.03	2.0	1.18	59
13C-2,3,3',4,4',5,5'-HpCB	189	51.748	1.09	2.0	1.39	70
13C-2,2',3,3',5,5',6,6'-OcCB	202	44.558	0.90	2.0	1.04	52
13C-2,3,3',4,4',5,5',6-OcCB	205	53.774	0.86	2.0	1.21	60
13C-2,2',3,3',4,4',5,5',6-NoCB	206	55.305	0.84	2.0	1.06	53
13C-2,2',3,3',4,5,5',6,6'-NoCB	208	51.295	0.83	2.0	1.11	56
13C--DeCB	209	56.857	0.69	2.0	1.10	55
CleanupStandards						
13C-2,4,4'-TrCB	28	24.065	1.00	2.0	1.29	64
13C-2,3,3',5,5'-PeCB	111	36.195	1.54	2.0	1.12	56
13C-2,2',3,3',5,5',6-HpCB	178	42.205	1.02	2.0	1.16	58
Recovery Standards						
13C-2,5-DiCB	9	15.856	1.59	2.0	NA	NA
13C-2,2',5,5'-TeCB	52	26.061	0.83	2.0	NA	NA
13C-2,2',4,5,5'-PeCB	101	33.411	1.53	2.0	NA	NA
13C-2,2',3,4,4',5'-HxCB	138	41.785	1.29	2.0	NA	NA
13C-2,2',3,3',4,4',5,5'-OcCB	194	53.386	0.92	2.0	NA	NA

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Tel: 612-607-1700
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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB055-F002
Lab Sample ID 92384453005
Filename P180528B_09

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
1		---	---	ND	---	24.9
2		---	---	ND	---	24.9
3		---	---	ND	---	24.9
4		---	---	ND	---	24.9
5		---	---	ND	---	24.9
6		---	---	ND	---	24.9
7		---	---	ND	---	24.9
8		---	---	ND	---	24.9
9		---	---	ND	---	24.9
10		---	---	ND	---	24.9
11		---	---	ND	---	244
12	12/13	---	---	ND	---	49.7
13	12/13	---	---	ND	---	49.7
14		---	---	ND	---	24.9
15		---	---	ND	---	32.8
16		---	---	ND	---	24.9
17		---	---	ND	---	24.9
18	18/30	---	---	ND	---	49.7
19		---	---	ND	---	24.9
20	20/28	---	---	ND	---	128
21	21/33	---	---	ND	---	134
22		---	---	ND	---	94.5
23		---	---	ND	---	24.9
24		---	---	ND	---	24.9
25		---	---	ND	---	24.9
26	26/29	---	---	ND	---	49.7
27		---	---	ND	---	24.9
28	20/28	---	---	ND	---	128
29	26/29	---	---	ND	---	49.7
30	18/30	---	---	ND	---	49.7
31		---	---	ND	---	129
32		---	---	ND	---	24.9
33	21/33	---	---	ND	---	134
34		---	---	ND	---	24.9
35		---	---	ND	---	24.9
36		---	---	ND	---	24.9
37		---	---	ND	---	52.7
38		---	---	ND	---	24.9
39		---	---	ND	---	24.9
40	40/41/71	---	---	ND	---	149
41	40/41/71	---	---	ND	---	149
42		---	---	ND	---	49.7
43	43/73	---	---	ND	---	49.7
44	44/47/65	---	---	ND	---	149
45	45/51	---	---	ND	---	99.5
46		---	---	ND	---	49.7
47	44/47/65	---	---	ND	---	149
48		---	---	ND	---	49.7

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB055-F002
Lab Sample ID 92384453005
Filename P180528B_09

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
49	49/69	---	---	ND	---	99.5
50	50/53	---	---	ND	---	99.5
51	45/51	---	---	ND	---	99.5
52		---	---	ND	---	153
53	50/53	---	---	ND	---	99.5
54		---	---	ND	---	49.7
55		---	---	ND	---	49.7
56		---	---	ND	---	49.7
57		---	---	ND	---	49.7
58		---	---	ND	---	49.7
59	59/62/75	---	---	ND	---	149
60		---	---	ND	---	49.7
61	61/70/74/76	---	---	ND	---	199
62	59/62/75	---	---	ND	---	149
63		---	---	ND	---	49.7
64		---	---	ND	---	49.7
65	44/47/65	---	---	ND	---	149
66		---	---	ND	---	83.6
67		---	---	ND	---	49.7
68		---	---	ND	---	49.7
69	49/69	---	---	ND	---	99.5
70	61/70/74/76	---	---	ND	---	199
71	40/41/71	---	---	ND	---	149
72		---	---	ND	---	49.7
73	43/73	---	---	ND	---	49.7
74	61/70/74/76	---	---	ND	---	199
75	59/62/75	---	---	ND	---	149
76	61/70/74/76	---	---	ND	---	199
77		---	---	ND	---	49.7
78		---	---	ND	---	49.7
79		---	---	ND	---	49.7
80		---	---	ND	---	49.7
81		---	---	ND	---	49.7
82		---	---	ND	---	49.7
83		---	---	ND	---	49.7
84		---	---	ND	---	49.7
85	85/116/117	---	---	ND	---	149
86	86/87/97/108/119/125	---	---	ND	---	298
87	86/87/97/108/119/125	---	---	ND	---	298
88	88/91	---	---	ND	---	99.5
89		---	---	ND	---	49.7
90	90/101/113	---	---	ND	---	149
91	88/91	---	---	ND	---	99.5
92		---	---	ND	---	49.7
93	93/98/100/102	---	---	ND	---	199
94		---	---	ND	---	49.7
95		---	---	ND	---	94.5
96		---	---	ND	---	49.7

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB055-F002
Lab Sample ID 92384453005
Filename P180528B_09

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
97	86/87/97/108/119/125	---	---	ND	---	298
98	93/98/100/102	---	---	ND	---	199
99		---	---	ND	---	49.7
100	93/98/100/102	---	---	ND	---	199
101	90/101/113	---	---	ND	---	149
102	93/98/100/102	---	---	ND	---	199
103		---	---	ND	---	49.7
104		---	---	ND	---	49.7
105		---	---	ND	---	49.7
106		---	---	ND	---	49.7
107	107/124	---	---	ND	---	99.5
108	86/87/97/108/119/125	---	---	ND	---	298
109		---	---	ND	---	49.7
110	110/115	---	---	ND	---	99.5
111		---	---	ND	---	49.7
112		---	---	ND	---	49.7
113	90/101/113	---	---	ND	---	149
114		---	---	ND	---	49.7
115	110/115	---	---	ND	---	99.5
116	85/116/117	---	---	ND	---	149
117	85/116/117	---	---	ND	---	149
118		38.632	1.64	67.8	---	63.7
119	86/87/97/108/119/125	---	---	ND	---	298
120		---	---	ND	---	49.7
121		---	---	ND	---	49.7
122		---	---	ND	---	49.7
123		---	---	ND	---	49.7
124	107/124	---	---	ND	---	99.5
125	86/87/97/108/119/125	---	---	ND	---	298
126		---	---	ND	---	49.7
127		---	---	ND	---	49.7
128	128/166	43.127	1.34	166	---	99.5
129	129/138/163	41.819	1.24	1360	---	149
130		---	---	ND	---	49.7
131		---	---	ND	---	49.7
132		38.716	1.19	58.1	---	49.7
133		---	---	ND	---	49.7
134	134/143	---	---	ND	---	99.5
135	135/151	36.430	1.15	119	---	99.5
136		---	---	ND	---	49.7
137		---	---	ND	---	49.7
138	129/138/163	41.819	1.24	(1360)	---	149
139	139/140	---	---	ND	---	99.5
140	139/140	---	---	ND	---	99.5
141		40.712	1.26	87.1	---	49.7
142		---	---	ND	---	49.7
143	134/143	---	---	ND	---	99.5
144		---	---	ND	---	49.7

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

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB055-F002
Lab Sample ID 92384453005
Filename P180528B_09

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
145		---	---	ND	---	49.7
146		39.873	1.22	190	---	49.7
147	147/149	37.408	1.26	197	---	99.5
148		---	---	ND	---	49.7
149	147/149	37.408	1.26	(197)	---	99.5
150		---	---	ND	---	49.7
151	135/151	36.430	1.15	(119)	---	99.5
152		---	---	ND	---	49.7
153	153/168	40.511	1.25	1060	---	99.5
154		---	---	ND	---	49.7
155		---	---	ND	---	49.7
156	156/157	---	---	ND	---	99.5
157	156/157	---	---	ND	---	99.5
158		42.221	1.15	102	---	49.7
159		---	---	ND	---	49.7
160		---	---	ND	---	49.7
161		---	---	ND	---	49.7
162		---	---	ND	---	49.7
163	129/138/163	41.819	1.24	(1360)	---	149
164		41.500	1.06	80.5	---	49.7
165		---	---	ND	---	49.7
166	128/166	43.127	1.34	(166)	---	99.5
167		44.893	1.20	71.4	---	49.7
168	153/168	40.511	1.25	(1060)	---	99.5
169		---	---	ND	---	49.7
170		48.750	1.07	997	---	49.7
171	171/173	45.145	1.04	246	---	99.5
172		46.771	1.05	173	---	49.7
173	171/173	45.145	1.04	(246)	---	99.5
174		44.055	1.00	502	---	49.7
175		---	---	ND	---	49.7
176		---	---	ND	---	49.7
177		44.507	1.08	443	---	49.7
178		42.238	1.06	198	---	49.7
179		39.454	1.14	182	---	49.7
180	180/193	47.459	1.04	2370	---	99.5
181		---	---	ND	---	49.7
182		---	---	ND	---	49.7
183	183/185	43.786	1.01	361	---	99.5
184		---	---	ND	---	49.7
185	183/185	43.786	1.01	(361)	---	99.5
186		---	---	ND	---	49.7
187		43.161	1.08	999	---	49.7
188		---	---	ND	---	49.7
189		---	---	ND	---	49.7
190		49.304	1.11	237	---	49.7
191		---	---	ND	---	49.7
192		---	---	ND	---	49.7

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
Nn = Value obtained from additional analyses

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ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion
X = Outside QC Limits
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ng's = Nanograms

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB055-F002
Lab Sample ID 92384453005
Filename P180528B_09

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
193	180/193	47.459	1.04	(2370)	---	99.5
194		53.408	0.90	692	---	74.6
195		51.575	0.85	314	---	74.6
196		50.092	0.88	320	---	74.6
197	197/200	---	---	ND	---	149
198	198/199	49.421	0.90	831	---	149
199	198/199	49.421	0.90	(831)	---	149
200	197/200	---	---	ND	---	149
201		---	---	ND	---	74.6
202		44.591	0.86	153	---	74.6
203		50.293	0.88	527	---	74.6
204		---	---	ND	---	74.6
205		---	---	ND	---	74.6
206		55.305	0.81	436	---	74.6
207		---	---	ND	---	74.6
208		51.317	0.84	125	---	74.6
209		56.878	0.64	249	---	74.6

Conc = Concentration
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A = Limit of Detection based on signal to noise
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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID	ABF-SB055-F002
Lab Sample ID	92384453005
Filename	P180528B_09

Congener Group	Concentration ng/Kg
Total Monochloro Biphenyls	ND
Total Dichloro Biphenyls	ND
Total Trichloro Biphenyls	ND
Total Tetrachloro Biphenyls	ND
Total Pentachloro Biphenyls	67.8
Total Hexachloro Biphenyls	3490
Total Heptachloro Biphenyls	6710
Total Octachloro Biphenyls	2840
Total Nonachloro Biphenyls	561
DecachloroBiphenyls	249
Total PCBs	13900

ND = Not Detected
Results reported on a dry weight basis

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Method 1668A Polychlorobiphenyl Sample Analysis Results

Client - PACE Charlotte

Client's Sample ID	ABF-SB055-D002		
Lab Sample ID	92384453006		
Filename	P180528B_10		
Injected By	BAL		
Total Amount Extracted	14.0 g	Matrix	Solid
% Moisture	28.0	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	05/09/2018 13:55
ICAL ID	P180528B01	Received	05/15/2018 09:30
CCal Filename(s)	P180528B_02	Extracted	05/16/2018 15:10
Method Blank ID	BLANK-62337	Analyzed	05/29/2018 02:22

PCB Isomer	IUPAC	RT	Ratio	ng's Added	ng's Found	% Recovery
Labeled Analytes						
13C-2-MoCB	1	10.095	3.35	2.0	0.858	43
13C-4-MoCB	3	13.031	3.48	2.0	0.933	47
13C-2,2'-DiCB	4	13.342	1.58	2.0	0.833	42
13C-4,4'-DiCB	15	20.638	1.52	2.0	1.08	54
13C-2,2',6-TrCB	19	17.247	1.20	2.0	1.14	57
13C-3,4,4'-TrCB	37	28.477	1.18	2.0	1.35	68
13C-2,2',6,6'-TeCB	54	20.964	0.89	2.0	1.04	52
13C-3,4,4',5-TeCB	81	35.627	0.81	2.0	1.38	69
13C-3,3',4,4'-TeCB	77	36.247	0.80	2.0	1.37	68
13C-2,2',4,6,6'-PeCB	104	27.102	1.77	2.0	0.988	49
13C-2,3,3',4,4'-PeCB	105	39.825	1.57	2.0	1.36	68
13C-2,3,4,4',5-PeCB	114	39.171	1.63	2.0	1.36	68
13C-2,3',4,4',5-PeCB	118	38.600	1.71	2.0	1.32	66
13C-2,3',4,4',5'-PeCB	123	38.265	1.64	2.0	1.30	65
13C-3,3',4,4',5-PeCB	126	43.028	1.57	2.0	1.42	71
13C-2,2',4,4',6,6'-HxCB	155	33.145	1.22	2.0	0.910	45
13C-HxCB(156/157)	156/157	46.069	1.29	4.0	2.26	57
13C-2,3',4,4',5,5'-HxCB	167	44.861	1.28	2.0	1.15	58
13C-3,3',4,4',5,5'-HxCB	169	49.389	1.23	2.0	1.26	63
13C-2,2',3,4',5,6,6'-HpCB	188	39.070	1.04	2.0	1.15	58
13C-2,3,3',4,4',5,5'-HpCB	189	51.771	1.06	2.0	1.33	66
13C-2,2',3,3',5,5',6,6'-OcCB	202	44.576	0.85	2.0	1.10	55
13C-2,3,3',4,4',5,5',6-OcCB	205	53.797	0.81	2.0	1.20	60
13C-2,2',3,3',4,4',5,5',6-NoCB	206	55.306	0.80	2.0	1.06	53
13C-2,2',3,3',4,5,5',6,6'-NoCB	208	51.296	0.74	2.0	1.13	57
13C--DeCB	209	56.879	0.78	2.0	1.06	53
CleanupStandards						
13C-2,4,4'-TrCB	28	24.050	1.15	2.0	1.34	67
13C-2,3,3',5,5'-PeCB	111	36.197	1.54	2.0	1.22	61
13C-2,2',3,3',5,5',6-HpCB	178	42.206	1.08	2.0	1.10	55
Recovery Standards						
13C-2,5-DiCB	9	15.856	1.53	2.0	NA	NA
13C-2,2',5,5'-TeCB	52	26.062	0.81	2.0	NA	NA
13C-2,2',4,5,5'-PeCB	101	33.396	1.56	2.0	NA	NA
13C-2,2',3,4,4',5'-HxCB	138	41.787	1.31	2.0	NA	NA
13C-2,2',3,3',4,4',5,5'-OcCB	194	53.387	0.90	2.0	NA	NA

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB055-D002
Lab Sample ID 92384453006
Filename P180528B_10

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
1		---	---	ND	---	24.8
2		---	---	ND	---	24.8
3		---	---	ND	---	24.8
4		---	---	ND	---	24.8
5		---	---	ND	---	24.8
6		---	---	ND	---	24.8
7		---	---	ND	---	24.8
8		---	---	ND	---	24.8
9		---	---	ND	---	24.8
10		---	---	ND	---	24.8
11		---	---	ND	---	243
12	12/13	---	---	ND	---	49.6
13	12/13	---	---	ND	---	49.6
14		---	---	ND	---	24.8
15		---	---	ND	---	32.7
16		---	---	ND	---	24.8
17		---	---	ND	---	24.8
18	18/30	---	---	ND	---	49.6
19		---	---	ND	---	24.8
20	20/28	---	---	ND	---	128
21	21/33	---	---	ND	---	134
22		---	---	ND	---	94.2
23		---	---	ND	---	24.8
24		---	---	ND	---	24.8
25		---	---	ND	---	24.8
26	26/29	---	---	ND	---	49.6
27		---	---	ND	---	24.8
28	20/28	---	---	ND	---	128
29	26/29	---	---	ND	---	49.6
30	18/30	---	---	ND	---	49.6
31		---	---	ND	---	129
32		---	---	ND	---	24.8
33	21/33	---	---	ND	---	134
34		---	---	ND	---	24.8
35		---	---	ND	---	24.8
36		---	---	ND	---	24.8
37		---	---	ND	---	52.6
38		---	---	ND	---	24.8
39		---	---	ND	---	24.8
40	40/41/71	---	---	ND	---	149
41	40/41/71	---	---	ND	---	149
42		---	---	ND	---	49.6
43	43/73	---	---	ND	---	49.6
44	44/47/65	---	---	ND	---	149
45	45/51	---	---	ND	---	99.2
46		---	---	ND	---	49.6
47	44/47/65	---	---	ND	---	149
48		---	---	ND	---	49.6

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB055-D002
Lab Sample ID 92384453006
Filename P180528B_10

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
49	49/69	---	---	ND	---	99.2
50	50/53	---	---	ND	---	99.2
51	45/51	---	---	ND	---	99.2
52		---	---	ND	---	153
53	50/53	---	---	ND	---	99.2
54		---	---	ND	---	49.6
55		---	---	ND	---	49.6
56		---	---	ND	---	49.6
57		---	---	ND	---	49.6
58		---	---	ND	---	49.6
59	59/62/75	---	---	ND	---	149
60		---	---	ND	---	49.6
61	61/70/74/76	---	---	ND	---	198
62	59/62/75	---	---	ND	---	149
63		---	---	ND	---	49.6
64		---	---	ND	---	49.6
65	44/47/65	---	---	ND	---	149
66		---	---	ND	---	83.3
67		---	---	ND	---	49.6
68		---	---	ND	---	49.6
69	49/69	---	---	ND	---	99.2
70	61/70/74/76	---	---	ND	---	198
71	40/41/71	---	---	ND	---	149
72		---	---	ND	---	49.6
73	43/73	---	---	ND	---	49.6
74	61/70/74/76	---	---	ND	---	198
75	59/62/75	---	---	ND	---	149
76	61/70/74/76	---	---	ND	---	198
77		---	---	ND	---	49.6
78		---	---	ND	---	49.6
79		---	---	ND	---	49.6
80		---	---	ND	---	49.6
81		---	---	ND	---	49.6
82		---	---	ND	---	49.6
83		---	---	ND	---	49.6
84		---	---	ND	---	49.6
85	85/116/117	---	---	ND	---	149
86	86/87/97/108/119/125	---	---	ND	---	298
87	86/87/97/108/119/125	---	---	ND	---	298
88	88/91	---	---	ND	---	99.2
89		---	---	ND	---	49.6
90	90/101/113	---	---	ND	---	149
91	88/91	---	---	ND	---	99.2
92		---	---	ND	---	49.6
93	93/98/100/102	---	---	ND	---	198
94		---	---	ND	---	49.6
95		---	---	ND	---	94.2
96		---	---	ND	---	49.6

Conc = Concentration
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Sample Analysis Results

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IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
97	86/87/97/108/119/125	---	---	ND	---	298
98	93/98/100/102	---	---	ND	---	198
99		---	---	ND	---	49.6
100	93/98/100/102	---	---	ND	---	198
101	90/101/113	---	---	ND	---	149
102	93/98/100/102	---	---	ND	---	198
103		---	---	ND	---	49.6
104		---	---	ND	---	49.6
105		---	---	ND	---	49.6
106		---	---	ND	---	49.6
107	107/124	---	---	ND	---	99.2
108	86/87/97/108/119/125	---	---	ND	---	298
109		---	---	ND	---	49.6
110	110/115	---	---	ND	---	99.2
111		---	---	ND	---	49.6
112		---	---	ND	---	49.6
113	90/101/113	---	---	ND	---	149
114		---	---	ND	---	49.6
115	110/115	---	---	ND	---	99.2
116	85/116/117	---	---	ND	---	149
117	85/116/117	---	---	ND	---	149
118		---	---	ND	---	63.5
119	86/87/97/108/119/125	---	---	ND	---	298
120		---	---	ND	---	49.6
121		---	---	ND	---	49.6
122		---	---	ND	---	49.6
123		---	---	ND	---	49.6
124	107/124	---	---	ND	---	99.2
125	86/87/97/108/119/125	---	---	ND	---	298
126		---	---	ND	---	49.6
127		---	---	ND	---	49.6
128	128/166	43.162	1.27	152	---	99.2
129	129/138/163	41.820	1.23	1000	---	149
130		---	---	ND	---	49.6
131		---	---	ND	---	49.6
132		---	---	ND	---	49.6
133		---	---	ND	---	49.6
134	134/143	---	---	ND	---	99.2
135	135/151	---	---	ND	---	99.2
136		---	---	ND	---	49.6
137		---	---	ND	---	49.6
138	129/138/163	41.820	1.23	(1000)	---	149
139	139/140	---	---	ND	---	99.2
140	139/140	---	---	ND	---	99.2
141		40.730	1.14	54.0	---	49.6
142		---	---	ND	---	49.6
143	134/143	---	---	ND	---	99.2
144		---	---	ND	---	49.6

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IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
145		---	---	ND	---	49.6
146		39.875	1.23	142	---	49.6
147	147/149	37.410	1.25	121	---	99.2
148		---	---	ND	---	49.6
149	147/149	37.410	1.25	(121)	---	99.2
150		---	---	ND	---	49.6
151	135/151	---	---	ND	---	99.2
152		---	---	ND	---	49.6
153	153/168	40.512	1.24	760	---	99.2
154		---	---	ND	---	49.6
155		---	---	ND	---	49.6
156	156/157	---	---	ND	---	99.2
157	156/157	---	---	ND	---	99.2
158		42.240	1.21	78.1	---	49.6
159		---	---	ND	---	49.6
160		---	---	ND	---	49.6
161		---	---	ND	---	49.6
162		---	---	ND	---	49.6
163	129/138/163	41.820	1.23	(1000)	---	149
164		---	---	ND	---	49.6
165		---	---	ND	---	49.6
166	128/166	43.162	1.27	(152)	---	99.2
167		44.878	1.24	60.1	---	49.6
168	153/168	40.512	1.24	(760)	---	99.2
169		---	---	ND	---	49.6
170		48.752	1.05	799	---	49.6
171	171/173	45.163	1.04	201	---	99.2
172		46.773	1.05	139	---	49.6
173	171/173	45.163	1.04	(201)	---	99.2
174		44.056	1.14	336	---	49.6
175		---	---	ND	---	49.6
176		---	---	ND	---	49.6
177		44.509	1.01	331	---	49.6
178		42.223	1.05	145	---	49.6
179		39.472	1.06	124	---	49.6
180	180/193	47.460	1.08	1930	---	99.2
181		---	---	ND	---	49.6
182		---	---	ND	---	49.6
183	183/185	43.788	0.99	280	---	99.2
184		---	---	ND	---	49.6
185	183/185	43.788	0.99	(280)	---	99.2
186		---	---	ND	---	49.6
187		43.162	1.03	923	---	49.6
188		---	---	ND	---	49.6
189		---	---	ND	---	49.6
190		49.305	1.04	189	---	49.6
191		---	---	ND	---	49.6
192		---	---	ND	---	49.6

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REPORT OF LABORATORY ANALYSIS

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

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB055-D002
Lab Sample ID 92384453006
Filename P180528B_10

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
193	180/193	47.460	1.08	(1930)	---	99.2
194		53.409	0.89	490	---	74.4
195		51.598	0.97	236	---	74.4
196		50.093	0.85	238	---	74.4
197	197/200	---	---	ND	---	149
198	198/199	49.423	0.94	650	---	149
199	198/199	49.423	0.94	(650)	---	149
200	197/200	---	---	ND	---	149
201		---	---	ND	---	74.4
202		44.592	0.86	126	---	74.4
203		50.311	0.89	409	---	74.4
204		---	---	ND	---	74.4
205		---	---	ND	---	74.4
206		55.327	0.76	324	---	74.4
207		---	---	ND	---	74.4
208		51.318	0.72	87.0	---	74.4
209		56.879	0.67	213	---	74.4

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID	ABF-SB055-D002
Lab Sample ID	92384453006
Filename	P180528B_10

Congener Group	Concentration ng/Kg
Total Monochloro Biphenyls	ND
Total Dichloro Biphenyls	ND
Total Trichloro Biphenyls	ND
Total Tetrachloro Biphenyls	ND
Total Pentachloro Biphenyls	ND
Total Hexachloro Biphenyls	2370
Total Heptachloro Biphenyls	5400
Total Octachloro Biphenyls	2150
Total Nonachloro Biphenyls	411
DecachloroBiphenyls	213
Total PCBs	10500

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Method 1668A Polychlorobiphenyl Sample Analysis Results

Client - PACE Charlotte

Client's Sample ID	ABF-SB056-F002		
Lab Sample ID	92384453007		
Filename	P180528B_11		
Injected By	BAL		
Total Amount Extracted	14.2 g	Matrix	Solid
% Moisture	28.8	Dilution	NA
Dry Weight Extracted	10.1 g	Collected	05/09/2018 13:30
ICAL ID	P180528B01	Received	05/15/2018 09:30
CCal Filename(s)	P180528B_02	Extracted	05/16/2018 15:10
Method Blank ID	BLANK-62337	Analyzed	05/29/2018 03:23

PCB Isomer	IUPAC	RT	Ratio	ng's Added	ng's Found	% Recovery
Labeled Analytes						
13C-2-MoCB	1	10.083	2.82	2.0	0.860	43
13C-4-MoCB	3	13.019	2.99	2.0	0.979	49
13C-2,2'-DiCB	4	13.330	1.63	2.0	0.888	44
13C-4,4'-DiCB	15	20.661	1.55	2.0	1.23	61
13C-2,2',6-TrCB	19	17.270	1.15	2.0	1.09	55
13C-3,4,4'-TrCB	37	28.493	1.11	2.0	1.42	71
13C-2,2',6,6'-TeCB	54	20.980	0.80	2.0	1.16	58
13C-3,4,4',5-TeCB	81	35.643	0.82	2.0	1.40	70
13C-3,3',4,4'-TeCB	77	36.246	0.76	2.0	1.43	71
13C-2,2',4,6,6'-PeCB	104	27.084	1.55	2.0	1.02	51
13C-2,3,3',4,4'-PeCB	105	39.840	1.58	2.0	1.36	68
13C-2,3,4,4',5-PeCB	114	39.153	1.59	2.0	1.36	68
13C-2,3',4,4',5-PeCB	118	38.599	1.63	2.0	1.34	67
13C-2,3',4,4',5'-PeCB	123	38.264	1.52	2.0	1.32	66
13C-3,3',4,4',5-PeCB	126	43.027	1.56	2.0	1.42	71
13C-2,2',4,4',6,6'-HxCB	155	33.144	1.32	2.0	1.00	50
13C-HxCB(156/157)	156/157	46.083	1.31	4.0	2.31	58
13C-2,3',4,4',5,5'-HxCB	167	44.893	1.25	2.0	1.21	61
13C-3,3',4,4',5,5'-HxCB	169	49.370	1.31	2.0	1.30	65
13C-2,2',3,4',5,6,6'-HpCB	188	39.085	1.06	2.0	1.22	61
13C-2,3,3',4,4',5,5'-HpCB	189	51.769	0.98	2.0	1.39	70
13C-2,2',3,3',5,5',6,6'-OcCB	202	44.591	0.90	2.0	1.15	57
13C-2,3,3',4,4',5,5',6-OcCB	205	53.795	0.92	2.0	1.24	62
13C-2,2',3,3',4,4',5,5',6-NoCB	206	55.304	0.86	2.0	1.12	56
13C-2,2',3,3',4,5,5',6,6'-NoCB	208	51.316	0.77	2.0	1.21	61
13C--DeCB	209	56.877	0.74	2.0	1.21	60
CleanupStandards						
13C-2,4,4'-TrCB	28	24.049	1.10	2.0	1.38	69
13C-2,3,3',5,5'-PeCB	111	36.196	1.49	2.0	1.24	62
13C-2,2',3,3',5,5',6-HpCB	178	42.205	1.08	2.0	1.12	56
Recovery Standards						
13C-2,5-DiCB	9	15.844	1.60	2.0	NA	NA
13C-2,2',5,5'-TeCB	52	26.061	0.81	2.0	NA	NA
13C-2,2',4,5,5'-PeCB	101	33.412	1.56	2.0	NA	NA
13C-2,2',3,4,4',5'-HxCB	138	41.802	1.30	2.0	NA	NA
13C-2,2',3,3',4,4',5,5'-OcCB	194	53.407	0.94	2.0	NA	NA

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Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB056-F002
Lab Sample ID 92384453007
Filename P180528B_11

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
1		---	---	ND	---	24.7
2		---	---	ND	---	24.7
3		13.042	3.04	26.3	---	24.7
4		---	---	ND	---	24.7
5		---	---	ND	---	24.7
6		---	---	ND	---	24.7
7		---	---	ND	---	24.7
8		---	---	ND	---	24.7
9		---	---	ND	---	24.7
10		---	---	ND	---	24.7
11		---	---	ND	---	242
12	12/13	---	---	ND	---	49.5
13	12/13	---	---	ND	---	49.5
14		---	---	ND	---	24.7
15		20.673	1.49	193	---	32.6
16		---	---	ND	---	24.7
17		---	---	ND	---	24.7
18	18/30	---	---	ND	---	49.5
19		---	---	ND	---	24.7
20	20/28	---	---	ND	---	128
21	21/33	---	---	ND	---	134
22		---	---	ND	---	94.0
23		---	---	ND	---	24.7
24		---	---	ND	---	24.7
25		---	---	ND	---	24.7
26	26/29	---	---	ND	---	49.5
27		---	---	ND	---	24.7
28	20/28	---	---	ND	---	128
29	26/29	---	---	ND	---	49.5
30	18/30	---	---	ND	---	49.5
31		---	---	ND	---	129
32		---	---	ND	---	24.7
33	21/33	---	---	ND	---	134
34		---	---	ND	---	24.7
35		---	---	ND	---	24.7
36		---	---	ND	---	24.7
37		28.510	1.04	101	---	52.4
38		---	---	ND	---	24.7
39		---	---	ND	---	24.7
40	40/41/71	---	---	ND	---	148
41	40/41/71	---	---	ND	---	148
42		---	---	ND	---	49.5
43	43/73	---	---	ND	---	49.5
44	44/47/65	---	---	ND	---	148
45	45/51	---	---	ND	---	98.9
46		---	---	ND	---	49.5
47	44/47/65	---	---	ND	---	148
48		---	---	ND	---	49.5

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB056-F002
Lab Sample ID 92384453007
Filename P180528B_11

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
49	49/69	---	---	ND	---	98.9
50	50/53	---	---	ND	---	98.9
51	45/51	---	---	ND	---	98.9
52		---	---	ND	---	152
53	50/53	---	---	ND	---	98.9
54		---	---	ND	---	49.5
55		---	---	ND	---	49.5
56		---	---	ND	---	49.5
57		---	---	ND	---	49.5
58		---	---	ND	---	49.5
59	59/62/75	---	---	ND	---	148
60		---	---	ND	---	49.5
61	61/70/74/76	---	---	ND	---	198
62	59/62/75	---	---	ND	---	148
63		---	---	ND	---	49.5
64		---	---	ND	---	49.5
65	44/47/65	---	---	ND	---	148
66		31.634	0.85	96.7	---	83.1
67		---	---	ND	---	49.5
68		---	---	ND	---	49.5
69	49/69	---	---	ND	---	98.9
70	61/70/74/76	---	---	ND	---	198
71	40/41/71	---	---	ND	---	148
72		---	---	ND	---	49.5
73	43/73	---	---	ND	---	49.5
74	61/70/74/76	---	---	ND	---	198
75	59/62/75	---	---	ND	---	148
76	61/70/74/76	---	---	ND	---	198
77		36.263	0.83	73.7	---	49.5
78		---	---	ND	---	49.5
79		---	---	ND	---	49.5
80		---	---	ND	---	49.5
81		---	---	ND	---	49.5
82		---	---	ND	---	49.5
83		---	---	ND	---	49.5
84		---	---	ND	---	49.5
85	85/116/117	35.357	1.52	494	---	148
86	86/87/97/108/119/125	---	---	ND	---	297
87	86/87/97/108/119/125	---	---	ND	---	297
88	88/91	---	---	ND	---	98.9
89		---	---	ND	---	49.5
90	90/101/113	33.446	1.58	264	---	148
91	88/91	---	---	ND	---	98.9
92		32.808	1.62	60.8	---	49.5
93	93/98/100/102	---	---	ND	---	198
94		---	---	ND	---	49.5
95		30.326	1.51	189	---	94.0
96		---	---	ND	---	49.5

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB056-F002
Lab Sample ID 92384453007
Filename P180528B_11

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
97	86/87/97/108/119/125	---	---	ND	---	297
98	93/98/100/102	---	---	ND	---	198
99		34.049	1.57	230	---	49.5
100	93/98/100/102	---	---	ND	---	198
101	90/101/113	33.446	1.58	(264)	---	148
102	93/98/100/102	---	---	ND	---	198
103		---	---	ND	---	49.5
104		---	---	ND	---	49.5
105		39.857	1.55	306	---	49.5
106		---	---	ND	---	49.5
107	107/124	---	---	ND	---	98.9
108	86/87/97/108/119/125	---	---	ND	---	297
109		38.163	1.56	59.1	---	49.5
110	110/115	35.508	1.58	586	---	98.9
111		---	---	ND	---	49.5
112		---	---	ND	---	49.5
113	90/101/113	33.446	1.58	(264)	---	148
114		---	---	ND	---	49.5
115	110/115	35.508	1.58	(586)	---	98.9
116	85/116/117	35.357	1.52	(494)	---	148
117	85/116/117	35.357	1.52	(494)	---	148
118		38.633	1.64	477	---	63.3
119	86/87/97/108/119/125	---	---	ND	---	297
120		---	---	ND	---	49.5
121		---	---	ND	---	49.5
122		---	---	ND	---	49.5
123		38.280	1.74	53.1	---	49.5
124	107/124	---	---	ND	---	98.9
125	86/87/97/108/119/125	---	---	ND	---	297
126		---	---	ND	---	49.5
127		---	---	ND	---	49.5
128	128/166	43.144	1.26	754	---	98.9
129	129/138/163	41.819	1.24	6360	---	148
130		41.148	1.15	219	---	49.5
131		---	---	ND	---	49.5
132		38.733	1.24	530	---	49.5
133		39.203	1.24	79.7	---	49.5
134	134/143	---	---	ND	---	98.9
135	135/151	36.431	1.27	1510	---	98.9
136		33.965	1.27	132	---	49.5
137		41.383	1.36	93.8	---	49.5
138	129/138/163	41.819	1.24	(6360)	---	148
139	139/140	---	---	ND	---	98.9
140	139/140	---	---	ND	---	98.9
141		40.729	1.22	803	---	49.5
142		---	---	ND	---	49.5
143	134/143	---	---	ND	---	98.9
144		37.034	1.21	110	---	49.5

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Sample Analysis Results

Client Sample ID ABF-SB056-F002
Lab Sample ID 92384453007
Filename P180528B_11

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
145		---	---	ND	---	49.5
146		39.874	1.22	979	---	49.5
147	147/149	37.409	1.28	2280	---	98.9
148		---	---	ND	---	49.5
149	147/149	37.409	1.28	(2280)	---	98.9
150		---	---	ND	---	49.5
151	135/151	36.431	1.27	(1510)	---	98.9
152		---	---	ND	---	49.5
153	153/168	40.511	1.26	5790	---	98.9
154		---	---	ND	---	49.5
155		---	---	ND	---	49.5
156	156/157	46.067	1.28	314	---	98.9
157	156/157	46.067	1.28	(314)	---	98.9
158		42.221	1.23	448	---	49.5
159		44.071	1.24	117	---	49.5
160		---	---	ND	---	49.5
161		---	---	ND	---	49.5
162		---	---	ND	---	49.5
163	129/138/163	41.819	1.24	(6360)	---	148
164		41.500	1.18	440	---	49.5
165		---	---	ND	---	49.5
166	128/166	43.144	1.26	(754)	---	98.9
167		44.910	1.28	255	---	49.5
168	153/168	40.511	1.26	(5790)	---	98.9
169		---	---	ND	---	49.5
170		48.767	1.02	3380	---	49.5
171	171/173	45.178	1.00	960	---	98.9
172		46.788	1.05	629	---	49.5
173	171/173	45.178	1.00	(960)	---	98.9
174		44.055	1.05	2970	---	49.5
175		42.909	1.06	127	---	49.5
176		40.377	1.04	241	---	49.5
177		44.507	1.03	1770	---	49.5
178		42.238	0.99	832	---	49.5
179		39.471	1.02	1020	---	49.5
180	180/193	47.459	1.06	8070	---	98.9
181		---	---	ND	---	49.5
182		---	---	ND	---	49.5
183	183/185	43.803	1.05	1780	---	98.9
184		---	---	ND	---	49.5
185	183/185	43.803	1.05	(1780)	---	98.9
186		---	---	ND	---	49.5
187		43.177	1.04	4560	---	49.5
188		---	---	ND	---	49.5
189		51.791	1.03	132	---	49.5
190		49.304	1.01	729	---	49.5
191		47.811	1.06	144	---	49.5
192		---	---	ND	---	49.5

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REPORT OF LABORATORY ANALYSIS

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

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID	ABF-SB056-F002
Lab Sample ID	92384453007
Filename	P180528B_11

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
193	180/193	47.459	1.06	(8070)	---	98.9
194		53.407	0.90	2130	---	74.2
195		51.575	0.89	948	---	74.2
196		50.092	0.91	1040	---	74.2
197	197/200	46.587	0.95	358	---	148
198	198/199	49.438	0.92	2610	---	148
199	198/199	49.438	0.92	(2610)	---	148
200	197/200	46.587	0.95	(358)	---	148
201		45.547	0.93	247	---	74.2
202		44.608	0.86	470	---	74.2
203		50.293	0.92	1610	---	74.2
204		---	---	ND	---	74.2
205		53.817	0.88	133	---	74.2
206		55.326	0.75	1140	---	74.2
207		52.092	0.82	128	---	74.2
208		51.316	0.75	290	---	74.2
209		56.899	0.70	745	---	74.2

Conc = Concentration
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ND = Not Detected
NA = Not Applicable
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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID	ABF-SB056-F002
Lab Sample ID	92384453007
Filename	P180528B_11

Congener Group	Concentration ng/Kg
Total Monochloro Biphenyls	26.3
Total Dichloro Biphenyls	193
Total Trichloro Biphenyls	101
Total Tetrachloro Biphenyls	170
Total Pentachloro Biphenyls	2720
Total Hexachloro Biphenyls	21200
Total Heptachloro Biphenyls	27300
Total Octachloro Biphenyls	9540
Total Nonachloro Biphenyls	1560
DecachloroBiphenyls	745
Total PCBs	63600

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Method 1668A Polychlorobiphenyl Sample Analysis Results

Client - PACE Charlotte

Client's Sample ID	ABF-SB057-F002		
Lab Sample ID	92384453008		
Filename	P180528B_12		
Injected By	BAL		
Total Amount Extracted	13.1 g	Matrix	Solid
% Moisture	23.5	Dilution	NA
Dry Weight Extracted	10.0 g	Collected	05/09/2018 13:05
ICAL ID	P180528B01	Received	05/15/2018 09:30
CCal Filename(s)	P180528B_02	Extracted	05/16/2018 15:10
Method Blank ID	BLANK-62337	Analyzed	05/29/2018 04:23

PCB Isomer	IUPAC	RT	Ratio	ng's Added	ng's Found	% Recovery
Labeled Analytes						
13C-2-MoCB	1	10.107	3.19	2.0	0.928	46
13C-4-MoCB	3	13.031	3.24	2.0	1.11	56
13C-2,2'-DiCB	4	13.342	1.50	2.0	0.988	49
13C-4,4'-DiCB	15	20.709	1.36	2.0	1.36	68
13C-2,2',6-TrCB	19	17.282	1.09	2.0	1.22	61
13C-3,4,4'-TrCB	37	28.511	1.05	2.0	1.52	76
13C-2,2',6,6'-TeCB	54	21.031	0.82	2.0	1.15	58
13C-3,4,4',5-TeCB	81	35.660	0.84	2.0	1.45	72
13C-3,3',4,4'-TeCB	77	36.248	0.83	2.0	1.57	78
13C-2,2',4,6,6'-PeCB	104	27.102	1.55	2.0	1.21	60
13C-2,3,3',4,4'-PeCB	105	39.841	1.69	2.0	1.52	76
13C-2,3,4,4',5-PeCB	114	39.187	1.65	2.0	1.51	76
13C-2,3',4,4',5-PeCB	118	38.617	1.60	2.0	1.47	73
13C-2,3',4,4',5'-PeCB	123	38.282	1.55	2.0	1.46	73
13C-3,3',4,4',5-PeCB	126	43.028	1.60	2.0	1.55	77
13C-2,2',4,4',6,6'-HxCB	155	33.145	1.24	2.0	1.20	60
13C-HxCB(156/157)	156/157	46.085	1.32	4.0	2.54	63
13C-2,3',4,4',5,5'-HxCB	167	44.895	1.31	2.0	1.40	70
13C-3,3',4,4',5,5'-HxCB	169	49.406	1.31	2.0	1.41	70
13C-2,2',3,4',5,6,6'-HpCB	188	39.087	1.04	2.0	1.33	66
13C-2,3,3',4,4',5,5'-HpCB	189	51.792	1.11	2.0	1.51	75
13C-2,2',3,3',5,5',6,6'-OcCB	202	44.593	0.94	2.0	1.24	62
13C-2,3,3',4,4',5,5',6-OcCB	205	53.818	0.83	2.0	1.36	68
13C-2,2',3,3',4,4',5,5',6-NoCB	206	55.327	0.89	2.0	1.21	61
13C-2,2',3,3',4,5,5',6,6'-NoCB	208	51.318	0.76	2.0	1.26	63
13C--DeCB	209	56.879	0.73	2.0	1.27	63
CleanupStandards						
13C-2,4,4'-TrCB	28	24.066	1.16	2.0	1.59	79
13C-2,3,3',5,5'-PeCB	111	36.214	1.53	2.0	1.28	64
13C-2,2',3,3',5,5',6-HpCB	178	42.223	1.09	2.0	1.26	63
Recovery Standards						
13C-2,5-DiCB	9	15.869	1.60	2.0	NA	NA
13C-2,2',5,5'-TeCB	52	26.079	0.82	2.0	NA	NA
13C-2,2',4,5,5'-PeCB	101	33.430	1.50	2.0	NA	NA
13C-2,2',3,4,4',5'-HxCB	138	41.804	1.35	2.0	NA	NA
13C-2,2',3,3',4,4',5,5'-OcCB	194	53.409	0.92	2.0	NA	NA

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB057-F002
Lab Sample ID 92384453008
Filename P180528B_12

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
1		---	---	ND	---	24.9
2		---	---	ND	---	24.9
3		13.055	2.80	32.4	---	24.9
4		---	---	ND	---	24.9
5		---	---	ND	---	24.9
6		---	---	ND	---	24.9
7		---	---	ND	---	24.9
8		16.947	1.71	29.7	---	24.9
9		---	---	ND	---	24.9
10		---	---	ND	---	24.9
11		---	---	ND	---	244
12	12/13	---	---	ND	---	49.9
13	12/13	---	---	ND	---	49.9
14		---	---	ND	---	24.9
15		20.709	1.55	156	---	32.9
16		---	---	ND	---	24.9
17		---	---	ND	---	24.9
18	18/30	---	---	ND	---	49.9
19		---	---	ND	---	24.9
20	20/28	---	---	ND	---	129
21	21/33	---	---	ND	---	135
22		---	---	ND	---	94.8
23		---	---	ND	---	24.9
24		---	---	ND	---	24.9
25		---	---	ND	---	24.9
26	26/29	---	---	ND	---	49.9
27		---	---	ND	---	24.9
28	20/28	---	---	ND	---	129
29	26/29	---	---	ND	---	49.9
30	18/30	---	---	ND	---	49.9
31		---	---	ND	---	130
32		---	---	ND	---	24.9
33	21/33	---	---	ND	---	135
34		---	---	ND	---	24.9
35		---	---	ND	---	24.9
36		---	---	ND	---	24.9
37		28.527	0.98	103	---	52.9
38		---	---	ND	---	24.9
39		---	---	ND	---	24.9
40	40/41/71	---	---	ND	---	150
41	40/41/71	---	---	ND	---	150
42		---	---	ND	---	49.9
43	43/73	---	---	ND	---	49.9
44	44/47/65	---	---	ND	---	150
45	45/51	---	---	ND	---	99.8
46		---	---	ND	---	49.9
47	44/47/65	---	---	ND	---	150
48		---	---	ND	---	49.9

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB057-F002
Lab Sample ID 92384453008
Filename P180528B_12

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
49	49/69	---	---	ND	---	99.8
50	50/53	---	---	ND	---	99.8
51	45/51	---	---	ND	---	99.8
52		---	---	ND	---	154
53	50/53	---	---	ND	---	99.8
54		---	---	ND	---	49.9
55		---	---	ND	---	49.9
56		32.340	0.86	60.6	---	49.9
57		---	---	ND	---	49.9
58		---	---	ND	---	49.9
59	59/62/75	---	---	ND	---	150
60		---	---	ND	---	49.9
61	61/70/74/76	31.300	0.79	275	---	200
62	59/62/75	---	---	ND	---	150
63		---	---	ND	---	49.9
64		28.561	0.76	64.7	---	49.9
65	44/47/65	---	---	ND	---	150
66		31.669	0.78	142	---	83.8
67		---	---	ND	---	49.9
68		---	---	ND	---	49.9
69	49/69	---	---	ND	---	99.8
70	61/70/74/76	31.300	0.79	(275)	---	200
71	40/41/71	---	---	ND	---	150
72		---	---	ND	---	49.9
73	43/73	---	---	ND	---	49.9
74	61/70/74/76	31.300	0.79	(275)	---	200
75	59/62/75	---	---	ND	---	150
76	61/70/74/76	31.300	0.79	(275)	---	200
77		36.281	0.79	77.1	---	49.9
78		---	---	ND	---	49.9
79		---	---	ND	---	49.9
80		---	---	ND	---	49.9
81		---	---	ND	---	49.9
82		35.879	1.53	54.9	---	49.9
83		---	---	ND	---	49.9
84		31.535	1.61	90.2	---	49.9
85	85/116/117	35.359	1.78	821	---	150
86	86/87/97/108/119/125	34.704	1.54	302	---	299
87	86/87/97/108/119/125	34.704	1.54	(302)	---	299
88	88/91	31.283	1.64	171	---	99.8
89		---	---	ND	---	49.9
90	90/101/113	33.463	1.54	536	---	150
91	88/91	31.283	1.64	(171)	---	99.8
92		32.843	1.49	130	---	49.9
93	93/98/100/102	---	---	ND	---	200
94		---	---	ND	---	49.9
95		30.344	1.57	451	---	94.8
96		---	---	ND	---	49.9

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-SB057-F002
Lab Sample ID 92384453008
Filename P180528B_12

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
97	86/87/97/108/119/125	34.704	1.54	(302)	---	299
98	93/98/100/102	---	---	ND	---	200
99		34.067	1.65	402	---	49.9
100	93/98/100/102	---	---	ND	---	200
101	90/101/113	33.463	1.54	(536)	---	150
102	93/98/100/102	---	---	ND	---	200
103		---	---	ND	---	49.9
104		---	---	ND	---	49.9
105		39.892	1.61	436	---	49.9
106		---	---	ND	---	49.9
107	107/124	---	---	ND	---	99.8
108	86/87/97/108/119/125	34.704	1.54	(302)	---	299
109		38.181	1.59	76.6	---	49.9
110	110/115	35.526	1.57	1240	---	99.8
111		---	---	ND	---	49.9
112		---	---	ND	---	49.9
113	90/101/113	33.463	1.54	(536)	---	150
114		---	---	ND	---	49.9
115	110/115	35.526	1.57	(1240)	---	99.8
116	85/116/117	35.359	1.78	(821)	---	150
117	85/116/117	35.359	1.78	(821)	---	150
118		38.634	1.57	717	---	63.9
119	86/87/97/108/119/125	34.704	1.54	(302)	---	299
120		---	---	ND	---	49.9
121		---	---	ND	---	49.9
122		---	---	ND	---	49.9
123		38.299	1.60	69.0	---	49.9
124	107/124	---	---	ND	---	99.8
125	86/87/97/108/119/125	34.704	1.54	(302)	---	299
126		---	---	ND	---	49.9
127		---	---	ND	---	49.9
128	128/166	43.162	1.18	1100	---	99.8
129	129/138/163	41.837	1.25	9170	---	150
130		41.166	1.27	362	---	49.9
131		---	---	ND	---	49.9
132		38.751	1.26	1190	---	49.9
133		39.221	1.29	117	---	49.9
134	134/143	37.645	1.14	135	---	99.8
135	135/151	36.449	1.25	2790	---	99.8
136		34.000	1.22	321	---	49.9
137		41.384	1.06	120	---	49.9
138	129/138/163	41.837	1.25	(9170)	---	150
139	139/140	---	---	ND	---	99.8
140	139/140	---	---	ND	---	99.8
141		40.747	1.25	1410	---	49.9
142		---	---	ND	---	49.9
143	134/143	37.645	1.14	(135)	---	99.8
144		37.052	1.21	238	---	49.9

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Lab Sample ID 92384453008
Filename P180528B_12

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
145		---	---	ND	---	49.9
146		39.892	1.25	1480	---	49.9
147	147/149	37.426	1.22	4570	---	99.8
148		---	---	ND	---	49.9
149	147/149	37.426	1.22	(4570)	---	99.8
150		---	---	ND	---	49.9
151	135/151	36.449	1.25	(2790)	---	99.8
152		---	---	ND	---	49.9
153	153/168	40.529	1.24	8530	---	99.8
154		---	---	ND	---	49.9
155		---	---	ND	---	49.9
156	156/157	46.085	1.29	427	---	99.8
157	156/157	46.085	1.29	(427)	---	99.8
158		42.239	1.20	690	---	49.9
159		44.073	1.11	201	---	49.9
160		---	---	ND	---	49.9
161		---	---	ND	---	49.9
162		---	---	ND	---	49.9
163	129/138/163	41.837	1.25	(9170)	---	150
164		41.518	1.20	773	---	49.9
165		---	---	ND	---	49.9
166	128/166	43.162	1.18	(1100)	---	99.8
167		44.928	1.26	339	---	49.9
168	153/168	40.529	1.24	(8530)	---	99.8
169		---	---	ND	---	49.9
170		48.785	1.03	5050	---	49.9
171	171/173	45.197	1.07	1490	---	99.8
172		46.806	1.02	927	---	49.9
173	171/173	45.197	1.07	(1490)	---	99.8
174		44.073	1.05	5220	---	49.9
175		42.910	1.05	197	---	49.9
176		40.395	1.02	462	---	49.9
177		44.542	1.03	3200	---	49.9
178		42.256	1.03	1240	---	49.9
179		39.489	1.05	1870	---	49.9
180	180/193	47.477	1.04	12100	---	99.8
181		---	---	ND	---	49.9
182		---	---	ND	---	49.9
183	183/185	43.821	1.07	2800	---	99.8
184		---	---	ND	---	49.9
185	183/185	43.821	1.07	(2800)	---	99.8
186		---	---	ND	---	49.9
187		43.195	1.05	6860	---	49.9
188		---	---	ND	---	49.9
189		51.814	1.05	201	---	49.9
190		49.322	1.02	1060	---	49.9
191		47.829	1.05	195	---	49.9
192		---	---	ND	---	49.9

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Lab Sample ID 92384453008
Filename P180528B_12

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
193	180/193	47.477	1.04	(12100)	---	99.8
194		53.430	0.91	3060	---	74.8
195		51.598	0.88	1400	---	74.8
196		50.110	0.90	1510	---	74.8
197	197/200	46.605	0.93	537	---	150
198	198/199	49.456	0.90	3640	---	150
199	198/199	49.456	0.90	(3640)	---	150
200	197/200	46.605	0.93	(537)	---	150
201		45.566	0.85	376	---	74.8
202		44.610	0.92	716	---	74.8
203		50.312	0.90	2260	---	74.8
204		---	---	ND	---	74.8
205		53.840	0.92	185	---	74.8
206		55.349	0.76	1440	---	74.8
207		52.116	0.79	171	---	74.8
208		51.340	0.76	399	---	74.8
209		56.901	0.70	1040	---	74.8

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
Nn = Value obtained from additional analyses

Results reported on a dry weight basis

ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion
X = Outside QC Limits
RT = Retention Time
I = Interference
ng's = Nanograms

REPORT OF LABORATORY ANALYSIS

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

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID	ABF-SB057-F002
Lab Sample ID	92384453008
Filename	P180528B_12

Congener Group	Concentration ng/Kg
Total Monochloro Biphenyls	32.4
Total Dichloro Biphenyls	186
Total Trichloro Biphenyls	103
Total Tetrachloro Biphenyls	619
Total Pentachloro Biphenyls	5500
Total Hexachloro Biphenyls	34000
Total Heptachloro Biphenyls	42900
Total Octachloro Biphenyls	13700
Total Nonachloro Biphenyls	2010
DecachloroBiphenyls	1040
Total PCBs	100000

ND = Not Detected
Results reported on a dry weight basis

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Minneapolis, MN 55414

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Method 1668A Polychlorobiphenyl Sample Analysis Results

Client - PACE Charlotte

Client's Sample ID	ABF-EB001-F002		
Lab Sample ID	92384453009		
Filename	P180525B_04		
Injected By	CVS		
Total Amount Extracted	1000 mL	Matrix	Water
% Moisture	NA	Dilution	NA
Dry Weight Extracted	NA	Collected	05/09/2018 14:30
ICAL ID	P180525B01	Received	05/15/2018 09:30
CCal Filename(s)	P180525B_02	Extracted	05/18/2018 13:10
Method Blank ID	BLANK-62423	Analyzed	05/25/2018 17:16

PCB Isomer	IUPAC	RT	Ratio	ng's Added	ng's Found	% Recovery
Labeled Analytes						
13C-2-MoCB	1	10.143	2.72	2.0	0.861	43
13C-4-MoCB	3	13.079	2.96	2.0	0.942	47
13C-2,2'-DiCB	4	13.378	1.51	2.0	0.837	42
13C-4,4'-DiCB	15	20.662	1.54	2.0	0.961	48
13C-2,2',6-TrCB	19	17.307	0.88	2.0	0.816	41
13C-3,4,4'-TrCB	37	28.543	1.14	2.0	0.998	50
13C-2,2',6,6'-TeCB	54	20.979	0.80	2.0	0.718	36
13C-3,4,4',5-TeCB	81	35.694	0.82	2.0	1.04	52
13C-3,3',4,4'-TeCB	77	36.298	0.78	2.0	1.06	53
13C-2,2',4,6,6'-PeCB	104	27.134	1.58	2.0	0.579	29
13C-2,3,3',4,4'-PeCB	105	39.892	1.65	2.0	1.24	62
13C-2,3,4,4',5-PeCB	114	39.204	1.60	2.0	1.17	59
13C-2,3',4,4',5-PeCB	118	38.651	1.66	2.0	1.12	56
13C-2,3',4,4',5'-PeCB	123	38.298	1.50	2.0	1.09	55
13C-3,3',4,4',5-PeCB	126	43.062	1.49	2.0	1.16	58
13C-2,2',4,4',6,6'-HxCB	155	33.178	1.27	2.0	0.695	35
13C-HxCB(156/157)	156/157	46.137	1.26	4.0	2.41	60
13C-2,3',4,4',5,5'-HxCB	167	44.912	1.22	2.0	1.20	60
13C-3,3',4,4',5,5'-HxCB	169	49.424	1.32	2.0	1.11	55
13C-2,2',3,4',5,6,6'-HpCB	188	39.120	1.04	2.0	1.07	53
13C-2,3,3',4,4',5,5'-HpCB	189	51.798	1.05	2.0	1.33	67
13C-2,2',3,3',5,5',6,6'-OcCB	202	44.610	0.88	2.0	1.25	62
13C-2,3,3',4,4',5,5',6-OcCB	205	53.825	0.91	2.0	1.21	61
13C-2,2',3,3',4,4',5,5',6-NoCB	206	55.355	0.81	2.0	1.15	58
13C-2,2',3,3',4,5,5',6,6'-NoCB	208	51.346	0.79	2.0	1.34	67
13C--DeCB	209	56.908	0.73	2.0	1.20	60
CleanupStandards						
13C-2,4,4'-TrCB	28	24.098	1.07	2.0	1.51	76
13C-2,3,3',5,5'-PeCB	111	36.247	1.58	2.0	1.51	75
13C-2,2',3,3',5,5',6-HpCB	178	42.257	1.03	2.0	1.59	80
Recovery Standards						
13C-2,5-DiCB	9	15.893	1.58	2.0	NA	NA
13C-2,2',5,5'-TeCB	52	26.111	0.82	2.0	NA	NA
13C-2,2',4,5,5'-PeCB	101	33.446	1.56	2.0	NA	NA
13C-2,2',3,4,4',5'-HxCB	138	41.837	1.23	2.0	NA	NA
13C-2,2',3,3',4,4',5,5'-OcCB	194	53.437	0.89	2.0	NA	NA

Conc = Concentration
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R = Recovery outside of Method 1668A control limits
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REPORT OF LABORATORY ANALYSIS

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

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-EB001-F002
Lab Sample ID 92384453009
Filename P180525B_04

IUPAC	Co-elutions	RT	Ratio	Concentration ng/L	EMPC ng/L	EML ng/L
1		---	---	ND	---	0.249
2		---	---	ND	---	0.249
3		---	---	ND	---	0.249
4		---	---	ND	---	0.249
5		---	---	ND	---	0.249
6		---	---	ND	---	0.249
7		---	---	ND	---	0.249
8		---	---	ND	---	0.249
9		---	---	ND	---	0.249
10		---	---	ND	---	0.249
11		---	---	ND	---	2.44
12	12/13	---	---	ND	---	0.498
13	12/13	---	---	ND	---	0.498
14		---	---	ND	---	0.249
15		---	---	ND	---	0.329
16		---	---	ND	---	0.249
17		---	---	ND	---	0.249
18	18/30	---	---	ND	---	0.498
19		---	---	ND	---	0.249
20	20/28	---	---	ND	---	1.29
21	21/33	---	---	ND	---	1.35
22		---	---	ND	---	0.947
23		---	---	ND	---	0.249
24		---	---	ND	---	0.249
25		---	---	ND	---	0.249
26	26/29	---	---	ND	---	0.498
27		---	---	ND	---	0.249
28	20/28	---	---	ND	---	1.29
29	26/29	---	---	ND	---	0.498
30	18/30	---	---	ND	---	0.498
31		---	---	ND	---	1.30
32		---	---	ND	---	0.249
33	21/33	---	---	ND	---	1.35
34		---	---	ND	---	0.249
35		---	---	ND	---	0.249
36		---	---	ND	---	0.249
37		---	---	ND	---	0.528
38		---	---	ND	---	0.249
39		---	---	ND	---	0.249
40	40/41/71	---	---	ND	---	1.50
41	40/41/71	---	---	ND	---	1.50
42		---	---	ND	---	0.498
43	43/73	---	---	ND	---	0.498
44	44/47/65	---	---	ND	---	1.50
45	45/51	---	---	ND	---	0.997
46		---	---	ND	---	0.498
47	44/47/65	---	---	ND	---	1.50
48		---	---	ND	---	0.498

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
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Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-EB001-F002
Lab Sample ID 92384453009
Filename P180525B_04

IUPAC	Co-elutions	RT	Ratio	Concentration ng/L	EMPC ng/L	EML ng/L
49	49/69	---	---	ND	---	0.997
50	50/53	---	---	ND	---	0.997
51	45/51	---	---	ND	---	0.997
52		---	---	ND	---	1.54
53	50/53	---	---	ND	---	0.997
54		---	---	ND	---	0.498
55		---	---	ND	---	0.498
56		---	---	ND	---	0.498
57		---	---	ND	---	0.498
58		---	---	ND	---	0.498
59	59/62/75	---	---	ND	---	1.50
60		---	---	ND	---	0.498
61	61/70/74/76	---	---	ND	---	1.99
62	59/62/75	---	---	ND	---	1.50
63		---	---	ND	---	0.498
64		---	---	ND	---	0.498
65	44/47/65	---	---	ND	---	1.50
66		---	---	ND	---	0.837
67		---	---	ND	---	0.498
68		---	---	ND	---	0.498
69	49/69	---	---	ND	---	0.997
70	61/70/74/76	---	---	ND	---	1.99
71	40/41/71	---	---	ND	---	1.50
72		---	---	ND	---	0.498
73	43/73	---	---	ND	---	0.498
74	61/70/74/76	---	---	ND	---	1.99
75	59/62/75	---	---	ND	---	1.50
76	61/70/74/76	---	---	ND	---	1.99
77		---	---	ND	---	0.498
78		---	---	ND	---	0.498
79		---	---	ND	---	0.498
80		---	---	ND	---	0.498
81		---	---	ND	---	0.498
82		---	---	ND	---	0.498
83		---	---	ND	---	0.498
84		---	---	ND	---	0.498
85	85/116/117	---	---	ND	---	1.50
86	86/87/97/108/119/125	---	---	ND	---	2.99
87	86/87/97/108/119/125	---	---	ND	---	2.99
88	88/91	---	---	ND	---	0.997
89		---	---	ND	---	0.498
90	90/101/113	---	---	ND	---	1.50
91	88/91	---	---	ND	---	0.997
92		---	---	ND	---	0.498
93	93/98/100/102	---	---	ND	---	1.99
94		---	---	ND	---	0.498
95		---	---	ND	---	0.947
96		---	---	ND	---	0.498

Conc = Concentration
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Tel: 612-607-1700
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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-EB001-F002
Lab Sample ID 92384453009
Filename P180525B_04

IUPAC	Co-elutions	RT	Ratio	Concentration ng/L	EMPC ng/L	EML ng/L
97	86/87/97/108/119/125	---	---	ND	---	2.99
98	93/98/100/102	---	---	ND	---	1.99
99		---	---	ND	---	0.498
100	93/98/100/102	---	---	ND	---	1.99
101	90/101/113	---	---	ND	---	1.50
102	93/98/100/102	---	---	ND	---	1.99
103		---	---	ND	---	0.498
104		---	---	ND	---	0.498
105		---	---	ND	---	0.498
106		---	---	ND	---	0.498
107	107/124	---	---	ND	---	0.997
108	86/87/97/108/119/125	---	---	ND	---	2.99
109		---	---	ND	---	0.498
110	110/115	---	---	ND	---	0.997
111		---	---	ND	---	0.498
112		---	---	ND	---	0.498
113	90/101/113	---	---	ND	---	1.50
114		---	---	ND	---	0.498
115	110/115	---	---	ND	---	0.997
116	85/116/117	---	---	ND	---	1.50
117	85/116/117	---	---	ND	---	1.50
118		---	---	ND	---	0.638
119	86/87/97/108/119/125	---	---	ND	---	2.99
120		---	---	ND	---	0.498
121		---	---	ND	---	0.498
122		---	---	ND	---	0.498
123		---	---	ND	---	0.498
124	107/124	---	---	ND	---	0.997
125	86/87/97/108/119/125	---	---	ND	---	2.99
126		---	---	ND	---	0.498
127		---	---	ND	---	0.498
128	128/166	---	---	ND	---	0.997
129	129/138/163	---	---	ND	---	1.50
130		---	---	ND	---	0.498
131		---	---	ND	---	0.498
132		---	---	ND	---	0.498
133		---	---	ND	---	0.498
134	134/143	---	---	ND	---	0.997
135	135/151	---	---	ND	---	0.997
136		---	---	ND	---	0.498
137		---	---	ND	---	0.498
138	129/138/163	---	---	ND	---	1.50
139	139/140	---	---	ND	---	0.997
140	139/140	---	---	ND	---	0.997
141		---	---	ND	---	0.498
142		---	---	ND	---	0.498
143	134/143	---	---	ND	---	0.997
144		---	---	ND	---	0.498

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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-EB001-F002
Lab Sample ID 92384453009
Filename P180525B_04

IUPAC	Co-elutions	RT	Ratio	Concentration ng/L	EMPC ng/L	EML ng/L
145		---	---	ND	---	0.498
146		---	---	ND	---	0.498
147	147/149	---	---	ND	---	0.997
148		---	---	ND	---	0.498
149	147/149	---	---	ND	---	0.997
150		---	---	ND	---	0.498
151	135/151	---	---	ND	---	0.997
152		---	---	ND	---	0.498
153	153/168	---	---	ND	---	0.997
154		---	---	ND	---	0.498
155		---	---	ND	---	0.498
156	156/157	---	---	ND	---	0.997
157	156/157	---	---	ND	---	0.997
158		---	---	ND	---	0.498
159		---	---	ND	---	0.498
160		---	---	ND	---	0.498
161		---	---	ND	---	0.498
162		---	---	ND	---	0.498
163	129/138/163	---	---	ND	---	1.50
164		---	---	ND	---	0.498
165		---	---	ND	---	0.498
166	128/166	---	---	ND	---	0.997
167		---	---	ND	---	0.498
168	153/168	---	---	ND	---	0.997
169		---	---	ND	---	0.498
170		---	---	ND	---	0.498
171	171/173	---	---	ND	---	0.997
172		---	---	ND	---	0.498
173	171/173	---	---	ND	---	0.997
174		---	---	ND	---	0.498
175		---	---	ND	---	0.498
176		---	---	ND	---	0.498
177		---	---	ND	---	0.498
178		---	---	ND	---	0.498
179		---	---	ND	---	0.498
180	180/193	---	---	ND	---	0.997
181		---	---	ND	---	0.498
182		---	---	ND	---	0.498
183	183/185	---	---	ND	---	0.997
184		---	---	ND	---	0.498
185	183/185	---	---	ND	---	0.997
186		---	---	ND	---	0.498
187		---	---	ND	---	0.498
188		---	---	ND	---	0.498
189		---	---	ND	---	0.498
190		---	---	ND	---	0.498
191		---	---	ND	---	0.498
192		---	---	ND	---	0.498

Conc = Concentration
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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID ABF-EB001-F002
Lab Sample ID 92384453009
Filename P180525B_04

IUPAC	Co-elutions	RT	Ratio	Concentration ng/L	EMPC ng/L	EML ng/L
193	180/193	---	---	ND	---	0.997
194		---	---	ND	---	0.748
195		---	---	ND	---	0.748
196		---	---	ND	---	0.748
197	197/200	---	---	ND	---	1.50
198	198/199	---	---	ND	---	1.50
199	198/199	---	---	ND	---	1.50
200	197/200	---	---	ND	---	1.50
201		---	---	ND	---	0.748
202		---	---	ND	---	0.748
203		---	---	ND	---	0.748
204		---	---	ND	---	0.748
205		---	---	ND	---	0.748
206		---	---	ND	---	0.748
207		---	---	ND	---	0.748
208		---	---	ND	---	0.748
209		---	---	ND	---	0.748

Conc = Concentration
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Method 1668A Polychlorobiphenyl
Sample Analysis Results

Client Sample ID	ABF-EB001-F002
Lab Sample ID	92384453009
Filename	P180525B_04

Congener Group	Concentration ng/L
Total Monochloro Biphenyls	ND
Total Dichloro Biphenyls	ND
Total Trichloro Biphenyls	ND
Total Tetrachloro Biphenyls	ND
Total Pentachloro Biphenyls	ND
Total Hexachloro Biphenyls	ND
Total Heptachloro Biphenyls	ND
Total Octachloro Biphenyls	ND
Total Nonachloro Biphenyls	ND
DecachloroBiphenyls	ND
Total PCBs	ND

ND = Not Detected

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Blank Analysis Results

Lab Sample ID	BLANK-62395		
Filename	P180523B_06		
Injected By	CVS	Matrix	Solid
Total Amount Extracted	10.6 g	Extracted	05/17/2018 15:20
ICAL ID	P180523B01	Analyzed	05/24/2018 02:42
CCal Filename(s)	P180523B_02	Dilution	NA

PCB Isomer	IUPAC	RT	Ratio	ng's Added	ng's Found	% Recovery
Labeled Analytes						
13C-2-MoCB	1	10.119	2.66	2.0	0.886	44
13C-4-MoCB	3	13.055	2.85	2.0	0.935	47
13C-2,2'-DiCB	4	13.354	1.68	2.0	0.893	45
13C-4,4'-DiCB	15	20.638	1.54	2.0	1.18	59
13C-2,2',6-TrCB	19	17.271	1.11	2.0	1.02	51
13C-3,4,4'-TrCB	37	28.510	1.14	2.0	1.20	60
13C-2,2',6,6'-TeCB	54	20.962	0.78	2.0	1.01	51
13C-3,4,4',5-TeCB	81	35.661	0.83	2.0	1.12	56
13C-3,3',4,4'-TeCB	77	36.315	0.82	2.0	1.19	59
13C-2,2',4,6,6'-PeCB	104	27.101	1.61	2.0	1.05	52
13C-2,3,3',4,4'-PeCB	105	39.843	1.70	2.0	1.08	54
13C-2,3,4,4',5-PeCB	114	39.172	1.68	2.0	1.07	53
13C-2,3',4,4',5-PeCB	118	38.602	1.61	2.0	1.11	55
13C-2,3',4,4',5'-PeCB	123	38.266	1.54	2.0	1.15	58
13C-3,3',4,4',5-PeCB	126	43.030	1.61	2.0	0.960	48
13C-2,2',4,4',6,6'-HxCB	155	33.145	1.20	2.0	1.15	58
13C-HxCB (156/157)	156/157	46.088	1.30	4.0	2.00	50
13C-2,3',4,4',5,5'-HxCB	167	44.880	1.27	2.0	1.04	52
13C-3,3',4,4',5,5'-HxCB	169	49.375	1.28	2.0	0.835	42
13C-2,2',3,4',5,6,6'-HpCB	188	39.088	1.07	2.0	1.51	75
13C-2,3,3',4,4',5,5'-HpCB	189	51.778	1.03	2.0	1.16	58
13C-2,2',3,3',5,5',6,6'-OcCB	202	44.578	0.88	2.0	1.38	69
13C-2,3,3',4,4',5,5',6-OcCB	205	53.805	0.87	2.0	1.07	53
13C-2,2',3,3',4,4',5,5',6-NoCB	206	55.292	0.89	2.0	1.07	53
13C-2,2',3,3',4,5,5',6,6'-NoCB	208	51.304	0.80	2.0	1.28	64
13C--DeCB	209	56.866	0.73	2.0	1.03	51
Cleanup Standards						
13C-2,4,4'-TrCB	28	24.065	1.03	2.0	1.16	58
13C-2,3,3',5,5'-PeCB	111	36.248	1.53	2.0	1.16	58
13C-2,2',3,3',5,5',6-HpCB	178	42.224	1.03	2.0	1.24	62
Recovery Standards						
13C-2,5-DiCB	9	15.893	1.56	2.0	NA	NA
13C-2,2',5,5'-TeCB	52	26.061	0.77	2.0	NA	NA
13C-2,2',4,5,5'-PeCB	101	33.413	1.58	2.0	NA	NA
13C-2,2',3,4,4',5'-HxCB	138	41.805	1.22	2.0	NA	NA
13C-2,2',3,3',4,4',5,5'-OcCB	194	53.395	0.93	2.0	NA	NA

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
Nn = Value obtained from additional analyses

Results reported on a total weight basis

ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion
X = Outside QC Limits
RT = Retention Time
I = Interference
ng's = Nanograms

REPORT OF LABORATORY ANALYSIS

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

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Blank Analysis Results

Lab Sample ID BLANK-62395
Filename P180523B_06

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
1		---	---	ND	---	23.6
2		---	---	ND	---	23.6
3		---	---	ND	---	23.6
4		---	---	ND	---	23.6
5		---	---	ND	---	23.6
6		---	---	ND	---	23.6
7		---	---	ND	---	23.6
8		---	---	ND	---	23.6
9		---	---	ND	---	23.6
10		---	---	ND	---	23.6
11		---	---	ND	---	231
12	12/13	---	---	ND	---	47.2
13	12/13	---	---	ND	---	47.2
14		---	---	ND	---	23.6
15		---	---	ND	---	23.6
16		---	---	ND	---	23.6
17		---	---	ND	---	23.6
18	18/30	---	---	ND	---	47.2
19		---	---	ND	---	23.6
20	20/28	---	---	ND	---	122
21	21/33	---	---	ND	---	127
22		---	---	ND	---	89.6
23		---	---	ND	---	23.6
24		---	---	ND	---	23.6
25		---	---	ND	---	23.6
26	26/29	---	---	ND	---	47.2
27		---	---	ND	---	23.6
28	20/28	---	---	ND	---	122
29	26/29	---	---	ND	---	47.2
30	18/30	---	---	ND	---	47.2
31		---	---	ND	---	123
32		---	---	ND	---	23.6
33	21/33	---	---	ND	---	127
34		---	---	ND	---	23.6
35		---	---	ND	---	23.6
36		---	---	ND	---	23.6
37		---	---	ND	---	50.0
38		---	---	ND	---	23.6
39		---	---	ND	---	23.6
40	40/41/71	---	---	ND	---	142
41	40/41/71	---	---	ND	---	142
42		---	---	ND	---	47.2
43	43/73	---	---	ND	---	47.2
44	44/47/65	---	---	ND	---	142
45	45/51	---	---	ND	---	94.3

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
ng/L = Nanograms per liter

ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion
X = Outside QC Limits
RT = Retention Time
I = Interference

Results reported on a total weight basis

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

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Blank Analysis Results

Lab Sample ID BLANK-62395
Filename P180523B_06

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
46		---	---	ND	---	47.2
47	44/47/65	---	---	ND	---	142
48		---	---	ND	---	47.2
49	49/69	---	---	ND	---	94.3
50	50/53	---	---	ND	---	94.3
51	45/51	---	---	ND	---	94.3
52		---	---	ND	---	145
53	50/53	---	---	ND	---	94.3
54		---	---	ND	---	47.2
55		---	---	ND	---	47.2
56		---	---	ND	---	47.2
57		---	---	ND	---	47.2
58		---	---	ND	---	47.2
59	59/62/75	---	---	ND	---	142
60		---	---	ND	---	47.2
61	61/70/74/76	---	---	ND	---	189
62	59/62/75	---	---	ND	---	142
63		---	---	ND	---	47.2
64		---	---	ND	---	47.2
65	44/47/65	---	---	ND	---	142
66		---	---	ND	---	79.2
67		---	---	ND	---	47.2
68		---	---	ND	---	47.2
69	49/69	---	---	ND	---	94.3
70	61/70/74/76	---	---	ND	---	189
71	40/41/71	---	---	ND	---	142
72		---	---	ND	---	47.2
73	43/73	---	---	ND	---	47.2
74	61/70/74/76	---	---	ND	---	189
75	59/62/75	---	---	ND	---	142
76	61/70/74/76	---	---	ND	---	189
77		---	---	ND	---	47.2
78		---	---	ND	---	47.2
79		---	---	ND	---	47.2
80		---	---	ND	---	47.2
81		---	---	ND	---	47.2
82		---	---	ND	---	47.2
83		---	---	ND	---	47.2
84		---	---	ND	---	47.2
85	85/116/117	---	---	ND	---	142
86	86/87/97/108/119/125	---	---	ND	---	283
87	86/87/97/108/119/125	---	---	ND	---	283
88	88/91	---	---	ND	---	94.3
89		---	---	ND	---	47.2
90	90/101/113	---	---	ND	---	142

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
ng/L = Nanograms per liter

ND = Not Detected
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Results reported on a total weight basis

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

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Blank Analysis Results

Lab Sample ID BLANK-62395
Filename P180523B_06

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
91	88/91	---	---	ND	---	94.3
92		---	---	ND	---	47.2
93	93/98/100/102	---	---	ND	---	189
94		---	---	ND	---	47.2
95		---	---	ND	---	89.6
96		---	---	ND	---	47.2
97	86/87/97/108/119/125	---	---	ND	---	283
98	93/98/100/102	---	---	ND	---	189
99		---	---	ND	---	47.2
100	93/98/100/102	---	---	ND	---	189
101	90/101/113	---	---	ND	---	142
102	93/98/100/102	---	---	ND	---	189
103		---	---	ND	---	47.2
104		---	---	ND	---	47.2
105		---	---	ND	---	47.2
106		---	---	ND	---	47.2
107	107/124	---	---	ND	---	94.3
108	86/87/97/108/119/125	---	---	ND	---	283
109		---	---	ND	---	47.2
110	110/115	---	---	ND	---	94.3
111		---	---	ND	---	47.2
112		---	---	ND	---	47.2
113	90/101/113	---	---	ND	---	142
114		---	---	ND	---	47.2
115	110/115	---	---	ND	---	94.3
116	85/116/117	---	---	ND	---	142
117	85/116/117	---	---	ND	---	142
118		---	---	ND	---	60.4
119	86/87/97/108/119/125	---	---	ND	---	283
120		---	---	ND	---	47.2
121		---	---	ND	---	47.2
122		---	---	ND	---	47.2
123		---	---	ND	---	47.2
124	107/124	---	---	ND	---	94.3
125	86/87/97/108/119/125	---	---	ND	---	283
126		---	---	ND	---	47.2
127		---	---	ND	---	47.2
128	128/166	---	---	ND	---	94.3
129	129/138/163	---	---	ND	---	142
130		---	---	ND	---	47.2
131		---	---	ND	---	47.2
132		---	---	ND	---	47.2
133		---	---	ND	---	47.2
134	134/143	---	---	ND	---	94.3
135	135/151	---	---	ND	---	94.3

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
ng/L = Nanograms per liter

ND = Not Detected
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* = See Discussion
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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Blank Analysis Results

Lab Sample ID BLANK-62395
Filename P180523B_06

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
136		---	---	ND	---	47.2
137		---	---	ND	---	47.2
138	129/138/163	---	---	ND	---	142
139	139/140	---	---	ND	---	94.3
140	139/140	---	---	ND	---	94.3
141		---	---	ND	---	47.2
142		---	---	ND	---	47.2
143	134/143	---	---	ND	---	94.3
144		---	---	ND	---	47.2
145		---	---	ND	---	47.2
146		---	---	ND	---	47.2
147	147/149	---	---	ND	---	94.3
148		---	---	ND	---	47.2
149	147/149	---	---	ND	---	94.3
150		---	---	ND	---	47.2
151	135/151	---	---	ND	---	94.3
152		---	---	ND	---	47.2
153	153/168	---	---	ND	---	94.3
154		---	---	ND	---	47.2
155		---	---	ND	---	47.2
156	156/157	---	---	ND	---	94.3
157	156/157	---	---	ND	---	94.3
158		---	---	ND	---	47.2
159		---	---	ND	---	47.2
160		---	---	ND	---	47.2
161		---	---	ND	---	47.2
162		---	---	ND	---	47.2
163	129/138/163	---	---	ND	---	142
164		---	---	ND	---	47.2
165		---	---	ND	---	47.2
166	128/166	---	---	ND	---	94.3
167		---	---	ND	---	47.2
168	153/168	---	---	ND	---	94.3
169		---	---	ND	---	47.2
170		---	---	ND	---	47.2
171	171/173	---	---	ND	---	94.3
172		---	---	ND	---	47.2
173	171/173	---	---	ND	---	94.3
174		---	---	ND	---	47.2
175		---	---	ND	---	47.2
176		---	---	ND	---	47.2
177		---	---	ND	---	47.2
178		---	---	ND	---	47.2
179		---	---	ND	---	47.2
180	180/193	---	---	ND	---	94.3

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
ng/L = Nanograms per liter

ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion
X = Outside QC Limits
RT = Retention Time
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Results reported on a total weight basis

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

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Blank Analysis Results

Lab Sample ID BLANK-62395
Filename P180523B_06

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
181		---	---	ND	---	47.2
182		---	---	ND	---	47.2
183	183/185	---	---	ND	---	94.3
184		---	---	ND	---	47.2
185	183/185	---	---	ND	---	94.3
186		---	---	ND	---	47.2
187		---	---	ND	---	47.2
188		---	---	ND	---	47.2
189		---	---	ND	---	47.2
190		---	---	ND	---	47.2
191		---	---	ND	---	47.2
192		---	---	ND	---	47.2
193	180/193	---	---	ND	---	94.3
194		---	---	ND	---	70.8
195		---	---	ND	---	70.8
196		---	---	ND	---	70.8
197	197/200	---	---	ND	---	142
198	198/199	---	---	ND	---	142
199	198/199	---	---	ND	---	142
200	197/200	---	---	ND	---	142
201		---	---	ND	---	70.8
202		---	---	ND	---	70.8
203		---	---	ND	---	70.8
204		---	---	ND	---	70.8
205		---	---	ND	---	70.8
206		---	---	ND	---	70.8
207		---	---	ND	---	70.8
208		---	---	ND	---	70.8
209		---	---	ND	---	70.8

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
ng/L = Nanograms per liter

ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion
X = Outside QC Limits
RT = Retention Time
I = Interference

Results reported on a total weight basis

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Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Blank Analysis Results

Client Sample ID	CBLKFB
Lab Sample ID	BLANK-62395
Filename	P180523B_06

Congener Group	Concentration ng/Kg
Total Monochloro Biphenyls	ND
Total Dichloro Biphenyls	ND
Total Trichloro Biphenyls	ND
Total Tetrachloro Biphenyls	ND
Total Pentachloro Biphenyls	ND
Total Hexachloro Biphenyls	ND
Total Heptachloro Biphenyls	ND
Total Octachloro Biphenyls	ND
Total Nonachloro Biphenyls	ND
DecachloroBiphenyls	ND
Total PCBs	ND

ND = Not Detected
Results reported on a total weight basis

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Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Blank Analysis Results

Lab Sample ID	BLANK-62337		
Filename	P180525A_08		
Injected By	CVS	Matrix	Solid
Total Amount Extracted	10.3 g	Extracted	05/16/2018 15:10
ICAL ID	P180525A01	Analyzed	05/25/2018 07:26
CCal Filename(s)	P180525A_02	Dilution	NA

PCB Isomer	IUPAC	RT	Ratio	ng's Added	ng's Found	% Recovery
Labeled Analytes						
13C-2-MoCB	1	10.143	2.69	2.0	1.09	55
13C-4-MoCB	3	13.103	3.60	2.0	1.05	52
13C-2,2'-DiCB	4	13.403	1.62	2.0	1.01	50
13C-4,4'-DiCB	15	20.687	1.61	2.0	1.25	63
13C-2,2',6-TrCB	19	17.379	0.99	2.0	1.16	58
13C-3,4,4'-TrCB	37	28.544	1.10	2.0	1.24	62
13C-2,2',6,6'-TeCB	54	20.996	0.83	2.0	1.06	53
13C-3,4,4',5-TeCB	81	35.694	0.78	2.0	0.933	47
13C-3,3',4,4'-TeCB	77	36.432	0.82	2.0	1.21	61
13C-2,2',4,6,6'-PeCB	104	27.135	1.54	2.0	1.11	56
13C-2,3,3',4,4'-PeCB	105	39.893	1.62	2.0	1.24	62
13C-2,3,4,4',5-PeCB	114	39.205	1.69	2.0	1.30	65
13C-2,3',4,4',5-PeCB	118	38.634	1.52	2.0	1.28	64
13C-2,3',4,4',5'-PeCB	123	38.316	1.56	2.0	1.30	65
13C-3,3',4,4',5-PeCB	126	43.063	1.60	2.0	1.20	60
13C-2,2',4,4',6,6'-HxCB	155	33.178	1.23	2.0	1.14	57
13C-HxCB (156/157)	156/157	46.120	1.26	4.0	2.44	61
13C-2,3',4,4',5,5'-HxCB	167	44.913	1.27	2.0	1.29	64
13C-3,3',4,4',5,5'-HxCB	169	49.408	1.27	2.0	1.12	56
13C-2,2',3,4',5,6,6'-HpCB	188	39.121	1.06	2.0	1.30	65
13C-2,3,3',4,4',5,5'-HpCB	189	51.799	1.12	2.0	1.33	67
13C-2,2',3,3',5,5',6,6'-OcCB	202	44.611	0.86	2.0	1.32	66
13C-2,3,3',4,4',5,5',6-OcCB	205	53.825	0.88	2.0	1.16	58
13C-2,2',3,3',4,4',5,5',6-NoCB	206	55.334	0.76	2.0	1.04	52
13C-2,2',3,3',4,5,5',6,6'-NoCB	208	51.346	0.78	2.0	1.18	59
13C--DeCB	209	56.887	0.75	2.0	1.04	52
Cleanup Standards						
13C-2,4,4'-TrCB	28	24.099	1.04	2.0	1.40	70
13C-2,3,3',5,5'-PeCB	111	36.348	1.53	2.0	1.27	64
13C-2,2',3,3',5,5',6-HpCB	178	42.257	1.11	2.0	1.29	65
Recovery Standards						
13C-2,5-DiCB	9	16.109	1.63	2.0	NA	NA
13C-2,2',5,5'-TeCB	52	26.095	0.78	2.0	NA	NA
13C-2,2',4,5,5'-PeCB	101	33.430	1.51	2.0	NA	NA
13C-2,2',3,4,4',5'-HxCB	138	41.838	1.28	2.0	NA	NA
13C-2,2',3,3',4,4',5,5'-OcCB	194	53.416	0.91	2.0	NA	NA

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
Nn = Value obtained from additional analyses

Results reported on a total weight basis

ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion
X = Outside QC Limits
RT = Retention Time
I = Interference
ng's = Nanograms

REPORT OF LABORATORY ANALYSIS

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

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Blank Analysis Results

Lab Sample ID BLANK-62337
Filename P180525A_08

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
1		---	---	ND	---	24.3
2		---	---	ND	---	24.3
3		---	---	ND	---	24.3
4		---	---	ND	---	24.3
5		---	---	ND	---	24.3
6		---	---	ND	---	24.3
7		---	---	ND	---	24.3
8		---	---	ND	---	24.3
9		---	---	ND	---	24.3
10		---	---	ND	---	24.3
11		---	---	ND	---	238
12	12/13	---	---	ND	---	48.5
13	12/13	---	---	ND	---	48.5
14		---	---	ND	---	24.3
15		---	---	ND	---	24.3
16		---	---	ND	---	24.3
17		---	---	ND	---	24.3
18	18/30	---	---	ND	---	48.5
19		---	---	ND	---	24.3
20	20/28	---	---	ND	---	125
21	21/33	---	---	ND	---	131
22		---	---	ND	---	92.2
23		---	---	ND	---	24.3
24		---	---	ND	---	24.3
25		---	---	ND	---	24.3
26	26/29	---	---	ND	---	48.5
27		---	---	ND	---	24.3
28	20/28	---	---	ND	---	125
29	26/29	---	---	ND	---	48.5
30	18/30	---	---	ND	---	48.5
31		---	---	ND	---	126
32		---	---	ND	---	24.3
33	21/33	---	---	ND	---	131
34		---	---	ND	---	24.3
35		---	---	ND	---	24.3
36		---	---	ND	---	24.3
37		---	---	ND	---	51.5
38		---	---	ND	---	24.3
39		---	---	ND	---	24.3
40	40/41/71	---	---	ND	---	146
41	40/41/71	---	---	ND	---	146
42		---	---	ND	---	48.5
43	43/73	---	---	ND	---	48.5
44	44/47/65	---	---	ND	---	146
45	45/51	---	---	ND	---	97.1

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
ng/L = Nanograms per liter

ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion
X = Outside QC Limits
RT = Retention Time
I = Interference

Results reported on a total weight basis

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

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Blank Analysis Results

Lab Sample ID BLANK-62337
Filename P180525A_08

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
46		---	---	ND	---	48.5
47	44/47/65	---	---	ND	---	146
48		---	---	ND	---	48.5
49	49/69	---	---	ND	---	97.1
50	50/53	---	---	ND	---	97.1
51	45/51	---	---	ND	---	97.1
52		---	---	ND	---	150
53	50/53	---	---	ND	---	97.1
54		---	---	ND	---	48.5
55		---	---	ND	---	48.5
56		---	---	ND	---	48.5
57		---	---	ND	---	48.5
58		---	---	ND	---	48.5
59	59/62/75	---	---	ND	---	146
60		---	---	ND	---	48.5
61	61/70/74/76	---	---	ND	---	194
62	59/62/75	---	---	ND	---	146
63		---	---	ND	---	48.5
64		---	---	ND	---	48.5
65	44/47/65	---	---	ND	---	146
66		---	---	ND	---	81.6
67		---	---	ND	---	48.5
68		---	---	ND	---	48.5
69	49/69	---	---	ND	---	97.1
70	61/70/74/76	---	---	ND	---	194
71	40/41/71	---	---	ND	---	146
72		---	---	ND	---	48.5
73	43/73	---	---	ND	---	48.5
74	61/70/74/76	---	---	ND	---	194
75	59/62/75	---	---	ND	---	146
76	61/70/74/76	---	---	ND	---	194
77		---	---	ND	---	48.5
78		---	---	ND	---	48.5
79		---	---	ND	---	48.5
80		---	---	ND	---	48.5
81		---	---	ND	---	48.5
82		---	---	ND	---	48.5
83		---	---	ND	---	48.5
84		---	---	ND	---	48.5
85	85/116/117	---	---	ND	---	146
86	86/87/97/108/119/125	---	---	ND	---	291
87	86/87/97/108/119/125	---	---	ND	---	291
88	88/91	---	---	ND	---	97.1
89		---	---	ND	---	48.5
90	90/101/113	---	---	ND	---	146

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
ng/L = Nanograms per liter

ND = Not Detected
NA = Not Applicable
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RT = Retention Time
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Results reported on a total weight basis

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Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Blank Analysis Results

Lab Sample ID BLANK-62337
Filename P180525A_08

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
91	88/91	---	---	ND	---	97.1
92		---	---	ND	---	48.5
93	93/98/100/102	---	---	ND	---	194
94		---	---	ND	---	48.5
95		---	---	ND	---	92.2
96		---	---	ND	---	48.5
97	86/87/97/108/119/125	---	---	ND	---	291
98	93/98/100/102	---	---	ND	---	194
99		---	---	ND	---	48.5
100	93/98/100/102	---	---	ND	---	194
101	90/101/113	---	---	ND	---	146
102	93/98/100/102	---	---	ND	---	194
103		---	---	ND	---	48.5
104		---	---	ND	---	48.5
105		---	---	ND	---	48.5
106		---	---	ND	---	48.5
107	107/124	---	---	ND	---	97.1
108	86/87/97/108/119/125	---	---	ND	---	291
109		---	---	ND	---	48.5
110	110/115	---	---	ND	---	97.1
111		---	---	ND	---	48.5
112		---	---	ND	---	48.5
113	90/101/113	---	---	ND	---	146
114		---	---	ND	---	48.5
115	110/115	---	---	ND	---	97.1
116	85/116/117	---	---	ND	---	146
117	85/116/117	---	---	ND	---	146
118		---	---	ND	---	62.1
119	86/87/97/108/119/125	---	---	ND	---	291
120		---	---	ND	---	48.5
121		---	---	ND	---	48.5
122		---	---	ND	---	48.5
123		---	---	ND	---	48.5
124	107/124	---	---	ND	---	97.1
125	86/87/97/108/119/125	---	---	ND	---	291
126		---	---	ND	---	48.5
127		---	---	ND	---	48.5
128	128/166	---	---	ND	---	97.1
129	129/138/163	---	---	ND	---	146
130		---	---	ND	---	48.5
131		---	---	ND	---	48.5
132		---	---	ND	---	48.5
133		---	---	ND	---	48.5
134	134/143	---	---	ND	---	97.1
135	135/151	---	---	ND	---	97.1

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
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R = Recovery outside of Method 1668A control limits
ng/L = Nanograms per liter

ND = Not Detected
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* = See Discussion
X = Outside QC Limits
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Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Blank Analysis Results

Lab Sample ID BLANK-62337
Filename P180525A_08

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
136		---	---	ND	---	48.5
137		---	---	ND	---	48.5
138	129/138/163	---	---	ND	---	146
139	139/140	---	---	ND	---	97.1
140	139/140	---	---	ND	---	97.1
141		---	---	ND	---	48.5
142		---	---	ND	---	48.5
143	134/143	---	---	ND	---	97.1
144		---	---	ND	---	48.5
145		---	---	ND	---	48.5
146		---	---	ND	---	48.5
147	147/149	---	---	ND	---	97.1
148		---	---	ND	---	48.5
149	147/149	---	---	ND	---	97.1
150		---	---	ND	---	48.5
151	135/151	---	---	ND	---	97.1
152		---	---	ND	---	48.5
153	153/168	---	---	ND	---	97.1
154		---	---	ND	---	48.5
155		---	---	ND	---	48.5
156	156/157	---	---	ND	---	97.1
157	156/157	---	---	ND	---	97.1
158		---	---	ND	---	48.5
159		---	---	ND	---	48.5
160		---	---	ND	---	48.5
161		---	---	ND	---	48.5
162		---	---	ND	---	48.5
163	129/138/163	---	---	ND	---	146
164		---	---	ND	---	48.5
165		---	---	ND	---	48.5
166	128/166	---	---	ND	---	97.1
167		---	---	ND	---	48.5
168	153/168	---	---	ND	---	97.1
169		---	---	ND	---	48.5
170		---	---	ND	---	48.5
171	171/173	---	---	ND	---	97.1
172		---	---	ND	---	48.5
173	171/173	---	---	ND	---	97.1
174		---	---	ND	---	48.5
175		---	---	ND	---	48.5
176		---	---	ND	---	48.5
177		---	---	ND	---	48.5
178		---	---	ND	---	48.5
179		---	---	ND	---	48.5
180	180/193	---	---	ND	---	97.1

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
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Minneapolis, MN 55414

Tel: 612-607-1700
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Method 1668A Polychlorobiphenyl
Blank Analysis Results

Lab Sample ID BLANK-62337
Filename P180525A_08

IUPAC	Co-elutions	RT	Ratio	Concentration ng/Kg	EMPC ng/Kg	EML ng/Kg
181		---	---	ND	---	48.5
182		---	---	ND	---	48.5
183	183/185	---	---	ND	---	97.1
184		---	---	ND	---	48.5
185	183/185	---	---	ND	---	97.1
186		---	---	ND	---	48.5
187		---	---	ND	---	48.5
188		---	---	ND	---	48.5
189		---	---	ND	---	48.5
190		---	---	ND	---	48.5
191		---	---	ND	---	48.5
192		---	---	ND	---	48.5
193	180/193	---	---	ND	---	97.1
194		---	---	ND	---	72.8
195		---	---	ND	---	72.8
196		---	---	ND	---	72.8
197	197/200	---	---	ND	---	146
198	198/199	---	---	ND	---	146
199	198/199	---	---	ND	---	146
200	197/200	---	---	ND	---	146
201		---	---	ND	---	72.8
202		---	---	ND	---	72.8
203		---	---	ND	---	72.8
204		---	---	ND	---	72.8
205		---	---	ND	---	72.8
206		---	---	ND	---	72.8
207		---	---	ND	---	72.8
208		---	---	ND	---	72.8
209		---	---	ND	---	72.8

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
ng/L = Nanograms per liter

ND = Not Detected
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Method 1668A Polychlorobiphenyl
Blank Analysis Results

Client Sample ID	CBLKEF
Lab Sample ID	BLANK-62337
Filename	P180525A_08

Congener Group	Concentration ng/Kg
Total Monochloro Biphenyls	ND
Total Dichloro Biphenyls	ND
Total Trichloro Biphenyls	ND
Total Tetrachloro Biphenyls	ND
Total Pentachloro Biphenyls	ND
Total Hexachloro Biphenyls	ND
Total Heptachloro Biphenyls	ND
Total Octachloro Biphenyls	ND
Total Nonachloro Biphenyls	ND
DecachloroBiphenyls	ND
Total PCBs	ND

ND = Not Detected
Results reported on a total weight basis

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Method 1668A Polychlorobiphenyl
Blank Analysis Results

Lab Sample ID	BLANK-62423		
Filename	P180527A_06		
Injected By	CVS	Matrix	Water
Total Amount Extracted	907 mL	Extracted	05/18/2018 13:10
ICAL ID	P180527A01	Analyzed	05/27/2018 06:39
CCal Filename(s)	P180527A_02	Dilution	NA

PCB Isomer	IUPAC	RT	Ratio	ng's Added	ng's Found	% Recovery
Labeled Analytes						
13C-2-MoCB	1	10.119	3.36	2.0	0.942	47
13C-4-MoCB	3	13.043	3.12	2.0	1.17	58
13C-2,2'-DiCB	4	13.342	1.60	2.0	1.02	51
13C-4,4'-DiCB	15	20.614	1.56	2.0	1.35	68
13C-2,2',6-TrCB	19	17.271	1.07	2.0	1.07	54
13C-3,4,4'-TrCB	37	28.508	1.12	2.0	1.65	82
13C-2,2',6,6'-TeCB	54	20.945	0.80	2.0	1.28	64
13C-3,4,4',5-TeCB	81	35.657	0.81	2.0	1.60	80
13C-3,3',4,4'-TeCB	77	36.261	0.82	2.0	1.58	79
13C-2,2',4,6,6'-PeCB	104	27.099	1.51	2.0	1.19	59
13C-2,3,3',4,4'-PeCB	105	39.854	1.58	2.0	1.82	91
13C-2,3,4,4',5-PeCB	114	39.167	1.60	2.0	1.82	91
13C-2,3',4,4',5-PeCB	118	38.613	1.67	2.0	1.80	90
13C-2,3',4,4',5'-PeCB	123	38.261	1.58	2.0	1.79	90
13C-3,3',4,4',5-PeCB	126	43.041	1.67	2.0	1.60	80
13C-2,2',4,4',6,6'-HxCB	155	33.141	1.26	2.0	1.22	61
13C-HxCB (156/157)	156/157	46.098	1.27	4.0	3.11	78
13C-2,3',4,4',5,5'-HxCB	167	44.874	1.27	2.0	1.61	80
13C-3,3',4,4',5,5'-HxCB	169	49.401	1.22	2.0	1.38	69
13C-2,2',3,4',5,6,6'-HpCB	188	39.083	1.03	2.0	1.70	85
13C-2,3,3',4,4',5,5'-HpCB	189	51.766	1.06	2.0	1.83	92
13C-2,2',3,3',5,5',6,6'-OcCB	202	44.572	0.89	2.0	1.55	77
13C-2,3,3',4,4',5,5',6-OcCB	205	53.792	0.91	2.0	1.72	86
13C-2,2',3,3',4,4',5,5',6-NoCB	206	55.301	0.82	2.0	1.45	72
13C-2,2',3,3',4,5,5',6,6'-NoCB	208	51.313	0.79	2.0	1.58	79
13C--DeCB	209	56.874	0.68	2.0	1.37	69
Cleanup Standards						
13C-2,4,4'-TrCB	28	24.064	1.02	2.0	1.87	93
13C-2,3,3',5,5'-PeCB	111	36.210	1.59	2.0	1.56	78
13C-2,2',3,3',5,5',6-HpCB	178	42.219	1.03	2.0	1.39	70
Recovery Standards						
13C-2,5-DiCB	9	15.868	1.61	2.0	NA	NA
13C-2,2',5,5'-TeCB	52	26.059	0.82	2.0	NA	NA
13C-2,2',4,5,5'-PeCB	101	33.410	1.60	2.0	NA	NA
13C-2,2',3,4,4',5'-HxCB	138	41.800	1.22	2.0	NA	NA
13C-2,2',3,3',4,4',5,5'-OcCB	194	53.404	0.91	2.0	NA	NA

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
Nn = Value obtained from additional analyses

ND = Not Detected
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Tel: 612-607-1700
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Method 1668A Polychlorobiphenyl Blank Analysis Results

Lab Sample ID BLANK-62423
Filename P180527A_06

IUPAC	Co-elutions	RT	Ratio	Concentration ng/L	EMPC ng/L	EML ng/L
1		---	---	ND	---	0.276
2		---	---	ND	---	0.276
3		---	---	ND	---	0.276
4		---	---	ND	---	0.276
5		---	---	ND	---	0.276
6		---	---	ND	---	0.276
7		---	---	ND	---	0.276
8		---	---	ND	---	0.276
9		---	---	ND	---	0.276
10		---	---	ND	---	0.276
11		---	---	ND	---	2.70
12	12/13	---	---	ND	---	0.551
13	12/13	---	---	ND	---	0.551
14		---	---	ND	---	0.276
15		---	---	ND	---	0.276
16		---	---	ND	---	0.276
17		---	---	ND	---	0.276
18	18/30	---	---	ND	---	0.551
19		---	---	ND	---	0.276
20	20/28	---	---	ND	---	1.42
21	21/33	---	---	ND	---	1.49
22		---	---	ND	---	1.05
23		---	---	ND	---	0.276
24		---	---	ND	---	0.276
25		---	---	ND	---	0.276
26	26/29	---	---	ND	---	0.551
27		---	---	ND	---	0.276
28	20/28	---	---	ND	---	1.42
29	26/29	---	---	ND	---	0.551
30	18/30	---	---	ND	---	0.551
31		---	---	ND	---	1.43
32		---	---	ND	---	0.276
33	21/33	---	---	ND	---	1.49
34		---	---	ND	---	0.276
35		---	---	ND	---	0.276
36		---	---	ND	---	0.276
37		---	---	ND	---	0.584
38		---	---	ND	---	0.276
39		---	---	ND	---	0.276
40	40/41/71	---	---	ND	---	1.65
41	40/41/71	---	---	ND	---	1.65
42		---	---	ND	---	0.551
43	43/73	---	---	ND	---	0.551
44	44/47/65	---	---	ND	---	1.65
45	45/51	---	---	ND	---	1.10

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
ng/L = Nanograms per liter

ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion
X = Outside QC Limits
RT = Retention Time
I = Interference

REPORT OF LABORATORY ANALYSIS

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1700 Elm Street - Suite 200
Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Blank Analysis Results

Lab Sample ID BLANK-62423
Filename P180527A_06

IUPAC	Co-elutions	RT	Ratio	Concentration ng/L	EMPC ng/L	EML ng/L
46		---	---	ND	---	0.551
47	44/47/65	---	---	ND	---	1.65
48		---	---	ND	---	0.551
49	49/69	---	---	ND	---	1.10
50	50/53	---	---	ND	---	1.10
51	45/51	---	---	ND	---	1.10
52		---	---	ND	---	1.70
53	50/53	---	---	ND	---	1.10
54		---	---	ND	---	0.551
55		---	---	ND	---	0.551
56		---	---	ND	---	0.551
57		---	---	ND	---	0.551
58		---	---	ND	---	0.551
59	59/62/75	---	---	ND	---	1.65
60		---	---	ND	---	0.551
61	61/70/74/76	---	---	ND	---	2.20
62	59/62/75	---	---	ND	---	1.65
63		---	---	ND	---	0.551
64		---	---	ND	---	0.551
65	44/47/65	---	---	ND	---	1.65
66		---	---	ND	---	0.926
67		---	---	ND	---	0.551
68		---	---	ND	---	0.551
69	49/69	---	---	ND	---	1.10
70	61/70/74/76	---	---	ND	---	2.20
71	40/41/71	---	---	ND	---	1.65
72		---	---	ND	---	0.551
73	43/73	---	---	ND	---	0.551
74	61/70/74/76	---	---	ND	---	2.20
75	59/62/75	---	---	ND	---	1.65
76	61/70/74/76	---	---	ND	---	2.20
77		---	---	ND	---	0.551
78		---	---	ND	---	0.551
79		---	---	ND	---	0.551
80		---	---	ND	---	0.551
81		---	---	ND	---	0.551
82		---	---	ND	---	0.551
83		---	---	ND	---	0.551
84		---	---	ND	---	0.551
85	85/116/117	---	---	ND	---	1.65
86	86/87/97/108/119/125	---	---	ND	---	3.31
87	86/87/97/108/119/125	---	---	ND	---	3.31
88	88/91	---	---	ND	---	1.10
89		---	---	ND	---	0.551
90	90/101/113	---	---	ND	---	1.65

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
ng/L = Nanograms per liter

ND = Not Detected
NA = Not Applicable
NC = Not Calculated
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X = Outside QC Limits
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Minneapolis, MN 55414

Tel: 612-607-1700
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Method 1668A Polychlorobiphenyl
Blank Analysis Results

Lab Sample ID BLANK-62423
Filename P180527A_06

IUPAC	Co-elutions	RT	Ratio	Concentration ng/L	EMPC ng/L	EML ng/L
91	88/91	---	---	ND	---	1.10
92		---	---	ND	---	0.551
93	93/98/100/102	---	---	ND	---	2.20
94		---	---	ND	---	0.551
95		---	---	ND	---	1.05
96		---	---	ND	---	0.551
97	86/87/97/108/119/125	---	---	ND	---	3.31
98	93/98/100/102	---	---	ND	---	2.20
99		---	---	ND	---	0.551
100	93/98/100/102	---	---	ND	---	2.20
101	90/101/113	---	---	ND	---	1.65
102	93/98/100/102	---	---	ND	---	2.20
103		---	---	ND	---	0.551
104		---	---	ND	---	0.551
105		---	---	ND	---	0.551
106		---	---	ND	---	0.551
107	107/124	---	---	ND	---	1.10
108	86/87/97/108/119/125	---	---	ND	---	3.31
109		---	---	ND	---	0.551
110	110/115	---	---	ND	---	1.10
111		---	---	ND	---	0.551
112		---	---	ND	---	0.551
113	90/101/113	---	---	ND	---	1.65
114		---	---	ND	---	0.551
115	110/115	---	---	ND	---	1.10
116	85/116/117	---	---	ND	---	1.65
117	85/116/117	---	---	ND	---	1.65
118		---	---	ND	---	0.705
119	86/87/97/108/119/125	---	---	ND	---	3.31
120		---	---	ND	---	0.551
121		---	---	ND	---	0.551
122		---	---	ND	---	0.551
123		---	---	ND	---	0.551
124	107/124	---	---	ND	---	1.10
125	86/87/97/108/119/125	---	---	ND	---	3.31
126		---	---	ND	---	0.551
127		---	---	ND	---	0.551
128	128/166	---	---	ND	---	1.10
129	129/138/163	---	---	ND	---	1.65
130		---	---	ND	---	0.551
131		---	---	ND	---	0.551
132		---	---	ND	---	0.551
133		---	---	ND	---	0.551
134	134/143	---	---	ND	---	1.10
135	135/151	---	---	ND	---	1.10

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
ng/L = Nanograms per liter

ND = Not Detected
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Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Blank Analysis Results

Lab Sample ID BLANK-62423
Filename P180527A_06

IUPAC	Co-elutions	RT	Ratio	Concentration ng/L	EMPC ng/L	EML ng/L
136		---	---	ND	---	0.551
137		---	---	ND	---	0.551
138	129/138/163	---	---	ND	---	1.65
139	139/140	---	---	ND	---	1.10
140	139/140	---	---	ND	---	1.10
141		---	---	ND	---	0.551
142		---	---	ND	---	0.551
143	134/143	---	---	ND	---	1.10
144		---	---	ND	---	0.551
145		---	---	ND	---	0.551
146		---	---	ND	---	0.551
147	147/149	---	---	ND	---	1.10
148		---	---	ND	---	0.551
149	147/149	---	---	ND	---	1.10
150		---	---	ND	---	0.551
151	135/151	---	---	ND	---	1.10
152		---	---	ND	---	0.551
153	153/168	---	---	ND	---	1.10
154		---	---	ND	---	0.551
155		---	---	ND	---	0.551
156	156/157	---	---	ND	---	1.10
157	156/157	---	---	ND	---	1.10
158		---	---	ND	---	0.551
159		---	---	ND	---	0.551
160		---	---	ND	---	0.551
161		---	---	ND	---	0.551
162		---	---	ND	---	0.551
163	129/138/163	---	---	ND	---	1.65
164		---	---	ND	---	0.551
165		---	---	ND	---	0.551
166	128/166	---	---	ND	---	1.10
167		---	---	ND	---	0.551
168	153/168	---	---	ND	---	1.10
169		---	---	ND	---	0.551
170		---	---	ND	---	0.551
171	171/173	---	---	ND	---	1.10
172		---	---	ND	---	0.551
173	171/173	---	---	ND	---	1.10
174		---	---	ND	---	0.551
175		---	---	ND	---	0.551
176		---	---	ND	---	0.551
177		---	---	ND	---	0.551
178		---	---	ND	---	0.551
179		---	---	ND	---	0.551
180	180/193	---	---	ND	---	1.10

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
ng/L = Nanograms per liter

ND = Not Detected
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NC = Not Calculated
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Minneapolis, MN 55414

Tel: 612-607-1700
Fax: 612- 607-6444

Method 1668A Polychlorobiphenyl
Blank Analysis Results

Lab Sample ID BLANK-62423
Filename P180527A_06

IUPAC	Co-elutions	RT	Ratio	Concentration ng/L	EMPC ng/L	EML ng/L
181		---	---	ND	---	0.551
182		---	---	ND	---	0.551
183	183/185	---	---	ND	---	1.10
184		---	---	ND	---	0.551
185	183/185	---	---	ND	---	1.10
186		---	---	ND	---	0.551
187		---	---	ND	---	0.551
188		---	---	ND	---	0.551
189		---	---	ND	---	0.551
190		---	---	ND	---	0.551
191		---	---	ND	---	0.551
192		---	---	ND	---	0.551
193	180/193	---	---	ND	---	1.10
194		---	---	ND	---	0.827
195		---	---	ND	---	0.827
196		---	---	ND	---	0.827
197	197/200	---	---	ND	---	1.65
198	198/199	---	---	ND	---	1.65
199	198/199	---	---	ND	---	1.65
200	197/200	---	---	ND	---	1.65
201		---	---	ND	---	0.827
202		---	---	ND	---	0.827
203		---	---	ND	---	0.827
204		---	---	ND	---	0.827
205		---	---	ND	---	0.827
206		---	---	ND	---	0.827
207		---	---	ND	---	0.827
208		---	---	ND	---	0.827
209		---	---	ND	---	0.827

Conc = Concentration
EML =Method Specified Reporting Limit (1668A)
EMPC = Estimated Maximum Possible Concentration
A = Limit of Detection based on signal to noise
B = Less than 10 times higher than method blank level
R = Recovery outside of Method 1668A control limits
ng/L = Nanograms per liter

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Method 1668A Polychlorobiphenyl
Blank Analysis Results

Client Sample ID	CBLKFL
Lab Sample ID	BLANK-62423
Filename	P180527A_06

Congener Group	Concentration ng/L
Total Monochloro Biphenyls	ND
Total Dichloro Biphenyls	ND
Total Trichloro Biphenyls	ND
Total Tetrachloro Biphenyls	ND
Total Pentachloro Biphenyls	ND
Total Hexachloro Biphenyls	ND
Total Heptachloro Biphenyls	ND
Total Octachloro Biphenyls	ND
Total Nonachloro Biphenyls	ND
DecachloroBiphenyls	ND
Total PCBs	ND

ND = Not Detected

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Method 1668A Polychlorobiphenyls
Laboratory Control Spike Analysis Results

Lab Sample ID	LCS-62396		
Filename	P180523B_03	Matrix	Solid
Total Amount Extracted	10.2 g	Dilution	NA
ICAL ID	P180523B01	Extracted	05/17/2018 15:20
CCal Filename(s)	P180523B_02	Analyzed	05/23/2018 23:40
Method Blank ID	BLANK-62395	Injected By	CVS

	Native Analytes			Labeled Analytes		
PCB Isomer	Spiked (ng)	Found (ng)	% Recovery	Spiked (ng)	Found (ng)	% Recovery
1	1.0	1.01	101	2.0	0.894	45
3	1.0	1.08	108	2.0	0.952	48
4	1.0	1.05	105	2.0	0.954	48
15	1.0	0.991	99	2.0	1.26	63
19	1.0	0.992	99	2.0	1.10	55
37	1.0	0.925	92	2.0	1.38	69
54	1.0	0.969	97	2.0	1.07	54
81	1.0	0.884	88	2.0	1.40	70
77	1.0	0.970	97	2.0	1.50	75
104	1.0	1.01	101	2.0	1.08	54
105	1.0	0.941	94	2.0	1.36	68
114	1.0	0.997	100	2.0	1.31	66
118	1.0	1.01	101	2.0	1.26	63
123	1.0	0.955	95	2.0	1.36	68
126	1.0	0.922	92	2.0	1.47	74
155	1.0	0.986	99	2.0	1.10	55
156/157	2.0	1.91	95	4.0	2.31	58
167	1.0	0.966	97	2.0	1.20	60
169	1.0	0.955	96	2.0	1.19	60
188	1.0	1.01	101	2.0	1.29	64
189	1.0	0.986	99	2.0	1.42	71
202	1.0	1.05	105	2.0	1.25	63
205	1.0	0.970	97	2.0	1.34	67
206	1.0	1.11	111	2.0	1.19	60
208	1.0	1.03	103	2.0	1.39	69
209	1.0	1.01	101	2.0	1.27	64

R = Recovery outside of method 1668A control limits
Nn = Result obtained from alternate analysis
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion
ng = Nanograms
I = Interference

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Method 1668A Polychlorobiphenyls
Laboratory Control Spike Analysis Results

Lab Sample ID	LCS-62338		
Filename	P180525A_05	Matrix	Solid
Total Amount Extracted	10.4 g	Dilution	NA
ICAL ID	P180525A01	Extracted	05/16/2018 15:10
CCal Filename(s)	P180525A_02	Analyzed	05/25/2018 04:24
Method Blank ID	BLANK-62337	Injected By	CVS

	Native Analytes			Labeled Analytes		
PCB Isomer	**Spiked (ng)**	**Found (ng)**	**% Recovery**	**Spiked (ng)**	**Found (ng)**	**% Recovery**
1	1.0	0.980	98	2.0	1.15	57
3	1.0	0.985	98	2.0	1.18	59
4	1.0	1.03	103	2.0	1.09	55
15	1.0	1.000	100	2.0	1.43	71
19	1.0	0.827	83	2.0	1.39	69
37	1.0	0.918	92	2.0	1.45	73
54	1.0	0.969	97	2.0	1.21	61
81	1.0	0.880	88	2.0	1.28	64
77	1.0	0.919	92	2.0	1.47	73
104	1.0	1.02	102	2.0	1.25	62
105	1.0	0.968	97	2.0	1.54	77
114	1.0	0.922	92	2.0	1.53	77
118	1.0	0.971	97	2.0	1.52	76
123	1.0	0.901	90	2.0	1.62	81
126	1.0	0.937	94	2.0	1.43	71
155	1.0	0.959	96	2.0	1.24	62
156/157	2.0	1.90	95	4.0	2.72	68
167	1.0	0.963	96	2.0	1.42	71
169	1.0	0.976	98	2.0	1.19	59
188	1.0	0.958	96	2.0	1.62	81
189	1.0	0.931	93	2.0	1.64	82
202	1.0	1.02	102	2.0	1.52	76
205	1.0	1.01	101	2.0	1.43	72
206	1.0	1.09	109	2.0	1.27	64
208	1.0	0.965	96	2.0	1.51	76
209	1.0	0.913	91	2.0	1.36	68

R = Recovery outside of method 1668A control limits
Nn = Result obtained from alternate analysis
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
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ng = Nanograms
I = Interference

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Method 1668A Polychlorobiphenyls
Laboratory Control Spike Analysis Results

Lab Sample ID	LCS-62424		
Filename	P180527A_03	Matrix	Water
Total Amount Extracted	886 mL	Dilution	NA
ICAL ID	P180527A01	Extracted	05/18/2018 13:10
CCal Filename(s)	P180527A_02	Analyzed	05/27/2018 03:36
Method Blank ID	BLANK-62423	Injected By	CVS

	Native Analytes			Labeled Analytes		
PCB Isomer	Spiked (ng)	Found (ng)	% Recovery	Spiked (ng)	Found (ng)	% Recovery
1	1.0	1.04	104	2.0	1.03	52
3	1.0	0.983	98	2.0	1.18	59
4	1.0	1.03	103	2.0	1.02	51
15	1.0	0.974	97	2.0	1.35	67
19	1.0	1.02	102	2.0	1.03	52
37	1.0	0.923	92	2.0	1.46	73
54	1.0	0.983	98	2.0	1.15	57
81	1.0	0.958	96	2.0	1.50	75
77	1.0	0.940	94	2.0	1.41	71
104	1.0	0.990	99	2.0	1.15	58
105	1.0	0.957	96	2.0	1.68	84
114	1.0	0.965	96	2.0	1.67	84
118	1.0	0.984	98	2.0	1.67	84
123	1.0	0.974	97	2.0	1.65	83
126	1.0	0.962	96	2.0	1.49	75
155	1.0	0.972	97	2.0	1.17	58
156/157	2.0	1.93	96	4.0	2.94	74
167	1.0	0.972	97	2.0	1.55	78
169	1.0	0.989	99	2.0	1.31	66
188	1.0	0.953	95	2.0	1.54	77
189	1.0	0.941	94	2.0	1.72	86
202	1.0	1.06	106	2.0	1.38	69
205	1.0	0.973	97	2.0	1.58	79
206	1.0	1.08	108	2.0	1.28	64
208	1.0	1.01	101	2.0	1.43	72
209	1.0	0.942	94	2.0	1.29	65

R = Recovery outside of method 1668A control limits
Nn = Result obtained from alternate analysis
ND = Not Detected
NA = Not Applicable
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Method 1668A Polychlorobiphenyls
Laboratory Control Spike Analysis Results

Lab Sample ID	LCSD-62397		
Filename	P180523B_04	Matrix	Solid
Total Amount Extracted	10.4 g	Dilution	NA
ICAL ID	P180523B01	Extracted	05/17/2018 15:20
CCal Filename(s)	P180523B_02	Analyzed	05/24/2018 00:40
Method Blank ID	BLANK-62395	Injected By	CVS

	Native Analytes			Labeled Analytes		
PCB Isomer	**Spiked (ng)**	**Found (ng)**	**% Recovery**	**Spiked (ng)**	**Found (ng)**	**% Recovery**
1	1.0	1.05	105	2.0	0.910	46
3	1.0	1.07	107	2.0	0.997	50
4	1.0	1.12	112	2.0	0.981	49
15	1.0	1.02	102	2.0	1.22	61
19	1.0	1.01	101	2.0	1.14	57
37	1.0	1.01	101	2.0	1.25	62
54	1.0	1.33	133	2.0	1.06	53
81	1.0	0.895	90	2.0	1.27	63
77	1.0	0.926	93	2.0	1.33	66
104	1.0	1.16	116	2.0	1.15	58
105	1.0	1.01	101	2.0	1.26	63
114	1.0	0.964	96	2.0	1.26	63
118	1.0	1.08	108	2.0	1.26	63
123	1.0	1.03	103	2.0	1.30	65
126	1.0	0.971	97	2.0	1.22	61
155	1.0	1.01	101	2.0	1.25	62
156/157	2.0	1.99	100	4.0	2.21	55
167	1.0	1.02	102	2.0	1.16	58
169	1.0	1.03	103	2.0	0.969	48
188	1.0	1.08	108	2.0	1.57	78
189	1.0	0.974	97	2.0	1.38	69
202	1.0	1.11	111	2.0	1.49	74
205	1.0	1.02	102	2.0	1.36	68
206	1.0	1.20	120	2.0	1.25	63
208	1.0	1.04	104	2.0	1.42	71
209	1.0	0.933	93	2.0	1.30	65

R = Recovery outside of method 1668A control limits
Nn = Result obtained from alternate analysis
ND = Not Detected
NA = Not Applicable
NC = Not Calculated
* = See Discussion
ng = Nanograms
I = Interference

REPORT OF LABORATORY ANALYSIS

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

Tel: 612-607-1700
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Method 1668A Polychlorobiphenyls
Laboratory Control Spike Analysis Results

Lab Sample ID	LCSD-62339		
Filename	P180525A_06	Matrix	Solid
Total Amount Extracted	10.0 g	Dilution	NA
ICAL ID	P180525A01	Extracted	05/16/2018 15:10
CCal Filename(s)	P180525A_02	Analyzed	05/25/2018 05:25
Method Blank ID	BLANK-62337	Injected By	CVS

	Native Analytes			Labeled Analytes		
PCB Isomer	**Spiked (ng)**	**Found (ng)**	**% Recovery**	**Spiked (ng)**	**Found (ng)**	**% Recovery**
1	1.0	1.04	104	2.0	1.20	60
3	1.0	1.05	105	2.0	1.19	59
4	1.0	1.14	114	2.0	1.17	58
15	1.0	1.04	104	2.0	1.43	72
19	1.0	0.951	95	2.0	1.31	65
37	1.0	0.956	96	2.0	1.50	75
54	1.0	0.983	98	2.0	1.23	62
81	1.0	0.967	97	2.0	1.03	52
77	1.0	0.988	99	2.0	1.44	72
104	1.0	1.06	106	2.0	1.24	62
105	1.0	1.00	100	2.0	1.46	73
114	1.0	0.982	98	2.0	1.43	72
118	1.0	1.11	111	2.0	1.45	72
123	1.0	1.00	100	2.0	1.45	73
126	1.0	0.934	93	2.0	1.36	68
155	1.0	0.967	97	2.0	1.30	65
156/157	2.0	1.97	99	4.0	2.80	70
167	1.0	0.996	100	2.0	1.43	72
169	1.0	0.990	99	2.0	1.28	64
188	1.0	1.01	101	2.0	1.50	75
189	1.0	0.904	90	2.0	1.56	78
202	1.0	1.10	110	2.0	1.44	72
205	1.0	1.01	101	2.0	1.38	69
206	1.0	1.02	102	2.0	1.22	61
208	1.0	1.00	100	2.0	1.44	72
209	1.0	1.02	102	2.0	1.21	61

R = Recovery outside of method 1668A control limits
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Method 1668A Polychlorobiphenyls
Laboratory Control Spike Analysis Results

Lab Sample ID	LCSD-62425		
Filename	P180527A_04	Matrix	Water
Total Amount Extracted	1050 mL	Dilution	NA
ICAL ID	P180527A01	Extracted	05/18/2018 13:10
CCal Filename(s)	P180527A_02	Analyzed	05/27/2018 04:37
Method Blank ID	BLANK-62423	Injected By	CVS

	Native Analytes			Labeled Analytes		
PCB Isomer	Spiked (ng)	Found (ng)	% Recovery	Spiked (ng)	Found (ng)	% Recovery
1	1.0	0.913	91	2.0	0.933	47
3	1.0	0.963	96	2.0	1.04	52
4	1.0	0.983	98	2.0	0.868	43
15	1.0	1.02	102	2.0	1.15	57
19	1.0	1.03	103	2.0	0.875	44
37	1.0	0.889	89	2.0	1.59	80
54	1.0	0.981	98	2.0	1.13	57
81	1.0	0.958	96	2.0	1.65	83
77	1.0	0.942	94	2.0	1.56	78
104	1.0	0.962	96	2.0	1.07	53
105	1.0	0.977	98	2.0	1.70	85
114	1.0	0.993	99	2.0	1.66	83
118	1.0	1.01	101	2.0	1.66	83
123	1.0	1.03	103	2.0	1.64	82
126	1.0	0.985	98	2.0	1.47	74
155	1.0	0.974	97	2.0	1.16	58
156/157	2.0	2.02	101	4.0	3.16	79
167	1.0	0.987	99	2.0	1.63	81
169	1.0	1.00	100	2.0	1.31	66
188	1.0	1.01	101	2.0	1.57	79
189	1.0	1.01	101	2.0	1.72	86
202	1.0	1.10	110	2.0	1.45	73
205	1.0	1.07	107	2.0	1.57	78
206	1.0	1.05	105	2.0	1.39	70
208	1.0	1.03	103	2.0	1.52	76
209	1.0	0.987	99	2.0	1.33	66

R = Recovery outside of method 1668A control limits
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Method 1668A

Spike Recovery Relative Percent Difference (RPD) Results

Client	PACE Charlotte		
Spike 1 ID	LCS-62396	Spike 2 ID	LCSD-62397
Spike 1 Filename	P180523B_03	Spike 2 Filename	P180523B_04

Compound	IUPAC	Spike 1 %REC	Spike 2 %REC	%RPD
2-MoCB	1	101	105	3.9
4-MoCB	3	108	107	0.9
2,2'-DiCB	4	105	112	6.5
4,4'-DiCB	15	99	102	3.0
2,2',6-TrCB	19	99	101	2.0
3,4,4'-TrCB	37	92	101	9.3
2,2',6,6'-TeCB	54	97	133	31.3
3,3',4,4'-TeCB	77	97	93	4.2
3,4,4',5-TeCB	81	88	90	2.2
2,2',4,6,6'-PeCB	104	101	116	13.8
2,3,3',4,4'-PeCB	105	94	101	7.2
2,3,4,4',5-PeCB	114	100	96	4.1
2,3',4,4',5-PeCB	118	101	108	6.7
2,3',4,4',5'-PeCB	123	95	103	8.1
3,3',4,4',5-PeCB	126	92	97	5.3
2,2',4,4',6,6'-HxCB	155	99	101	2.0
(156/157)	156/157	95	100	5.1
2,3',4,4',5,5'-HxCB	167	97	102	5.0
3,3',4,4',5,5'-HxCB	169	96	103	7.0
2,2',3,4',5,6,6'-HpCB	188	101	108	6.7
2,3,3',4,4',5,5'-HpCB	189	99	97	2.0
2,2',3,3',5,5',6,6'-OcCB	202	105	111	5.6
2,3,3',4,4',5,5',6-OcCB	205	97	102	5.0
2,2',3,3',4,4',5,5',6-NoCB	206	111	120	7.8
2,2',3,3',4,5,5',6,6'-NoCB	208	103	104	1.0
Decachlorobiphenyl	209	101	93	8.2

%REC = Percent Recovered
RPD = The difference between the two values divided by the mean value

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Method 1668A

Spike Recovery Relative Percent Difference (RPD) Results

Client	PACE Charlotte		
Spike 1 ID	LCS-62338	Spike 2 ID	LCSD-62339
Spike 1 Filename	P180525A_05	Spike 2 Filename	P180525A_06

Compound	IUPAC	Spike 1 %REC	Spike 2 %REC	%RPD
2-MoCB	1	98	104	5.9
4-MoCB	3	98	105	6.9
2,2'-DiCB	4	103	114	10.1
4,4'-DiCB	15	100	104	3.9
2,2',6-TrCB	19	83	95	13.5
3,4,4'-TrCB	37	92	96	4.3
2,2',6,6'-TeCB	54	97	98	1.0
3,3',4,4'-TeCB	77	92	99	7.3
3,4,4',5-TeCB	81	88	97	9.7
2,2',4,6,6'-PeCB	104	102	106	3.8
2,3,3',4,4'-PeCB	105	97	100	3.0
2,3,4,4',5-PeCB	114	92	98	6.3
2,3',4,4',5-PeCB	118	97	111	13.5
2,3',4,4',5'-PeCB	123	90	100	10.5
3,3',4,4',5-PeCB	126	94	93	1.1
2,2',4,4',6,6'-HxCB	155	96	97	1.0
(156/157)	156/157	95	99	4.1
2,3',4,4',5,5'-HxCB	167	96	100	4.1
3,3',4,4',5,5'-HxCB	169	98	99	1.0
2,2',3,4',5,6,6'-HpCB	188	96	101	5.1
2,3,3',4,4',5,5'-HpCB	189	93	90	3.3
2,2',3,3',5,5',6,6'-OcCB	202	102	110	7.5
2,3,3',4,4',5,5',6-OcCB	205	101	101	0.0
2,2',3,3',4,4',5,5',6-NoCB	206	109	102	6.6
2,2',3,3',4,5,5',6,6'-NoCB	208	96	100	4.1
Decachlorobiphenyl	209	91	102	11.4

%REC = Percent Recovered
RPD = The difference between the two values divided by the mean value

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Method 1668A

Spike Recovery Relative Percent Difference (RPD) Results

Client	PACE Charlotte		
Spike 1 ID	LCS-62424	Spike 2 ID	LCSD-62425
Spike 1 Filename	P180527A_03	Spike 2 Filename	P180527A_04

Compound	IUPAC	Spike 1 %REC	Spike 2 %REC	%RPD
2-MoCB	1	104	91	13.3
4-MoCB	3	98	96	2.1
2,2'-DiCB	4	103	98	5.0
4,4'-DiCB	15	97	102	5.0
2,2',6-TrCB	19	102	103	1.0
3,4,4'-TrCB	37	92	89	3.3
2,2',6,6'-TeCB	54	98	98	0.0
3,3',4,4'-TeCB	77	94	94	0.0
3,4,4',5-TeCB	81	96	96	0.0
2,2',4,6,6'-PeCB	104	99	96	3.1
2,3,3',4,4'-PeCB	105	96	98	2.1
2,3,4,4',5-PeCB	114	96	99	3.1
2,3',4,4',5-PeCB	118	98	101	3.0
2,3',4,4',5'-PeCB	123	97	103	6.0
3,3',4,4',5-PeCB	126	96	98	2.1
2,2',4,4',6,6'-HxCB	155	97	97	0.0
(156/157)	156/157	96	101	5.1
2,3',4,4',5,5'-HxCB	167	97	99	2.0
3,3',4,4',5,5'-HxCB	169	99	100	1.0
2,2',3,4',5,6,6'-HpCB	188	95	101	6.1
2,3,3',4,4',5,5'-HpCB	189	94	101	7.2
2,2',3,3',5,5',6,6'-OcCB	202	106	110	3.7
2,3,3',4,4',5,5',6-OcCB	205	97	107	9.8
2,2',3,3',4,4',5,5',6-NoCB	206	108	105	2.8
2,2',3,3',4,5,5',6,6'-NoCB	208	101	103	2.0
Decachlorobiphenyl	209	94	99	5.2

%REC = Percent Recovered
RPD = The difference between the two values divided by the mean value

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