HYDRODEC OF NORTH AMERICA, LLC

PCB DEMONSTRATION TEST REPORT

February 15, 2017

PCB DEMONSTRATION TEST REPORT

PCB DISPOSAL BY NON-THERMAL ALTERNATIVE METHODS

Hydrodec of North America LLC

2021 Steinway Boulevard

Canton, Ohio 44707

Test Date: September 20 through September 22, 2016

Submission Date: February 15, 2017

Submission Number: 001 (one)

Submitted by:

Hydrodec of North America, LLC
2021 Steinway Boulevard SE
Canton, Ohio 44707

Ron Kubala, Plant Manager
(330) 454-8202

Submitted to:

Winston Lue
1200 Pennsylvania Avenue, NW
Mail Code: 5303P
Washington, DC 20460

Table of Contents

Appendices:

Certification Letter

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Canton, OH 44707
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February 15, 2017

Winston Lue
U. S. Environmental Protection Agency
1200 Pennsylvania Avenue NW
Mailcode: 5303P
Washington, DC 20460

Dear Mr. Lue,

This letter is to certify that Hydrodec of North America, LLC carried out a demonstration test in accordance with the approved test plan and the results of all determinations are submitted in this report. The demonstration test was carried out under the PCB disposal by Non-Thermal Alternative Methods.

Sincerely,

Ronald W. Kubala
Plant Manager
Hydrodec of North America, LLC

1. Executive Summary:

Hydrodec of North America (Hydrodec) operates a facility for the re-refining of transformer oils contaminated with Polychlorinated Biphenyls (PCBs) by non-thermal alternative methods. The resulting output is a high quality transformer oil product which is suitable for use in a wide variety of applications.

Hydrodec conducted a Demonstration Test at its Canton, Ohio facility on 20th through 22nd of September 2016. The Demonstration Test consisted of three separate runs at different process conditions, all of which were successful in treating the feed oil to <1 mg/kg PCB and generating no wastewater at 0.5 ug/L PCB or greater.

The Demonstration Test processing runs were each six hours in duration, and took concentrated PCB feed, and blended it at approximately 4:1 with non-PCB feed by means of a small volume, dedicated system, to achieve reactor feed concentrations in approximately the 400-600 mg/kg range. This was then processed at a temperature of approximately 305°C and a pressure of around 3.4 MPa (at varying feed rates for the runs) to produce an output that was <1 mg/kg PCB.

A summary of the processing conditions is included below:

PCB Demonstration Test Summary				
Parameter	**Units**	**Run 1 Average**	**Run 2 Average**	**Run 3 Average**
P Tank Concentration	mg/kg	2932	3059	2086
Feed Tank Concentration	mg/kg	583	614	411
PU-021 Charge Pump Feed Rate	kg/hr	650.3	700.3	699.9
PU-023 Scavenger Feed Rate	kg/hr	5.59	3.66	2.32
PU-024 Quench Water Feed Rate	kg/hr	81.0	65.2	64.2
Hydrogen Flow Rate	kg/hr	20.3	20.1	20.2
RA-123 Reactor Average Temperature	°C	305.3	304.8	305.4
RA-123 Reactor Outlet Pressure	kPa	3420	3420	3420
VE-201 Pressure	kPa	3098	3100	3099
Reactor Outlet Concentration	mg/kg	<1	<1	<1
Total Oil Processed	gallons	1178	1269	1268
Total Concentrated PCB Feed Treated	gallons	234	255	250
Bulk Processed Oil Concentration	mg/kg	<1	<1	<1
Wastewater PCB Concentration	ug/L	0.3	<0.1	<0.1

Deviations from Original Demonstration Test Plan:

1. **Change to sampling plan**: In discussion with the EPA representatives on site, there were some modifications made to the sampling plan, including removal of the concentrated PCB feed sample during the flush runs (as none of this material was being processed) and relocation of the reactor feed sample during those flush runs to the appropriate tank. Some sample times were also altered slightly to achieve more meaningful results. A full comparison between the original sampling plan and the modified sampling plan is included in the relevant section of the report.

2. **Change to feed concentration**: Originally, Hydrodec had proposed to prepare concentrated PCB feed of approximately 5000 mg/kg for this test. The resulting concentration of the material was in approximately the 2000-3000 mg/kg range for each of the three runs.
3. **Change to blend rate**: Hydrodec had proposed to blend material at a rate of approximately 10:1, however due to equipment constraints the blend ratio achieved was in the 4-5:1 range.
4. **Change to service provider for PCB congener analysis**: Hydrodec had proposed to use TestAmerica for PCB homolog analysis, however, despite their original quotation they were unable to provide suitably low detection limits in the sample matrix. Samples were subsequently submitted to Summit Environmental Laboratories for PCB congener analysis.

Sample Analysis Results:

The Demonstration Test was a success with all post-reactor samples returning results of <1 mg.kg PCB. A summary of the results is presented below:

PCB Demonstration Test Oil Results Summary				
Parameter	**Units**	**Run 1**	**Run 2**	**Run 3**
Demonstration Test Sample Code		D-1-CT-06	D-2-CO-06	D-3-CO-06
Hydrodec Sample ID		DEMO1609013	DEMO1609038	DEMO1609064
Hydrodec PCB Result	mg/kg	<1	<1	<1
Summit Sample ID		16101510-01	16101510-02	16101510-03
TOTAL PCB	ug/kg	0	1*	0
TOTAL TEQ	ug/kg	0.00	0.00	0.00

Three samples were sent for PCB Congener analysis by Summit Laboratories, to confirm the effectiveness of Hydrodec's in-house PCB analysis methods for the demonstration of the destruction of PCB by the process.

*One non-zero value was obtained for total PCB by the congener analysis method (1 ug/kg), however this is the sum of four individual non-zero values, each below the limit of detection for that congener. A full presentation of the individual results for each congener is presented in the results section of this report.

The results of the congener analysis fully support both the effectiveness of the Hydrodec laboratory's PCB analytical capabilities, and the PCB destruction capability of the process.

No PCB wastewaters were generated during the demonstration test, water samples sent for analysis are presented in the table below:

PCB Demonstration Test Water Results Summary				
Parameter	**Units**	**Run 1**	**Run 2**	**Run 3**
Hydrodec Sample ID		D-1-WW-06	D-2-WW-06	D-3-WW-06
PCB Result	ug/L	0.3	<0.1	<0.1

One sample returned a result of above the limit of detection, but below the federal PCB regulatory limit of 0.5 ug/L for PCB wastewater.

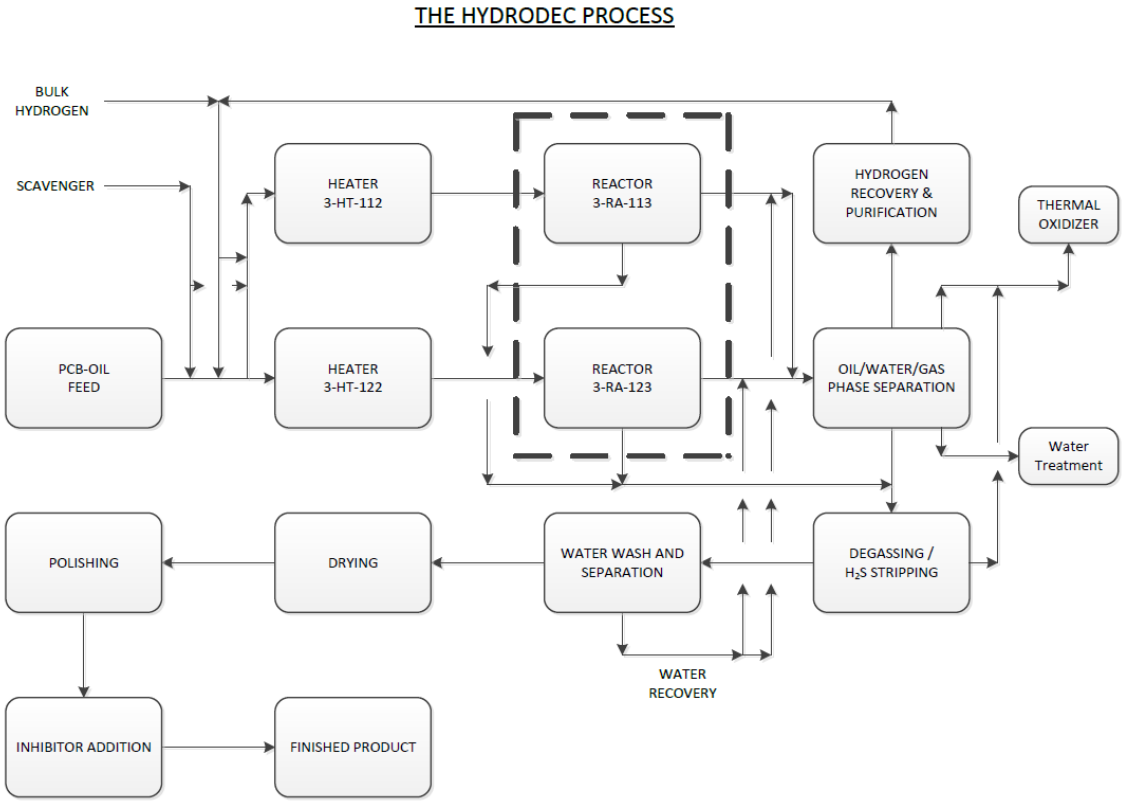
2. Process Operation

2.1 General Description

The Hydrodec technology was developed specifically for the purpose of refining used oils and organic chemicals. It is as near to a closed loop near zero emission process for the complete treatment of PCBs as is available in the world at this point in time. The Canton facility consists of six reactor trains. The following provides a description of the Hydrodec process as it flows through one of these trains. Figure 2-1 provides a Process Flow diagram.

Figure 2-1

Process Flow Diagram



2.2 Operation during the Test

Hydrodec proposed, and the EPA agreed, that the use one reactor train for the demonstration would be sufficient.

- PCB contaminated oil between 2000 and 3000 mg/kg was used for the test and blended approximately 4:1 in a small volume, dedicated system to achieve reactor feed concentrations in the 400-620mg/kg range.
- This blended PCB material was fed to the reactor at a rate of 650-700 kg/hr through three separate test runs.

- The reactor was maintained at an average temperature of 305°C and an average pressure of 3420 kPa throughout the demonstration.
- There were approximately 3715 gallons of total feed oil processed during the demonstration test runs and approximately 739 gallons of concentrated PCB feed oil treated.
- All samples taken post reactor returned results of <1 mg/kg PCB by both in-house and external testing laboratories.
- Operating parameters remained constant throughout the individual runs; see Appendix F for a list of process data.

2.3 Deviations from Test Plan

During the Hydrodec demonstration test there were a number of project modifications, described below:

1. **Change to sampling plan**: In discussion with the EPA representatives on site, there were some modifications made to the sampling plan, including removal of the concentrated PCB feed sample during the flush runs (as none of this material was being processed) and relocation of the reactor feed sample during those flush runs to the appropriate tank. Some sample times were also altered slightly to achieve more meaningful results. A full comparison between the original sampling plan and the modified sampling plan is included in the relevant section of the report.
2. **Change to feed concentration**: Originally, Hydrodec had proposed to prepare concentrated PCB feed oil of approximately 5000 mg/kg for this test. The resulting concentration of the material was in approximately the 2000-3000 mg/kg range for each of the three runs.
3. **Change to blend rate**: Hydrodec had proposed to blend material at a rate of approximately 10:1, however due to equipment constraints the blend ratio achieved was in the 4-5:1 range.
4. **Change to service provider for PCB congener analysis**: Hydrodec had proposed to use TestAmerica for PCB homolog analysis, however, despite their original quotation they were unable to provide suitably low detection limits in the sample matrix. Samples were subsequently submitted to Summit Environmental Laboratories for PCB congener analysis.

3. Sampling and Monitoring Procedures

3.1 Sampling Procedures

The samples were taken in accordance with EPA methodology for representative sampling. The QAPP provides a detailed discussion on the sampling procedures for the Hydrodec process.

Oil samples from each run were taken by collecting a sample of oil from the PCB Tank outlet and the Reactor feedstock sample port at the beginning, middle and end of a 6-hour run. Samples of treated oil were taken from the reactor outlet filter sample port 1 hour after commencement, 3.5 hours after commencement and at the end of the 6-hour run. In addition, three QA field duplicate sample were taken for each test run (one each of PCB Tank oil, Reactor feedstock and treated oil). All samples were taken directly into 4 oz. glass containers. The samples were then analyzed using approved methods listed in the QAPP to obtain the results.

3.2 Process Samples

The sampling procedures for the Demonstration Test are summarized in the following table:

Analyte	Method	Matrix	Sample Volume	Holding time	Preservation
PCBs	ASTM 4059	Oil	2oz Glass	180 days	N/A
PCBs	EPA 608	Water	32oz Glass	7 days	N/A

PCB oil was sampled from the outlet of the PCB tank. Reactor feed was sampled just before the feed pump to the reactor prior to being fed into the process. Samples of the treated oil were taken from the reactor sampling port. Wastewater samples were taken from bulk wastewater tanks collecting process waste water.

Samples were manually transported to the laboratory where they were logged by for analysis. Chain of custody forms were prepared for all externally analysed samples and are included in the relevant appendices for each set of analytical results.

There were some deviations from the projected sampling plan in agreement with EPA personnel on site. These changes, highlighted in yellow, are summarised in the following tables:

3 x 6 Hour Test Runs

Original Sample Plan			Revised Sample Plan		
Sample Type	**Sample Location**	**Sample Time**	**Sample Type**	**Sample Location**	**Sample Time**
Treated Oil - Output	3-FL-123A / 3-FL-123B	Test Start + 15 Minutes	Treated Oil - Output	3-FL-123A / 3-FL-123B	Test Start + 1 Hour
		Test Start + 3.25 Hours			Test Start + 3.5 Hours
		Test Start + 6.25 Hours			Test Start + 6 Hours

3 x 18 Hour Flush Runs

Original Sample Plan			Revised Sample Plan		
Sample Type	**Sample Location**	**Sample Time**	**Sample Type**	**Sample Location**	**Sample Time**
PCB Oil – PCB Tank Outlet	P Tank	Flush Start	SAMPLE DELETED FROM TEST PLAN		
		Flush Start + 9 Hours			
		Flush Start + 18 Hours			
PCB Oil – Reactor Feed	3-TK-005	Flush Start	Oil – Reactor Feed	3-TK-001	Flush Start
		Flush Start + 9 Hours			Flush Start + 9 Hours
		Flush Start + 18 Hours			Flush Start + 18 Hours
Treated Oil - Output	3-FL-123A / 3-FL-123B	Flush Start	Treated Oil - Output	3-FL-123A / 3-FL-123B	Flush Start + 1 Hour
		Flush Start + 9 Hours			Flush Start + 9 Hours
		Flush Start + 18 Hours			Flush Start + 18 Hours

3.3 Monitoring Procedures

The following operating parameters were monitored:

Location	Parameter
Reactor Train	Oil Flow Rate
Reactor Train	Reactor Temperature
Reactor Train	System Pressure
Reactor Train	Recycle Gas Flow
Reactor Train	Scavenger Flow
Reactor Train	Quench Water Flow
Stage 2	System Pressure

All monitoring data was recorded by Hydrodec's DeltaV distributed control system which operates during all Hydrodec oil processing activities. A summary of the collected data is provided in Appendix F.

4. Analytical Procedures

Hydrodec created test feedstock by combining PCB oil of greater than 600,000 ppm PCB oil with non-PCB oil in a PCB storage tank. The oil from this tank (Aroclor 1260) was then used to feed the small volume blending system, and the output of this blending system used to feed the reactor.

All samples were tested using either approved ASTM or EPA standard methods during the test. The analysis performed on samples is given below.

Testing was completed by Hydrodec using the ASTM D4059 method. For this test, the specimen is diluted with a suitable solvent. The resulting solution is treated by a procedure to remove interfering substances after which a small portion of the resulting solution is injected into a gas chromatographic column. The components are separated as they pass through the column with carrier gas and their presence in the effluent is measured by an electron capture detector and recorded as a chromatogram. The test method is made quantitative by comparing the sample chromatogram with a chromatogram of a known quantity of one or more standard Aroclors, obtained under the same analytical conditions. A summary of the Hydrodec analytical data is presented in Appendix C.

Additional samples were also obtained and submitted to Summit Environmental Laboratories, these samples were analyzed using EPA Method 8082. This method uses approximately 50 mg of oil that is diluted in hexane, spiked with surrogate internal standards, and an aliquot removed and applied to a florisil clean-up column. Based on information about the expected concentrations in the feed samples, those extracts are diluted prior to analysis. The extracts are spiked with internal standards, and then submitted for analysis. Extracts are then analyzed using gas chromatography/electron capture detection. Sample data were then quantified by the method of internal standards, using the internal standards compounds. Data are then reported on mg/kg basis.

Some samples were also analysed for PCB congeners by Summit Environmental Laboratories using EPA Method 1668B. This method involves extraction of the material from the matrix, clean-up to remove interfering compounds (using acid, base or florisil), concentration of the extract, and analysis of the concentrated extract by High Resolution GCMS. A summary of the Summit Environmental Laboratories analytical data is presented in Appendix D.

A complete summary of analytical data can also be found in Appendix B, which shows results from Hydrodec, Summit Environmental Laboratories and Crystal Laboratories.

5. Test Results

5.1 Test Results

Analytical results for concentrated PCB feed oil ranged from approximately 2000 to over 3200 mg/kg during the test.

Reactor feed concentrations ranged from 267 to 705 mg/kg throughout the test.

All processed oil sample results returned results of <1 mg/kg by Hydrodec analysis by ASTM D4059 and those tested by Summit Environmental Laboratories also returned consistent results at <1mg/kg by USEPA 8082.

Three samples of processed oil were sent for PCB congener analysis by Summit Environmental Laboratories using USEPA 1668B and all returned results of 1 ug/kg or less.

Three process waste water samples were tested by Crystal Laboratories and all returned analytical results of <0.5 ug/L PCB.

These analytical results confirm the capability for effective treatment of PCB contaminated feed oil by the process, and the analytical competency of the Hydrodec Laboratory for the monitoring of the effectiveness of the process. This Demonstration Test was a success.

A complete summary of analytical data can be found in Appendix B, and full analytical data from the three laboratories used in Appendices C through E.

5.2 Anomalies

One sample for the reactor feed returned a significantly lower result than expected, due to the likely presence of a tank heel in the feed tank before commencement of the first Demonstration Test Run. This result was discarded.

Three samples failed to meet the ±30% reproducibility criteria set out for evaluation, though all of these were low level samples at less than 5 x the LOD of the method, and all were from material processed during the flushing stages and therefore have no impact on the performance of the test.

6. Quality Assurance Summary

6.1 Data Generation and Acquisition

The Quality Assurance Plan that was developed was used to produce reliable data that would be generated throughout the demonstration test by:

- Ensuring the validity and integrity of the data;
- Ensuring and providing mechanisms for ongoing control of data quality
- Evaluating data quality in terms of PARCCS; and
- Providing usable, quantitative data for analysis, interpretation, and decision making.

6.2 Data Verification/Usability

The data verification was a process of evaluating the completeness, correctness, and contractual compliance of a data set against the method standard, SOP, or contract requirements. Data verification was performed internally by the analytical group and the laboratory generating the data.

In order to perform the data verification, the reported data was supported by complete data packages which include sample receipt and tracking information, COC records, tabulated data summary forms, and analytical data for all samples standards.

All control samples run during the analysis of samples were within the target value range.

All laboratory replicates were within the target RPD values.

All field QA duplicates during the PCB processing activities were within the target RPD values. One sample during the flushing runs was outside this requirement due to being below 5 x LOD for the test method.

In total, one sample was rejected as being non-representative, and four samples (all from flushing runs) did not meet target requirements for reproducibility between laboratories. A completeness value of >90% was achieved for the usability of data.

6.3 Results

All quality objectives were met as well as accuracy objectives, quality control samples, performance audit samples, and system audits. Audits of the operation during demonstration, sampling and analysis were completed and documented for quality and recordkeeping purposes.

7. Visits and Audits

7.1 Visits

During the demonstration that was held at Hydrodec of North America, LLC there were 4 visitors from the U.S. EPA.

Winston Lue, Chemical Engineer
U.S. EPA Headquarters
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Mail Code 5303P
Washington, DC 20460
(703) 305-1617

Josh Smeraldi, Environmental Engineer
U.S. EPA Headquarters
Ariel Rios Building
1200 Pennsylvania Avenue, N.W.
Mail Code 5303P
Washington, DC 20460
(703) 308-0441

Lisa Graczyk
U.S. EPA REGION 5
77 West Jackson Boulevard
Mail Code LR-8J
Chicago, IL 60604-3507
(312) 353-3219

Karen Swetland-Johnson, Ph.D.
U.S. EPA Headquarters
Office of Resource Conservation and Recovery
1200 Pennsylvania Avenue, N.W.
Mail Code 5303P
Washington, DC 20460
(703) 308-8421

All visitors to Hydrodec from the EPA were onsite for the duration of the testing and monitored the process and sampling techniques being used. Samples were split and given to these contacts for analysis at a laboratory unknown to Hydrodec.

Hydrodec's sampling locations, methods and handling were all observed by EPA contacts during each test and no discrepancies or issues were found during the demonstration. Deviations from the original test plan are discussed in the section "Executive Summary".

7.2 Field Audit

Daily field audits were conducted near the beginning of each run to ensure the quality of all sample collection activities. A data collection checklist was utilized to record field audit results. During the demonstration event no deviations from the Quality Assurance Plan were found. The checklists are attached in Appendix A.

8. Closure

8.1 Closure

All oil prepared for use during the demonstration test was processed during the test runs. As a result, no PCB oil was sent offsite for disposal. However, manifests have been attached for the disposal of PPE and associated materials, see Appendix G. All manifested items sent offsite were disposed of in accordance with TSCA and RCRA regulations. Relevant disposal certifications are included in the appendix.

9. Waste Handling and Disposal

9.1 Waste Handling and Disposal

All waste that was generated during the PCB Demonstration was properly disposed of by Hydrodec in accordance with TSCA and RCRA regulations. All materials have been disposed of by approved facilities in accordance to regulation. Manifests have been attached to this report to show documentation of disposal, see Appendix G.

Appendices:

APPENDIX A – Quality Assurance Report

APPENDIX B – Summary of Analytical Data

APPENDIX C – Hydrodec .Analytical Data

APPENDIX D – Summit Environmental Laboratories Analytical Data

APPENDIX E – Crystal Laboratories Analytical Data

APPENDIX F – Process Data

APPENDIX G – Waste Manifests

Appendix A

Quality Assurance Report

Quality Assurance Report for PCB Demonstration with USEPA

This report is being completed to verify that the Quality Procedures and Controls that were developed and put into place for the PCB Demonstration were completed in their entirety and accurately.

A Quality Assurance Procedure was developed for the sole purpose of producing reliable data that could be generated throughout the demonstration by ensuring the validity and integrity of the data, ensuring and providing mechanisms for ongoing control of data quality, evaluating data quality and providing usable, quantitative data for analysis, interpretation and decision making.

The following items were implemented into the demonstration and examples of how the applicant adhered to them.

1.1 Sampling Process Design

Laboratory test parameters for the sampling program included analysis of PCBs in accordance with ASTM D4059.

Both the PCB contaminated transformer oil and treated oil were tested using ASTM D4059 methods with documented results as were required.

1.2 Analytical Methods Requirements

In order to preserve the integrity of samples both before and during analysis, specific analytical methods and requirements for those methods were followed.

Samples were collected in 4 oz. glass bottles by the trained staff and witnessed by EPA representatives in accordance with standard operating procedures. All samples were in the control of Hydrodec staff from sampling to delivery to the Laboratory.

1.3 Sample Handling and Custody Requirements

Proper sample handling and custody procedures are crucial to ensuring the quality and validity of data obtained through plant and laboratory analyses. The possession and handling of samples was documented from the time of collection to the delivery to the laboratory.

Samples were drawn by the Operator and witnessed by EPA representatives at designated periods during the demonstration. These samples were then taken to the Hydrodec laboratory and logged in to the sample log whereby custody was relinquished to the laboratory. Samples were in the sole custody of Hydrodec until they were signed over to an external laboratory (where applicable). Completed chain of custody forms have been attached to Demonstration Report.

1.4 Sample Collection Documentation

Sample handling procedures included process documentation, chain-of-custody documentation, sample shipment, and laboratory tracking information.

Samples were taken according to standard operating procedures and remained in Hydrodec custody until a chain of custody was signed over to an external laboratory (where applicable) for ownership of the samples.

1.5 Sample Log

A sample log was provided in the Demonstration Test Plan and was used to document sample details such as time and sample number.

The sample log was completed on both sides of the process and was signed by the Operator for all samples taken and when.

1.6 Identification System

Each sample collected during the demonstration was given a unique identification code. Each sample identification consisted of the Project Identification Code (D), the Run Number (1-3), Location Code (FE or CO), and Time Code (1-18).

All samples were made up with the same identification system and an example is D-3-FE-06, which would be Demonstration - Day 3 - Feed Oil- Sixth Hour. Each sample was individually catalogued by the Operator and verified by the EHS Coordinator.

1.7 Sample Packaging and Shipping

Samples were packaged and transported in a manner that maintained the integrity of the sample and permitted the analysis to be performed within the prescribed holding time.

Prior to shipment, each sample was checked for the proper labelling and identification codes.

1.8 Quality Control Requirements

The Quality Control requirements ensure that the data collected is of the highest standard feasible as appropriate for the intended application.

Documented and approved procedures were used for calibrating measuring and testing equipment. Procedures published by the USEPA and ASTM were adopted for sampling and analysis purposes.

In conclusion, all quality standards set forth by Hydrodec and the USEPA prior to the demonstration were met as well as the intended precision and accuracy required for this test.

Naomi Mattingly, EH&S Coordinator

02/11/2017

Date

Field Audit Checklist For 2016 PCB Demostration Test

Item	Description of Field Audit Activities	Date	Initials
1	Review of sampling records	9/20/2016	NLM
2	Review of process checklist	9/20/2016	NLM
3	Examination of the sample label and identifications	9/20/2016	NLM
4	Review of the sample handling and packaging procedures	9/20/2016	NLM
5	Review of COC procedures	9/20/2016	NLM

Item 1 - Chain of Custody should be properly completed and photocopied prior to submission of samples to Lab by the EH&S Coordinator

Item 2 - Confirm that Operators are following the proper procedures and protocol as determined by the Process Coordinator and Process Engineer

Item 3 - Check labels that have been provided to confirm the accuracy of the samples, labels, times and material that are being sent to Test America and the Hydrodec Lab.

Item 4 - Ensure that samples are collected and packaged in a manner that will ensure that all samples will maintain their integrity.

Item 5 - Ensure that COC procedures are being properly followed by Operators and Test America to maintain accuracy in sampling, labeling and analysis.

The above items are to start 15 minutes prior to the intial sampling of materials and will continue through the process. Once it has been determined that procedures are being followed, the EH&S Coordinator and the Project Manager will sign off to that effect. From that point on, random observations and checks will be completed no less than 5 times per sampling period (8:30 am - 5:30pm). Recommendations or revisions needed will be hand-written on the reverse side of this paper and then electronically entered into a submittal by the EH&S Coordinator to the Project Manager.

Naomi Mattingly, EH&S Coordinator — Date: 9/20/16

Ron Kubala, Hydrodec Project Manager — Date: 9/20/2016

Field Audit Checklist For PCB Demostration

Item	Description of Field Audit Activities	Date	Initials
1	Review of sampling records	9/21/2016	NLM
2	Review of process checklist	9/21/2016	N LM
3	Examination of the sample label and identifications	9/21/2016	NLM
4	Review of the sample handling and packaging procedures	9/21/2016	NLM
5	Review of COC procedures	9/21/2016	NLM

Item 1 - Chain of Custody should be properly completed and photocopied prior to submission of samples to Lab by the EH&S Coordinator

Item 2 - Confirm that Operators are following the proper procedures and protocol as determined by the Process Coordinator and Process Engineer

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Naomi Mattingly, EH&S Coordinator — Date: 9/21/16

Ron Kubala, Hydrodec Project Manager — Date: 9/21/2016

Field Audit Checklist For PCB Demostration

Item	Description of Field Audit Activities	Date	Initials
1	Review of sampling records	9/22/2016	NCM
2	Review of process checklist	9/22/2016	NCM
3	Examination of the sample label and identifications	9/22/2016	NCM
4	Review of the sample handling and packaging procedures	9/22/2016	NCM
5	Review of COC procedures	9/22/2016	NCM

Item 1 - Chain of Custody should be properly completed and photocopied prior to submission of samples to Lab by the EH&S Coordinator

Item 2 - Confirm that Operators are following the proper procedures and protocol as determined by the Process Coordinator and Process Engineer

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The above items are to start 15 minutes prior to the intial sampling of materials and will continue through the process. Once it has been determined that procedures are being followed, the EHS&Q Coordinator and the Project Manager will sign off to that effect. From that point on, random observations and checks will be completed no less than 5 times per sampling period (8:30 am - 5:30pm). Recommendations or revisions needed will be hand-written on the reverse side of this paper and then electronically entered into a submittal by the EH&S Coordinator to the Project Manager.

Naomi Mattingly, EH&S Coordinator — Date: 9/22/16

Ron Kubala, Hydrodec Project Manager — Date: 9/22/2016

9/22/16 Field Audit Notes

Field audits were conducted daily during the 2016 PCB Demo test. All sampling and related activities were peformed within the specifications of Hydrodecs Q.A. Plan. There are no recommendations or revisions to offer at this time.

NCM

Appendix B

Summary of Analytical Data

RUN 1 – 20th September 2016

Sample ID	Sample Type	Hydrodec Lab ID	Hydrodec Result (mg/kg)	Summit Result (mg/kg, EPA 8082)	Summit Result (ug/kg, EPA 1668)	Crystal Result (ug/L)
D-1-PT-01	Conc. PCB Oil	DEMO1609001	2792	N/A	N/A	N/A
D-1-PT-04A	Conc. PCB Oil	DEMO1609004	3080	N/A	N/A	N/A
D-1-PT-04B	Conc. PCB Oil	DEMO1609005	2940	2520	N/A	N/A
D-1-PT-06	Conc. PCB Oil	DEMO1609010	2994	N/A	N/A	N/A
D-1-FE-01	Feed Oil	DEMO1609002	30	N/A	N/A	N/A
D-1-FE-01	Feed Oil	DEMO1609002-2	31	N/A	N/A	N/A
D-1-FE-04A	Feed Oil	DEMO1609006	462	N/A	N/A	N/A
D-1-FE-04B	Feed Oil	DEMO1609007	460	435	N/A	N/A
D-1-FE-06	Feed Oil	DEMO1609011	705	N/A	N/A	N/A
D-1-CO-01	Processed Oil	DEMO1609003	<1	N/A	N/A	N/A
D-1-CO-04A	Processed Oil	DEMO1609008	<1	N/A	N/A	N/A
D-1-CO-04B	Processed Oil	DEMO1609009	<1	<1	N/A	N/A
D-1-CO-06	Processed Oil	DEMO1609012	<1	N/A	N/A	N/A
D-1-CO-06	Processed Oil	DEMO1609012-2	<1	N/A	N/A	N/A
D-1-CT-06	Processed Oil	DEMO1609013	<1	N/A	0	N/A
D-1-WW-06	Waste Water	DEMO1609014	N/A	N/A	N/A	0.3

N/A – Not applicable, the specified laboratory did not perform analysis on this sample.

RUN 2 – 21st September 2016

Sample ID	Sample Type	Hydrodec Lab ID	Hydrodec Result (mg/kg)	Summit Result (mg/kg, EPA 8082)	Summit Result (ug/kg, EPA 1668)	Crystal Result (ug/L)
D-2-PT-01	Conc. PCB Oil	DEMO1609027	2994	N/A	N/A	N/A
D-2-PT-04A	Conc. PCB Oil	DEMO1609030	2988	N/A	N/A	N/A
D-2-PT-04B	Conc. PCB Oil	DEMO1609031	2966	2600	N/A	N/A
D-2-PT-06	Conc. PCB Oil	DEMO1609036	3207	N/A	N/A	N/A
D-2-FE-01	Feed Oil	DEMO1609028	680	N/A	N/A	N/A
D-2-FE-04A	Feed Oil	DEMO1609032	640	N/A	N/A	N/A
D-2-FE-04B	Feed Oil	DEMO1609033	608	656	N/A	N/A
D-2-FE-06	Feed Oil	DEMO1609037	556	N/A	N/A	N/A
D-2-FE-06	Feed Oil	DEMO1609037-2	520	N/A	N/A	N/A
D-2-CO-01	Processed Oil	DEMO1609029	<1	N/A	N/A	N/A
D-2-CO-01	Processed Oil	DEMO1609029-2	<1	N/A	N/A	N/A
D-2-CO-04A	Processed Oil	DEMO1609034	<1	N/A	N/A	N/A
D-2-CO-04B	Processed Oil	DEMO1609035	<1	<1	N/A	N/A
D-2-CO-06	Processed Oil	DEMO1609038	<1	N/A	1	N/A
D-2-CT-06	Processed Oil	DEMO1609039	<1	N/A	N/A	N/A
D-2-WW-06	Waste Water	DEMO1609040	N/A	N/A	N/A	<0.1

N/A – Not applicable, the specified laboratory did not perform analysis on this sample.

RUN 3 – 22nd September 2016

Sample ID	Sample Type	Hydrodec Lab ID	Hydrodec Result (mg/kg)	Summit Result (mg/kg, EPA 8082)	Summit Result (ug/kg, EPA 1668)	Crystal Result (ug/L)
D-3-PT-01	Conc. PCB Oil	DEMO1609053	2074	N/A	N/A	N/A
D-3-PT-04A	Conc. PCB Oil	DEMO1609056	2054	N/A	N/A	N/A
D-3-PT-04B	Conc. PCB Oil	DEMO1609057	2316	1970	N/A	N/A
D-3-PT-06	Conc. PCB Oil	DEMO1609062	1999	N/A	N/A	N/A
D-3-FE-01	Feed Oil	DEMO1609054	508	N/A	N/A	N/A
D-3-FE-04A	Feed Oil	DEMO1609058	453	N/A	N/A	N/A
D-3-FE-04B	Feed Oil	DEMO1609059	463	391	N/A	N/A
D-3-FE-06	Feed Oil	DEMO1609063	272	N/A	N/A	N/A
D-3-FE-06	Feed Oil	DEMO1609063-2	263	N/A	N/A	N/A
D-3-CO-01	Processed Oil	DEMO1609055	<1	N/A	N/A	N/A
D-3-CO-04A	Processed Oil	DEMO1609060	<1	N/A	N/A	N/A
D-3-CO-04B	Processed Oil	DEMO1609061	<1	<1	N/A	N/A
D-3-CO-06	Processed Oil	DEMO1609064	<1	N/A	0	N/A
D-3-CT-06	Processed Oil	DEMO1609065	<1	N/A	N/A	N/A
D-3-WW-06	Waste Water	DEMO1609066	N/A	N/A	N/A	<0.1

N/A – Not applicable, the specified laboratory did not perform analysis on this sample.

Appendix C

Hydrodec Analytical Data

Hydrodec of North America - PCB Demonstration Test September 2016 - Sample Custody Log

Sample ID	Sampled From	Sample Date/Time	Sampled By	Required Analyses	Relinquished to Laboratory			Lab ID
				PCB/Other	Name	Time	Signature	
D-1-PT-01	P Tank	9-20-16 10:07A	K. Kohler	PCB	Ken Kohler	10:15 A.M.		DEMO1609001
D-1-FE-01	3-TK-005	9-20-16 9:55	K. Kohler	PCB	Ken Kohler	10:15 A.M.		DEMO1609002
D-1-CO-01	Reactor	9-20-16 11:00A	K. Kohler	PCB	Ken Kohler	11:07 A.M.		DEMO1609003
D-1-PT-04A	P Tank	9-20-16 1:00p	T. Robinson	PCB	Tom Robinson	1:20 pm		DEMO1609004
D-1-PT-04B	P Tank	9-20-16 1:05p	T. Robinson	PCB	Tom Robinson	1:20 pm		DEMO1609005
D-1-FE-04A	3-TK-005	9-2016 1:09p	T. Robinson	PCB	Tom Robinson	1:20 pm		DEMO1609006
D-1-FE-04B	3-TK-005	9-2016 1:09p	T. Robinson	PCB	Tom Robinson	1:20 pm		DEMO1609007
D-1-CO-04A	Reactor	9-20-16 1:30pm	T. Robinson	PCB	Tom Robinson	1:40 pm		DEMO1609008
D-1-CO-04B	Reactor	9-20-16 1:30pm	T. Robinson	PCB	Tom Robinson	1:40 pm		DEMO1609009
D-1-PT-06	P Tank	9-20-16 ~~4:05~~ 4:01 GJ pm	G. Jones	PCB	Gonzalez Jones	4:15 pm		DEMO1609010
D-1-FE-06	3-TK-005	9-20-16 4:00pm	T. Robinson	PCB	Tom Robinson	4:16 pm		DEMO1609011
D-1-CO-06	Reactor	9-20-16 4:05pm	T. Robinson	PCB	Tom Robinson	4:16 pm		DEMO1609012
D-1-CT-06	C5	9-20-16 4:05pm	G. Jones	PCB	Gonzalez Jones	4:16 pm		DEMO1609013
D-1-WW-06	3-VE-223	9-20-16 4:10pm	T. Robinson	PCB	Tom Robinson	4:16 pm		DEMO1609014

Hydrodec of North America - PCB Demonstration Test September 2016 - Sample Custody Log

Sample ID	Sampled From	Sample Date/Time	Sampled By	Required Analyses	Relinquished to Laboratory			Lab ID
				PCB/Other	Name	Time	Signature	
D-F1-PT-01	P Tank	NOT REQUIRED		PCB	W-HAND			DEMO1609015
D-F1-FE-01	~~3-TK-005~~ 3-TK-001	9-20-16 4:25pm	T. Robinson	PCB	Tom Robinson	4:30 pm		DEMO1609016
D-F1-CO-01	Reactor	9-20-16 5:25pm	T. Robinson	PCB	Tom Robinson	5:30 pm		DEMO1609017
D-F1-PT-09A	P Tank	NOT REQUIRED		PCB	W-HAND			DEMO1609018
D-F1-PT-09B	P Tank	NOT REQUIRED		PCB	W-HAND			DEMO1609019
D-F1-FE-09A	~~3-TK-005~~ 3-TK-001	9-21-16 1:25AM	A. Hoffner	PCB	A. Hoffner	1:35AM		DEMO1609020
D-F1-FE-09B	~~3-TK-005~~ 3-TK-001	9-21-16 1:25AM	A. Hoffner	PCB	A. Hoffner	1:35AM		DEMO1609021
D-F1-CO-09A	Reactor	9-21-16 1:25AM	A. Hoffner	PCB	A. Hoffner	1:35AM		DEMO1609022
D-F1-CO-09B	Reactor	9-21-16 1:25AM	A. Hoffner	PCB	A. Hoffner	1:35AM		DEMO1609023
D-F1-PT-18	P Tank	NOT REQUIRED		PCB	W-HAND			DEMO1609024
D-F1-FE-18	~~3-TK-005~~ 3-TK-001	9-21-16 8:25am	T. Robinson	PCB	Tom Robinson	8:30 am		DEMO1609025
D-F1-CO-18	Reactor	9-21-16 8:27AM	G. Jones	PCB	Gonzalee Jones	8:33 AM		DEMO1609026

Hydrodec of North America - PCB Demonstration Test September 2016 - Sample Custody Log

Sample ID	Sampled From	Sample Date/Time	Sampled By	Required Analyses	Relinquished to Laboratory			Lab ID
				PCB/Other	Name	Time	Signature	
D-2-PT-01	P Tank	9-21-16 8:40am	T. Robinson	PCB	Tom Robinson	8:45 Am		DEMO1609027
D-2-FE-01	3-TK-005	9-21-16 8:35am	T. Robinson	PCB	Tom Robinson	8:45 Am		DEMO1609028
D-2-CO-01	Reactor	9-21-16 9:36	T. Robinson	PCB	Tom Robinson	9:45 Am		DEMO1609029
D-2-PT-04A	P Tank	9-21-16 11:38 Am	T. Robinson	PCB	Tom Robinson	11:45 Am		DEMO1609030
D-2-PT-04B	P Tank	9-21-16 11:38 Am	T. Robinson	PCB	Tom Robinson	11:45 Am		DEMO1609031
D-2-FE-04A	3-TK-005	9-21-16 11:35 Am	T. Robinson	PCB	Tom Robinson	11:45 Am		DEMO1609032
D-2-FE-04B	3-TK-005	9-21-16 11:35am	T. Robinson	PCB	Tom Robinson	11:45 Am		DEMO1609033
D-2-CO-04A	Reactor	9-21-16 12:06 P	K. Kohler	PCB	Ken Kohler	12:12 P.M		DEMO1609034
D-2-CO-04B	Reactor	9-21-16 12:06 P	K. Kohler	PCB	Ken Kohler	12:12 P.M.		DEMO1609035
D-2-PT-06	P Tank	9-21-16 2:48 Pm	W. Blevins	PCB	Wes Blevins	2:49 P.m.		DEMO1609036
D-2-FE-06	3-TK-005	9-21-16 2:50pm	G. Jones	PCB	Gonzalez Jones	3:00 pm		DEMO1609037
D-2-CO-06	Reactor.	9-21-16 2:50pm	G. Jones	PCB	Gonzalez Jones	3:00 pm		DEMO1609038
D-2-CT-06	C5	9-21-16 2:49 P	W. Blevins	PCB	Wes Blevins	2:49 P.m		DEMO1609039
D-2-WW-06	3-VE-223	9-21-16 2:41pm	G. Jones	PCB	Gonzalez Jones	3:00 pm		DEMO1609040

Hydrodec of North America - PCB Demonstration Test September 2016 - Sample Custody Log

Sample ID	Sampled From	Sample Date/Time	Sampled By	Required Analyses	Relinquished to Laboratory			Lab ID
				PCB/Other	Name	Time	Signature	
D-F2-PT-01	P Tank	NOT	REQUIRED	PCB	W. HAND			DEMO1609041
D-F2-FE-01	~~3 TK-005~~ 3-TK-001	9-21-16 3:00 PM	W Davis	PCB	W. Davis	3:05 PM		DEMO1609042
D-F2-CO-01	Reactor	9-21-16 4:00pm	G. Jones	PCB	Gonzalee Jones	4:08 PM	Gonzalee Jones	DEMO1609043
D-F2-PT-09A	P Tank	NOT	REQUIRED	PCB	W. HAND			DEMO1609044
D-F2-PT-09B	P Tank	NOT	REQUIRED	PCB	W. HAND			DEMO1609045
D-F2-FE-09A	~~3 TK-005~~ 3-TK-001	9-21-16 11:55Pm	A. Hoffner	PCB	A. Hoffner	12:05 Am		DEMO1609046
D-F2-FE-09B	~~3-TK-005~~ 3-TK-001	9-21-16 11:55Pm	A. Hoffner	PCB	A. Hoffner	12:05 Am		DEMO1609047
D-F2-CO-09A	Reactor	9-21-16 11:55Pm	A. Hoffner	PCB	A. Hoffner	12:05 Am		DEMO1609048
D-F2-CO-09B	Reactor	9-21-16 11:55Pm	A. Hoffner	PCB	A. Hoffner	12:05 Am		DEMO1609049
D-F2-PT-18	P Tank	NOT	REQUIRED	PCB	W. HAND			DEMO1609050
D-F2-FE-18	~~3-TK-005~~ 3-TK-001	9-22-16 9:00Am	G. Jones	PCB	Gonzalee Jones	9:08 AM	Gonzalee Jones	DEMO1609051
D-F2-CO-18	Reactor	9-22-16 9:02 Am	G. Jones	PCB	Gonzalee Jones	9:08 AM	Gonzalee Jones	DEMO1609052

Hydrodec of North America - PCB Demonstration Test September 2016 - Sample Custody Log

Sample ID	Sampled From	Sample Date/Time	Sampled By	Required Analyses	Relinquished to Laboratory			Lab ID
				PCB/Other	Name	Time	Signature	
D-3-PT-01	P Tank	9-22-16 9:52AM	Gonzalee Jones	PCB	G. Jones	10:00 AM	Gonzalee Jones	DEMO1609053
D-3-FE-01	3-TK-005	9-22-16 9:49AM	Gonzalee Jones	PCB	G. Jones	10:00 AM	Gonzalee Jones	DEMO1609054
D-3-CO-01	Reactor	9-22-16 10:49AM	Gonzalee Jones	PCB	G. Jones	10:55 AM	Gonzalee Jones	DEMO1609055
D-3-PT-04A	P Tank	9-22-16 12:55PM	Gonzalee Jones	PCB	G Jones	1:05 PM	Gonzalee Jones	DEMO1609056
D-3-PT-04B	P Tank	9-22-16 12:55PM	Gonzalee Jones	PCB	G. Jones	1:05 PM	Gonzalee Jones	DEMO1609057
D-3-FE-04A	3-TK-005	9-22-16 12:51PM	Gonzalee Jones	PCB	G. Jones	1:05 PM	Gonzalee Jones	DEMO1609058
D-3-FE-04B	3-TK-005	9-22-16 12:51 PM	Gonzalee Jones	PCB	G. Jones	1:05 PM	Gonzalee Jones	DEMO1609059
D-3-CO-04A	Reactor	9-22-16 1:20 PM	Gonzalee Jones	PCB	G. Jones	1:35 PM	Gonzalee Jones	DEMO1609060
D-3-CO-04B	Reactor	9-22-16 1:20 PM	Gonzalee Jones	PCB	G Jones	1:35 PM	Gonzalee Jones	DEMO1609061
D-3-PT-06	P Tank	9-22-16 3:50 PM	Kyle Deese	PCB	K. Deese	4:00 PM	Kyle Deese	DEMO1609062
D-3-FE-06	3-TK-005	9-22-16 3:51 PM	Gonzalee Jones	PCB	G. Jones	4:13 PM	Gonzalee Jones	DEMO1609063
D-3-CO-06	Reactor	9-22-16 3:56 PM	Gonzalee Jones	PCB	G. Jones	4:13 PM	Gonzalee Jones	DEMO1609064
D-3-CT-06	C5	9-22-16 3:50 PM	Kyle Deese	PCB	K. Deese	4:00 PM	Kyle Deese	DEMO1609065
D-3-WW-06	3-VE-223	9-22-16 3:47pm	Gonzalee Jones	PCB	G. Jones	4:15 PM	Gonzalee Jones	DEMO1609066

Hydrodec of North America - PCB Demonstration Test September 2016 - Sample Custody Log

Sample ID	Sampled From	Sample Date/Time	Sampled By	Required Analyses	Relinquished to Laboratory			Lab ID
				PCB/Other	Name	Time	Signature	
D-F3-PT-01	P Tank	NOT REQUIRED		PCB	W. HAND			DEMO1609067
D-F3-FE-01	~~3-TK-005~~ 3-TK-001	9-22-16 / 4:10PM	D. Blevins	PCB	D Blevins	4:17 PM		DEMO1609068
D-F3-CO-01	Reactor	9-22-16 5:15pm	G. Jones	PCB	Gonzalee Jones	5:30 PM	Gonzalee Jones	DEMO1609069
D-F3-PT-09A	P Tank	NOT REQUIRED		PCB	W. HAND			DEMO1609070
D-F3-PT-09B	P Tank	NOT REQUIRED		PCB	W. HAND			DEMO1609071
D-F3-FE-09A	3-TK-005	9-23-16 1:10am	Travis Devore	PCB	T Devore	1:20 am	Travis Devore	DEMO1609072
D-F3-FE-09B	3-TK-005	9-23-16 1:10am	Travis Devore	PCB	T Devore	1:20 am	Travis Devore	DEMO1609073
D-F3-CO-09A	Reactor	9-23-16 1:10am	Travis Devore	PCB	T Devore	1:20 am	Travis Devore	DEMO1609074
D-F3-CO-09B	Reactor	9-23-16 1:10am	Travis Devore	PCB	T Devore	1:20 am	Travis Devore	DEMO1609075
D-F3-PT-18	P Tank	NOT REQUIRED		PCB	W. HAND			DEMO1609076
D-F3-FE-18	3-TK-005	9-23-16 9:35AM	Gonzalee Jones	PCB	G. Jones	9:45 AM	Gonzalee Jones	DEMO1609077
D-F3-CO-18	Reactor	9-23-16 9:37AM	G. Jones	PCB	G. Jones	9:45 AM	Gonzalee Jones	DEMO1609078

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

hydrodec

Sampled By	K. Kohler	Sample Number	~~[illegible]~~ P2016092001
Company		Sample Date	9-20-16
Container#		Sampled From	P-2
QC Schedule		Batch/Load Number	

			Analyst	Date
Is the oil PCB Oil?	YES	NO		
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanum (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

1 0.1005g

PCBs	Mass (g)	1242	1254	1260	Total (mg/kg)
ASTM D4059 2	0.1004	<1	<1	2792	2792
Analyst	[signature]	Date :	09-22-16		

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Int mass: 0.1155g
final mass: 10.0398g

1242 <1
1254 <1
1260 32.13

	D.11	D.12
1242	<1	<1
1254	<1	<1
1260	30.40	32.13

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	Ken Kohler	Sample Number	© Demo 1609002
Company		Sample Date	9-20-16
Container#		Sampled From	3-TK-005
QC Schedule		Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

9-30-16 NTAT 0.0992 3.5 < 27.5 < 31.0

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

	*2 0.1002	<1	<1	30.23	30.23	
PCBs Di ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)	
	*2 10.1005	~~<1~~	~~<1~~	~~32.3~~	~~32.3~~	
Analyst			Date	09-21-16		
	10.1005	<1	<1	30.23	30.23	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Init mass: 10.3019g
final mass: 10.3079g

#1 1242 <1
1254 <1
1260 3.023

#2 1242 <1
1254 <1
1260 3.235

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	K. Kohler	Sample Number	RR @ Demo1608003
Company		Sample Date	9-20-16
Container#		Sampled From	3-RA-123
QC Schedule		Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N%	C_A%	C_P%	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

Neat "1 0,1004 g

PCBs Neat "2 ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0999 g	< 1	< 1	< 1	< 1
Analyst	PAC		Date	09/20/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	Dem0160904
Company		Sample Date	9-20-16
Container#		Sampled From	T2
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0998	<1	<1	3208	3208
Analyst			Date	09-21-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	Demo 160902H
Company		Sample Date	9-20-16
Container#		Sampled From	P3
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0998	<1	<1	3208	3208
Analyst			Date	09-21-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Dil Soln

W_I = 0.5919g . 0.0998g

W_F = 72.1050g

1242. <1

1254. <1

1260. 25.287

dec01609004

Analysis Date
User Name
Vial

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	Dem0160905
Company		Sample Date	9-20-16
Container#		Sampled From	T2
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N%	C_A%	C_P%	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1002	<1	<1	2940	2940
Analyst			Date	09-21-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	Dem01609005
Company		Sample Date	9-20-16
Container#		Sampled From	P2
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1002	<1	<1	2940	2940
Analyst			Date	09-21-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Dil Soln

W_I = 0.6298g. 0.1002g

W_F = 73.5146g

1242. <1

1254. <1

1260. 25.185

~~9.00~~ Demo160905

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	DCM0116291006
Company		Sample Date	9-20-11
Container#		Sampled From	3-TK-005
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N%	C_A%	C_P%	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

See back of PG for D.L. Calc

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1002	<1	21	462	462
Analyst	PAR		Date	09/20/11	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Int mass: 1.0083

final mass: 10.4178g

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	Dem0160906
Company		Sample Date	9-20-16
Container#		Sampled From	3-TK-005
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

See back of Pg for D.I Calc

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1003	<1	<1	462	462
Analyst	PAR		Date	09/20/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Int mass. 1.0083

final mass. 10.4198g

1242 <1

1254 <1

1260 $44.671\left(\frac{10.4198}{1.0083}\right) = 462$

Demo1609066

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	Demo/160907
Company		Sample Date	9-20-16
Container#		Sampled From	T-TK-003
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N%	C_A%	C_P%	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

See back for info

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0899	<1	<1	460	460
Analyst			Date	09-21-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Jar mass: 1.0279g

final mass: 10.2100g

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Rob Sikkson	Sample Number	Dem0160907
Company		Sample Date	9-20-16
Container#		Sampled From	3-TK-005
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

See back for INFO

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0999	<1	<1	460	460
Analyst			Date	08-21-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Jar mass: 1.0799g

final mass: 10.2100g

1242	<1
1254	<1
1260	46.45

Demo1609007

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	Demo/160900 B
Company		Sample Date	9-20-16
Container#		Sampled From	3-RA-123
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1002	<1	<1	<1	<1
Analyst			Date	09-21-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	Demo 16090094
Company		Sample Date	9-20-16
Container#		Sampled From	3-KA-123
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1004	<1	<1	<1	<1
Analyst		[signature]	Date	09/20/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEM0160910
Company		Sample Date	9-20-16
Container#		Sampled From	P2
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

See back for Oil info

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0886	<1	<1	2994	2994
Analyst			Date	09-21-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEM0160910
Company		Sample Date	9-20-16
Container#		Sampled From	P2
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

See back for Oil info

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0998	<1	<1	2994	2994
Analyst			Date	09-21-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Dil Soln

W_I = 0.2428 · 0.0999 g

W_F = 34.9168

1242. <1
1254. <1 .
1260. 20.823

Demo1609010

Analysis Date & Time
User Name
Vial#
Sample N
Sampl
Sa

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	Dem1/6090/1
Company		Sample Date	9-20-16
Container#		Sampled From	3-TK-005
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type (ASTM D2140)	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

Sent back for D.I (NP)

PCBs (ASTM D4059)	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0998	<1	<1	705	705
Analyst			Date	09-21-16	

Corrosive Sulphur (ASTM D1275)	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	Dem0160911
Company		Sample Date	9-20-16
Container#		Sampled From	3-TK-005
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

Send back Sent D.I (NFD

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0998	<1	<1	705	705
Analyst			Date	09-21-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Dil Soln

W_I = 0.2581 0.0998g

W_F = 35.9110

1242 <1
1254 <1
1260 4.912

Pemoleoil

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	Demo160912
Company		Sample Date	9-20-16
Container#		Sampled From	3-RA-123
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

Neat #2 0.0695 <1 <1 <1 <1

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
NOT	0.0995	<1	<1	<1	<1
Analyst			Date	09-21-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

DEM01609013

Sampled By	GJ	Sample Number	~~EHDPO160913~~
Company		Sample Date	9-20-16
Container#		Sampled From	CS
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059 DRAFT	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1001	<1	<1	<1	<1
Analyst			Date	09-21-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	Dem01609614
Company		Sample Date	9-20-16
Container#		Sampled From	3-UC-223
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
Analyst			Date		

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T Robinson	Sample Number	Demo160916
Company		Sample Date	9-20-16
Container#		Sampled From	3-TK-001
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

See back for Dil info

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1004	1.06	1.23	2.49	4.78
Analyst	DAE		Date	09/22/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	Dem/160916
Company		Sample Date	9-20-16
Container#		Sampled From	3-TK-001
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N%	C_A%	C_P%	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

See back Sour Dil INR

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1004	1.06	1.23	2.49	4.78
Analyst		DAE	Date	09/22/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

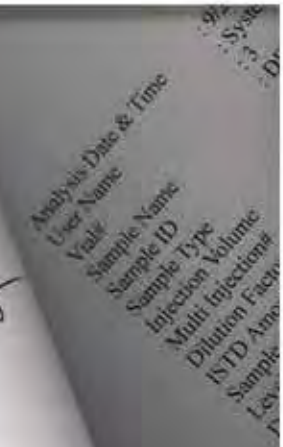
Neat Results
1242 - 0.8
1254 1.1
1260 3.49
Total : 5.39 mg/kg
JB 10/10/16

Dil Soln

$W_I = 0.2233 \cdot 0.0998$ g

$W_F = 24.8360$

Needs RERun < 50 ppm PCB



Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	Demo 1609017
Company		Sample Date	9-20-16
Container#		Sampled From	T-KA-123
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N%	C_A%	C_P%	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs NEAT ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1003	<1	<1	<1	<1
Analyst			Date	09-21-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By		Sample Number	DCM0160920
Company		Sample Date	9-21-16
Container#		Sampled From	3-TM-001
QC Schedule		Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type (ASTM D2140)	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1000	0.86	1.2	3.2	5.3
Analyst			Date	09-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By		Sample Number	PEM0160921
Company		Sample Date	9-21-16
Container#		Sampled From	3-TK-001
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.8998	0.9	1.2	3.2	4.4
Analyst			Date	9.28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By		Sample Number	DEMO160022
Company		Sample Date	9-21-16
Container#		Sampled From	3-RA-123
QC Schedule		Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1045	<1	<1	<1	<1
Analyst		PA	Date	09/21/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By		Sample Number	DEMO160923
Company		Sample Date	9-21-16
Container#		Sampled From	3-RA-123
QC Schedule		Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1015	<1	<1	<1	<1
Analyst	DAE		Date	09/21/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	Dem/1609025
Company		Sample Date	9-21-16
Container#		Sampled From	3-TK-051
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N%	C_A%	C_P%	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1004	1.16	1.20	3.32	5.68
Analyst			Date	09/22/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEMO1609026
Company		Sample Date	9-21-16
Container#		Sampled From	RA-123 Plant 3
QC Schedule	PCB	Batch/Load Number	8:27 AM

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1004	<1	<1	<1	<1
Analyst			Date	09-21-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

hydrodec

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Laboratory Worksheet

Sampled By	[illegible]	Sample Number	Demo1609027 ~~[illegible]~~
Company		Sample Date	9-21-16
Container#		Sampled From	172
QC Schedule	PCB	Batch/Load Number	

			Analyst	Date
Is the oil PCB Oil?	YES	NO		
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059 D1	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0995	<1	<1	2994	2994
Analyst	[illegible]		Date	09/22/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

W_I = 0.0886g
W_F = 12.03898

1242 <1
1254 <1
1260 22.038

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	Dem D1609B2
Company		Sample Date	9-21-16
Container#		Sampled From	3-Tanks
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0997	<1	<1	680	680
Analyst			Date	09-21-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

1st JAT mass 1.0005 g

final mass: 10.3421 g

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	DEM01609023
Company		Sample Date	9-21-16
Container#		Sampled From	3-Tk005
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N%	C_A%	C_P%	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0997	<1	<1	680	680
Analyst			Date	09-21-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

1st Jar mass 1.0005 g

final mass: 10.3421 g

Analysis Date & Time
User Name
Vial#
Sample Name
Sample ID
Sample Info

1st dilution over Calibration Range

JD 9-21-16

1242 - <1

1254 - <1

1260 - 610 mg/kg

2nd dilution

0.1001 g

Int mass: 0.9974 g

final mass: 14.5292 g

1242 - <1

1254 - <1

1260 - ~~50 3015~~ 46.700

~~517 mg/kg~~ JD 9-21-16

Demo1602028

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. ROSINSKI	Sample Number	Demo 1609029
Company		Sample Date	9-21-16
Container#		Sampled From	3-RD-123
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

Next #2

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1001	<1	<1	<1	<1
	0.1003	<1	<1	<1	<1
Analyst			Date	09-21-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	Demo/1609/33U
Company		Sample Date	9-21-16
Container#		Sampled From	~~3 PL 3~~ P2
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1028	<1	<1	~~30.599~~ 2998	~~30.6~~ 2998
Analyst	PAR		Date	09/21/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Int mass 10.1028g
final mass 10.0417g

1242 <1
1254 <1
1260 2998

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	Demo/609031
Company		Sample Date	9-21-16
Container#		Sampled From	~~3[illegible]~~ P2
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N%	C_A%	C_P%	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

Rerun 09/29/16 Re-Dark 2964

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1003	<1	<1	3773	3773
Analyst			Date	09/22/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

INT mass. 0.09845
final mass: 12.6711g

1242 <1
1254 <1
1260 29.29

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T Robinson	Sample Number	Demo160903 1
Company		Sample Date	9-21-16
Container#		Sampled From	~~3-T-505~~ P2
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

Rerun 09/29/16 Re Dark

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1003	<1	<1	3773	3773
Analyst			Date	09/22/16	

2965

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

IAT mass. 0.0984 g
final mass: 12.6711 g

1242 <1
1254 <1
1260 29 29

$W_I = 0.1002$ 0.1003

$W_F = 12.8282$

1242	<1	
1254	<1	
1260	23.165	2966

Demo1609031

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Kobiasa	Sample Number	Dem01609032
Company		Sample Date	9-21-16
Container#		Sampled From	3-TK-005
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1004	<1	<1	639.76	640
Analyst			Date	09-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Int mass. 1.0048g
final mass. 14.3026

1242. <1
1254. <1
1260. 44,845

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Robinson	Sample Number	DPM-1669033
Company		Sample Date	9-21-16
Container#		Sampled From	3-Tk-025
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1002	<1	<1	608.35	608
Analyst			Date	09-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Int mass: 1.1354g
final mass: 15.3753g

1242, <1
1254, <1
1260: 44.924

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	Ken Kohler	Sample Number	Demo 1609034
Company		Sample Date	9-21-16
Container#		Sampled From	3-RA-123
QC Schedule		Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1000	<1	<1	<1	<1
Analyst			Date	09/21/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	Ken Kohler	Sample Number	Demo 160935
Company		Sample Date	9-21-16
Container#		Sampled From	3RA-123
QC Schedule		Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1005	<1	<1	<1	<1
Analyst			Date	09/21/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	L Blevins	Sample Number	DENA1609036
Company		Sample Date	9-21-16
Container#		Sampled From	P2
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N%	C_A%	C_P%	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

D.I

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1000	<1	<1	3206.5	3206.5
Analyst			Date	09-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

$W_F = 0.0905$

$W_F = 12.7071$

1242 , <1
1254 <1
1260 22.837

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEM01609037
Company		Sample Date	9-21-16
Container#		Sampled From	3TK-005
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

#2 DJ 0.005 <1 <1 520.42 520.42

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1000	<1	<1	555.65	555.65
Analyst			Date	09-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

W_i = 0.0992 g

W_f = 2.0455 g

1242 <1
1254 <1
1260 26.547

#2
INT Mass: 0.7525g
Final mass: 10.9194g

1242 <1
1254 <1
1260 35.864

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEM0160938
Company		Sample Date	9-21-16
Container#		Sampled From	3-RA-123
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs NEAT ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1000	<1	<1	<1	<1
Analyst	PAC		Date	09/23/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	L Bevis	Sample Number	DFM01609039
Company		Sample Date	9-21-16
Container#		Sampled From	CS
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059 WORK	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0998	<1	<1	<1	<1
Analyst	AK		Date	09/23/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet WATER

Sampled By	GJ	Sample Number	DEM0160940
Company		Sample Date	9-21-16
Container#		Sampled From	VE-223 Plant 3
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
Analyst			Date		

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	W Dennis	Sample Number	DEM01605042
Company		Sample Date	5-21-16
Container#		Sampled From	B-TK-001
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

Neat	0.1002	<1	1.46	3.63	5.1
PCBs ASTM D4059	Mass (g) 0.0998	1242 <1	1254 24.6	1260 50.6	Total (mg/kg) 75.2
Analyst			Date	09/23/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

$W_I = 0.0992g$ $W_F = 1.6732g$

1242 <1
1254 1.46
1260 3.63

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEMD1609043
Company		Sample Date	9-21-16
Container#		Sampled From	3 RA-123
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1988	<1	<1	<1	<1
Analyst			Date	09/23/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	A. Hollister	Sample Number	DEM0160046
Company		Sample Date	9-21-16
Container#	3-TK-001	Sampled From	3-TK 001
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs Neat ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1000	<1	<1	3.06	3.1
Analyst		DAE	Date	09/23/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	A. Hoffner	Sample Number	DEM01609047
Company		Sample Date	9-21-16
Container#	3-TK-001	Sampled From	3-TK001
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs Neat ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1004	0.8	1.5	3.0	5.3
Analyst			Date	09-23-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

DEMO 160948

Sampled By	A. Hoffner	Sample Number	DEMO 160948
Company		Sample Date	9-21-16
Container#	3-RA-123	Sampled From	3-RA-123
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0998 Near	<1	<1	<1	<1
Analyst	PAC		Date	09/23/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

DEMO1609049

Sampled By	A. Hoffer	Sample Number	Demo1609949
Company		Sample Date	9-21-16
Container#	3-RA-123	Sampled From	3RA-123
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs Neat ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1004	<1	<1	<1	<1
Analyst	[signature]		Date	09/23/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEM01609051
Company		Sample Date	9-22-16
Container#		Sampled From	3-TK-001
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059 Neat	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1005	<1	<1	3.00	3.0
Analyst	PAC		Date	09/23/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEM01609052
Company		Sample Date	9-22-16
Container#		Sampled From	3-RA-123
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

9-30-16 #2 0.1004 <1 <1 <1 <1

Aroclor PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1000	<1	<1	<1	<1
Analyst			Date	09-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEM0160 9053
Company		Sample Date	9-22-16
Container#		Sampled From	P Tank
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1004	<1	<1	2014	2014
Analyst			Date	9-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Jar mass: 0.1021g
final mass 11.0631g

1260 19.142 mg/kg

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEM01609054
Company		Sample Date	9-22-16
Container#		Sampled From	3-TK-005
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1003	<1	<1	= 47.34 mg/kg	50.9
Analyst			Date	09-22-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

INT mass: 1.0383 g
final mass: 11.1416 g

1260

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEM01609055
Company		Sample Date	9-22-16
Container#		Sampled From	3-RA-123
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs Neat ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0977	<1	<1	<1	<1
Analyst			Date	09-23-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEMO160955
Company		Sample Date	9-22-16
Container#		Sampled From ~~9-18-16~~	~~P-TANK~~ 3-RA-123
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

		Date
Moisture		
Color		
Saybolt Color		
DDF		
Resistivity		
Breakdown		
Inhibitor		
Aniline Point		
Flash Point		
Pour Point		
Density 15°C		
Viscosity 100°C		
Viscosity 40°C		
Viscosity 0°C		
Refractive Index		

Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

DEMO
160955
RERAN as Neat
RAC 09/23/16

ICP Analysis	
Mass (g)	
Analyst	
Date	

Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

0.1001

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	Dil ~~0.1~~ 11.0	<1	<1	<1	<1
Analyst	~~RTZ~~		Date	09/23/16	

Neat 0.1000

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

~~W_F = 0.0911~~
~~10.8213~~
~~W_F = 10.8213~~ 09/23/16

W_F = 0.0991
W_F = 10.8213

1242 <1
1254 <1
1260 <1

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEMO1609056
Company		Sample Date	9-22-16
Container#		Sampled From	P-Tank
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1002	<1	<1	2054	2054
Analyst	AC		Date	09/23/16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

$W_I = 0.0938$

$W_F = 10.6434$

1242 <1
1254 <1
1260 18.11

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GT	Sample Number	DEMO1609057
Company		Sample Date	9/12/16
Container#		Sampled From	P-TANK
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type (ASTM D2140)	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

0.1003

PCBs (ASTM D4059)	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0999	<1	<1	2316	2316
Analyst			Date	09-29-16	

Corrosive Sulphur (ASTM D1275)	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

W_I = 0.0911 ~~0.7008~~ SA 9.28.16

W_F = ~~10.8213~~ 13.7238

Init mass: 0.0991g

final mass: 10.4622g

1242 - <1

USC-LAB-FRM-001, Issue 2, 15th August 2015

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GT	Sample Number	DEMO1609057
Company		Sample Date	8/24/16
Container#		Sampled From	P-TANK
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

0.1003

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0999	<1	<1	2316	2316
Analyst			Date	08-29-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

W_I = 0.0911 ~~0.7008~~ SA 9.28.16

W_F = ~~10.8213~~ 13.7238

IAt mass: 0.0991g

final mass: 10.4622g

1242 - <1

1254 - <1

1260 - 21.942

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEM0160958
Company		Sample Date	9-22-16
Container#		Sampled From	3-TK-005
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

452.86 453

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1002	<1	<1	~~26.0~~	~~26.0~~
Analyst			Date	09-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

W_I = 0.1000 9/23/16 0.8038

W_F = 13.7238 14.0002

1242 - <1
1254 - <1
1260 - 26.0

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEMO 160959
Company		Sample Date	9-22-16
Container#		Sampled From	3-TK-005
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1001	<1	<1	463.2	463
Analyst			Date	9-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

$W_I = 0.8252$

$W_F = 13.2379$

1242 - <1
1254 - <1
1260 - 28.880 9-28

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEM0160906O
Company		Sample Date	9-22-16
Container#		Sampled From	3-RA-123
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number – ASTM D974		Interfacial Tension – ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs WET ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0998	<1	<1	<1	<1
Analyst			Date	09-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEMO1609061
Company		Sample Date	9-22-16
Container#		Sampled From	3-RA-123
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059 NEAT	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1009	<1	<1	<1	<1
Analyst			Date	09-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	R. Davis	Sample Number	DFM0116090162
Company		Sample Date	9-22-16
Container#		Sampled From	23 PT P2
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1002	<1	<1	1998.88	1979
Analyst			Date	09.28.16	

D1 2.1.11

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

W_I = 0.0873

W_F = 10.9209

1242 - <1

1254 - <1

1260 - 15.979

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEM01609063
Company		Sample Date	9-22-16
Container#		Sampled From	3-TK-005
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

#2 0.1001 <1 <1 262.72 262.72

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1000	<1	<1	271.46	271.5
Analyst			Date	09-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

$W_I = 0.7997$

$W_F = 13.8679$

1242. <1
1254 <1
1260 15.654

#2 Int mass. 0.9633g
Final mass. 10.1309g

1242, <1
1254, <1
1260. 271.46

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEM01609063
Company		Sample Date	9-22-16
Container#		Sampled From	3-TK-005
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		

Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	

Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

#2 0.1001 <1 <1 262.72 262.72

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1000	<1	<1	271.46	271.5
Analyst			Date	09-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

$W_I = 0.7997$

$W_F = 13.8679$

1242 <1
1254 <1
1260 15.634

#2 Int mass. 0.7653g
Fnl mass. 10.1309g

1242 <1
1254 <1
1260 24.981

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEM01609064
Company		Sample Date	9-22-16
Container#		Sampled From	3-RA-123
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0997 WET	<1	<1	<1	<1
Analyst			Date	09-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	K. Danso	Sample Number	DEMS16090115
Company		Sample Date	9-22-16
Container#		Sampled From	C5
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs LIGHT ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1003	<1	<1	<1	<1
Analyst			Date	09-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet WW

Sampled By	GJ	Sample Number	DEM01609066
Company		Sample Date	9-22-16
Container#		Sampled From	3-VE-223
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
Analyst			Date		

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	L. Weims	Sample Number	DEMO1609048
Company		Sample Date	5-12-16
Container#		Sampled From	3-TK-001
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059 Not	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1007	<1	4.5	2.6	7.1
Analyst			Date	SJ 5-28-16	5-28-16

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEMOIL09069
Company		Sample Date	9-22-16
Container#		Sampled From	3-RA-123
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs NOT ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.100	<1	<1	<1	<1
Analyst			Date	09-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Devore	Sample Number	Demo160922
Company		Sample Date	9-23-16
Container#	3-TK-001	Sampled From	3-TK-001
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	**Result (mg/kg)**
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs NEW ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1000	<1	5.6	2.5	8.1
Analyst			Date	09-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Devoie	Sample Number	Dem0160973
Company		Sample Date	9-23-16
Container#	3-TK-001	Sampled From	3-TK-001
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N%	C_A%	C_P%	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.0995	<1	6.6	2.4	9.0
Analyst			Date	07-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Devore	Sample Number	Demo1609074
Company		Sample Date	9-23-16
Container#	3-RA-123	Sampled From	3-RA-123
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
WET	0.0998	<1	<1	<1	<1
Analyst			Date	09-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	T. Devore	Sample Number	Dem1160907S
Company		Sample Date	9-23-16
Container#	3-RA-123	Sampled From	3-RA-123
QC Schedule	PCB	Batch/Load Number	

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type (ASTM D2140)	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1000	<1	<1	<1	<1
Analyst			Date	09-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEM01609077
Company		Sample Date	9-23-16
Container#		Sampled From	3-TK-001
QC Schedule	PCB	Batch/Load Number	D-F3-FE-18

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Sliver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059 HEAT	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1999	<1	4.9	2.3	7.2
Analyst			Date	09-28-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Hydrodec of North America - Canton Laboratory

Laboratory Worksheet

Sampled By	GJ	Sample Number	DEMO1609078
Company		Sample Date	9-23-16
Container#		Sampled From	3-RA-123
QC Schedule	PCB	Batch/Load Number	D-FJ-CO-18

Is the oil PCB Oil?	YES	NO	Analyst	Date
PCB Break Test	PASS	FAIL		
Halogens Break Test	PASS	FAIL		

	Result	Units	Method	Analyst	Date
Moisture		mg/kg	ASTM D1533		
Color		ASTM color	ASTM D1500		
Saybolt Color		Saybolt color	ASTM D156		
DDF		radians	ASTM D924		
Resistivity		G Ω m	ASTM D1169		
Breakdown		kV	ASTM D1816		
Inhibitor		% w/w	ASTM D2668		
Aniline Point		°C	ASTM D611		
Flash Point		°C	ASTM D92		
Pour Point		°C	ASTM D97		
Density 15°C		g/ml	ASTM D4052		
Viscosity 100°C		cSt	ASTM D7042		
Viscosity 40°C		cSt	ASTM D7042		
Viscosity 0°C		cSt	ASTM D7042		
Refractive Index		units	ASTM D1218		
Carbon Type ASTM D2140	C_N %	C_A %	C_P %	Analyst	Date

ICP Analysis	
Mass (g)	
Analyst	
Date	
Element	Result (mg/kg)
Aluminium (Al)	
Nickel (Ni)	
Chromium (Cr)	
Iron (Fe)	
Copper (Cu)	
Lead (Pb)	
Tin (Sn)	
Silicon (Si)	
Sodium (Na)	
Potassium (K)	
Molybdenum (Mo)	
Boron (B)	
Magnesium (Mg)	
Calcium (Ca)	
Zinc (Zn)	
Phosphorus (P)	
Barium (Ba)	
Cadmium (Cd)	
Manganese (Mn)	
Titanium (Ti)	
Vanadium (V)	
Silver (Ag)	
Antimony (Sb)	
Sulphur (S)	

Neutralization Number - ASTM D974		Interfacial Tension - ASTM D971	
Mass Oil (g)		Temp (°C)	
Titre (ml)		Water (mN/m)	
Blank (ml)		Sample (RAW)	
KOH Conc (M)			
Result (mg KOH/g)		IFT (mN/m)	

PCBs ASTM D4059	Mass (g)	1242	1254	1260	Total (mg/kg)
	0.1009	<1	<1	<1	<1
Analyst			Date	09-26-16	

Corrosive Sulphur ASTM D1275	Corrosive	Non-Corrosive	Rating

Sample Type	Feedstock	Base Oil	Transformer Oil
Sample Classification	ON SPEC	OFF SPEC	REJECT
Signed		Date	

Laboratory Replicates, ±10% RPD

Sample Number	Sample Code	Values	Average	Difference	Difference (%)	Meets Criteria (Y/N)
DEMO1609002	D-1-FE-01	30.23	30.615	0.77	2.5%	Y
DEMO1609002-2		31				
DEMO1609012	D-1-CO-06	<1	<1	0	0.0%	Y
DEMO1609012-2		<1				
DEMO1609029	D-2-CO-01	<1	<1	0	0.0%	Y
DEMO1609029-2		<1				
DEMO1609037	D-2-FE-06	555.65	538.035	35.23	6.5%	Y
DEMO1609037-2		520.42				
DEMO1609052	D-F2-CO-18	<1	<1	0	0.0%	Y
DEMO1609052-2		<1				
DEMO1609063	D-3-FE-06	271.5	267.11	8.78	3.3%	Y
DEMO1609063-2		262.72				

Field QA Duplicates, ±30% RPD

Sample Number	Sample Code	Values	Average	Difference	Difference (%)	Meets Criteria (Y/N)
DEMO1609004	D-1-PT-04A	3080	3010	140	4.7%	Y
DEMO1609005	D-1-PT-04B	2940				
DEMO1609006	D-1-FE-04A	462	461	2	0.4%	Y
DEMO1609007	D-1-FE-04B	460				
DEMO1609008	D-1-CO-04A	<1	<1	0	0.0%	Y
DEMO1609009	D-1-CO-04B	<1				
DEMO1609020	D-F1-FE-09A	5.3	4.85	0.9	18.6%	Y
DEMO1609021	D-F1-FE-09B	4.4				
DEMO1609022	D-F1-CO-09A	<1	<1	0	0.0%	Y
DEMO1609023	D-F1-CO-09B	<1				
DEMO1609030	D-2-PT-04A	2988	2977	22	0.7%	Y
DEMO1609031	D-2-PT-04B	2966				
DEMO1609032	D-2-FE-04A	640	624	32	5.1%	Y
DEMO1609033	D-2-FE-04B	608				
DEMO1609034	D-2-CO-04A	<1	<1	0	0.0%	Y
DEMO1609035	D-2-CO-04B	<1				
DEMO1609046	D-F2-FE-09A	3.1	4.2	2.2	52.4%	N
DEMO1609047	D-F2-FE-09B	5.3				
DEMO1609048	D-F2-CO-09A	<1	<1	0	0.0%	Y
DEMO1609049	D-F2-CO-09B	<1				
DEMO1609056	D-3-PT-04A	2054	2185	262	12.0%	Y
DEMO1609057	D-3-PT-04B	2316				
DEMO1609058	D-3-FE-04A	453	458	10	2.2%	Y
DEMO1609059	D-3-FE-04B	463				
DEMO1609060	D-3-CO-04A	<1	<1	0	0.0%	Y
DEMO1609061	D-3-CO-04B	<1				
DEMO1609072	D-F3-FE-09A	8.1	8.55	0.9	10.5%	Y
DEMO1609073	D-F3-FE-09B	9				
DEMO1609074	D-F3-CO-09A	<1	<1	0	0.0%	Y
DEMO1609075	D-F3-CO-09B	<1				

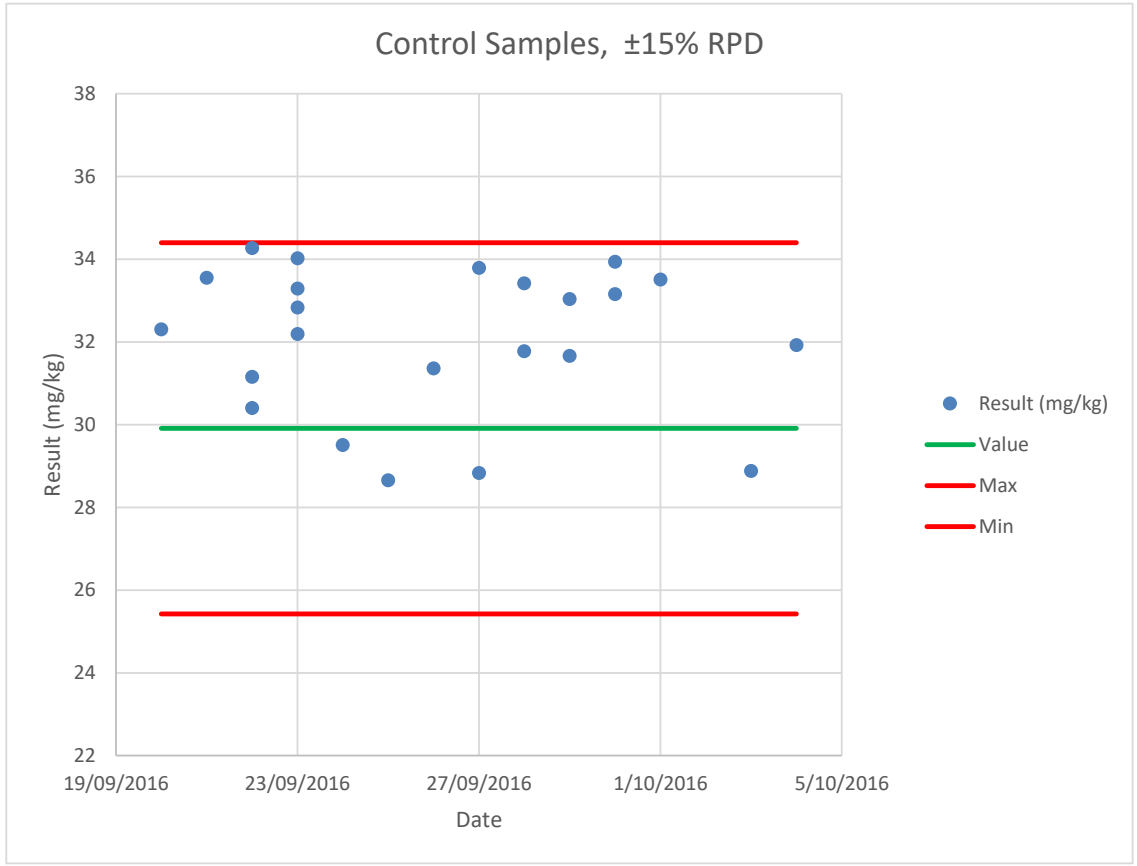
External Laboratory Method Check, ±30% RPD

Sample Number	Sample Code	Hydrodec Value	Summit Value	Average	Difference	Difference (%)	Meets Criteria (Y/N)
DEMO1609005	D-1-PT-04B	2940	2520	2730	420	15.4%	Y
DEMO1609007	D-1-FE-04B	460	435	447.5	25	5.6%	Y
DEMO1609009	D-1-CO-04B	<1	<1	<1	0	0.0%	Y
DEMO1609021	D-F1-FE-09B	4.4	2.81	3.605	1.59	44.1%	N
DEMO1609023	D-F1-CO-09B	<1	<1	<1	0	0.0%	Y
DEMO1609031	D-2-PT-04B	2966	2600	2783	366	13.2%	Y
DEMO1609033	D-2-FE-04B	608	656	632	48	7.6%	Y
DEMO1609035	D-2-CO-04B	<1	<1	<1	0	0.0%	Y
DEMO1609047	D-F2-FE-09B	5.3	2.81	4.055	2.49	61.4%	N
DEMO1609049	D-F2-CO-09B	<1	<1	<1	0	0.0%	Y
DEMO1609057	D-3-PT-04B	2316	1970	2143	346	16.1%	Y
DEMO1609059	D-3-FE-04B	463	391	427	72	16.9%	Y
DEMO1609061	D-3-CO-04B	<1	<1	<1	0	0.0%	Y
DEMO1609073	D-F3-FE-09B	9	3.45	6.225	5.55	89.2%	N
DEMO1609075	D-F3-CO-09B	<1	<1	<1	0	0.0%	Y

Control Samples, ±15% RPD

Calculated Concentraton from Sample Preparation 29.91 mg/kg

Date	Sample File	Result (mg/kg)	RPD	Meets Criteria (Y/N)
20/09/2016	CONTROL_294	32.297	7.98%	Y
21/09/2016	CONTROL_299	33.546	12.16%	Y
22/09/2016	CONTROL_094	30.399	1.63%	Y
22/09/2016	CONTROL_096	34.266	14.56%	Y
22/09/2016	CONTROL_139	31.149	4.14%	Y
23/09/2016	CONTROL_302	32.189	7.62%	Y
23/09/2016	CONTROL_313	32.829	9.76%	Y
23/09/2016	CONTROL_097	33.285	11.28%	Y
23/09/2016	CONTROL_304	34.016	13.73%	Y
24/09/2016	CONTROL_316	29.505	1.35%	Y
25/09/2016	CONTROL_341	28.654	4.20%	Y
26/09/2016	CONTROL_140	31.357	4.84%	Y
27/09/2016	CONTROL_098	33.786	12.96%	Y
27/09/2016	CONTROL_312	28.829	3.61%	Y
28/09/2016	CONTROL_141	33.414	11.72%	Y
28/09/2016	CONTROL_317	31.775	6.24%	Y
29/09/2016	CONTROL_142	33.031	10.43%	Y
29/09/2016	CONTROL_325	31.657	5.84%	Y
30/09/2016	CONTROL_143	33.934	13.45%	Y
30/09/2016	CONTROL_331	33.155	10.85%	Y
1/10/2016	CONTROL_339	33.502	12.01%	Y
3/10/2016	CONTROL_324	28.876	3.46%	Y
4/10/2016	CONTROL_340	31.919	6.72%	Y

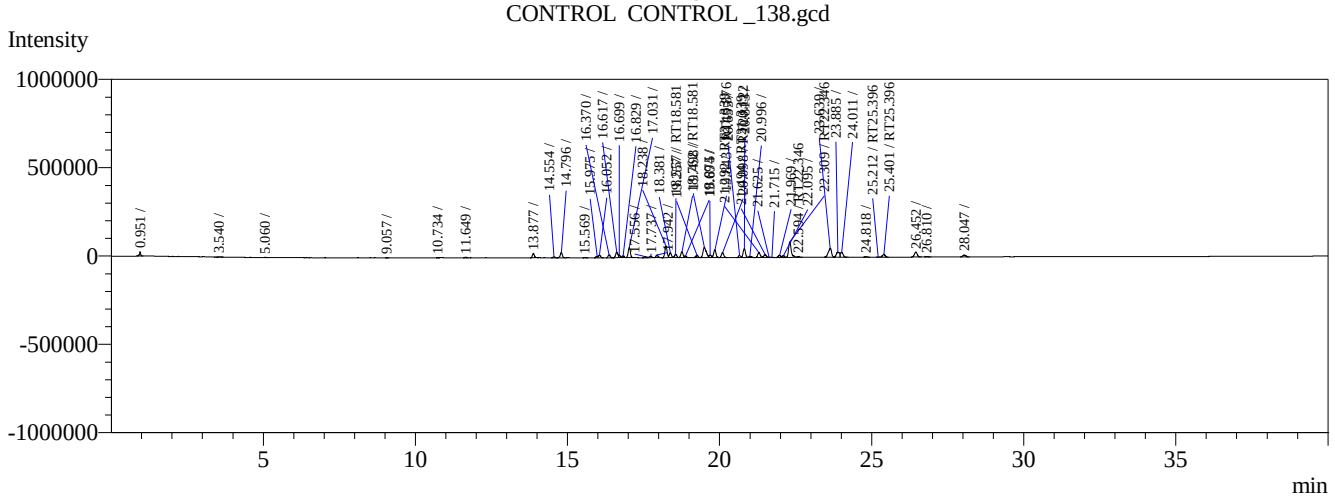


Sample Information

Analysis Date & Time	: 9/21/2016 8:43:14 AM
User Name	: System Administrator
Vial#	: 38
Sample Name	: CONTROL
Sample ID	:
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL _138.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL _138.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\System\DEFAULT.lsr
Batch Name	: C:\LabSolutions\Data\Project2\160920-.gcb

Chromatogram

CONTROL CONTROL _138.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	267002	52719	33.233	ppm
2	RT19.876	19.843	231766	43493	32.837	ppm
3	RT20.122	20.098	143391	27430	32.727	ppm
4	RT21.339	21.305	248698	44509	33.464	ppm
5	RT22.346	22.351	557218	92042	34.127	ppm
6	RT25.396	25.396	99416	16486	32.670	ppm

Group Results

ECD1

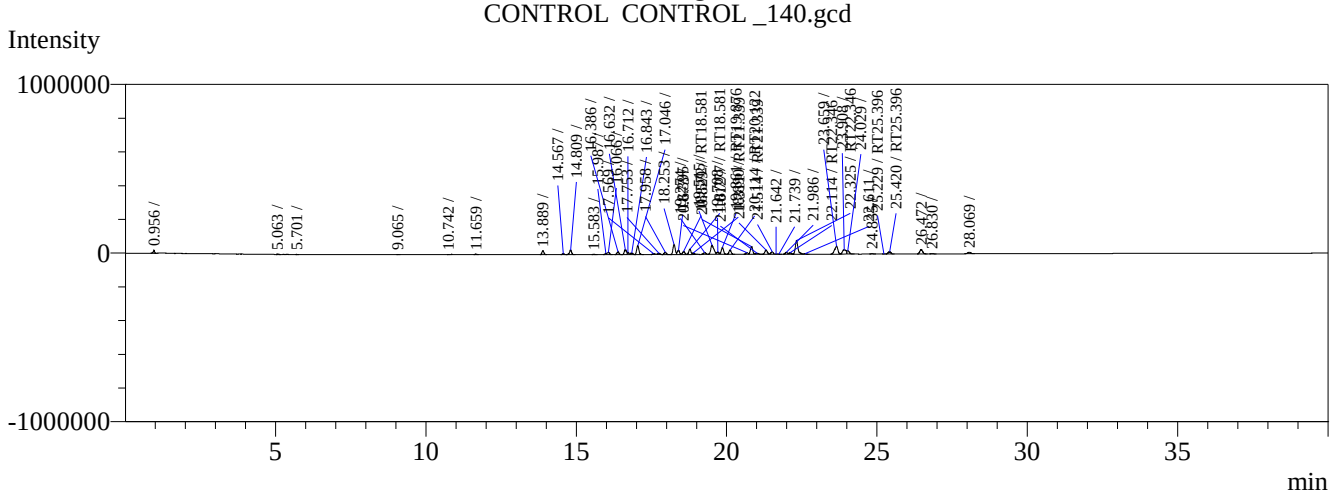
Group#	Name	Conc.	Unit	Area
1	1260	33.440	ppm	1547492
Total		33.440		

Sample Information

Analysis Date & Time	: 9/26/2016 7:59:10 AM
User Name	: System Administrator
Vial#	: 2
Sample Name	: CONTROL
Sample ID	: UNK-0002
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL _140.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL _140.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160926.gcb

Chromatogram

CONTROL CONTROL _140.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	249464	48973	30.644	ppm
2	RT19.876	19.861	216200	40703	30.178	ppm
3	RT20.122	20.114	132950	25664	29.908	ppm
4	RT21.339	21.305	232607	41482	31.039	ppm
5	RT22.346	22.351	543388	89812	33.138	ppm
6	RT25.396	25.396	89989	14776	29.340	ppm

Group Results

ECD1

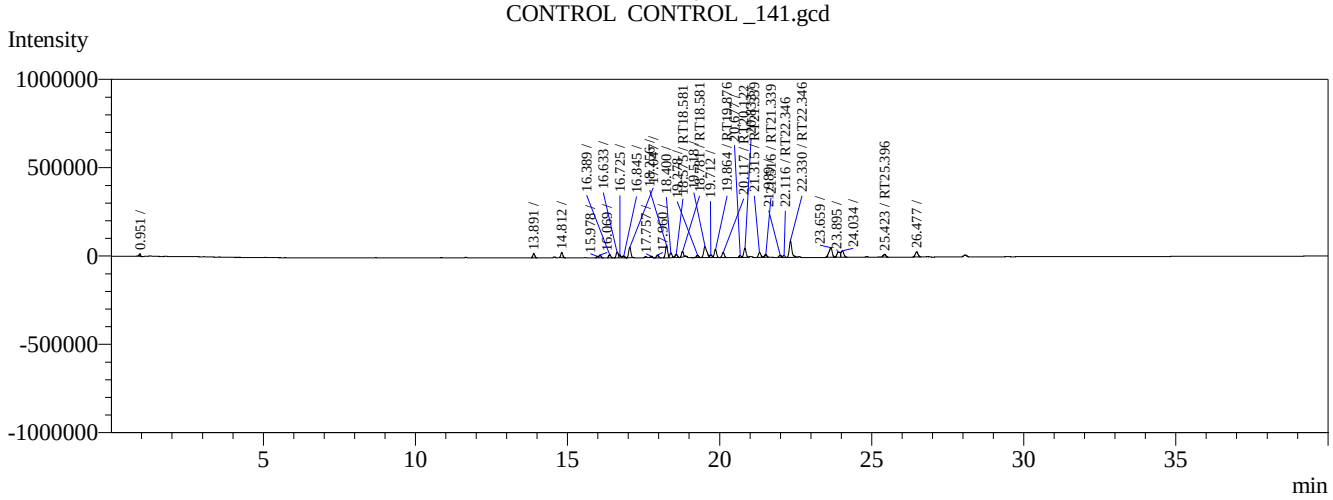
Group#	Name	Conc.	Unit	Area
1	1260	31.357	ppm	1464597
Total		31.357		

Sample Information

Analysis Date & Time	: 9/28/2016 2:03:55 PM
User Name	: System Administrator
Vial#	: 8
Sample Name	: CONTROL
Sample ID	:
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL _141.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL _141.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160928.gcb

Chromatogram

CONTROL CONTROL _141.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	240198	51382	29.277	ppm
2	RT19.876	19.864	236639	46118	33.670	ppm
3	RT20.122	20.117	144567	28791	33.044	ppm
4	RT21.339	21.305	236508	45009	31.627	ppm
5	RT22.346	22.351	609731	105659	37.880	ppm
6	RT25.396	25.423	78790	14413	25.385	ppm

Group Results

ECD1

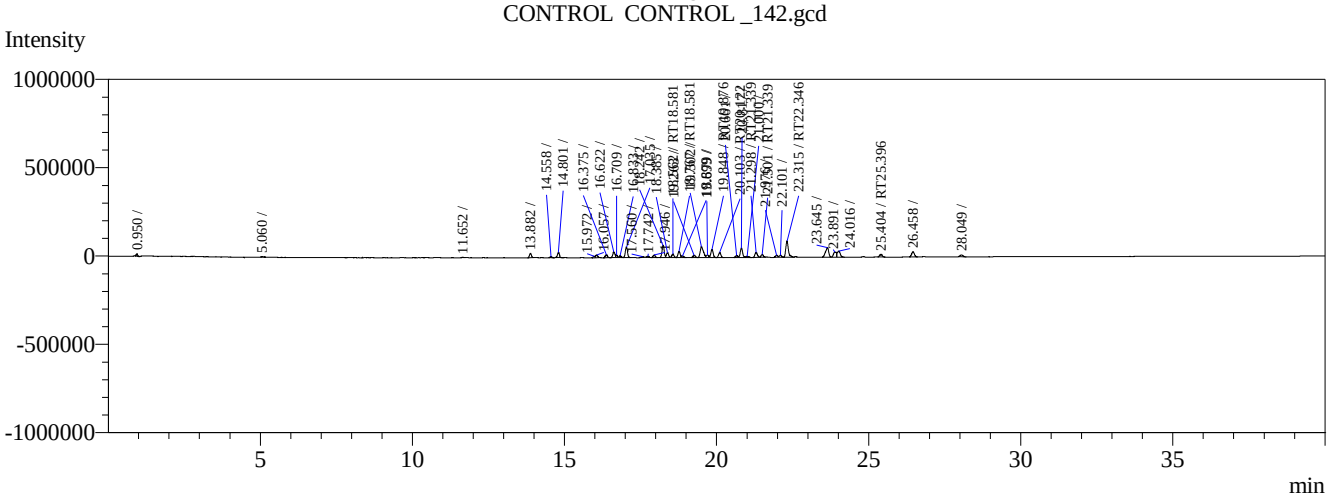
Group#	Name	Conc.	Unit	Area
1	1260	33.414	ppm	1546433
Total		33.414		

Sample Information

Analysis Date & Time	: 9/29/2016 9:44:43 AM
User Name	: System Administrator
Vial#	: 2
Sample Name	: CONTROL
Sample ID	: UNK-0002
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL _142.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL _142.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160929.gcb

Chromatogram

CONTROL CONTROL _142.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	276425	54529	34.624	ppm
2	RT19.876	19.848	239746	45663	34.200	ppm
3	RT20.122	20.103	146169	28894	33.477	ppm
4	RT21.339	21.305	234340	44558	31.300	ppm
5	RT22.346	22.315	546162	92865	33.336	ppm
6	RT25.396	25.404	88359	15417	28.765	ppm

Group Results

ECD1

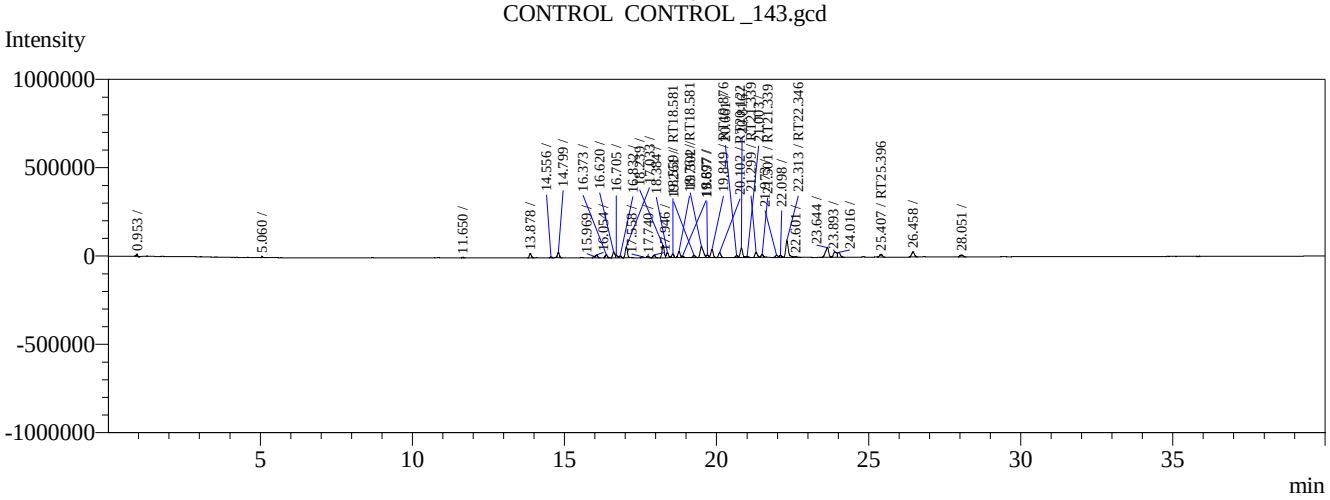
Group#	Name	Conc.	Unit	Area
1	1260	33.031	ppm	1531201
Total		33.031		

Sample Information

Analysis Date & Time	: 9/30/2016 11:09:58 AM
User Name	: System Administrator
Vial#	: 2
Sample Name	: CONTROL
Sample ID	: UNK-0002
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL _143.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL _143.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160930.gcb

Chromatogram

CONTROL CONTROL _143.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	280903	55942	35.284	ppm
2	RT19.876	19.849	243540	46272	34.848	ppm
3	RT20.122	20.102	148574	28998	34.126	ppm
4	RT21.339	21.305	238790	44591	31.970	ppm
5	RT22.346	22.313	564918	94241	34.677	ppm
6	RT25.396	25.407	90398	15180	29.485	ppm

Group Results

ECD1

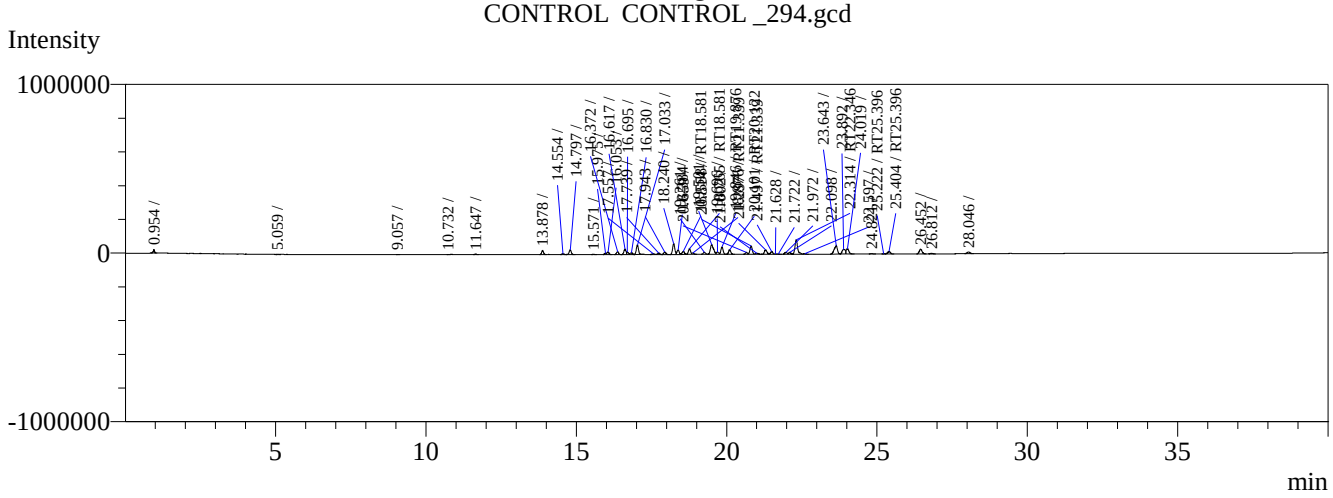
Group#	Name	Conc.	Unit	Area
1	1260	33.934	ppm	1567122
Total		33.934		

Sample Information

Analysis Date & Time	: 9/20/2016 7:39:09 AM
User Name	: System Administrator
Vial#	: 2
Sample Name	: CONTROL
Sample ID	: UNK-0002
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL _294.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL _294.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160920-.gcb

Chromatogram

CONTROL CONTROL _294.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	264760	51928	32.902	ppm
2	RT19.876	19.846	227234	43208	32.063	ppm
3	RT20.122	20.101	141120	27290	32.114	ppm
4	RT21.339	21.305	245924	43611	33.046	ppm
5	RT22.346	22.314	523940	85056	31.748	ppm
6	RT25.396	25.396	99015	15962	32.528	ppm

Group Results

ECD1

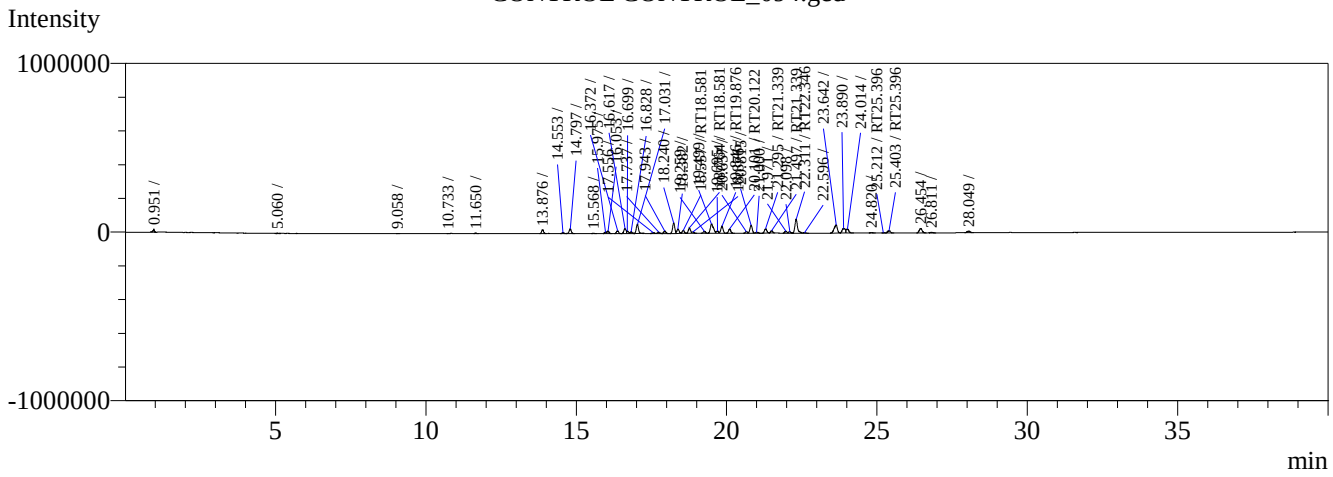
Group#	Name	Conc.	Unit	Area
1	1260	32.297	ppm	1501994
Total		32.297		

Sample Information

Analysis Date & Time	: 9/22/2016 7:37:30 AM
User Name	: System Administrator
Vial#	: 12
Sample Name	: CONTROL
Sample ID	: UNK-0025
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL_094.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL_094.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160920-.gcb

Chromatogram

CONTROL CONTROL_094.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	255542	50350	31.541	ppm
2	RT19.876	19.846	219766	41403	30.787	ppm
3	RT20.122	20.101	135867	26137	30.696	ppm
4	RT21.339	21.305	214703	40399	28.340	ppm
5	RT22.346	22.311	506252	83145	30.484	ppm
6	RT25.396	25.396	94329	15459	30.873	ppm

Group Results

ECD1

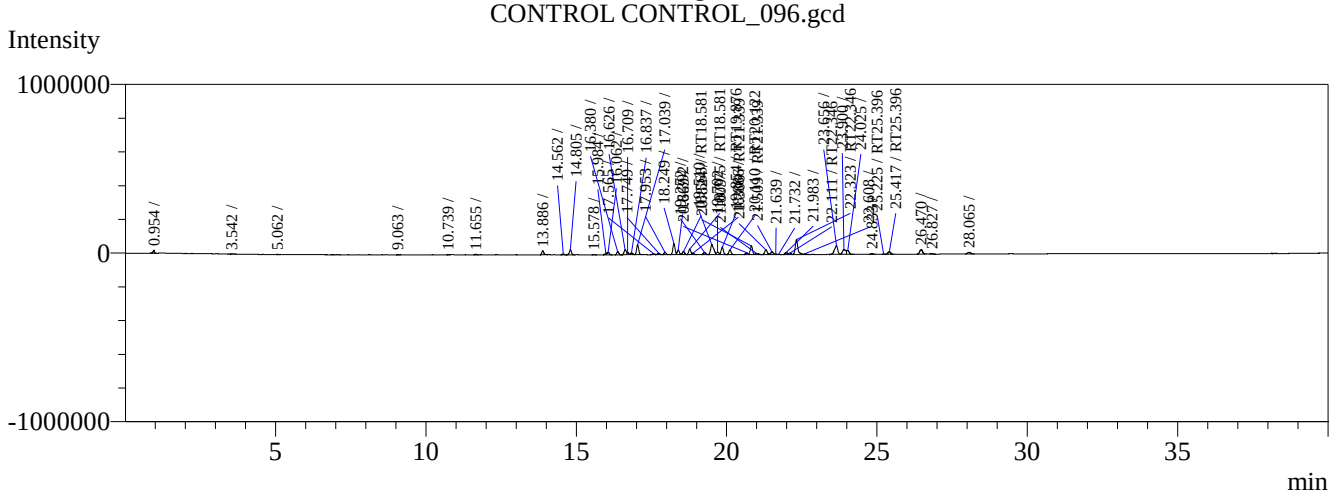
Group#	Name	Conc.	Unit	Area
1	1260	30.399	ppm	1426459
Total		30.399		

Sample Information

Analysis Date & Time	: 9/22/2016 6:31:23 PM
User Name	: System Administrator
Vial#	: 19
Sample Name	: CONTROL
Sample ID	: UNK-0019
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL_096.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL_096.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160921.gcb

Chromatogram

CONTROL CONTROL_096.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	269028	52260	33.532	ppm
2	RT19.876	19.854	232751	44164	33.005	ppm
3	RT20.122	20.110	143810	27560	32.840	ppm
4	RT21.339	21.305	249973	44279	33.656	ppm
5	RT22.346	22.351	584748	97543	36.094	ppm
6	RT25.396	25.396	100031	16559	32.887	ppm

Group Results

ECD1

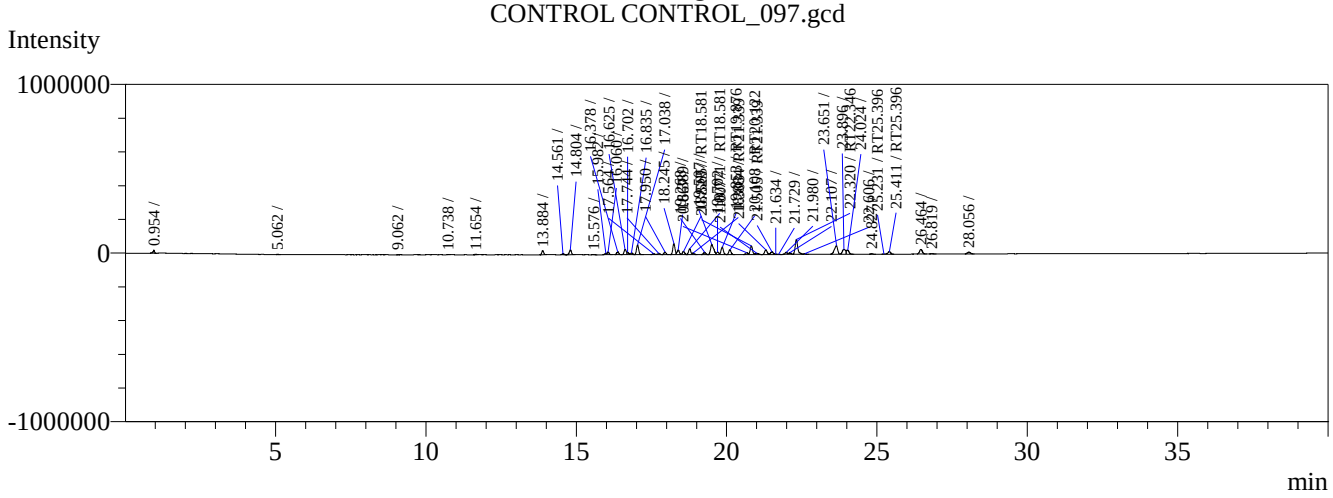
Group#	Name	Conc.	Unit	Area
1	1260	34.266	ppm	1580341
Total		34.266		

Sample Information

Analysis Date & Time	: 9/23/2016 1:59:42 PM
User Name	: System Administrator
Vial#	: 52
Sample Name	: CONTROL
Sample ID	: UNK-0044
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL_097.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL_097.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160921.gcb

Chromatogram

CONTROL CONTROL_097.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	269987	52874	33.673	ppm
2	RT19.876	19.853	233787	43679	33.182	ppm
3	RT20.122	20.108	144022	27747	32.897	ppm
4	RT21.339	21.305	251167	44752	33.836	ppm
5	RT22.346	22.320	541814	88379	33.026	ppm
6	RT25.396	25.396	100551	16504	33.071	ppm

Group Results

ECD1

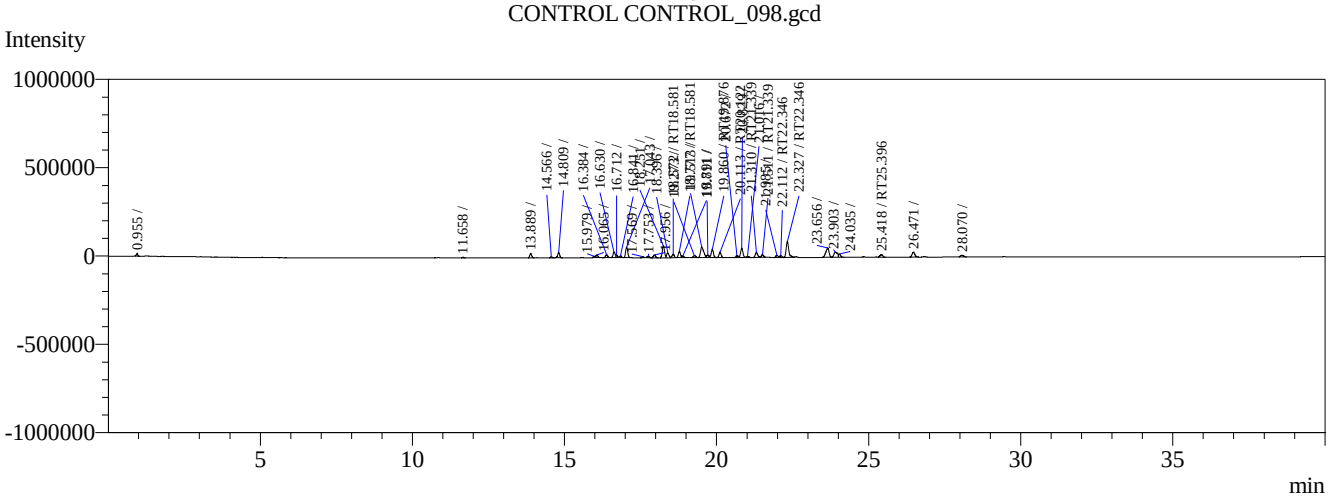
Group#	Name	Conc.	Unit	Area
1	1260	33.285	ppm	1541328
Total		33.285		

Sample Information

Analysis Date & Time	: 9/27/2016 11:05:31 AM
User Name	: System Administrator
Vial#	: 35
Sample Name	: CONTROL
Sample ID	: UNK-0034
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL_098.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL_098.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160926.gcb

Chromatogram

CONTROL CONTROL_098.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	274258	54777	34.304	ppm
2	RT19.876	19.860	237350	44964	33.791	ppm
3	RT20.122	20.113	145570	28285	33.315	ppm
4	RT21.339	21.305	231036	43880	30.802	ppm
5	RT22.346	22.351	585617	101851	36.156	ppm
6	RT25.396	25.418	87406	14892	28.428	ppm

Group Results

ECD1

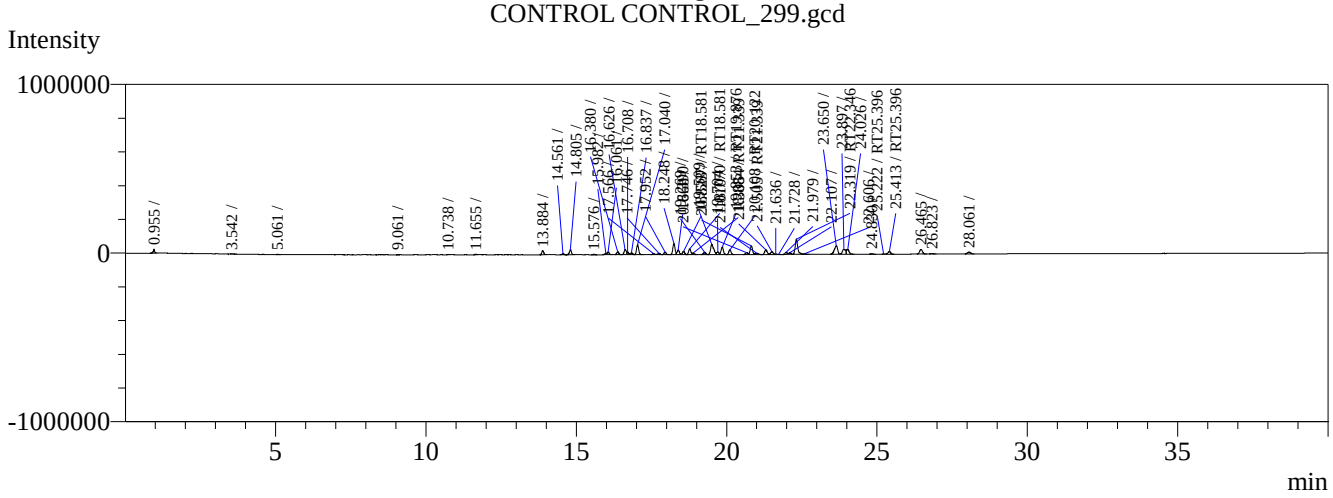
Group#	Name	Conc.	Unit	Area
1	1260	33.786	ppm	1561237
Total		33.786		

Sample Information

Analysis Date & Time	: 9/21/2016 7:00:26 PM
User Name	: System Administrator
Vial#	: 2
Sample Name	: CONTROL
Sample ID	: UNK-0002
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL_299.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL_299.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160921.gcb

Chromatogram

CONTROL CONTROL_299.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	271344	53996	33.874	ppm
2	RT19.876	19.853	235503	44353	33.476	ppm
3	RT20.122	20.108	145516	27719	33.300	ppm
4	RT21.339	21.305	253449	44641	34.180	ppm
5	RT22.346	22.319	544041	89360	33.185	ppm
6	RT25.396	25.396	101832	16658	33.523	ppm

Group Results

ECD1

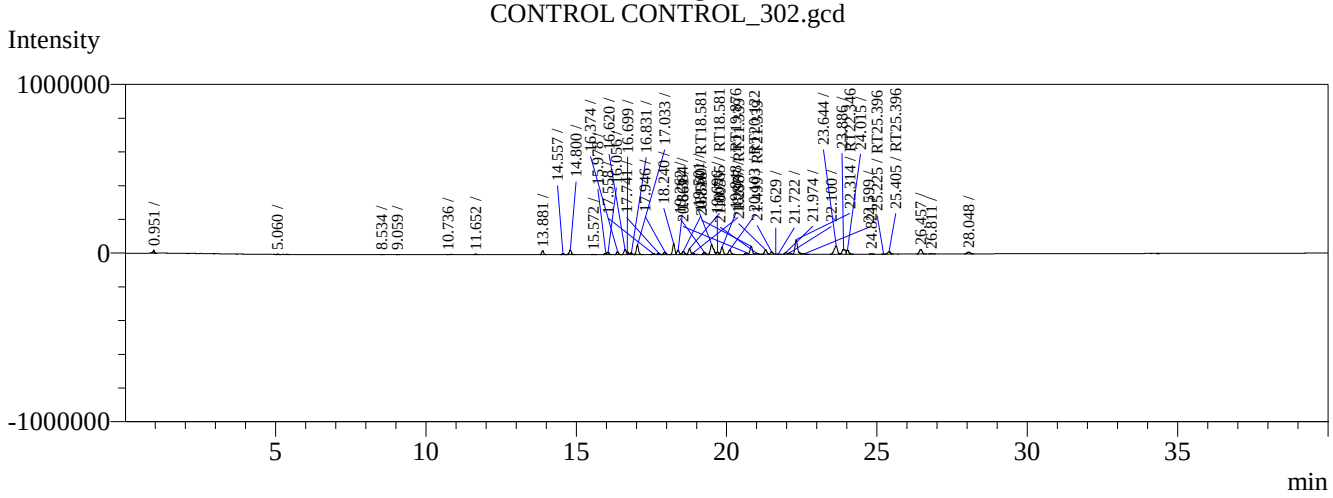
Group#	Name	Conc.	Unit	Area
1	1260	33.546	ppm	1551685
Total		33.546		

Sample Information

Analysis Date & Time	: 9/23/2016 1:31:51 AM
User Name	: System Administrator
Vial#	: 36
Sample Name	: CONTROL
Sample ID	: UNK-0028
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL_302.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL_302.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160921.gcb

Chromatogram

CONTROL CONTROL_302.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	262316	51927	32.541	ppm
2	RT19.876	19.848	227906	42676	32.178	ppm
3	RT20.122	20.103	140752	26881	32.014	ppm
4	RT21.339	21.305	242842	43380	32.581	ppm
5	RT22.346	22.314	524734	87383	31.805	ppm
6	RT25.396	25.396	99162	16104	32.580	ppm

Group Results

ECD1

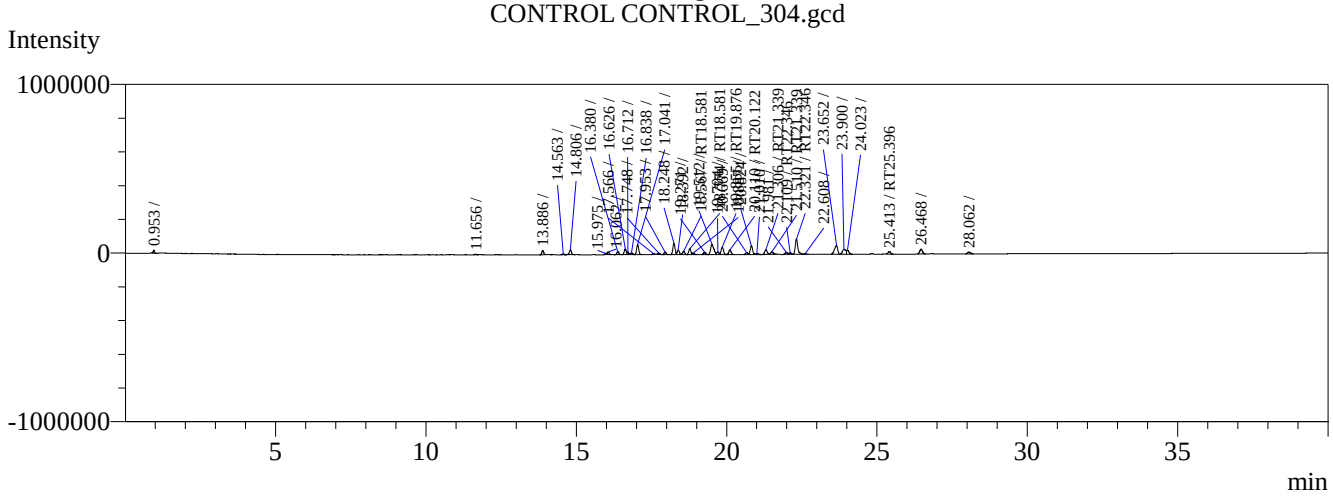
Group#	Name	Conc.	Unit	Area
1	1260	32.189	ppm	1497712
Total		32.189		

Sample Information

Analysis Date & Time	: 9/23/2016 5:43:04 PM
User Name	: System Administrator
Vial#	: 2
Sample Name	: CONTROL
Sample ID	: UNK-0002
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL_304.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL_304.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160923.gcb

Chromatogram

CONTROL CONTROL_304.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	273514	53973	34.194	ppm
2	RT19.876	19.855	235699	44935	33.509	ppm
3	RT20.122	20.110	144625	28094	33.060	ppm
4	RT21.339	21.305	230781	43324	30.764	ppm
5	RT22.346	22.351	597101	101621	36.977	ppm
6	RT25.396	25.413	88671	14843	28.875	ppm

Group Results

ECD1

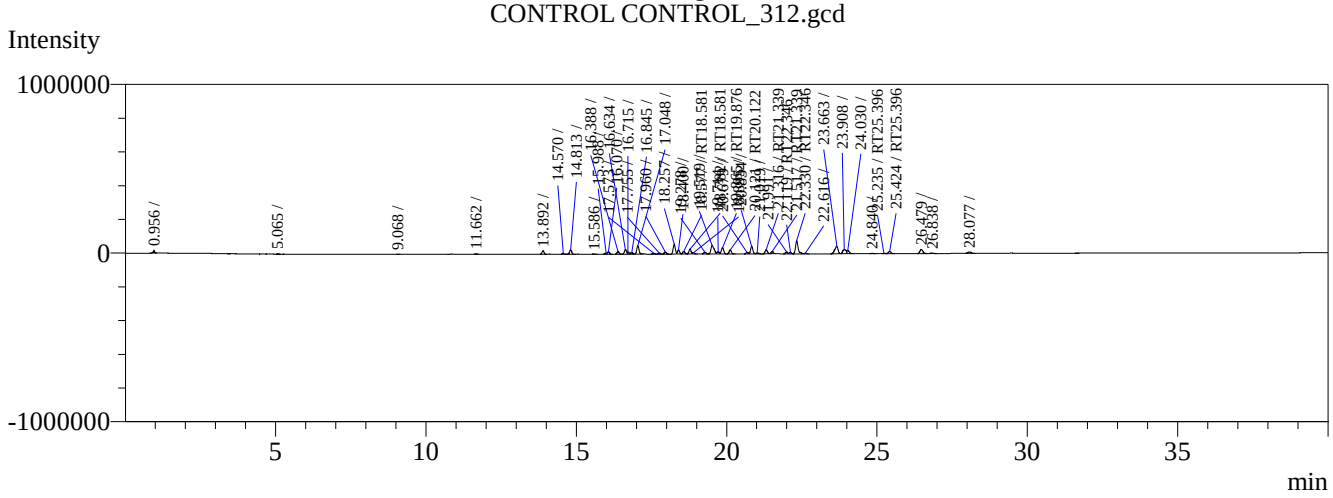
Group#	Name	Conc.	Unit	Area
1	1260	34.016	ppm	1570391
Total		34.016		

Sample Information

Analysis Date & Time	: 9/27/2016 3:30:01 PM
User Name	: System Administrator
Vial#	: 2
Sample Name	: CONTROL
Sample ID	: UNK-0002
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL_312.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL_312.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160927.gcb

Chromatogram

CONTROL CONTROL_312.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	235321	46620	28.557	ppm
2	RT19.876	19.865	205024	38253	28.269	ppm
3	RT20.122	20.121	126474	24449	28.160	ppm
4	RT21.339	21.305	199517	37370	26.052	ppm
5	RT22.346	22.351	510121	85699	30.761	ppm
6	RT25.396	25.396	87542	14320	28.476	ppm

Group Results

ECD1

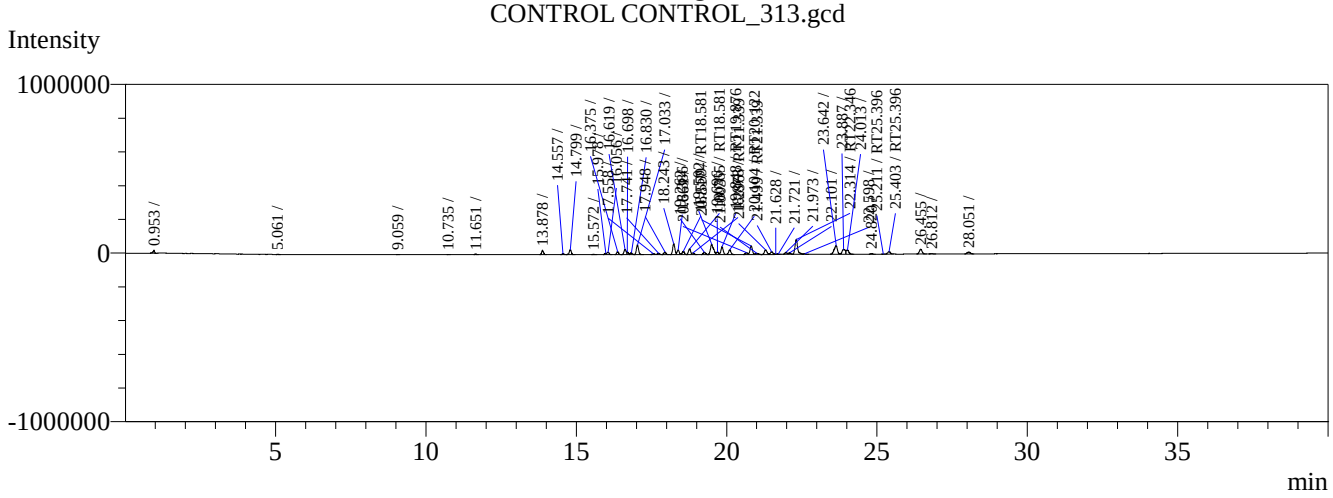
Group#	Name	Conc.	Unit	Area
1	1260	28.829	ppm	1363999
Total		28.829		

Sample Information

Analysis Date & Time	: 9/23/2016 10:06:03 AM
User Name	: System Administrator
Vial#	: 47
Sample Name	: CONTROL
Sample ID	: UNK-0039
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL_313.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL_313.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160921.gcb

Chromatogram

CONTROL CONTROL_313.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	266340	52514	33.135	ppm
2	RT19.876	19.848	230590	44117	32.636	ppm
3	RT20.122	20.104	143082	27316	32.643	ppm
4	RT21.339	21.305	249014	44533	33.511	ppm
5	RT22.346	22.314	535616	87412	32.583	ppm
6	RT25.396	25.396	98534	16286	32.359	ppm

Group Results

ECD1

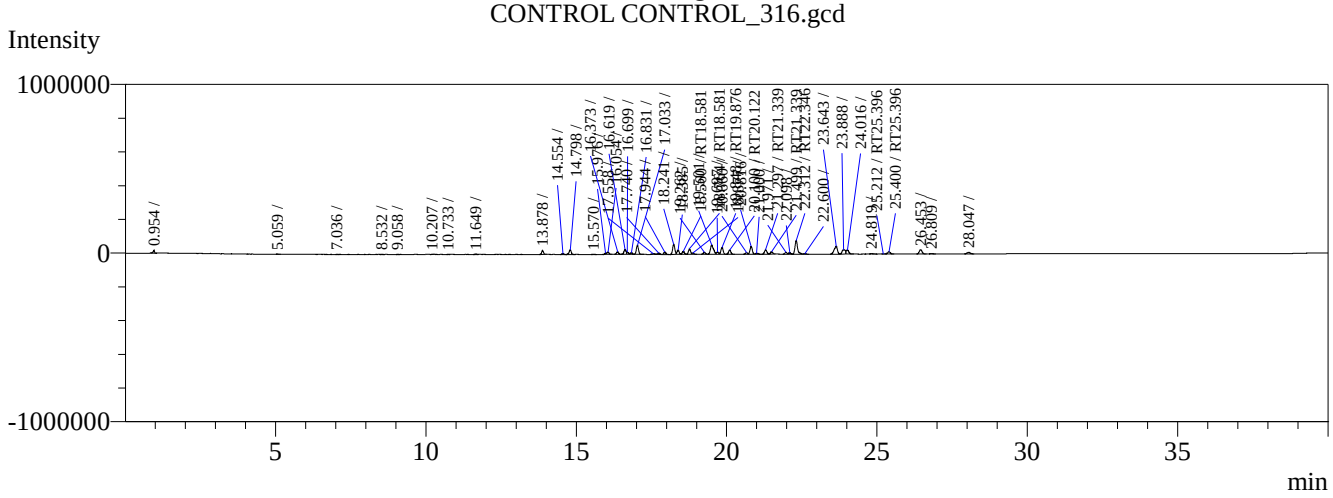
Group#	Name	Conc.	Unit	Area
1	1260	32.829	ppm	1523175
Total		32.829		

Sample Information

Analysis Date & Time	: 9/24/2016 10:51:23 AM
User Name	: System Administrator
Vial#	: 23
Sample Name	: CONTROL
Sample ID	: UNK-0023
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL_316.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL_316.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160923.gcb

Chromatogram

CONTROL CONTROL_316.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	249073	49314	30.586	ppm
2	RT19.876	19.848	216036	40657	30.150	ppm
3	RT20.122	20.100	132744	25555	29.853	ppm
4	RT21.339	21.305	209084	39130	27.494	ppm
5	RT22.346	22.312	493674	80558	29.585	ppm
6	RT25.396	25.396	90297	14859	29.449	ppm

Group Results

ECD1

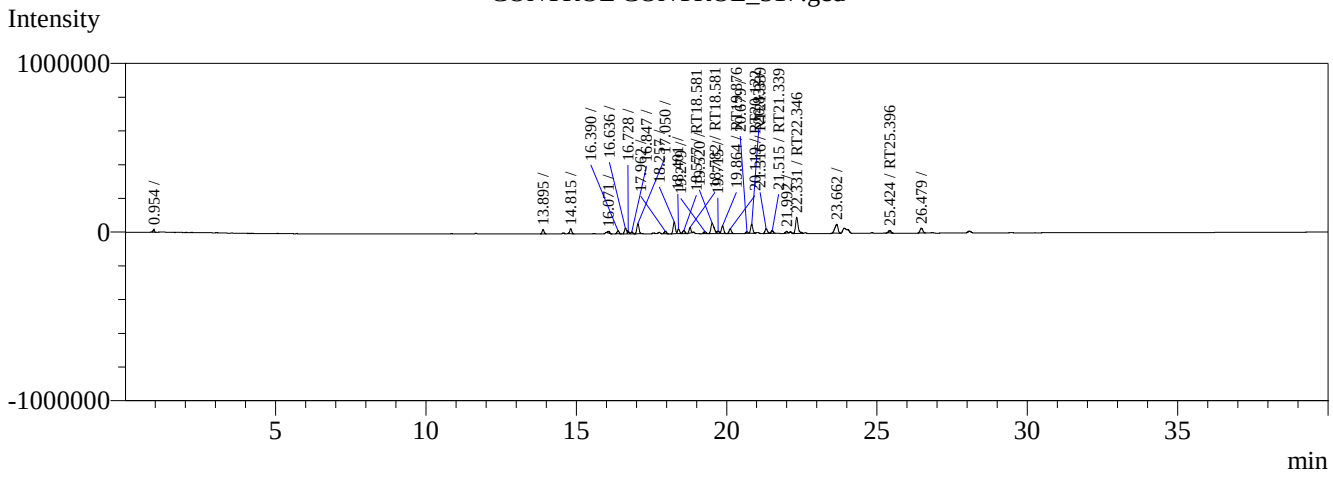
Group#	Name	Conc.	Unit	Area
1	1260	29.505	ppm	1390908
Total		29.505		

Sample Information

Analysis Date & Time	: 9/28/2016 3:10:52 AM
User Name	: System Administrator
Vial#	: 17
Sample Name	: CONTROL
Sample ID	: UNK-0017
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL_317.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL_317.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160927.gcb

Chromatogram

CONTROL CONTROL_317.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	241584	52144	29.481	ppm
2	RT19.876	19.864	237545	46323	33.824	ppm
3	RT20.122	20.119	143300	28797	32.702	ppm
4	RT21.339	21.305	230529	44353	30.725	ppm
5	RT22.346	22.331	556367	95704	34.066	ppm
6	RT25.396	25.424	71912	13840	22.956	ppm

Group Results

ECD1

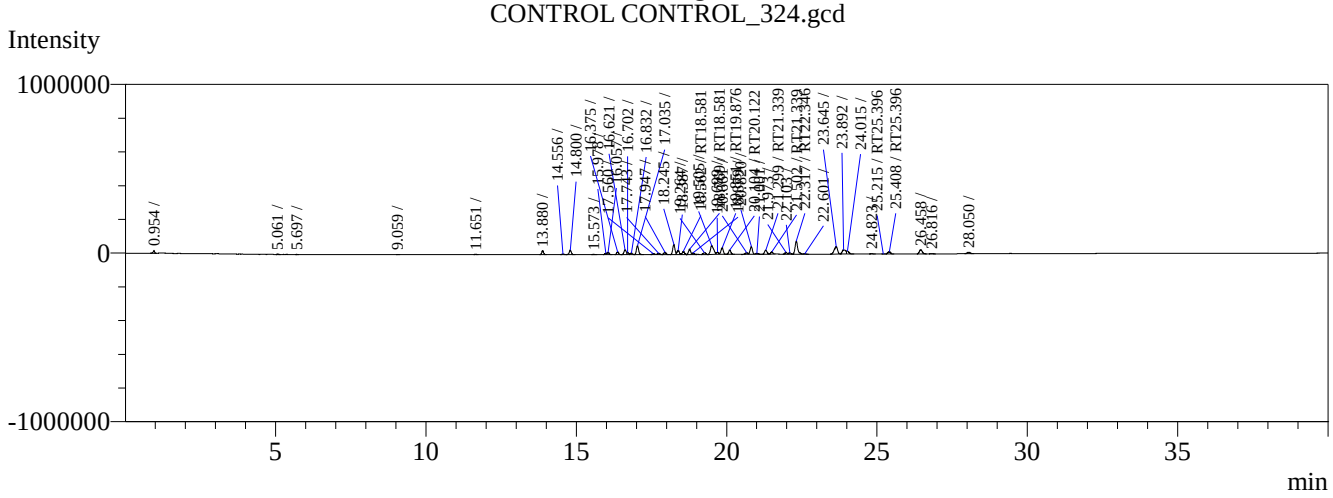
Group#	Name	Conc.	Unit	Area
1	1260	31.775	ppm	1481235
Total		31.775		

Sample Information

Analysis Date & Time	: 10/3/2016 10:06:52 AM
User Name	: System Administrator
Vial#	: 2
Sample Name	: CONTROL
Sample ID	: UNK-0002
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL_324.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL_324.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\161003.gcb

Chromatogram

CONTROL CONTROL_324.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	244758	48456	29.950	ppm
2	RT19.876	19.851	212310	39765	29.514	ppm
3	RT20.122	20.104	130380	25328	29.215	ppm
4	RT21.339	21.305	205498	38641	26.953	ppm
5	RT22.346	22.317	484892	77647	28.958	ppm
6	RT25.396	25.396	88046	14529	28.654	ppm

Group Results

ECD1

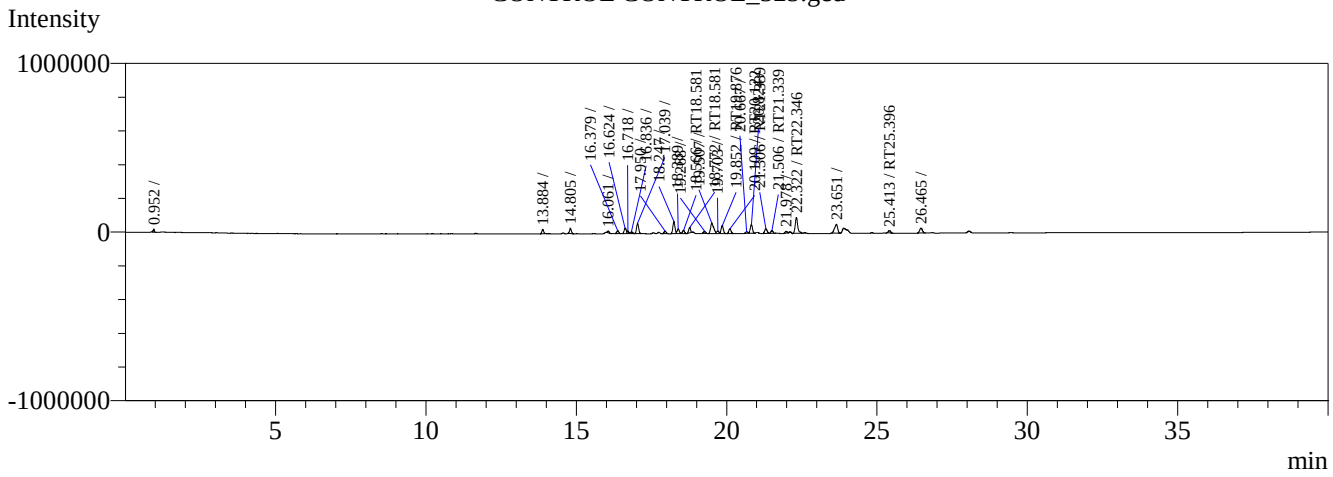
Group#	Name	Conc.	Unit	Area
1	1260	28.876	ppm	1365885
Total		28.876		

Sample Information

Analysis Date & Time	: 9/29/2016 3:18:37 AM
User Name	: System Administrator
Vial#	: 21
Sample Name	: CONTROL
Sample ID	: UNK-0019
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL_325.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL_325.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160928.gcb

Chromatogram

CONTROL CONTROL_325.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	240410	51821	29.308	ppm
2	RT19.876	19.852	236225	46237	33.599	ppm
3	RT20.122	20.109	143348	28765	32.715	ppm
4	RT21.339	21.305	231143	44112	30.818	ppm
5	RT22.346	22.322	553423	93795	33.855	ppm
6	RT25.396	25.413	71989	13435	22.983	ppm

Group Results

ECD1

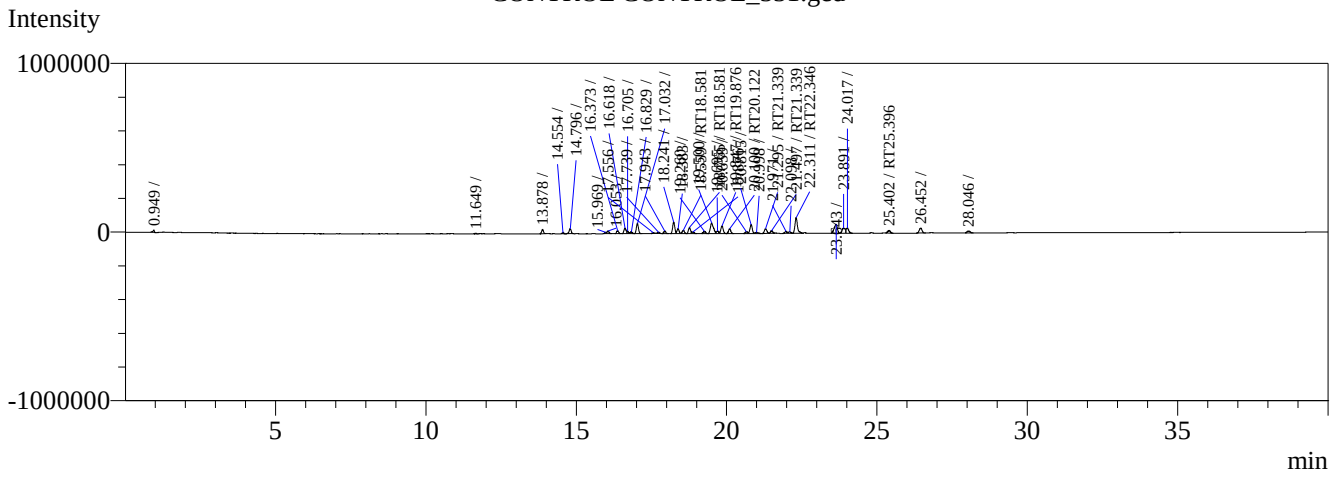
Group#	Name	Conc.	Unit	Area
1	1260	31.657	ppm	1476538
Total		31.657		

Sample Information

Analysis Date & Time	: 9/30/2016 5:59:12 AM
User Name	: System Administrator
Vial#	: 28
Sample Name	: CONTROL
Sample ID	: UNK-0026
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL_331.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL_331.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160929.gcb

Chromatogram

CONTROL CONTROL_331.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	277743	55700	34.818	ppm
2	RT19.876	19.847	240827	45142	34.385	ppm
3	RT20.122	20.100	146782	28583	33.642	ppm
4	RT21.339	21.305	233233	43500	31.133	ppm
5	RT22.346	22.311	546788	93592	33.381	ppm
6	RT25.396	25.402	90781	15263	29.620	ppm

Group Results

ECD1

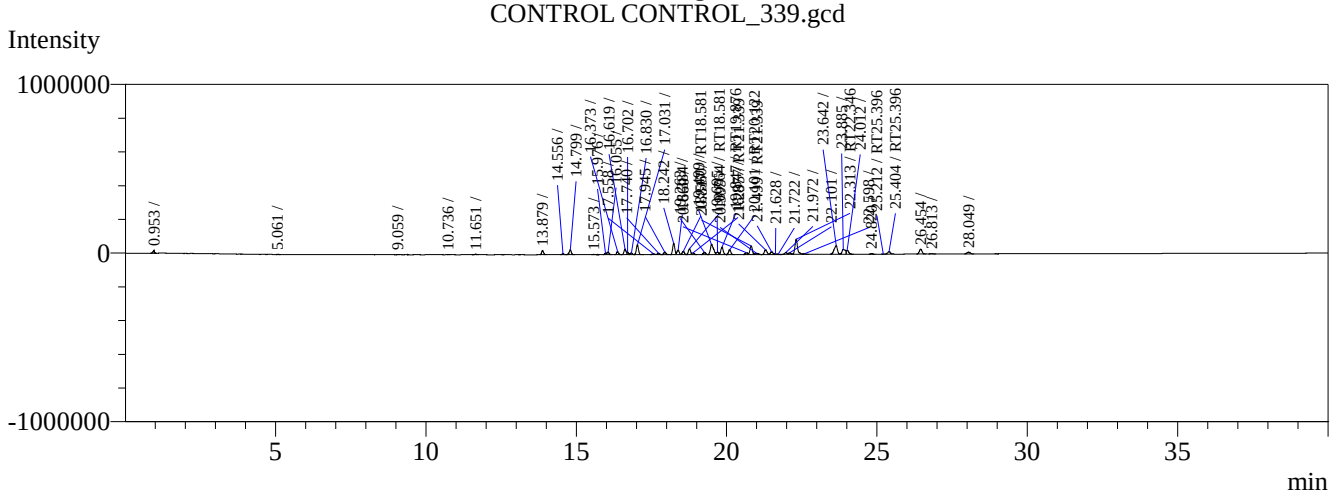
Group#	Name	Conc.	Unit	Area
1	1260	33.155	ppm	1536154
Total		33.155		

Sample Information

Analysis Date & Time	: 10/1/2016 8:12:38 AM
User Name	: System Administrator
Vial#	: 28
Sample Name	: CONTROL
Sample ID	: UNK-0025
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL_339.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL_339.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160930.gcb

Chromatogram

CONTROL CONTROL_339.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	271659	53242	33.920	ppm
2	RT19.876	19.847	235268	43942	33.435	ppm
3	RT20.122	20.101	144860	27999	33.123	ppm
4	RT21.339	21.305	253243	45134	34.149	ppm
5	RT22.346	22.313	543839	90003	33.170	ppm
6	RT25.396	25.396	101085	16479	33.259	ppm

Group Results

ECD1

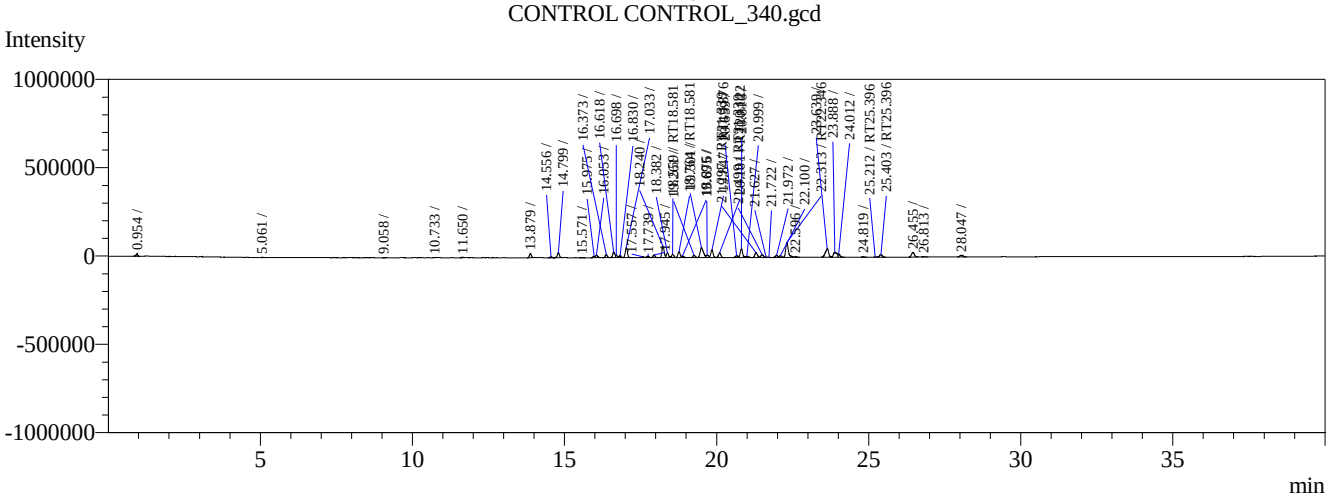
Group#	Name	Conc.	Unit	Area
1	1260	33.502	ppm	1549953
Total		33.502		

Sample Information

Analysis Date & Time	: 10/4/2016 7:59:56 AM
User Name	: System Administrator
Vial#	: 29
Sample Name	: CONTROL
Sample ID	: UNK-0029
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL_340.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL_340.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\161003.gcb

Chromatogram

CONTROL CONTROL_340.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	262304	51243	32.539	ppm
2	RT19.876	19.847	226397	42382	31.920	ppm
3	RT20.122	20.101	139970	26837	31.803	ppm
4	RT21.339	21.305	244033	43105	32.761	ppm
5	RT22.346	22.313	517493	84643	31.288	ppm
6	RT25.396	25.396	96766	15788	31.734	ppm

Group Results

ECD1

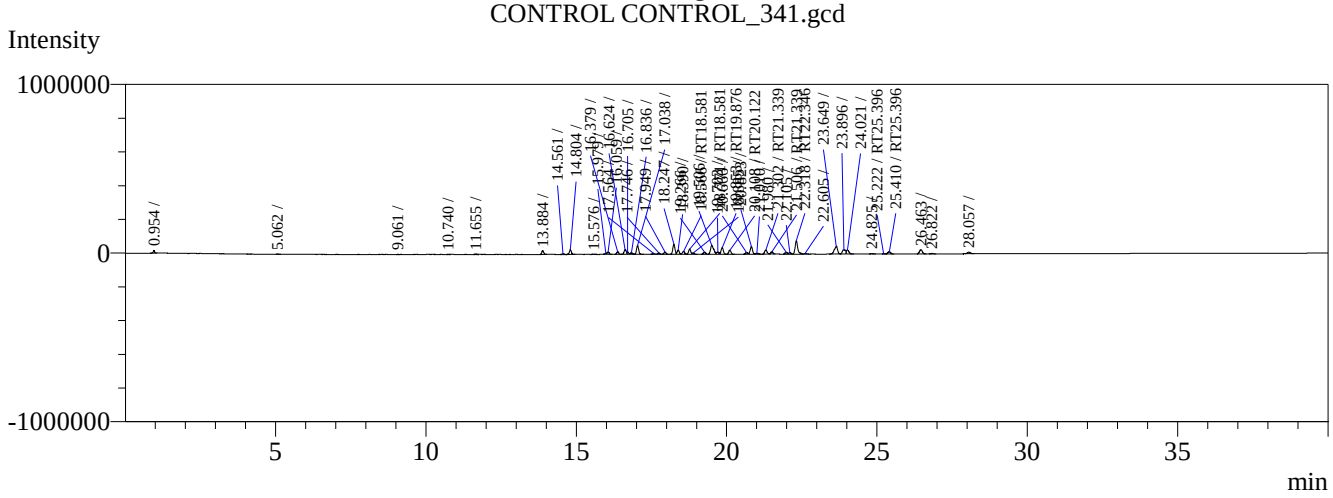
Group#	Name	Conc.	Unit	Area
1	1260	31.919	ppm	1486962
Total		31.919		

Sample Information

Analysis Date & Time	: 9/25/2016 5:33:17 AM
User Name	: System Administrator
Vial#	: 47
Sample Name	: CONTROL
Sample ID	: UNK-0047
Sample Type	: Unknown
Injection Volume	: 2
Multi Injection#	: 1
Dilution Factor	: 1
ISTD Amount	: (Level1 Conc.)
Sample Amount	: 100
Level#	: 0
Data Name	: C:\LabSolutions\Data\Project2\CONTROL_341.gcd
Original Data Name	: C:\LabSolutions\Data\Project2\CONTROL_341.gcd
Baseline Data Name	:
Method Name	: C:\LabSolutions\Data\Project2\PCB1260 SYSTEM #2.gcm
Report Name	: C:\LabSolutions\Data\Project2\REP6.gcr
Batch Name	: C:\LabSolutions\Data\Project2\160923.gcb

Chromatogram

CONTROL CONTROL_341.gcd



Quantitative Results

ECD1

ID#	Name	Ret.Time	Area	Height	Conc.	Units
1	RT18.581	18.658	243225	47986	29.723	ppm
2	RT19.876	19.853	209771	39948	29.080	ppm
3	RT20.122	20.108	129362	24384	28.940	ppm
4	RT21.339	21.305	203138	38119	26.598	ppm
5	RT22.346	22.318	482587	79252	28.793	ppm
6	RT25.396	25.396	88940	14697	28.970	ppm

Group Results

ECD1

Group#	Name	Conc.	Unit	Area
1	1260	28.654	ppm	1357023
Total		28.654		

Hydrodec of North America – Laboratory Operations

PCB Analysis – Preparation of Standard Solutions

Date	5-18-16
Standard Prepared	C-C Control
Std Diluted (Show actual concentration from certificate or calculation)	AccuStandard® 125 Market Street • New Haven, CT 06513 • USA Tel. 203-786-5290 • www.accustandard.com C-260-ST-2 Aroclor 1260 500 ppm w/w in Transformer oil Lot: 212061220 Exp: Jun 18, 2022 1 mL 1 comp(s) Possible Irritant FOR LABORATORY USE ONLY H313 H335 H331 H303 P338 P380 P501 P404 P235 P262 P202 P264 P284 P280 Storage: Ambient 5 Warning Concentration: 502.1
Mass Std Diluted	0.8818 g
Aim total Mass	14.7583 g
Actual total mass	14.8025 g
Calculated actual conc. Of prepared std.	$\frac{0.8818}{14.8025} \times 502.1 = 29.9106 = 29.91$ mg/kg
Standard verified	Yes JS

Date	
Standard Prepared	
Std Diluted (Show actual concentration from certificate or calculation)	Concentration
Mass Std Diluted	
Aim total Mass	
Actual total mass	
Calculated actual conc. Of prepared std.	
Standard verified	

Hydrodec of North America – Laboratory Operations

PCB Analysis – Preparation of Standard Solutions

Date	05-10-16
Standard Prepared	1242-50
Std Diluted (Show actual concentration from certificate or calculation)	AccuStandard® 125 Market Street • New Haven, CT 06513 • USA Tel. 203-786-5290 • www.accustandard.com C-242-ST-2 1 mL Aroclor 1242 500 ppm w/w in Transformer oil Lot: 213081112 1 comp(s) Exp: Aug 07, 2023 Possible Irritant FOR LABORATORY USE ONLY H313 H335 H333 H303 P338 P260 P333 P404 P262 P272 P264 P284 P280 Storage: Ambient 5 Warning Concentration: 502.1
Mass Std Diluted	0.7358 g
Aim total Mass	7.3889 g
Actual total mass	7.3405 g
Calculated actual conc. Of prepared std.	$\frac{0.7358}{7.3405} \times 502.1 = 50.3297 = 50.33$ mg/kg
Standard verified	Yes

Date	5-10-16
Standard Prepared	1242-10
Std Diluted (Show actual concentration from certificate or calculation)	1242-50 5-10-16 Concentration: 50.33
Mass Std Diluted	0.9408 g
Aim total Mass	4.7350 g
Actual total mass	4.7380 g
Calculated actual conc. Of prepared std.	$\frac{0.9408}{4.7380} \times 50.33 = 9.9997 = 9.89$ mg/kg
Standard verified	JB

Hydrodec of North America – Laboratory Operations

PCB Analysis – Preparation of Standard Solutions

Date	05.10-2016	
Standard Prepared	1242-2	
Std Diluted (Show actual concentration from certificate or calculation)	1242-50 5-10-16	Concentration: 50.33
Mass Std Diluted	0.4298g	
Aim total Mass	10.8159g	
Actual total mass	10.8240g	
Calculated actual conc. Of prepared std.	$\frac{0.4298g}{10.8240} \times 50.33 = 1.9985 = 2.0mg/L$	
Standard verified	Yes	

Date		
Standard Prepared		
Std Diluted (Show actual concentration from certificate or calculation)		Concentration:
Mass Std Diluted		
Aim total Mass		
Actual total mass		
Calculated actual conc. Of prepared std.		
Standard verified		

Hydrodec of North America – Laboratory Operations

PCB Analysis – Preparation of Standard Solutions

Date	05-10-16	
Standard Prepared	1254-50	
Std Diluted (Show actual concentration from certificate or calculation)	AccuStandard® 125 Market St. - New Haven, CT 06513 - USA Tel. 203-786-5290 - www.accustandard.com C-254-ST-2 1 mL Aroclor 1254 500 ppm w/w in Transformer oil Lot: 212021102 Exp: Feb 9, 2022 IRRITANT FOR LABORATORY USE ONLY WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm STORAGE: Ambient	Concentration 500.9
Mass Std Diluted	0.8445g	
Aim total Mass	8.4602g	
Actual total mass	8.4611g	
Calculated actual conc. Of prepared std.	$\frac{0.8445}{8.4611} \times 500.9 = 49.9796 = 49.98$ mg/kg	
Standard verified	Yes	

Date	05-10-16	
Standard Prepared	1254-10	
Std Diluted (Show actual concentration from certificate or calculation)	1254-50 5-10-16	Concentration 49.99
Mass Std Diluted	1.0564g	
Aim total Mass	5.2809	
Actual total mass	5.2801	
Calculated actual conc. Of prepared std.	$\frac{1.0564g}{5.2801} \times 49.99 = 9.9826 = 9.98$ mg/kg	
Standard verified	Yes	

Hydrodec of North America – Laboratory Operations

PCB Analysis – Preparation of Standard Solutions

Date	05-10-16	
Standard Prepared	1254-10	
Std Diluted (Show actual concentration from certificate or calculation)	1254-50 5-10-16	Concentration 49.99
Mass Std Diluted	0.4148g	
Aim total Mass	10.3679g	
Actual total mass	10.3743g	
Calculated actual conc. Of prepared std.	$\frac{0.4148}{10.3743} \times 49.99 = 1.9987 = 2.00$ mg/kg	
Standard verified	YES	

Date		
Standard Prepared		
Std Diluted (Show actual concentration from certificate or calculation)		Concentration
Mass Std Diluted		
Aim total Mass		
Actual total mass		
Calculated actual conc. Of prepared std.		
Standard verified		

Hydrodec of North America – Laboratory Operations

PCB Analysis – Preparation of Standard Solutions

Date	05-10-16
Standard Prepared	1260-50
Std Diluted (Show actual concentration from certificate or calculation)	AccuStandard® 125 Market Street • New Haven, CT 06513 • USA Tel. 203-786-5290 • www.accustandard.com C-260-ST-2 1 mL Aroclor 1260 500 ppm w/w in Transformer oil Lot: 212061220 1 comp(s) Exp. Jun 18, 2022 Possible Irritant FOR LABORATORY USE ONLY H313 H335 H333 H303 P338 P360 P331 P404 P235 P262 P202 P264 P280 Storage: Ambient 5 Warning Concentration: 502.0
Mass Std Diluted	0.9287 g
Aim total Mass	9.3241 g
Actual total mass	9.3270 g
Calculated actual conc. Of prepared std.	$\frac{0.9287}{9.3270} \times 502.0 = 49.9847 = 49.98$ mg/kg
Standard verified	Yes

Date	05-10-16
Standard Prepared	
Std Diluted (Show actual concentration from certificate or calculation)	1260-50 5-10-16 Concentration: 49.98
Mass Std Diluted	1.1355 g
Aim total Mass	5.6763 g
Actual total mass	5.6762 g
Calculated actual conc. Of prepared std.	$\frac{1.1355 \text{ g}}{5.6762} \times 49.98 = 9.9982 = 10.00$ mg/kg
Standard verified	Yes

Hydrodec of North America – Laboratory Operations

PCB Analysis – Preparation of Standard Solutions

Date	5-10-16	
Standard Prepared	1260-2	
Std Diluted (Show actual concentration from certificate or calculation)	1260-50 5-10-16	Concentration 49.98
Mass Std Diluted	0.4526 g	
Aim total Mass	11.3104 g	
Actual total mass	11.3120 g	
Calculated actual conc. Of prepared std.	$\frac{0.4526}{11.3120} \times 49.98 = 1.9997 = 2.00$ mg/kg	
Standard verified		

Date		
Standard Prepared		
Std Diluted (Show actual concentration from certificate or calculation)		Concentration
Mass Std Diluted		
Aim total Mass		
Actual total mass		
Calculated actual conc. Of prepared std.		
Standard verified		

125 Market Street
New Haven, CT 06513
USA

AccuStandard®, Inc.

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

Catalog No: C-242-ST-2
Description: Aroclor 1242
Lot: 213081112
Solvent: Transformer oil (PCB Free)
Hazards: **Possible Irritant** - *Refer to SDS for safety info*

Warning 5

Date Certified: Aug 7, 2013
Expiration: Aug 7, 2023
Sample Size: 1 mL
Storage Condition: Ambient

[X] Included on ISO/IEC 17025 Scope of Accreditation
[X] Included on ISO Guide 34 Scope of Accreditation

Component	CAS #	Purity % (GC/FID)	Prepared Concentration[1] (µg/g)	Certified Analyte Concentration[2] (µg/g)
Aroclor 1242	53469-21-9	Tech Mix	502.1	502.1

[1] All weights are traceable through NIST, Test No. 822-275872-11

[2] Certified Analyte Concentration = Purity x Prepared Concentration. The Uncertainty associated with the gravimetric values reported on this certificate is ±0.24%. The CRM Uncertainty calculated for this product is ±5%. These values are the expanded uncertainty and represent an estimated standard deviation equal to the positive square root of the total variation of the uncertainty of components. A normal distribution is assumed and a coverage factor of K=2 is chosen using approximately a 95% confidence level.

A product with a suffix (-1A, -2B, etc. or -01, -02, etc.) on its lot number has had its expiration date extended and is identical to the same lot number without the suffix.

Labels and certificates follow U.S. Conventions in reporting numerical values.
A comma (,) is used to separate units of one-thousand or greater.
A period (.) is used as a decimal place marker.

See reverse side for additional information

Certified By:
Larry Decker, Organic QC Manager

For use in routine laboratory analysis.

125 Market Street
New Haven, CT 06513
USA

AccuStandard® Inc.

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

CATALOG NO: C-254-ST-2
DESCRIPTION: Aroclor 1254
LOT: 212021102
SOLVENT: Transformer oil (PCB

DATE CERTIFIED: Feb 9, 2012
EXPIRATION: Feb 9, 2022
SAMPLE SIZE: 1 mL
STORAGE CONDITION: Ambient
HAZARDS: IRRITANT

Component	CAS #	Purity % (GC/FID)	Prepared Concentration[1] (µg/g)	Certified Analyte Concentration[2] (µg/g)
Aroclor 1254	11097-69-1	Tech	500.9	500.9

Please note:
A product with a suffix (-1A, -2B, etc. or -01, -02, etc.) on its lot number has had its expiration date extended and is identical to the same lot number without the suffix.

AccuStandard follows U.S. conventions in reporting numerical values on both certificates and labels:

A comma (,) is used to separate units of one-thousand or greater.
A period (.) is used as a decimal place marker.

1. All weights are traceable through NIST, Test No.822-275872-11
2. Certified Analyte Concentration = Purity x Prepared Concentration. The Uncertainty calculated for this product is ±2% which is the Combined Uncertainty uc(y). It represents an estimated standard deviation equal to the positive square root of the total variance of the uncertainty of components. The Expanded Uncertainty is U which is Uc(y) *K where K is the coverage factor at the 95% confidence level (K=2).

Certified by: R. Cooper
Russ Cooper, QC Manager

125 Market Street
New Haven, CT 06513
USA

AccuStandard® Inc.

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

Catalog No: C-260-ST-2
Description: Aroclor 1260

Lot: 212061220
Solvent: Transformer oil (PCB

Date Certified: Jun 18, 2012
Expiration: Jun 18, 2022
Sample Size: 1 mL
Storage Condition: Ambient
Hazards: IRRITANT

[X] Included on ISO/IEC 17025 Scope of Accreditation
[X] Included on ISO Guide 34 Scope of Accreditation

Component	CAS #	Purity % (GC/FID)	Prepared Concentration[1] (µg/g)	Certified Analyte Concentration[2] (µg/g)
Aroclor 1260	11096-82-5	Tech Mix	502.0	502.0

AccuStandard follows U.S. conventions in reporting numerical values on both certificates and labels:

A comma (,) is used to separate units of one-thousand or greater.
A period (.) is used as a decimal place marker.

1. All weights are traceable through NIST, Test No822-275872-11
2. Certified Analyte Concentration = Purity x Prepared Concentration. The Uncertainty associated with the gravimetric values reported on this certificate is ±0.24%. The CRM Uncertainty calculated for this product is ±5%. These values are the expanded uncertainty and represent an estimated standard deviation equal to the positive square root of the total variation of the uncertainty of components. A normal distribution is assumed and a coverage factor of K=2 is chosen using approximately a 95% confidence level.
3. A product with a suffix (-1A, -2B, etc. or -01, -02, etc.) on its lot# has had its expiration date extended and is identical to the same lot# without the suffix.

For use in routine laboratory analysis.

See reverse side for additional information
Refer to the MSDS for additional safety information

Certified by: R. Cooper
Russ Cooper, QC Manager

Appendix D

Summit Environmental Laboratories Analytical Data

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

November 01, 2016

John Burkhardt
Hydrodec North America, LLC
2021 Steinway Blvd. SE
Canton, OH 44707
TEL: 330-454-8202
FAX: 330-454-8870

RE: Demo 2016

Dear John Burkhardt:

Order No.: 16101502

Summit Environmental Technologies, Inc. received 15 sample(s) on 10/27/2016 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative.

Quality control data is within laboratory defined or method specified acceptance limits except where noted.

If you have any questions regarding these tests results, please feel free to call the laboratory.

Sincerely,

Ana C. Slocum

Project Manager

3310 Win St.
Cuyahoga Falls, Ohio 44223

Alabama 41600, Arkansas 88-0735, California 07256CA, Colorado, Connecticut PH-0105, Delaware, Florida NELAC E87688, Georgia E87688, Idaho OH00923, Illinois 200061, Indiana C-OH-13, Kansas E-10347, Kentucky (Underground Storage Tank) 3, Kentucky 90146, Louisiana 04061, Maryland 339, Massachusetts M-OPH923, Minnesota 409711, New Hampshire 2996, New Jersey OH006, New York 11777, North Carolina 39705 and 631, North Dakota R-201, Ohio Drinking Water 4170, Ohio VAP CL0052, Oklahoma 9940, Oregon OH200001, Rhode Island LA000317, South Carolina 92016001, Texas T104704466-11-5, Region 8 8TMS-L, USDA/APHIS P330-11-00244, Utah OH009232011-1, Vermont VT-87688, Virginia 00440 and 1581, Washington C891, West Virginia 248 and 9957C and E87688, Wisconsin 399013010

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Case Narrative

WO#: **16101502**
Date: **11/1/2016**

CLIENT: Hydrodec North America, LLC
Project: Demo 2016

WorkOrder Narrative:
16101502: This report in its entirety consists of the documents listed below. All documents contain the Summit Environmental Technologies, Inc., Work Order Number assigned to this report.

Paginated Report including Cover Letter, Case Narrative, Analytical Results, Applicable Quality Control Summary Reports, and copies of the Chain of Custody Documents are supplied with this sample set.

Concentrations reported with a J-Flag in the Qualifier Field are values below the Limit of Quantitation (LOQ) but greater than the established Method Detection Limit (MDL).

Method numbers, unless specified as SM (Standard Methods) or ASTM, are EPA methods.

Estimated uncertainty values are available upon request.

Analysis performed by DBM, VRM, or SFG were performed at Summit Labs 2704 Eatonton Highway Haddock, GA 31033

All results for Solid Samples are reported on an "as received" or "wet weight" basis unless indicated as "dry weight" using the "-dry" designation on the reporting units.

Summit Environmental Technologies, Inc., holds the accreditations/certifications listed at the bottom of the cover letter that may or may not pertain to this report.

 The results contained in this report are only representative of the samples received. Conditions can vary at different times and at different sampling conditions. Summit Environmental Technologies, Inc. is not responsible for use or interpretation of the data included herein.

This report is believed to meet all of the requirements of NELAC or the accrediting / certifying agency. Any comments or problems with the analytical events associated with this report are noted below.

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Case Narrative

WO#: **16101502**
Date: **11/1/2016**

CLIENT: Hydrodec North America, LLC
Project: Demo 2016

WorkOrder Comments:
16101502: Accreditation is not offered by Ohio EPA for the analyses presented in this report.

Report supplied as Level I.

Analytical Sequence Sample Comments:
16101502-001A 1007148: Analytical Comments for PCB_OIL(8082), Sample 16101502-001A, Batch ID 102816a : Surrogate recovery unable to be adequately evaluated due to dilution; Sample diluted to obtain results for Aroclor 1260 within calibration range.
16101502-006A 1007150: Analytical Comments for PCB_OIL(8082), Sample 16101502-006A, Batch ID 102816a : Surrogate recovery unable to be adequately evaluated due to dilution; Sample diluted to obtain results for Aroclor 1260 within calibration range.
16101502-011A 1007152: Analytical Comments for PCB_OIL(8082), Sample 16101502-011A, Batch ID 102816a : Surrogate recovery unable to be adequately evaluated due to dilution; The surrogate was diluted out. Sample diluted due to native concentration.

Analytical Sequence QC Comments:
16101502-001AMS 1007146: Analytical Comments for PCB_OIL(8082), Sample 16101502-001AMS, Batch ID 102816a : The PCB MS (Batch 102816a) was unable to be adequately evaluated due to dilution; The spikes and surrogate were diluted out. Sample diluted due to matrix and/or native concentration.
16101502-001AMSD 1007147: Analytical Comments for PCB_OIL(8082), Sample 16101502-001AMSD, Batch ID 102816a : The PCB MSD (Batch 102816a) was unable to be adequately evaluated due to dilution; The spikes and surrogate were diluted out. Sample diluted due to matrix and/or native concentration.

Summit Environmental Technologies, In
3310 Win S
Cuyahoga Falls, Ohio 4422
TEL: (330) 253-8211 FAX: (330) 253-448
Website: http://www.settek.co

Qualifiers and Acronyms

WO#: **16101502**
Date: **11/1/2016**

These commonly used Qualifiers and Acronyms may or may not be present in this report.

Qualifiers

U	The compound was analyzed for but was not detected.
J	The reported value is greater than the Method Detection Limit but less than the Reporting Limit.
H	The hold time for sample preparation and/or analysis was exceeded.
D	The result is reported from a dilution.
E	The result exceeded the linear range of the calibration or is estimated due to interference.
MC	The result is below the Minimum Compound Limit.
*****	The result exceeds the Regulatory Limit or Maximum Contamination Limit.
m	Manual integration was used to determine the area response.
N	The result is presumptive based on a Mass Spectral library search assuming a 1:1 response.
P	The second column confirmation exceeded 25% difference.
C	The result has been confirmed by GC/MS.
X	The result was not confirmed when GC/MS Analysis was performed.
B/MB+	The analyte was detected in the associated blank.
G	The ICB or CCB contained reportable amounts of analyte.
QC-/+	The CCV recovery failed low (-) or high (+).
R/QDR	The RPD was outside of accepted recovery limits.
QL-/+	The LCS or LCSD recovery failed low (-) or high (+).
QLR	The LCS/LCSD RPD was outside of accepted recovery limits.
QM-/+	The MS or MSD recovery failed low (-) or high (+).
QMR	The MS/MSD RPD was outside of accepted recovery limits.
QV-/+	The ICV recovery failed low (-) or high (+).
S	The spike result was outside of accepted recovery limits.
Z	Deviation; A deviation from the method was performed; Please refer to the Case Narrative for additional information

Acronyms

ND	Not Detected	**RL**	Reporting Limit
QC	Quality Control	**MDL**	Method Detection Limit
MB	Method Blank	**LOD**	Level of Detection
LCS	Laboratory Control Sample	**LOQ**	Level of Quantitation
LCSD	Laboratory Control Sample Duplicate	**PQL**	Practical Quantitation Limit
QCS	Quality Control Sample	**CRQL**	Contract Required Quantitation Limit
DUP	Duplicate	**PL**	Permit Limit
MS	Matrix Spike	**RegLvl**	Regulatory Limit
MSD	Matrix Spike Duplicate	**MCL**	Maximum Contamination Limit
RPD	Relative Percent Different	**MinCL**	Minimum Compound Limit
ICV	Initial Calibration Verification	**RA**	Reanalysis
ICB	Initial Calibration Blank	**RE**	Reextraction
CCV	Continuing Calibration Verification	**TIC**	Tentatively Identified Compound
CCB	Continuing Calibration Blank	**RT**	Retention Time
RLC	Reporting Limit Check	**CF**	Calibration Factor
DF	Dilution Factor	**RF**	Response Factor

This list of Qualifiers and Acronyms reflects the most commonly utilized Qualifiers and Acronyms for reporting. Please refer to the Analytical Notes in the Case Narrative for any Qualifiers or Acronyms that do not appear in this list or for additional information regarding the use of these Qualifiers on reported data.

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Workorder Sample Summary

WO#: **16101502**
01-Nov-16

CLIENT: Hydrodec North America, LLC
Project: Demo 2016

Lab SampleID	Client Sample ID	Tag No	Date Collected	Date Received	Matrix
16101502-001	Demo1609005		9/20/2016 1:20:00 PM	10/27/2016 9:40:00 AM	Oil
16101502-002	Demo1609007		9/20/2016 1:20:00 PM	10/27/2016 9:40:00 AM	Oil
16101502-003	Demo1609009		9/20/2016 1:40:00 PM	10/27/2016 9:40:00 AM	Oil
16101502-004	Demo1609021		9/21/2016 1:35:00 AM	10/27/2016 9:40:00 AM	Oil
16101502-005	Demo1609023		9/21/2016 1:35:00 AM	10/27/2016 9:40:00 AM	Oil
16101502-006	Demo1609031		9/21/2016 11:45:00 AM	10/27/2016 9:40:00 AM	Oil
16101502-007	Demo1609033		9/21/2016 11:45:00 AM	10/27/2016 9:40:00 AM	Oil
16101502-008	Demo1609035		9/21/2016 12:12:00 AM	10/27/2016 9:40:00 AM	Oil
16101502-009	Demo1609047		9/21/2016 12:05:00 AM	10/27/2016 9:40:00 AM	Oil
16101502-010	Demo1609049		9/21/2016 12:05:00 AM	10/27/2016 9:40:00 AM	Oil
16101502-011	Demo1609057		9/22/2016 1:05:00 PM	10/27/2016 9:40:00 AM	Oil
16101502-012	Demo1609059		9/22/2016 1:05:00 PM	10/27/2016 9:40:00 AM	Oil
16101502-013	Demo1609061		9/22/2016 1:35:00 PM	10/27/2016 9:40:00 AM	Oil
16101502-014	Demo1609073		9/23/2016 1:20:00 AM	10/27/2016 9:40:00 AM	Oil
16101502-015	Demo1609075		9/23/2016 1:20:00 AM	10/27/2016 9:40:00 AM	Oil

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Canton OH 44707
Received: 10/27/2016
Project#: Demo 2016

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
Demo1609005	001	9/20/2016	Aroclor 1016	< 100	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609005	001	9/20/2016	Aroclor 1221	< 100	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609005	001	9/20/2016	Aroclor 1232	< 100	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609005	001	9/20/2016	Aroclor 1242	< 100	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609005	001	9/20/2016	Aroclor 1248	< 100	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609005	001	9/20/2016	Aroclor 1254	< 100	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609005	001	9/20/2016	Aroclor 1260	2520	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609005	001	9/20/2016	Total PCBs	2520	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
Demo1609007	002	9/20/2016	Aroclor 1016	< 10.0	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609007	002	9/20/2016	Aroclor 1221	< 10.0	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609007	002	9/20/2016	Aroclor 1232	< 10.0	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609007	002	9/20/2016	Aroclor 1242	< 10.0	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609007	002	9/20/2016	Aroclor 1248	< 10.0	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609007	002	9/20/2016	Aroclor 1254	< 10.0	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609007	002	9/20/2016	Aroclor 1260	435	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609007	002	9/20/2016	Total PCBs	435	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
Demo1609009	003	9/20/2016	Aroclor 1016	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609009	003	9/20/2016	Aroclor 1221	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609009	003	9/20/2016	Aroclor 1232	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609009	003	9/20/2016	Aroclor 1242	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609009	003	9/20/2016	Aroclor 1248	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609009	003	9/20/2016	Aroclor 1254	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609009	003	9/20/2016	Aroclor 1260	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609009	003	9/20/2016	Total PCBs	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH

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Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
Demo1609021	004	9/21/2016	Aroclor 1016	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609021	004	9/21/2016	Aroclor 1221	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609021	004	9/21/2016	Aroclor 1232	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609021	004	9/21/2016	Aroclor 1242	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609021	004	9/21/2016	Aroclor 1248	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609021	004	9/21/2016	Aroclor 1254	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609021	004	9/21/2016	Aroclor 1260	2.81	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609021	004	9/21/2016	Total PCBs	2.81	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
Demo1609023	005	9/21/2016	Aroclor 1016	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609023	005	9/21/2016	Aroclor 1221	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609023	005	9/21/2016	Aroclor 1232	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609023	005	9/21/2016	Aroclor 1242	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609023	005	9/21/2016	Aroclor 1248	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609023	005	9/21/2016	Aroclor 1254	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609023	005	9/21/2016	Aroclor 1260	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609023	005	9/21/2016	Total PCBs	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
Demo1609031	006	9/21/2016	Aroclor 1016	< 100	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609031	006	9/21/2016	Aroclor 1221	< 100	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609031	006	9/21/2016	Aroclor 1232	< 100	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609031	006	9/21/2016	Aroclor 1242	< 100	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609031	006	9/21/2016	Aroclor 1248	< 100	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609031	006	9/21/2016	Aroclor 1254	< 100	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609031	006	9/21/2016	Aroclor 1260	2600	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609031	006	9/21/2016	Total PCBs	2600	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH

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Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
Demo1609033	007	9/21/2016	Aroclor 1016	< 10.0	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609033	007	9/21/2016	Aroclor 1221	< 10.0	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609033	007	9/21/2016	Aroclor 1232	< 10.0	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609033	007	9/21/2016	Aroclor 1242	< 10.0	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609033	007	9/21/2016	Aroclor 1248	< 10.0	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609033	007	9/21/2016	Aroclor 1254	< 10.0	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609033	007	9/21/2016	Aroclor 1260	656	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609033	007	9/21/2016	Total PCBs	656	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
Demo1609035	008	9/21/2016	Aroclor 1016	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609035	008	9/21/2016	Aroclor 1221	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609035	008	9/21/2016	Aroclor 1232	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609035	008	9/21/2016	Aroclor 1242	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609035	008	9/21/2016	Aroclor 1248	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609035	008	9/21/2016	Aroclor 1254	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609035	008	9/21/2016	Aroclor 1260	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609035	008	9/21/2016	Total PCBs	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
Demo1609047	009	9/21/2016	Aroclor 1016	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609047	009	9/21/2016	Aroclor 1221	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609047	009	9/21/2016	Aroclor 1232	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609047	009	9/21/2016	Aroclor 1242	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609047	009	9/21/2016	Aroclor 1248	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609047	009	9/21/2016	Aroclor 1254	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609047	009	9/21/2016	Aroclor 1260	2.81	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609047	009	9/21/2016	Total PCBs	2.81	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH

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Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
Demo1609049	010	9/21/2016	Aroclor 1016	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609049	010	9/21/2016	Aroclor 1221	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609049	010	9/21/2016	Aroclor 1232	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609049	010	9/21/2016	Aroclor 1242	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609049	010	9/21/2016	Aroclor 1248	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609049	010	9/21/2016	Aroclor 1254	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609049	010	9/21/2016	Aroclor 1260	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609049	010	9/21/2016	Total PCBs	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
Demo1609057	011	9/22/2016	Aroclor 1016	< 100	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609057	011	9/22/2016	Aroclor 1221	< 100	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609057	011	9/22/2016	Aroclor 1232	< 100	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609057	011	9/22/2016	Aroclor 1242	< 100	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609057	011	9/22/2016	Aroclor 1248	< 100	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609057	011	9/22/2016	Aroclor 1254	< 100	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609057	011	9/22/2016	Aroclor 1260	1970	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH
Demo1609057	011	9/22/2016	Total PCBs	1970	ppm	Oil	EPA 8082	100	100	11/1/2016	BJH

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
Demo1609059	012	9/22/2016	Aroclor 1016	< 10.0	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609059	012	9/22/2016	Aroclor 1221	< 10.0	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609059	012	9/22/2016	Aroclor 1232	< 10.0	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609059	012	9/22/2016	Aroclor 1242	< 10.0	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609059	012	9/22/2016	Aroclor 1248	< 10.0	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609059	012	9/22/2016	Aroclor 1254	< 10.0	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609059	012	9/22/2016	Aroclor 1260	391	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH
Demo1609059	012	9/22/2016	Total PCBs	391	ppm	Oil	EPA 8082	10	10.0	11/1/2016	BJH

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Demo1609061	013	9/22/2016	Aroclor 1016	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609061	013	9/22/2016	Aroclor 1221	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609061	013	9/22/2016	Aroclor 1232	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609061	013	9/22/2016	Aroclor 1242	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609061	013	9/22/2016	Aroclor 1248	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609061	013	9/22/2016	Aroclor 1254	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609061	013	9/22/2016	Aroclor 1260	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609061	013	9/22/2016	Total PCBs	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
Demo1609073	014	9/23/2016	Aroclor 1016	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609073	014	9/23/2016	Aroclor 1221	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609073	014	9/23/2016	Aroclor 1232	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609073	014	9/23/2016	Aroclor 1242	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609073	014	9/23/2016	Aroclor 1248	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609073	014	9/23/2016	Aroclor 1254	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609073	014	9/23/2016	Aroclor 1260	3.45	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609073	014	9/23/2016	Total PCBs	3.45	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH

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Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

WO#: **16101502**
Date Reported: **11/1/2016**
Company: Hydrodec North America, LLC
Address: 2021 Steinway Blvd. SE
Canton OH 44707
Received: 10/27/2016
Project#: Demo 2016

Client ID#	Lab ID#	Collected	Analyte	Result	Units	Matrix	Method	DF	RL	Run	Analyst
Demo1609075	015	9/23/2016	Aroclor 1016	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609075	015	9/23/2016	Aroclor 1221	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609075	015	9/23/2016	Aroclor 1232	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609075	015	9/23/2016	Aroclor 1242	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609075	015	9/23/2016	Aroclor 1248	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609075	015	9/23/2016	Aroclor 1254	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609075	015	9/23/2016	Aroclor 1260	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH
Demo1609075	015	9/23/2016	Total PCBs	< 1.00	ppm	Oil	EPA 8082	1	1.00	10/28/2016	BJH

Project Manager: _____

Analysis Request / Chain of Custody

16 101502-001 015CSL

Page 1 of 1 SET No

Client Name	Project Identification
Hydrodec	Demo 2016
Client Address	Project Address
2021 Steinway BLVD SE Canton Ohio 44707	2021 Steinway BLVD SE Canton Ohio 44707
Client Phone	Report To
330 454 8202 ext 119	John Burkhart@hydrodec.com
Client Fax No / Fax Results ☐	PO Number 2770
n/a	
Contact Person	Quote Number
John Burkhart	Dr Osman Email
Sampled By	☐
See Hydrodec Laboratory Log	

#	Sample Identification			Date Collected	Time Collected	Grab	Composite	Matrix: S=Solid, L=Liquid, O=Oil SL=Sludge, A=Air	Preservative	Number of Containers	Analytical Parameters and Methods: PCBS METHOD EPA 8082
1	DEMO1609005	P2	D-1-PT-04B	9/20/16	1:20PM	x		O	NONE	1	X
2	DEMO1609007	3-TK-005	D-1-FE-04B	9/20/16	1:20PM	x		O	NONE	1	X
3	DEMO1609009	3-RA-123	D-1-CO-04B	9/20/16	1:40PM	x		O	NONE	1	X
4	DEMO1609021	3-TK-001	D-F1-FE-09B	9/21/16	1:35AM	x		O	NONE	1	X
5	DEMO1609023	3-RA-123	D-F1-CO-09B	9/21/16	1:35AM	x		O	NONE	1	X
6	DEMO1609031	P2	D-2-PT-04B	9/21/16	11:45AM	x		O	NONE	1	X
7	DEMO1609033	3-TK-005	D-2-FE-04B	9/21/16	11:45AM	x		O	NONE	1	X
8	DEMO1609035	3-RA-123	D-2-CO-04B	9/21/16	12:12AM	x		O	NONE	1	X
9	DEMO1609047	3-TK-001	D-F2-FE-09B	9/21/16	12:05AM	x		O	NONE	1	X
10	DEMO1609049	3-RA-123	D-F2-CO-09B	9/21/16	12:05AM	x		O	NONE	1	X
11	DEMO1609057	P2	D-3-PT-04B	9/22/16	1:05PM	x		O	NONE	1	X
12	DEMO1609059	3-TK-005	D-3-FE-04B	9/22/16	1:05PM	x		O	NONE	1	X
13	DEMO1609061	3-RA-123	D-3-CO-04B	9/22/16	1:35PM	x		O	NONE	1	X
14	DEMO1609073	3-TK-001	D-F3-FE-09B	9/23/16	1:20AM	x		O	NONE	1	X
15	DEMO1609075	3-RA-123	D-F3-CO-09B	9/23/16	1:20AM	x		O	NONE	1	X

Relinquished by:	Date	Time	Received by:	Date	Time
	10-27-16	8:45AM		10/27/16	8:45

Received in Lab by:	Date	Time	Rush Requested: ____ Day(s)
	10-27-16	940	Must be approved by Lab Manager

Notes / Comments:
Return all retains to Hydrodec of North America

DC-7
Rev. 16

Effective Date: 07/14/16

Summit Environmental Technologies, Inc.
Cooler Receipt Form

Initials of person inspecting cooler and samples: CSL

Client: Hydrodec

Order Number: 16101502

Date Received: 10/27 Time Received: 940 Date cooler(s) opened and samples inspected: 10/27

Number of Coolers/Boxes: _____ N/A

Shipper: FED EX UPS DHL Airborne US Postal Walk-in (Pickup) Other: _____

Packaging: Peanuts (Bubble Wrap) Paper Foam None Other: _____

Tape on cooler/box:	Y	(N)	N/A
Custody Seals intact	Y	N	(N/A)
C-O-C in plastic	Y	(N)	N/A
Ice_____ Blue ice _____	present / absent / melted		(N/A)
Sample Temperature IR Gun #16020459 CF 0.0 °C	9.0 °C		N/A
Radiological Testing Instrument serial #35127 (see page 2 for scan results)	Y	N	(N/A)

****Use 1 sheet per sample for Radiological Testing. If sample is HOT, the Radiological Safety Officer must be notified immediately.**

C-O-C filled out properly	(Y)	N	N/A
Samples in separate bags	(Y)	N	N/A
Sample containers intact*	(Y)	N	N/A

*If no, list broken sample(s): _____

Sample label(s) complete (ID, date, etc.)	(Y)	N	N/A
Label(s) agree with C-O-C	(Y)	N	N/A
Correct containers used	(Y)	N	N/A
Sufficient sample received	(Y)	N	N/A
Samples received within holding time	(Y)	N	
Bubbles absent from 40 mL vials**	Y	N	(N/A)

** Samples with bubbles <6mm are acceptable. Indicate bubble size if >6mm. _____

Was client contacted about samples	Y	N
Will client send new samples	Y	N

Client contact: _____

Date/Time: _____

Logged in by: _____

Comments: _____

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

December 20, 2016

John Burkhart
Hydrodec North America, LLC
2021 Steinway Blvd. SE
Canton, OH 44707
TEL: 330-454-8202
FAX: 330-454-8870

RE: Demo 2016

Dear John Burkhart:

Order No.: 16101510

Summit Environmental Technologies, Inc. received 3 sample(s) on 10/27/2016 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative.

Quality control data is within laboratory defined or method specified acceptance limits except where noted.

If you have any questions regarding these tests results, please feel free to call the laboratory.

Sincerely,

Jennifer Woolf

Project Manager

3310 Win St.
Cuyahoga Falls, Ohio 44223

Summit Environmental Technologies, Inc.
3310 Win St.
Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Case Narrative

WO#: **16101510**
Date: **12/20/2016**

CLIENT: Hydrodec North America, LLC
Project: Demo 2016

This report in its entirety consists of the documents listed below. All documents contain the Summit Environmental Technologies, Inc., Work Order Number assigned to this report.

Paginated Report including Cover Letter, Case Narrative, Analytical Results, Applicable Quality Control Summary Reports, and copies of the Chain of Custody Documents are supplied with this sample set.

Concentrations reported with a J-Flag in the Qualifier Field are values below the Limit of Quantitation (LOQ) but greater than the established Method Detection Limit (MDL).

Method numbers, unless specified as SM (Standard Methods) or ASTM, are EPA methods.

Estimated uncertainty values are available upon request.

Analysis performed by DBM, VRM, or SFG were performed at Summit Labs 2704 Eatonton Highway Haddock, GA 31033

All results for Solid Samples are reported on an "as received" or "wet weight" basis unless indicated as "dry weight" using the "-dry" designation on the reporting units.

Summit Environmental Technologies, Inc., holds the accreditations/certifications listed at the bottom of the cover letter that may or may not pertain to this report.

 The results contained in this report are only representative of the samples received. Conditions can vary at different times and at different sampling conditions. Summit Environmental Technologies, Inc. is not responsible for use or interpretation of the data included herein.

This report is believed to meet all of the requirements of NELAC or the accrediting / certifying agency. Any comments or problems with the analytical events associated with this report are noted below.

SUMMIT ENVIRONMENTAL TECHNOLOGIES, INC
Analytical Laboratories

Summit Environmental Technologies, In
3310 Win S
Cuyahoga Falls, Ohio 4422
TEL: (330) 253-8211 FAX: (330) 253-448
Website: http://www.settek.co

Qualifiers and Acronyms

WO#: **16101510**
Date: **12/20/2016**

These commonly used Qualifiers and Acronyms may or may not be present in this report.

Qualifiers

U	The compound was analyzed for but was not detected.
J	The reported value is greater than the Method Detection Limit but less than the Reporting Limit.
H	The hold time for sample preparation and/or analysis was exceeded.
D	The result is reported from a dilution.
E	The result exceeded the linear range of the calibration or is estimated due to interference.
MC	The result is below the Minimum Compound Limit.
*****	The result exceeds the Regulatory Limit or Maximum Contamination Limit.
m	Manual integration was used to determine the area response.
N	The result is presumptive based on a Mass Spectral library search assuming a 1:1 response.
P	The second column confirmation exceeded 25% difference.
C	The result has been confirmed by GC/MS.
X	The result was not confirmed when GC/MS Analysis was performed.
B/MB+	The analyte was detected in the associated blank.
G	The ICB or CCB contained reportable amounts of analyte.
QC-/+	The CCV recovery failed low (-) or high (+).
R/QDR	The RPD was outside of accepted recovery limits.
QL-/+	The LCS or LCSD recovery failed low (-) or high (+).
QLR	The LCS/LCSD RPD was outside of accepted recovery limits.
QM-/+	The MS or MSD recovery failed low (-) or high (+).
QMR	The MS/MSD RPD was outside of accepted recovery limits.
QV-/+	The ICV recovery failed low (-) or high (+).
S	The spike result was outside of accepted recovery limits.
Z	Deviation; A deviation from the method was performed; Please refer to the Case Narrative for additional information

Acronyms

ND	Not Detected	**RL**	Reporting Limit
QC	Quality Control	**MDL**	Method Detection Limit
MB	Method Blank	**LOD**	Level of Detection
LCS	Laboratory Control Sample	**LOQ**	Level of Quantitation
LCSD	Laboratory Control Sample Duplicate	**PQL**	Practical Quantitation Limit
QCS	Quality Control Sample	**CRQL**	Contract Required Quantitation Limit
DUP	Duplicate	**PL**	Permit Limit
MS	Matrix Spike	**RegLvl**	Regulatory Limit
MSD	Matrix Spike Duplicate	**MCL**	Maximum Contamination Limit
RPD	Relative Percent Different	**MinCL**	Minimum Compound Limit
ICV	Initial Calibration Verification	**RA**	Reanalysis
ICB	Initial Calibration Blank	**RE**	Reextraction
CCV	Continuing Calibration Verification	**TIC**	Tentatively Identified Compound
CCB	Continuing Calibration Blank	**RT**	Retention Time
RLC	Reporting Limit Check	**CF**	Calibration Factor
DF	Dilution Factor	**RF**	Response Factor

This list of Qualifiers and Acronyms reflects the most commonly utilized Qualifiers and Acronyms for reporting. Please refer to the Analytical Notes in the Case Narrative for any Qualifiers or Acronyms that do not appear in this list or for additional information regarding the use of these Qualifiers on reported data.

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Cuyahoga Falls, Ohio 44223
TEL: (330) 253-8211 FAX: (330) 253-4489
Website: http://www.settek.com

Workorder Sample Summary

WO#: **16101510**
20-Dec-16

CLIENT: Hydrodec North America, LLC
Project: Demo 2016

Lab SampleID	Client Sample ID	Tag No	Date Collected	Date Received	Matrix
16101510-001	D-1-CT-06-DEMO 1609013		9/20/2016 4:05:00 PM	10/27/2016 9:40:00 AM	Oil
16101510-002	D-1-CT-06-DEMO 1609038		9/21/2016 2:50:00 PM	10/27/2016 9:40:00 AM	Oil
16101510-003	D-1-CT-06-DEMO 1609064		9/22/2016 3:55:00 PM	10/27/2016 9:40:00 AM	Oil

SUMMIT
ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-01 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-1	0.0	U	0.4	0.5
PCB-3	0.0	U	0.4	0.5
PCB-4/10	0.0	U	1.6	1.9
PCB-15	0.0	U	4.0	4.3
PCB-19	0.0	U	0.9	0.9
PCB-37	0.0	U	3.4	3.6
PCB-54	0.0	U	0.5	0.7
PCB-104	0.0	U	0.5	0.7
PCB-81	0.0	U	0.6	0.9
PCB-77	0.0	U	1.3	1.3
PCB-155	0.0	U	0.3	0.7
PCB-107/123	0.0	U	1.1	1.6
PCB-118	0.0	U	2.6	2.7
PCB-114	0.0	U	0.5	0.6
PCB-105	0.0	U	1.4	1.6
PCB-126	0.0	U	0.5	0.8
PCB-167	0.0	U	0.6	0.9
PCB-156	0.0	U	0.7	0.9
PCB-157	0.0	U	0.4	0.6
PCB-169	0.0	U	0.5	0.7
PCB-188	0.0	U	0.4	0.7
PCB-202	0.0	U	0.7	1.1
PCB-189	0.0	U	0.5	0.7
PCB-205	0.0	U	0.7	1.1
PCB-208	0.0	U	0.7	1.0
PCB-206	0.0	U	0.7	1.1
PCB-209	0.0	U	0.8	1.2
PCB-2	0.0	U	0.1	0.3
PCB-9/7	0.0	U	0.6	0.9
PCB-6	0.0	U	0.9	1.0
PCB-8/5	0.0	U	4.4	4.9

SUMMIT
ENVIRONMENTAL TECHNOLOGIES, INC.
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Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-01 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-14	0.0	U	0.1	0.2
PCB-11	0.0	U	13.0	13.0
PCB-12	0.0	U	0.1	0.3
PCB-13	0.0	U	0.3	0.4
PCB-30	0.0	U	0.1	0.2
PCB-18	0.0	U	5.9	5.9
PCB-17	0.0	U	2.6	2.8
PCB-27	0.0	U	0.4	0.6
PCB-24	0.0	U	0.2	0.3
PCB-16	0.0	U	1.3	2.5
PCB-32	0.0	U	1.3	2.5
PCB-34	0.0	U	0.1	0.4
PCB-23	0.0	U	0.1	0.3
PCB-29	0.0	U	0.2	0.5
PCB-26	0.0	U	1.6	2.1
PCB-25	0.0	U	0.5	0.5
PCB-31	0.0	U	4.9	5.0
PCB-28	0.0	U	7.0	7.0
PCB-33/20/21	0.0	U	4.3	4.3
PCB-22	0.0	U	2.3	2.4
PCB-36	0.0	U	0.1	0.2
PCB-39	0.0	U	0.1	0.2
PCB-38	0.0	U	0.1	0.2
PCB-35	0.0	U	1.0	1.0
PCB-50	0.0	U	0.6	0.9
PCB-53	0.0	U	1.6	2.0
PCB-51	0.0	U	1.1	1.4
PCB-45	0.0	U	2.3	2.7
PCB-46	0.0	U	1.2	1.5
PCB-73	0.0	U	0.6	0.9
PCB-69	0.0	U	0.7	1.0
PCB-52/43	0.0	U	10.9	14.1

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Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-01 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-49	0.0	U	6.7	7.5
PCB-48	0.0	U	3.4	4.2
PCB-75/47/65	0.0	U	4.5	5.5
PCB-62	0.0	U	0.5	0.9
PCB-44	0.0	U	7.8	10.1
PCB-59	0.0	U	1.4	2.0
PCB-42	0.0	U	4.8	5.8
PCB-71	0.0	U	2.8	3.4
PCB-41/72	0.0	U	2.7	3.8
PCB-68/64	0.0	U	5.8	6.9
PCB-40	0.0	U	2.2	3.0
PCB-57	0.0	U	0.2	0.6
PCB-58/67	0.0	U	0.4	1.0
PCB-96	0.0	U	0.6	0.9
PCB-103	0.0	U	0.7	1.0
PCB-100	0.0	U	0.6	0.8
PCB-94	0.0	U	0.4	0.6
PCB-63	0.0	U	0.8	1.4
PCB-61	0.0	U	0.8	1.4
PCB-76/74	0.0	U	2.4	3.7
PCB-70	0.0	U	4.0	5.3
PCB-66	0.0	U	3.6	4.5
PCB-80	0.0	U	0.2	0.6
PCB-55	0.0	U	0.2	0.6
PCB-56	0.0	U	1.8	2.5
PCB-60	0.0	U	1.1	1.4
PCB-79	0.0	U	0.5	0.7
PCB-78	0.0	U	0.5	0.8
PCB-102	0.0	U	0.7	0.8
PCB-98	0.0	U	0.5	0.7
PCB-93	0.0	U	0.7	0.9
PCB-95/121	0.0	U	3.8	4.1

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Analytical Laboratories

Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-01 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-88	0.0	U	1.0	1.0
PCB-91	0.0	U	1.3	1.6
PCB-92	0.0	U	0.8	1.0
PCB-89	0.0	U	0.9	1.2
PCB-84	0.0	U	0.2	0.5
PCB-90	0.0	U	0.3	0.5
PCB-113/101	0.0	U	2.3	2.9
PCB-99	0.0	U	1.2	1.6
PCB-119	0.0	U	0.5	0.7
PCB-83/112	0.0	U	0.4	1.1
PCB-108	0.0	U	0.1	0.4
PCB-125	0.0	U	0.3	0.5
PCB-86	0.0	U	0.1	0.5
PCB-97	0.0	U	1.2	1.6
PCB-116/117/111	0.0	U	1.4	1.8
PCB-87/115	0.0	U	1.3	1.7
PCB-85	0.0	U	1.1	1.3
PCB-120	0.0	U	0.2	0.6
PCB-110	0.0	U	2.8	3.1
PCB-82	0.0	U	0.8	1.0
PCB-150	0.0	U	0.2	0.6
PCB-152	0.0	U	0.6	0.9
PCB-145	0.0	U	0.2	0.7
PCB-148	0.0	U	0.7	0.9
PCB-136	0.0	U	1.0	1.6
PCB-154	0.0	U	0.7	1.0
PCB-151	0.0	U	1.5	1.8
PCB-135	0.0	U	1.0	1.1
PCB-143	0.0	U	1.0	1.3
PCB-140	0.0	U	0.5	1.0
PCB-124	0.0	U	0.6	1.0
PCB-109	0.0	U	0.4	0.6

SUMMIT
ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-01 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-106	0.0	U	0.5	0.8
PCB-122	0.0	U	0.7	1.1
PCB-127	0.0	U	0.4	0.6
PCB-149	0.0	U	3.4	3.5
PCB-139	0.0	U	0.6	0.8
PCB-147/144	0.0	U	1.2	1.5
PCB-134	0.0	U	0.8	1.0
PCB-142/133/131	0.0	U	0.0	2.8
PCB-165	0.0	U	0.3	0.7
PCB-146	0.0	U	0.7	0.9
PCB-161	0.0	U	0.6	0.8
PCB-168	0.0	U	0.1	0.5
PCB-153/132	0.0	U	3.4	3.8
PCB-141	0.0	U	0.9	1.1
PCB-137	0.0	U	0.6	0.8
PCB-130	0.0	U	0.7	1.0
PCB-164	0.0	U	0.4	0.7
PCB-163/138	0.0	U	2.6	3.0
PCB-160/158	0.0	U	0.7	1.5
PCB-129	0.0	U	0.8	1.1
PCB-166	0.0	U	0.6	0.8
PCB-159	0.0	U	0.5	0.7
PCB-162/128	0.0	U	1.0	1.3
PCB-184	0.0	U	0.3	0.6
PCB-179	0.0	U	0.6	0.8
PCB-176	0.0	U	0.7	0.9
PCB-186	0.0	U	0.3	0.5
PCB-178	0.0	U	0.6	0.8
PCB-175/182	0.0	U	1.0	1.3
PCB-187	0.0	U	0.7	0.8
PCB-183	0.0	U	0.7	0.9
PCB-185	0.0	U	0.5	0.7

SUMMIT
ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-01 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-174	0.0	U	0.7	0.9
PCB-181	0.0	U	0.3	0.6
PCB-177	0.0	U	0.6	0.9
PCB-171	0.0	U	0.6	0.8
PCB-173	0.0	U	0.4	0.6
PCB-172	0.0	U	0.4	0.6
PCB-192	0.0	U	0.2	0.4
PCB-180/193	0.0	U	1.0	1.3
PCB-191	0.0	U	0.5	0.7
PCB-170	0.0	U	0.5	0.8
PCB-190	0.0	U	0.5	0.7
PCB-201	0.0	U	1.4	2.2
PCB-204	0.0	U	1.3	1.9
PCB-197	0.0	U	0.9	1.4
PCB-200	0.0	U	1.4	2.1
PCB-198	0.0	U	1.2	1.9
PCB-199	0.0	U	0.9	1.4
PCB-196	0.0	U	1.0	1.6
PCB-203	0.0	U	0.5	1.2
PCB-195	0.0	U	1.5	2.2
PCB-194	0.0	U	1.5	2.2
PCB-207	0.0	U	1.3	1.9

TOTAL MONOCHLORO	0 ug/kg
TOTAL DICHLORO	0 ug/kg
TOTAL TRICHLORO	0 ug/kg
TOTAL TETRACHLORO	0 ug/kg
TOTAL PENTACHLORO	0 ug/kg
TOTAL HEXACHLORO	0 ug/kg
TOTAL HEPTACHLRO	0 ug/kg
TOTAL OCTACHLORO	0 ug/kg
TOTAL NONACHLORO	0 ug/kg

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-01 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
TOTAL DECACHLORO	0 ug/kg			
TOTAL PCB	0 ug/kg			
TOTAL TEQ	**0.00** ug/kg		TEQ (DL/2)	**0.05** ug/kg

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-02 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-1	0.2	< LOD	0.4	0.5
PCB-3	0.0	U	0.4	0.5
PCB-4/10	0.5	< LOD	1.6	1.9
PCB-15	0.0	U	4.0	4.3
PCB-19	0.2	< LOD	0.9	0.9
PCB-37	0.0	U	3.4	3.6
PCB-54	0.1	< LOD	0.5	0.7
PCB-104	0.0	U	0.5	0.7
PCB-81	0.0	U	0.6	0.9
PCB-77	0.0	U	1.3	1.3
PCB-155	0.0	U	0.3	0.7
PCB-107/123	0.0	U	1.1	1.6
PCB-118	0.0	U	2.6	2.7
PCB-114	0.0	U	0.5	0.6
PCB-105	0.0	U	1.4	1.6
PCB-126	0.0	U	0.5	0.8
PCB-167	0.0	U	0.6	0.9
PCB-156	0.0	U	0.7	0.9
PCB-157	0.0	U	0.4	0.6
PCB-169	0.0	U	0.5	0.7
PCB-188	0.0	U	0.4	0.7
PCB-202	0.0	U	0.7	1.1
PCB-189	0.0	U	0.5	0.7
PCB-205	0.0	U	0.7	1.1
PCB-208	0.0	U	0.7	1.0
PCB-206	0.0	U	0.7	1.1
PCB-209	0.0	U	0.8	1.2
PCB-2	0.0	U	0.1	0.3
PCB-9/7	0.0	U	0.6	0.9
PCB-6	0.0	U	0.9	1.0
PCB-8/5	0.0	U	4.4	4.9

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-02 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-14	0.0	U	0.1	0.2
PCB-11	0.0	U	13.0	13.0
PCB-12	0.0	U	0.1	0.3
PCB-13	0.0	U	0.3	0.4
PCB-30	0.0	U	0.1	0.2
PCB-18	0.0	U	5.9	5.9
PCB-17	0.0	U	2.6	2.8
PCB-27	0.0	U	0.4	0.6
PCB-24	0.0	U	0.2	0.3
PCB-16	0.0	U	1.3	2.5
PCB-32	0.0	U	1.3	2.5
PCB-34	0.0	U	0.1	0.4
PCB-23	0.0	U	0.1	0.3
PCB-29	0.0	U	0.2	0.5
PCB-26	0.0	U	1.6	2.1
PCB-25	0.0	U	0.5	0.5
PCB-31	0.0	U	4.9	5.0
PCB-28	0.0	U	7.0	7.0
PCB-33/20/21	0.0	U	4.3	4.3
PCB-22	0.0	U	2.3	2.4
PCB-36	0.0	U	0.1	0.2
PCB-39	0.0	U	0.1	0.2
PCB-38	0.0	U	0.1	0.2
PCB-35	0.0	U	1.0	1.0
PCB-50	0.0	U	0.6	0.9
PCB-53	0.0	U	1.6	2.0
PCB-51	0.0	U	1.1	1.4
PCB-45	0.0	U	2.3	2.7
PCB-46	0.0	U	1.2	1.5
PCB-73	0.0	U	0.6	0.9
PCB-69	0.0	U	0.7	1.0
PCB-52/43	0.0	U	10.9	14.1

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-02 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-49	0.0	U	6.7	7.5
PCB-48	0.0	U	3.4	4.2
PCB-75/47/65	0.0	U	4.5	5.5
PCB-62	0.0	U	0.5	0.9
PCB-44	0.0	U	7.8	10.1
PCB-59	0.0	U	1.4	2.0
PCB-42	0.0	U	4.8	5.8
PCB-71	0.0	U	2.8	3.4
PCB-41/72	0.0	U	2.7	3.8
PCB-68/64	0.0	U	5.8	6.9
PCB-40	0.0	U	2.2	3.0
PCB-57	0.0	U	0.2	0.6
PCB-58/67	0.0	U	0.4	1.0
PCB-96	0.0	U	0.6	0.9
PCB-103	0.0	U	0.7	1.0
PCB-100	0.0	U	0.6	0.8
PCB-94	0.0	U	0.4	0.6
PCB-63	0.0	U	0.8	1.4
PCB-61	0.0	U	0.8	1.4
PCB-76/74	0.0	U	2.4	3.7
PCB-70	0.0	U	4.0	5.3
PCB-66	0.0	U	3.6	4.5
PCB-80	0.0	U	0.2	0.6
PCB-55	0.0	U	0.2	0.6
PCB-56	0.0	U	1.8	2.5
PCB-60	0.0	U	1.1	1.4
PCB-79	0.0	U	0.5	0.7
PCB-78	0.0	U	0.5	0.8
PCB-102	0.0	U	0.7	0.8
PCB-98	0.0	U	0.5	0.7
PCB-93	0.0	U	0.7	0.9
PCB-95/121	0.0	U	3.8	4.1

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-02 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-88	0.0	U	1.0	1.0
PCB-91	0.0	U	1.3	1.6
PCB-92	0.0	U	0.8	1.0
PCB-89	0.0	U	0.9	1.2
PCB-84	0.0	U	0.2	0.5
PCB-90	0.0	U	0.3	0.5
PCB-113/101	0.0	U	2.3	2.9
PCB-99	0.0	U	1.2	1.6
PCB-119	0.0	U	0.5	0.7
PCB-83/112	0.0	U	0.4	1.1
PCB-108	0.0	U	0.1	0.4
PCB-125	0.0	U	0.3	0.5
PCB-86	0.0	U	0.1	0.5
PCB-97	0.0	U	1.2	1.6
PCB-116/117/111	0.0	U	1.4	1.8
PCB-87/115	0.0	U	1.3	1.7
PCB-85	0.0	U	1.1	1.3
PCB-120	0.0	U	0.2	0.6
PCB-110	0.0	U	2.8	3.1
PCB-82	0.0	U	0.8	1.0
PCB-150	0.0	U	0.2	0.6
PCB-152	0.0	U	0.6	0.9
PCB-145	0.0	U	0.2	0.7
PCB-148	0.0	U	0.7	0.9
PCB-136	0.0	U	1.0	1.6
PCB-154	0.0	U	0.7	1.0
PCB-151	0.0	U	1.5	1.8
PCB-135	0.0	U	1.0	1.1
PCB-143	0.0	U	1.0	1.3
PCB-140	0.0	U	0.5	1.0
PCB-124	0.0	U	0.6	1.0
PCB-109	0.0	U	0.4	0.6

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-02 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-106	0.0	U	0.5	0.8
PCB-122	0.0	U	0.7	1.1
PCB-127	0.0	U	0.4	0.6
PCB-149	0.0	U	3.4	3.5
PCB-139	0.0	U	0.6	0.8
PCB-147/144	0.0	U	1.2	1.5
PCB-134	0.0	U	0.8	1.0
PCB-142/133/131	0.0	U	0.0	2.8
PCB-165	0.0	U	0.3	0.7
PCB-146	0.0	U	0.7	0.9
PCB-161	0.0	U	0.6	0.8
PCB-168	0.0	U	0.1	0.5
PCB-153/132	0.0	U	3.4	3.8
PCB-141	0.0	U	0.9	1.1
PCB-137	0.0	U	0.6	0.8
PCB-130	0.0	U	0.7	1.0
PCB-164	0.0	U	0.4	0.7
PCB-163/138	0.0	U	2.6	3.0
PCB-160/158	0.0	U	0.7	1.5
PCB-129	0.0	U	0.8	1.1
PCB-166	0.0	U	0.6	0.8
PCB-159	0.0	U	0.5	0.7
PCB-162/128	0.0	U	1.0	1.3
PCB-184	0.0	U	0.3	0.6
PCB-179	0.0	U	0.6	0.8
PCB-176	0.0	U	0.7	0.9
PCB-186	0.0	U	0.3	0.5
PCB-178	0.0	U	0.6	0.8
PCB-175/182	0.0	U	1.0	1.3
PCB-187	0.0	U	0.7	0.8
PCB-183	0.0	U	0.7	0.9
PCB-185	0.0	U	0.5	0.7

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-02 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-174	0.0	U	0.7	0.9
PCB-181	0.0	U	0.3	0.6
PCB-177	0.0	U	0.6	0.9
PCB-171	0.0	U	0.6	0.8
PCB-173	0.0	U	0.4	0.6
PCB-172	0.0	U	0.4	0.6
PCB-192	0.0	U	0.2	0.4
PCB-180/193	0.0	U	1.0	1.3
PCB-191	0.0	U	0.5	0.7
PCB-170	0.0	U	0.5	0.8
PCB-190	0.0	U	0.5	0.7
PCB-201	0.0	U	1.4	2.2
PCB-204	0.0	U	1.3	1.9
PCB-197	0.0	U	0.9	1.4
PCB-200	0.0	U	1.4	2.1
PCB-198	0.0	U	1.2	1.9
PCB-199	0.0	U	0.9	1.4
PCB-196	0.0	U	1.0	1.6
PCB-203	0.0	U	0.5	1.2
PCB-195	0.0	U	1.5	2.2
PCB-194	0.0	U	1.5	2.2
PCB-207	0.0	U	1.3	1.9

TOTAL MONOCHLORO	0 ug/kg
TOTAL DICHLORO	0 ug/kg
TOTAL TRICHLORO	0 ug/kg
TOTAL TETRACHLORO	0 ug/kg
TOTAL PENTACHLORO	0 ug/kg
TOTAL HEXACHLORO	0 ug/kg
TOTAL HEPTACHLRO	0 ug/kg
TOTAL OCTACHLORO	0 ug/kg
TOTAL NONACHLORO	0 ug/kg

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-02 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
TOTAL DECACHLORO	0 ug/kg			
TOTAL PCB	1 ug/kg			
TOTAL TEQ	**0.00** ug/kg		TEQ (DL/2)	**0.05** ug/kg

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-03 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-1	0.1	< LOD	0.4	0.5
PCB-3	0.0	U	0.4	0.5
PCB-4/10	0.0	U	1.6	1.9
PCB-15	0.0	U	4.0	4.3
PCB-19	0.0	U	0.9	0.9
PCB-37	0.0	U	3.4	3.6
PCB-54	0.0	U	0.5	0.7
PCB-104	0.0	U	0.5	0.7
PCB-81	0.0	U	0.6	0.9
PCB-77	0.0	U	1.3	1.3
PCB-155	0.0	U	0.3	0.7
PCB-107/123	0.0	U	1.1	1.6
PCB-118	0.0	U	2.6	2.7
PCB-114	0.0	U	0.5	0.6
PCB-105	0.0	U	1.4	1.6
PCB-126	0.0	U	0.5	0.8
PCB-167	0.0	U	0.6	0.9
PCB-156	0.0	U	0.7	0.9
PCB-157	0.0	U	0.4	0.6
PCB-169	0.0	U	0.5	0.7
PCB-188	0.0	U	0.4	0.7
PCB-202	0.0	U	0.7	1.1
PCB-189	0.0	U	0.5	0.7
PCB-205	0.0	U	0.7	1.1
PCB-208	0.0	U	0.7	1.0
PCB-206	0.0	U	0.7	1.1
PCB-209	0.0	U	0.8	1.2
PCB-2	0.0	U	0.1	0.3
PCB-9/7	0.0	U	0.6	0.9
PCB-6	0.0	U	0.9	1.0
PCB-8/5	0.0	U	4.4	4.9

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-03 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-14	0.0	U	0.1	0.2
PCB-11	0.0	U	13.0	13.0
PCB-12	0.0	U	0.1	0.3
PCB-13	0.0	U	0.3	0.4
PCB-30	0.0	U	0.1	0.2
PCB-18	0.0	U	5.9	5.9
PCB-17	0.0	U	2.6	2.8
PCB-27	0.0	U	0.4	0.6
PCB-24	0.0	U	0.2	0.3
PCB-16	0.0	U	1.3	2.5
PCB-32	0.0	U	1.3	2.5
PCB-34	0.0	U	0.1	0.4
PCB-23	0.0	U	0.1	0.3
PCB-29	0.0	U	0.2	0.5
PCB-26	0.0	U	1.6	2.1
PCB-25	0.0	U	0.5	0.5
PCB-31	0.0	U	4.9	5.0
PCB-28	0.0	U	7.0	7.0
PCB-33/20/21	0.0	U	4.3	4.3
PCB-22	0.0	U	2.3	2.4
PCB-36	0.0	U	0.1	0.2
PCB-39	0.0	U	0.1	0.2
PCB-38	0.0	U	0.1	0.2
PCB-35	0.0	U	1.0	1.0
PCB-50	0.0	U	0.6	0.9
PCB-53	0.0	U	1.6	2.0
PCB-51	0.0	U	1.1	1.4
PCB-45	0.0	U	2.3	2.7
PCB-46	0.0	U	1.2	1.5
PCB-73	0.0	U	0.6	0.9
PCB-69	0.0	U	0.7	1.0
PCB-52/43	0.0	U	10.9	14.1

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-03 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-49	0.0	U	6.7	7.5
PCB-48	0.0	U	3.4	4.2
PCB-75/47/65	0.0	U	4.5	5.5
PCB-62	0.0	U	0.5	0.9
PCB-44	0.0	U	7.8	10.1
PCB-59	0.0	U	1.4	2.0
PCB-42	0.0	U	4.8	5.8
PCB-71	0.0	U	2.8	3.4
PCB-41/72	0.0	U	2.7	3.8
PCB-68/64	0.0	U	5.8	6.9
PCB-40	0.0	U	2.2	3.0
PCB-57	0.0	U	0.2	0.6
PCB-58/67	0.0	U	0.4	1.0
PCB-96	0.0	U	0.6	0.9
PCB-103	0.0	U	0.7	1.0
PCB-100	0.0	U	0.6	0.8
PCB-94	0.0	U	0.4	0.6
PCB-63	0.0	U	0.8	1.4
PCB-61	0.0	U	0.8	1.4
PCB-76/74	0.0	U	2.4	3.7
PCB-70	0.0	U	4.0	5.3
PCB-66	0.0	U	3.6	4.5
PCB-80	0.0	U	0.2	0.6
PCB-55	0.0	U	0.2	0.6
PCB-56	0.0	U	1.8	2.5
PCB-60	0.0	U	1.1	1.4
PCB-79	0.0	U	0.5	0.7
PCB-78	0.0	U	0.5	0.8
PCB-102	0.0	U	0.7	0.8
PCB-98	0.0	U	0.5	0.7
PCB-93	0.0	U	0.7	0.9
PCB-95/121	0.0	U	3.8	4.1

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-03 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-88	0.0	U	1.0	1.0
PCB-91	0.0	U	1.3	1.6
PCB-92	0.0	U	0.8	1.0
PCB-89	0.0	U	0.9	1.2
PCB-84	0.0	U	0.2	0.5
PCB-90	0.0	U	0.3	0.5
PCB-113/101	0.0	U	2.3	2.9
PCB-99	0.0	U	1.2	1.6
PCB-119	0.0	U	0.5	0.7
PCB-83/112	0.0	U	0.4	1.1
PCB-108	0.0	U	0.1	0.4
PCB-125	0.0	U	0.3	0.5
PCB-86	0.0	U	0.1	0.5
PCB-97	0.0	U	1.2	1.6
PCB-116/117/111	0.0	U	1.4	1.8
PCB-87/115	0.0	U	1.3	1.7
PCB-85	0.0	U	1.1	1.3
PCB-120	0.0	U	0.2	0.6
PCB-110	0.0	U	2.8	3.1
PCB-82	0.0	U	0.8	1.0
PCB-150	0.0	U	0.2	0.6
PCB-152	0.0	U	0.6	0.9
PCB-145	0.0	U	0.2	0.7
PCB-148	0.0	U	0.7	0.9
PCB-136	0.0	U	1.0	1.6
PCB-154	0.0	U	0.7	1.0
PCB-151	0.0	U	1.5	1.8
PCB-135	0.0	U	1.0	1.1
PCB-143	0.0	U	1.0	1.3
PCB-140	0.0	U	0.5	1.0
PCB-124	0.0	U	0.6	1.0
PCB-109	0.0	U	0.4	0.6

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-03 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-106	0.0	U	0.5	0.8
PCB-122	0.0	U	0.7	1.1
PCB-127	0.0	U	0.4	0.6
PCB-149	0.0	U	3.4	3.5
PCB-139	0.0	U	0.6	0.8
PCB-147/144	0.0	U	1.2	1.5
PCB-134	0.0	U	0.8	1.0
PCB-142/133/131	0.0	U	0.0	2.8
PCB-165	0.0	U	0.3	0.7
PCB-146	0.0	U	0.7	0.9
PCB-161	0.0	U	0.6	0.8
PCB-168	0.0	U	0.1	0.5
PCB-153/132	0.0	U	3.4	3.8
PCB-141	0.0	U	0.9	1.1
PCB-137	0.0	U	0.6	0.8
PCB-130	0.0	U	0.7	1.0
PCB-164	0.0	U	0.4	0.7
PCB-163/138	0.0	U	2.6	3.0
PCB-160/158	0.0	U	0.7	1.5
PCB-129	0.0	U	0.8	1.1
PCB-166	0.0	U	0.6	0.8
PCB-159	0.0	U	0.5	0.7
PCB-162/128	0.0	U	1.0	1.3
PCB-184	0.0	U	0.3	0.6
PCB-179	0.0	U	0.6	0.8
PCB-176	0.0	U	0.7	0.9
PCB-186	0.0	U	0.3	0.5
PCB-178	0.0	U	0.6	0.8
PCB-175/182	0.0	U	1.0	1.3
PCB-187	0.0	U	0.7	0.8
PCB-183	0.0	U	0.7	0.9
PCB-185	0.0	U	0.5	0.7

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-03 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-174	0.0	U	0.7	0.9
PCB-181	0.0	U	0.3	0.6
PCB-177	0.0	U	0.6	0.9
PCB-171	0.0	U	0.6	0.8
PCB-173	0.0	U	0.4	0.6
PCB-172	0.0	U	0.4	0.6
PCB-192	0.0	U	0.2	0.4
PCB-180/193	0.0	U	1.0	1.3
PCB-191	0.0	U	0.5	0.7
PCB-170	0.0	U	0.5	0.8
PCB-190	0.0	U	0.5	0.7
PCB-201	0.0	U	1.4	2.2
PCB-204	0.0	U	1.3	1.9
PCB-197	0.0	U	0.9	1.4
PCB-200	0.0	U	1.4	2.1
PCB-198	0.0	U	1.2	1.9
PCB-199	0.0	U	0.9	1.4
PCB-196	0.0	U	1.0	1.6
PCB-203	0.0	U	0.5	1.2
PCB-195	0.0	U	1.5	2.2
PCB-194	0.0	U	1.5	2.2
PCB-207	0.0	U	1.3	1.9

TOTAL MONOCHLORO	0 ug/kg
TOTAL DICHLORO	0 ug/kg
TOTAL TRICHLORO	0 ug/kg
TOTAL TETRACHLORO	0 ug/kg
TOTAL PENTACHLORO	0 ug/kg
TOTAL HEXACHLORO	0 ug/kg
TOTAL HEPTACHLRO	0 ug/kg
TOTAL OCTACHLORO	0 ug/kg
TOTAL NONACHLORO	0 ug/kg

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-03 ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
TOTAL DECACHLORO	0 ug/kg			
TOTAL PCB	0 ug/kg			
TOTAL TEQ	**0.00** ug/kg		TEQ (DL/2)	**0.05** ug/kg

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	16101510-03MS %Recovery
PCB-1	68.7
PCB-3	69.0
PCB-4/10	71.6
PCB-15	69.3
PCB-19	68.5
PCB-37	67.3
PCB-54	68.2
PCB-104	78.1
PCB-81	68.4
PCB-77	70.4
PCB-155	71.8
PCB-107/123	67.4
PCB-118	66.1
PCB-114	67.5
PCB-105	65.9
PCB-126	67.2
PCB-167	64.9
PCB-156	68.2
PCB-157	66.2
PCB-169	69.7
PCB-188	66.9
PCB-202	65.9
PCB-189	67.0
PCB-205	68.3
PCB-208	70.0
PCB-206	76.5
PCB-209	64.7

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Sample #	16101510-01	16101510-02	16101510-03	16101510-03MS	
Surrogate	**% Recovery**	**% Recovery**	**% Recovery**	**% Recovery**	**Limits**
13C-PCB-1	85.8	67.3	82.3	68.3	25-150
13C-PCB-3	87.5	70.3	86.6	77.0	25-150
13C-PCB-4/10	88.3	69.4	87.2	77.9	25-150
13C-PCB-15	91.7	73.3	90.4	89.3	25-150
13C-PCB-19	78.0	61.5	74.2	75.0	25-150
13C-PCB-37	99.2	82.6	102.9	98.3	25-150
13C-PCB-54	85.5	66.1	85.4	84.6	25-150
13C-PCB-81	106.2	87.5	112.0	101.2	25-150
13C-PCB-77	102.6	87.7	111.2	97.0	25-150
13C-PCB-104	73.8	56.4	70.3	67.3	25-150
13C-PCB-107/123	100.2	81.9	97.1	94.4	25-150
13C-PCB-114	98.4	79.0	96.5	94.6	25-150
13C-PCB-118	100.0	80.2	99.1	96.4	25-150
13C-PCB-105	99.8	79.7	95.4	94.4	25-150
13C-PCB-126	100.2	77.3	94.8	92.8	25-150
13C-PCB-155	88.1	68.9	85.4	84.8	25-150
13C-PCB-156	95.1	76.5	89.4	92.6	25-150
13C-PCB-157	86.3	79.9	92.4	88.7	25-150
13C-PCB-167	93.8	79.1	89.6	93.1	25-150
13C-PCB-169	90.7	74.8	86.5	85.0	25-150
13C-PCB-188	89.0	78.0	88.7	98.4	25-150
13C-PCB-189	94.0	77.0	97.4	90.1	25-150
13C-PCB-202	88.6	72.5	83.7	80.4	25-150
13C-PCB-205	96.9	67.4	94.6	89.3	25-150
13C-PCB-206	84.2	62.8	80.4	77.6	25-150
13C-PCB-208	91.3	71.5	92.0	83.1	25-150
13C-PCB-209	94.0	75.7	85.1	85.9	25-150
13C-PCB-9	95.0	97.9	96.7	103.7	30-135
13C-PCB-52	94.0	94.2	89.9	101.1	30-135
13C-PCB-101	97.1	103.4	101.8	105.2	30-135
13C-PCB-138	100.0	100.0	100.0	100.0	30-135
13C-PCB-194	87.7	91.6	87.8	91.1	30-135

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	BLANK ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-1	0.0	U	0.4	0.5
PCB-3	0.0	U	0.4	0.5
PCB-4/10	0.0	U	1.6	1.9
PCB-15	0.0	U	4.0	4.3
PCB-19	0.0	U	0.9	0.9
PCB-37	0.0	U	3.4	3.6
PCB-54	0.0	U	0.5	0.7
PCB-104	0.0	U	0.5	0.7
PCB-81	0.0	U	0.6	0.9
PCB-77	0.0	U	1.3	1.3
PCB-155	0.0	U	0.3	0.7
PCB-107/123	0.0	U	1.1	1.6
PCB-118	0.0	U	2.6	2.7
PCB-114	0.0	U	0.5	0.6
PCB-105	0.0	U	1.4	1.6
PCB-126	0.0	U	0.5	0.8
PCB-167	0.0	U	0.6	0.9
PCB-156	0.0	U	0.7	0.9
PCB-157	0.0	U	0.4	0.6
PCB-169	0.0	U	0.5	0.7
PCB-188	0.0	U	0.4	0.7
PCB-202	0.0	U	0.7	1.1
PCB-189	0.0	U	0.5	0.7
PCB-205	0.0	U	0.7	1.1
PCB-208	0.0	U	0.7	1.0
PCB-206	0.0	U	0.7	1.1
PCB-209	0.0	U	0.8	1.2
PCB-2	0.0	U	0.1	0.3
PCB-9/7	0.0	U	0.6	0.9
PCB-6	0.0	U	0.9	1.0
PCB-8/5	0.0	U	4.4	4.9

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	BLANK ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-14	0.0	U	0.1	0.2
PCB-11	0.0	U	13.0	13.0
PCB-12	0.0	U	0.1	0.3
PCB-13	0.0	U	0.3	0.4
PCB-30	0.0	U	0.1	0.2
PCB-18	0.0	U	5.9	5.9
PCB-17	0.0	U	2.6	2.8
PCB-27	0.0	U	0.4	0.6
PCB-24	0.0	U	0.2	0.3
PCB-16	0.0	U	1.3	2.5
PCB-32	0.0	U	1.3	2.5
PCB-34	0.0	U	0.1	0.4
PCB-23	0.0	U	0.1	0.3
PCB-29	0.0	U	0.2	0.5
PCB-26	0.0	U	1.6	2.1
PCB-25	0.0	U	0.5	0.5
PCB-31	0.0	U	4.9	5.0
PCB-28	0.0	U	7.0	7.0
PCB-33/20/21	0.0	U	4.3	4.3
PCB-22	0.0	U	2.3	2.4
PCB-36	0.0	U	0.1	0.2
PCB-39	0.0	U	0.1	0.2
PCB-38	0.0	U	0.1	0.2
PCB-35	0.0	U	1.0	1.0
PCB-50	0.0	U	0.6	0.9
PCB-53	0.0	U	1.6	2.0
PCB-51	0.0	U	1.1	1.4
PCB-45	0.0	U	2.3	2.7
PCB-46	0.0	U	1.2	1.5
PCB-73	0.0	U	0.6	0.9
PCB-69	0.0	U	0.7	1.0
PCB-52/43	0.0	U	10.9	14.1

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Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	BLANK ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-49	0.0	U	6.7	7.5
PCB-48	0.0	U	3.4	4.2
PCB-75/47/65	0.0	U	4.5	5.5
PCB-62	0.0	U	0.5	0.9
PCB-44	0.0	U	7.8	10.1
PCB-59	0.0	U	1.4	2.0
PCB-42	0.0	U	4.8	5.8
PCB-71	0.0	U	2.8	3.4
PCB-41/72	0.0	U	2.7	3.8
PCB-68/64	0.0	U	5.8	6.9
PCB-40	0.0	U	2.2	3.0
PCB-57	0.0	U	0.2	0.6
PCB-58/67	0.0	U	0.4	1.0
PCB-96	0.0	U	0.6	0.9
PCB-103	0.0	U	0.7	1.0
PCB-100	0.0	U	0.6	0.8
PCB-94	0.0	U	0.4	0.6
PCB-63	0.0	U	0.8	1.4
PCB-61	0.0	U	0.8	1.4
PCB-76/74	0.0	U	2.4	3.7
PCB-70	0.0	U	4.0	5.3
PCB-66	0.0	U	3.6	4.5
PCB-80	0.0	U	0.2	0.6
PCB-55	0.0	U	0.2	0.6
PCB-56	0.0	U	1.8	2.5
PCB-60	0.0	U	1.1	1.4
PCB-79	0.0	U	0.5	0.7
PCB-78	0.0	U	0.5	0.8
PCB-102	0.0	U	0.7	0.8
PCB-98	0.0	U	0.5	0.7
PCB-93	0.0	U	0.7	0.9
PCB-95/121	0.0	U	3.8	4.1

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Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	BLANK ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-88	0.0	U	1.0	1.0
PCB-91	0.0	U	1.3	1.6
PCB-92	0.0	U	0.8	1.0
PCB-89	0.0	U	0.9	1.2
PCB-84	0.0	U	0.2	0.5
PCB-90	0.0	U	0.3	0.5
PCB-113/101	0.0	U	2.3	2.9
PCB-99	0.0	U	1.2	1.6
PCB-119	0.0	U	0.5	0.7
PCB-83/112	0.0	U	0.4	1.1
PCB-108	0.0	U	0.1	0.4
PCB-125	0.0	U	0.3	0.5
PCB-86	0.0	U	0.1	0.5
PCB-97	0.0	U	1.2	1.6
PCB-116/117/111	0.0	U	1.4	1.8
PCB-87/115	0.0	U	1.3	1.7
PCB-85	0.0	U	1.1	1.3
PCB-120	0.0	U	0.2	0.6
PCB-110	0.4	< LOD	2.8	3.1
PCB-82	0.0	U	0.8	1.0
PCB-150	0.0	U	0.2	0.6
PCB-152	0.0	U	0.6	0.9
PCB-145	0.0	U	0.2	0.7
PCB-148	0.0	U	0.7	0.9
PCB-136	0.0	U	1.0	1.6
PCB-154	0.0	U	0.7	1.0
PCB-151	0.0	U	1.5	1.8
PCB-135	0.0	U	1.0	1.1
PCB-143	0.0	U	1.0	1.3
PCB-140	0.0	U	0.5	1.0
PCB-124	0.0	U	0.6	1.0
PCB-109	0.0	U	0.4	0.6

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Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	BLANK ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-106	0.0	U	0.5	0.8
PCB-122	0.0	U	0.7	1.1
PCB-127	0.0	U	0.4	0.6
PCB-149	0.0	U	3.4	3.5
PCB-139	0.0	U	0.6	0.8
PCB-147/144	0.0	U	1.2	1.5
PCB-134	0.0	U	0.8	1.0
PCB-142/133/131	0.0	U	0.0	2.8
PCB-165	0.0	U	0.3	0.7
PCB-146	0.0	U	0.7	0.9
PCB-161	0.0	U	0.6	0.8
PCB-168	0.0	U	0.1	0.5
PCB-153/132	0.0	U	3.4	3.8
PCB-141	0.0	U	0.9	1.1
PCB-137	0.0	U	0.6	0.8
PCB-130	0.0	U	0.7	1.0
PCB-164	0.0	U	0.4	0.7
PCB-163/138	0.0	U	2.6	3.0
PCB-160/158	0.0	U	0.7	1.5
PCB-129	0.0	U	0.8	1.1
PCB-166	0.0	U	0.6	0.8
PCB-159	0.0	U	0.5	0.7
PCB-162/128	0.0	U	1.0	1.3
PCB-184	0.0	U	0.3	0.6
PCB-179	0.0	U	0.6	0.8
PCB-176	0.0	U	0.7	0.9
PCB-186	0.0	U	0.3	0.5
PCB-178	0.0	U	0.6	0.8
PCB-175/182	0.0	U	1.0	1.3
PCB-187	0.0	U	0.7	0.8
PCB-183	0.0	U	0.7	0.9
PCB-185	0.0	U	0.5	0.7

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Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	BLANK ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
PCB-174	0.0	U	0.7	0.9
PCB-181	0.0	U	0.3	0.6
PCB-177	0.0	U	0.6	0.9
PCB-171	0.0	U	0.6	0.8
PCB-173	0.0	U	0.4	0.6
PCB-172	0.0	U	0.4	0.6
PCB-192	0.0	U	0.2	0.4
PCB-180/193	0.0	U	1.0	1.3
PCB-191	0.0	U	0.5	0.7
PCB-170	0.0	U	0.5	0.8
PCB-190	0.0	U	0.5	0.7
PCB-201	0.0	U	1.4	2.2
PCB-204	0.0	U	1.3	1.9
PCB-197	0.0	U	0.9	1.4
PCB-200	0.0	U	1.4	2.1
PCB-198	0.0	U	1.2	1.9
PCB-199	0.0	U	0.9	1.4
PCB-196	0.0	U	1.0	1.6
PCB-203	0.0	U	0.5	1.2
PCB-195	0.0	U	1.5	2.2
PCB-194	0.0	U	1.5	2.2
PCB-207	0.0	U	1.3	1.9

TOTAL MONOCHLORO	0 ng/kg
TOTAL DICHLORO	0 ng/kg
TOTAL TRICHLORO	0 ng/kg
TOTAL TETRACHLORO	0 ng/kg
TOTAL PENTACHLORO	0 ng/kg
TOTAL HEXACHLORO	0 ng/kg
TOTAL HEPTACHLRO	0 ng/kg

SUMMIT
ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

Extraction Date: 11/21/2016 **Batch #** PCB-132
Analysis Date: 12/13/2016 **Instrument:** HRMS-1
Method 1668B LOD = 2015_Q4
Analyst AJG LOQ = 2015_Q4

Analyte	BLANK ug/kg	Qualifier	Adj. LOD (ug/kg)	Adj. LOQ (ug/kg)
TOTAL OCTACHLORO	0 ng/kg			
TOTAL NONACHLORO	0 ng/kg			
TOTAL DECACHLORO	0 ng/kg			
TOTAL PCB	0 ng/kg			
TOTAL TEQ	**0.00** ng/kg	TEQ (DL/2)		**0.03** ng/kg

"Analytical Integrity" · EPA Certified · NELAP Certified
3310 Win Street · Cuyahoga Falls, Ohio 44223 • Phone: 330-253-8211 · Fax: 330-253-4489
Web Site: www.settek.com

SUMMIT
ENVIRONMENTAL TECHNOLOGIES, INC.
Analytical Laboratories

Extraction Date: 11/21/2016
Analysis Date: 12/13/2016
Method 1668B
Analyst AJG

Batch # PCB-132
Instrument: HRMS-1
LOD = 2015_Q4
LOQ = 2015_Q4

Analyte	LCS-132 % Recovery	LCSD-132 % Recovery	RPD
PCB-1	72.8	114.8	44.8%
PCB-3	70.0	112.8	46.8%
PCB-4	67.7	119.2	55.1%
PCB-15	66.3	116.7	55.0%
PCB-19	66.9	119.9	56.8%
PCB-37	67.0	115.6	53.3%
PCB-54	67.1	119.3	56.0%
PCB-104	65.4	116.3	56.1%
PCB-81	65.0	114.3	55.0%
PCB-77	66.3	119.1	56.9%
PCB-155	59.2	120.7	68.3%
PCB-123	63.6	115.4	57.9%
PCB-118	60.9	112.9	59.8%
PCB-114	64.9	117.4	57.6%
PCB-105	64.6	115.2	56.2%
PCB-126	64.2	113.6	55.6%
PCB-167	63.1	110.3	54.5%
PCB-156	63.0	116.7	59.7%
PCB-157	60.0	119.8	66.6%
PCB-169	63.8	124.1	64.2%
PCB-188	58.2	121.7	70.6%
PCB-202	62.0	114.9	59.9%
PCB-189	64.4	110.7	52.9%
PCB-205	62.7	115.1	59.0%
PCB-208	67.2	119.4	55.9%
PCB-206	68.4	125.2	58.6%
PCB-209	57.5	107.5	60.7%

Analysis Request / Chain of Custody

 SET No

Client Name	Project Identification
Hydrodec of North America	Demo 2016
Client Address	Project Address
2021 Steinway BLVD SE Canton Ohio 44707	2021 Steinway BLVD SE Canton Ohio 44707
Client Phone	Report To
330 454 8202 ext 119	john.burkhart@hydrodec.com
Client Fax No ☐ to Receive Results by Fax	PO Number
n/a	2770
Contact Person	Quote Number
John Burkhart	Mo Osman Email
Sampled By	☐
See Hydrodec Labroratory Log	

#	Sample Identification	Date Collected	Time Collected	Grab	Composite	Matrix: S=Solid, L=Liquid, O=Oil SL=Sludge, A=Air	Preservative	Number of Containers	Analytical Parameters and Methods: EPA Method 1668 congerner
1	D-1-CT-06-DEMO 1609013	09/20/16	4:05PM	X		O	None	1	x
2	D-1-CT-06-DEMO 1609038	09/21/16	2:50PM	X		O	None	1	x
3	D-1-CT-06-DEMO 1609064	09/22/16	3:55PM	x		O	None	1	x

16101510-001 003 4L

Relinquished by:	Date	Time	Received by:	Date	Time
	10-27-16	8:45AM		10/27/16	8:45
Received in Lab by:	**Date**	**Time**	**Rush Requested:** ____ Day(s)		
	10-27-16	940	Must be approved by Lab Manager		

Notes / Comments:
Return all retains to Hydrodec of North America

DC-7
Rev. 16

Effective Date: 07/14/15

Summit Environmental Technologies, Inc.
Cooler Receipt Form

Initials of person inspecting cooler and samples: CSL

Client: Hydrodec

Order Number: 161015.10

Date Received: 10.27 Time Received: 940 Date cooler(s) opened and samples inspected: 10.27

Number of Coolers/Boxes: _____ N/A

Shipper: FED EX UPS DHL Airborne US Postal Walk-in (Pickup) Other: _____

Packaging: Peanuts (Bubble Wrap) Paper Foam None Other: _____

Tape on cooler/box:	Y	(N)	N/A
Custody Seals intact	Y	N	(N/A)
C-O-C in plastic	Y	(N) CSL	N/A
Ice_____ Blue ice _____	present / absent / melted		(N/A)
Sample Temperature IR Gun #16020459 CF 0.0 °C	9.0 °C		N/A
Radiological Testing Instrument serial #35127 (see page 2 for scan results)	Y	N	(N/A)

****Use 1 sheet per sample for Radiological Testing. If sample is HOT, the Radiological Safety Officer must be notified immediately.**

C-O-C filled out properly	(Y)	N	N/A
Samples in separate bags	(Y)	N	N/A
Sample containers intact*	(Y)	N	N/A

*If no, list broken sample(s): _____

Sample label(s) complete (ID, date, etc.)	(Y)	N	N/A
Label(s) agree with C-O-C	(Y)	N	N/A
Correct containers used	(Y)	N	N/A
Sufficient sample received	(Y)	N	N/A
Samples received within holding time	(Y)	N	
Bubbles absent from 40 mL vials**	Y	N	(N/A)

** Samples with bubbles <6mm are acceptable. Indicate bubble size if >6mm. _____

Was client contacted about samples	Y	N
Will client send new samples	Y	N

Client contact: _____

Date/Time: _____

Logged in by: _____

Comments: _____

Page 1 of 2

Analysis Request / Chain of Custody

Page 1 of 1 SET No.

Client Name	Project Identification
Hydrodec of North America	Demo 2016
Client Address	**Project Address**
2021 Steinway BLVD SE Canton Ohio 44707	2021 Steinway BLVD SE Canton Ohio 44707
Client Phone	**Report To**
330 454 8202 ext 119	john.burkhart@hydrodec.com
Client Fax No. √ to Receive Results by Fax ☐	**PO Number** 2770
n/a	
Contact Person	**Quote Number**
John Burkhart	Mo Osman Email
Sampled By	☐
See Hydrodec Labroratory Log	

#	Sample Identification	Date Collected	Time Collected	Grab	Composite	Matrix: S=Solid, L=Liquid, O=Oil SL=Sludge, A=Air	Preservative	Number of Containers	Analytical Parameters and Methods: EPA Method 1668 congerner
1	D-1-CT-06-DEMO 1609013	09/20/16	4:05PM	X		O	None	1	x
2	D-1-CT-06-DEMO 1609038	09/21/16	2:50PM	X		O	None	1	x
3	D-1-CT-06-DEMO 1609064	09/22/16	3:55PM	x		O	None	1	x

Relinquished by:	Date	Time	Received by:	Date	Time
	10-27-16	8:45Am		10/27/16	8:45

Received in Lab by:	Date	Time

Rush Requested: _____ **Day(s)**
Must be approved by Lab Manager

Notes / Comments:
Return all retains to Hydrodec of North America

Analysis Request / Chain of Custody

Page 1 of 1 SET No.

Client Name	Project Identification
Hydrodec	Demo 2016
Client Address	**Project Address**
2021 Steinway BLVD SE Canton Ohio 44707	2021 Steinway BLVD SE Canton Ohio 44707
Client Phone	**Report To**
330 454 8202 ext 119	John.Burkhart@hydrodec.com
Client Fax No √ to Receive Results by Fax ☐	**PO Number**
n/a	
Contact Person	**Quote Number**
John Burkhart	Dr Osman Email
Sampled By	☐
See Hydrodec Laboratory Log	

#	Sample Identification			Date Collected	Time Collected	Grab	Composite	Matrix: S=Solid, L=Liquid, O=Oil SL=Sludge, A=Air	Preservative	Number of Containers	Analytical Parameters and Methods: PCBS METHOD EPA 8082
1	DEMO1609005	P2	D-1-PT-04B	9/20/16	1:20PM	x		O	NONE	1	X
2	DEMO1609007	3-TK-005	D-1-FE-04B	9/20/16	1:20PM	x		O	NONE	1	X
3	DEMO1609009	3-RA-123	D-1-CO-04B	9/20/16	1:40PM	x		O	NONE	1	X
4	DEMO1609021	3-TK-001	D-F1-FE-09B	9/21/16	1:35AM	x		O	NONE	1	X
5	DEMO1609023	3-RA-123	D-F1-CO-09B	9/21/16	1:35AM	x		O	NONE	1	X
6	DEMO1609031	P2	D-2-PT-04B	9/21/16	11:45AM	x		O	NONE	1	X
7	DEMO1609033	3-TK-005	D-2-FE-04B	9/21/16	11:45AM	x		O	NONE	1	X
8	DEMO1609035	3-RA-123	D-2-CO-04B	9/21/16	12:12AM	x		O	NONE	1	X
9	DEMO1609047	3-TK-001	D-F2-FE-09B	9/21/16	12:05AM	x		O	NONE	1	X
10	DEMO1609049	3-RA-123	D-F2-CO-09B	9/21/16	12:05AM	x		O	NONE	1	X
11	DEMO1609057	P2	D-3-PT-04B	9/22/16	1:05PM	x		O	NONE	1	X
12	DEMO1609059	3-TK-005	D-3-FE-04B	9/22/16	1:05PM	x		O	NONE	1	X
13	DEMO1609061	3-RA-123	D-3-CO-04B	9/22/16	1:35PM	x		O	NONE	1	X
14	DEMO1609073	3-TK-001	D-F3-FE-09B	9/23/16	1:20AM	x		O	NONE	1	X
15	DEMO1609075	3-RA-123	D-F3-CO-09B	9/23/16	1:20AM	x		O	NONE	1	X

Relinquished by:	Date	Time	Received by:	Date	Time
	10-27-16	8:45AM		10/27/16	8:45

Received in Lab by:	Date	Time

Rush Requested: _____ **Day(s)**
Must be approved by Lab Manager

Notes / Comments:
Return all retains to Hydrodec of North America

Appendix E

Crystal Laboratories Analytical Data

1201 Camden Ave, SW * Canton, Ohio 44706
Phone No: 330-454-4222

Laboratory No. 160926414 **Customer:** Hydrodec
2021 Steinway Blvd. SE
Date Received: 09/26/16 Canton, OH 44707
Date Sampled: 09/20/16
Time Sampled: 4:00 pm
Project Name: Demo 2016
Identification: D-1-WW-06 Demo 1609014
Sample Matrix: Water

Analysis	Method	Results	Detection Limits	Date of Analysis
PCB	EPA 608	0.3 ug/l	0.1 ug/l	09/27/16
(arochlor1260)		0.3 ug/l	0.1 ug/l	09/27/16
(arochlor1221)		<0.1 ug/l	0.1 ug/l	09/27/16
(arochlor1254)		<0.1 ug/l	0.1 ug/l	09/27/16
(arochlor1248)		<0.1 ug/l	0.1 ug/l	09/27/16
(arochlor1242)		<0.1 ug/l	0.1 ug/l	09/27/16
(arochlor1232)		<0.1 ug/l	0.1 ug/l	09/27/16
(arochlor1016)		<0.1 ug/l	0.1 ug/l	09/27/16

Approved By: *Ron Jack*

1201 Camden Ave, SW * Canton, Ohio 44706
Phone No: 330-454-4222

Laboratory No. 160926415 **Customer:** Hydrodec
2021 Steinway Blvd. SE
Date Received: 09/26/16 Canton, OH 44707
Date Sampled: 09/21/16
Time Sampled: 2:41 pm
Project Name: Demo 2016
Identification: D-2-WW-06 Demo 1609040
Sample Matrix: Water

Analysis	Method	Results	Detection Limits	Date of Analysis
PCB	EPA 608	<0.1 ug/l	0.1 ug/l	09/27/16
(arochlor1260)		<0.1 ug/l	0.1 ug/l	09/27/16
(arochlor1221)		<0.1 ug/l	0.1 ug/l	09/27/16
(arochlor1254)		<0.1 ug/l	0.1 ug/l	09/27/16
(arochlor1248)		<0.1 ug/l	0.1 ug/l	09/27/16
(arochlor1242)		<0.1 ug/l	0.1 ug/l	09/27/16
(arochlor1232)		<0.1 ug/l	0.1 ug/l	09/27/16
(arochlor1016)		<0.1 ug/l	0.1 ug/l	09/27/16

Approved By: *Ron Jack*

1201 Camden Ave, SW * Canton, Ohio 44706
Phone No: 330-454-4222

Laboratory No. 160926416 **Customer:** Hydrodec
2021 Steinway Blvd. SE
Date Received: 09/26/16 Canton, OH 44707
Date Sampled: 09/22/16
Time Sampled: 3:47 pm
Project Name: Demo 2016
Identification: D-3-WW-06 Demo 1609066
Sample Matrix: Water

Analysis	Method	Results	Detection Limits	Date of Analysis
PCB	EPA 608	<0.1 ug/l	0.1 ug/l	09/27/16
(arochlor1260)		<0.1 ug/l	0.1 ug/l	09/27/16
(arochlor1221)		<0.1 ug/l	0.1 ug/l	09/27/16
(arochlor1254)		<0.1 ug/l	0.1 ug/l	09/27/16
(arochlor1248)		<0.1 ug/l	0.1 ug/l	09/27/16
(arochlor1242)		<0.1 ug/l	0.1 ug/l	09/27/16
(arochlor1232)		<0.1 ug/l	0.1 ug/l	09/27/16
(arochlor1016)		<0.1 ug/l	0.1 ug/l	09/27/16

Approved By: *Ron Jack*

Crystal Lab

Analysis Request / Chain of Custody

Page 1 of 1 SET No.

Client Name	Project Identification
Hydrodec	~~Hydrodec Testing~~ DEMO 2016
Client Address	**Project Address**
2021 Steinway BLVD SE Canton Ohio 44707	2021 Steinway BLVD SE Canton Ohio 44707
Client Phone	**Report To**
330 454 8202 ext 119	john.burkhart@hydrodec.com
Client Fax No. ☑ to Receive Results by Fax ☐	**PO Number**
n/a	
Contact Person	**Quote Number**
John Burkhart	
Sampled By	☐
John Burkhart	

#	Sample Identification	Date Collected	Time Collected	Grab	Composite	Matrix: S= Solid, L= Liquid, O= Oil SL= Sludge, A= Air	Preservative	Number of Containers	Analytical Parameters and Methods: PCB
	D-1-WW-06 DEMO 160914	9.20.16	4:00pm	✓		L	N/A	1	✓
	D-2-WW-06 DEMO 160940	9.21.16	2:41 pm	✓		L	N/A	1	✓
	D-3-WW-06 DEMO 160966	9.22.16	3:47pm	✓		L	N/A	1	✓

Relinquished by:	Date	Time	Received by:	Date	Time
Aron Mallory	4.26.16	4:40pm			
				4-26-16	4:40pm

Received in Lab by:	Date	Time	Rush Requested: _____ Day(s)
			Must be approved by Lab Manager

Notes / Comments:

Appendix F

Process Data

Process Data Summary for the Demonstration Test runs:

Log Date		Plant 3 Inside Operator Shift Log							
20/09/2016									
Tag No.	Description	Units	10:30 AM	11:30 AM	12:30 PM	1:30 PM	2:30 PM	3:30 PM	**Average**
Reactor 2: 3-RA-123									
FI-02103	PU-021 Charge Pump Feed Rate	kg/hr	650.11	650.82	650.12	650.53	650.25	650.22	**650.34**
FI-02303	PU-023 Scavenger Feed Rate	SP & kg/hr	5.57	5.55	5.93	5.48	5.54	5.47	**5.59**
FI-02404	PU-024 Quench Water Feed Rate	SP & kg/hr	83.78	84.24	79.93	78.64	77.68	81.67	**80.99**
FI-12702	Hydrogen Flow Rate	kg/hr	20.13	20.18	20.19	20.40	20.63	20.43	**20.33**
TI-12307/8	Ra-123 Reactor Average Temperat	°C	305.84	305.16	304.92	305.17	305.35	305.28	**305.29**
PI-12303B	RA-123 Reactor Outlet Pressure	kPa	3420.09	3420.87	3420.13	3418.93	3420.41	3420.30	**3420.12**
Stage 2: Recycle Gas									
PI-20105	VE-201 Pressure	kPa	3098.71	3099.72	3093.41	3099.92	3099.36	3098.43	**3098.26**

Log Date		Plant 3 Inside Operator Shift Log							
21/09/2016									
Tag No.	Description	Units	9:30 AM	10:30 AM	11:30 AM	12:30 PM	1:30 PM	2:30 PM	**Average**
Reactor 2: 3-RA-123									
FI-02103	PU-021 Charge Pump Feed Rate	kg/hr	699.99	700.59	700.34	701.14	699.89	699.90	**700.31**
FI-02303	PU-023 Scavenger Feed Rate	SP & kg/hr	6.28	6.27	2.19	2.63	2.55	2.02	**3.66**
FI-02404	PU-024 Quench Water Feed Rate	SP & kg/hr	60.31	58.57	75.43	60.88	68.92	67.36	**65.24**
FI-12702	Hydrogen Flow Rate	kg/hr	20.31	19.78	20.03	19.99	20.36	20.38	**20.14**
TI-12307/8	Ra-123 Reactor Average Temperat	°C	303.92	303.25	304.16	305.52	305.82	305.93	**304.77**
PI-12303B	RA-123 Reactor Outlet Pressure	kPa	3418.71	3419.64	3419.41	3420.72	3419.66	3419.68	**3419.64**
Stage 2: Recycle Gas									
PI-20105	VE-201 Pressure	kPa	3095.96	3100.03	3100.85	3101.13	3098.70	3100.91	**3099.60**

Log Date		Plant 3 Inside Operator Shift Log							
22/09/2016									
Tag No.	Description	Units	9:30 AM	10:30 AM	11:30 AM	12:30 PM	1:30 PM	2:30 PM	**Average**
Reactor 2: 3-RA-123									
FI-02103	PU-021 Charge Pump Feed Rate	kg/hr	699.80	700.60	700.44	699.42	700.03	699.40	**699.95**
FI-02303	PU-023 Scavenger Feed Rate	SP & kg/hr	3.01	2.13	1.91	3.03	1.81	2.02	**2.32**
FI-02404	PU-024 Quench Water Feed Rate	SP & kg/hr	69.56	56.54	63.36	66.66	62.47	66.50	**64.18**
FI-12702	Hydrogen Flow Rate	kg/hr	21.32	20.94	20.73	19.34	19.62	19.35	**20.22**
TI-12307/8	RA-123 Reactor Average Tempera	°C	304.69	306.00	305.41	305.44	305.45	305.34	**305.39**
PI-12303B	RA-123 Reactor Outlet Pressure	kPa	3419.80	3419.44	3420.48	3419.80	3419.48	3421.29	**3420.05**
Stage 2: Recycle Gas									
PI-20105	VE-201 Pressure	kPa	3094.96	3099.89	3097.98	3099.12	3100.04	3099.39	**3098.56**

Full process operational data is contained in the following pages.

Log Date	Plant 3 Insi
20/09/2016	

Tag No.	Description	Units	Limits	12:30 AM	1:30 AM	2:30 AM	3:30 AM	4:30 AM	5:30 AM	6:30 AM	7:30 AM	8:30 AM	9:30 AM
Reactor 2: 3-RA-123													
FI-02103	PU-021 Charge Pump Feed Rate	kg/hr		599.85	600.08	599.99	599.89	599.96	599.71	599.68	599.90	600.58	650.55
FI-02303	PU-023 Scavenger Feed Rate	SP & kg/hr		2.50	1.82	2.59	2.50	2.03	2.64	2.59	1.61	1.66	2.59
	RA-123 Scavenger Level		80-120	Record times and scavenger concentrations here:									
FI-02404	PU-024 Quench Water Feed Rate	SP & kg/hr		60.17	58.84	47.14	60.01	56.60	38.57	45.64	41.93	61.44	42.18
FI-12702	Hydrogen Flow Rate	kg/hr		27.12	26.80	26.91	27.17	27.11	27.11	27.01	27.15	27.05	26.46
PI-12705	VE-127 H2 Accumulator Pressure	kPa		3500.84	3502.69	3501.00	3501.11	3500.21	3500.00	3498.69	3501.19	3498.57	3499.43
TI-12307/8	Ra-123 Reactor Average Temperature	°C		305.47	305.24	305.21	305.23	305.32	305.19	305.15	305.09	305.12	305.10
LI-12306	Ra-123 Reactor Level	%	15	14.71	14.79	15.17	14.79	15.23	15.37	14.93	14.77	15.11	14.69
PI-12303B	RA-123 Reactor Outlet Pressure	kPa		3401.01	3401.54	3399.38	3400.31	3398.81	3399.19	3400.36	3400.75	3400.13	3401.02
DPI-12303	Ra-123 Reactor Differential Pressure	kPa		33.35	34.57	33.59	33.26	33.98	33.46	31.92	33.29	31.95	33.08
TI-12309	RA-123 Off-Gas Line Temperature	°C	140-150	142.67	142.32	142.12	142.68	143.03	142.64	142.07	142.31	142.52	142.44
DPI-12311	FL-123A/B Filter Differential Pressure	kPa		-0.95	-1.01	-0.98	-1.40	-0.36	-0.89	-1.16	-0.67	-1.02	-1.19
Buffer Tanks													
LI-00104	TK-001 Feed Oil Buffer Tank Level	%	30-70	66.78	50.59	38.27	67.43	50.34	33.21	61.26	44.42	55.46	55.75
LI-00204	TK-002 Clean Oil Buffer Tank Level	%	30-70	66.39	66.37	66.36	66.32	66.31	66.30	66.31	66.27	66.27	66.27
LI-00304	TK-003 Scavenger Buffer Tank Level	%	40-85	58.40	56.65	86.36	85.03	83.38	81.69	80.18	78.53	76.78	75.10
LI-00404	TK-004 Quench Water Buffer Tank Level	%	30-85	36.08	76.27	59.85	48.47	39.12	30.31	65.35	51.38	41.47	32.67
Stage 2: Recycle Gas													
PI-20105	VE-201 Pressure	kPa		3101.74	3102.32	3099.75	3097.92	3099.10	3099.43	3100.57	3098.25	3101.53	3100.19
LI-20102	VE-201 Level	%	25	24.96	24.96	24.95	25.03	25.04	25.03	25.01	24.99	25.02	25.05
TI-20104	VE-201 Temperature	°C		139.49	138.79	138.54	139.02	139.24	139.21	138.39	138.63	138.75	138.94
LI-21202	VE-212 Level	%	50	50.03	50.00	49.94	49.97	49.97	49.95	49.94	49.93	49.95	49.94
LI-21302	SC-213 Level (if online)	%	65-70	71.12	71.18	71.26	71.34	71.40	71.43	71.49	71.55	71.64	71.71
PI-21305	SC-213 Pressure (if online)	kPa		3077.33	3077.66	3075.38	3073.74	3074.51	3075.13	3076.39	3074.29	3076.89	3075.92
LI-21402	SC-214 Level (if online)	%	65-70	21.62	21.63	21.63	21.63	21.64	21.64	21.64	21.65	21.65	21.64
PI-21405	SC-214 Pressure (if online)	kPa		20.28	19.72	19.49	19.32	18.88	18.53	18.23	18.23	17.75	17.57
	Scrubber Caustic %	%	>2	Record times and caustic concentrations here:									
TI-21602	HX-216 Recycle Gas Temperature	°C		3.33	2.31	2.90	2.92	2.81	2.61	2.54	2.43	2.36	2.63
LI-21702	CN-217 Level	%	25	25.00	25.00	25.00	25.00	25.00	25.00	25.00	24.99	24.98	24.96
Stage 2: Condensate / Waste Water													
DPI-20108	FL-201A/B Filter Differential Pressure	kPa		-2.24	-2.44	-2.11	-2.49	-2.45	-2.44	-2.48	-2.46	-2.49	-2.49
LI-20201A	VE-202 Oil Level	%		87.96	87.96	88.02	87.96	88.08	87.97	87.99	87.96	88.00	87.98
LI-20201B	VE-202 Interface Level	%		19.97	20.04	20.06	19.98	19.97	20.15	19.94	19.98	19.97	20.06
PI-20202	VE-202 Pressure	kPa	300	301.64	296.29	297.88	301.06	299.04	295.40	297.35	297.03	300.42	296.49
DPI-20204	FL-202A/B Filter Differential Pressure	kPa		0.68	0.87	0.80	0.75	0.67	0.98	0.78	0.90	0.76	0.97
LI-22301	VE-223 Level	%	50	49.98	49.97	49.98	49.98	49.98	50.00	50.01	50.05	50.06	50.06
Stage 2: Vent System													
TI-23103	HX-231 Condensate Temperature	°C		10.16	9.34	9.29	9.27	8.95	8.64	8.48	8.12	8.49	9.80
LI-23201	VE-232 Level	%		50.00	49.98	49.99	49.99	49.99	49.99	49.99	50.00	50.00	50.07
LI-23301	SC-233 Level (if online)	%		11.71	11.70	11.70	11.69	11.68	11.68	11.67	11.67	11.67	11.68
PI-23302	SC-233 Pressure (if online)	kPa		-5.02	-5.03	-5.03	-5.03	-5.03	-5.03	-5.03	-5.02	-5.02	-5.03
LI-23401	SC-234 Level (if online)	%		67.13	67.13	67.13	67.13	67.13	67.12	67.12	67.12	67.12	67.11
PI-23402	SC-234 Pressure (if online)	kPa		21.33	21.25	21.37	21.35	21.05	21.25	20.98	20.93	21.22	22.04
	Scrubber Cautic %	%	>2	Record times and caustic concentrations here:									
Stage 2: Reacted Oil Before Degassing													
LI-20302	VE-203 Level	%	50	50.05	50.03	50.02	50.02	50.00	50.02	50.03	50.01	49.99	50.04
TI-20301	VE-203 Temperature	°C		193.80	194.33	193.77	194.13	194.29	193.78	193.48	193.61	193.37	193.79
PI-20307	VE-203 Pressure	kPa	150	149.89	149.86	150.10	150.17	150.50	150.14	150.10	150.46	150.32	149.31
DPI-20303	FL-203A/B Differential Pressure	kPa		1.10	0.86	1.03	1.00	1.17	2.03	2.83	1.02	1.00	1.05
FI-20312	Oil Flow Rate to LVD-500	kg/hr		652.95	650.20	631.40	708.76	702.16	670.92	572.65	684.48	663.47	701.16
TI-20401	Oil Temperature to LVD-500	°C		85.01	85.09	85.37	85.56	84.61	83.86	83.47	85.38	85.29	85.29
Degassing: LVD-500													
TE-24401	Oil Inlet Temperature	°C		80.56	80.27	80.53	80.34	80.10	79.93	80.10	79.86	80.14	80.58
VI-25101	Vacuum Level in Chamber	Torr		55.64	55.69	55.33	55.65	55.19	54.79	55.11	54.31	54.21	53.89
LI-24506	Oil Level	inches		12.79	13.04	12.80	13.06	13.07	13.07	13.08	13.08	13.08	13.39
PU-246_SPD	Oil Pump Speed	%		33.46	32.29	30.32	42.50	37.79	43.29	29.93	35.82	34.64	45.64
Stage 2: Reacted Oil After Degassing													
FI-30201	Oil Rate from LVD-500	kg/hr		605.78	560.29	521.52	804.67	694.57	821.85	500.66	645.55	618.37	862.20
FI-30202	Wash Water Flow Rate	kg/hr		52.87	49.60	51.55	53.43	52.65	50.32	48.71	49.65	49.53	50.27
LI-30204B	VE-302 Interface Level	%		4.99	4.92	5.02	4.92	4.98	5.01	5.01	5.02	5.10	5.01
LI-30306	VE-303 Level	%	50	49.96	50.03	50.03	50.06	50.05	50.05	50.02	50.03	50.03	50.06
LI-30305	Oil Flow Rate to TORS-2000	kg/hr		694.64	660.66	671.77	659.28	665.73	636.77	671.03	649.86	650.48	634.79
DPI-30304	FL-303A/B Filter Differential Pressure	kPa		12.61	12.18	12.45	12.30	12.50	11.96	12.75	12.39	12.47	12.26
DPI-32104	FL-321A/B Filter Differential Pressure	kPa		6.64	6.47	7.13	6.80	7.13	7.49	6.94	7.18	7.09	8.04

ide Operator Shift Log

10:30 AM	11:30 AM	12:30 PM	1:30 PM	2:30 PM	3:30 PM	4:30 PM	5:30 PM	6:30 PM	7:30 PM	8:30 PM	9:30 PM	10:30 PM	11:30 PM
650.11	650.82	650.12	650.53	650.25	650.22	599.66	599.73	599.61	600.18	599.77	600.35	600.49	600.11
5.57	5.55	5.93	5.48	5.54	5.47	2.86	6.77	6.49	6.64	6.70	6.62	6.54	6.61
83.78	84.24	79.93	78.64	77.68	81.67	60.71	55.79	51.34	65.15	59.61	57.29	44.33	51.45
20.13	20.18	20.19	20.40	20.63	20.43	21.09	21.28	20.81	21.54	21.13	21.13	21.30	21.14
3500.56	3499.55	3498.85	3499.70	3501.30	3500.72	3500.35	3499.67	3498.98	3499.43	3499.07	3501.16	3500.26	3498.89
305.84	305.16	304.92	305.17	305.35	305.28	305.07	304.81	305.20	305.64	305.82	305.95	306.00	305.67
15.12	14.88	14.87	15.01	15.01	14.96	14.88	15.02	15.12	15.12	14.87	14.96	15.13	15.11
3420.09	3420.87	3420.13	3418.93	3420.41	3420.30	3420.45	3420.43	3419.28	3419.71	3420.35	3420.29	3419.24	3419.04
27.95	25.39	25.81	27.36	27.04	27.95	25.79	24.35	25.27	24.44	24.08	25.63	26.05	25.33
134.33	133.42	133.63	133.17	134.03	133.55	138.92	144.47	143.07	144.04	144.33	142.84	143.57	143.71
-0.17	-0.52	-0.55	-0.67	-0.32	-0.50	-0.79	-1.02	-0.77	-0.68	-0.72	-0.74	-0.51	-0.52
53.52	64.00	31.35	41.83	52.45	62.75	64.01	54.78	37.61	65.54	48.38	31.28	65.39	48.16
66.27	66.31	66.39	66.37	66.44	66.44	66.47	66.55	66.49	66.46	66.54	66.46	66.34	66.33
74.06	73.45	72.39	71.49	70.73	69.68	68.78	65.63	62.17	58.73	55.33	84.16	80.75	77.52
48.12	79.52	46.45	78.56	46.63	79.12	46.75	33.97	67.09	49.31	36.43	70.92	51.88	38.15
3098.71	3099.72	3093.41	3099.92	3099.36	3098.43	3097.21	3100.18	3101.05	3101.31	3099.22	3100.40	3100.39	3101.13
25.03	25.02	25.01	25.00	25.00	25.00	25.01	25.01	25.05	25.03	25.02	25.01	25.00	25.00
133.91	133.90	133.74	134.10	134.59	134.43	135.90	139.96	138.96	139.56	139.79	138.85	139.02	139.36
49.97	49.95	49.95	49.97	49.98	49.97	49.98	49.99	49.98	49.97	49.97	49.95	49.99	49.98
71.73	71.78	71.08	71.18	71.21	71.24	71.32	71.36	71.41	71.42	71.48	71.53	71.50	71.55
3077.66	3078.79	3072.86	3078.20	3077.96	3076.68	3075.34	3078.05	3078.55	3078.56	3077.13	3078.35	3078.41	3079.20
21.64	21.64	21.63	21.63	21.62	21.61	21.62	21.63	21.64	21.65	21.66	21.67	21.69	21.70
18.17	18.53	19.12	19.90	20.55	21.19	22.00	22.40	23.00	23.65	22.97	22.58	22.10	21.42
2.91	3.47	3.97	2.46	2.95	4.03	2.51	2.85	4.25	3.77	2.88	2.58	3.72	3.95
24.95	25.01	25.05	25.04	25.03	25.01	25.00	25.00	25.00	25.00	25.00	25.00	25.00	24.99
-2.04	-2.05	-2.47	-1.99	-2.07	-2.16	-2.44	-2.49	-2.45	-2.43	-2.50	-2.48	-2.49	-2.42
88.11	87.95	87.96	88.05	88.07	88.07	87.94	87.96	87.97	88.04	88.03	87.99	87.99	87.95
15.07	15.00	14.97	15.00	14.98	15.00	14.86	15.04	14.90	15.00	15.09	15.07	15.08	15.01
299.70	303.04	298.65	299.49	303.16	298.39	302.71	298.66	298.72	301.21	299.69	297.15	299.15	296.97
1.32	1.33	1.38	1.37	1.40	1.42	1.15	1.09	1.03	1.08	1.02	1.01	0.96	1.04
49.86	49.98	49.97	49.97	49.97	49.97	49.97	49.97	49.96	50.02	50.04	50.04	50.02	49.98
15.28	11.90	11.37	10.69	10.97	11.40	10.61	11.19	11.79	11.88	11.20	11.01	11.07	10.98
50.07	49.96	49.96	49.96	49.96	49.96	49.96	49.95	49.95	49.96	49.97	49.97	49.97	49.98
11.70	11.72	11.73	11.75	11.78	11.80	11.81	11.81	11.81	11.80	11.80	11.78	11.76	11.74
-5.03	-5.03	-4.80	-4.19	-3.70	-3.26	-2.88	-2.56	-2.29	-2.37	-2.90	-3.44	-4.01	-4.55
67.11	67.11	67.11	67.11	67.11	67.11	67.11	67.11	67.11	67.10	67.10	67.09	67.09	67.08
8.06	20.98	24.65	24.06	24.36	24.99	25.37	24.58	24.63	24.70	25.39	25.46	24.89	25.07
50.05	50.05	50.04	50.03	49.97	49.95	50.00	49.99	49.98	50.02	49.98	49.95	50.03	50.00
182.46	192.01	193.70	194.33	194.45	194.50	194.58	195.08	195.24	195.02	194.82	194.84	194.84	194.36
154.60	160.11	149.15	150.78	150.39	150.57	149.98	149.97	150.64	149.34	150.07	149.78	149.28	150.24
1.44	1.98	0.94	0.92	0.96	0.93	0.99	0.78	0.84	0.91	0.90	0.93	0.93	0.98
745.32	684.64	643.30	687.55	643.93	705.38	692.19	674.43	659.20	655.34	693.03	705.93	605.41	707.01
84.40	90.83	87.10	85.57	85.28	85.00	84.99	85.54	85.05	85.13	84.63	84.56	84.89	84.91
66.95	85.31	83.28	81.73	81.27	81.24	81.45	81.83	81.65	81.12	81.20	80.76	80.91	80.56
53.45	52.80	52.75	53.67	53.22	53.20	53.49	53.78	53.62	53.59	52.99	53.27	53.09	52.90
12.80	12.75	12.72	13.28	12.95	13.26	13.25	13.24	13.24	12.92	13.27	13.28	12.73	13.32
70.00	39.75	28.36	47.21	43.29	46.04	38.18	37.39	45.64	44.86	30.32	34.25	30.32	41.32
1515.48	763.11	486.45	888.88	820.60	863.23	684.91	658.83	869.00	857.12	486.66	579.24	516.16	765.09
57.71	54.28	51.99	47.59	51.58	46.76	44.00	44.62	49.60	54.25	38.72	46.66	51.83	43.00
5.42	5.16	5.06	5.17	5.02	4.98	5.00	5.01	4.93	5.02	5.01	5.01	5.01	5.01
48.48	49.94	49.97	49.99	50.04	49.94	49.97	50.04	49.95	49.96	49.92	50.04	50.03	49.95
109.28	677.97	697.40	626.88	665.86	608.50	622.56	626.50	633.44	670.72	602.77	654.63	684.22	609.66
2.90	13.31	12.86	11.26	12.07	11.03	11.38	11.43	11.42	12.09	11.22	12.20	12.84	11.53
10.98	8.22	6.92	8.60	7.52	8.00	7.56	7.28	7.67	8.27	7.50	6.61	7.24	7.84

Log Date	Plant 3 Insi
21/09/2016	

Tag No.	Description	Units	Limits	12:30 AM	1:30 AM	2:30 AM	3:30 AM	4:30 AM	5:30 AM	6:30 AM	7:30 AM	8:30 AM	9:30 AM
Reactor 2: 3-RA-123													
FI-02103	PU-021 Charge Pump Feed Rate	kg/hr		599.85	599.56	600.15	600.61	599.78	599.16	600.31	599.09	600.22	699.99
FI-02303	PU-023 Scavenger Feed Rate	SP & kg/hr		6.46	6.62	6.44	6.62	6.61	6.61	6.39	6.55	6.60	6.28
	RA-123 Scavenger Level		80-120	Record times and scavenger concentrations here:									
FI-02404	PU-024 Quench Water Feed Rate	SP & kg/hr		66.11	69.17	51.22	62.73	47.30	46.99	56.55	64.94	70.25	60.31
FI-12702	Hydrogen Flow Rate	kg/hr		21.08	21.28	21.07	21.04	21.45	21.56	21.26	21.37	21.31	20.31
PI-12705	VE-127 H2 Accumulator Pressure	kPa		3499.23	3501.57	3500.52	3500.74	3501.37	3498.39	3500.62	3501.52	3500.44	3499.41
TI-12307/8	Ra-123 Reactor Average Temperature	°C		305.64	305.64	305.57	305.55	305.43	305.25	305.32	305.32	305.25	303.92
LI-12306	Ra-123 Reactor Level	%	15	14.92	14.93	15.17	14.91	15.24	15.18	14.93	14.86	14.88	15.03
PI-12303B	RA-123 Reactor Outlet Pressure	kPa		3419.46	3420.51	3419.48	3419.20	3418.19	3418.90	3420.21	3420.70	3420.45	3418.71
DPI-12303	Ra-123 Reactor Differential Pressure	kPa		25.38	26.11	26.64	27.27	29.03	24.74	26.39	26.07	25.29	26.97
TI-12309	RA-123 Off-Gas Line Temperature	°C	140-150	142.52	142.53	143.44	142.39	142.61	142.97	143.20	142.96	142.84	138.41
DPI-12311	FL-123A/B Filter Differential Pressure	kPa		-0.65	-0.55	-0.49	-0.59	-0.49	-0.35	-0.78	-0.73	0.04	0.45
Buffer Tanks													
LI-00104	TK-001 Feed Oil Buffer Tank Level	%	30-70	30.98	58.86	41.71	69.96	52.68	35.61	63.89	47.00	34.32	44.99
LI-00204	TK-002 Clean Oil Buffer Tank Level	%	30-70	66.34	66.33	66.32	66.25	66.31	66.28	66.27	66.26	66.27	66.25
LI-00304	TK-003 Scavenger Buffer Tank Level	%	40-85	74.05	70.90	67.54	64.34	60.95	57.75	86.29	83.14	79.79	78.74
LI-00404	TK-004 Quench Water Buffer Tank Level	%	30-85	75.22	54.39	39.96	82.21	57.47	42.11	45.26	61.56	45.35	47.45
Stage 2: Recycle Gas													
PI-20105	VE-201 Pressure	kPa		3098.46	3098.93	3099.72	3097.57	3099.55	3101.61	3100.61	3098.88	3099.52	3095.96
LI-20102	VE-201 Level	%	25	25.00	25.00	25.00	25.00	25.01	25.01	25.04	25.05	25.04	25.04
TI-20104	VE-201 Temperature	°C		138.06	138.25	138.79	138.44	138.28	138.39	138.74	137.86	138.19	135.61
LI-21202	VE-212 Level	%	50	49.97	49.96	49.95	50.00	49.99	49.93	49.98	49.93	49.99	49.97
LI-21302	SC-213 Level (if online)	%	65-70	71.64	71.70	71.70	71.85	71.80	71.92	71.94	71.93	71.93	71.97
PI-21305	SC-213 Pressure (if online)	kPa		3076.97	3078.20	3079.87	3077.36	3079.06	3080.88	3080.40	3078.46	3079.35	3075.79
LI-21402	SC-214 Level (if online)	%	65-70	21.74	21.82	66.38	66.42	65.91	65.87	65.87	65.88	65.88	65.88
PI-21405	SC-214 Pressure (if online)	kPa		21.04	7.88	-0.10	-0.59	3071.10	3048.84	3040.35	3036.49	3034.30	3036.35
	Scrubber Caustic %	%	>2	Record times and caustic concentrations here:									
TI-21602	HX-216 Recycle Gas Temperature	°C		3.83	3.55	3.48	3.24	3.11	2.93	2.83	2.73	2.81	3.06
LI-21702	CN-217 Level	%	25	24.99	24.99	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.02
Stage 2: Condensate / Waste Water													
DPI-20108	FL-201A/B Filter Differential Pressure	kPa		-2.44	-2.46	-2.47	-2.49	-2.50	-2.50	-2.50	-2.49	-2.50	-2.46
LI-20201A	VE-202 Oil Level	%		88.11	87.95	87.97	88.00	87.99	88.08	88.02	87.97	88.01	88.15
LI-20201B	VE-202 Interface Level	%		15.07	15.00	15.05	15.02	15.09	15.00	15.04	15.01	15.00	14.90
PI-20202	VE-202 Pressure	kPa	300	300.58	295.88	298.01	298.26	301.90	300.24	300.35	296.52	301.55	298.30
DPI-20204	FL-202A/B Filter Differential Pressure	kPa		1.09	1.03	1.24	1.02	1.20	0.98	1.04	0.95	0.99	1.06
LI-22301	VE-223 Level	%	50	49.97	49.97	49.97	49.97	49.97	49.97	49.97	49.97	49.97	50.05
Stage 2: Vent System													
TI-23103	HX-231 Condensate Temperature	°C		10.40	10.10	10.26	9.69	9.42	9.42	9.02	9.10	9.58	9.82
LI-23201	VE-232 Level	%		49.99	49.98	49.98	49.98	49.99	49.99	50.00	49.97	49.99	50.01
LI-23301	SC-233 Level (if online)	%		11.73	11.72	11.71	11.70	11.69	11.68	11.68	11.68	11.68	11.70
PI-23302	SC-233 Pressure (if online)	kPa		-4.95	-5.02	-5.03	-5.03	-5.03	-5.03	-5.03	-5.03	-5.03	-5.02
LI-23401	SC-234 Level (if online)	%		67.08	67.07	67.07	67.07	67.07	67.07	67.02	66.99	67.01	67.03
PI-23402	SC-234 Pressure (if online)	kPa		25.02	24.69	25.03	24.42	24.11	24.00	23.54	23.76	23.65	27.88
	Scrubber Cautic %	%	>2	Record times and caustic concentrations here:									
Stage 2: Reacted Oil Before Degassing													
LI-20302	VE-203 Level	%	50	49.95	49.97	50.05	49.97	50.00	49.96	49.98	49.96	50.04	49.99
TI-20301	VE-203 Temperature	°C		194.85	194.49	194.63	194.52	194.46	194.56	194.07	194.25	194.35	194.14
PI-20307	VE-203 Pressure	kPa	150	150.31	150.95	150.10	150.43	150.25	149.20	151.05	150.34	150.02	150.00
DPI-20303	FL-203A/B Differential Pressure	kPa		0.92	0.86	0.94	0.82	0.84	0.96	0.89	0.91	0.89	0.94
FI-20312	Oil Flow Rate to LVD-500	kg/hr		688.83	628.96	708.37	666.15	643.72	660.59	636.04	633.89	635.23	640.29
TI-20401	Oil Temperature to LVD-500	°C		85.07	85.28	84.87	85.32	84.74	85.16	84.92	85.17	85.68	85.09
Degassing: LVD-500													
TE-24401	Oil Inlet Temperature	°C		80.69	80.38	80.64	80.29	80.08	80.19	80.27	79.93	80.45	80.44
VI-25101	Vacuum Level in Chamber	Torr		53.12	52.69	52.66	52.74	53.06	53.60	53.91	53.49	53.01	51.52
LI-24506	Oil Level	inches		13.33	13.03	13.03	13.04	12.80	12.80	12.81	12.81	13.06	12.79
PU-246_SPD	Oil Pump Speed	%		45.64	43.29	48.79	40.93	32.29	29.54	34.64	40.93	29.14	32.68
Stage 2: Reacted Oil After Degassing													
FI-30201	Oil Rate from LVD-500	kg/hr		865.04	837.14	980.41	765.65	567.87	508.65	623.04	779.16	476.98	582.96
FI-30202	Wash Water Flow Rate	kg/hr		49.55	48.29	50.52	53.65	52.47	52.83	43.73	56.03	49.78	47.22
LI-30204B	VE-302 Interface Level	%		4.72	5.01	5.01	5.35	5.10	4.96	4.92	4.99	5.04	5.01
LI-30306	VE-303 Level	%	50	50.05	49.95	49.97	50.05	50.03	50.07	50.01	50.04	49.98	50.03
LI-30305	Oil Flow Rate to TORS-2000	kg/hr		632.08	625.83	637.49	662.49	675.97	698.33	660.62	709.41	682.41	672.54
DPI-30304	FL-303A/B Filter Differential Pressure	kPa		12.05	11.94	12.17	12.89	13.08	13.70	12.91	13.98	13.51	13.14
DPI-32104	FL-321A/B Filter Differential Pressure	kPa		9.50	7.81	8.31	8.29	7.01	7.15	7.47	7.78	7.27	6.99

ide Operator Shift Log

10:30 AM	11:30 AM	12:30 PM	1:30 PM	2:30 PM	3:30 PM	4:30 PM	5:30 PM	6:30 PM	7:30 PM	8:30 PM	9:30 PM	10:30 PM	11:30 PM
700.59	700.34	701.14	699.89	699.90	699.31	700.14	700.97	700.07	700.21	699.83	699.36	700.46	700.57
6.27	2.19	2.63	2.55	2.02	3.06	3.15	2.79	1.90	2.09	1.86	2.33	2.56	1.95
58.57	75.43	60.88	68.92	67.36	70.89	60.82	68.57	70.65	62.71	64.71	61.81	66.40	63.16
19.78	20.03	19.99	20.36	20.38	20.45	20.33	20.91	20.53	20.43	21.02	20.29	20.74	20.69
3499.52	3499.00	3499.73	3499.43	3501.11	3498.03	3501.64	3500.24	3498.42	3499.27	3499.49	3498.92	3501.04	3498.82
303.25	304.16	305.52	305.82	305.93	305.70	305.82	306.15	306.32	306.26	305.55	305.48	305.45	305.26
15.04	15.02	15.13	14.71	15.03	14.92	15.00	14.98	15.01	15.02	14.93	14.90	14.98	14.96
3419.64	3419.41	3420.72	3419.66	3419.68	3420.57	3419.83	3420.05	3419.72	3419.35	3420.16	3421.05	3419.59	3419.32
26.14	25.71	23.72	25.39	27.03	23.21	27.24	25.69	24.77	25.90	24.86	23.96	26.58	25.25
136.98	132.86	131.78	133.29	134.38	132.53	134.27	133.48	134.37	135.24	132.47	133.49	134.02	132.04
0.34	0.16	0.61	0.04	0.61	0.82	1.59	3.11	5.07	7.94	8.28	9.81	12.65	15.66
55.43	66.55	33.83	46.56	56.87	52.94	31.77	56.86	35.01	61.60	39.67	63.15	44.62	68.17
66.28	66.36	66.41	66.41	66.41	66.41	66.46	66.45	66.56	66.44	66.53	66.46	66.50	66.51
77.99	77.04	76.28	75.41	74.37	72.89	71.23	69.25	67.57	65.63	63.64	61.96	60.02	58.21
56.48	38.28	70.45	46.87	31.01	58.11	39.95	74.35	50.27	34.11	64.42	44.62	63.17	56.05
3100.03	3100.85	3101.13	3098.70	3100.91	3098.82	3100.22	3100.37	3100.58	3101.15	3100.34	3101.39	3098.74	3100.46
25.04	25.03	25.03	25.02	25.01	25.00	24.99	24.99	24.99	24.99	25.00	25.00	25.00	25.00
134.73	133.20	132.46	133.35	134.14	133.06	134.20	133.80	134.25	134.97	132.99	133.51	134.03	132.58
49.96	49.99	50.01	49.96	49.94	49.99	49.94	49.99	49.98	50.00	49.90	49.93	49.96	49.95
72.00	72.01	72.04	72.05	71.61	71.59	71.68	71.66	71.67	71.66	71.75	71.69	71.75	71.30
3080.15	3080.31	3080.24	3077.76	3079.85	3077.46	3079.00	3079.32	3079.41	3080.25	3079.51	3080.52	3078.20	3080.10
65.87	65.86	65.85	65.84	65.84	65.83	65.82	65.82	65.82	65.82	65.82	65.82	65.82	65.83
3041.78	3049.02	3058.67	3069.11	3078.87	3088.21	3097.41	3106.18	3112.35	3116.52	3113.19	3106.30	3098.37	3090.35
2.63	3.01	3.37	3.59	3.27	2.65	3.96	3.30	2.70	3.82	3.66	2.89	3.05	2.94
25.04	25.05	25.03	25.02	25.01	24.99	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
-2.49	-2.44	-2.43	-2.45	-2.43	-2.43	-2.43	-2.43	-2.44	-2.44	-2.46	-2.47	-2.44	-2.45
88.06	88.02	87.98	88.01	88.00	88.06	87.80	87.95	87.98	87.91	88.04	87.97	87.81	87.89
15.00	15.00	14.97	15.09	15.00	15.05	15.00	15.03	15.08	15.00	15.00	15.00	15.00	14.90
299.46	298.90	300.09	301.17	298.25	301.52	299.91	297.83	297.81	300.24	299.47	299.80	296.76	297.46
1.27	1.18	1.15	1.27	1.27	1.31	1.27	1.25	1.26	1.15	1.38	1.15	1.31	1.17
50.02	50.00	49.98	49.96	49.96	49.96	49.97	49.98	50.01	50.04	50.01	49.97	49.98	50.01
10.74	10.83	11.16	11.49	11.57	11.43	12.77	12.03	11.40	12.03	11.86	11.08	10.59	10.11
50.02	50.04	50.04	50.05	50.05	50.02	50.04	50.04	50.05	49.99	49.99	50.02	50.06	49.96
11.72	11.74	11.75	11.76	11.78	11.79	11.80	11.80	11.80	11.80	11.80	11.78	11.76	11.74
-5.01	-5.00	-4.49	-3.92	-3.43	-2.96	-2.55	-2.15	-1.97	-1.98	-2.44	-2.95	-3.39	-3.84
67.04	67.06	67.06	67.07	67.07	67.07	67.07	67.07	67.07	67.07	67.07	67.06	67.06	67.06
28.45	28.40	29.79	30.49	31.73	32.68	25.99	34.02	35.40	35.27	35.43	35.82	36.11	35.94
50.02	49.95	49.98	49.99	49.96	49.96	50.03	50.04	50.05	49.97	49.96	50.03	50.04	50.01
193.84	193.90	194.49	194.89	195.45	196.00	196.09	196.12	196.06	195.95	195.63	195.35	195.47	195.87
149.79	150.16	149.76	150.04	149.93	149.79	149.38	150.01	150.16	150.19	149.91	150.07	150.74	149.67
0.94	1.01	0.81	0.96	0.78	0.71	0.79	0.75	0.81	0.75	0.87	0.82	0.73	0.79
677.48	635.85	651.09	667.48	650.44	654.32	656.39	672.39	667.35	685.90	689.44	634.14	661.08	651.20
84.83	85.90	85.04	85.19	85.03	85.18	85.06	84.53	84.71	84.44	84.35	84.36	84.90	84.94
80.70	81.32	81.20	81.48	81.55	81.62	81.34	81.37	81.44	81.47	81.09	81.20	80.86	81.09
51.94	51.49	52.05	51.96	53.18	54.07	53.78	54.11	54.32	54.20	53.73	52.98	53.70	54.10
13.01	12.99	12.96	13.26	12.92	13.23	12.90	12.89	12.64	13.22	12.92	13.26	12.96	12.72
23.64	45.64	25.21	48.79	26.00	33.46	43.29	48.00	36.61	40.93	28.75	37.79	43.29	36.61
337.91	878.13	379.16	937.45	399.45	565.27	818.12	953.54	685.24	757.77	456.72	680.91	826.20	675.46
38.42	52.12	38.29	48.77	45.53	45.21	53.97	49.87	55.35	49.00	50.05	45.34	49.54	54.13
5.04	5.01	5.08	5.01	5.10	4.94	5.01	4.57	5.01	5.01	4.98	5.02	4.93	5.01
49.95	49.95	50.00	49.97	50.06	50.05	49.98	50.02	50.05	49.94	50.00	49.97	50.04	50.04
635.46	666.19	671.56	638.36	669.51	635.37	687.15	635.29	711.17	620.58	689.87	619.54	675.25	691.21
12.66	12.86	13.00	12.33	12.89	12.31	13.01	12.00	13.56	11.88	13.21	12.03	13.00	13.45
7.21	7.36	6.27	7.93	6.83	7.60	7.53	8.75	7.23	8.01	7.59	8.09	8.12	7.36

Log Date	Plant 3 Insi
22/09/2016	

Tag No.	Description	Units	Limits	12:30 AM	1:30 AM	2:30 AM	3:30 AM	4:30 AM	5:30 AM	6:30 AM	7:30 AM	8:30 AM	9:30 AM
Reactor 2: 3-RA-123													
FI-02103	PU-021 Charge Pump Feed Rate	kg/hr		699.62	700.40	700.84	700.36	700.79	699.57	700.44	700.60	450.40	699.80
FI-02303	PU-023 Scavenger Feed Rate	SP & kg/hr		1.86	2.89	1.90	2.79	2.80	1.96	2.42	2.02	1.62	3.01
	RA-123 Scavenger Level		80-120	Record times and scavenger concentrations here:									
FI-02404	PU-024 Quench Water Feed Rate	SP & kg/hr		60.11	72.57	70.84	60.97	74.36	69.62	56.85	58.57	49.27	69.56
FI-12702	Hydrogen Flow Rate	kg/hr		20.98	20.95	20.96	20.80	20.48	20.64	20.89	20.81	26.30	21.32
PI-12705	VE-127 H2 Accumulator Pressure	kPa		3500.90	3501.23	3500.29	3498.28	3499.17	3500.66	3499.39	3500.53	3499.76	3500.07
TI-12307/8	Ra-123 Reactor Average Temperature	°C		305.27	305.29	305.15	305.18	305.18	305.17	305.17	305.15	304.58	304.69
LI-12306	Ra-123 Reactor Level	%	15	15.00	15.02	15.03	14.91	14.82	14.67	15.16	15.02	14.99	15.20
PI-12303B	RA-123 Reactor Outlet Pressure	kPa		3420.45	3420.16	3420.39	3419.88	3420.19	3420.09	3419.44	3420.71	3419.25	3419.80
DPI-12303	Ra-123 Reactor Differential Pressure	kPa		25.65	25.72	25.03	23.76	24.86	26.32	25.48	25.72	21.58	25.57
TI-12309	RA-123 Off-Gas Line Temperature	°C	140-150	132.72	130.82	132.37	132.30	130.61	131.90	130.52	131.00	140.21	131.46
DPI-12311	FL-123A/B Filter Differential Pressure	kPa		15.67	15.77	20.06	19.04	18.81	23.48	23.98	26.83	8.93	42.06
Buffer Tanks													
LI-00104	TK-001 Feed Oil Buffer Tank Level	%	30-70	46.15	69.46	47.25	59.65	50.33	45.02	51.67	31.70	41.20	37.21
LI-00204	TK-002 Clean Oil Buffer Tank Level	%	30-70	66.39	66.31	66.32	66.32	66.32	66.31	66.27	66.31	58.08	58.07
LI-00304	TK-003 Scavenger Buffer Tank Level	%	40-85	56.55	54.84	53.34	51.85	50.17	48.20	46.56	44.58	77.24	86.09
LI-00404	TK-004 Quench Water Buffer Tank Level	%	30-85	38.74	70.78	48.31	32.75	61.85	41.78	76.96	51.79	35.19	62.76
Stage 2: Recycle Gas													
PI-20105	VE-201 Pressure	kPa		3099.56	3100.61	3098.34	3097.93	3100.31	3098.67	3102.42	3100.91	3101.18	3094.96
LI-20102	VE-201 Level	%	25	25.00	25.00	25.00	25.00	25.01	25.03	25.03	25.03	25.04	25.03
TI-20104	VE-201 Temperature	°C		132.84	131.52	132.69	132.72	131.13	132.00	131.04	131.34	138.64	134.75
LI-21202	VE-212 Level	%	50	49.95	49.96	49.98	50.00	49.95	49.95	49.95	49.99	49.94	50.02
LI-21302	SC-213 Level (if online)	%	65-70	71.35	71.37	71.36	71.47	71.85	72.21	72.02	71.83	71.72	71.69
PI-21305	SC-213 Pressure (if online)	kPa		3080.04	3080.43	3078.52	3077.70	3079.57	3077.60	3080.82	3079.27	3072.65	3070.31
LI-21402	SC-214 Level (if online)	%	65-70	65.83	65.83	65.84	65.84	65.85	65.85	65.85	65.85	65.85	65.86
PI-21405	SC-214 Pressure (if online)	kPa		3082.25	3075.43	3069.17	3064.19	3059.31	3054.89	3050.35	3046.55	3044.50	3046.98
	Scrubber Caustic %	%	>2	Record times and caustic concentrations here:									
TI-21602	HX-216 Recycle Gas Temperature	°C		3.01	2.88	2.87	2.66	2.49	2.43	2.25	2.16	2.60	2.49
LI-21702	CN-217 Level	%	25	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
Stage 2: Condensate / Waste Water													
DPI-20108	FL-201A/B Filter Differential Pressure	kPa		-2.49	-2.45	-2.45	-2.40	-2.49	-2.49	-2.48	-2.49	-2.45	-2.41
LI-20201A	VE-202 Oil Level	%		88.06	88.00	87.76	88.01	87.92	87.99	88.05	87.96	87.96	87.95
LI-20201B	VE-202 Interface Level	%		15.00	15.00	14.95	15.01	15.00	15.00	15.00	14.96	15.05	15.00
PI-20202	VE-202 Pressure	kPa	300	300.46	298.49	296.28	298.01	298.10	302.61	299.14	300.48	295.88	297.86
DPI-20204	FL-202A/B Filter Differential Pressure	kPa		1.17	1.27	1.25	1.15	1.25	1.21	1.31	1.19	0.89	1.17
LI-22301	VE-223 Level	%	50	50.04	50.05	50.05	50.05	50.05	50.05	50.04	49.99	50.16	50.02
Stage 2: Vent System													
TI-23103	HX-231 Condensate Temperature	°C		9.99	9.76	9.71	9.30	9.07	9.02	8.42	8.18	15.15	9.71
LI-23201	VE-232 Level	%		49.95	49.96	49.97	49.97	49.98	49.98	49.96	49.93	49.93	49.95
LI-23301	SC-233 Level (if online)	%		11.73	11.72	11.71	11.70	11.69	11.69	11.69	11.68	11.69	11.71
PI-23302	SC-233 Pressure (if online)	kPa		-4.23	-4.59	-4.85	-4.97	-5.03	-5.03	-5.03	-5.03	-5.03	-5.01
LI-23401	SC-234 Level (if online)	%		67.06	67.06	67.06	67.06	67.06	67.06	67.06	67.06	67.06	67.06
PI-23402	SC-234 Pressure (if online)	kPa		35.11	37.21	37.02	37.38	36.67	34.45	34.30	34.29	8.92	35.90
	Scrubber Cautic %	%	>2	Record times and caustic concentrations here:									
Stage 2: Reacted Oil Before Degassing													
LI-20302	VE-203 Level	%	50	50.04	49.96	49.97	50.03	49.96	50.05	50.05	50.05	50.00	50.06
TI-20301	VE-203 Temperature	°C		195.93	195.72	195.89	195.55	195.85	195.68	196.12	195.66	184.64	167.08
PI-20307	VE-203 Pressure	kPa	150	149.80	149.43	149.64	150.00	150.48	149.74	150.12	150.29	145.24	137.71
DPI-20303	FL-203A/B Differential Pressure	kPa		0.84	0.79	0.95	0.84	0.86	0.90	0.83	0.81	0.51	2.51
FI-20312	Oil Flow Rate to LVD-500	kg/hr		656.44	633.13	666.54	666.25	663.97	650.31	665.25	654.03	286.31	535.54
TI-20401	Oil Temperature to LVD-500	°C		84.92	84.79	84.80	84.98	85.02	85.38	85.10	84.86	85.43	87.76
Degassing: LVD-500													
TE-24401	Oil Inlet Temperature	°C		80.70	80.73	80.60	80.80	80.84	80.87	80.55	80.30	70.07	83.03
VI-25101	Vacuum Level in Chamber	Torr		53.70	53.31	53.95	53.45	53.52	53.27	53.21	53.09	54.10	53.10
LI-24506	Oil Level	inches		12.99	13.00	13.00	13.33	12.77	13.34	13.35	13.03	13.04	12.78
PU-246_SPD	Oil Pump Speed	%		48.79	41.71	41.71	35.82	32.29	35.04	40.54	43.29	33.86	20.11
Stage 2: Reacted Oil After Degassing													
FI-30201	Oil Rate from LVD-500	kg/hr		951.87	787.05	786.14	626.95	566.46	604.94	738.08	824.70	586.85	266.81
FI-30202	Wash Water Flow Rate	kg/hr		52.05	50.57	53.26	42.21	51.28	42.86	43.86	51.32	41.33	37.50
LI-30204B	VE-302 Interface Level	%		4.92	4.86	5.10	5.01	5.09	5.01	5.10	5.01	5.10	4.94
LI-30306	VE-303 Level	%	50	49.97	49.97	49.95	50.02	50.03	50.03	50.03	50.04	49.50	50.00
LI-30305	Oil Flow Rate to TORS-2000	kg/hr		668.53	652.80	668.84	621.11	672.37	627.55	622.13	647.31	317.53	526.46
DPI-30304	FL-303A/B Filter Differential Pressure	kPa		13.03	12.90	13.28	12.48	13.54	12.79	12.75	13.13	7.04	12.03
DPI-32104	FL-321A/B Filter Differential Pressure	kPa		8.11	6.05	7.86	7.73	7.23	7.55	8.11	7.61	5.11	5.75

ide Operator Shift Log

10:30 AM	11:30 AM	12:30 PM	1:30 PM	2:30 PM	3:30 PM	4:30 PM	5:30 PM	6:30 PM	7:30 PM	8:30 PM	9:30 PM	10:30 PM	11:30 PM
700.60	700.44	699.42	700.03	699.40	699.06	700.52	699.79	700.21	700.26	699.46	699.94	699.04	700.21
2.13	1.91	3.03	1.81	2.02	2.86	1.90	2.79	1.88	2.40	1.92	3.07	2.38	2.05
56.54	63.36	66.66	62.47	66.50	65.32	48.88	46.63	43.32	53.05	34.92	35.84	50.87	48.90
20.94	20.73	19.34	19.62	19.35	19.85	19.69	19.95	19.39	19.34	19.62	19.14	19.27	19.85
3498.62	3498.58	3499.77	3499.19	3501.00	3500.03	3498.91	3500.54	3498.87	3500.62	3499.55	3498.69	3500.09	3500.28
306.00	305.41	305.44	305.45	305.34	305.25	305.19	305.43	305.72	305.82	306.05	305.88	305.71	305.67
14.89	14.99	14.99	15.13	14.88	15.05	15.06	15.05	14.90	15.05	15.07	15.05	14.81	15.11
3419.44	3420.48	3419.80	3419.48	3421.29	3419.14	3419.14	3419.89	3419.41	3420.24	3419.30	3419.59	3421.32	3419.86
25.06	24.20	26.52	26.29	25.87	26.73	25.21	26.27	25.87	26.73	26.08	25.39	24.97	25.93
132.28	130.91	133.05	134.19	132.48	133.70	137.99	139.02	142.31	141.71	141.49	140.88	142.28	141.78
34.35	28.73	26.47	26.96	23.86	27.48	32.72	31.11	53.45	82.76	62.95	58.80	58.32	65.13
42.86	53.12	63.41	30.91	41.16	51.62	51.93	30.25	54.24	32.37	63.74	48.89	50.45	52.90
58.07	58.07	58.11	58.14	58.17	58.11	58.17	58.11	58.19	58.29	58.19	58.20	58.22	58.16
84.91	83.89	82.98	81.93	80.74	79.83	78.31	76.33	74.39	72.40	70.45	68.47	66.57	64.54
40.15	74.30	49.76	33.60	62.82	42.45	80.25	59.97	48.96	39.66	31.58	68.38	54.13	43.88
3099.89	3097.98	3099.12	3100.04	3099.39	3099.25	3099.39	3099.48	3099.98	3099.54	3100.52	3100.79	3101.30	3098.25
25.02	25.00	25.02	25.04	25.04	25.03	25.02	25.00	24.98	24.97	24.96	24.95	24.97	24.98
133.24	133.12	134.22	135.15	134.31	135.00	136.61	137.84	139.48	139.32	138.98	138.55	139.26	139.03
49.95	50.05	50.00	49.97	50.00	50.02	49.96	49.92	49.96	49.98	49.98	49.95	49.97	49.98
71.64	71.62	20.64	20.88	21.11	21.30	21.41	21.52	21.64	21.72	21.77	21.83	21.88	21.92
3077.33	3075.54	46.96	49.52	51.22	52.74	53.86	54.80	55.78	56.37	56.54	56.20	55.96	55.66
65.87	65.87	66.12	66.08	66.23	66.21	66.31	66.39	66.43	66.45	66.54	66.62	66.68	66.76
3053.70	3062.82	3079.75	3080.43	3079.13	3079.31	3079.39	3079.32	3080.21	3079.91	3080.72	3080.98	3081.92	3078.50
2.98	3.15	2.64	3.15	2.89	3.24	3.95	2.92	2.97	3.55	3.15	2.90	3.79	3.81
24.99	24.99	25.00	25.00	23.57	24.98	25.00	25.00	25.00	25.00	25.00	25.00	25.00	25.00
-2.44	-2.26	-2.45	-2.48	-2.44	-2.45	-2.48	-2.48	-2.42	-2.49	-2.45	-2.49	-2.49	-2.45
88.02	88.07	87.80	88.02	87.99	88.03	87.97	87.96	87.97	88.19	87.99	87.99	88.02	87.97
15.09	15.05	14.75	15.02	15.00	15.00	14.95	14.93	14.95	15.11	14.95	15.00	15.00	15.00
298.41	299.27	296.48	300.88	298.91	297.54	298.15	298.01	298.76	297.02	292.39	288.15	291.33	290.21
1.16	1.23	0.99	1.15	1.25	1.19	0.97	0.90	1.03	1.01	0.99	0.89	0.98	0.89
49.97	49.97	49.97	49.97	49.96	49.96	49.93	49.96	49.96	49.96	49.96	49.97	49.97	49.97
11.35	11.53	11.08	11.71	11.66	11.69	13.16	11.86	11.81	12.43	11.63	11.34	11.44	11.07
50.00	49.98	49.96	49.99	50.02	50.05	50.02	49.97	49.96	49.97	49.98	50.00	50.00	50.00
11.73	11.75	11.77	11.78	11.79	11.79	11.80	11.80	11.80	11.80	11.80	11.78	11.77	11.75
-4.87	-4.21	-3.64	-3.08	-2.62	-2.22	-1.93	-1.62	-1.40	-1.48	-2.03	-2.66	-3.10	-3.51
67.06	67.05	67.01	66.99	67.01	67.03	67.04	67.00	66.98	66.98	66.99	66.99	66.99	66.98
34.14	34.60	34.03	33.36	33.99	34.88	35.44	35.95	36.02	35.93	35.96	35.72	36.30	34.75
50.04	50.03	50.05	50.05	49.99	49.97	50.04	50.04	50.04	49.97	50.00	50.06	50.03	50.05
173.01	191.97	194.22	195.24	196.04	196.18	196.57	196.38	196.68	195.91	195.34	195.04	194.95	194.84
147.57	150.25	150.66	150.11	150.14	149.75	150.78	149.34	149.45	149.59	150.28	150.23	149.57	150.52
1.44	0.86	0.98	0.85	0.83	0.70	0.75	0.74	0.76	0.83	0.89	0.80	0.89	0.89
665.57	618.36	690.93	647.18	643.59	663.65	687.89	639.42	621.59	661.98	650.17	663.03	629.72	645.45
87.65	90.42	87.29	85.60	85.29	85.17	85.28	84.95	85.49	84.54	84.06	84.76	85.22	84.92
82.67	85.99	83.70	82.03	81.60	81.22	81.85	81.69	82.08	81.29	80.56	80.69	81.00	80.89
54.21	54.10	53.94	54.48	55.56	55.73	56.34	55.83	55.66	56.34	56.14	54.97	55.39	56.47
12.98	12.70	12.93	12.66	12.74	13.22	12.89	13.20	12.88	12.90	12.92	13.26	12.97	12.72
42.50	38.18	41.71	32.68	26.39	35.43	35.43	41.71	26.79	41.71	38.57	39.75	27.57	30.32
805.19	715.64	792.49	574.00	428.30	617.68	633.65	773.51	420.64	780.33	710.71	730.19	438.74	524.81
52.35	54.78	51.27	53.60	48.59	43.81	52.78	51.40	47.37	53.21	52.55	44.88	49.02	48.33
5.01	4.56	5.01	4.98	4.99	5.09	4.92	5.04	5.09	4.98	5.01	5.06	5.09	4.99
50.06	50.04	50.04	49.96	50.06	50.05	49.95	50.03	49.98	49.96	49.96	50.04	49.97	50.04
677.09	694.46	639.37	692.83	692.11	632.22	667.48	645.05	675.90	665.48	659.21	619.99	688.44	689.61
15.36	14.80	12.89	13.90	13.95	12.80	13.47	13.07	13.71	13.33	13.33	12.76	14.33	14.33
7.28	7.88	8.05	7.00	7.24	7.53	7.89	8.31	7.64	8.22	8.31	7.86	7.34	7.32

SECTION 8 – DATA REPORTING

A data summary sheet will be prepared for each test run. This summary sheet will be used to present the key data in the Demonstration Test Report. An example of the data summary sheet is given in Table 8-1.

TABLE 8-1

DEMONSTRATION TEST DATA SUMMARY SHEET

PCB Treatment Log

Record Number	1	2	3
Date/Time of treatment start	09/20/16 10:00 am	09/21/16 8:35 am	09/22/16 9:45 am
Date/Time of treatment end	09/20/16 4:00 pm	09/21/16 2:35 pm	09/22/16 3:45 pm
Treatment run time (hours)	6	6	6
Feed oil flow rate (kg/hr)	650.3	700.3	699.9
Reactor Temperature (degC)	305.3	304.8	305.4
Reactor pressure (kpa)	3420	3420	3420
Recycle gas flow (kg/hr)	20.3	20.1	20.2
Scavenger flow (kg/hr)	5.59	3.66	2.32
Quench wastewater (kg/hr)	81.0	65.2	64.2
Bulk (P Tank) PCB level prior to treatment (ppm)	2792	2994	2074
Aroclor 1260 and under level prior to treatment	2792	2994	2074
Short Interval parameters collected by historian? (yes/no)	Yes	Yes	Yes
Total Volume of PCB oil treated (gallons)	1178	1269	1268
Volume of concentrated PCB oil treated (gallons)	234	255	250
PCB concentration of oil post treatment (ppm)	< 1	< 1	< 1
Volume of PCB contaminated water (gallons)	145	150	150
PCB concentration of contaminated water (ppm)	0.0003	< 0.0001	< 0.0001
Name of each client of PCB waste treated	TCI of Alabama, LLC. Duke Energy Progress, Inc.	TCI of Alabama, LLC. Duke Energy Progress, Inc.	TCI of Alabama, LLC. Duke Energy Progress, Inc.
Operators	Ken Kohler Tom Robinson Gonzalee Jones	Ken Kohler Tom Robinson Gonzalee Jones	Ken Kohler Tom Robinson Gonzalee Jones Kyle Devore
Supervisor	Wesley Blevins	Wesley Blevins	Wesley Blevins

Notes:

Appendix G

Waste Manifests

Hydrodec of North America, LLC
2021 Steinway Boulevard S.E.
Canton, Ohio 44707
Phone: (330) 454-8202
Fax: (330) 454-8870

PCB Certificate of Disposal

This is to certify that used high-PCB transformer oil, as described below, was disposed of via a hydrodechlorination process by:

Hydrodec of North America, LLC
2021 Steinway Boulevard S.E.
Canton, OH 44707
EPA ID Number OHR000143263

Generator Name:	**Duke Energy Progress Inc.**
Delivery Date:	**09/16/2016**
Identifying Description:	**High-PCB Transformer Oil**
Manifest No:	**012459411 JJK**
Initial PCB Level:	**5.3**
Final PCB Level:	**< 1 mg/kg**
Gallons Disposed of:	**4139**
Date of Disposal:	**09/28/2016**

"Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations, I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the person who, acting under my direct instructions, made the verification that this information is true, accurate and complete."

Signed:  Date: 11/22/2016

Title: EHS Manager

FOR LEAK, FIRE OR MEDICAL EMERGENCY, CALL INFOTRAC
AT 1-800-535-5053 AND REFERENCE CONTRACT #104631

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number NCD982019126 40CFRPART761	2. Page 1 of 1	3. Emergency Response Phone	4. Manifest Tracking Number 012459411 JJK

GENERATOR

5. Generator's Name and Mailing Address
DUKE ENERGY PROGRESS INC.
1404 MECHANICAL BLVD. , GARNER, NC 27959
Generator's Phone: (919) 219-6041

Generator's Site Address (if different than mailing address)

6. Transporter 1 Company Name: ENVROSERVE, J.V. (216) 642-1311 — U.S. EPA ID Number: OHD017730540

7. Transporter 2 Company Name — U.S. EPA ID Number

8. Designated Facility Name and Site Address
HYDRODEC NORTH AMERICA, LLC
2021 STEINWAY BLVD SE, CANTON, OH 44707
Facility's Phone: (330) 454-8202 — U.S. EPA ID Number: OHR0100143263

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. UN2315, POLYCHLORINATED BIPHENYLS, LIQUID, 9, PGIII, ERG 171 RQ	XX1	TT	14642	K	
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
Stuck tank At 47 Inches = 4295gal
SEAL #'S 2876151 thru 2876154
ENVSRV POE
0025131

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Scott Canady — Signature: Scott Canady — Month: 09 — Day: 15 — Year: 16

INTL

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: J M. Le Page — Signature: J M. Le Page — Month: 09 — Day: 15 — Year: 16

Transporter 2 Printed/Typed Name — Signature — Month — Day — Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month — Day — Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name: Chris Hess — Signature — Month: 9 — Day: 16 — Year: 16

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY'S COPY

Hydrodec of North America, LLC
2021 Steinway Boulevard S.E.
Canton, Ohio 44707
Phone: (330) 454-8202
Fax: (330) 454-8870

PCB Certificate of Disposal

This is to certify that used high-PCB transformer oil, as described below, was disposed of via a hydrodechlorination process by:

Hydrodec of North America, LLC
2021 Steinway Boulevard S.E.
Canton, OH 44707
EPA ID Number OHR000143263

Generator Name:	**TCI ofAlabama, LLC**
Delivery Date:	**September 19, 2016**
Identifying Description:	**High-PCB Transformer Oil**
Manifest No:	**009410625 FLE**
Initial PCB Level:	**1,000,000**
Final PCB Level:	**< 1 mg/kg**
Gallons Disposed of:	**2**
Date of Disposal:	**September 22, 2016**

"Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations, I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy, I certify as the company official having supervisory responsibility for the person who, acting under my direct instructions, made the verification that this information is true, accurate and complete."

Signed:  Date: October 21, 2016

Title: EHS Manager

168459

Please print or type. (Form designed for use on elite (12-pitch) typewriter.)

Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST	1. Generator ID Number: ALD983167891	2. Page 1 of	3. Emergency Response Phone: 800-424-9300	4. Manifest Tracking Number: 009410625 FLE

GENERATOR

5. Generator's Name and Mailing Address: TCI of Alabama, LLC, 101 Parkway East, Pell City, AL 35125-2749
Generator's Phone: 205-338-8887
Generator's Site Address (if different than mailing address):

6. Transporter 1 Company Name: Allstate Oil Recovery — U.S. EPA ID Number: NJD986588630

7. Transporter 2 Company Name — U.S. EPA ID Number:

8. Designated Facility Name and Site Address: Hydrodec of North America, LLC, 2021 Steinway Blvd. S.E., Canton, OH 44707 USA
Facility's Phone: (330) 454 8202 — U.S. EPA ID Number: OHR000143263

9a HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. RQ, UN2315, POLYCHLORINATED BIPHENYLS, LIQUID, 9, PG III	02	CM	Est. 68	K	
	2.					
	3.					
	4.					

RECEIVED SEP 20 2016

14. Special Handling Instructions and Additional Information: MODEF — Date removed from service for disposal: 9/13/16
over 500PPM — 24 Hr. Emergency contact: CHEMTREC — ERG #171
Gallons: 2 — Pounds: 15

15. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name and are classified, packaged marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: GEORGE NEWMARK — Signature: [signature] — Month 9 — Day 14 — Year 16

INT'L

16. International Shipments: ☐ Import to U.S. ☐ Export from U.S. — Port of entry/exit: — Date leaving U.S.:
Transporter signature (for exports only):

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Robert Cooper — Signature: Robert Cooper — Month 9 — Day 14 — Year 16

Transporter 2 Printed/Typed Name — Signature — Month — Day — Year

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space: ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number:
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month — Day — Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name: Gonzalee Jones — Signature: Gonzalee Jones — Month 09 — Day 19 — Year 2016

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO DESTINATION STATE (IF REQUIRED)

CERTIFICATE OF DISPOSAL

FOR MANIFESTED PCB WASTE

This certificate is to verify the wastes identified as PCB Solid

and specified on Manifest # 014415768 LLH, Line Item 1 has been landfilled on

Nov 10, 2014 in accordance with all local, state and federal regulations by:

Wayne Disposal, Inc

(EPA I.D. # MID048090633)

49350 N. I-94 Service Drive, Belleville, Michigan 48111
Telephone: 1-800-KWALITY (592-5489)
Fax: 1-800-KWALFAX (592-5329)

Under civil and criminal penalties of law for the making or submission of false or fraudulent statements or representations (18 U.S.C. 1001 and 15 U.S.C. 2615), I certify that the information contained in or accompanying this document is true, accurate and complete. As to the identified section(s) of this document for which I cannot personally verify truth and accuracy. I certify as the company official having supervisory responsibility for the persons who are acting under my direct instructions made the verification that this information is true accurate and complete.

Authorized Signature: Brooke Bostwick

FOR LEAK, FIRE OR MEDICAL EMERGENCY, CALL INFOTRAC
AT 1-800-535-5053 AND REFERENCE CONTRACT #104631

Please print or type. (Form designed for use on elite (12-pitch) typewriter.) Form Approved. OMB No. 2050-0039

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Manifest Tracking Number
OHR000143263	1	(800) 535-5053	014415168 JJK

GENERATOR

5. Generator's Name and Mailing Address
HYDRODEC OF NORTH AMERICA, LLC
2021 STEINWAY BLVD SE, CANTON, OH 44707
Generator's Phone: (330) 454-8402

Generator's Site Address (if different than mailing address)

6. Transporter 1 Company Name: ENVIROSERVE, J.V. (216) 642-1311 — U.S. EPA ID Number: OHD017730540

7. Transporter 2 Company Name: EQ Industrial Services — U.S. EPA ID Number: MIK135642742

8. Designated Facility Name and Site Address
WAYNE DISPOSAL, INC. (SITE #2)
49350 N I-94 SERVICE DRIVE, BELLEVILLE, MI 48111
Facility's Phone: (800) 592-5489 — U.S. EPA ID Number: MID048090633

9a. HM	9b. U.S. DOT Description (including Proper Shipping Name, Hazard Class, ID Number, and Packing Group (if any))	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	13. Waste Codes
X	1. RQ, UN3432, WASTE POLYCHLORINATED BIPHENYLS, SOLID, 9, PGII (DEBRIS > 50PPM AND < 2000PPM), ERG 171 APPR # G135015WDI	01	DM	181 400 lb	K	PCB6
	2.					
	3.					
	4.					

14. Special Handling Instructions and Additional Information
ENVSRV PO#
0030593
SSD: 10/30/16 TDF 101

15. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. If export shipment and I am the Primary Exporter, I certify that the contents of this consignment conform to the terms of the attached EPA Acknowledgment of Consent.
I certify that the waste minimization statement identified in 40 CFR 262.27(a) (if I am a large quantity generator) or (b) (if I am a small quantity generator) is true.

Generator's/Offeror's Printed/Typed Name: Naomi Mattingly (For Hydrodec) — Signature — Month 10 Day 31 Year 16

INTL

16. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter signature (for exports only): Date leaving U.S.:

TRANSPORTER

17. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Howard Sutton — Signature — Month 10 Day 31 Year 16

Transporter 2 Printed/Typed Name: Tonya Sheppard — Signature — Month 11 Day 02 Year 16

DESIGNATED FACILITY

18. Discrepancy

18a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

18b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:

18c. Signature of Alternate Facility (or Generator) — Month Day Year

19. Hazardous Waste Report Management Method Codes (i.e., codes for hazardous waste treatment, disposal, and recycling systems)

1.	2.	3.	4.
PCB			

20. Designated Facility Owner or Operator: Certification of receipt of hazardous materials covered by the manifest except as noted in Item 18a

Printed/Typed Name: Mike Sandy — Signature — Month 11 Day 10 Year 16

EPA Form 8700-22 (Rev. 3-05) Previous editions are obsolete.

DESIGNATED FACILITY TO GENERATOR

EnviroServe

4600 Brookpark Road
Cleveland, OH 44134
216-642-1311, fax 216-642-1474

Land Disposal Restriction & Certification Form

0030593

Generator Name: HYDRODEC OF NORTH AMERICA, LLC **U.S. EPA ID No.:** OHR000143263

Generator Address: 2021 STEINWAY BLVD SE CANTON , OH 44707 **Disposal Facility:** WAYNE DISPOSAL, INC. (SITE #2)

Manifest Doc. No.: 014415168JJK

Instructions

Column 1: Identify all U.S. EPA hazardous waste codes that apply to this waste shipment.
Column 2: Choose the appropriate treatability group: Non-Wastewater (NWW) or Wastewater (WW). **If no choice is made, NWW will be assumed.**
Column 3: Enter the appropriate Subcategory, if applicable, and also enter "Contaminated Soil" or "Debris" if the waste will be treated using one of the alternative treatment technologies provided by 268.49 (c) – soil, or 268.45 – debris.
Column 4: Enter the letter of the appropriate paragraph from pages 1-2 of this form.
Column 5: For F001 – F005, F039, D001 – D043, Debris and Contaminated Soil: please enter the name any constituents in your waste stream subject to treatment. **If applicable and no constituents are listed, the waste will be presumed to contain all UHC/LDR constituents.**

Manifest Line Item	U.S. EPA Hazardous Waste Code (s)	NWW or WW	Subcategory	How Must the Waste be Managed	Name of Hazardous Constituents contained in the waste. Complete for F001-F005, F039, D001-D043, Soil and Debris wastes.
9b-1	PCB6	NWW		A	
9b-2					
9b-3					
9b-4					

I hereby certify that all information submitted on this and all associated documents is complete and accurate to the best of my knowledge and information.

Generator Signature: _____ **Title:** _____

Printed Name: _____ **Date:** _____

How Must the Waste Be Managed?

S. THIS CONTAMINATED SOIL *DOES / DOES NOT* CONTAIN LISTED HAZARDOUS WASTE AND *DOES / DOES NOT* EXHIBIT A CHARACTERISTIC OF HAZARDOUS WASTE AND *IS SUBJECT TO / COMPLIES WITH* THE SOIL TREATMENT STANDARDS AS PROVIDED BY 268.49(c) OR THE UNIVERSAL TREATMENT STANDARDS. (CIRCLE ONE) (CIRCLE ONE) (CIRCLE ONE) I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification and believe that it has been maintained and operated properly so as to comply with treatment standards specified in 40 CFR 268.49 without impermissible dilution of the prohibited wastes. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.

A. THIS RESTRICTED WASTE REQUIRES TREATMENT TO THE APPLICABLE STANDARD. This waste must be treated to the applicable performance based treatment standard set forth in 40CFR Part 268 Subpart C, 268.32, Subpart D, 268.40 or RCRA Section 3004(d) prior to land disposal.

B. THIS HAZARDOUS DEBRIS IS SUBJECT TO THE ALTERNATIVE TREATMENT STANDARDS OF 40 CFR 268.45.

EnviroServe

4600 Brookpark Road
Cleveland, OH 44134
216-642-1311, fax 216-642-1474

Land Disposal Restriction & Certification Form

C. THIS RESTRICTED WASTE HAS BEEN TREATED TO THE PERFORMANCE STANDARDS. I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification. Based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the treatment process has been operated and maintained properly so as to comply with the treatment standards specified in 40 CFR 268.40 without impermissible dilution of the prohibited waste. I am aware there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.

D. THIS RESTRICTED WASTE CAN BE LAND DISPOSED WITHOUT TREATMENT. I certify under penalty of law that I have personally examined and am familiar with the waste through analysis and testing or through knowledge of the waste to support this certification that the waste complies with the treatment standards specified in 40 CFR Part 268 Subpart D and all applicable prohibitions set forth in 40 CFR 268.32 or RCRA Section 3004(d). I believe that the information I submitted is true, accurate and complete. I am aware that there are significant penalties for submitting a false certification, including the possibility of a fine and imprisonment.

E. THIS LAB PACK DOES NOT CONTAIN ANY WASTES IDENTIFIED AT APPENDIX IV TO PART 268. I certify under penalty of law that I personally have examined and am familiar with the waste and that the lab pack contains only wastes that have not been excluded under appendix IV to 40 CFR part 268 and that this lab pack will be sent to a combustion facility in compliance with the alternative treatment standards for lab packs at 40 CFR 268.42(c). I am aware that there are significant penalties for submitting a false certification, including the possibility of fine or imprisonment.

F. THIS RESTRICTED WASTE HAS BEEN TREATED TO REMOVE THE HAZARDOUS CHARACTERISTIC AND CONTAINS UNDERLYING HAZARDOUS CONSTITUENTS THAT REQUIRE FURTHER TREATMENT TO MEET THE UNIVERSAL TREATMENT STANDARDS. I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.40 or 268.49 to remove the hazardous characteristic. This decharacterized waste contains underlying hazardous constituents that require further treatment to meet treatment standards. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.

G. THIS RESTRICTED WASTE HAS BEEN TREATED TO REMOVE THE HAZARDOUS CHARACTERISTIC AND BEEN TREATED FOR UNDERLYING HAZARDOUS CONSTITUENTS. I certify under penalty of law that the waste has been treated in accordance with the requirements of 40 CFR 268.40 to remove the hazardous characteristic and that underlying hazardous constituents, as defined in 268.2(i) have been treated on-site to meet the 268.48 Universal Treatment Standards. I am aware that there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.

H. THIS RESTRICTED WASTE IS SUBJECT TO AN EXEMPTION FROM LAND DISPOSAL. *(Please include the date the waste is subject to the prohibitions in Column 5)* This waste is subject to an exemption from a prohibition on the type of land disposal method utilized for the waste (such as, but not limited to, a case-by-case extension under 40 CFR Part 268.5, an exemption under 40 CFR 268.6, or a nationwide capacity variance under 40 CFR 269 Subpart C)

I. THIS RESTRICTED WASTE WITH TREATMENT STANDARDS EXPRESSED AS CONCENTRATIONS IN THE WASTE PURSUANT TO 268.43, IF COMPLIANCE WITH THE TREATMENT STANDARDS IN SUBPART D OF THIS PART IS BASED IN PART OR IN WHOLE ON THE ANALYTICAL DETECTION LIMIT ALTERNATIVE IN 268.439(c). I certify under penalty of law that I have personally examined and am familiar with the treatment technology and operation of the treatment process used to support this certification. Based on my inquiry of those individuals immediately responsible for obtaining this information, I believe that the nonwastewater organic constituents have been treated by combustion units as specified in 268.42, Table 1. I have been unable to detect the nonwastewater organic constituents, despite having used best good-faith efforts to analyze for such constituents. I am aware there are significant penalties for submitting a false certification, including the possibility of fine and imprisonment.