

#### **Environmental Remediation Group**

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## SENT VIA OVERNIGHT COURIER AND FILE TRANSFER PORTAL

February 22, 2019

Mr. Brian Sadowski Division of Environmental Remediation New York State Department of Environmental Conservation 270 Michigan Avenue Buffalo, New York 14203-2999

Re: Charles Gibson Site, Niagara Falls, New York

Site No. 932063

Annual Periodic Review Report - 2018

Post Closure Operation, Maintenance, and Monitoring Activities

Dear Mr. Sadowski:

Olin hereby submits a CD containing a PDF of the 2018 Annual Periodic Review Report on the Post-Closure Operation, Maintenance, and Monitoring activities for the Charles Gibson Site. The annual certification is attached as hard copy and as part of the PDF. The full document is also available via Olin's File Transfer Portal.

Please direct any questions or comments to me at 423/336-4540 or by email at dmshare@olin.com.

Sincerely,

**OLIN CORPORATION** 

David M. Share, P.E.

Director, Environmental Remediation

Charles Gibson Site
Site No. 932063
Periodic Review Report

February 22, 2019

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#### I. INTRODUCTION

#### **Brief Summary, Nature and Extent, Remedial History:**

Construction of the remedy on the Charles Gibson Site concluded in 1990. The remedy consisted of rerouting Cayuga Creek around and away from the waste, installation of a fully circumscribed soil-bentonite slurry wall barrier and installation of a double flexible membrane liner cap with a perimeter collection drain system. The first year of operations and maintenance (O&M) of the containment remedy for the site and the groundwater monitoring program began in 1993. Waters collected in the site perimeter collection drain system are managed by direct discharge to the City of Niagara Falls Wastewater Treatment Facility. The Charles Gibson site is classified as a commercial/small industrial/residential user (CSIRU) and does not require a permit.

#### **Effectiveness of Remedial Program:**

Groundwater monitoring indicates there are no increased concentrations of compounds being monitored. Evaluation of the monitor well and sediment analytical results indicate the containment remedy is effective. An evaluation of data from the piezometer pairs at the Site indicates that a materially inward hydraulic gradient has been established in the containment area of the site. The remedial program is achieving the objectives of containing groundwater flow and maintaining groundwater quality standards.

#### Compliance:

There are no areas of non-compliance.

#### Recommendations:

No recommendations. Conditions at the Site are stable.

#### II. SITE OVERVIEW

#### Site Description and Nature/Extent Prior to Remediation:

The Site as now defined incorporates approximately two acres bounded to the east and north by Cayuga Creek, to the west by Tuscarora Road and to the south by Niagara Mohawk Power Corporation right-of-way and the Auto Zone Incorporated auto parts store and parking lot. The Site cap is slightly mounded with the center of the capped area essentially flat. The capped area is enclosed by a chain link fence. A wooden privacy fence is immediately next to and outside of the chain link fence on portions of the perimeter.

#### Remediation Chronology:

The Agreement includes a provision in the event that after seven years following the delivery of a Release of Liability (issued December 15, 1992), Olin demonstrates that conditions at the Site are such that the stated frequency or duration of the requirements are no longer necessary to determine whether the remediation is effective, Olin may reduce the frequency and duration of such monitoring or inspections. Olin has submitted annual reports and has conducted the required monitoring for the duration of the remediation.

#### III. REMEDY PERFORMANCE, EFFECTIVENESS, AND PROTECTIVENESS

The work performed for the Site during 2018 was reviewed and found to be in accordance with the approved O&M Manual (Revised 2009) as well as the NYSDEC approved reduction in annual sampling dated April 25, 2013. Groundwater monitoring indicates there are no increased concentrations of the Site compounds being monitored. Evaluation of the groundwater data generated during the 2018 monitoring year indicates that the containment remedy is effective. Drawdown in both manholes was effectively maintained at specified levels throughout the year.

#### IV. IC/EC PLAN

#### **IC/EC Requirements:**

Fence is in place around the landfill, effectively restricting access

Clean soil cover is in place on the landfill, restricting infiltration and promoting runoff

A hydraulic control system is in place, effectively controlling groundwater flow direction

#### Certification:

Attachment A

#### V. MONITORING PLAN COMPLIANCE REPORT

#### **Components of Monitoring Plan:**

Operation, maintenance, and monitoring activities to be performed include:

- Performance of a groundwater monitoring program to monitor ground water quality at the site and to verify the inward hydraulic gradient within the capped area.
- The current groundwater level monitoring system for the Site consists of six piezometers (P-1 through P-6) and two manholes (A and B). Piezometers P-1, P-2 and Manhole A are located in the northeast section of the Site; P-3, P-4, and Manhole B are located in the southeast section; and P-5 and P-6 are located toward the southwest (see *Attachment B*).
- All piezometers are constructed of Schedule 80 PVC and are 2 inches in diameter. Each piezometer has been constructed with 5 feet of screen and was screened at the water table.
- The construction of the piezometer screens at the water table allows for continued monitoring of the water table elevation inside and outside of the containment area during periods of water level fluctuations. Piezometers P-1, P-3, and P-5 are located outside of the slurry wall that runs along the perimeter of the Site. Piezometers P-2, P-4, and P-6 are inside the slurry wall and paired opposite the three piezometers outside the slurry wall.
- Water level elevations are measured quarterly at the Site in Manholes A and B and piezometers P-1 through P-6. Water level elevations are measured by means of an acoustical sounder or electronic water level probe. The sounder or probe is lowered into the manhole or piezometer until it makes contact with the free water surface. The depth

from the top of the piezometer riser pipe or manhole rim to the water surface is measured to an accuracy of 0.01 ft. Depth to water measurements are converted into mean sea level elevations by referring to the surveyed elevation of the top of the piezometer riser pipe or manhole rim provided on the Groundwater Elevation Form. The depth to water measurements for Manholes A and B are checked to see that they are not greater than 10.27 feet and 12.41 feet, respectively to ensure that the automatic sump pump is functioning.

• Consultants visited the site on 06/28/2018 to preform redevelopment of piezometer pair P-1/P-2. Fluctuations of groundwater elevations within this pair indicate that minor outward hydraulic gradients occur, but typically revert back to inward gradients by the next quarter.

#### Summary and Comparison to Remedial Objectives:

The isolation of groundwater within the capped area has been established and is being maintained by current operation and maintenance activities. The groundwater monitoring and sampling is performed on an annual basis in rotating quarters to help assess seasonal variability with Groundwater Sampling Field Parameters presented in **Attachment C**.

Currently two locations, immediately upstream and downstream of the Site and the adjacent remediated portion of the Cayuga Creek bed, are sampled once per year, in the Fall or 'low water' period. Beginning with the October 2000 sample event, annual creek sediment samples have been analyzed for BHC isomers only. Sample collection and analysis of creek sediments are performed annually during the second half of the calendar year. The 2018 data is non-detect and consistent with historical results (Table 3).

The water elevation data collected from the piezometers and ground water wells was used to determine whether an inward hydraulic gradient exists was made by comparing water level measurements within the capped area to those measured outside the capped area. The groundwater elevation data indicates that ground water within the capped area is consistent with historical data. An evaluation of data from the piezometer pairs at the Site indicates that all the piezometer pairs exhibited inward gradients during first two quarters of the year. Third quarter data reveals outward gradients for all the piezometers, however, all the piezometer pairs returned to inward gradients during the fourth quarter except for P1/P2. We will continue to closely monitor these pairs moving forward. Drawdown in both manholes was effectively maintained at specified levels throughout the year. **Table 4** shows the most recent piezometric data.

#### **Deficiencies:**

None

#### **Recommendations for Changes:**

No recommendations. Conditions at the Site are stable.

#### VI. O&M PLAN COMPLIANCE REPORT

#### Components of the O&M Plan:

Site remediation requirements have been met by Olin through rerouting of Cayuga Creek around and away from the waste, by constructing a fully circumscribing soil-bentonite slurry

wall barrier, and through installing a double flexible membrane liner cap as part of the final cover with a perimeter collection drain system. This O&M Plan safeguards that remedy and provides for monitoring of the Gibson Site in compliance with the Settlement Agreement.

Quarterly inspections of the Gibson Site are conducted to identify any potential problems with physical deterioration of structures, possible malfunctions of the slurry wall or of the perforated CPVC drain system, and to ensure that all site remedial measures components are operating effectively, in accordance with the Settlement Agreement.

The Environmental Inspector conducts the inspections to ensure that the remedial measures at the Site will remain operative. Additionally, the inspections address the safeguards to control, minimize or eliminate threats to human health and the environment. Operation, maintenance, and monitoring activities are conducted to identify proposed changes to the O&M Manual or site procedures which would provide a safer and/or more efficient and cost-effective operation.

Recordkeeping is conducted for each site visit and inspection.

#### Operation & Monitoring (O&M) Summary:

The groundwater collection system is inspected for the buildup of hard or soft scale-like deposits. The inspection is performed concurrently with inspection of the capped area. If a component of the groundwater collection system is found to be damaged or malfunctioning, it is repaired or replaced.

The capped area is mowed on a regular basis to prevent establishment of woody vegetation during this reporting period. The capped area functions as designed and complies with the O&M Plan.

Inspections are conducted using the items listed on the Site Inspection Form presented in **Attachment D**. Information to be entered on these forms includes the inspector's name, date, and time of inspection, item inspected and any comments. The inspector indicates on the forms whether the condition of each item was acceptable or unacceptable to ensure that the requirements of this O&M Plan are fulfilled. The scheduled Site monitoring inspections are performed by a qualified individual assigned to inspect the items and systems noted on the Site Inspection Form. The completed Site Inspection Forms are maintained at Olin Environmental Remediation offices in Cleveland, TN. Inspections are performed, at a minimum, on a quarterly basis.

#### **Evaluation of Remedial Systems:**

All components are performing as designed.

#### **O&M** deficiencies:

None

#### **Conclusions:**

The O&M system is being run and maintained properly and does not require additions or modifications at this time.

#### VII. OVERALL PRR CONCLUSIONS AND RECOMMENDATIONS

#### Compliance with SMP:

Based on the operations and maintenance documentation listed above, the system requirements are being met. There are no new exposure pathways. Additional plans and modifications are not necessary.

#### **Remedy Effectiveness:**

The isolation of ground water within the capped area has been established and is being maintained by current operation and maintenance activities.

Review of the groundwater elevation data indicate that inward hydraulic gradients were observed between piezometers within the capped area and piezometers outside of the capped area with previously noted exceptions. Fluctuations of groundwater elevations indicate that minor outward hydraulic gradients historically occur, but typically revert back to inward gradients by the next quarter.

Currently two locations, immediately upstream and downstream of the Site and the adjacent remediated portion of the Cayuga Creek bed, are sampled once per year, in the Fall or 'low water' period. A sample is collected downstream of the Site to monitor changes in levels of contaminants in creek sediments, if any. The other sample, immediately upstream of the Site is used to monitor potential upstream contaminant sources or potential 'backwash' effects caused by the changing level of the Niagara River. Beginning with the October 2000 sample event, annual creek sediment samples have been analyzed for BHC isomers only. Both upstream and downstream concentrations of BHC were non-detect in 2018.

Based on the data developed to date, the remedy has been effective in attaining the remedial objectives.

#### **Future Submittals:**

Future submittals of this report will continue to be submitted annually.

# <u>Attachment A</u>

# **Institutional & Engineering Certification Form**



# Enclosure 2 NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION Site Management Periodic Review Report Notice Institutional and Engineering Controls Certification Form



							D	
Site	e No.	932063		Site Details			Box 1	
Site	e Name C	Charles Gibso	n Site					
City		liagara Falls ara	Niagara Falls B	lvd. & Tuscarora	Rd.	Zip Code: 14304		
Rep	oorting Pe	riod: January	31, 2018 to Jar	uary 31, 2019		⇒ Ä		
				±			p14552.025	- V4L
							YES	NO
1.	Is the info	ormation above	e correct?				W	∃
	If NO, inc	lude handwritt	en above or on	a separate shee	t.		Ar .	
2.	Has some tax map a	e or all of the s amendment du	ite property bed ring this Repor	en sold, subdivid ting Period?	ed, merge	d, or undergone a	Ŋ	
3.		been any cha CRR 375-1.11		he site during thi	s Reportin	g Period	. III	
4.			and/or local pering this Report		ling, disch	arge) been issued		
*:	If you an that doc	swered YES tumentation h	o questions 2 as been previo	thru 4, include usly submitted	document with this	ation or evidence certification form		
5.	Is the site	currently und	ergoing develo	oment?				The state of the s
	18			Ē				
							Box 2	
ж							YES	NO
6.	Is the cur Closed La		onsistent with t	he use(s) listed b	elow?		O .	
7.		20	and functionin	g as designed?				D
	IF	THE ANSWER	TO EITHER QU	JESTION 6 OR 7 REST OF THIS F	IS NO, sig ORM. Oth	n and date below erwise continue.	and	
AC	Corrective	Measures Wo	rk Plan must be	submitted alon	g with this	form to address t	these iss	ues.
			e <sup>st</sup>	- 2/52	7/			
Sig	nature of C	Owner, Remedi	al Party or Desig	nated Represent	ative	Date		(9)

SITE NO. 932063

Box 3

**Description of Institutional Controls** 

Parcel

Owner

161.05-3-7

OLIN CORPORATION

Institutional Control

Monitoring Plan O&M Plan

Consent Judgement 3/12/85 including IC stipulations p. 23 Permits and Easements, sections 11-24. Operation and Maintenance Manual; September 30, 2009.

- Groundwater Quality Monitoring.
- Leachate Monitoring.
- Creek Sediment Monitoring.

161.05-5-12

**OLIN CORPORATION** 

Monitoring Plan O&M Plan

Consent Judgment 3/12/85 including IC stipulations p. 23 Permits and Easements, sections 11-24.

- Groundwater Quality Monitoring.
- Leachate Monitoring.
- Creek Sediment Monitoring.

Box 4

#### **Description of Engineering Controls**

Parcel

**Engineering Control** 

161.05-3-7

Cover System

Groundwater Containment Leachate Collection Fencing/Access Control

- Realignment of Cayuga Creek from the waste.
- Fully circumscribed soil-bentonite slurry wall barrier.
- Double flexible membrane liner cap.
- Perimeter Leachate Collection System with discharge to NFWWTP.
- Final cover soil cap.
- Perimeter chain link and portions of wooden privacy fencing with locked gates.

161.05-5-12

Cover System Groundwater Containment Leachate Collection Fencing/Access Control

- Realignment of Cayuga Creek away from the waste.
- Fully circumscribed soil-bentonite slurry barrier wall.
- Double flexible membrane liner cap.
- Perimeter leachate collection system with discharge to the NFWWTP.
- Final soil cover cap.
- Perimeter chain link with portions of wooden privacy fencing with locked gates.

#### Periodic Review Report (PRR) Certification Statements

- 1. I certify by checking "YES" below that:
  - a) the Periodic Review report and all attachments were prepared under the direction of, and reviewed by, the party making the certification;
  - b) to the best of my knowledge and belief, the work and conclusions described in this certification are in accordance with the requirements of the site remedial program, and generally accepted engineering practices; and the information presented is accurate and compete.

YES NO

- 2. If this site has an IC/EC Plan (or equivalent as required in the Decision Document), for each Institutional or Engineering control listed in Boxes 3 and/or 4, I certify by checking "YES" below that all of the following statements are true:
  - (a) the Institutional Control and/or Engineering Control(s) employed at this site is unchanged since the date that the Control was put in-place, or was last approved by the Department;
  - (b) nothing has occurred that would impair the ability of such Control, to protect public health and the environment;
  - (c) access to the site will continue to be provided to the Department, to evaluate the remedy, including access to evaluate the continued maintenance of this Control;
  - (d) nothing has occurred that would constitute a violation or failure to comply with the Site Management Plan for this Control; and
  - (e) if a financial assurance mechanism is required by the oversight document for the site, the mechanism remains valid and sufficient for its intended purpose established in the document.



IF THE ANSWER TO QUESTION 2 IS NO, sign and date below and DO NOT COMPLETE THE REST OF THIS FORM. Otherwise continue.

A Corrective Measures Work Plan must be submitted along with this form to address these issues.

Signature of Owner, Remedial Party or Designated Representative

Date

#### IC CERTIFICATIONS SITE NO. 932063

Box 6

#### SITE OWNER OR DESIGNATED REPRESENTATIVE SIGNATURE

I certify that all information and statements in Boxes 1,2, and 3 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

David M. Share print name	at 3855 N. Ococest. Cleveland TN 34312 print business address	_
am certifying as Olin Cospo	(Owner or Remedial Pa	arty
for the Site named in the Site Details Sec	ction of this form.	
Signature of Owner, Remedial Party, or Di Rendering Certification	Designated Representative Date	20

#### IC/EC CERTIFICATIONS

Box 7

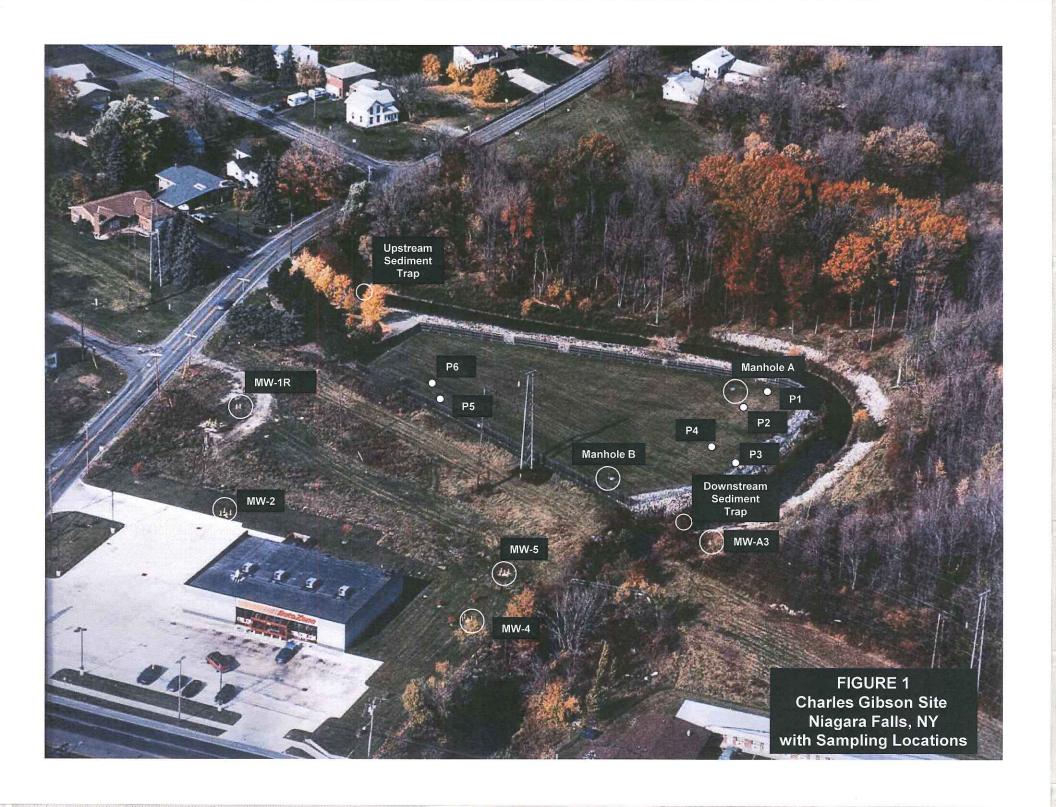
## Professional Engineer Signature

I certify that all information in Boxes 4 and 5 are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law.

David M. Share at 3855	N. Oloce St. Cleveland TN 3731;
print name	print business address
am certifying as a Professional Engineer for the	Olin Corporation
¥	(Owner or Remedial Party)
as B	The state of the s
1.0	TE SENTENCE OF THE SENTENCE OF
Dand of the	2/11/19
Signature of Professional Engineer, for the Owner of	
Remedial Party, Rendering Certification	(Required for PE)

# <u>Attachment B</u>

Site Features Map Figure 1



# <u>Attachment C</u>

**Field Sampling Forms** 

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COMPANY: S	グモイナンシャイ	MONITO	MONITORING WELL: MW-5			
		CONDIT	ION: C. DD			
GROUNDWATE	R PURGE DATA	PURGE DATE:		NOTE: ALL GIBSON SITE		
DEPTH TO BOT	TOM FROM TOP OF RIS	ER: 15.28	(FT.)	MONITORING WELLS ARE		
DEPTH TO WAT	ER FROM TOP OF RISE	R: 11.45	(FT.)	2-INCH DIAMETER STAIN-		
	WATER COLUMN:	3.83	(FT.)	LESS STEEL. WELL DEPTHS:		
	2" DIA. WELL CON	STANT: 0.	16	MW-1R 12.10'		
	ONE WELL VOLUM		(GALS)	MW-2 12.13' MW-A3 11.95'		
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		SPECIFIC				
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			16.4			
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SAMPLING OBS			. * 44 ~ .			
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OTHER OBSER	VATIONS/COMMENTS:	SH-POED AT 92	5 0- 9/2	<i>s</i>   12		

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COMPANY:	SEVENDON	MONITO	ORING WELL:	MU-	1111111111111
		CONDI	TION: Go	00	
GROUNDWAT	ER PURGE DATA	PURGE DATE:		NOTE: A	LL GIBSON SITE
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DEPTH TO WA	TER FROM TOP OF RISE	R: 7.98	(FT.)	2-INCH E	DIAMETER STAIN-
	WATER COLUMN:	5.17	(FT.)	LESS ST	EEL. WELL DEPTHS
	2" DIA. WELL CON	STANT: 0.	16	MW-1R	12.10'
	ONE WELL VOLUM	1E= .9232	(GALS)	MW-2 MW-A3	12.13' 11. <u>95</u> '
				MW-4 MW-5	13.75) 15.28'
FIELD PARAM	ETER MEASUREMENTS:				
		SPECIFIC			
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3	6.94	.777 .7 <b>6</b> 8	16.94	ggio" Statio Part Seattern	CUAL
4	6,92	. 19,	16.83		CLEAN
5					
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SAMPLE METH	HOD: PRASTRUTE long	DEDICATED TUBING			
	SERVATIONS: CEAR				
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OTHER OBSE	RVATIONS/COMMENTS:	mij ta oggmaz	on 2/16/18		
Noto: specific o	onductivity formula to 25 de	grape Calcius: SC/25)	SC measu		
Note. Specific C	oriductivity formula to 25 0e	grees veilins. 30(25)	- 111-23/10.0	-1111	

RECORDED BY: CLURS JONES	SAMPLE ID: MAB - 492518
SAMPLED BY: CHIUS JOWES	SAMPLING EVENT/DATE: Annual
COMPANY: SEMENSUN	MONITORING WELL: MH-B
	CONDITION: 600
GROUNDWATER PURGE DATA PUI	RGE DATE:  NOTE: ALL GIBSON SITE
DEPTH TO BOTTOM FROM TOP OF RISER:	(FT.) MONITORING WELLS ARE
DEPTH TO WATER FROM TOP OF RISER:	(FT.) 2-INCH DIAMETER STAIN-
WATER COLUMN:	(FT.) LESS STEEL WELL DEPTHS:
ZOIA. WELL CONSTANT	r: 0.16 MW-1R 12.10'
ONE WELL VOLUME= PURGE METHOD: BOTTOM OF WELL/SILT BUILDUP:	(GALS) MW-2 12.13' MW-A3 11.95' MW-4 13.75' MW-5 15.28'
	OP TIME:
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WELL CO	ECIFIC TEMP.
	hos/cm) (C OR F) NOTES:
1	
2	
3 4	
5	
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GROUNDWATER OR SEDIMENT SAMPLING D	ATA: SAMPLE DATE: 1/25/18
MEDIA: GROUNDWATER	SAMPLE TIME: 1205
LOCATION: OF PP OF LAPOFIL	
SAMPLE METHOD: PERNITAGE PUMP	DEDICATED TUBING
SAMPLING OBSERVATIONS: CLEAR	
OC SAMPLES TAKEN: D FIELD BO	ANE -692518 THEY AT 1222
OTHER OBSERVATIONS/COMMENTS:	parentee AT 1205 ON 9/25/18 FOR BHK
	SC measured
Note: specific conductivity formula to 25 degrees	Celcius: SC(25)= {[1-25)(0.02)]+1

RECORDED BY: CHAIS JONES	SAMPLEID: MU-A3-692618
SAMPLED BY: CAMS JONES	SAMPLING EVENT/DATE: ANMAL
COMPANY: SEVENSON	MONITORING WELL: MU-A3
	CONDITION: COOD
GROUNDWATER PURGE DATA PURG	E DATE:
	NOTE: ALL GIBSON SITE
DEPTH TO BOTTOM FROM TOP OF RISER:	(FT.) MONITORING WELLS ARE
DEPTH TO WATER FROM TOP OF RISER:	(FT.) 2-INCH DIAMETER STAIN-
WATER COLUMN:	(FT.) LESS STEEL. WELL DEPTHS:
2" DIA. WELL CONSTANT:	0.16 MW-1R 12.10'
ONE WELL VOLUME=	(GALS) MW-2 12.13'
PURGE METHOD:	MW-A3 11.95' MW-4 18.75'
BOTTOM OF WELL/SILT BUILDUP:	MW-5 15.28'
PURGE START TIME: STOP PURGE OBSERVATIONS:	TIME:
PURGE OBSERVATIONS:	
FIELD PARAMETER MEASUREMENTS:	
SPEC	
[18] 전 <del>및 경우</del> 이번에 보면 이렇게 되는 데양 및 18점 시간 모임 - "~~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	UCTIVITY TEMP. (C OR F) NOTES:
VOLUME pH umhos	NOTES.
2	
3	
4	
5	
TOTAL VOLUME PURGED:	
GROUNDWATER OR SEDIMENT SAMPLING DAT	A: SAMPLE DATE:
WEDIA. ODOUNDWATER	SAMPLE TIME:
MEDIA: GROUNDWATER CREEK SEDIMENT	SAMIFLE TIME.
LOCATION:	
SAMPLE METHOD:	
SAMPLING OBSERVATIONS:	
QC SAMPLES TAKEN:	
OTHER OBSERVATIONS/COMMENTS: Dry	NO SAMPLE TAKEN
	SC measured
Note: specific conductivity formula to 25 degrees Cel	cius: SC(25)= {{T-25)(0.02)}+1



# CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM 53502

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAGE Project Number 6 ANALYSIS REQUESTED (Include Method Number and Container Preservative) CHMIES GISSON -OUN Project Manager O **PRESERVATIVE** 0 DAVID SHARE DAVID SHALE Preservative Key 0. NONE 1. HCL Company/Address OUN CORP NUMBER OF CONTAINERS 2. HNO<sub>3</sub> 3. H<sub>2</sub>SO<sub>4</sub> 4. NaOH 3655 NORTH OLDER ST SINTE ZOD 5. Zn. Acetate CLEVELAND TH 37312 6. MeOH 7. NaHSO4 8. Other (423) 336-4987 Onshore Colin, com Sampler's Printed Name
CANAL JONES REMARKS/ ALTERNATE DESCRIPTION FOR OFFICE USE SAMPLING ONLY LAS ID MATRIX CLIENT SAMPLE ID DATE TIME 7/25/18 2 MW-5-092518 925 CV 2 1015 2 2 MW-7-092518 4 ms/msd volume 4 4 LLII mw-1- 097518 MAB-092518 2 1205 2 1222 4 2 下記しのよかしのつだべ 3 TEMP BLAMIS SPECIAL INSTRUCTIONS/COMMENTS INVOICE INFORMATION TURNAROUND REQUIREMENTS REPORT REQUIREMENTS RUSH (SURCHARGES APPLY) L Results Only SAMPLED IN 3 COLENS PO # V II. Results + OC Summaries 1 day \_\_\_\_ 2 day \_\_\_\_ 3 day (LCS, DUP, MS/MSD as required) 4 day \_\_\_\_5 day OUN .. Standard (10 business days-No Surcharge III. Results + QC and Calibration Summaries REQUESTED REPORT DATE IV. Data Validation Report with Raw Data Craconato See QAPP Edata \_\_\_\_\_Yes \_\_\_\_No STATE WHERE SAMPLES WERE COLLECTED RELINQUISHED BY RECEIVED BY RELINQUISHED BY RECEIVED BY RECEIVED BY **AELINQUISHED BY** Signature Signature Signature Signature Printed Name Printed Name Printed Name Printed Name Printed Name 1 STORL Firm Firm Firm Flom SES

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RECORDED BY:	Chris Jones	_	SAMPLE	ID:	US-1-101	118
SAMPLED Chris Jone	S	<u></u> )	SAMPLIN	G EVENT/[	DATE:	annual creek
COMPANY:	Sevenson	<u></u> :	MONITOF	RING WELL	_ Upstream	1
			CONDITIO	ON:		
GROUNDWATER PU	RGE DATA	PURGE DA	ATE:			
<b>DEPTH TO BOTTOM</b>	FROM TOP OF RISE	ER:		(FT.)		LL GIBSON SITE RING WELLS ARE
DEPTH TO WATER F	ROM TOP OF RISE	₹:		(FT.)	2-INCH D	IAMETER STAIN-
	WATER COLUMN:			(FT.)	LESS ST	EEL. WELL DEPTHS:
	2" DIA. WELL CONS	TANT:	0.16		MW-1R	12.10'
	ONE WELL VOLUME	<u> </u>		(GALS)	MW-2 MW-A3	12.13' 11.95'
PURGE METHOD: BOTTOM OF WELL/S PURGE START TIME PURGE OBSERVATION		STOP TIM	E:		MW-4 MW-5	13.75' 15.28'
FIELD PARAMETER I	MEASUREMENTS:					182
WELL VOLUME	рН	SPECIFIC CONDUCT umhos/cm)		TEMP. (C OR F)	_	NOTES:
1			Kess 2			
2						
3						
4						-
5						
TOTAL VOLUME PUR	RGED:					
GROUNDWATER OR	SEDIMENT SAMPLI	NG DATA:		SAMPLE [	DATE:	101118
MEDIA: GROUNDV CREEK SE	VATER DIMENT X	-		SAMPLE	ГІМЕ:	930
LOCATION:	Upstream					
SAMPLE METHOD:	Sed Trap			****		- Carrier
SAMPLING OBSERVA	ATIONS:		·			TO STATE OF THE ST
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Note: specific conducti	vity formula to 25 deg	rees Celcius	s: SC(25)=	SC measu {{T-25)(0.0	red 2)}+1	-

RECORDED BY:	Chris Jones	_	SAMPLE	ID:	DS-1-101	118	Print di la com
SAMPLED Chris Jone	es	<u></u>	SAMPLIN	G EVENT/I	DATE:	annual creek	
COMPANY:	Sevenson	_	MONITOR	RING WELI	downstre	am	
			CONDITIO	ON:			
GROUNDWATER PL	JRGE DATA	PURGE DA	ATE:				
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	WATER COLUMN:			(FT.)	LESS ST	EEL. WELL DEPTH	IS:
	2" DIA. WELL CONS	TANT:	0.16		MW-1R	12.10'	
	ONE WELL VOLUME	==		(GALS)	MW-2	12.13'	
PURGE METHOD: BOTTOM OF WELL/S PURGE START TIME PURGE OBSERVATI	<b>:</b>	STOP TIM	E:		MW-A3 MW-4 MW-5	11.95' 13.75' 15.28'	
FIELD PARAMETER	MEASUREMENTS:						
WELL VOLUME	рН	SPECIFIC CONDUCT umhos/cm)		TEMP. (C OR F)	-	NOTES:	
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2 3					MIL. 1993		
4		the state of the s	<u> </u>				
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TOTAL VOLUME PU	RGED:						
GROUNDWATER OF	R SEDIMENT SAMPLI	ING DATA:		SAMPLE I	DATE:	101118	
MEDIA: GROUND CREEK SE	WATER EDIMENT X	<del>-</del> 3		SAMPLE 7	ГІМЕ:	1030	
LOCATION:	downstream		-				
SAMPLE METHOD:	Sed Trap	7587 (III.)					
SAMPLING OBSERV	ATIONS:		the section of the section	Service of the servic		DESCRIPTION OF THE PROPERTY OF	
QC SAMPLES TAKEI	<u>N:</u> 0					II	
OTHER OBSERVATI	ONS/COMMENTS:	sampled fo	r BHC			The second secon	
Note: specific conduc	tivity formula to 25 deg	rees Celcius	s: SC(25)=	SC measu {{T-25}(0.0		-	



# CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM

53536

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAGE OF CHANGS GIBSON -OUN ANALYSIS REQUESTED (Include Method Number and Container Preservative) 1186 Project Manager Report CC PRESERVATIVE 0 DAVID SHARE DAVID SHARE Company/Address Preservative Key OUN CORP O. NONE CONTAINERS 1. HCL 2. HNO<sub>3</sub> 3855 NORTH OLDER ST SLITE ZOU H<sub>2</sub>SQ<sub>4</sub> NaOH Zn. Acetate 37312 CLEVELAND TH 40 6. MeOH 7. NaHSO<sub>4</sub> DMShare & Olinicon 423 336 4987 Other Sampler's Signature Sampler's Printed Name REMARKS/ CHINE UNITUS ALTERNATE DESCRIPTION FOR OFFICE USE SAMPLING CLIENT SAMPLE ID ONLY LAB ID DATE TIME MATRIX 10/11/18 1 115-1-101118 930 SED M5-1-101118 DOGV 1 1030 05-1-101118 TEMB BUNDE SPECIAL INSTRUCTIONS/COMMENTS TURNAROUND REQUIREMENTS REPORT REQUIREMENTS INVOICE INFORMATION **RUSH (SURCHARGES APPLY)** i. Results Only CHARLES GIBSON ANNUAL CREEK BED SEDIMENT K II. Results + OC Summaries ..... 1 day .......... 2 day .......... 3 day (LCS, DUP, MS/MSO as required) \_\_\_ 4 day \_\_\_\_5 day OUN . Standard (10 business days-No Surcharge) Ili. Results + QC and Calibration REQUESTED REPORT DATE STANDARD IV. Data Validation Report with Raw Data See OAPP STATE WHERE SAMPLES WERE COLLECTED Edata Yes No RELINQUISHED BY RECEIVED BY RELINQUISHED BY RECEIVED BY RELINQUISHED BY RECEIVED BY Signature Signature Signature Signature Signature Printed Name No Sories Printed Name Printed Name Printed Name Printed Name Printed Name SES Ekm 0011 Bilita Date/Time Date/Time Date/Time Date/Time Date/Time

# <u>Attachment D</u>

**Site Inspection Forms** 

THIS FORM TO BE USED FOR	QUARTERLY	AND ALL O	THER SITE INSPECTIONS	
DATE: 3 13 18	_TIME:	1230	· ·	
INSPECTOR: C らいもら	Annual Control of the	COMPANY:	SEVENSIA	
WEATHER: 33° CLEAN			¥!	
REASON FOR INSPECTION (Q	UARTERLY	OR OTHER <u>):</u>		
subsidence (sinking), and rodent burrows.	e conditions r ponded wate For site secur	ote existence r, stressed ve ity, note abse	PTABLE A=ACCEPTABLE e of bare areas (number,size), cracks, egetation, soil discoloration or seeps, ence of locks, gates open or damaged, ny other unusual occurences.)	
		C	OMMENTS	
ACCESS ROAD	A		3-4" SNOW	
COVER VEGETATION	A	200	SNOW COVER	
TREES	A			
LITTER	A	18	H =	
EROSION (CAP)	A	\$ <del></del>		
EROSION (BANK)	A	1		
SECURITY:				
FENCE/LOCKS	Po.			
PIEZOMETERS/LOCKS	A	<del>- 1-2-1</del>		
MONITORING WELLS/LOCKS	A	<del></del>		
MANHOLES/LIDS/LOCKS	4	24 2011-0-100		
ELECTRICAL PANEL	-			
ADDITIONAL COMMENTS:	All locks	Secured	on arrival. About 3.4"	
				Ş

THIS FORM TO BE USED FOR			THER SITE INSPECTIONS
DATE: <u>5/21/18</u>	_TIME: .	0830	
INSPECTOR: ONLS JONES		COMPANY:	SEVENSON
WEATHER: (5° SUN ~)			
REASON FOR INSPECTION (QU	JARTERLY (	OR OTHER <u>):</u>	2nd quarter inspection
subsidence (sinking), and rodent burrows. F	e conditions r ponded wate For site secui	note existence er, stressed ve rity, note abse	PTABLE A=ACCEPTABLE of bare areas (number,size), cracks, egetation, soil discoloration or seeps, ence of locks, gates open or damaged, ny other unusual occurences.)
		C	OMMENTS
ACCESS ROAD	4_	A	EMOVED THE LIMBS
COVER VEGETATION		*	AND THE STATE OF T
TREES	<u>A</u>		
LITTER		R	Empto Minimum Trash
EROSION (CAP)		I <del>-sec</del>	
EROSION (BANK)		-	
SECURITY:			
FENCE/LOCKS	<b>A</b>	1	REPLACED LOCK ON PS
PIEZOMETERS/LOCKS	A	-	
MONITORING WELLS/LOCKS	A	Manufacture	
MANHOLES/LIDS/LOCKS	A		
ELECTRICAL PANEL	A		
			2 2
ADDITIONAL COMMENTS:	SITE SE	coled asing	J ARMVAL.
		(ii)	
			the contract of the contract o

INSPECTOR: CHRUS JONE	S	_COMPANY:	SEVENSON	
WEATHER: 80° SUNNY	aimU4,			
REASON FOR INSPECTION (C	QUARTERLY	OR OTHER <u>):</u>	WELL REDEVELOPMENT	
GENERAL SITE CONDITIONS: (Note: For general si			TABLE A=ACCEPTABLE of bare areas (number, size), cracks,	
and rodent burrows.	For site sec	curity, note abse	getation, soil discoloration or seeps, nce of locks, gates open or damaged, y other unusual occurences.)	
		CO	DMMENTS	
ACCESS ROAD	_A_	_		
COVER VEGETATION	A			
TREES	A			
LITTER	A			
EROSION (CAP)	A	_		
EROSION (BANK)	A	_	Alle Andrews and the Control of the	
SECURITY:				
FENCE/LOCKS	A	_		
PIEZOMETERS/LOCKS	A	_	¥	
MONITORING WELLS/LOCKS	_A_			
MANHOLES/LIDS/LOCKS	A	-		
ELECTRICAL PANEL	A	-		
ADDITIONAL COMMENTS:		Name and the second	8 8 8	
SEVENSON AND NOT	HNAGLE I	NEME ON S	ITE TO REDEVELOPE	
PIEZOMETERS PLO	md P2	. SEVENSON	WILL RETURN TO SITE	
TO DOCUMENT NESS	IUS.			
8	•			
			The state of the s	

MODECTOD, Charle 1		THAD A NIV.	Skyraicad
INSPECTOR: CHAS JONES		OMPANY:	SEVENSON
WEATHER: 65° SUNTY			
REASON FOR INSPECTION (QU	ARTERLY OF	OTHER):	AHUUAL
subsidence (sinking), p and rodent burrows. F	conditions no conded water, or site security	te existence stressed ve y, note abse	TABLE A=ACCEPTABLE of bare areas (number,size), cracks, getation, soil discoloration or seeps, nce of locks, gates open or damaged, y other unusual occurences.)
		CC	DMMENTS
ACCESS ROAD			
COVER VEGETATION			
TREES	<u>A</u>		
LITTER	<u>A</u>		
EROSION (CAP)	<u> </u>		
EROSION (BANK)			
SECURITY:			
FENCE/LOCKS	A		
PIEZOMETERS/LOCKS	A		
MONITORING WELLS/LOCKS	A		
MANHOLES/LIDS/LOCKS	A		
ELECTRICAL PANEL	A		
ADDITIONAL COMMENTS:			
PERFORMED AHMVAL	SAMPLIN	, EVEN	
MW-A3 WAS DAY	NO SIAMPL	E TAKEN	
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PUE TO HEAVY RAIM	S TAR (	THE BY	MUZ WILL CONMAC THEM
LATER IN WELL.			

DATE:	10/11/20	)18	_TIME:	900		-
INSPECT	ΓOR:	C Jones		_COMPAN	Y:	Sevenson
WEATHE	ER:	70 P/C				
REASON	FOR INSE	PECTION (QU	JARTERLY	OR OTHER	R):	annual creek sed sampling
GENERA	(Note: For subsident and rode	ce (sinking), p nt burrows. F	oonded wat or site secu	note existe er, stressed urity, note al	nce of bare vegetation osence of lo	A=ACCEPTABLE areas (number,size), cracks, , soil discoloration or seeps, ocks, gates open or damaged, unusual occurences.)
					COMMEN	TS
ACCESS			<u>A</u>	_		
COVER \	VEGETATION	NC	<u>A</u>	_		
TREES			<u>A</u>	_		
LITTER			<u>A</u>	_		
EROSIO	N (CAP)		<u>A</u>	_	Branch and the second	
EROSIO	N (BANK)		<u>A</u>		St.	
SECURIT	ΓY:					
FENCE/L	OCKS		Α	_		
PIEZOME	ETERS/LO	CKS	Α	_		
MONITO	RING WEL	LS/LOCKS	A	_	10	
MANHOL	ES/LIDS/L	OCKS	Α	_		
ELECTRI	ICAL PANE	EL	Α	_		
ADDITIO	NAL COMI	MENTS:				
Sevensor	n sampled t	he creek sed	for BHCs (	PEST) A bl	ind duplicat	e was taken upstream and labled
MS-1-101	1118					
Jones 4h	rs					
Wright 2h	nrs					

DATE: 9 11/8/18	_TIME:	<u> </u>
INSPECTOR: CLINIS JOHES		COMPANY: SEVENSH
WEATHER:		
REASON FOR INSPECTION (QU	JARTERLY	OR OTHER): Gilbom Site 4th Queter inspection 2018
subsidence (sinking), and rodent burrows.	ponded wat For site sec	U=UNACCEPTABLE A=ACCEPTABLE s note existence of bare areas (number,size), cracks, ater, stressed vegetation, soil discoloration or seeps, curity, note absence of locks, gates open or damaged, dalism. Note any other unusual occurences.)
ACCESS ROAD	A	COMMENTS
COVER VEGETATION	A	
TREES	A	
LITTER	A	
EROSION (CAP)	A	
EROSION (BANK)	A	
SECURITY:		
FENCE/LOCKS	A	
PIEZOMETERS/LOCKS	A	
MONITORING WELLS/LOCKS	A	
MANHOLES/LIDS/LOCKS	A	
ELECTRICAL PANEL	A	
ADDITIONAL COMMENTS:		
A SMALL AMOUNT OF	Trasa W	IN COLECTED.

## TABLE 1 **CHARLES GIBSON SITE** NIAGARA FALLS, NEW YORK

#### ANALYTICAL SUMMARY **GROUND WATER SAMPLING 2012-2018**

MONITOR WELL: MW-A3

	2012			2013		2014		2015		2016		2017		2018	
Parameter	April	September	May	September	April	September	May	September	May	September	May	September	May	Septembe	
Alpha-BHC	NR	0.050U	0.047U	NR	NR	0.047U	0.047U	NR	NR	-	0.047U	NR	NR	-	
Beta-BHC	NR	0.050U	0.047U	NR	NR	0.047U	0.047U	NR	NR	-	0.047U	NR	NR	841	
Gamma-BHC	NR	0.050U	0.047U	NR	NR	0.047U	0.047U	NR	NR	-	0.047U	NR	NR	:=1	
Delta-BHC	NR	0.050U	0.047U	NR	NR	0.047U	0.047U	NR	NR	-	0.047U	NR	NR	-	
Hexachlorobenzene	NR	20U	NR	NR	NR	9.4U	NR	NR	NR	=	NR	NR	NR	_	

MONITOR WELL: MW-4

	2012		2013		2014		2015		2016		2017		2018	
Parameter	April	September	May	September	April	September	May	September	May	September	May	September	May	September
Alpha-BHC	NR	0.047U	0.047U	NR	NR	0.047U	0.047U	NR	NR	0.056U	0.047U	NR	NR	0.047U
Beta-BHC	NR	0.047U	0.047U	NR	NR	0.047U	0.047U	NR	NR	0.056U	0.047U	NR	NR	0.047U
Gamma-BHC	NR	0.047U	0.047U	NR	NR	0.047U	0.047U	NR	NR	0.056U	0.047U	NR	NR	0.047U
Delta-BHC	NR	0.047U	0.047U	NR	NR	0.047U	0.047U	NR	NR	0.056U	0.047U	NR	NR	0.047U
Hexachlorobenzene	NR	9.4U	NR	NR	NR	9.4U	NR	NR	NR	10U	NR	NR	NR	9.4U

MONITOR WELL: MW-5

		2012		2013		2014		2015		2016		2017		2018
Parameter	April	September	May	September	April	September	May	September	May	September	May	September	May	September
Alpha-BHC	NR	0.047U	0.047U	NR	NR	0.050U	0.047U	NR	NR	0.056U	0.047U	NR	NR	0.047U
Beta-BHC	NR	0.047U	0.047U	NR	NR	0.050U	0.047U	NR	NR	0.056U	0.047U	NR	NR	0.047U
Gamma-BHC	NR	0.047U	0.047U	NR	NR	0.050U	0.047U	NR	NR	0.056U	0.047U	NR	NR	0.047U
Delta-BHC	NR	0.047U	0.047U	NR	NR	0.050U	0.047U	NR	NR	0.056U	0.047U	NR	NR	0.047U
Hexachlorobenzene	NR	9.4U	NR	NR	NR	9.4U	NR	NR	NR	10U	NR	NR	NR	9.4U

Notes: Concentration in ug/I - insufficient sample

U Undetected

J Estimated value

NR Not required

# Table 2 Annual Manhole B Sampling

#### CHARLES GIBSON SITE NIAGARA FALLS, NEW YORK

# ANALYTICAL RESULTS SUMMARY ANNUAL LEACHATE SAMPLING

## September 25, 2018

	MANHOLE B (MHB)
PARAMETER	
alpha-BHC	0.047U
beta-BHC	0.062
delta-BHC	0.047U
gamma-BHC	0.047U
Hexachlorobenzene	NR

#### Notes:

U

Undetected

J

Estimated value

NR

Not Required

Concentration in ug/l

Field blank was non-detect for all parameters of interest.

Data has been validated and judged acceptable as qualified.

Next hexachlorobenzene (HCB) sampling scheduled for fall 2020

# TABLE 3 Charles Gibson Site Niagara Falls, New York

# **ANALYTICAL SUMMARY**

# Annual Cayuga Creek Sediment Sampling 2008 - 2018

#### **UPSTREAM**

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Parameter	September										
Alpha- BHC	77	240	94	200J	17	170J	120	NS	9.7	200	57U
Beta- BHC	69	260	97	120J	48	190J	280	NS	25	190	57U
Gamma- BHC	17J	18J	33J	190U	5.5U	28U	49U	NS	5.6U	51U	57U
Delta- BHC	26U	39J	52J	140J	23	28U	49U	NS	19	51U	57U

#### DOWNSTREAM

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Parameter	September										
Alpha- BHC	5200	210	53J	230J	9.8	29U	55	52U	7	69U	63U
Beta- BHC	1000	73	62J	130J	37	89	100	76	18	87	63U
Gamma- BHC	66J	60U	63U	220U	5.9U	29U	52U	52U	4.9U	69U	63U
Delta- BHC	82J	32	56J	170J	. 18	29U .	52U	52U	15	69U	63U

#### Notes:

Concentration in microgram per kilogram (ug/kg)

U Not Detected

J Estimated value

NS No sample in trap

Table 4 2018 Quarterly Groundwater Elevations Summary

Piezometer Pair	3/13/2018	Inward gradient	5/24/2018	Inward gradient	9/25/2018	Inward gradient	11/8/2018	Inward gradient
P1 outside P2 inside	565.64 565.54	Inward	565.90 565.53	Inward	564.33 565.34	Outward	563.33 565.19	Outward
P3 outside P4 inside	568.64 565.49	Inward	567.21 565.35	Inward	563.86 569.13	Outward	568.91 568.16	Inward
P5 outside P6 inside	568.26 567.77	Inward	568.70 567.57	Inward	566.20 567.12	Outward	568.85 566.57	Inward
		Below 565 ft msl		Below 565 ft msl		Below 565 ft msl		Below 565 ft msl
Manhole A Manhole B	563.77 563.79	Yes Yes	563.24 563.31	Yes Yes	563.10 563.14	Yes Yes	563.21 563.25	Yes Yes

Notes: Measurement units are in feet above MSL.

Piezometers P1, P3, P5 are outside the slurry wall. Piezometers P2, P4, P6 are located within the containment area.

NA - Not Available Manhole monitoring:

• Maintain water level below 565 feet to prevent hydrostatic pressure buildup under concrete slab.

• Pump Manhole B as required to maintain an inward gradient.

# Table 5 Olin Corp. Gibson Site Discharge Volumes

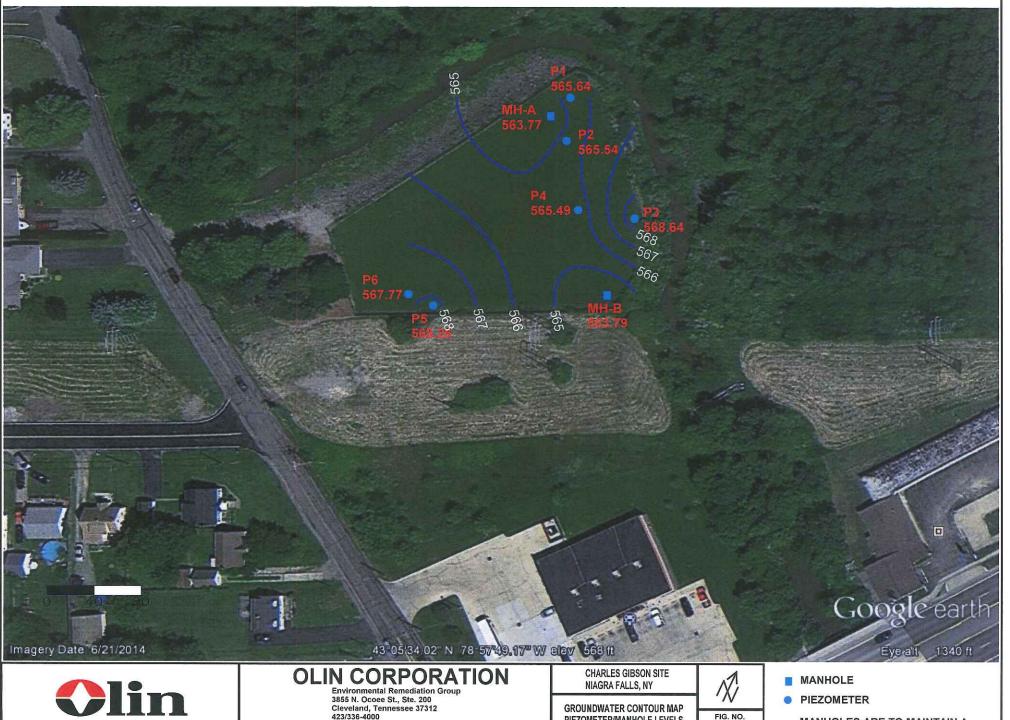
# Monthly Discharge Volumes 2018

# **Summary of Yearly Discharge Volumes**

Date	Volume (gallons)
2008	40,223
2009	40,187
2010	28,118
2011	40,625
2012	29,623
2013	46,766
2014	33,564
2015	18,537
2016	28,172
2017	35,492
2018	33,837
TOTALS	375,144

Month	Volume (gallons)
Jan	2,446
Feb	6,082
Mar	4,138
Apr	7161
Мау	7,312
Jun	0
Jul	3,020
Aug	2,884
Sep	0
Oct	0
Nov	0
Dec	794
Total	33,837

DATE:	13 18	_TIME:	1230		A	V Maria
INSPECTOR: C	Janes	_COMPANY:_	SEV	ENSUN		
WEATHER: 3	33° CLEAR					
PIEZOMETER	RISER ELEVATION (INSIDE CASING)	DEPTH TO W (FT.)	VATER	WATER ELEVATION	COMMENTS	
P-1	572.72	7.08		565.64	***************************************	ŧ
P-2	574.89	9.35		565.54		·
P-3	574.16	5.52		568.64		ž
P-4	576.14	10.65		565.49		
P-5	575.05	6.79		568.26	.*	
P-6	578.28	10.51		567.77	2 2	
MANHOLE A	575.22	11.45		563.77		
		100		State of the state	To the second of the second	The Little Chief.
	577.34	13.55	ed Manh	563.79	utomatically to the	Town of
Niagara Tuscarora F in Manhole B (and b water distance from (Note: riser elevation	577.34  mpties into Manhole B by Road sanitary sewer line y extension Manhole A) I the manhole rim should is (re)surveyed Septemb	y gravity feed an by a float contro below an elevat not be <u>less</u> than ber, 1999 by We	olled sur ion of 56 n 12.41 f	ole B is pumped a mp pump which m 55 ft. above mean ft. at Manhole B ar	aintains groundwasea level. There	ater elevations fore, Depth to
(Note: Manhole A en Niagara Tuscarora F in Manhole B (and b water distance from (Note: riser elevation	mpties into Manhole B by Road sanitary sewer line y extension Manhole A) l the manhole rim should is (re)surveyed Septemb	y gravity feed an by a float contro below an elevat not be <u>less</u> than ber, 1999 by We	olled sur ion of 56 n 12.41 f	ole B is pumped a mp pump which m 55 ft. above mean ft. at Manhole B ar	aintains groundwasea level. There	ater elevations fore, Depth to
(Note: Manhole A en Niagara Tuscarora F in Manhole B (and b water distance from (Note: riser elevation	mpties into Manhole B by Road sanitary sewer line y extension Manhole A) l the manhole rim should is (re)surveyed Septemb	y gravity feed an by a float contro below an elevat not be <u>less</u> than ber, 1999 by We	olled sur ion of 56 n 12.41 f	ole B is pumped a mp pump which m 55 ft. above mean ft. at Manhole B ar	aintains groundwasea level. There	ater elevations fore, Depth to
(Note: Manhole A en Niagara Tuscarora F in Manhole B (and b water distance from (Note: riser elevation	mpties into Manhole B by Road sanitary sewer line y extension Manhole A) l the manhole rim should is (re)surveyed Septemb	y gravity feed an by a float contro below an elevat not be <u>less</u> than ber, 1999 by We	olled sur ion of 56 n 12.41 f	ole B is pumped a mp pump which m 55 ft. above mean ft. at Manhole B ar	aintains groundwasea level. There	ater elevations fore, Depth to
(Note: Manhole A en Niagara Tuscarora F in Manhole B (and b water distance from (Note: riser elevation	mpties into Manhole B by Road sanitary sewer line y extension Manhole A) l the manhole rim should is (re)surveyed Septemb	y gravity feed an by a float contro below an elevat not be <u>less</u> than ber, 1999 by We	olled sur ion of 56 n 12.41 f	ole B is pumped a mp pump which m 55 ft. above mean ft. at Manhole B ar	aintains groundwasea level. There	ater elevations fore, Depth to
(Note: Manhole A en Niagara Tuscarora F in Manhole B (and b water distance from (Note: riser elevation	mpties into Manhole B by Road sanitary sewer line y extension Manhole A) l the manhole rim should is (re)surveyed Septemb	y gravity feed an by a float contro below an elevat not be <u>less</u> than ber, 1999 by We	olled sur ion of 56 n 12.41 f	ole B is pumped a mp pump which m 55 ft. above mean ft. at Manhole B ar	aintains groundwasea level. There	ater elevations fore, Depth to





	423/336-4000		
SCALE:	DRAWN BY: JRH	DATE: 2-5-2019	۱
).5 IN = 40 FT.	CHKD. BY: ABC	DATE: 2-11-2019	

GROUNDWATER CONTOUR MAP PIEZOMETER/MANHOLE LEVELS SAMPLING EVENT MARCH 13, 2018

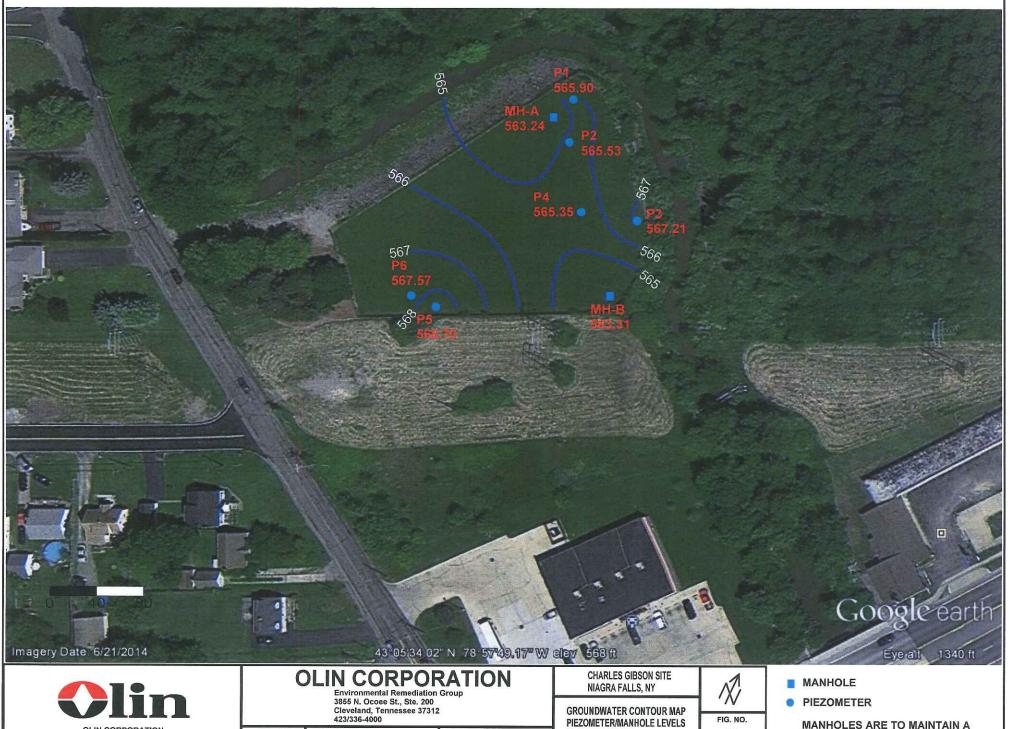


FIG. NO.

PIEZOMETER

MANHOLES ARE TO MAINTAIN A WATER LEVEL BELOW 565 FT (AMSL)

THIS FORM TO BE U WATER ELEVATION			METER .	AND MANHOLE G	ROUND-	
DATE: 5(24	18	_TIME:	0830	2	Š.	
INSPECTOR: CHA	is Jones	_COMPANY:_	SEV	ENSON		
WEATHER: 65°	Suny		, <del>i</del>			
PIEZOMETER	RISER ELEVATION (INSIDE CASING)	DEPTH TO V (FT.)	VATER	WATER ELEVATION	COMMENTS,	
P-1	572.72	6.82		565.90		
P-2	574.89	9.36		565-53		
P-3.	574.16	6.95		567.21		ž
P-4	576.14	10.79		565.35		12
P-5	575.05	6.35		568.70		
P-6	578.28	10.71		567.57		
MANHOLE A	575.22	11.98		563.24		
MANHOLE B	577.34	14.03		563.31		<u> </u>
(Note: Manhole A emp Niagara Tuscarora Ro- in Manhole B (and by a water distance from the (Note: riser elevations	ad sanitary sewer line extension Manhole A) l e manhole rim should	by a float contro below an elevat not be <u>less</u> that	olled sur tion of 56 n 12.41 f	np pump which ma 55 ft. above mean s t. at Manhole B and	intains groundwa ea level. Theref	ater elevations fore, Depth to
ADDITIONAL COMME	NTS/OBSERVATION	S: SITE WAS	SECUE	EO UPUN AKKUL	IAC. LIMITED	
TRASH WAS COL	LECTED. LOCK (	was ChanGEC	TAC	P.S. TREE LIMB	s while	
CLEARED ON ACC	ess Rand		<del></del>	Well-man C. Very		
3		, idea		A STATE OF THE STA		
					A LINE	
N				**************************************		
						,





SCALE: 0.5 IN = 40 FT.

DRAWN BY: JRH CHKD. BY: ABC

DATE: 2-5-2019 DATE: 2-11-2019 GROUNDWATER CONTOUR MAP PIEZOMETER/MANHOLE LEVELS SAMPLING EVENT MAY 24, 2018

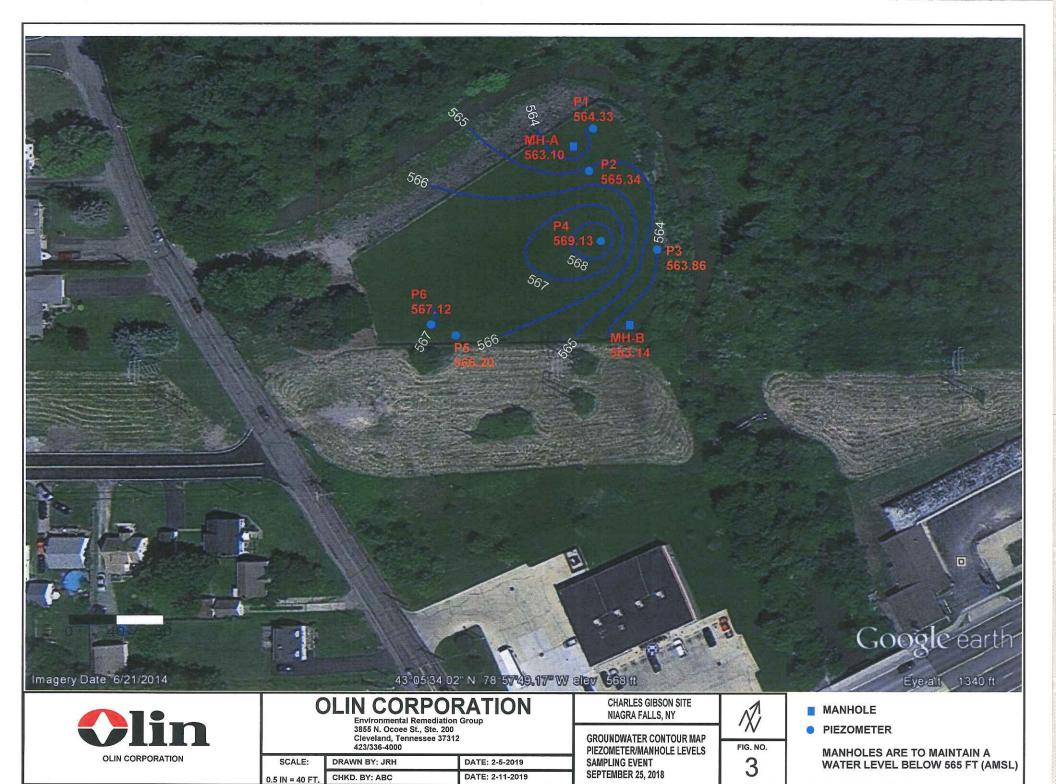


FIG. NO.

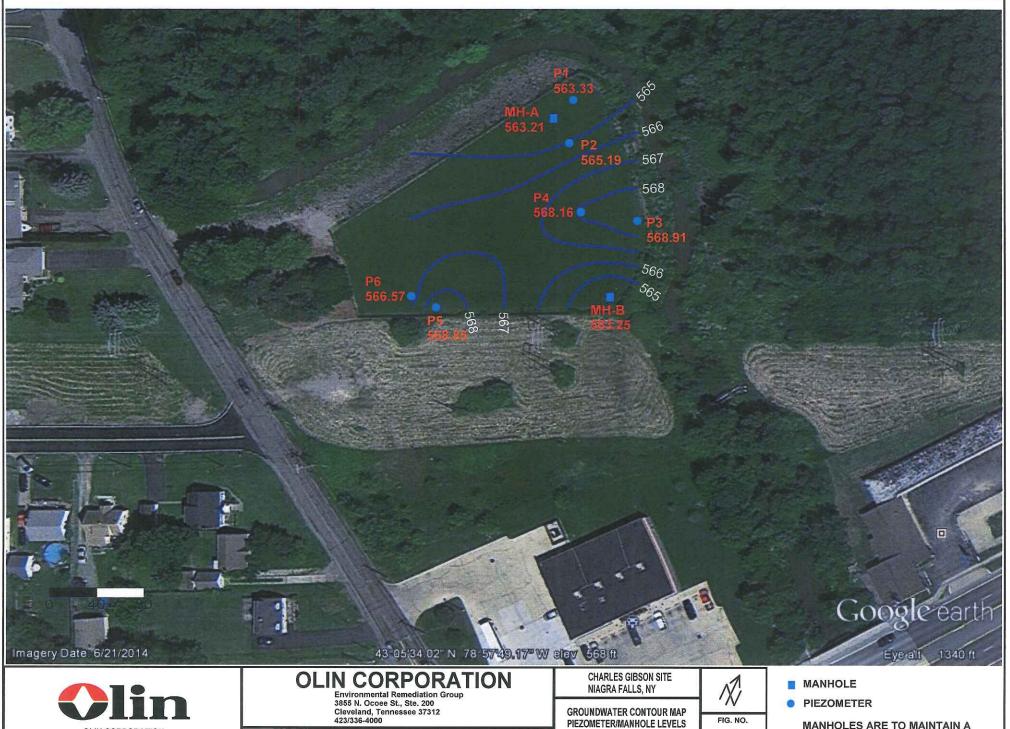
MANHOLES ARE TO MAINTAIN A WATER LEVEL BELOW 565 FT (AMSL)

	USED FOR ALL QUAR MEASURING EVENT		OMETER	AND MANHOLE	GROUND-	
DATE: 7/10	2/18	_TIME: _	1245			
INSPECTOR: CHO	us lines	_COMPANY:	SEVE	ENSUN		
WEATHER: %	o° sundy					
PIEZOMETER	RISER ELEVATION (INSIDE CASING)	DEPTH TO '	WATER	WATER ELEVATION	COMMENTS	
P-1	572.72	10.25		562.47		.03
P-2	574.89	9.42		565.47	XXIII XXIIIX	
P-3	574.16	,			*****	
P-4	576.14	(*************************************			V	
P-5	575.05			***************************************		
P-6	578.28	6)				
MANHOLE A	575.22					
MANHOLE B	577.34					
Niagara Tuscarora Ro in Manhole B (and by water distance from th	pties into Manhole B by oad sanitary sewer line extension Manhole A) t he manhole rim should i s (re)surveyed Septemb	by a float cont below an eleva not be <u>less</u> tha	trolled sur ation of 56 an 12.41 f	mp pump which 65 ft. above mea ft. at Manhole B	maintains groundwa an sea level. Therefo	iter elevations ore, Depth to
ADDITIONAL COMM	ENTS/OBSERVATIONS	S:				
SEVENSUN	WAS ON SITE TO	à CHECIL	37AW	n LEVELS	FUL PLEZOMET	ens I hnd 2
		W		errotorio a constitución de la c		
				mente state en	· · · · · · · · · · · · · · · · · · ·	
					8	
		wheeling and the six				
			<del> </del>			

WEATHER:         65° 500000         DEPTH TO WATER WATER ELEVATION (INSIDE CASING)         DEPTH TO WATER WATER ELEVATION         COMMENTS ELEVATION           P-1         572.72         8.39         564.33           P-2         574.89         9.55         565.34           P-3         574.16         10.30         563.86           P-4         576.14         7.01         569.13           P-5         575.05         8.85         56.20           P-6         578.28         11.61         548.567.12           MANHOLE A         575.22         12.12         563.10	DATE: 9/25	18	_TIME:0830		
RISER ELEVATION DEPTH TO WATER WATER COMMENTS PIEZOMETER (INSIDE CASING) (FT.) ELEVATION P-1 572.72 \$.39 \$64.33 P-2 574.89 \$1.55 \$63.86 P-4 576.14 7.01 \$563.13 P-5 575.05 \$8.85 \$563.72 P-6 578.28 \$11.61 \$563.19  MANHOLE A 575.22 \$12.12 \$563.19  (Note: Manhole A empties into Manhole B by gravity feed and Manhole B is pumped automatically to the Town on Niagara Tuscarora Road sanitary sewer line by a float controlled sump pump which maintains groundwater elevin Manhole B (and by extension Manhole A) below an elevation of 565 ft. above mean sea level. Therefore, Depwater distance from the manhole rim should not be less than 12.41 ft. at Manhole B and 10.22 ft. at Manhole A. (Note: riser elevations (re)surveyed September, 1999 by Wendel Surveyors)	INSPECTOR: 4	Agus Jones	COMPANY: S	とっていっと	
PIEZOMETER (INSIDE CASING) (FT.) ELEVATION  P-1 572.72 8.39 564.33  P-2 574.89 9.55 565.34  P-3 574.16 10.30 563.86  P-4 576.14 7.01 569.13  P-5 575.05 8.85 562.20  P-6 578.28 11.61 563.10  MANHOLE A 575.22 12.12 563.10  (Note: Manhole A empties into Manhole B by gravity feed and Manhole B is pumped automatically to the Town of Niagara Tuscarora Road sanitary sewer line by a float controlled sump pump which maintains groundwater eleving Manhole B (and by extension Manhole A) below an elevation of 565 ft. above mean sea level. Therefore, Dewater distance from the manhole rim should not be less than 12.41 ft. at Manhole B and 10.22 ft. at Manhole A. (Note: riser elevations (re)surveyed September, 1999 by Wendel Surveyors)	WEATHER: 6	5° SUNNY			
PIEZOMETER (INSIDE CASING) (FT.) ELEVATION  P-1 572.72 8.39 564.33  P-2 574.89 9.55 565.34  P-3 574.16 30.30 563.86  P-4 576.14 7.01 569.13  P-5 575.05 8.85 566.70  P-6 578.28 11.61 563.19  MANHOLE A 575.22 12.12 563.19  (Note: Manhole A empties into Manhole B by gravity feed and Manhole B is pumped automatically to the Town of Niagara Tuscarora Road sanitary sewer line by a float controlled sump pump which maintains groundwater elevation Manhole B (and by extension Manhole A) below an elevation of 565 ft. above mean sea level. Therefore, Depwater distance from the manhole rim should not be less than 12.41 ft. at Manhole B and 10.22 ft. at Manhole A. (Note: riser elevations (re)surveyed September, 1999 by Wendel Surveyors)		RISER EI EVATION	DEPTH TO WATER	WATER (	COMMENTS
P-2 574.89 9.55 565.34  P-3 574.16 10.30 563.86  P-4 576.14 7.01 569.13  P-5 575.05 8.85 566.20  P-6 578.28 11.61 565.12  MANHOLE A 575.22 12.12 563.19  (Note: Manhole A empties into Manhole B by gravity feed and Manhole B is pumped automatically to the Town of Niagara Tuscarora Road sanitary sewer line by a float controlled sump pump which maintains groundwater eleving Manhole B (and by extension Manhole A) below an elevation of 565 ft. above mean sea level. Therefore, Depwater distance from the manhole rim should not be less than 12.41 ft. at Manhole B and 10.22 ft. at Manhole A. (Note: riser elevations (re)surveyed September, 1999 by Wendel Surveyors)	PIEZOMETER				Olimetro
P-3 574.16 10.30 563.86  P-4 576.14 7.01 569.13  P-5 575.05 8.85 546.20  P-6 578.28 11.61 563.10  MANHOLE A 575.22 12.12 563.10  (Note: Manhole A empties into Manhole B by gravity feed and Manhole B is pumped automatically to the Town of Niagara Tuscarora Road sanitary sewer line by a float controlled sump pump which maintains groundwater eleving Manhole B (and by extension Manhole A) below an elevation of 565 ft. above mean sea level. Therefore, Depwater distance from the manhole rim should not be less than 12.41 ft. at Manhole B and 10.22 ft. at Manhole A. (Note: riser elevations (re)surveyed September, 1999 by Wendel Surveyors)	P-1	572.72	8.39	564.33	
P-4 576.14 7.01 569.13  P-5 575.05 8.85 569.70  P-6 578.28 11.61 569.12  MANHOLE A 575.22 12.12 563.19  (Note: Manhole A empties into Manhole B by gravity feed and Manhole B is pumped automatically to the Town of Niagara Tuscarora Road sanitary sewer line by a float controlled sump pump which maintains groundwater elevation Manhole B (and by extension Manhole A) below an elevation of 565 ft. above mean sea level. Therefore, Depwater distance from the manhole rim should not be less than 12.41 ft. at Manhole B and 10.22 ft. at Manhole A. (Note: riser elevations (re)surveyed September, 1999 by Wendel Surveyors)	P-2	574.89	9.55	565.34	
P-5 575.05 8.85 566.720  P-6 578.28 11-61 565.10  MANHOLE A 575.22 12-12 565.10  MANHOLE B 577.34 14.20 563.14  (Note: Manhole A empties into Manhole B by gravity feed and Manhole B is pumped automatically to the Town of Niagara Tuscarora Road sanitary sewer line by a float controlled sump pump which maintains groundwater eleventh Manhole B (and by extension Manhole A) below an elevation of 565 ft. above mean sea level. Therefore, Deptivater distance from the manhole rim should not be less than 12.41 ft. at Manhole B and 10.22 ft. at Manhole A. (Note: riser elevations (re)surveyed September, 1999 by Wendel Surveyors)	P-3	574.16	10.30	563.86	
P-6 578.28 11.61 565.19  MANHOLE A 575.22 12.12 565.19  MANHOLE B 577.34 14.20 563.14  (Note: Manhole A empties into Manhole B by gravity feed and Manhole B is pumped automatically to the Town of Niagara Tuscarora Road sanitary sewer line by a float controlled sump pump which maintains groundwater elevation Manhole B (and by extension Manhole A) below an elevation of 565 ft. above mean sea level. Therefore, Deptivater distance from the manhole rim should not be less than 12.41 ft. at Manhole B and 10.22 ft. at Manhole A. (Note: riser elevations (re)surveyed September, 1999 by Wendel Surveyors)	P-4	576.14	7.01	569.13	
MANHOLE A 575.22 12.12 563.19  MANHOLE B 577.34 14.20 563.19  (Note: Manhole A empties into Manhole B by gravity feed and Manhole B is pumped automatically to the Town of Niagara Tuscarora Road sanitary sewer line by a float controlled sump pump which maintains groundwater elevation Manhole B (and by extension Manhole A) below an elevation of 565 ft. above mean sea level. Therefore, Depti water distance from the manhole rim should not be less than 12.41 ft. at Manhole B and 10.22 ft. at Manhole A. (Note: riser elevations (re)surveyed September, 1999 by Wendel Surveyors)	P-5	575.05	8.85	566,20	
MANHOLE B 577.34 14.20 563.14  (Note: Manhole A empties into Manhole B by gravity feed and Manhole B is pumped automatically to the Town of Niagara Tuscarora Road sanitary sewer line by a float controlled sump pump which maintains groundwater elevation Manhole B (and by extension Manhole A) below an elevation of 565 ft. above mean sea level. Therefore, Departer distance from the manhole rim should not be less than 12.41 ft. at Manhole B and 10.22 ft. at Manhole A. (Note: riser elevations (re)surveyed September, 1999 by Wendel Surveyors)	P-6	578.28	11-61	567.12	
(Note: Manhole A empties into Manhole B by gravity feed and Manhole B is pumped automatically to the Town of Niagara Tuscarora Road sanitary sewer line by a float controlled sump pump which maintains groundwater elevation Manhole B (and by extension Manhole A) below an elevation of 565 ft. above mean sea level. Therefore, Departer distance from the manhole rim should not be less than 12.41 ft. at Manhole B and 10.22 ft. at Manhole A. (Note: riser elevations (re)surveyed September, 1999 by Wendel Surveyors)	MANHOLE A	575.22	12.12	563.10	
(Note: Manhole A empties into Manhole B by gravity feed and Manhole B is pumped automatically to the Town of Niagara Tuscarora Road sanitary sewer line by a float controlled sump pump which maintains groundwater elevents in Manhole B (and by extension Manhole A) below an elevation of 565 ft. above mean sea level. Therefore, Depwater distance from the manhole rim should not be less than 12.41 ft. at Manhole B and 10.22 ft. at Manhole A. (Note: riser elevations (re)surveyed September, 1999 by Wendel Surveyors)					
	(Note: Manhole A e	empties into Manhole B by	gravity feed and Manh	nole B is pumped autom	
	(Note: Manhole A e Niagara Tuscarora in Manhole B (and I water distance from (Note: riser elevatio	empties into Manhole B by Road sanitary sewer line by extension Manhole A) on the manhole rim should ons (re)surveyed Septemb	gravity feed and Manh by a float controlled su below an elevation of 5 not be less than 12.41 per, 1999 by Wendel Su	nole B is pumped autom mp pump which mainta 65 ft. above mean sea ft. at Manhole B and 10	ins groundwater elev level. Therefore, Dep
	(Note: Manhole A e Niagara Tuscarora in Manhole B (and I water distance from (Note: riser elevatio	empties into Manhole B by Road sanitary sewer line by extension Manhole A) on the manhole rim should ons (re)surveyed Septemb	gravity feed and Manh by a float controlled su below an elevation of 5 not be less than 12.41 per, 1999 by Wendel Su	nole B is pumped autom mp pump which mainta 65 ft. above mean sea ft. at Manhole B and 10	ins groundwater elev level. Therefore, Dep
	(Note: Manhole A e Niagara Tuscarora in Manhole B (and I water distance from (Note: riser elevatio	empties into Manhole B by Road sanitary sewer line by extension Manhole A) on the manhole rim should ons (re)surveyed Septemb	gravity feed and Manh by a float controlled su below an elevation of 5 not be less than 12.41 per, 1999 by Wendel Su	nole B is pumped autom mp pump which mainta 65 ft. above mean sea ft. at Manhole B and 10	lins groundwater elev level. Therefore, Dep 0.22 ft. at Manhole A.
	(Note: Manhole A e Niagara Tuscarora in Manhole B (and I water distance from (Note: riser elevatio	empties into Manhole B by Road sanitary sewer line by extension Manhole A) on the manhole rim should ons (re)surveyed Septemb	gravity feed and Manh by a float controlled su below an elevation of 5 not be less than 12.41 per, 1999 by Wendel Su	nole B is pumped autom mp pump which mainta 65 ft. above mean sea ft. at Manhole B and 10	lins groundwater elev level. Therefore, Dep 0.22 ft. at Manhole A.
	Niagara Tuscarora in Manhole B (and t water distance from (Note: riser elevatio	empties into Manhole B by Road sanitary sewer line by extension Manhole A) in the manhole rim should ons (re)surveyed Septemb	gravity feed and Manh by a float controlled su below an elevation of 5 not be less than 12.41 per, 1999 by Wendel Su	nole B is pumped autom mp pump which mainta 65 ft. above mean sea ft. at Manhole B and 10	lins groundwater elev level. Therefore, Dep 0.22 ft. at Manhole A.



	HLIS Jonés	COMPANY: SEVE		
WEATHER: 3			NXN	
	9' PARTLY CLOVDY			
PIEZOMETER	RISER ELEVATION (INSIDE CASING)	DEPTH TO WATER (FT.)	WATER ELEVATION	COMMENTS
P-1	572.72	9.39	563.33	
P-2	574.89	9.70	565.19	
o_3	574.16	5.25	568.91	
<b>9-4</b>	576.14	3.98	768.16	
P-5	575.05	4.20	568,85	
o-6	578.28	11.71	566,57	
MANHOLE A	575.22	1201	563.21	
MANHOLE B	577.34	14.09	563.25	
n Manhole B (and b water distance from Note: riser elevation	Road sanitary sewer line by extension Manhole A) the manhole rim should ns (re)surveyed September MENTS/OBSERVATION	below an elevation of 5 not be <u>less</u> than 12.41 per, 1999 by Wendel S	65 ft. above mean se ft. at Manhole B and	a level. There
CHECKED M	W-A3 FOR RUSION	E PFA SAMPLING	. THE WELL WAS	Dry





SCALE: 0.5 IN = 40 FT.

DRAWN BY: JRH CHKD, BY: ABC

DATE: 2-6-2019 DATE: 2-11-2019

GROUNDWATER CONTOUR MAP PIEZOMETER/MANHOLE LEVELS SAMPLING EVENT **NOVEMBER 8, 2018** 



FIG. NO.

PIEZOMETER

MANHOLES ARE TO MAINTAIN A WATER LEVEL BELOW 565 FT (AMSL)



Service Request No:R1809336

Mr. Dave Share Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312

Laboratory Results for: Charles Gibson - Olin

Dear Mr.Share,

Enclosed are the results of the sample(s) submitted to our laboratory September 27, 2018 For your reference, these analyses have been assigned our service request number R1809336.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and ALS Environmental is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7472. You may also contact me via email at Janice.Jaeger@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Janice Jaeger Project Manager

Jaman Sage

CC: Adam Carringer



ALS Environmental ALS Group USA, Corp 1565 Jefferson Road, Building 300, Suite 360 Rochester, NY 14623

T: +1 585 288 5380 F: +1 585 288 8475 www.alsglobal.com

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# **Narrative Documents**

ALS Environmental—Rochester Laboratory 1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623 Phone (585) 288-5380 Fax (585) 288-8475 www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER



Client:

Olin Corporation

Project:

Charles Gibson - Olin

Sample Matrix: Water

Service Request: R1809336

Date Received: 09/27/2018

#### CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV, validation deliverables including all summary forms and associated raw data. Analytical procedures performed by the lab are validated in accordance with NELAC standards. Any parameters that are not included in the lab's NELAC accreditation are identified on a "Non-Certified Analytes" report in the Miscellaneous Forms Section of this report. Individual analytical results requiring further explanation are flagged with qualifiers and/or discussed below. The flags are explained in the Report Qualifiers and Definitions page in the Miscellaneous Forms section of this report.

#### Sample Receipt:

Five water samples were received for analysis at ALS Environmental on 09/27/2018. Any discrepancies noted upon initial sample inspection are noted on the cooler receipt and preservation form included in this data package. The samples were received in good condition and consistent with the accompanying chain of custody form. Samples are refrigerated at 6°C upon receipt at the lab except for aqueous samples designated for metals analyses, which are stored at room temperature.

#### Semivolatiles by GC/MS:

Method 8270D, 10/01/2018: The control limit was exceeded for one or more surrogates in the Continuing Calibration Verification (CCV). The surrogates were within acceptance limits for the associated field samples. The data quality was not significantly affected and no further corrective action was taken.

#### Semivoa GC:

No significant anomalies were noted with this analysis.

Please note: This report has been revised to not report the HCB analysis for MHB-092518 as it was not requested on the COC.

Jamansta

Approved	The second			
Annroved	DV/			

Date

10/16/2018



# **SAMPLE DETECTION SUMMARY**

CLIENT ID: MHB-092518	\$P\$ 经保证证券的证据 (1915年) 1915年 (1915年)	Lab	ID: R1809	336-004		
Analyte	Results	Flag	MDL	MRL	Units	Method
beta-BHC	0.062		0.020	0.047	ug/L	8081B



# Sample Receipt Information

ALS Environmental—Rochester Laboratory 1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623 Phone (585) 288-5380 Fax (585) 288-8475 www.alsglobal.com

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Project: Olin Corporation

Charles Gibson - Olin/1186

Service Request:R1809336

# **SAMPLE CROSS-REFERENCE**

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
R1809336-001	MW-5-092518	9/25/2018	0925
R1809336-002	MW-7-092518	9/25/2018	1015
R1809336-003	MW-4-092518	9/25/2018	1111
R1809336-004	MHB-092518	9/25/2018	1205
R1809336-005	Field Blank-092518	9/25/2018	1222



# CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM 53502

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAGE 1 OF 1 Project Number 6 ANALYSIS REQUESTED (Include Method Number and Container Preservative) CAMIES GROON -OUN Project Manager 0 PRESERVATIVE 0 DAVID SHARE DAVID SHALE Company/Address Preservative Key

0. NONE OUN CORP 1. HCL 2. HNO<sub>3</sub> 3. H<sub>2</sub>SO<sub>4</sub> 4. NaOH 3655 NORTH OLDER ST SINTE 200 5. Zn. Acetate QEVELAND TN 37312 6. MeOH 7. NaHSO4 376-4987 Onshore @ Olin, on 8. Other Sampler's Printed Name REMARKS/ ALTERNATE DESCRIPTION CHANGE JONES FOR OFFICE USE SAMPLING - CLIENT SAMPLE ID ONLY LAB ID DATE TIME MATRIX 7/25/18 MW-5-092518 925 CW 2 2 MW-7-092518 1015 2 2 4 mw-4-092518 1111 8 4 4 MS/MSD VOLUME M4B-092518 1205 2 7\_ FROODANL-ONZER 1222 4 2 2 TEMP BLOWLS 3 SPECIAL INSTRUCTIONS/COMMENTS TURNAROUND REQUIREMENTS REPORT REQUIREMENTS INVOICE INFORMATION RUSH (SURCHARGES APPLY) SHIPPED IN 3 COLENS \_ I. Results Only II. Results + OC Summarles PO I . 1 day \_\_\_\_\_ 2 day \_\_\_\_\_ 3 day (LCS, DUP, MS/MSD as required) 4 day .......5 day . Standard (10 business days-No Surcharge) OUN III. Results + OC and Calibration Summaries REQUESTED REPORT DATE Cracousto \_ IV. Data Validation Report with Raw Data See QAPP STATE WHERE SAMPLES WERE COLLECTED Edata \_\_\_\_\_ Yes \_\_\_\_ No RELINQUISHED BY RELINQUISHED BY RECEIVED BY RELINQUISHED BY RECEIVED BY RECEIVED BY Signatura Signature Signature Signature R1809336 Printed Name Printed Name Printed Name Strol Printed Name Olin Corporation Charles Gibson - Olin CUNS 26 1500 Date/Time Date/Time 1950 Distribution: White - Lab Copy; Yellow - Return to Originator © 2012 by ALS Group "

Page 10 of 498



# Cooler Receipt and Preservation Check Form

(	R1809336	5
	Charles Gibson - Olin	

Project/Cli	ientOl	ew			Folder Number_			📖		
Cooler receiv	ved on9	127/18	by:	0	_ COURIER:	ALS	UPS FED	EX VELC	CITY CLIEN	Т
1 Were C	ustody seals o	n outside of cool	er?		N Sa Percl	hlorate	samples have r	equired hea	dspace?	NA
2 Custody	y papers prope	erly completed (i	nk, sigr	ned)?	MAN 15b IDid V	/OA vi	als, Alk,or Sulfi	ide have sig	* bubbles?	NNA
		good condition		and the state of t	0 / 1 ///-	e did th	e bottles origin	ate?	ALS/ROC)	CLIENT
		- T	- n	525						
4 Circle:	Wet'ice Dr	y Ice Gel packs	s pre	sent?		VOA re	ceived as:	Bulk End	core 5035se	
8. Temperatu	ire Readings	Date: 9/2	7/18	_Time	: <u>0946</u> ID:	IR#7	18#10	From:	Pemp Blank	Sample Bottle -
Observed T	emp (°C)	1,8		1.	7 1.4					
Correction	Factor (°C)	+0.4	-							
Corrected T	emp (°C)	2.2		2.1	1.8					
Temp from	Type of bottle		4-		<del></del>					
Within 0-6°	C?	(Y) N		(1)	N (N)	Y	NY	N	YN	YN
If<0°C, we	re samples fro	zen? Y N		Y	N Y N	Y	NY	N	YN	YN
If out of	Temperature.	, note packing/i	ce conc	lition:	Ice mel	ted 1	Poorly Packed (	described b		me Day Rule
	y 5 5	1			nding Approval Clien		.8		850	2-1, 11.1.1
						/				
	s held in storag		R-a	16	by <u>@</u> on 9/2-//	rat .	0945			
5035 sampl	es placed in si	torage location:			by on	at .				
	describerates the								10 E - 10 B - 10 E - 10	
		ervation Check*				1924		y: Du		
					preservation, etc.)?			NO		
		abels and tags ag					YES.	NO		
		ontainers used fo					YES	NO	Æ.	a).
		ls acceptable (no	extra i	abeis,	not leaking)?		YES	NO	ebti	A
		Tacasttan / Tubas	Intent	with A	100 Cominton Duccour	i mad	Tadlad	D 1		<u> </u>
		Cassettes / Tubes				1 -		Bags Infla	1	
pH	Lot of test	Cassettes / Tubes Reagent	Intact Preser		MS? Canisters Pressur Lot Received	Exp	Sample ID	Vol.	Lot Added	Final
рН			Prese	rved?		1 -			1	
	Lot of test	Reagent	Prese	rved?		1 -	Sample ID	Vol.	1	Final
pH ≥12	Lot of test	Reagent NaOH	Prese	rved?		1 -	Sample ID	Vol.	1	Final
pH ≥12 ≤2 ≤2 <4	Lot of test	Reagent NaOH HNO <sub>3</sub>	Prese	rved?	Lot Received	1 -	Sample ID	Vol.	1	Final
pH ≥12 ≤2 ≤2 <4 5-9	Lot of test	Reagent  NaOH  HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaHSO <sub>4</sub> For 608pest	Prese	rved?	Lot Received  No=Notify for 3day	1 -	Sample ID	Vol.	1	Final
pH ≥12 ≤2 ≤2 <4 5-9 Residual	Lot of test	Reagent  NaOH  HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaHSO <sub>4</sub> For 608pest  For CN,	Prese	rved?	No=Notify for 3day If+, contact PM to add	1 -	Sample ID	Vol.	1	Final
pH ≥12 ≤2 ≤2 <4 5-9 Residual Chlorine	Lot of test	Reagent  NaOH  HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaHSO <sub>4</sub> For 608pest  For CN, Phenol, 625,	Prese	rved?	No=Notify for 3day If+, contact PM to add Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (625, 608,	1 -	Sample ID	Vol.	1	Final
pH ≥12 ≤2 ≤2 <4 5-9 Residual	Lot of test	Reagent  NaOH  HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaHSO <sub>4</sub> For 608pest  For CN, Phenol, 625, 608pest, 522	Prese	rved?	No=Notify for 3day If+, contact PM to add	1 -	Sample ID	Vol.	1	Final
pH  ≥12  ≤2  ≤2  <4  5-9  Residual Chlorine	Lot of test	Reagent  NaOH  HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaHSO <sub>4</sub> For 608pest  For CN, Phenol, 625, 608pest, 522  Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Prese	rved?	No=Notify for 3day If+, contact PM to add Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (625, 608,	1 -	Sample ID Adjusted	Vol. Added	Lot Added	Final pH
pH ≥12 ≤2 ≤2 <4 5-9 Residual Chlorine	Lot of test	Reagent  NaOH  HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaHSO <sub>4</sub> For 608pest  For CN,  Phenol, 625, 608pest, 522  Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ZnAcetate	Prese: Yes	No No	No=Notify for 3day If+, contact PM to add Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (625, 608,	1 -	Sample ID Adjusted  **VOAs and 16	Vol. Added	Lot Added	Final pH
pH ≥12 ≤2 ≤2 <4 5-9 Residual Chlorine	Lot of test	Reagent  NaOH  HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaHSO <sub>4</sub> For 608pest  For CN, Phenol, 625, 608pest, 522  Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	Prese	rved?	No=Notify for 3day If+, contact PM to add Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (625, 608,	1 -	Sample ID Adjusted  **VOAs and 16	Vol. Added  64 Not to be to office of all say	Lot Added	Final pH
pH ≥12 ≤2 ≤4 5-9 Residual Chlorine (-)	Lot of test paper	Reagent  NaOH  HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaHSO <sub>4</sub> For 608pest  For CN, Phenol, 625, 608pest, 522  Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ZnAcetate  HCl	Prese: Yes	No No	No=Notify for 3day If+, contact PM to add Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (625, 608,	1 -	Sample ID Adjusted  **VOAs and 16 Otherwise, all be	Vol. Added  64 Not to be to office of all say	Lot Added	Final pH
pH  ≥12  ≤2  ≤4  5-9  Residual Chlorine (-)	Lot of test paper	Reagent  NaOH  HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaHSO <sub>4</sub> For 608pest  For CN,  Phenol, 625, 608pest, 522  Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ZnAcetate  HCl	Prese: Yes	No No	No=Notify for 3day If+, contact PM to add Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (625, 608,	1 -	Sample ID Adjusted  **VOAs and 16 Otherwise, all be	Vol. Added  64 Not to be to office of all say	Lot Added	Final pH
pH  ≥12  ≤2  ≤4  5-9  Residual Chlorine (-)	Lot of test paper	Reagent  NaOH  HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaHSO <sub>4</sub> For 608pest  For CN, Phenol, 625, 608pest, 522  Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ZnAcetate  HCl	Prese: Yes	No No	No=Notify for 3day If+, contact PM to add Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (625, 608,	1 -	Sample ID Adjusted  **VOAs and 16 Otherwise, all be	Vol. Added  64 Not to be to office of all say	Lot Added	Final pH
pH  ≥12  ≤2  ≤4  5-9  Residual Chlorine (-)	Lot of test paper	Reagent  NaOH  HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaHSO <sub>4</sub> For 608pest  For CN,  Phenol, 625, 608pest, 522  Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ZnAcetate  HCl	Prese: Yes	No No	No=Notify for 3day If+, contact PM to add Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (625, 608,	1 -	Sample ID Adjusted  **VOAs and 16 Otherwise, all be	Vol. Added  64 Not to be to office of all say	Lot Added  ested before analys riples with chemicatives).	Final pH  is. al preservatives
pH  ≥12  ≤2  ≤4  5-9  Residual Chlorine (-)	Lot of test paper	Reagent  NaOH  HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaHSO <sub>4</sub> For 608pest  For CN,  Phenol, 625, 608pest, 522  Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ZnAcetate  HCl	Prese: Yes	No No	No=Notify for 3day If+, contact PM to add Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (625, 608,	1 -	Sample ID Adjusted  **VOAs and 16 Otherwise, all be	Vol. Added  64 Not to be to office of all say	Lot Added  ested before analys inples with chemicatives).  CLRES DO	Final pH  is. al preservatives  BULK FLDT
pH  ≥12  ≤2  ≤4  5-9  Residual Chlorine (-)	Lot of test paper	Reagent  NaOH  HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaHSO <sub>4</sub> For 608pest  For CN,  Phenol, 625, 608pest, 522  Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ZnAcetate  HCl	Prese: Yes	No No	No=Notify for 3day If+, contact PM to add Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (625, 608,	1 -	Sample ID Adjusted  **VOAs and 16 Otherwise, all be	Vol. Added  64 Not to be to office of all say	Lot Added  ested before analys riples with chemical atives).  CLRES DO HPROD	Final pH  is. al preservatives  BULK FLDT HGFB
pH  ≥12  ≤2  ≤4  5-9  Residual Chlorine (-)	Lot of test paper	Reagent  NaOH  HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaHSO <sub>4</sub> For 608pest  For CN,  Phenol, 625, 608pest, 522  Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ZnAcetate  HCl	Prese: Yes	No No	No=Notify for 3day If+, contact PM to add Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (625, 608,	1 -	Sample ID Adjusted  **VOAs and 16 Otherwise, all be	Vol. Added  64 Not to be to office of all say	Lot Added  ested before analys riples with chemical arrives).  CLRES DO HPROD HTR	Final pH  is. al preservatives  BULK FLDT HGFB LL3541
pH  ≥12  ≤2  ≤4  5-9  Residual Chlorine (-)	Lot of test paper	Reagent  NaOH  HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaHSO <sub>4</sub> For 608pest  For CN,  Phenol, 625, 608pest, 522  Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ZnAcetate  HCl	Prese: Yes	No No	No=Notify for 3day If+, contact PM to add Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (625, 608,	1 -	Sample ID Adjusted  **VOAs and 16 Otherwise, all be	Vol. Added  64 Not to be to office of all say	Lot Added  ested before analys riples with chemical atives).  CLRES  DO  HPROD  HTR  PH	Final pH  is. al preservatives  BULK FLDT HGFB LL3541 SUB
pH  ≥12  ≤2  ≤4  5-9  Residual Chlorine (-)	Lot of test paper	Reagent  NaOH  HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaHSO <sub>4</sub> For 608pest  For CN,  Phenol, 625, 608pest, 522  Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ZnAcetate  HCl	Prese: Yes	No No	No=Notify for 3day If+, contact PM to add Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (625, 608,	1 -	Sample ID Adjusted  **VOAs and 16 Otherwise, all be	Vol. Added  64 Not to be to office of all say	Lot Added  ested before analyst riples with chemical atives).  CLRES DO HPROD HTR PH SO3	Final pH  is. al preservatives  BULK FLDT HGFB LL3541 SUB MARRS
pH  ≥12  ≤2  <4  5-9  Residual Chlorine (-)  Bottle lot Explain a	numbers: O	Reagent  NaOH  HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaHSO <sub>4</sub> For 608pest  For CN, Phenol, 625, 608pest, 522  Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ZnAcetate  HCl  GT318-1 bK  es/ Other Comm	Prese:	No No	No=Notify for 3day If+, contact PM to add Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (625, 608,	1 -	Sample ID Adjusted  **VOAs and 16 Otherwise, all be	Vol. Added  64 Not to be to office of all say	Lot Added  ested before analys riples with chemical atives).  CLRES  DO  HPROD  HTR  PH	Final pH  is. al preservatives  BULK FLDT HGFB LL3541 SUB
pH  ≥12  ≤2  <4  5-9  Residual Chlorine (-)  Bottle lot Explain a	numbers: O	Reagent  NaOH  HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaHSO <sub>4</sub> For 608pest  For CN, Phenol, 625, 608pest, 522  Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ZnAcetate  HCl  CISIS-1 bk  es/ Other Comm	Prese:	No No	No=Notify for 3day If+, contact PM to add Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (625, 608, CN), ascorbic (phenol).	Ехр	**VOAs and 16 Otherwise, all be are checked (not	Vol. Added  64 Not to be to ottles of all sar just represent	CLRES DO HPROD HTR PH SO3 ALS	Final pH  is. al preservatives  BULK. FLDT HGFB  LL3541 SUB MARRS REV
pH  ≥12  ≤2  <4  5-9  Residual Chlorine (-)  Bottle lot Explain a	numbers: O	Reagent  NaOH  HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaHSO <sub>4</sub> For 608pest  For CN, Phenol, 625, 608pest, 522  Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ZnAcetate  HCl  CISIS-1 bk  es/ Other Comm	Prese:	No No	No=Notify for 3day If+, contact PM to add Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> (625, 608, CN), ascorbic (phenol).	Ехр	**VOAs and 16 Otherwise, all be are checked (not	Vol. Added  64 Not to be to ottles of all sar just represent	Lot Added  ested before analyst riples with chemical atives).  CLRES DO HPROD HTR PH SO3	Final pH  is. al preservatives  BULK. FLDT HGFB  LL3541 SUB MARRS REV

# Internal Chain of Custody Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Service Request: R1809336

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
R1809336-001.05	(Sec. 19, 25)			-	
	8081B				
		9/27/2018	1925	SMO/DWARD	
		9/28/2018	0810	In Lab / CHARRINGTON	
R1809336-001.06					
		Victoria (State Control of Contro			
		9/27/2018	1926	SMO / DWARD	
R1809336-001.07					
	8270D				
		9/27/2018	1926	SMO / DWARD	
		9/28/2018	0813	In Lab / CHARRINGTON	
R1809336-001.08					
		9/27/2018	1926	SMO / DWARD	
R1809336-002.05					
		9/27/2018	1925	SMO / DWARD	
R1809336-002.06				2.	
		9/27/2018	1926	SMO / DWARD	
R1809336-002.07					
	8270D				
		9/27/2018	1926	SMO / DWARD	
		9/28/2018	0813	In Lab / CHARRINGTON	
R1809336-002.08					
	8081B				
		9/27/2018	1926	SMO / DWARD	
		9/28/2018	0811	In Lab / CHARRINGTON	
R1809336-003.09					
	8270D				
		9/27/2018	1925	SMO / DWARD	
LEGINO DE LA CONTRACTOR D		9/28/2018	0813	In Lab / CHARRINGTON	
R1809336-003.10					
		9/27/2018	1926	SMO / DWARD	
R1809336-003.11					
		9/27/2018	1926		

# Internal Chain of Custody Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Service Request: R1809336

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
	8081B				
		9/27/2018	1926	SMO / DWARD	
		9/28/2018	0811	In Lab / CHARRINGTON	
R1809336-003.13					
		1970 1970 1970			
		9/27/2018	1926	SMO/DWARD	
		9/28/2018	0813	In Lab / CHARRINGTON	
R1809336-003.14					
		0/27/2019	1007	CMO / DWARD	
		9/27/2018 9/28/2018	1926 0813	SMO / DWARD In Lab / CHARRINGTON	
D100000 000 1F		9/26/2016	0615	III Lab / CHARRINGTON	
R1809336-003.15					
		9/27/2018	1926	SMO / DWARD	
		9/28/2018	0811	In Lab / CHARRINGTON	
R1809336-003.16		**************************************			
1100/330-003.10					
		9/27/2018	1926	SMO / DWARD	
		9/28/2018	0811	In Lab / CHARRINGTON	
R1809336-004.05					
	8081B				
		9/27/2018	1925	SMO / DWARD	
		9/28/2018	0811	In Lab / CHARRINGTON	
R1809336-004.06					
	8270D				
		9/27/2018	1926	SMO/DWARD	
		9/28/2018	0814	In Lab / CHARRINGTON	
R1809336-005.05					
			1 2022		
		9/27/2018	1925	SMO / DWARD	www.
R1809336-005.06					
		0/27/2018	1000	CMO / DWARF	
***************************************		9/27/2018	1926	SMO / DWARD	
R1809336-005.07	0001D				
	8081B	9/27/2018	1926	SMO / DWARD	
		9/28/2018	0811	In Lab / CHARRINGTON	
D1900226 005 00		7/20/2010	0011	III Lau / CITARATING TOIN	
R1809336-005.08	8270D				
	02/01	9/27/2018	1926	SMO / DWARD	
		, = //ao10			

# Internal Chain of Custody Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Service Request: R1809336

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
	8270D		4-6-8-1 <del></del>		
		9/28/2018	0814	In Lab / CHARRINGTON	



# Miscellaneous Forms

ALS Environmental—Rochester Laboratory 1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623 Phone (585) 288-5380 Fax (585) 288-8475 www.alsglobal.com

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# Analyst Summary report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Service Request: R1809336

Sample Name:

Field Blank-092518

Lab Code:

R1809336-005

Sample Matrix:

Water

Date Collected: 09/25/18

Date Received: 09/27/18

**Analysis Method** 

8081B 8270D Extracted/Digested By

CHARRINGTON

CHARRINGTON

**Analyzed By** 

BALLGEIER

**JMISIUREWICZ** 



# **INORGANIC PREPARATION METHODS**

The preparation methods associated with this report are found in these tables unless discussed in the case narrative.

# Water/Liquid Matrix

Analytical Method	Preparation Method
200.7	200.2
200.8	200.2
6010C	3005A/3010A
6020A	ILM05.3
9014 Cyanide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Acid	9030B
Soluble	
9056A Bomb (Halogens)	5050A
9066 Manual Distillation	9065
SM 4500-CN-E Residual	SM 4500-CN-G
Cyanide	
SM 4500-CN-E WAD	SM 4500-CN-I
Cyanide	

# Solid/Soil/Non-Aqueous Matrix

Analytical Method	Preparation Method
6010C	3050B
6020A	3050B
6010C TCLP (1311)	3005A/3010A
extract	2
6010 SPLP (1312) extract	3005A/3010A
7196A	3060A
7199	3060A
9056A Halogens/Halides	5050
300.0 Anions/ 350.1/ 353.2/ SM 2320B/ SM 5210B/ 9056A Anions	DI extraction

For analytical methods not listed, the preparation method is the same as the analytical method reference.



# Sample Results

ALS Environmental—Rochester Laboratory 1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623 Phone (585) 288-5380 Fax (585) 288-8475 www.alsglobal.com

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# Semivolatile Organic Compounds by GC/MS

ALS Environmental—Rochester Laboratory 1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623 Phone (585) 288-5380 Fax (585) 288-8475 www.alsglobal.com

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# Analytical Report

Client:

Olin Corporation

Service Request: R1809336

Project:

Charles Gibson - Olin/1186

Date Collected: 09/25/18 09:25

Sample Matrix:

Water

Date Received: 09/27/18 09:50

Sample Name:

MW-5-092518

Units: ug/L

Lab Code:

R1809336-001

Basis: NA

# Semivolatile Organic Compounds by GC/MS

**Analysis Method:** 

8270D

Prep Method:

EPA 3510C

Analyte Name	Result	MRL	Dil.	Date A	nalyzed	Date Ext	racted	Q
Hexachlorobenzene	ND U	9.4	1 10/01/2		18 16:15	9/28/	9/28/18	
		W.						
Surrogate Name	ν <del>α</del> α × ∞	% Rec	Contro	l Limits	Date A	nalyzed	Q	
2,4,6-Tribromophenol		70	35 -	141	10/01/1	18 16:15		
2-Fluorobiphenyl		74	31 -	118	10/01/1	18 16:15		
2-Fluorophenol		34	10 -	105	10/01/1	18 16:15		
Nitrobenzene-d5		68	31 -	110	10/01/1	18 16:15		
Phenol-d6		26	10 -	107	10/01/1	8 16:15		
p-Terphenyl-d14		45	10 -	165	10/01/1	8 16:15		

# Analytical Report

Client:

Olin Corporation

Service Request: R1809336

Project:

Charles Gibson - Olin/1186

Date Collected: 09/25/18 10:15

Sample Matrix:

Water

Date Received: 09/27/18 09:50

Sample Name:

Units: ug/L

Lab Code:

MW-7-092518

R1809336-002

Basis: NA

# Semivolatile Organic Compounds by GC/MS

Analysis Method:

8270D

Prep Method:

**EPA 3510C** 

Analyte Name	Result	MRL	Dil.	Date A	nalyzed	Date Ext	racted	Q
Hexachlorobenzene	ND U	9.4	1	10/01/	18 16:43	9/28/	18	
C N		0/ T	7.00 <del>-</del> 00 - 2217		92400 /N VOIC	MACA evalu	_	
Surrogate Name		% Rec		ol Limits		nalyzed	Q	
2,4,6-Tribromophenol		72	35	- 141	10/01/	18 16:43		
2-Fluorobiphenyl		76	31	- 118	10/01/2	18 16:43		
2-Fluorophenol		38	10	- 105	10/01/2	18 16:43		
Nitrobenzene-d5		73	31	- 110	10/01/2	18 16:43		
Phenol-d6		28	10	- 107	10/01/2	18 16:43		
p-Terphenyl-d14		48	10	- 165	10/01/	8 16:43		

### Analytical Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Sample Matrix:

Water

Service Request: R1809336

Date Collected: 09/25/18 11:11

10/01/18 17:11

10/01/18 17:11

10/01/18 17:11

Date Received: 09/27/18 09:50

Sample Name:

MW-4-092518

Lab Code:

R1809336-003

Units: ug/L

Basis: NA

# Semivolatile Organic Compounds by GC/MS

Analysis Method:

8270D

Prep Method:

Nitrobenzene-d5

p-Terphenyl-d14

Phenol-d6

EPA 3510C

Analyte Name	Result	MRL	Dil.	Date Analyze	d Date Ext	racted	Q
Hexachlorobenzene	ND U	9.4	1	10/01/18 17:1	1 9/28/	18	
Surrogate Name		% Rec Contr		Limits Dat	e Analyzed	nalyzed Q	
2,4,6-Tribromophenol		76	35 - 1	41 10/	01/18 17:11		
2-Fluorobiphenyl		78	31 - 1	18 10/	01/18 17:11		
2-Fluorophenol		38	10 - 1	05 10/	01/18 17:11		

72

29

55

31 - 110

10 - 107

10 - 165

### Analytical Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Sample Matrix:

Water

Service Request: R1809336

Date Collected: 09/25/18 12:22

Date Received: 09/27/18 09:50

Sample Name:

Lab Code:

Field Blank-092518

R1809336-005

Units: ug/L Basis: NA

Semivolatile Organic Compounds by GC/MS

**Analysis Method:** 

8270D

Prep Method:

EPA 3510C

Analyte Name	Result	MRL	Dil.	Date Analyzed		<b>Date Extracted</b>		Q
Hexachlorobenzene	ND U	9.4	1 10/01/1		8 19:03 9/28/18			
Surrogate Name		% Rec	Contro	ol Limits	Date A	nalvzed	Q	
2,4,6-Tribromophenol		70	35	- 141	10/01/	18 19:03		
2-Fluorobiphenyl		82	31	- 118	10/01/3	18 19:03		
2-Fluorophenol		46	10	- 105	10/01/2	18 19:03		
Nitrobenzene-d5		79	31	- 110	10/01/2	18 19:03		
Phenol-d6		31	10	- 107	10/01/2	18 19:03		
n-Temberryl-d14		86	10	- 165	10/01/	8 19:03		



# Semivolatile Organic Compounds by GC

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### Analytical Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Sample Matrix:

Water

Sample Name: Lab Code:

MW-5-092518

R1809336-001

Service Request: R1809336

Date Collected: 09/25/18 09:25

Date Received: 09/27/18 09:50

Units: ug/L Basis: NA

Organochlorine Pesticides by Gas Chromatography

**Analysis Method:** 

8081B

Prep Method:

EPA 3510C

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
alpha-BHC	ND U	0.047	1	10/02/18 17:21	9/28/18	
beta-BHC	ND U	0.047	1	10/02/18 17:21	9/28/18	
delta-BHC	ND U	0.047	1	10/02/18 17:21	9/28/18	
gamma-BHC (Lindane)	ND U	0.047	1	10/02/18 17:21	9/28/18	

Surrogate Name	% Rec	<b>Control Limits</b>	Date Analyzed	Q
Decachlorobiphenyl	20	10 - 164	10/02/18 17:21	
Tetrachloro-m-xylene	60	10 - 147	10/02/18 17:21	

### Analytical Report

Client:

Olin Corporation

Charles Gibson - Olin/1186

Service Request: R1809336

Project:

Date Collected: 09/25/18 10:15

Sample Matrix:

Water

Date Received: 09/27/18 09:50

Sample Name:

MW-7-092518

Units: ug/L

Lab Code:

R1809336-002

Basis: NA

### Organochlorine Pesticides by Gas Chromatography

**Analysis Method:** 

8081B

Prep Method:

Analyte Name	Result	MRL	Dil.	Date Analyzed	<b>Date Extracted</b>	Q
alpha-BHC	ND U	0.047	1	10/02/18 18:15	9/28/18	
beta-BHC	ND U	0.047	1	10/02/18 18:15	9/28/18	
delta-BHC	ND U	0.047	1	10/02/18 18:15	9/28/18	
gamma-BHC (Lindane)	ND U	0.047	1	10/02/18 18:15	9/28/18	

Surrogate Name	% Rec	<b>Control Limits</b>	Date Analyzed	Q
Decachlorobiphenyl	15	10 - 164	10/02/18 18:15	
Tetrachloro-m-xylene	52	10 - 147	10/02/18 18:15	

### Analytical Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Sample Matrix:

Water

Service Request: R1809336 Date Collected: 09/25/18 11:11

Date Received: 09/27/18 09:50

Sample Name:

MW-4-092518

Units: ug/L

Lab Code:

R1809336-003

Basis: NA

### Organochlorine Pesticides by Gas Chromatography

**Analysis Method:** 

8081B

Prep Method:

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
alpha-BHC	ND U	0.047	1	10/02/18 18:33	9/28/18	
beta-BHC	ND U	0.047	1	10/02/18 18:33	9/28/18	
delta-BHC	ND U	0.047	1	10/02/18 18:33	9/28/18	
gamma-BHC (Lindane)	ND U	0.047	1	10/02/18 18:33	9/28/18	

Surrogate Name	% Rec	<b>Control Limits</b>	Date Analyzed	Q	
Decachlorobiphenyl	13	10 - 164	10/02/18 18:33		
Tetrachloro-m-xylene	56	10 - 147	10/02/18 18:33		

### Analytical Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Sample Matrix:

Water

W atti

Sample Name: Lab Code: MHB-092518 R1809336-004 charytical Report

Service Request: R1809336

Date Collected: 09/25/18 12:05

Date Received: 09/27/18 09:50

Units: ug/L

Units: ug/L
Basis: NA

### Organochlorine Pesticides by Gas Chromatography

Analysis Method:

8081B

Prep Method:

Analyte Name	Result	MRL	Dil	Date Analyzed	<b>Date Extracted</b>	Q
alpha-BHC	ND U	0.047	1	10/02/18 19:46	9/28/18	
beta-BHC	0.062	0.047	1	10/02/18 19:46	9/28/18	
delta-BHC	ND U	0.047	1	10/02/18 19:46	9/28/18	
gamma-BHC (Lindane)	ND U	0.047	1	10/02/18 19:46	9/28/18	

Surrogate Name	% Rec	<b>Control Limits</b>	Date Analyzed	Q
Decachlorobiphenyl	36	10 - 164	10/02/18 19:46	
Tetrachloro-m-xylene	61	10 - 147	10/02/18 19:46	

### Analytical Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Sample Matrix:

Water

Service Request: R1809336

Date Collected: 09/25/18 12:22

Date Received: 09/27/18 09:50

Sample Name:

Field Blank-092518

Lab Code:

R1809336-005

Units: ug/L

Basis: NA

### Organochlorine Pesticides by Gas Chromatography

Analysis Method:

8081B

Prep Method:

Analyte Name	Result	MRL	Dil.	Date Analyzed	<b>Date Extracted</b>	Q
alpha-BHC	ND U	0.047	1	10/02/18 20:04	9/28/18	
beta-BHC	ND U	0.047	1	10/02/18 20:04	9/28/18	
delta-BHC	ND U	0.047	1	10/02/18 20:04	9/28/18	
gamma-BHC (Lindane)	ND U	0.047	1	10/02/18 20:04	9/28/18	

Surrogate Name	% Rec	<b>Control Limits</b>	Date Analyzed	Q
Decachlorobiphenyl	40	10 - 164	10/02/18 20:04	
Tetrachloro-m-xylene	56	10 - 147	10/02/18 20:04	



# **QC Summary Forms**

ALS Environmental—Rochester Laboratory 1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623 Phone (585) 288-5380 Fax (585) 288-8475 www.alsglobal.com

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# Semivolatile Organic Compounds by GC/MS

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QA/QC Report

Client:

Olin Corporation

Service Request: R1809336

Project:

Charles Gibson - Olin/1186

Sample Matrix:

Water

SURROGATE RECOVERY SUMMARY Semivolatile Organic Compounds by GC/MS

Analysis Method:

8270D

**Extraction Method:** 

		2,4,6-Tribromophenol	2-Fluorobiphenyl	2-Fluorophenol
Sample Name	Lab Code	35-141	31-118	10-105
MW-5-092518	R1809336-001	70	74	34
MW-7-092518	R1809336-002	72	76	38
MW-4-092518	R1809336-003	76	78	38
Field Blank-092518	R1809336-005	70	82	46
Method Blank	RQ1810347-01	76	72	44
Lab Control Sample	RQ1810347-02	66	75	44
Duplicate Lab Control Sample	RQ1810347-03	61	71	43
MW-4-092518 MS	RQ1810347-06	71	79	42
MW-4-092518 DMS	RQ1810347-07	66	73	34

QA/QC Report

Client:

Olin Corporation

Service Request: R1809336

Project:

Charles Gibson - Olin/1186

Sample Matrix:

Water

SURROGATE RECOVERY SUMMARY Semivolatile Organic Compounds by GC/MS

Analysis Method:

8270D

**Extraction Method:** 

		Nitrobenzene-d5	Phenol-d6	p-Terphenyl-d14
Sample Name	Lab Code	31-110	10-107	10-165
MW-5-092518	R1809336-001	68	26	45
MW-7-092518	R1809336-002	73	28	48
MW-4-092518	R1809336-003	72	29	55
Field Blank-092518	R1809336-005	79	31	86
Method Blank	RQ1810347-01	74	32	92
Lab Control Sample	RQ1810347-02	77	34	82
Duplicate Lab Control Sample	RQ1810347-03	74	31	74
MW-4-092518 MS	RQ1810347-06	76	31	64
MW-4-092518 DMS	RQ1810347-07	70	27	59

QA/QC Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Sample Matrix:

Water

Service Request:

R1809336

Date Collected:

09/25/18

Date Received:

09/27/18

Date Analyzed: Date Extracted: 10/1/18 09/28/18

Duplicate Matrix Spike Summary Semivolatile Organic Compounds by GC/MS

Sample Name:

MW-4-092518

Units:

ug/L

Lab Code:

D1000006.000

\_\_\_\_

NTA

Analysis Method:

R1809336-003

Basis:

NA

Prep Method:

8270D EPA 3510C

Matrix Spike

**Duplicate Matrix Spike** 

RQ1810347-06

RQ1810347-07

Sample Spike Spike % Rec RPD Result Analyte Name Result Amount % Rec Result Amount % Rec Limits RPD Limit Hexachlorobenzene ND U 37.9 47.2 37.0 47.2 42-125 30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Sample Matrix:

Water

Service Request: R1809336

Date Analyzed: 10/01/18 12:00

Date Extracted: 09/28/18

**Method Blank Summary** 

Semivolatile Organic Compounds by GC/MS

Sample Name:

Method Blank

Instrument ID:R-MS-51

Lab Code:

RQ1810347-01

 $\textbf{File ID:} I: \ACQUDATA \5973A \DATA \100118 \DP421.D \COMMAN \COMM$ 

Analysis Method:

8270D

Analysis Lot: 608974

Prep Method:

EPA 3510C

Extraction Lot:322901

This Method Blank applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Lab Control Sample	RQ1810347-02	I:\ACQUDATA\5973A\DATA\100118\DP422.D\	10/01/18 12:29
Duplicate Lab Control Sample	RQ1810347-03	I:\ACQUDATA\5973A\DATA\100118\DP423.D\	10/01/18 12:57
MW-5-092518	R1809336-001	I:\ACQUDATA\5973A\DATA\100118\DP430.D\	10/01/18 16:15
MW-7-092518	R1809336-002	I:\ACQUDATA\5973A\DATA\100118\DP431.D\	10/01/18 16:43
MW-4-092518	R1809336-003	I:\ACQUDATA\5973A\DATA\100118\DP432.D\	10/01/18 17:11
MW-4-092518MS	RQ1810347-06	I:\ACQUDATA\5973A\DATA\100118\DP433.D\	10/01/18 17:39
MW-4-092518DMS	RQ1810347-07	I:\ACQUDATA\5973A\DATA\100118\DP434.D\	10/01/18 18:07
Field Blank-092518	R1809336-005	I:\ACQUDATA\5973A\DATA\100118\DP436.D\	10/01/18 19:03

### Analytical Report

Client:

Olin Corporation

Service Request: R1809336

Project:

Charles Gibson - Olin/1186

Date Collected: NA

Sample Matrix:

Water

Date Received: NA

Sample Name:

Units: ug/L

Lab Code:

Method Blank RQ1810347-01

Basis: NA

### Semivolatile Organic Compounds by GC/MS

Analysis Method:

8270D

Prep Method:

Analyte Name	Result	MRL	Dil.	Date A	nalyzed	Date Ext	racted	Q
Hexachlorobenzene	ND U	10	1	10/01/1	8 12:00	9/28/	18	
Surrogate Name		% Rec	Control	Limits	Date A	nalvzed	Q	
2,4,6-Tribromophenol		76	35 -			8 12:00		
2-Fluorobiphenyl		72	31 -	118	10/01/1	8 12:00		
2-Fluorophenol		44	10 -	105	10/01/1	8 12:00		
Nitrobenzene-d5		74	31 -	110	10/01/1	8 12:00		
Phenol-d6		32	10 -	107	10/01/1	18 12:00		
p-Terphenyl-d14		92	10 -	165	10/01/1	8 12:00		

QA/QC Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Sample Matrix:

Water

Service Request: R1809336

Date Analyzed: 10/01/18 12:29

Date Extracted: 09/28/18

Lab Control Sample Summary
Semivolatile Organic Compounds by GC/MS

Sample Name:

Lab Control Sample

Instrument ID:R-MS-51

Lab Code:

RQ1810347-02

 $\textbf{File ID:} I: \ACQUDATA \5973A \DATA \100118 \DP422.D \COMMAN \COMM$ 

Analysis Method:
Prep Method:

8270D

EPA 3510C

Analysis Lot: 608974

Extraction Lot:322901

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	RQ1810347-01	I:\ACQUDATA\5973A\DATA\100118\DP421.D\	10/01/18 12:00
Duplicate Lab Control Sample	RQ1810347-03	I:\ACQUDATA\5973A\DATA\100118\DP423.D\	10/01/18 12:57
MW-5-092518	R1809336-001	I:\ACQUDATA\5973A\DATA\100118\DP430.D\	10/01/18 16:15
MW-7-092518	R1809336-002	I:\ACQUDATA\5973A\DATA\100118\DP431.D\	10/01/18 16:43
MW-4-092518	R1809336-003	I:\ACQUDATA\5973A\DATA\100118\DP432.D\	10/01/18 17:11
MW-4-092518MS	RQ1810347-06	I:\ACQUDATA\5973A\DATA\100118\DP433.D\	10/01/18 17:39
MW-4-092518DMS	RQ1810347-07		
Field Blank-092518	R1809336-005	I:\ACQUDATA\5973A\DATA\100118\DP436.D\	10/01/18 19:03

QA/QC Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Sample Matrix:

Water

Service Request: R1809336

Date Analyzed: 10/01/18

Duplicate Lab Control Sample Summary Semivolatile Organic Compounds by GC/MS

> Units:ug/L Basis:NA

Lab Control Sample

**Duplicate Lab Control Sample** 

RQ1810347-02

RQ1810347-03

	Analytical		Spike			Spike		% Rec		RPD
Analyte Name	Method	Result	Amount	% Rec	Result	Amount	% Rec	Limits	RPD	Limit
Hexachlorobenzene	8270D	42.2	50.0	84	39.4	50.0	79	53-123	6	30

QC/QC Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Service Request:R1809336

Date Analyzed: 10/01/18 10:18

# Tune Summary Semivolatile Organic Compounds by GC/MS

File ID:

I:\ACQUDATA\5973A\DATA\100118\DP417.D\

Analytical Method: 8270D

Instrument ID:

R-MS-51

Analysis Lot: 608974

Target Mass	Relative to Mass	Lower Limit %	Upper Limit %	Relative Abundance %	Raw Abundance	Result Pass/Fai
51	198	10	80	30.44	32577	Pass
68	69	0.00	2	1.43	591	Pass
69	198	0.00	100	38.62	41332	Pass
70	69	0.00	2	0.76	316	Pass
127	198	10	80	49.08	52520	Pass
197	198	0.00	2	0.00	0	Pass
198	198	100	100	100.00	107019	Pass
199	198	5	9	7.58	8114	Pass
275	198	10	60	22.27	23829	Pass
365	198	1	100	2.71	2899	Pass
441	442	0.01	24	18.39	17921	Pass
442	442	100	100	100.00	97429	Pass
443	442	15	24	19.65	19141	Pass

Sample Name	Lab Code	File ID:	Date Analyzed:	Q
Continuing Calibration Verification	RQ1810427-02	I:\ACQUDATA\5973A\DATA\100118\DP419.D\	10/01/18 11:04	
Continuing Calibration Verification	RQ1810427-03	I:\ACQUDATA\5973A\DATA\100118\DP420.D\	10/01/18 11:32	
Method Blank	RQ1810347-01	I:\ACQUDATA\5973A\DATA\100118\DP421.D\	10/01/18 12:00	
Lab Control Sample	RQ1810347-02	I:\ACQUDATA\5973A\DATA\100118\DP422.D\	10/01/18 12:29	
Duplicate Lab Control Sample	RQ1810347-03	I:\ACQUDATA\5973A\DATA\100118\DP423.D\	10/01/18 12:57	
MW-5-092518	R1809336-001	I:\ACQUDATA\5973A\DATA\100118\DP430.D\	10/01/18 16:15	
MW-7-092518	R1809336-002	I:\ACQUDATA\5973A\DATA\100118\DP431.D\	10/01/18 16:43	
MW-4-092518	R1809336-003	I:\ACQUDATA\5973A\DATA\100118\DP432.D\	10/01/18 17:11	
MW-4-092518	RQ1810347-06	I:\ACQUDATA\5973A\DATA\100118\DP433.D\	10/01/18 17:39	
MW-4-092518	RQ1810347-07	I:\ACQUDATA\5973A\DATA\100118\DP434.D\	10/01/18 18:07	
Field Blank-092518	R1809336-005	I:\ACQUDATA\5973A\DATA\100118\DP436.D\	10/01/18 19:03	

QA/QC Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Service Request: R1809336

Date Analyzed: 10/01/18 11:04

Internal Standard Area and RT SUMMARY Semivolatile Organic Compounds by GC/MS

File ID:

I:\ACQUDATA\5973A\DATA\100118\DP419.D\

Lab Code: RQ1810427-02

Instrument ID:

R-MS-51

Analysis Lot: 608974

Analysis Method:

8270D

	72	1,4-Dichlorobenzene-d4		Acenaphthene-d10		Chrysene-d12	
	(A.	Area	RT	Area	RT	Area	RT
	Result ==>	160,049	4.69	317,410	7.56	473,372	12.27
	Upper Limit ==>	320,098	5.19	634,820	8.06	946,744	12.77
	Lower Limit =>>	80,025	4.19	158,705	7.06	236,686	11.77
Associated Analyses	22						
Continuing Calibration Verification	RQ1810427-02	160049	4.69	317410	7.56	473372	12.27

QA/QC Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Service Request:R1809336

Date Analyzed: 10/01/18 11:04

Internal Standard Area and RT SUMMARY Semivolatile Organic Compounds by GC/MS

File ID:

I:\ACQUDATA\5973A\DATA\100118\DP419.D\

Lab Code: RQ1810427-02

Instrument ID:

R-MS-51

Analysis Lot: 608974

Analysis Method:

8270D

	Naphthalene-d8		Peryler	ne-d12	Phenanthrene-d10	
Result ==>	Area	RT	Area	RT	Area	RT
	Result => 595,934	595,934	595,934 5.86	443,460	15.20	456,091
Upper Limit ==>	1,191,868	6.36	886,920	15.70	912,182	9.53
Lower Limit ==>	297,967	5.36	221,730	14.70	228,046	8.53
RQ1810427-02	595934	5.86	443460	15.20	456091	9.03
	Upper Limit ⇒> Lower Limit ⇒>	Area	Area         RT           Result ⇒         595,934         5.86           Upper Limit ⇒         1,191,868         6.36           Lower Limit ⇒         297,967         5.36	Area         RT         Area           Result ⇒         595,934         5.86         443,460           Upper Limit ⇒         1,191,868         6.36         886,920           Lower Limit ⇒         297,967         5.36         221,730	Area         RT         Area         RT           Result ⇒         595,934         5.86         443,460         15.20           Upper Limit ⇒         1,191,868         6.36         886,920         15.70           Lower Limit ⇒         297,967         5.36         221,730         14.70	Area         RT         Area         RT         Area           Result ⇒         595,934         5.86         443,460         15.20         456,091           Upper Limit ⇒         1,191,868         6.36         886,920         15.70         912,182           Lower Limit ⇒         297,967         5.36         221,730         14.70         228,046

QA/QC Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Service Request:R1809336

Date Analyzed: 10/01/18 11:32

Internal Standard Area and RT SUMMARY Semivolatile Organic Compounds by GC/MS

File ID:

I:\ACQUDATA\5973A\DATA\100118\DP420.D\

Instrument ID:

R-MS-51

Analysis Method:

8270D

Lab Code: RQ1810427-03

Analysis Lot: 608974

	2	1,4-Dichloro	benzene-d4	Acenaphti	Acenaphthene-d10		ne-d12
	3.7 Na	Area	RT	Area	RT	Area	RT
	Result ==>	171,080	4.69	349,653	7.57	500,509	12.28
Ti.	Upper Limit ==>	342,160	5.19	699,306	8.07	1,001,018	12.78
	Lower Limit ==>	85,540	4.19	174,827	7.07	250,255	11.78
Associated Analyses						12.	
Method Blank	RQ1810347-01	141923	4.70	278027	7.56	389100	12.27
Lab Control Sample	RQ1810347-02	138041	4.69	278969	7.57	421106	12.28
Duplicate Lab Control Sample	RQ1810347-03	144351	4.69	294737	7.57	422597	12.28
MW-5-092518	R1809336-001	134206	4.69	270484	7.56	416979	12.27
MW-7-092518	R1809336-002	143205	4.69	290932	7.56	434685	12.27
MW-4-092518	R1809336-003	141838	4.69	287337	7.57	443273	12.27
MW-4-092518MS	RQ1810347-06	140578	4.69	279574	7.56	420949	12.27
MW-4-092518DMS	RQ1810347-07	142534	4.69	282369	7.56	411973	12.27
Field Blank-092518	R1809336-005	135702	4.69	265517	7.57	393712	12.27

### QA/QC Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Service Request:R1809336

Date Analyzed: 10/01/18 11:32

Internal Standard Area and RT SUMMARY Semivolatile Organic Compounds by GC/MS

File ID:

I:\ACQUDATA\5973A\DATA\100118\DP420.D\

Instrument ID:

R-MS-51

Analysis Method:

8270D

Lab Code: RQ1810427-03

Analysis Lot: 608974

		Naphthal	ene-d8	Peryle	ne-d12	Phenanthr	ene-d10
		Area	RT	Area	RT	Area	RT
	Result ==>	654,308	5.86	499,477	15.20	529,917	9.04
	Upper Limit ==>	1,308,616	6.36	998,954	15.70	1,059,834	9.54
	Lower Limit ==>	327,154	5.36	249,739	14.70	264,959	8.54
Associated Analyses							
Method Blank	RQ1810347-01	532457	5.86	417879	15.19	445852	9.04
Lab Control Sample	RQ1810347-02	522764	5.86	416441	15.19	393036	9.03
Duplicate Lab Control Sample	RQ1810347-03	542010	5.86	427616	15.19	407438	9.03
MW-5-092518	R1809336-001	505418	5.86	410833	15.19	445233	9.03
MW-7-092518	R1809336-002	540225	5.86	433830	15.19	466889	9.03
MW-4-092518	R1809336-003	537991	5.86	438627	15.19	465337	9.04
MW-4-092518MS	RQ1810347-06	528144	5.86	422493	15.19	410494	9.03
MW-4-092518DMS	RQ1810347-07	536572	5.86	414148	15.19	419065	9.04
Field Blank-092518	R1809336-005	508251	5.86	416064	15.19	433267	9.04



# Semivolatile Organic Compounds by GC

ALS Environmental—Rochester Laboratory 1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623 Phone (585) 288-5380 Fax (585) 288-8475 www.alsglobal.com

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QA/QC Report

Client:

Olin Corporation

Service Request: R1809336

Project:

Charles Gibson - Olin/1186

Sample Matrix:

Water

SURROGATE RECOVERY SUMMARY

Organochlorine Pesticides by Gas Chromatography

Analysis Method:

8081B

**Extraction Method:** 

		Decachlorobiphenyl	Tetrachloro-m-xylene	
Sample Name	Lab Code	10-164	10-147	
MW-5-092518	R1809336-001	20	60	
MW-7-092518	R1809336-002	15	52	
MW-4-092518	R1809336-003	13	56	
MHB-092518	R1809336-004	36	61	
Field Blank-092518	R1809336-005	40	56	
Method Blank	RQ1810348-01	37	57	
Lab Control Sample	RQ1810348-02	36	56	
Duplicate Lab Control Sample	RQ1810348-03	37	55	
MW-4-092518 MS	RQ1810348-06	13	53	
MW-4-092518 DMS	RQ1810348-07	14	56	

QA/QC Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Sample Matrix:

Water

Service Request:

R1809336

Date Collected:

09/25/18

Date Received: Date Analyzed: 09/27/18

Date Extracted:

10/2/18 09/28/18

**Duplicate Matrix Spike Summary** Organochlorine Pesticides by Gas Chromatography

Sample Name:

MW-4-092518

Units:

ug/L

Lab Code:

R1809336-003

Basis:

NA

Analysis Method:

8081B

Prep Method:

EPA 3510C

Matrix Spike RQ1810348-06 **Duplicate Matrix Spike** 

RQ1810348-07

	Sample		Spike			Spike		% Rec		RPD
Analyte Name	Result	Result	Amount	% Rec	Result	Amount	% Rec	Limits	RPD	Limit
alpha-BHC	ND U	0.145	0.189	77	0.169	0.189	90	27-154	15	30
beta-BHC	ND U	0.155	0.189	82	0.162	0.189	86	32-184	4	30
delta-BHC	ND U	0.120	0.189	64	0.124	0.189	66	10-182	3	30
gamma-BHC (Lindane)	ND U	0.145	0.189	77	0.150	0.189	80	43-164	4	30

Results flagged with an asterisk (\*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

QA/QC Report

Client:

Olin Corporation

Project: Sample Matrix: Charles Gibson - Olin/1186

Charles Gloson - Ohn/1

Water

Service Request: R1809336

Date Analyzed: 10/02/18 16:09

Date Extracted: 09/28/18

Method Blank Summary

Organochlorine Pesticides by Gas Chromatography

Sample Name:

Method Blank

Instrument ID:R-GC-62

Lab Code:

RQ1810348-01

File ID:I:\ACQUDATA\7890m\DATA\100218\ax026.D\

Analysis Method: Prep Method:

8081B

EPA 3510C

Analysis Lot: 609406

Extraction Lot: 322902

This Method Blank applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Lab Control Sample	RQ1810348-02	I:\ACQUDATA\7890m\DATA\100218\ax027.D\	10/02/18 16:27
Duplicate Lab Control Sample	RQ1810348-03	I:\ACQUDATA\7890m\DATA\100218\ax028.D\	10/02/18 16:45
MW-5-092518	R1809336-001	I:\ACQUDATA\7890m\DATA\100218\ax030.D\	10/02/18 17:21
MW-7-092518	R1809336-002	I:\ACQUDATA\7890m\DATA\100218\ax033.D\	10/02/18 18:15
MW-4-092518	R1809336-003	I:\ACQUDATA\7890m\DATA\100218\ax034.D\	10/02/18 18:33
MW-4-092518MS	RQ1810348-06	I:\ACQUDATA\7890m\DATA\100218\ax035.D\	10/02/18 18:51
MW-4-092518DMS	RQ1810348-07	I:\ACQUDATA\7890m\DATA\100218\ax037.D\	10/02/18 19:28
MHB-092518	R1809336-004	I:\ACQUDATA\7890m\DATA\100218\ax038.D\	10/02/18 19:46
Field Blank-092518	R1809336-005	I:\ACQUDATA\7890m\DATA\100218\ax039.D\	10/02/18 20:04

### Analytical Report

Client:

Olin Corporation

Project: Charles Gibson - Olin/1186

Date Collected: NA

Sample Matrix:

Water

Date Received: NA

Service Request: R1809336

Sample Name:

Method Blank

Units: ug/L

Lab Code:

RQ1810348-01

Basis: NA

### Organochlorine Pesticides by Gas Chromatography

Analysis Method:

8081B

Prep Method:

Analyte Name	Result	MIRL	Dil.	Date Analyzed	<b>Date Extracted</b>	Q
alpha-BHC	ND U	0.050	1	10/02/18 16:09	9/28/18	
beta-BHC	ND U	0.050	1	10/02/18 16:09	9/28/18	
delta-BHC	ND U	0.050	1	10/02/18 16:09	9/28/18	
gamma-BHC (Lindane)	ND U	0.050	1	10/02/18 16:09	9/28/18	

Surrogate Name	% Rec	<b>Control Limits</b>	Date Analyzed	Q
Decachlorobiphenyl	37	10 - 164	10/02/18 16:09	
Tetrachloro-m-xylene	57	10 - 147	10/02/18 16:09	

QA/QC Report

Client:

Olin Corporation

Project: Sample Matrix: Charles Gibson - Olin/1186

Water

Service Request: R1809336

Date Analyzed: 10/02/18 16:27

Date Extracted: 09/28/18

Lab Control Sample Summary

Organochlorine Pesticides by Gas Chromatography

Sample Name:

Lab Control Sample

Instrument ID:R-GC-62

Lab Code:

RQ1810348-02

File ID:I:\ACQUDATA\7890m\DATA\100218\ax027.D\

Analysis Method: Prep Method:

8081B

EPA 3510C

Analysis Lot:609406

Extraction Lot: 322902

This Lab Control Sample applies to the following analyses.

Sample Name	Lab Code	File ID	Date Analyzed
Method Blank	RQ1810348-01	I:\ACQUDATA\7890m\DATA\100218\ax026.D\	10/02/18 16:09
Duplicate Lab Control Sample	RQ1810348-03	I:\ACQUDATA\7890m\DATA\100218\ax028.D\	10/02/18 16:45
MW-5-092518	R1809336-001	I:\ACQUDATA\7890m\DATA\100218\ax030.D\	10/02/18 17:21
MW-7-092518	R1809336-002	I:\ACQUDATA\7890m\DATA\100218\ax033.D\	10/02/18 18:15
MW-4-092518	R1809336-003	I:\ACQUDATA\7890m\DATA\100218\ax034.D\	10/02/18 18:33
MW-4-092518MS	RQ1810348-06	I:\ACQUDATA\7890m\DATA\100218\ax035.D\	10/02/18 18:51
MW-4-092518DMS	RQ1810348-07	I:\ACQUDATA\7890m\DATA\100218\ax037.D\	10/02/18 19:28
MHB-092518	R1809336-004	I:\ACQUDATA\7890m\DATA\100218\ax038.D\	10/02/18 19:46
Field Blank-092518	R1809336-005	I:\ACQUDATA\7890m\DATA\100218\ax039.D\	10/02/18 20:04

QA/QC Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Sample Matrix:

Water

Service Request: R1809336

Date Analyzed: 10/02/18

Duplicate Lab Control Sample Summary
Organochlorine Pesticides by Gas Chromatography

Units:ug/L Basis:NA

Lab Control Sample

**Duplicate Lab Control Sample** 

RQ1810348-02

RQ1810348-03

	Analytical		Spike			Spike		% Rec		RPD
Analyte Name	Method	Result	Amount	% Rec	Result	Amount	% Rec	Limits	RPD	Limit
alpha-BHC	8081B	0.151	0.200	76	0.154	0.200	77	36-151	2	30
beta-BHC	8081B	0.163	0.200	81	0.153	0.200	76	55-149	6	30
delta-BHC	8081B	0.147	0.200	73	0.157	0.200	78	29-159	7	30
gamma-BHC (Lindane)	8081B	0.155	0.200	77	0.155	0.200	78	41-149	<1	30

#### Confirmation Results

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Water

Service Request: R1809336

Date Collected: 09/25/18 12:05

Date Received: 9/27/18

Sample Name:

**SRM Matrix:** 

MHB-092518

Lab Code:

R1809336-004

Units: ug/L

Basis: NA

### Organochlorine Pesticides by Gas Chromatography

Analytical Method: 8081B

Prep Method:

		Primary	Confirmation			Dilution	
Analyte Name	MRL	Result	Result	RPD	Q	<b>Factor</b>	<b>Date Analyzed</b>
beta-BHC	0.047	0.062	0.069	11		1	10/02/18 19:46

#### Confirmation Results

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

**SRM Matrix:** 

Water

Date Collected: NA

Service Request: R1809336

**Date Received:** 

Sample Name:

Lab Control Sample

Lab Code:

RQ1810348-02

Units: ug/L

Basis: NA

### Organochlorine Pesticides by Gas Chromatography

Analytical Method: 8081B

Prep Method:

		Primary	Confirmation			Dilution	
Analyte Name	MRL	Result	Result	RPD	Q	Factor	<b>Date Analyzed</b>
alpha-BHC	0.050	0.151	0.165	9		1	10/02/18 16:27
beta-BHC	0.050	0.163	0.167	2		1	10/02/18 16:27
delta-BHC	0.050	0.147	0.159	8		1	10/02/18 16:27
gamma-BHC (Lindane)	0.050	0.155	0.167	7		1	10/02/18 16:27

#### Confirmation Results

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

**SRM Matrix:** 

Water

Date Collected: NA

Service Request: R1809336

Date Received:

Sample Name:

**Duplicate Lab Control Sample** 

Lab Code:

RQ1810348-03

Units: ug/L

Basis: NA

### Organochlorine Pesticides by Gas Chromatography

Analytical Method: 8081B

Prep Method:

		Primary	Confirmation			Dilution	
Analyte Name	MRL	Result	Result	RPD	Q	Factor	<b>Date Analyzed</b>
alpha-BHC	0.050	0.154	0.166	8		1	10/02/18 16:45
beta-BHC	0.050	0.153	0.166	8		1	10/02/18 16:45
delta-BHC	0.050	0.157	0.162	3		1	10/02/18 16:45
gamma-BHC (Lindane)	0.050	0.155	0.167	7		1	10/02/18 16:45

#### Confirmation Results

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

SRM Matrix:

Water

Service Request: R1809336 Date Collected: 09/25/18 11:11

Date Received: 9/27/18

Sample Name:

MW-4-092518

Lab Code:

RQ1810348-06

Units: ug/L Basis: NA

Organochlorine Pesticides by Gas Chromatography

Analytical Method: 8081B

**Prep Method:** 

		Primary	Confirmation			Dilution	
Analyte Name	MRL	Result	Result	RPD	Q	Factor	<b>Date Analyzed</b>
alpha-BHC	0.047	0.145	0.167	14		1	10/02/18 18:51
beta-BHC	0.047	0.155	0.170	9		1	10/02/18 18:51
delta-BHC	0.047	0.120	0.133	10		1	10/02/18 18:51
gamma-BHC (Lindane)	0.047	0.145	0.175	19		1	10/02/18 18:51

#### Confirmation Results

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

**SRM Matrix:** 

Sample Name:

Water

MW-4-092518

Lab Code:

RQ1810348-07

Service Request: R1809336

Date Collected: 09/25/18 11:11

Date Received: 9/27/18

Units: ug/L

Basis: NA

### Organochlorine Pesticides by Gas Chromatography

Analytical Method: 8081B

Prep Method:

		Primary	Confirmation			Dilution	
Analyte Name	MRL	Result	Result	RPD	Q	Factor	<b>Date Analyzed</b>
alpha-BHC	0.047	0.169	0.173	2		1	10/02/18 19:28
beta-BHC	0.047	0.162	0.187	14		1	10/02/18 19:28
delta-BHC	0.047	0.124	0.139	11		1	10/02/18 19:28
gamma-BHC (Lindane)	0.047	0.150	0.188	22		1	10/02/18 19:28



Service Request No:R1809911

Mr. Dave Share Olin Corporation 3855 North Ocoee Street Suite 200 Cleveland, TN 37312

Laboratory Results for: Charles Gibson - Olin

Dear Mr.Share,

Enclosed are the results of the sample(s) submitted to our laboratory October 12, 2018 For your reference, these analyses have been assigned our service request number R1809911.

All analyses were performed according to our laboratory's quality assurance program. The test results meet requirements of the NELAP standards except as noted in the case narrative report. All results are intended to be considered in their entirety, and ALS Environmental is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report. The measurement uncertainty of the results included in this report is within that expected when using the prescribed method(s) for analysis of these samples, and represented by Laboratory Control Sample control limits. Any events, such as QC failures, which may add to the uncertainty are explained in the report narrative.

Please contact me if you have any questions. My extension is 7472. You may also contact me via email at Janice.Jaeger@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Janice Jaeger Project Manager

Jamanes 500

CC: Adam Carringer



ALS Environmental ALS Group USA, Corp 1565 Jefferson Road, Building 300, Suite 360 Rochester, NY 14623

T: +1 585 288 5380 F: +1 585 288 8475 www.alsglobal.com

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# **Narrative Documents**

ALS Environmental—Rochester Laboratory 1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623 Phone (585) 288-5380 Fax (585) 288-8475 www.alsglobal.com

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Service Request: R1809911

Date Received: 10/12/2018



Client:

Olin Corporation

Project:

Charles Gibson - Olin

Sample Matrix: Soil

#### CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier IV, validation deliverables including all summary forms and associated raw data. Analytical procedures performed by the lab are validated in accordance with NELAC standards. Any parameters that are not included in the lab's NELAC accreditation are identified on a "Non-Certified Analytes" report in the Miscellaneous Forms Section of this report. Individual analytical results requiring further explanation are flagged with qualifiers and/or discussed below. The flags are explained in the Report Qualifiers and Definitions page in the Miscellaneous Forms section of this report.

#### Sample Receipt:

Three soil samples were received for analysis at ALS Environmental on 10/12/2018. Any discrepancies noted upon initial sample inspection are noted on the cooler receipt and preservation form included in this data package. The samples were received in good condition and consistent with the accompanying chain of custody form. Samples are refrigerated at 0 to 6°C upon receipt at the lab except for aqueous samples designated for metals analyses, which are stored at room temperature. If any samples were received for the analysis of pH, chlorine residual, sulfite, dissolved oxygen, or ferrous iron, the samples were analyzed past their holding time expiration since these analyses are required to be analyzed within 15 minutes of sampling.

#### Semivoa GC:

Method 8081B, 10/29/2018: The upper control limit was exceeded for one or more analytes in the Continuing Calibration Verification (CCV). The field samples analyzed in this sequence did not contain the analyte(s) in question above the Method Reporting Limit (MRL). Since the exceedance equates to a potential high bias, the data quality was not significantly affected and no further corrective action was taken.

Method 8081B, : The samples were diluted to elevate the reporting limit above the presence of non-target background components indicated on the chromatogram. The matrix interference prevented adequate resolution of one or more target compound(s) at the reporting limit.

#### General Chemistry:

Approved by

No significant anomalies were noted with this analysis.

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D .	4010410040
Date	10/31/2018



### **SAMPLE DETECTION SUMMARY**

CLIENT ID: US-1-101118		Lab	ID: R1809	911-001		
Analyte	Results	Flag	MDL	MRL	Units	Method
Total Solids	29.6				Percent	ALS SOP
CLIENT ID: MS-1-101118		Lab	ID: R1809	911-002		
Analyte	Results	Flag	MDL	MRL	Units	Method
Total Solids	28.4				Percent	ALS SOP
CLIENT ID: DS-1-101118		Lab	ID: R1809	911-003		
Analyte	Results	Flag	MDL	MRL	Units	Method
Total Solids	27.2				Percent	ALS SOP



# Sample Receipt Information

ALS Environmental—Rochester Laboratory 1565 Jefferson Road, Building 300, Suite 360, Rochester, NY 14623 Phone (585) 288-5380 Fax (585) 288-8475 www.alsglobal.com

RIGHT SOLUTIONS I RIGHT PARTNER

Client:

Olin Corporation

Service Request:R1809911

Project:

Charles Gibson - Olin/1186

### SAMPLE CROSS-REFERENCE

CLIENT SAMPLE ID	DATE	TIME
US-1-101118	10/11/2018	0930
MS-1-101118	10/11/2018	1000
DS-1-101118	10/11/2018	1030
	US-1-101118 MS-1-101118	US-1-101118 10/11/2018 MS-1-101118 10/11/2018



### CHAIN OF CUSTODY/LABORATORY ANALYSIS REQUEST FORM 53536

1565 Jefferson Road, Building 300, Suite 360 • Rochester, NY 14623 | +1 585 288 5380 +1 585 288 8475 (fax) PAGE OF ANALYSIS REQUESTED (Include Method Number and Container Preservative) CHENES GIBSON -OLIN 1186 Project Manager
DAVID SHANE Report CC PRESERVATIVE 0 DAVID SHARE Company/Address Preservative Key OWN CORP O. NONE HCL HNO3 3055 NORTH OLDER ST SUITE ZOO 3. H<sub>2</sub>SO<sub>4</sub> 4. NaOH 5. Zn. Acetate CLEVELAND TN 37312 6. MeOH NUMBER OF 7. NaHSO4 DMShare @ Olimican 423 336 4987 8. Other Sampler's Signature Sampler's Printed Name REMARKS/ CHILL SURS ALTERNATE DESCRIPTION FOR OFFICE USE SAMPLING ONLY LAB ID CLIENT SAMPLE ID DATE TIME MATRIX 8,1110 930 115-1-101118 SED M5-1-10118 1000 1030 B1118 -1-50 TEMP BLANK SPECIAL INSTRUCTIONS/COMMENTS TURNAROUND REQUIREMENTS REPORT REQUIREMENTS INVOICE INFORMATION **RUSH (SURCHARGES APPLY)** \_ I. Results Only CHANLES GIBSON ANNVAL CREEK BED SEDIMENT of II, Results + QC Summarles PO # 1 day ....... 2 day ........ 3 day (LCS, DUP, MS/MSD as required) 4 day \_\_\_\_5 day BILL TO: OUN . Standard (10 business days-No Surcharge) III. Results + QC and Calibration Summarles REQUESTED REPORT DATE IV, Data Validation Report with Raw Data STAMBARD See QAPP STATE WHERE SAMPLES WERE COLLECTED NY Edata \_\_\_\_\_No RELINQUISHED BY RELINQUISHED BY RECEIVED BY RELINQUISHED BY RECEIVED BY Signature Signature Signature Printed Name Printed Name Printed Name dated Name R1809911 SES Olin Corporation Charles Gibson - Olin Data/Timo 10/12/2018 7:30 Date/Time 0011 Bilitles Date/Time Date/Time Distribution: White - Lab Copy: Yellow - Return to Originator Page 10 of 270

CHE
(ALS)

### Cooler Receipt and Preservation Check Form

ř	R1809911 5
	Off Corporation
1	Charles Gloson - Olin

	100			-						!				1881 100J
Project/Cl	ient <u>Xvun</u> y	N COMMONNO	Mc15	V.CZ	Folde	er Nur	nber_			·	1 10010110			
Cooler recei	ved on 10/12	12018	by:	VS	_	COU	RIER:	ALS	UPS 1	FEDEX	VELOC	CITY CLIEN	JT	
1 Were C	Custody seals o	n outside of cool	ler?		YN	5a	Percl	lorate	samples ha	ve requir	ed heads	space?	YNV	A)
2 Custod	v papers prope	erly completed (i	ink, sign	ned)?	W (B)	5b			als, Alk,or	-20			Y N,N	
		good condition	_		300 S	6			ie bottles oi			~	CLIENT	
													Thous	
4 Circle:	Wet Ice Dr	y Ice Gel pack	s pre	sent?	Y N	7	Soil \	OA re	ceived as:	Bulk	Enco	re 5035se	t (NA)	
151	ure Readings	Date: 10/12	18	_Time	9045		ID:	IR#7	IR#10	F	rom: (	emp Blank	Sample B	ottle
Observed 7		3.8												
Correction														
Corrected 7	STATE OF STA	3.8												
	:Type of bottle	(certitus	9											
Within 0-6		(Q)		Y	N	Y	N	Y	N	YN		YN	YN	
If<0°C, we	ere samples fro	zen? Y	D	Y	N	Y	N	Y	N	Y N		YN	YN	
All sample 5035 samp	s held in stora	torage location:	R-0	12	by <u>/S</u> by		18/12/	aware	at drop-of	Client	notified	l by:		a **
10. 11. 12.	Did all bottle la Were correct o Were 5035 via	labels complete abels and tags ag ontainers used fo ls acceptable (no Cassettes / Tubes	ree with or the te extra la	n custo sts ind abels, i	dy papers icated? not leaking	;? g)?	.)? Pressur	ized	YES YES Ter	1	10 10 10 10 10 10 10 10 10 10 10 10	W P	(A)	
pH	Lot of test	Reagent	Prese		Lot Rec		1103541	Exp	Sample I			Lot Added	Fina	al
1	paper		Yes	No					Adjusted		dded		pН	
≥12		NaOH												
≤2		HNO <sub>3</sub>												
≤2		H₂SO₄	ļ	-										
<4	-	NaHSO <sub>4</sub>			\$1. \$1									
5-9 Residual	<u> </u>	For 608pest	-	-	No=Noti									
Chlorine		For CN, Phenol, 625,		1	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>					- 1	1			
(-)		608pest, 522			CN), asco					- 1			1000	. 1
		Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>												
	<del>/</del>	ZnAcetate	-	-					**VOAs ar	d 1664 No	to be test	ed before analys	sis.	
		HCI	半水	**						all bottles o	f all samp	les with chemic		ves
Bottle lot	numbers:	112017-1	R								•			•
Explain a	Il Discrepancie	es/ Other Comm	ents:											
	9		2									CLRES	BULK	
												DO	FLDT	
												HPROD	HGFB	
												HTR	LL3541	
	¥											HTR PH	-	
												1,000,000	SUB	
												РН	SUB MARRS	
	the state of the s	viewed by:	<u>a</u>		īd 10)		~		1		N/O	PH SO3 ALS	SUB MARRS REV	
	econdary re indary Revie	25 A	as S	10/1	IS/19)	*signi	ficant a	ir bubb	oles: VOA	> 5-6 mл	ı: WC>	PH SO3	SUB MARRS REV	

### **Internal Chain of Custody Report**

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Service Request: R1809911

Bottle ID	Methods	Date	Time	Sample Location / User	Disposed On
R1809911-001.01					
	8081B,ALS SOP				
		10/15/2018	1315	SMO / GLAFORCE	
		10/15/2018	1315	R-002 / GLAFORCE	
		10/16/2018	0650	In Lab / DMURPHY	
		10/16/2018	0754	R-002 / DMURPHY	
R1809911-002.01			***************************************		
	ALS SOP,8081B				
		10/15/2018	1315	SMO / GLAFORCE	
		10/15/2018	1315	R-002 / GLAFORCE	
		10/16/2018	0650	In Lab / DMURPHY	
		10/16/2018	0754	R-002 / DMURPHY	
R1809911-003.01					
	ALS SOP,8081B				
		10/15/2018	1315	SMO / GLAFORCE	
		10/15/2018	1315	R-002 / GLAFORCE	
		10/16/2018	0650	In Lab / DMURPHY	
		10/16/2018	0754	R-002 / DMURPHY	



# Miscellaneous Forms

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### REPORT QUALIFIERS AND DEFINITIONS

- U Analyte was analyzed for but not detected. The sample quantitation limit has been corrected for dilution and for percent moisture, unless otherwise noted in the case narrative.
- J Estimated value due to either being a Tentatively Identified Compound (TIC) or that the concentration is between the MRL and the MDL. Concentrations are not verified within the linear range of the calibration. For DoD: concentration >40% difference between two GC columns (pesticides/Arclors).
- B Analyte was also detected in the associated method blank at a concentration that may have contributed to the sample result.
- E Inorganics- Concentration is estimated due to the serial dilution was outside control limits.
- E Organics- Concentration has exceeded the calibration range for that specific analysis.
- D Concentration is a result of a dilution, typically a secondary analysis of the sample due to exceeding the calibration range or that a surrogate has been diluted out of the sample and cannot be assessed.
- \* Indicates that a quality control parameter has exceeded laboratory limits. Under the "Notes" column of the Form I, this qualifier denotes analysis was performed out of Holding Time.
- H Analysis was performed out of hold time for tests that have an "immediate" hold time criteria.
- # Spike was diluted out.

- + Correlation coefficient for MSA is <0.995.
- N Inorganics- Matrix spike recovery was outside laboratory limits.
- N Organics- Presumptive evidence of a compound (reported as a TIC) based on the MS library search.
- S Concentration has been determined using Method of Standard Additions (MSA).
- W Post-Digestion Spike recovery is outside control limits and the sample absorbance is <50% of the spike absorbance.
- P Concentration >40% difference between the two GC columns.
- C Confirmed by GC/MS
- Q DoD reports: indicates a pesticide/Aroclor is not confirmed (≥100% Difference between two GC columns).
- X See Case Narrative for discussion.
- MRL Method Reporting Limit. Also known as:
- LOQ Limit of Quantitation (LOQ)

  The lowest concentration at which the method analyte may be reliably quantified under the method conditions.
- MDL Method Detection Limit. A statistical value derived from a study designed to provide the lowest concentration that will be detected 99% of the time. Values between the MDL and MRL are estimated (see J qualifier).
- LOD Limit of Detection. A value at or above the MDL which has been verified to be detectable.
- ND Non-Detect. Analyte was not detected at the concentration listed. Same as U qualifier.



#### Rochester Lab ID # for State Certifications1

Connecticut ID # PH0556	Maine ID #NY0032	Pennsylvania ID# 68-786
Delaware Approved	New Hampshire ID # 2941	Rhode Island ID # 158
DoD ELAP #65817	New York ID # 10145	Virginia #460167
Florida ID # E87674	North Carolina #676	

<sup>&</sup>lt;sup>1</sup> Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state or agency requirements. The test results meet requirements of the current NELAP/TNI standards or state or agency requirements, where applicable, except as noted in the case narrative. Since not all analyte/method/matrix combinations are offered for state/NELAC accreditation, this report may contain results which are not accredited. For a specific list of accredited analytes, contact the laboratory or go to <a href="https://www.alsglobal.com/locations/americas/north-america/usa/new-vork/rochester-environmental">https://www.alsglobal.com/locations/americas/north-america/usa/new-vork/rochester-environmental</a>

### ALS Laboratory Group

**RCRA** 

STM

TPH

tr

### Acronyms

ASTM American Society for Testing and Materials A2LA American Association for Laboratory Accreditation **CARB** California Air Resources Board CAS Number Chemical Abstract Service registry Number **CFC** Chlorofluorocarbon **CFU** Colony-Forming Unit DEC Department of Environmental Conservation Department of Environmental Quality DEO DHS Department of Health Services DOE Department of Ecology DOH Department of Health EPA U. S. Environmental Protection Agency ELAP Environmental Laboratory Accreditation Program GC Gas Chromatography Gas Chromatography/Mass Spectrometry GC/MS LUFT Leaking Underground Fuel Tank M Modified MCL Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA. Method Detection Limit MDL MPN Most Probable Number MRL Method Reporting Limit NA Not Applicable NC Not Calculated **NCASI** National Council of the Paper Industry for Air and Stream Improvement ND Not Detected NIOSH National Institute for Occupational Safety and Health POL **Practical Quantitation Limit** 

Resource Conservation and Recovery Act

Selected Ion Monitoring

Total Petroleum Hydrocarbons

greater than or equal to the MDL.

Trace level is the concentration of an analyte that is less than the PQL but

#### Analyst Summary report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Service Request: R1809911

Sample Name:

US-1-101118

Lab Code:

R1809911-001

Sample Matrix:

Soil

Date Collected: 10/11/18

Date Received: 10/12/18

**Analysis Method** 

8081B

ALS SOP

Extracted/Digested By

**DMURPHY** 

Analyzed By

MCYMBAL

KAWONG

Sample Name:

MS-1-101118

Lab Code:

R1809911-002

Sample Matrix:

Soil

Date Collected: 10/11/18

Date Received: 10/12/18

**Analysis Method** 

8081B

ALS SOP

Extracted/Digested By

**DMURPHY** 

Analyzed By

MCYMBAL

KAWONG

Sample Name:

DS-1-101118

Lab Code:

R1809911-003

Sample Matrix:

Soil

Date Collected: 10/11/18

Date Received: 10/12/18

**Analysis Method** 

8081B

ALS SOP

Extracted/Digested By

**DMURPHY** 

Analyzed By

**MCYMBAL** 

KAWONG



### **INORGANIC PREPARATION METHODS**

The preparation methods associated with this report are found in these tables unless discussed in the case narrative.

### Water/Liquid Matrix

Analytical Method	Preparation Method
200.7	200.2
200.8	200.2
6010C	3005A/3010A
6020A	ILM05.3
9014 Cyanide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Reactivity	SW846 Ch7, 7.3.4.2
9034 Sulfide Acid	9030B
Soluble	
9056A Bomb (Halogens)	5050A
9066 Manual Distillation	9065
SM 4500-CN-E Residual	SM 4500-CN-G
Cyanide	
SM 4500-CN-E WAD	SM 4500-CN-I
Cyanide	

### Solid/Soil/Non-Aqueous Matrix

Analytical Method	Preparation
20	Method
6010C	3050B
6020A	3050B
6010C TCLP (1311)	3005A/3010A
extract	
6010 SPLP (1312) extract	3005A/3010A
7196A	3060A
7199	3060A
9056A Halogens/Halides	5050
300.0 Anions/ 350.1/ 353.2/ SM 2320B/ SM 5210B/ 9056A Anions	DI extraction

For analytical methods not listed, the preparation method is the same as the analytical method reference.



# Sample Results

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# Semivolatile Organic Compounds by GC

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### Analytical Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Sample Matrix:

Soil

Service Request: R1809911

Date Collected: 10/11/18 09:30

Date Received: 10/12/18 09:30

Sample Name:

US-1-101118

Lab Code:

R1809911-001

Units: ug/Kg

Basis: Dry

### Organochlorine Pesticides by Gas Chromatography

Analysis Method:

8081B

Prep Method:

EPA 3541

Analyte Name	Result	MRL	Dil.	Date Analyzed	Date Extracted	Q
alpha-BHC	ND U	57	10	10/29/18 17:17	10/25/18	
beta-BHC	ND U	57	10	10/29/18 17:17	10/25/18	
delta-BHC	ND U	57	10	10/29/18 17:17	10/25/18	
gamma-BHC (Lindane)	ND U	57	10	10/29/18 17:17	10/25/18	

Surrogate Name	% Rec	<b>Control Limits</b>	Date Analyzed	Q
Decachlorobiphenyl	88	10 - 145	10/29/18 17:17	
Tetrachloro-m-xylene	75	10 - 123	10/29/18 17:17	

### Analytical Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Sample Matrix:

Soil

Service Request: R1809911

Date Collected: 10/11/18 10:00

Date Received: 10/12/18 09:30

Sample Name:

MS-1-101118

Lab Code:

R1809911-002

Units: ug/Kg

Basis: Dry

### Organochlorine Pesticides by Gas Chromatography

Analysis Method:

8081B

Prep Method:

EPA 3541

Analyte Name	Result	MRL	Dil.	Date Analyzed	<b>Date Extracted</b>	Q
alpha-BHC	ND U	60	10	10/29/18 17:35	10/25/18	
beta-BHC	ND U	60	10	10/29/18 17:35	10/25/18	
delta-BHC	ND U	60	10	10/29/18 17:35	10/25/18	
gamma-BHC (Lindane)	ND U	60	10	10/29/18 17:35	10/25/18	

Surrogate Name	% Rec	<b>Control Limits</b>	Date Analyzed	Q
Decachlorobiphenyl	35	10 - 145	10/29/18 17:35	
Tetrachloro-m-xylene	22	10 - 123	10/29/18 17:35	

### Analytical Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Sample Matrix:

Soil

Service Request: R1809911

Date Collected: 10/11/18 10:30

Date Received: 10/12/18 09:30

Sample Name:

DS-1-101118

Lab Code:

R1809911-003

Units: ug/Kg

Basis: Dry

### Organochlorine Pesticides by Gas Chromatography

Analysis Method:

8081B

Prep Method:

EPA 3541

Analyte Name	Result	MRL	Dil.	Date Analyzed	<b>Date Extracted</b>	Q
alpha-BHC	ND U	63	10	10/29/18 17:52	10/25/18	
beta-BHC	ND U	63	10	10/29/18 17:52	10/25/18	
delta-BHC	ND U	63	10	10/29/18 17:52	10/25/18	
gamma-BHC (Lindane)	ND U	63	10	10/29/18 17:52	10/25/18	

Surrogate Name	% Rec	<b>Control Limits</b>	Date Analyzed	Q
Decachlorobiphenyl	82	10 - 145	10/29/18 17:52	
Tetrachloro-m-xylene	75	10 - 123	10/29/18 17:52	



# **General Chemistry**

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Analytical Report

Client:

Olin Corporation

Project:

Sample Matrix:

Sample Name:

Charles Gibson - Olin/1186

US-1-101118

Lab Code:

R1809911-001

Service Request: R1809911

Date Collected: 10/11/18 09:30

Date Received: 10/12/18 09:30

Basis: As Received

**Inorganic Parameters** 

Analysis Analyte Name Total Solids Method Result Units MIRL Dil. Date Analyzed Q ALS SOP 29.6 Percent 10/18/18 10:10

Analytical Report

Client:

Olin Corporation

Project:

Charles Gibson - Olin/1186

Sample Matrix:

Soil

Service Request: R1809911

Date Collected: 10/11/18 10:00

Date Received: 10/12/18 09:30

Sample Name: Lab Code:

MS-1-101118 R1809911-002 Basis: As Received

**Inorganic Parameters** 

Analyte Name	Analysis Method	Result	Units	MRI.	Dil.	Date Analyzed	0
2 Zamany ou I tomano	T.A.OURO G	ALODUS	C Miles	AT JULY COLU	AD AMS	Date I heldery zoed	
Total Solids	ALS SOP	28.4	Percent	-	1	10/18/18 10:10	

Analytical Report

Client:

Olin Corporation

Project:

Lab Code:

Sample Matrix:

Charles Gibson - Olin/1186

Sample Name:

DS-1-101118 R1809911-003

Service Request: R1809911

Date Collected: 10/11/18 10:30

Date Received: 10/12/18 09:30

Basis: As Received

**Inorganic Parameters** 

	Analysis						
Analyte Name	Method	Result	Units	MIRL	Dil.	Date Analyzed	Q
Total Solids	ALS SOP	27.2	Percent	-	1	10/18/18 10:10	



# **QC Summary Forms**

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# Semivolatile Organic Compounds by GC

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