10-Aug-2021

Scott Boshart
City of Bad Axe WWTP
603 Chickory St
Bad Axe, MI 48413

Re: **Sludge** Work Order: **21072477**

Dear Scott,

ALS Environmental received 1 sample on 29-Jul-2021 10:00 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 14.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

Report of Laboratory Analysis

Certificate No: MN 026-999-449

ALS Group, USA

Date: 10-Aug-21

Client: City of Bad Axe WWTP
Project: Sludge
Work Order: **21072477**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
21072477-01	Sludge Sample	Sludge		7/28/2021 11:06	7/29/2021 10:00	☐

ALS Group, USA

Date: 10-Aug-21

Client: City of Bad Axe WWTP
Project: Sludge
WorkOrder: **21072477**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
% of sample	Percent of Sample
ng/Kg	Nanograms per Kilogram

ALS Group, USA

Date: *10-Aug-21*

Client: City of Bad Axe WWTP
Project: Sludge

Work Order: 21072477

Lab ID: 21072477-01A
Client Sample ID: Sludge Sample

Collection Date: 7/28/2021 11:06:00 AM
Matrix: SLUDGE

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
PFAS BY LC-MS-MS			**D7968-17A**	Prep: D7968-17a 8/6/21 11:50		Analyst: **SK**
Perfluorobutanoic Acid (PFBA)	**19**		**4.7**	**µg/Kg-dry**	1	8/5/2021 08:16 PM
Perfluoropentanoic Acid (PFPeA)	ND		4.7	µg/Kg-dry	1	8/5/2021 08:16 PM
Perfluorohexanoic Acid (PFHxA)	ND		4.7	µg/Kg-dry	1	8/5/2021 08:16 PM
Perfluoroheptanoic Acid (PFHpA)	ND		4.7	µg/Kg-dry	1	8/5/2021 08:16 PM
Perfluorooctanoic Acid (PFOA)	ND		0.94	µg/Kg-dry	1	8/5/2021 08:16 PM
Perfluorononanoic Acid (PFNA)	ND		0.94	µg/Kg-dry	1	8/6/2021 04:25 PM
Perfluorodecanoic Acid (PFDA)	ND		4.7	µg/Kg-dry	1	8/5/2021 08:16 PM
Perfluoroundecanoic Acid (PFUnA)	ND		4.7	µg/Kg-dry	1	8/5/2021 08:16 PM
Perfluorododecanoic Acid (PFDoA)	ND		4.7	µg/Kg-dry	1	8/5/2021 08:16 PM
Perfluorotridecanoic Acid (PFTriA)	ND		4.7	µg/Kg-dry	1	8/6/2021 04:25 PM
Perfluorotetradecanoic Acid (PFTeA)	ND		4.7	µg/Kg-dry	1	8/6/2021 04:25 PM
Perfluorobutanesulfonic Acid (PFBS)	ND		0.94	µg/Kg-dry	1	8/5/2021 08:16 PM
Perfluoropentanesulfonic Acid (PFPeS)	ND		0.94	µg/Kg-dry	1	8/5/2021 08:16 PM
Perfluorohexanesulfonic Acid (PFHxS)	ND		4.7	µg/Kg-dry	1	8/5/2021 08:16 PM
Perfluoroheptanesulfonic Acid (PFHpS)	ND		4.7	µg/Kg-dry	1	8/5/2021 08:16 PM
Perfluorooctanesulfonic Acid (PFOS)	**4.5**		**0.94**	**µg/Kg-dry**	1	8/5/2021 08:16 PM
Perfluorononanesulfonic Acid (PFNS)	ND		4.7	µg/Kg-dry	1	8/5/2021 08:16 PM
Perfluorodecanesulfonic Acid (PFDS)	ND		0.94	µg/Kg-dry	1	8/5/2021 08:16 PM
Fluorotelomer Sulphonic Acid 4:2 (FtS 4:2)	ND		4.7	µg/Kg-dry	1	8/5/2021 08:16 PM
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	ND		4.7	µg/Kg-dry	1	8/5/2021 08:16 PM
Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	ND		4.7	µg/Kg-dry	1	8/5/2021 08:16 PM
Perfluorooctanesulfonamide (PFOSA)	ND		0.94	µg/Kg-dry	1	8/5/2021 08:16 PM
N-Ethylperfluorooctanesulfonamidoacetic Acid	**10**		**4.7**	**µg/Kg-dry**	1	8/5/2021 08:16 PM
N-Methylperfluorooctanesulfonamidoacetic Acid	**9.8**		**4.7**	**µg/Kg-dry**	1	8/5/2021 08:16 PM
11Cl-Pf3OUdS	ND		0.94	µg/Kg-dry	1	8/5/2021 08:16 PM
4,8-Dioxa-3H-perfluorononanoic Acid (DONA)	ND		0.94	µg/Kg-dry	1	8/5/2021 08:16 PM
9Cl-PF3ONS	ND		0.94	µg/Kg-dry	1	8/5/2021 08:16 PM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND		4.7	µg/Kg-dry	1	8/5/2021 08:16 PM
Surr: 13C4-PFBA	*87.8*		*50-130*	*%REC*	1	8/5/2021 08:16 PM
Surr: 13C5-PFPeA	*124*		*50-130*	*%REC*	1	8/5/2021 08:16 PM
Surr: 13C2-PFHxA	*79.4*		*50-130*	*%REC*	1	8/5/2021 08:16 PM
Surr: 13C4-PFHpA	*74.4*		*50-130*	*%REC*	1	8/5/2021 08:16 PM
Surr: 13C4-PFOA	*54.9*	S	*70-130*	*%REC*	1	8/5/2021 08:16 PM
Surr: 13C5-PFNA	*74.8*		*70-130*	*%REC*	1	8/5/2021 08:16 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Surr: 13C5-PFNA	*88.7*		*70-130*	*%REC*	1	8/6/2021 04:25 PM
Surr: 13C2-PFDA	*68.7*	S	*70-130*	*%REC*	1	8/5/2021 08:16 PM
Surr: 13C2-PFUnA	*49.5*	S	*70-130*	*%REC*	1	8/5/2021 08:16 PM
Surr: 13C2-PFDoA	*27.4*	S	*70-130*	*%REC*	1	8/5/2021 08:16 PM
Surr: 13C2-PFTeA	*14.0*	S	*50-130*	*%REC*	1	8/6/2021 04:25 PM
Surr: 13C3-PFBS	*72.9*		*50-130*	*%REC*	1	8/5/2021 08:16 PM
Surr: 18O2-PFHxS	*74.2*		*70-130*	*%REC*	1	8/5/2021 08:16 PM
Surr: 13C4-PFOS	*52.1*	S	*70-130*	*%REC*	1	8/5/2021 08:16 PM
Surr: 13C2-FtS 4:2	*84.4*		*50-130*	*%REC*	1	8/5/2021 08:16 PM
Surr: 13C2-FtS 6:2	*88.0*		*50-130*	*%REC*	1	8/5/2021 08:16 PM
Surr: 13C2-FtS 8:2	*67.5*		*50-130*	*%REC*	1	8/5/2021 08:16 PM
Surr: 13C8-FOSA	*15.1*	S	*50-130*	*%REC*	1	8/5/2021 08:16 PM
Surr: d3-N-MeFOSAA	*48.5*	S	*50-130*	*%REC*	1	8/5/2021 08:16 PM
Surr: d5-N-EtFOSAA	*61.0*		*50-130*	*%REC*	1	8/5/2021 08:16 PM
Surr: 13C3-HFPO-DA	*68.7*		*50-130*	*%REC*	1	8/5/2021 08:16 PM
MOISTURE			**SW3550C**			Analyst: **ALG**
Moisture	**97**		**0.10**	**% of sample**	1	8/3/2021 02:48 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 10-Aug-21

Client: City of Bad Axe WWTP

Work Order: 21072477

Project: Sludge

QC BATCH REPORT

Batch ID: **181554** Instrument ID **LCMS1** Method: **D7968-17a**

MBLK1 Sample ID: **MBLK1-181554-181554** Units: **ng/Kg** Analysis Date: **8/6/2021 02:30 PM**

Client ID: Run ID: **LCMS1_210806B** SeqNo: **7648890** Prep Date: **8/6/2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorononanoic Acid (PFNA)	ND	25	0	0	0		0			
Surr: 13C5-PFNA	*452.1*	0	*400*	0	*113*	*70-130*	0			

MBLK2 Sample ID: **MBLK2-181554-181554** Units: **ng/Kg** Analysis Date: **8/6/2021 03:12 PM**

Client ID: Run ID: **LCMS1_210806B** SeqNo: **7648894** Prep Date: **8/6/2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorononanoic Acid (PFNA)	ND	25	0	0	0		0			
Surr: 13C5-PFNA	*451*	0	*400*	0	*113*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: City of Bad Axe WWTP
Work Order: 21072477
Project: Sludge

QC BATCH REPORT

Batch ID: **181554** Instrument ID **LCMS1** Method: **D7968-17a**

MS Sample ID: **21080175-03A MS** Units: **ng/Kg** Analysis Date: **8/5/2021 07:03 PM**
Client ID: Run ID: **LCMS1_210805B** SeqNo: **7646505** Prep Date: **8/6/2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorobutanoic Acid (PFBA)	496.2	120	500	16.63	95.9	50-130	0			
Perfluoropentanoic Acid (PFPeA)	462.9	120	500	-5.435	93.7	70-130	0			
Perfluorohexanoic Acid (PFHxA)	436.4	120	500	0	87.3	50-130	0			
Perfluoroheptanoic Acid (PFHpA)	459.3	120	500	0	91.9	50-130	0			
Perfluorooctanoic Acid (PFOA)	502.1	25	500	13.21	97.8	70-130	0			
Perfluorodecanoic Acid (PFDA)	512.7	120	500	20.12	98.5	70-130	0			
Perfluoroundecanoic Acid (PFUnA)	552.9	120	500	60.28	98.5	70-130	0			
Perfluorododecanoic Acid (PFDoA)	490.8	120	500	4.978	97.2	70-130	0			
Perfluorotridecanoic Acid (PFTriA)	458.3	120	500	11.77	89.3	70-130	0			
Perfluorotetradecanoic Acid (PFTeA)	405.3	120	500	4.474	80.2	70-130	0			
Perfluorobutanesulfonic Acid (PFBS)	400.7	25	442	0	90.7	70-130	0			
Perfluoropentanesulfonic Acid (PFPeS	460.2	25	469	0	98.1	70-130	0			
Perfluorohexanesulfonic Acid (PFHxS)	412.8	120	455	11.7	88.2	70-130	0			
Perfluoroheptanesulfonic Acid (PFHpS	400.9	120	476	0	84.2	70-130	0			
Perfluorooctanesulfonic Acid (PFOS)	559.2	25	464	99.39	99.1	70-130	0			
Perfluorononanesulfonic Acid (PFNS)	422.8	120	480	11.17	85.8	70-130	0			
Perfluorodecanesulfonic Acid (PFDS)	439.4	25	482	13.28	88.4	70-130	0			
Fluorotelomer Sulphonic Acid 4:2 (FtS	428.6	120	467	0	91.8	70-130	0			
Fluorotelomer Sulphonic Acid 6:2 (FtS	497.5	120	474	0	105	70-130	0			
Fluorotelomer Sulphonic Acid 8:2 (FtS	501.6	120	479	0	105	70-130	0			
Perfluorooctanesulfonamide (PFOSA)	467.3	25	500	12.27	91	70-130	0			
N-Ethylperfluorooctanesulfonamidoace	644.5	120	500	151.7	98.6	70-130	0			
N-Methylperfluorooctanesulfonamidoa	507.4	120	500	0	101	70-130	0			
11Cl-Pf3OUdS	482.6	25	471	0	102	70-130	0			
4,8-Dioxa-3H-perfluorononanoic Acid (	464.6	25	471	0	98.6	70-130	0			
9Cl-PF3ONS	419.9	25	466	0	90.1	70-130	0			
Hexafluoropropylene oxide dimer acid	498.6	120	500	0	99.7	50-130	0			
Surr: 13C4-PFBA	*382.9*	0	*400*	0	*95.7*	*50-130*	0			
Surr: 13C5-PFPeA	*365.6*	0	*400*	0	*91.4*	*50-130*	0			
Surr: 13C2-PFHxA	*353.9*	0	*400*	0	*88.5*	*50-130*	0			
Surr: 13C4-PFHpA	*363.8*	0	*400*	0	*90.9*	*50-130*	0			
Surr: 13C4-PFOA	*395.6*	0	*400*	0	*98.9*	*70-130*	0			
Surr: 13C5-PFNA	*399.2*	0	*400*	0	*99.8*	*70-130*	0			
Surr: 13C2-PFDA	*388.7*	0	*400*	0	*97.2*	*70-130*	0			
Surr: 13C2-PFUnA	*377*	0	*400*	0	*94.3*	*70-130*	0			
Surr: 13C2-PFDoA	*354.3*	0	*400*	0	*88.6*	*70-130*	0			
Surr: 13C2-PFTeA	*280*	0	*400*	0	*70*	*50-130*	0			
Surr: 13C3-PFBS	*340*	0	*400*	0	*85*	*50-130*	0			
Surr: 18O2-PFHxS	*363.9*	0	*378*	0	*96.3*	*70-130*	0			
Surr: 13C4-PFOS	*315*	0	*383*	0	*82.2*	*70-130*	0			
Surr: 13C2-FtS 4:2	*279.5*	0	*373*	0	*74.9*	*50-130*	0			
Surr: 13C2-FtS 6:2	*288.7*	0	*380*	0	*76*	*50-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **181554** Instrument ID **LCMS1** Method: **D7968-17a**

Surr: 13C2-FtS 8:2	*313.6*	0	*383*	0	*81.9*	*50-130*	0
Surr: 13C8-FOSA	*374.6*	0	*400*	0	*93.6*	*50-130*	0
Surr: d3-N-MeFOSAA	*359*	0	*400*	0	*89.8*	*50-130*	0
Surr: d5-N-EtFOSAA	*418*	0	*400*	0	*105*	*50-130*	0
Surr: 13C3-HFPO-DA	*375.5*	0	*400*	0	*93.9*	*50-130*	0

MS Sample ID: **21080175-03A MS** Units: **ng/Kg** Analysis Date: **8/6/2021 03:22 PM**

Client ID: Run ID: **LCMS1_210806B** SeqNo: **7648895** Prep Date: **8/6/2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorononanoic Acid (PFNA)	522.3	25	500	1.424	104	70-130	0			
Surr: 13C5-PFNA	*424.5*	0	*400*	0	*106*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: City of Bad Axe WWTP
Work Order: 21072477
Project: Sludge

QC BATCH REPORT

Batch ID: **181554** Instrument ID **LCMS1** Method: **D7968-17a**

DUP Sample ID: **21080175-02A DUP** Units: **ng/Kg** Analysis Date: **8/5/2021 07:45 PM**
Client ID: Run ID: **LCMS1_210805B** SeqNo: **7646509** Prep Date: **8/6/2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorobutanoic Acid (PFBA)	ND	120	0	0	0		43.01	0	30	
Perfluoropentanoic Acid (PFPeA)	ND	120	0	0	0		19.78	0	30	
Perfluorohexanoic Acid (PFHxA)	18.11	120	0	0	0		21.91	0	30	J
Perfluoroheptanoic Acid (PFHpA)	22.57	120	0	0	0		11.02	0	30	J
Perfluorooctanoic Acid (PFOA)	204.2	25	0	0	0		193	5.64	30	
Perfluorodecanoic Acid (PFDA)	20.38	120	0	0	0		26.36	0	30	J
Perfluoroundecanoic Acid (PFUnA)	49.44	120	0	0	0		36.66	0	30	J
Perfluorododecanoic Acid (PFDoA)	ND	120	0	0	0		4.446	0	30	
Perfluorotridecanoic Acid (PFTriA)	ND	120	0	0	0		10.39	0	30	
Perfluorotetradecanoic Acid (PFTeA)	ND	120	0	0	0		7.158	0	30	
Perfluorobutanesulfonic Acid (PFBS)	ND	25	0	0	0		0	0	30	
Perfluoropentanesulfonic Acid (PFPeS	ND	25	0	0	0		0	0	30	
Perfluorohexanesulfonic Acid (PFHxS)	ND	120	0	0	0		24.75	0	30	
Perfluoroheptanesulfonic Acid (PFHpS	27.22	120	0	0	0		25.85	0	30	J
Perfluorooctanesulfonic Acid (PFOS)	4465	25	0	0	0		4052	9.71	30	
Perfluorononanesulfonic Acid (PFNS)	ND	120	0	0	0		4.818	0	30	
Perfluorodecanesulfonic Acid (PFDS)	ND	25	0	0	0		0	0	30	
Fluorotelomer Sulphonic Acid 4:2 (FtS	ND	120	0	0	0		0	0	30	
Fluorotelomer Sulphonic Acid 6:2 (FtS	ND	120	0	0	0		0	0	30	
Fluorotelomer Sulphonic Acid 8:2 (FtS	ND	120	0	0	0		0	0	30	
Perfluorooctanesulfonamide (PFOSA)	118.4	25	0	0	0		122.7	3.55	30	
N-Ethylperfluorooctanesulfonamidoace	1687	120	0	0	0		1746	3.44	30	
N-Methylperfluorooctanesulfonamidoa	ND	120	0	0	0		0	0	30	
11Cl-Pf3OUdS	ND	25	0	0	0		0	0	30	
4,8-Dioxa-3H-perfluorononanoic Acid (	ND	25	0	0	0		0	0	30	
9Cl-PF3ONS	ND	25	0	0	0		0	0	30	
Hexafluoropropylene oxide dimer acid	ND	120	0	0	0		0	0	30	
Surr: 13C4-PFBA	*368.4*	0	*396*	0	*93*	*50-130*	363.3	*1.39*	*30*	
Surr: 13C5-PFPeA	*371.7*	0	*396*	0	*93.9*	*50-130*	361.3	*2.84*	*30*	
Surr: 13C2-PFHxA	*358*	0	*396*	0	*90.4*	*50-130*	347.3	*3.04*	*30*	
Surr: 13C4-PFHpA	*366.8*	0	*396*	0	*92.6*	*50-130*	353.2	*3.78*	*30*	
Surr: 13C4-PFOA	*374*	0	*396*	0	*94.4*	*70-130*	352.5	*5.92*	*30*	
Surr: 13C5-PFNA	*385.3*	0	*396*	0	*97.3*	*70-130*	370.5	*3.93*	*30*	
Surr: 13C2-PFDA	*366.3*	0	*396*	0	*92.5*	*70-130*	350.6	*4.36*	*30*	
Surr: 13C2-PFUnA	*360.2*	0	*396*	0	*91*	*70-130*	347.5	*3.6*	*30*	
Surr: 13C2-PFDoA	*336.5*	0	*396*	0	*85*	*70-130*	324.1	*3.76*	*30*	
Surr: 13C2-PFTeA	*211.6*	0	*396*	0	*53.4*	*50-130*	217.5	*2.75*	*30*	
Surr: 13C3-PFBS	*334.3*	0	*396*	0	*84.4*	*50-130*	346.4	*3.55*	*30*	
Surr: 18O2-PFHxS	*334.9*	0	*374.3*	0	*89.5*	*70-130*	309.7	*7.82*	*30*	
Surr: 13C4-PFOS	*336.8*	0	*379.2*	0	*88.8*	*70-130*	305.9	*9.6*	*30*	
Surr: 13C2-FtS 4:2	*233.8*	0	*369.3*	0	*63.3*	*50-130*	230.4	*1.49*	*30*	
Surr: 13C2-FtS 6:2	*291.7*	0	*376.2*	0	*77.5*	*50-130*	306.3	*4.87*	*30*	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: City of Bad Axe WWTP
Work Order: 21072477
Project: Sludge

QC BATCH REPORT

Batch ID: **181554** Instrument ID **LCMS1** Method: **D7968-17a**

Surr: 13C2-FtS 8:2	*315.2*	0	*379.2*	0	*83.1*	*50-130*	263.7	*17.8*	*30*	
Surr: 13C8-FOSA	*365.5*	0	*396*	0	*92.3*	*50-130*	340.6	*7.06*	*30*	
Surr: d3-N-MeFOSAA	*358.2*	0	*396*	0	*90.4*	*50-130*	354.6	*0.988*	*30*	
Surr: d5-N-EtFOSAA	*419*	0	*396*	0	*106*	*50-130*	365.8	*13.6*	*30*	
Surr: 13C3-HFPO-DA	*352.5*	0	*396*	0	*89*	*50-130*	296.5	*17.3*	*30*	

DUP Sample ID: **21080175-02A DUP** Units: **ng/Kg** Analysis Date: **8/6/2021 03:53 PM**
Client ID: Run ID: **LCMS1_210806B** SeqNo: **7648898** Prep Date: **8/6/2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorononanoic Acid (PFNA)	23.48	25	0	0	0		17.93	0	30	J
Surr: 13C5-PFNA	*424.9*	0	*396*	0	*107*	*70-130*	432	*1.65*	*30*	

LCS1 Sample ID: **LCS1-181554-181554** Units: **ng/Kg** Analysis Date: **8/6/2021 02:40 PM**
Client ID: Run ID: **LCMS1_210806B** SeqNo: **7648891** Prep Date: **8/6/2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorononanoic Acid (PFNA)	25.02	25	25	0	100	35-150	0			
Surr: 13C5-PFNA	*432*	0	*400*	0	*108*	*70-130*	0			

LCS2 Sample ID: **LCS2-181554-181554** Units: **ng/Kg** Analysis Date: **8/6/2021 03:01 PM**
Client ID: Run ID: **LCMS1_210806B** SeqNo: **7648893** Prep Date: **8/6/2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorononanoic Acid (PFNA)	552.9	25	500	0	111	70-130	0			
Surr: 13C5-PFNA	*458.1*	0	*400*	0	*115*	*70-130*	0			

LCS3 Sample ID: **LCS3-181554-181554** Units: **ng/Kg** Analysis Date: **8/6/2021 02:51 PM**
Client ID: Run ID: **LCMS1_210806B** SeqNo: **7648892** Prep Date: **8/6/2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorononanoic Acid (PFNA)	124.2	25	125	0	99.3	35-150	0			
Surr: 13C5-PFNA	*461.3*	0	*400*	0	*115*	*70-130*	0			

The following samples were analyzed in this batch: 21072477-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: City of Bad Axe WWTP
Work Order: 21072477
Project: Sludge

QC BATCH REPORT

Batch ID: **R323523** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R323523** Units: **% of sample** Analysis Date: **8/3/2021 02:48 PM**
Client ID: Run ID: **MOIST_210803C** SeqNo: **7634868** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.10								

LCS Sample ID: **LCS-R323523** Units: **% of sample** Analysis Date: **8/3/2021 02:48 PM**
Client ID: Run ID: **MOIST_210803C** SeqNo: **7634867** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	100	0.10	100	0	100	98-102	0			

DUP Sample ID: **21080016-01B DUP** Units: **% of sample** Analysis Date: **8/3/2021 02:48 PM**
Client ID: Run ID: **MOIST_210803C** SeqNo: **7634852** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	16.74	0.10	0	0	0	0-0	17.22	2.83	10	

DUP Sample ID: **21080076-03A DUP** Units: **% of sample** Analysis Date: **8/3/2021 02:48 PM**
Client ID: Run ID: **MOIST_210803C** SeqNo: **7634863** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	1.55	0.10	0	0	0	0-0	1.55	0	10	

The following samples were analyzed in this batch: 21072477-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 229945

ALS Project Manager: | ALS Work Order #: 2107277

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name		A	PFAS
Work Order		Project Number		B	
Company Name	City of Bad Axe WWTP	Bill To Company	City of Bad Axe WWTP	C	
Send Report To	Scott Boshart	Invoice Attn	Scott Boshart	D	
Address	603 Chickory St	Address	603 Chickory St	E	
				F	
City/State/Zip	Bad Axe, MI 48413	City/State/Zip	Bad Axe, MI 48413	G	
Phone	(989) 269-9132	Phone	(989) 269-9132	H	
Fax	(989) 582-0045	Fax	(989) 582-0045	I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	Sludge Sample	7/28/21	1106			1	X										
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: RICHARD Barker Richard Barker

Shipment Method: UPS

Required Turnaround Time: (Check Box) ☒ 10 BD ☐ 5 BD ☐ 3 BD ☐ Other 2 BD ☐ 1 BD

Results Due Date:

Relinquished by: Richard Barker Date: 7/28/21 Time: 1106

Received by: Ace Hardware / UPS

Relinquished by: UPS Date: 7/29/21 Time: 1000

Received by (Laboratory):

Logged by (Laboratory): Date: 7/29/21 Time: 1245

Checked by (Laboratory):

Notes:

Cooler ID	Cooler Temp.
NO ICE	26.4°C

QC Package: (Check One Box Below)
☐ Level II Std QC ☐ TRRP CheckList
☐ Level III Std QC/Raw Data ☐ TRRP Level IV
☐ Level IV SW846/CLP
☐ Other

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note:
1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

CUSTOMER COUNTER
(989) 269-9131
ACE PARCEL SHIPPING SERVICE
735 N VAN DYKE
BAD AXE MI 48413

4 LBS

1 OF 1

DWT: 14,14,9

SHIP TO:
ALS GROUP USA.
3352 128TH. ST.
HOLLAND MI 49424

MI 495 9-04

UPS GROUND

TRACKING #: 1Z YE1 974 03 4221 8566

BILLING: P/P

REF 1:141530
REF 2:DB

US 24.8.24 LP2844 48.0A 07/2021

ALL HUMAN READABLE regarding UPS terms and notice of limitation of liability. Where allowed by law, shipper authorizes UPS to act as forwarding agent for export control and customs purposes. If exported from the US, shipper certifies that the commodities, technology or software were exported from the US in accordance with the Export Administration Regulations. Diversion contrary to law is prohibited.

RRD R 04/21

Custody Seal

http://www.alsglobal.com

ALS Environment
3352 128th Avenue
Holland, Michigan 494[illegible]
Phone: 616-399-60[illegible]
Attn: Sample Receiving

Company: City of BAD Axe
Name: Richard Barker
Date: 7/28/21

NO ICE

26.4°C

ALS Group, USA

Sample Receipt Checklist

Client Name: **BADAXEWWTP** Date/Time Received: **29-Jul-21 10:00**

Work Order: **21072477** Received by: **LYS**

Checklist completed by Lydia Sweet (eSignature) 29-Jul-21 (Date) Reviewed by: Bill Carey (eSignature) 29-Jul-21 (Date)

Matrices: Sludge
Carrier name: UPS

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☐	No ☑	
Sample(s) received on ice?	Yes ☐	No ☑	
Temperature(s)/Thermometer(s):	26.4/26.4c	IR1	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	7/29/2021 7/29/2021		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction: