PARAGON LABORATORIES

12649 Richfield Ct.
Livonia, MI 48150
P:734.462.3900
paragonlaboratories.com

Friday, June 4, 2021

Ron Kleinman
City of Munising WWTP
301 E. Munising
Munising, MI 49862

Workorder: 369008
Project Name: Munising WWTP

Ron Kleinman,
Paragon Laboratories, Inc. received the samples associated with the workorder listed above for the analyses presented in the following report. The analyses pertain only to the aliquot of sample received.

This material is confidential and is intended solely for the person to whom it is addressed. If this is received in error, please contact the number below.

Please note that any unused portion of the sample(s) will be discarded 40 days after sample receipt, unless requested otherwise.

We appreciate the opportunity to assist you. If you have any questions concerning this report, please contact me at 734.469.5623.

Sincerely,

Bryant D Dugan
Account Coordinator

GLOSSARY

Abbreviation	Meaning	Explanation
ID	Identification	Preceeded by "Lab", it describes the unique 10-digit sample number assigned by the laboratory. Preceeded by "Sample", it describes the client-specified sample identifier.
Qual	Qualifier	Column that populates with an asterisk (*) when a related narrative comment appears in the Workorder Summary.
RL	Reporting Limit	The value at or above which a result is routinely reported.
MDL	Method Detection Limit	The minimum measured concentration that can be reported with 99% confidence that the measured concentration is distinguishable from method blank results.
DF	Dilution Factor	The dilution applied to the sample during analysis to arrive at the final reported analyte result.
Min	Minimum	The minimum value that a result can be to meet the applicable specification, regulatory, permit, or client-specified limit.
Max	Maximum	The maximum value that a result can be to meet the applicable specification, regulatory, permit, or client-specified limit.
(S)	Surrogate	A compound that is added to the sample to mimic one or more compounds of interest. Its recovery is used to evaluate the efficiency of recovering the compound(s) of interest.
<	Less Than	Symbol that indicates that a result is less than the value following it.
>	Greater Than	Symbol that indicates that a result is greater than the value following it.

SAMPLE SUMMARY

Lab ID	Sample ID	Sample Description	Matrix	Date Collected	Date Received	Collector
3690080001	Biosolids Munising	Grab	SO	04/27/2021 09:35	04/28/2021 09:45	JG
3690080002	Biosolids 2 Munising	Grab	SO	04/27/2021 09:35	04/28/2021 09:45	JG
3690080003	Field Blank		SO	04/27/2021 09:35	04/28/2021 09:45	JG
3690080004	Trip Blank		SO	04/27/2021 09:35	04/28/2021 09:45	JG

WORKORDER SUMMARY

Accreditations

Paragon Laboratories, Inc. is certified by the Michigan Department of Environment, Great Lakes, and Energy to analyze Drinking Water. (EGLE Lab No. 9901 Expires 2/25/2023)

Workorder Narrative

General Comment:

No suspected contamination during sampling process, therefore the trip blank was not analyzed.

Surrogate Results Narrative

3690080001 - Biosolids Munising - M4PFBA
Surrogate recovery is below the lower control limit, possibly due to matrix interferences.
3690080001 - Biosolids Munising - M4PFHpA
Surrogate recovery is below the lower control limit, possibly due to matrix interferences.
3690080001 - Biosolids Munising - M5PFHxA
Surrogate recovery is below the lower control limit, possibly due to matrix interferences.
3690080001 - Biosolids Munising - M2-6:2 FTS
Surrogate recovery is above the upper control limit, possibly due to matrix interferences.
3690080001 - Biosolids Munising - M2-8:2 FTS
Surrogate recovery is above the upper control limit, possibly due to matrix interferences.
3690080001 - Biosolids Munising - M2PFTeDA
Surrogate recovery is below the lower control limit, possibly due to matrix interferences.
3690080002 - Biosolids 2 Munising - M2-6:2 FTS
Surrogate recovery is above the upper control limit, possibly due to matrix interferences.
3690080002 - Biosolids 2 Munising - M2PFTeDA
Surrogate recovery is below the lower control limit, possibly due to matrix interferences.
3690080002 - Biosolids 2 Munising - M4PFBA
Surrogate recovery is below the lower control limit, possibly due to matrix interferences.
3690080002 - Biosolids 2 Munising - M5PFHxA
Surrogate recovery is below the lower control limit, possibly due to matrix interferences.
3690080002 - Biosolids 2 Munising - M4PFHpA
Surrogate recovery is below the lower control limit, possibly due to matrix interferences.

ANALYTICAL RESULTS

Lab ID: 3690080001
Sample ID: Biosolids Munising
Description: Grab

Date Collected: 04/27/2021 09:35
Date Received: 04/28/2021 09:45

Matrix: Solid (SO)
Collector: JG

Parameter	Result	Qual	Unit	RL	MDL	DF	Min	Max	Analyzed	By
Individual Parameters by SM 2540 G										
Percent Total Solids	4.0		% m/m	0.10		1			04/29/2021 11:10	JKP
Per- & Polyfluoroalkyls (PFAS) by ASTM D7968 Mod.										
11Cl-PF3OUdS	110		ng/Kg-dry	100	65	1			05/21/2021 03:13	JKP
4:2 FTSA	<100		ng/Kg-dry	100	58	1			05/21/2021 03:13	JKP
6:2 FTSA	450		ng/Kg-dry	150	130	1			05/21/2021 03:13	JKP
8:2 FTSA	<100		ng/Kg-dry	100	50	1			05/21/2021 03:13	JKP
9Cl-PF3ONS	380		ng/Kg-dry	100	59	1			05/21/2021 03:13	JKP
ADONA	<100		ng/Kg-dry	100	68	1			05/21/2021 03:13	JKP
HFPO-DA	<150		ng/Kg-dry	150	130	1			05/21/2021 03:13	JKP
NEtFOSAA	6900		ng/Kg-dry	100	57	1			05/21/2021 03:13	JKP
NMeFOSAA	7900		ng/Kg-dry	200	190	1			05/21/2021 03:13	JKP
PFBA	3000		ng/Kg-dry	25	20	1			05/21/2021 03:13	JKP
PFBS	11000		ng/Kg-dry	10	9.2	1			05/21/2021 03:13	JKP
PFDA	8500		ng/Kg-dry	15	14	1			05/21/2021 03:13	JKP
PFDS	5700		ng/Kg-dry	15	15	1			05/21/2021 03:13	JKP
PFDoA	2800		ng/Kg-dry	20	17	1			05/21/2021 03:13	JKP
PFHpA	710		ng/Kg-dry	20	16	1			05/21/2021 03:13	JKP
PFHpS	360		ng/Kg-dry	15	12	1			05/21/2021 03:13	JKP
PFHxA	6000		ng/Kg-dry	10	7.5	1			05/21/2021 03:13	JKP
PFHxS	2200		ng/Kg-dry	10	5.8	1			05/21/2021 03:13	JKP
PFNA	1800		ng/Kg-dry	10	5.2	1			05/21/2021 03:13	JKP
PFNS	<30		ng/Kg-dry	30	29	1			05/21/2021 03:13	JKP
PFOA	6200		ng/Kg-dry	10	9.3	1			05/21/2021 03:13	JKP
PFOS	26000		ng/Kg-dry	400	20	1			05/21/2021 03:13	JKP
PFOSA	2200		ng/Kg-dry	15	10	1			05/21/2021 03:13	JKP
PFPeA	12000		ng/Kg-dry	15	12	1			05/21/2021 03:13	JKP
PFPeS	<15		ng/Kg-dry	15	15	1			05/21/2021 03:13	JKP
PFTeDA	<25		ng/Kg-dry	25	23	1			05/21/2021 03:13	JKP
PFTrDA	550		ng/Kg-dry	20	10	1			05/21/2021 03:13	JKP
PFUnDA	1300		ng/Kg-dry	10	8.7	1			05/21/2021 03:13	JKP
PFecHS	<15		ng/Kg-dry	15	9.6	1			05/21/2021 03:13	JKP

Surrogate	Unit	Spiked Amount	Spike Result	Spike % Recovery	Control Limits	Qual
13C-HFPO-DA (S)	ng/Kg-dry	190000	140000	72	70 - 130	
d3-NMeFOSAA (S)	ng/Kg-dry	19000	24000	130	70 - 130	
d5-NEtFOSAA (S)	ng/Kg-dry	19000	24000	125	70 - 130	
M2-4:2 FTS (S)	ng/Kg-dry	19000	19000	101	70 - 130	
M2-6:2 FTS (S)	ng/Kg-dry	19000	26000	137	70 - 130	*
M2-8:2 FTS (S)	ng/Kg-dry	19000	26000	138	70 - 130	*
M2PFDoA (S)	ng/Kg-dry	19000	19000	101	70 - 130	

M2PFTeDA (S)	ng/Kg-dry	19000	3200	17	70 - 130			*
M3PFBS (S)	ng/Kg-dry	19000	15000	81	70 - 130			
M3PFHxS (S)	ng/Kg-dry	19000	22000	117	70 - 130			
M4PFBA (S)	ng/Kg-dry	19000	13000	70	70 - 130			*
M4PFHpA (S)	ng/Kg-dry	19000	13000	68	70 - 130			*
M5PFHxA (S)	ng/Kg-dry	19000	13000	68	70 - 130			*
M5PFPeA (S)	ng/Kg-dry	19000	16000	85	70 - 130			
M6PFDA (S)	ng/Kg-dry	19000	19000	100	70 - 130			
M7PFUnDA (S)	ng/Kg-dry	19000	17000	92	70 - 130			
M8PFOA (S)	ng/Kg-dry	19000	14000	76	70 - 130			
M8PFOS (S)	ng/Kg-dry	19000	18000	96	70 - 130			
M8PFOSA (S)	ng/Kg-dry	19000	17000	89	70 - 130			
M9PFNA (S)	ng/Kg-dry	19000	19000	98	70 - 130			
Sample Preparation by ASTM D7968 Mod.								
Tumble Extraction for PFAS	2.0098	grams			1	05/10/2021 14:57	JKP	

ANALYTICAL RESULTS

Lab ID:	3690080002	Date Collected:	04/27/2021 09:35	Matrix:	Solid (SO)
Sample ID:	Biosolids 2 Munising	Date Received:	04/28/2021 09:45	Collector:	JG
Description:	Grab				

Parameter	Result	Qual	Unit	RL	MDL	DF	Min	Max	Analyzed	By
Individual Parameters by SM 2540 G										
Percent Total Solids	4.1		% m/m	0.10		1			04/29/2021 11:49	JKP
Per- & Polyfluoroalkyls (PFAS) by ASTM D7968 Mod.										
11Cl-PF3OUdS	130		ng/Kg-dry	100	65	1			05/21/2021 04:15	JKP
4:2 FTSA	<100		ng/Kg-dry	100	58	1			05/21/2021 04:15	JKP
6:2 FTSA	470		ng/Kg-dry	150	130	1			05/21/2021 04:15	JKP
8:2 FTSA	<100		ng/Kg-dry	100	50	1			05/21/2021 04:15	JKP
9Cl-PF3ONS	420		ng/Kg-dry	100	59	1			05/21/2021 04:15	JKP
ADONA	<100		ng/Kg-dry	100	68	1			05/21/2021 04:15	JKP
HFPO-DA	<150		ng/Kg-dry	150	130	1			05/21/2021 04:15	JKP
NEtFOSAA	7600		ng/Kg-dry	100	57	1			05/21/2021 04:15	JKP
NMeFOSAA	8400		ng/Kg-dry	200	190	1			05/21/2021 04:15	JKP
PFBA	3000		ng/Kg-dry	25	20	1			05/21/2021 04:15	JKP
PFBS	11000		ng/Kg-dry	10	9.2	1			05/21/2021 04:15	JKP
PFDA	8200		ng/Kg-dry	15	14	1			05/21/2021 04:15	JKP
PFDS	5400		ng/Kg-dry	15	15	1			05/21/2021 04:15	JKP
PFDoA	2700		ng/Kg-dry	20	17	1			05/21/2021 04:15	JKP
PFHpA	620		ng/Kg-dry	20	16	1			05/21/2021 04:15	JKP
PFHpS	<15		ng/Kg-dry	15	12	1			05/21/2021 04:15	JKP
PFHxA	5500		ng/Kg-dry	10	7.5	1			05/21/2021 04:15	JKP
PFHxS	1800		ng/Kg-dry	10	5.8	1			05/21/2021 04:15	JKP
PFNA	1800		ng/Kg-dry	10	5.2	1			05/21/2021 04:15	JKP
PFNS	<30		ng/Kg-dry	30	29	1			05/21/2021 04:15	JKP
PFOA	5700		ng/Kg-dry	10	9.3	1			05/21/2021 04:15	JKP
PFOS	23000		ng/Kg-dry	20	20	1			05/21/2021 04:15	JKP
PFOSA	2200		ng/Kg-dry	15	10	1			05/21/2021 04:15	JKP
PFPeA	11000		ng/Kg-dry	15	12	1			05/21/2021 04:15	JKP
PFPeS	<15		ng/Kg-dry	15	15	1			05/21/2021 04:15	JKP
PFTeDA	89		ng/Kg-dry	25	23	1			05/21/2021 04:15	JKP
PFTrDA	560		ng/Kg-dry	20	10	1			05/21/2021 04:15	JKP
PFUnDA	1300		ng/Kg-dry	10	8.7	1			05/21/2021 04:15	JKP
PFecHS	<15		ng/Kg-dry	15	9.6	1			05/21/2021 04:15	JKP

Surrogate	Unit	Spiked Amount	Spike Result	Spike % Recovery	Control Limits	Qual
13C-HFPO-DA (S)	ng/Kg-dry	190000	140000	70	70 - 130	
d3-NMeFOSAA (S)	ng/Kg-dry	19000	23000	120	70 - 130	
d5-NEtFOSAA (S)	ng/Kg-dry	19000	24000	126	70 - 130	
M2-4:2 FTS (S)	ng/Kg-dry	19000	18000	93	70 - 130	
M2-6:2 FTS (S)	ng/Kg-dry	19000	26000	136	70 - 130	*
M2-8:2 FTS (S)	ng/Kg-dry	19000	24000	125	70 - 130	
M2PFDoA (S)	ng/Kg-dry	19000	19000	97	70 - 130	

M2PFTeDA (S)	ng/Kg-dry	19000	4200	22	70 - 130			*
M3PFBS (S)	ng/Kg-dry	19000	16000	80	70 - 130			
M3PFHxS (S)	ng/Kg-dry	19000	24000	122	70 - 130			
M4PFBA (S)	ng/Kg-dry	19000	13000	65	70 - 130			*
M4PFHpA (S)	ng/Kg-dry	19000	13000	66	70 - 130			*
M5PFHxA (S)	ng/Kg-dry	19000	12000	64	70 - 130			*
M5PFPeA (S)	ng/Kg-dry	19000	16000	82	70 - 130			
M6PFDA (S)	ng/Kg-dry	19000	19000	97	70 - 130			
M7PFUnDA (S)	ng/Kg-dry	19000	17000	87	70 - 130			
M8PFOA (S)	ng/Kg-dry	19000	15000	75	70 - 130			
M8PFOS (S)	ng/Kg-dry	19000	14000	74	70 - 130			
M8PFOSA (S)	ng/Kg-dry	19000	17000	86	70 - 130			
M9PFNA (S)	ng/Kg-dry	19000	18000	94	70 - 130			
Sample Preparation by ASTM D7968 Mod.								
Tumble Extraction for PFAS	2.001	grams			1	05/10/2021 14:57	JKP	

ANALYTICAL RESULTS

Lab ID:	3690080003	Date Collected:	04/27/2021 09:35	Matrix:	Solid (SO)
Sample ID:	Field Blank	Date Received:	04/28/2021 09:45	Collector:	JG
Description:					

Parameter	Result	Qual	Unit	RL	MDL	DF	Min	Max	Analyzed	By
Per- & Polyfluoroalkyls (PFAS) by ASTM D7968 Mod.										
11Cl-PF3OUdS	<100		ng/Kg-dry	100	65	1			05/21/2021 05:17	JKP
4:2 FTSA	<100		ng/Kg-dry	100	58	1			05/21/2021 05:17	JKP
6:2 FTSA	<150		ng/Kg-dry	150	130	1			05/21/2021 05:17	JKP
8:2 FTSA	<100		ng/Kg-dry	100	50	1			05/21/2021 05:17	JKP
9Cl-PF3ONS	<100		ng/Kg-dry	100	59	1			05/21/2021 05:17	JKP
ADONA	<100		ng/Kg-dry	100	68	1			05/21/2021 05:17	JKP
HFPO-DA	<150		ng/Kg-dry	150	130	1			05/21/2021 05:17	JKP
NEtFOSAA	<100		ng/Kg-dry	100	57	1			05/21/2021 05:17	JKP
NMeFOSAA	<200		ng/Kg-dry	200	190	1			05/21/2021 05:17	JKP
PFBA	<25		ng/Kg-dry	25	20	1			05/21/2021 05:17	JKP
PFBS	<10		ng/Kg-dry	10	9.2	1			05/21/2021 05:17	JKP
PFDA	<15		ng/Kg-dry	15	14	1			05/21/2021 05:17	JKP
PFDS	<15		ng/Kg-dry	15	15	1			05/21/2021 05:17	JKP
PFDoA	<20		ng/Kg-dry	20	17	1			05/21/2021 05:17	JKP
PFHpA	<20		ng/Kg-dry	20	16	1			05/21/2021 05:17	JKP
PFHpS	<15		ng/Kg-dry	15	12	1			05/21/2021 05:17	JKP
PFHxA	<10		ng/Kg-dry	10	7.5	1			05/21/2021 05:17	JKP
PFHxS	<10		ng/Kg-dry	10	5.8	1			05/21/2021 05:17	JKP
PFNA	<10		ng/Kg-dry	10	5.2	1			05/21/2021 05:17	JKP
PFNS	<30		ng/Kg-dry	30	29	1			05/21/2021 05:17	JKP
PFOA	<10		ng/Kg-dry	10	9.3	1			05/21/2021 05:17	JKP
PFOS	<20		ng/Kg-dry	20	20	1			05/21/2021 05:17	JKP
PFOSA	<15		ng/Kg-dry	15	10	1			05/21/2021 05:17	JKP
PFPeA	<15		ng/Kg-dry	15	12	1			05/21/2021 05:17	JKP
PFPeS	<15		ng/Kg-dry	15	15	1			05/21/2021 05:17	JKP
PFTeDA	<25		ng/Kg-dry	25	23	1			05/21/2021 05:17	JKP
PFTrDA	<20		ng/Kg-dry	20	10	1			05/21/2021 05:17	JKP
PFUnDA	<10		ng/Kg-dry	10	8.7	1			05/21/2021 05:17	JKP
PFecHS	<15		ng/Kg-dry	15	9.6	1			05/21/2021 05:17	JKP

Surrogate	Unit	Spiked Amount	Spike Result	Spike % Recovery	Control Limits	Qual
13C-HFPO-DA (S)	ng/Kg-dry	8000	8300	104	70 - 130	
d3-NMeFOSAA (S)	ng/Kg-dry	800	880	110	70 - 130	
d5-NEtFOSAA (S)	ng/Kg-dry	800	940	118	70 - 130	
M2-4:2 FTS (S)	ng/Kg-dry	800	780	97	70 - 130	
M2-6:2 FTS (S)	ng/Kg-dry	800	880	110	70 - 130	
M2-8:2 FTS (S)	ng/Kg-dry	800	850	106	70 - 130	
M2PFDoA (S)	ng/Kg-dry	800	960	120	70 - 130	
M2PFTeDA (S)	ng/Kg-dry	800	980	123	70 - 130	
M3PFBS (S)	ng/Kg-dry	800	830	104	70 - 130	
M3PFHxS (S)	ng/Kg-dry	800	850	106	70 - 130	

M4PFBA (S)	ng/Kg-dry	800	810	102	70 - 130
M4PFHpA (S)	ng/Kg-dry	800	810	102	70 - 130
M5PFHxA (S)	ng/Kg-dry	800	810	101	70 - 130
M5PFPeA (S)	ng/Kg-dry	800	830	104	70 - 130
M6PFDA (S)	ng/Kg-dry	800	980	123	70 - 130
M7PFUnDA (S)	ng/Kg-dry	800	960	120	70 - 130
M8PFOA (S)	ng/Kg-dry	800	830	104	70 - 130
M8PFOS (S)	ng/Kg-dry	800	830	104	70 - 130
M8PFOSA (S)	ng/Kg-dry	800	820	102	70 - 130
M9PFNA (S)	ng/Kg-dry	800	900	113	70 - 130

Sample Preparation by ASTM D7968 Mod.

Tumble Extraction for PFAS	2.0092	grams		1	05/10/2021 14:57 JKP

ANALYTICAL RESULTS

Lab ID:	3690080004	Date Collected:	04/27/2021 09:35	Matrix:	Solid (SO)
Sample ID:	Trip Blank	Date Received:	04/28/2021 09:45	Collector:	JG
Description:					

Parameter	Result	Qual	Unit	RL	MDL	DF	Min	Max	Analyzed	By

No results available.