June 10, 2021

Vista Work Order No. 2105192

Mr. Nick Covello
City of Grandville
15 Baldwin St
Jenison, MI 49428

Dear Mr. Covello,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on May 20, 2021 under your Project Name 'City of Grandville CWP Biosolids'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director

Vista Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Work Order No. 2105192
Case Narrative

Sample Condition on Receipt:

One sludge sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology. The sample was received in good condition and within the recommended temperature requirements.

Analytical Notes:

PFAS Isotope Dilution Method

The sample was extracted and analyzed for a selected list of PFAS using Vista's Isotope Dilution Method. The results for PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Results for all other analytes include the linear isomers only.

Holding Times

The sample was extracted and analyzed within the hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above the Reporting Limit (RL). The OPR recoveries were within the method acceptance criteria.

Due to the low percent solids, an aliquot of the sample was transferred to a 250-mL bottle and was extracted as an aqueous sample.

The labeled standard recoveries outside the acceptance criteria are listed in the table below. The responses of the internal standards with low recoveries were greater than 10:1 signal-to-noise, which is the limit generally considered acceptable for accurate quantitation by isotope dilution analysis.

QC Anomalies

LabNumber	SampleName	Analysis	Analyte	Flag	%Rec
2105192-01	Biosolids	PFAS Isotope Dilution Method	13C2-PFDoA	H	11.0
2105192-01	Biosolids	PFAS Isotope Dilution Method	13C2-PFTeDA	H	3.00
B1E0225-BLK1	B1E0225-BLK1	PFAS Isotope Dilution Method	13C3-PFBA	H	156
B1E0225-BS1	B1E0225-BS1	PFAS Isotope Dilution Method	13C3-PFBA	H	160

H = Recovery was outside laboratory acceptance criteria.

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Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
2105192-01	Biosolids	19-May-21 10:00	20-May-21 09:09	HDPE Bottle, 250 mL HDPE Bottle, 250 mL

Vista Project: 2105192

Client Project: City of Grandville CWP Biosolids

ANALYTICAL RESULTS

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: City of Grandville
Project: City of Grandville CWP Biosolids
Matrix: Solid

Laboratory Data

Lab Sample: B1E0225-BLK1
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	1.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
PFPeA	2706-90-3	ND	1.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
PFBS	375-73-5	ND	1.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
4:2 FTS	757124-72-4	ND	1.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
PFHxA	307-24-4	ND	2.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
PFPeS	2706-91-4	ND	1.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
HFPO-DA	13252-13-6	ND	2.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
PFHpA	375-85-9	ND	1.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
ADONA	919005-14-4	ND	1.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
PFHxS	355-46-4	ND	1.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
6:2 FTS	27619-97-2	ND	2.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
PFOA	335-67-1	ND	1.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
PFHpS	375-92-8	ND	2.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
PFNA	375-95-1	ND	1.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
PFOSA	754-91-6	ND	1.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
PFOS	1763-23-1	ND	2.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
9Cl-PF3ONS	756426-58-1	ND	2.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
PFDA	335-76-2	ND	2.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
8:2 FTS	39108-34-4	ND	2.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
PFNS	68259-12-1	ND	2.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
MeFOSAA	2355-31-9	ND	1.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
EtFOSAA	2991-50-6	ND	2.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
PFUnA	2058-94-8	ND	1.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
PFDS	335-77-3	ND	2.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
11Cl-PF3OUdS	763051-92-9	ND	3.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
PFDoA	307-55-1	ND	1.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
PFTrDA	72629-94-8	ND	2.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
PFTeDA	376-06-7	ND	2.00		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	156	25 - 150	H	B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
13C3-PFPeA	IS	95.1	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
13C3-PFBS	IS	105	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
13C3-HFPO-DA	IS	97.6	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
13C2-4:2 FTS	IS	98.0	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
13C2-PFHxA	IS	99.7	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
13C4-PFHpA	IS	95.3	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
13C3-PFHxS	IS	92.4	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
13C2-6:2 FTS	IS	94.2	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: City of Grandville
Project: City of Grandville CWP Biosolids
Matrix: Solid

Laboratory Data

Lab Sample: B1E0225-BLK1
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C5-PFNA	IS	97.8	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
13C8-PFOSA	IS	60.3	10 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
13C2-PFOA	IS	94.5	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
13C8-PFOS	IS	93.5	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
13C2-PFDA	IS	91.8	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
13C2-8:2 FTS	IS	86.8	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
d3-MeFOSAA	IS	82.5	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
13C2-PFUnA	IS	82.6	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
d5-EtFOSAA	IS	77.9	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
13C2-PFDoA	IS	74.8	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1
13C2-PFTeDA	IS	82.6	20 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 19:53	1

RL - Reporting limit

The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to RL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

Sample ID: OPR **PFAS Isotope Dilution Method**

Client Data

Name: City of Grandville
Project: City of Grandville CWP Biosolids
Matrix: Solid

Laboratory Data

Lab Sample: B1E0225-BS1
Column: BEH C18

Analyte	CAS Number	Amt Found (ng/g)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	16.4	20.0	82.2	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
PFPeA	2706-90-3	18.9	20.0	94.5	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
PFBS	375-73-5	19.4	20.0	97.0	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
4:2 FTS	757124-72-4	15.8	20.0	78.8	60 - 145		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
PFHxA	307-24-4	20.6	20.0	103	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
PFPeS	2706-91-4	17.9	20.0	89.5	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
HFPO-DA	13252-13-6	15.1	20.0	75.3	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
PFHpA	375-85-9	17.1	20.0	85.3	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
ADONA	919005-14-4	17.1	20.0	85.4	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
PFHxS	355-46-4	16.9	20.0	84.4	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
6:2 FTS	27619-97-2	17.6	20.0	87.9	60 - 140		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
PFOA	335-67-1	16.8	20.0	84.2	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
PFHpS	375-92-8	16.3	20.0	81.3	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
PFNA	375-95-1	16.2	20.0	81.1	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
PFOSA	754-91-6	16.5	20.0	82.3	65 - 140		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
PFOS	1763-23-1	16.9	20.0	84.3	65 - 140		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
9Cl-PF3ONS	756426-58-1	16.2	20.0	81.2	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
PFDA	335-76-2	17.1	20.0	85.6	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
8:2 FTS	39108-34-4	17.1	20.0	85.7	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
PFNS	68259-12-1	14.1	20.0	70.7	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
MeFOSAA	2355-31-9	17.8	20.0	89.2	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
EtFOSAA	2991-50-6	17.2	20.0	86.0	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
PFUnA	2058-94-8	17.4	20.0	87.2	65 - 140		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
PFDS	335-77-3	13.8	20.0	68.9	50 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
11Cl-PF3OUdS	763051-92-9	18.3	20.0	91.5	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
PFDoA	307-55-1	16.8	20.0	84.1	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
PFTrDA	72629-94-8	17.6	20.0	88.0	60 - 140		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
PFTeDA	376-06-7	16.3	20.0	81.4	65 - 135		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	160	25 - 150	H	B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
13C3-PFPeA	IS	98.9	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
13C3-PFBS	IS	103	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
13C3-HFPO-DA	IS	90.5	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
13C2-4:2 FTS	IS	102	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
13C2-PFHxA	IS	98.7	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1

Sample ID: OPR **PFAS Isotope Dilution Method**

Client Data

Name: City of Grandville
Project: City of Grandville CWP Biosolids
Matrix: Solid

Laboratory Data

Lab Sample: B1E0225-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C4-PFHpA	IS	102	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
13C3-PFHxS	IS	102	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
13C2-6:2 FTS	IS	90.9	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
13C5-PFNA	IS	103	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
13C8-PFOSA	IS	63.0	10 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
13C2-PFOA	IS	100	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
13C8-PFOS	IS	99.8	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
13C2-PFDA	IS	99.4	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
13C2-8:2 FTS	IS	96.0	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
d3-MeFOSAA	IS	83.3	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
13C2-PFUnA	IS	86.8	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
d5-EtFOSAA	IS	79.1	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
13C2-PFDoA	IS	78.0	25 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1
13C2-PFTeDA	IS	89.5	20 - 150		B1E0225	02-Jun-21	0.500 g	04-Jun-21 20:03	1

Sample ID: Biosolids

PFAS Isotope Dilution Method

Client Data

Name: City of Grandville
Project: City of Grandville CWP Biosolids
Location: ESD
Matrix: Sludge
Date Collected: 19-May-21 10:00

Laboratory Data

Lab Sample: 2105192-01
Date Received: 20-May-21 09:09
% Solids: 0.754
Column: BEH C18

Analyte	CAS Number	Conc. (ng/g)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBA	375-22-4	ND	0.999		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
PFPeA	2706-90-3	ND	0.999		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
PFBS	375-73-5	ND	0.999		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
4:2 FTS	757124-72-4	ND	0.999		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
PFHxA	307-24-4	2.62	2.00		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
PFPeS	2706-91-4	ND	0.999		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
HFPO-DA	13252-13-6	ND	2.00		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
PFHpA	375-85-9	ND	0.999		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
ADONA	919005-14-4	ND	0.999		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
PFHxS	355-46-4	ND	0.999		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
6:2 FTS	27619-97-2	ND	2.00		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
PFOA	335-67-1	ND	0.999		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
PFHpS	375-92-8	ND	2.00		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
PFNA	375-95-1	ND	0.999		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
PFOSA	754-91-6	ND	0.999		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
PFOS	1763-23-1	2.07	2.00		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
9Cl-PF3ONS	756426-58-1	ND	2.00		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
PFDA	335-76-2	ND	2.00		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
8:2 FTS	39108-34-4	ND	2.00		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
PFNS	68259-12-1	ND	2.00		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
MeFOSAA	2355-31-9	1.75	0.999		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
EtFOSAA	2991-50-6	ND	2.00		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
PFUnA	2058-94-8	ND	0.999		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
PFDS	335-77-3	ND	2.00		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
11Cl-PF3OUdS	763051-92-9	ND	3.00		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
PFDoA	307-55-1	ND	0.999		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
PFTrDA	72629-94-8	ND	2.00		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
PFTeDA	376-06-7	ND	2.00		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	40.7	25 - 150		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
13C3-PFPeA	IS	77.6	25 - 150		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
13C3-PFBS	IS	100	25 - 150		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
13C3-HFPO-DA	IS	58.6	25 - 150		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
13C2-4:2 FTS	IS	104	25 - 150		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
13C2-PFHxA	IS	86.4	25 - 150		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
13C4-PFHpA	IS	90.8	25 - 150		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
13C3-PFHxS	IS	98.9	25 - 150		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1

Sample ID: Biosolids — **PFAS Isotope Dilution Method**

Client Data

Name:	City of Grandville	Matrix:	Sludge
Project:	City of Grandville CWP Biosolids	Date Collected:	19-May-21 10:00
Location:	ESD		

Laboratory Data

Lab Sample:	2105192-01	Column:	BEH C18
Date Received:	20-May-21 09:09		
% Solids:	0.754		

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-6:2 FTS	IS	107	25 - 150		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
13C5-PFNA	IS	86.1	25 - 150		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
13C8-PFOSA	IS	54.7	10 - 150		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
13C2-PFOA	IS	93.0	25 - 150		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
13C8-PFOS	IS	71.4	25 - 150		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
13C2-PFDA	IS	72.2	25 - 150		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
13C2-8:2 FTS	IS	89.7	25 - 150		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
d3-MeFOSAA	IS	39.7	25 - 150		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
13C2-PFUnA	IS	34.5	25 - 150		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
d5-EtFOSAA	IS	39.7	25 - 150		B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
13C2-PFDoA	IS	11.0	25 - 150	H	B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1
13C2-PFTeDA	IS	3.00	20 - 150	H	B1E0225	02-Jun-21	66.4 g	04-Jun-21 20:13	1

RL - Reporting limit

The results are reported in dry weight.
The sample size is reported in wet weight.
Results reported to RL.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

DATA QUALIFIERS & ABBREVIATIONS

B	This compound was also detected in the method blank
Conc.	Concentration
CRS	Cleanup Recovery Standard
D	Dilution
DL	Detection Limit
E	The associated compound concentration exceeded the calibration range of the instrument
H	Recovery and/or RPD was outside laboratory acceptance limits
I	Chemical Interference
IS	Internal Standard
J	The amount detected is below the Reporting Limit/LOQ
LOD	Limit of Detection
LOQ	Limit of Quantitation
M	Estimated Maximum Possible Concentration (CA Region 2 projects only)
MDL	Method Detection Limit
NA	Not applicable
ND	Not Detected
OPR	Ongoing Precision and Recovery sample
P	The reported concentration may include contribution from chlorinated diphenyl ether(s).
Q	The ion transition ratio is outside of the acceptance criteria.
RL	Reporting Limit
RL	For 537.1, the reported RLs are the MRLs.
TEQ	Toxic Equivalency, sum of the toxic equivalency factors (TEF) multiplied by the sample concentrations.
TEQMax	TEQ calculation that uses the detection limit as the concentration for non-detects
TEQMin	TEQ calculation that uses zero as the concentration for non-detects
TEQRisk	TEQ calculation that uses ½ the detection limit as the concentration for non-detects
U	Not Detected (specific projects only)
*	See Cover Letter

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

Vista Analytical Laboratory Certifications

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	21-023-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-26
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2020018
Massachusetts Department of Environmental Protection	M-CA413
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1980678
New Hampshire Environmental Accreditation Program	207720
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Ohio Environmental Protection Agency	87778
Oregon Laboratory Accreditation Program	4042-016
Pennsylvania Department of Environmental Protection	017
Texas Commission on Environmental Quality	T104704189-21-12
Vermont Department of Health	VT-4042
Virginia Department of General Services	10769
Washington Department of Ecology	C584
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	**Method**
Determination of Polychlorinated p- Dioxins & Polychlorinated Dibenzofurans	EPA 23
Polychlorinated Dibenzodioxins in Ambient Air by GC/HRMS	EPA TO-9A

MATRIX: Biological Tissue	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613/1613B
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537.1
Determination of Per- and Polyfluoroalkyl Substances in Drinking Water by Isotope Dilution Anion Exchange Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry	EPA 533
Perfluorooctanesulonate (PFOS) and Perfluorooctanoate (PFOA) - Method for Unfiltered Samples Using Solid Phase Extraction and Liquid Chromatography/Mass Spectrometry	ISO 25101 2009

MATRIX: Non-Potable Water	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	**Method**
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

Vista Analytical Laboratory

CHAIN OF CUSTODY

For Laboratory Use Only
Work Order #: 2105192 Temp: 7.7 °C
Storage ID: R-13, WR-2 Storage Secured: Yes ☑ No ☐

Project ID: City of Grandville CWP Biosolids PO#: CWP Sampler: Nick Covello (name)

TAT (check one): Standard: [X] 21 days; Rush (surcharge may apply): [ ] 14 days [ ] 7 days Specify:

Relinquished by (printed name and signature)	Date	Time	Received by (printed name and signature)	Date	Time
NICK COVELLO	5-19-21	10:15 AM			
SCOTT YONKERS	5/19/21	10:15 AM	Karen Y. Arndt	05/20/21	08:39

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
(916) 673-1520 * Fax (916) 673-0106

ATTN:

Method of Shipment: FedEx
Tracking No.: 773763665984

Add Analysis(es) Requested

Sample ID	Date	Time	Location/ Sample Description	Container(s) Quantity	Type	Matrix	PFAS by Isotope Dilution: PFOA/ PFOS	UCMR3 PFAS List:6	537.1 List: 14 or 18 (Circle One)	EPA Draft List of 24	OTHER: Please attach analyte list	EPA Method 537 (DW only): PFOA/ PFOS	UCMR3 PFAS List:6	537.1 List of 14	537.1 List of 18	Comments
Biosolids	5-19-21	10:00 AM	ESD	2	P	SL					Michigan 28 Analytes					

Special Instructions/Comment

SEND DOCUMENTATION AND RESULTS TO:

Name: Nick Covello
Company: City of Grandville CWP
Address: 15 Baldwin St.
City: Jenison State: MI Zip: 49428
Phone: 616-457-0720 616-328-1034
Email: covellon@cityofgrandville.com

Container Types: P = HDPE, PJ = HDPE Jar, PY = Polypropylene, O= Other

Bottle Preservation Type: TZ= Trizma:

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment, SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other

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Sample Log-In Checklist

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Vista Work Order #: 2105192 TAT std

Samples Arrival:	**Date/Time** 05/20/21 09:09		**Initials:** IG		**Location:** WR-2 **Shelf/Rack:** MM2		
Delivered By:	~~FedEx~~	UPS	On Trac	GLS	DHL	Hand Delivered	Other
Preservation:	Ice		Blue Ice		Techni Ice	Dry Ice	None
Temp °C: 7.8 (uncorrected) **Temp °C:** 7.7 (corrected)			**Probe used:** Y / (N)		**Thermometer ID:** IR-4		

	YES	NO	NA
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?	✓		
Airbill ✓ Trk # 7717 6766 5984	✓		
Shipping Documentation Present?	✓		
Shipping Container: Vista / (Client) / Retain / (Return)		Dispose	
Chain of Custody / Sample Documentation Present?	✓		
Chain of Custody / Sample Documentation Complete?	✓		
Holding Time Acceptable?	✓		

Logged In:	**Date/Time** 05/20/21 1311	**Initials:** WWS	**Location:** R-13, WR-2 **Shelf/Rack:** B-1, F-4	
COC Anomaly/Sample Acceptance Form completed?			NO ✓	NA ✓

Comments:

CoC/Label Reconciliation Report WO# 2105192

LabNumber	CoC Sample ID	SampleAlias	Sample Date/Time	Container	BaseMatrix	Sample Comments
2105192-01	A Biosolids ☑	ESD	19-May-21 10:00 ☑	HDPE Bottle, 250 mL	Solid	
2105192-01	B Biosolids ☑	ESD	19-May-21 10:00 ☑	HDPE Bottle, 250 mL	Solid	

Checkmarks indicate that information on the COC reconciled with the sample label.
Any discrepancies are noted in the following columns.

	Yes	No	NA
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Adequate Sample Volume?	✓		
Container Type Appropriate for Analysis(es)	✓		

Comments:

Preservation Documented: Na2S2O3 Trizma NH4CH3CO2 (None) Other

Verifed by/Date: WWS 05/20/21