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Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Roger Brewer
Hawaii Department of Health
919 Ala Moana Blvd
Room 206
Honolulu, Hawaii 96814

Generated 11/28/2023 10:02:43 AM

JOB DESCRIPTION

Wastewater Treatment

JOB NUMBER

320-105614-2

Eurofins Sacramento
880 Riverside Parkway
West Sacramento CA 95605

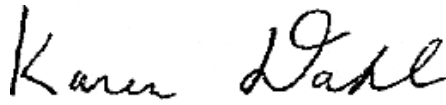See page two for job notes and contact information.

my EOL

Eurofins Sacramento

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Northern California, LLC Project Manager.

Authorization

Generated
11/28/2023 10:02:43 AM

Authorized for release by
Karen Dahl, Senior Project Manager
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Table of Contents

Eurofins Sacramento
11/28/2023

Definitions/Glossary

Qualifiers

LCMS

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
H3	Sample was received and analyzed past holding time. This does not meet regulatory requirements.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Eurofins Sacramento

11/28/2023

Client: Hawaii Department of Health

Project/Site: Wastewater Treatment

Job ID: 320-105614-2

Laboratory: Eurofins Sacramento

Narrative

Job Narrative
320-105614-2

Comments

As requested, these samples were analyzed for two analytes by method 537 Modified. These results are provided in this report.

Receipt

The samples were received on 10/4/2023 9:30 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 3.6º C.

Receipt Exceptions

The following sample were received outside of the laboratories recommended holding time for TOPS analysis: SIWWTP-EFFL (320-105614-2) and HNWWTP-EFFL (320-105614-3).

As requested, the NTA analysis was placed on hold.

The container label for the following samples did not match the information listed on the Chain-of-Custody (COC): LAWWTP-EFFL (320-105614-1), SIWWTP-EFFL (320-105614-2) and HNWWTP-EFFL (320-105614-3).
The containers for sample LAWWTP-EFFL (320-105614-1) were labeled with collection dates of 9/25/23 & 9/26/23. The containers for sample SIWWTP-EFFL (320-105614-2) were labeled with collection dates of 9/14/23 & 9/15/23. The containers for sample HNWWTP-EFFL (320-105614-3) were labeled with collection dates of 9/18/23 & 9/19/23. The collection dates listed on the COC were used in the report.

No collection times were listed on the COC. The earliest collection time listed on the containers was used in the report.

LCMS

No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep

Method 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-722290.

Method 3535: The following sample in preparation batch 320-722290 was light green in color following extraction. HNWWTP-EFFL (320-105614-3)

Method 3535: The following samples were activated outside of the preparation holding time: LAWWTP-EFFL (320-105614-1), SIWWTP-EFFL (320-105614-2) and HNWWTP-EFFL (320-105614-3).

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Eurofins Sacramento
11/28/2023

Detection Summary

Client Sample ID: LAWWTP-EFFL   Lab Sample ID: 320-105614-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
PFPrA	8.0	H	4.9	2.5	ng/L	1		537 (modified)	Total/NA

Client Sample ID: SIWWTP-EFFL   Lab Sample ID: 320-105614-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
PFPrA	7.4	H H3	5.0	2.5	ng/L	1		537 (modified)	Total/NA

Client Sample ID: HNWWTP-EFFL   Lab Sample ID: 320-105614-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
PFPrA	15	H H3	5.0	2.5	ng/L	1		537 (modified)	Total/NA

This Detection Summary does not include radiochemical test results.

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Client Sample Results

Client: Hawaii Department of Health
Project/Site: Wastewater Treatment

Client Sample ID: LAWWTP-EFFL
Date Collected: 09/26/23 09:00
Date Received: 10/04/23 09:30

Lab Sample ID: 320-105614-1
Matrix: Water

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PFPrS	ND	H	2.0	0.24	ng/L		11/22/23 05:24	11/27/23 00:08	1
PFPrA	**8.0**	**H**	4.9	2.5	ng/L		11/22/23 05:24	11/27/23 00:08	1

Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	102		25 - 150				11/22/23 05:24	11/27/23 00:08	1
13C3-PFPrA	72		25 - 150				11/22/23 05:24	11/27/23 00:08	1

Client Sample ID: SIWWTP-EFFL
Date Collected: 09/19/23 08:31
Date Received: 10/04/23 09:30

Lab Sample ID: 320-105614-2
Matrix: Water

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PFPrS	ND	H H3	2.0	0.24	ng/L		11/22/23 05:24	11/27/23 00:18	1
PFPrA	**7.4**	**H H3**	5.0	2.5	ng/L		11/22/23 05:24	11/27/23 00:18	1

Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	88		25 - 150				11/22/23 05:24	11/27/23 00:18	1
13C3-PFPrA	51		25 - 150				11/22/23 05:24	11/27/23 00:18	1

Client Sample ID: HNWWTP-EFFL
Date Collected: 09/19/23 07:40
Date Received: 10/04/23 09:30

Lab Sample ID: 320-105614-3
Matrix: Water

Method: EPA 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PFPrS	ND	H H3	2.0	0.24	ng/L		11/22/23 05:24	11/27/23 00:28	1
PFPrA	**15**	**H H3**	5.0	2.5	ng/L		11/22/23 05:24	11/27/23 00:28	1

Isotope Dilution	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	86		25 - 150				11/22/23 05:24	11/27/23 00:28	1
13C3-PFPrA	81		25 - 150				11/22/23 05:24	11/27/23 00:28	1

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11/28/2023

Isotope Dilution Summary

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Isotope Dilution Recovery (Acceptance Limits)	
		PFBA **(25-150)**	**3C3PFPrA** **(25-150)**
320-105614-1	LAWWTP-EFFL	102	72
320-105614-2	SIWWTP-EFFL	88	51
320-105614-3	HNWWTP-EFFL	86	81
LCS 320-722290/2-A	Lab Control Sample	101	84
LCSD 320-722290/3-A	Lab Control Sample Dup	97	81
MB 320-722290/1-A	Method Blank	102	91

Surrogate Legend

PFBA = 13C4 PFBA

13C3PFPrA = 13C3-PFPrA

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Client: Hawaii Department of Health

Project/Site: Wastewater Treatment

Job ID: 320-105614-2

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-722290/1-A
Matrix: Water
Analysis Batch: 722863

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 722290

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
PFPrS	ND		2.0	0.24	ng/L		11/22/23 05:24	11/26/23 23:27	1
PFPrA	ND		5.0	2.5	ng/L		11/22/23 05:24	11/26/23 23:27	1

Isotope Dilution	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
13C4 PFBA	102		25 - 150				11/22/23 05:24	11/26/23 23:27	1
13C3-PFPrA	91		25 - 150				11/22/23 05:24	11/26/23 23:27	1

Lab Sample ID: LCS 320-722290/2-A
Matrix: Water
Analysis Batch: 722863

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 722290

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
PFPrS	36.8	32.0		ng/L		87	70 - 130
PFPrA	40.0	46.5		ng/L		116	70 - 130

Isotope Dilution	LCS %Recovery	LCS Qualifier	Limits
13C4 PFBA	101		25 - 150
13C3-PFPrA	84		25 - 150

Lab Sample ID: LCSD 320-722290/3-A
Matrix: Water
Analysis Batch: 722863

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 722290

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
PFPrS	36.8	35.3		ng/L		96	70 - 130	10	30
PFPrA	40.0	47.8		ng/L		119	70 - 130	3	30

Isotope Dilution	LCSD %Recovery	LCSD Qualifier	Limits
13C4 PFBA	97		25 - 150
13C3-PFPrA	81		25 - 150

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QC Association Summary

LCMS

Prep Batch: 722290

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-105614-1	LAWWTP-EFFL	Total/NA	Water	3535	
320-105614-2	SIWWTP-EFFL	Total/NA	Water	3535	
320-105614-3	HNWWTP-EFFL	Total/NA	Water	3535	
MB 320-722290/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-722290/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-722290/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 722863

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-105614-1	LAWWTP-EFFL	Total/NA	Water	537 (modified)	722290
320-105614-2	SIWWTP-EFFL	Total/NA	Water	537 (modified)	722290
320-105614-3	HNWWTP-EFFL	Total/NA	Water	537 (modified)	722290
MB 320-722290/1-A	Method Blank	Total/NA	Water	537 (modified)	722290
LCS 320-722290/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	722290
LCSD 320-722290/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	722290

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Client: Hawaii Department of Health
Project/Site: Wastewater Treatment

Job ID: 320-105614-2

Client Sample ID: LAWWTP-EFFL
Date Collected: 09/26/23 09:00
Date Received: 10/04/23 09:30

Lab Sample ID: 320-105614-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			252.6 mL	10.0 mL	722290	11/22/23 05:24	GAT	EET SAC
Total/NA	Analysis	537 (modified)		1	1 mL	1 mL	722863	11/27/23 00:08	C1P	EET SAC

Client Sample ID: SIWWTP-EFFL
Date Collected: 09/19/23 08:31
Date Received: 10/04/23 09:30

Lab Sample ID: 320-105614-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			252.5 mL	10.0 mL	722290	11/22/23 05:24	GAT	EET SAC
Total/NA	Analysis	537 (modified)		1	1 mL	1 mL	722863	11/27/23 00:18	C1P	EET SAC

Client Sample ID: HNWWTP-EFFL
Date Collected: 09/19/23 07:40
Date Received: 10/04/23 09:30

Lab Sample ID: 320-105614-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			251 mL	10.0 mL	722290	11/22/23 05:24	GAT	EET SAC
Total/NA	Analysis	537 (modified)		1	1 mL	1 mL	722863	11/27/23 00:28	C1P	EET SAC

Laboratory References:

EET SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

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11/28/2023

Accreditation/Certification Summary

Laboratory: Eurofins Sacramento

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Hawaii	State	<cert No.>	01-29-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
537 (modified)	3535	Water	PFPrA
537 (modified)	3535	Water	PFPrS

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Method Summary

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	EET SAC
3535	Solid-Phase Extraction (SPE)	SW846	EET SAC

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET SAC = Eurofins Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

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11/28/2023

Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-105614-1	LAWWTP-EFFL	Water	09/26/23 09:00	10/04/23 09:30
320-105614-2	SIWWTP-EFFL	Water	09/19/23 08:31	10/04/23 09:30
320-105614-3	HNWWTP-EFFL	Water	09/19/23 07:40	10/04/23 09:30

Eurofins Sacramento
11/28/2023

Chain of Custody Record

703586

Invoice to:
Contact: Eric Jensen
Address: TetraTech
737 Bishop St Ste 2340   eric.jensen@tetratech.com
Honolulu, HI 96813   Report to: roger.brewer@doh.hawaii.gov
808-225-7084

Client Contact

Company Name: Hawaii Dept of Health-HEER
Address: 2385 Waimano Home Rd #100
City/State/Zip: Pearl City, HI 96782
Phone: 1-808-586-4244
Fax:
Project Name: Wastewater Treatment
Site:
P O #

Project Manager: Roger Brewer
Tel/Email: roger.brewer@doh.hawaii.gov

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other: ___

Site Contact:
Lab Contact:

Analysis Turnaround Time
☐ CALENDAR DAYS ☐ WORKING DAYS
TAT if different from Below
☐ 2 weeks
☐ 1 week
☐ 2 days
☐ 1 day

COC No:
_____ of _____ COCs
Sampler:

For Lab Use Only:
Walk-in Client:
Lab Sampling:
Job / SDG No.:

Date:
Carrier:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	PFAS 537 Prestops / TOPS	NTA	AOF		Sample Specific Notes:
L A WWTP - EFFL	9/26/23			water	5	X		X	X	X		
S I WWTP - EFFL	9/19/23			"	5	X		X	X	X		
H N WWTP - EFFL	9/19/23			"	5	X		X	X	X		

Preservation ☐: Cl; 3= H2SO4; 4=HNO3; 5=NaOH; 6= Other

Possible Hazard Identification:
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

Special Instructions/QC Requirements & Comments:
Filter samples (0.45 um)

Custody Seals Intact: ☐ Yes ☐ No
Custody Seal No.:

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

320-105614 Chain of Custody

	Company:	Date/Time:		Company:	Date/Time:
Relinquished by:	Hoold	11/3/23 9:00am	Received by:	YSA Sam	10/4/23 0830
Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

Cooler Temp. (°C): Obs'd: 3.6 Corr'd: 3.6 Therm ID No.: 6-7

Loc: 320
105614

Tracking #: 7845 7574 2010

Job:_____

SO (PO) FO / SAT / 2-Day / Ground / UPS / CDO / Courier
GSL / OnTrac / Goldstreak / USPS / Other_____

Use this form to record Sample Custody Seal, Cooler Custody Seal, Temperature & corrected Temperature & other observations.
File in the job folder with the COC.

Therm. ID: W2   Corr. Factor: (+ / -) _____ °C

Ice ___/___ Wet _____ Gel _____ Other _____

Cooler Custody Seal: _____

Cooler ID: _____

Temp Observed: 3.6 °C   Corrected: 3.6 °C
      From: Temp Blank ☑   Sample ☐

Opening/Processing The Shipment	Yes	No	NA
Cooler compromised/tampered with?	☐	☑	☐
Cooler Temperature is acceptable?	☑	☐	☐
Frozen samples show signs of thaw?	☐	☐	☑

Initials: M   Date: 10/4/23

Unpacking/Labeling The Samples	Yes	No	NA
Containers are not broken or leaking?	☑	☐	☐
Samples compromised/tampered with?	☐	☑	☐
COC is complete w/o discrepancies	☐	☑	☐
Sample custody seal?	☐	☐	☑
Sample containers have legible labels?	☑	☐	☐
Sample date/times are provided?	☑	☐	☐
Appropriate containers are used?	☑	☐	☐
Sample bottles are completely filled?	☑	☐	☐
Sample preservatives verified?	☐	☐	☑
Is the Field Sampler's name on COC?	☐	☑	☐
Samples w/o discrepancies?	☐	☑	☐
Zero headspace?*	☐	☐	☑
Alkalinity has no headspace?	☐	☐	☑
Perchlorate has headspace? (Methods 314, 331, 6850)	☐	☐	☑
Multiphasic samples are not present?	☑	☐	☐

Containers requiring zero headspace have no headspace, or bubble < 6 mm (1/4")

Initials: SD   Date: 10/5/12

Notes: _____ timr
① times 0900-0845
② tmr 0831-0739
③ tmr 0740-0757

            bttr
① 9/25 - 26/23
② 9/14 - 15/23
③ 9/18 - 19/23

_____
_____
_____
_____

Trizma Lot #(s): _____

_____

_____

Ammonium

Acetate Lot #(s): _____

_____

_____

Login Completion	Yes	No	NA
Receipt Temperature on COC?	☑	☐	☐
NCM Filed?	☑	☐	☐
Samples received within hold time?	☐	☑	☐
Log Release checked in TALS?	☑	☐	☐

Initials: SD   Date: 10/5/23

\\TACORP\CORP\QA\QA_FACILITIES\SACRAMENTO-QA\DOCUMENT-MANAGEMENT\FORMS\QA-812 SAMPLE RECEIVING NOTES.DOC   QA-812 MBB 2023-08-07

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Login Sample Receipt Checklist

Client: Hawaii Department of Health

Job Number: 320-105614-2

Login Number: 105614
List Number: 1
Creator: Oropeza, Salvador

List Source: Eurofins Sacramento

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	REFER TO SSRN
The cooler's custody seal, if present, is intact.	N/A	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	N/A	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	N/A	
Cooler Temperature is recorded.	N/A	
COC is present.	N/A	
COC is filled out in ink and legible.	N/A	
COC is filled out with all pertinent information.	N/A	
Is the Field Sampler's name present on COC?	N/A	
There are no discrepancies between the containers received and the COC.	N/A	
Samples are received within Holding Time (excluding tests with immediate HTs)	N/A	
Sample containers have legible labels.	N/A	
Containers are not broken or leaking.	N/A	
Sample collection date/times are provided.	N/A	
Appropriate sample containers are used.	N/A	
Sample bottles are completely filled.	N/A	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	N/A	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	N/A	
Samples do not require splitting or compositing.	N/A	
Residual Chlorine Checked.	N/A	

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11/28/2023