Tetra Tech Inc (HI)
737 Bishop St, Suite 2340
Honolulu, Hawaii 96813
Tel: 808-441-6600
Email: Yvonne.parry@Tetratech.com

RE: HDOH Red Hill

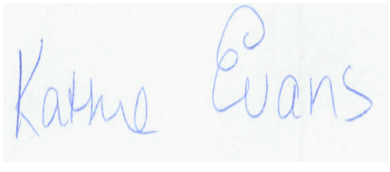
Work Order No.: 2112255

Dear Yvonne Parry:

Torrent Laboratory, Inc. received 1 sample(s) on December 21, 2021 for the analyses presented in the following Report.

All data for associated QC met EPA or laboratory specification(s) except where noted in the case narrative.

Torrent Laboratory, Inc. is certified by the State of California, ELAP #1991. If you have any questions regarding these test results, please feel free to contact the Project Management Team at (408)263-5258; ext 204.



Kathie Evans
Project Manager

January 06, 2022
Date

Date: 1/6/2022

Client: Tetra Tech Inc (HI)

Project: HDOH Red Hill

Work Order: 2112255

CASE NARRATIVE

Unless otherwise indicated in the following narrative, no issues encountered with the receiving, preparation, analysis or reporting of the results associated with this work order.

Unless otherwise indicated in the following narrative, no results have been method and/or field blank corrected.

Reported results relate only to the items/samples tested by the laboratory.

This report shall not be reproduced, except in full, without the written approval of Torrent Laboratory, Inc

Torrent LABORATORY, INC.

Sample Result Summary

Report prepared for: Yvonne Parry
Tetra Tech Inc (HI)

Date Received: 12/21/21
Date Reported: 01/06/22

ERH2265 / RHMW2254-01

2112255-001

Parameters:	Analysis Method	DF	MDL	PQL	Results	Unit

All compounds were non-detectable for this sample.

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Yvonne Parry
Tetra Tech Inc (HI)

Date/Time Received: 12/21/21, 11:00 am
Date Reported: 01/06/22

Client Sample ID:	ERH2265 / RHMW2254-01	**Lab Sample ID:**	2112255-001A
Project Name/Location:	HDOH Red Hill	**Sample Matrix:**	Water
Project Number:	103S518817512		
Date/Time Sampled:	12/20/21 / 10:15		
SDG:			

Prep Method:	PFAS-W-QSM 5.3	**Prep Batch Date/Time:**	12/29/21 3:02:00PM
Prep Batch ID:	1138049	**Prep Analyst:**	TOMA

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
4 2 FTS	QSM 5.3 Table B-15	1	2.74	10.0	ND		ng/L	12/29/21	19:19	MK	462593
6 2 FTS	QSM 5.3 Table B-15	1	2.37	10.0	ND		ng/L	12/29/21	19:19	MK	462593
8 2 FTS	QSM 5.3 Table B-15	1	3.09	10.0	ND		ng/L	12/29/21	19:19	MK	462593
10:2 Fluorotelomer sulfonic acid	QSM 5.3 Table B-15	1	1.37	5.00	ND		ng/L	12/29/21	19:19	MK	462593
Perfluorobutanoic acid	QSM 5.3 Table B-15	1	2.14	10.0	ND		ng/L	12/29/21	19:19	MK	462593
Perfluoropentanoic acid	QSM 5.3 Table B-15	1	1.40	10.0	ND		ng/L	12/29/21	19:19	MK	462593
Perfluorobutane sulfonic acid	QSM 5.3 Table B-15	1	3.49	10.0	ND		ng/L	12/29/21	19:19	MK	462593
Perfluorohexanoic acid	QSM 5.3 Table B-15	1	1.29	10.0	ND		ng/L	12/29/21	19:19	MK	462593
Perfluoropentane sulfonoic acid	QSM 5.3 Table B-15	1	1.61	10.0	ND		ng/L	12/29/21	19:19	MK	462593
Perfluoroheptanoic acid	QSM 5.3 Table B-15	1	3.48	10.0	ND		ng/L	12/29/21	19:19	MK	462593
Perfluorohexane sulfonic acid (PFHxS)	QSM 5.3 Table B-15	1	2.91	10.0	ND		ng/L	12/29/21	19:19	MK	462593
Perfluorooctanoic acid	QSM 5.3 Table B-15	1	2.37	10.0	ND		ng/L	12/29/21	19:19	MK	462593
Perfluorononanoic acid	QSM 5.3 Table B-15	1	4.71	10.0	ND		ng/L	12/29/21	19:19	MK	462593
Perfluoroheptane sulfonic acid (PFHpS)	QSM 5.3 Table B-15	1	2.75	10.0	ND		ng/L	12/29/21	19:19	MK	462593
Perfluorooctane sulfonic acid	QSM 5.3 Table B-15	1	3.49	10.0	ND		ng/L	12/29/21	19:19	MK	462593
Perfluorodecanoic acid	QSM 5.3 Table B-15	1	4.18	10.0	ND		ng/L	12/29/21	19:19	MK	462593
Perfluorononane sulfonic acid (PFNS)	QSM 5.3 Table B-15	1	3.20	10.0	ND		ng/L	12/29/21	19:19	MK	462593
NMeFOSAA	QSM 5.3 Table B-15	1	2.41	10.0	ND		ng/L	12/29/21	19:19	MK	462593
NEtFOSAA	QSM 5.3 Table B-15	1	2.90	10.0	ND		ng/L	12/29/21	19:19	MK	462593
Perfluoroundecanoic acid	QSM 5.3 Table B-15	1	2.37	10.0	ND		ng/L	12/29/21	19:19	MK	462593
Perfluorodecane sulfonic acid (PFDS)	QSM 5.3 Table B-15	1	1.66	10.0	ND		ng/L	12/29/21	19:19	MK	462593
Perfluorododecanoic acid	QSM 5.3 Table B-15	1	1.79	5.00	ND		ng/L	12/29/21	19:19	MK	462593
Perfluorotridecanoic acid	QSM 5.3 Table B-15	1	1.31	10.0	ND		ng/L	12/29/21	19:19	MK	462593
Perfluorotetradecanoic acid	QSM 5.3 Table B-15	1	1.74	10.0	ND		ng/L	12/29/21	19:19	MK	462593

Torrent LABORATORY, INC.

SAMPLE RESULTS

Report prepared for: Yvonne Parry
Tetra Tech Inc (HI)

Date/Time Received: 12/21/21, 11:00 am
Date Reported: 01/06/22

Client Sample ID:	ERH2265 / RHMW2254-01	**Lab Sample ID:**	2112255-001A
Project Name/Location:	HDOH Red Hill	**Sample Matrix:**	Water
Project Number:	103S518817512		
Date/Time Sampled:	12/20/21 / 10:15		
SDG:			

Prep Method:	PFAS-W-QSM 5.3	**Prep Batch Date/Time:**	12/29/21 3:02:00PM
Prep Batch ID:	1138049	**Prep Analyst:**	TOMA

Parameters:	Analysis Method	DF	MDL	PQL	Results	Q	Units	Analyzed	Time	By	Analytical Batch
Perfluorooctanesulfonamide	QSM 5.3 Table B-15	1	2.36	10.0	ND		ng/L	12/29/21	19:19	MK	462593
Perfluorobutanesulfoamide	QSM 5.3 Table B-15	1	2.36	10.0	ND		ng/L	12/29/21	19:19	MK	462593
Gen-X	QSM 5.3 Table B-15	1	3.95	15.0	ND		ng/L	12/29/21	19:19	MK	462593
ADONA	QSM 5.3 Table B-15	1	2.44	10.0	ND		ng/L	12/29/21	19:19	MK	462593
Perfluorohexanesulfoamide	QSM 5.3 Table B-15	1	4.50	10.0	ND		ng/L	12/29/21	19:19	MK	462593
9-Cl-PF3ONS	QSM 5.3 Table B-15	1	1.55	5.00	ND		ng/L	12/29/21	19:19	MK	462593
11-Cl-PF3OUdS	QSM 5.3 Table B-15	1	1.32	5.00	ND		ng/L	12/29/21	19:19	MK	462593

Torrent LABORATORY, INC.

MB Summary Report

Work Order:	2112255	**Prep Method:**	PFAS-W-QSM 5.3	**Prep Date:**	12/29/21	**Prep Batch:**	1138049
Matrix:	Water	**Analytical Method:**	QSM 5.3 Table B-15	**Analyzed Date:**	12/29/2021	**Analytical Batch:**	462593
Units:	ng/L						

Parameters	MDL	PQL	Method Blank Conc.	Lab Qualifier
4 2 FTS	2.7	10.0	ND	
6 2 FTS	2.4	10.0	ND	
8 2 FTS	3.1	10.0	ND	
10:2 Fluorotelomer sulfonic acid	1.4	5.00	ND	
Perfluorobutanoic acid	2.1	10.0	ND	
Perfluoropentanoic acid	1.4	10.0	ND	
Perfluorobutane sulfonic acid	3.5	10.0	ND	
Perfluorohexanoic acid	1.3	10.0	ND	
Perfluoropentane sulfonoic acid	1.6	10.0	ND	
Perfluoroheptanoic acid	3.5	10.0	ND	
Perfluorohexane sulfonic acid (PFHxS)	1.9	10.0	ND	
Perfluorooctanoic acid	2.4	10.0	ND	
Perfluorononanoic acid	4.7	10.0	ND	
Perfluoroheptane sulfonic acid (PFHpS)	2.8	10.0	ND	
Perfluorooctane sulfonic acid	3.5	10.0	ND	
Perfluorodecanoic acid	4.2	10.0	ND	
Perfluorononane sulfonic acid (PFNS)	3.2	10.0	ND	
NMeFOSAA	2.4	10.0	ND	
NEtFOSAA	2.9	10.0	ND	
Perfluoroundecanoic acid	2.4	10.0	ND	
Perfluorodecane sulfonic acid (PFDS)	1.7	10.0	ND	
Perfluorododecanoic acid	1.8	5.00	ND	
Perfluorotridecanoic acid	1.3	10.0	ND	
Perfluorotetradecanoic acid	1.7	10.0	ND	
Perfluorooctanesulfonamide	2.4	10.0	ND	
Perfluorobutanesulfoamide	2.4	10.0	ND	
Gen-X	4.0	15.0	ND	
ADONA	2.4	10.0	ND	
Perfluorohexanesulfoamide	4.5	10.0	ND	
9-Cl-PF3ONS	1.6	5.00	ND	
11-Cl-PF3OUdS	1.3	5.00	ND	

Torrent LABORATORY, INC.

LCS/LCSD Summary Report

Raw values are used in quality control assessment.

Work Order:	2112255	**Prep Method:**	PFAS-W-QSM 5.3	**Prep Date:**	12/29/21	**Prep Batch:**	1138049
Matrix:	Water	**Analytical Method:**	QSM 5.3 Table B-15	**Analyzed Date:**	12/29/2021	**Analytical Batch:**	462593
Units:	ng/L						

Parameters	MDL	PQL	Method Blank Conc.	Spike Conc.	LCS % Recovery	LCSD % Recovery	LCS/LCSD % RPD	% Recovery Limits	% RPD Limits	Lab Qualifier
4 2 FTS	2.74	10.0	ND	30	90.2	92.2	2.56	70 - 130	30	
6 2 FTS	2.37	10.0	ND	30	92.8	92.9	0.359	70 - 130	30	
8 2 FTS	3.09	10.0	ND	30	105	117	10.8	70 - 130	30	
10:2 Fluorotelomer sulfonic ac	1.37	5.00	ND	30	99.8	103	2.63	70 - 130	30	
Perfluorobutanoic acid	2.14	10.0	ND	30	102	103	0.325	70 - 130	30	
Perfluoropentanoic acid	1.40	10.0	ND	30	99.6	99.6	0.000	70 - 130	30	
Perfluorobutane sulfonic acid	3.49	10.0	ND	30	87.5	87.2	0.381	70 - 130	30	
Perfluorohexanoic acid	1.29	10.0	ND	30	99.7	98.6	1.01	70 - 130	30	
Perfluoropentane sulfonoic aci	1.61	10.0	ND	30	92.4	87.6	5.19	70 - 130	30	
Perfluoroheptanoic acid	3.48	10.0	ND	30	92.2	94.6	2.86	70 - 130	30	
Perfluorohexane sulfonic acid	2.91	10.0	ND	30	89.7	88.7	1.12	70 - 130	30	
Perfluorooctanoic acid	2.37	10.0	ND	30	90.7	89.8	1.11	70 - 130	30	
Perfluorononanoic acid	4.71	10.0	ND	30	95.0	95.3	0.350	70 - 130	30	
Perfluoroheptane sulfonic acid	2.75	10.0	ND	30	86.8	88.9	2.66	70 - 130	30	
Perfluorooctane sulfonic acid	3.49	10.0	ND	30	94.0	98.1	4.17	70 - 130	30	
Perfluorodecanoic acid	4.18	10.0	ND	30	95.3	92.9	2.48	70 - 130	30	
Perfluorononane sulfonic acid	3.20	10.0	ND	30	92.3	99.2	7.30	70 - 130	30	
NMeFOSAA	2.41	10.0	ND	30	98.1	98.9	1.02	70 - 130	30	
NEtFOSAA	2.90	10.0	ND	30	99.7	96.1	3.75	70 - 130	30	
Perfluoroundecanoic acid	2.37	10.0	ND	30	103	107	3.17	70 - 130	30	
Perfluorodecane sulfonic acid	1.66	10.0	ND	30	102	100	1.97	70 - 130	30	
Perfluorododecanoic acid	1.79	5.00	ND	30	90.4	89.2	1.49	70 - 130	30	
Perfluorotridecanoic acid	1.31	10.0	ND	30	104	102	2.26	70 - 130	30	
Perfluorotetradecanoic acid	1.74	10.0	ND	30	96.6	94.7	2.09	70 - 130	30	
Perfluorooctanesulfonamide	2.36	10.0	ND	30	103	97.6	5.32	70 - 130	30	
Perfluorobutanesulfoamide	2.36	10.0	ND	30	99.5	99.5	0.000	70 - 130	30	
Gen-X	3.95	15.0	ND	30	92.2	92.0	0.362	70 - 130	30	
ADONA	2.44	10.0	ND	30	93.3	93.8	0.357	70 - 130	30	
Perfluorohexanesulfoamide	4.50	10.0	ND	30	94.8	104	9.08	70 - 130	30	
9-Cl-PF3ONS	1.55	5.00	ND	30	96.8	94.1	2.80	70 - 130	30	
11-Cl-PF3OUdS	1.32	5.00	ND	30	92.4	93.7	1.43	70 - 130	30	

Laboratory Qualifiers and Definitions

DEFINITIONS:

Accuracy/Bias (% Recovery) - The closeness of agreement between an observed value and an accepted reference value.
Blank (Method/Preparation Blank) -MB/PB - An analyte-free matrix to which all reagents are added in the same volumes/proportions as used in sample processing. The method blank is used to document contamination resulting from the analytical process.
Duplicate - a field sample and/or laboratory QC sample prepared in duplicate following all of the same processes and procedures used on the original sample (sample duplicate, LCSD, MSD)
Laboratory Control Sample (LCS ad LCSD) - A known matrix spiked with compounds representative of the target analyte(s). This is used to document laboratory performance.
Matrix - the component or substrate that contains the analyte of interest (e.g., - groundwater, sediment, soil, waste water, etc)
Matrix Spike (MS/MSD) - Client sample spiked with identical concentrations of target analyte (s). The spiking occurs prior to the sample preparation and analysis. They are used to document the precision and bias of a method in a given sample matrix.
Method Detection Limit (MDL) - the minimum concentration of a substance that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero
Practical Quantitation Limit/Reporting Limit/Limit of Quantitation (PQL/RL/LOQ) - a laboratory determined value at 2 to 5 times above the MDL that can be reproduced in a manner that results in a 99% confidence level that the result is both accurate and precise. PQLs/RLs/LODs reflect all preparation factors and/or dilution factors that have been applied to the sample during the preparation and/or analytical processes.
Precision (%RPD) - The agreement among a set of replicate/duplicate measurements without regard to known value of the replicates
Surrogate (S) or (Surr) - An organic compound which is similar to the target analyte(s) in chemical composition and behavior in the analytical process, but which is not normally found in environmental samples. Surrogates are used in most organic analysis to demonstrate matrix compatibility with the chosen method of analysis
Tentatively Identified Compound (TIC) - A compound not contained within the analytical calibration standards but present in the GCMS library of defined compounds. When the library is searched for an unknown compound, it can frequently give a tentative identification to the compound based on retention time and primary and secondary ion match. TICs are reported as estimates and are candidates for further investigation.
Units: the unit of measure used to express the reported result - **mg/L** and ***mg/Kg*** (equivalent to PPM - parts per million in **liquid** and ***solid***), **ug/L** and ***ug/Kg*** (equivalent to PPB - parts per billion in **liquid** and ***solid***), **ug/m3**, ***mg/m3***, **ppbv** and ***ppmv*** (all units of measure for reporting concentrations in air), **%** (equivalent to 10000 ppm or 1,000,000 ppb), **ug/Wipe** (concentration found on the surface of a single Wipe usually taken over a 100cm2 surface)

LABORATORY QUALIFIERS:

B - Indicates when the analyte is found in the associated method or preparation blank
D - Surrogate is not recoverable due to the necessary dilution of the sample
E - Indicates the reportable value is outside of the calibration range of the instrument but within the linear range of the instrument (unless otherwise noted) Values reported with an E qualifier should be considered as estimated.
H- Indicates that the recommended holding time for the analyte or compound has been exceeded
J- Indicates a value between the method MDL and PQL and that the reported concentration should be considered as estimated rather the quantitative
NA - Not Analyzed
N/A - Not Applicable
ND - Not Detected at a concentration greater than the PQL/RL or, if reported to the MDL, at greater than the MDL.
NR - Not recoverable - a matrix spike concentration is not recoverable due to a concentration within the original sample that is greater than four times the spike concentration added
R- The % RPD between a duplicate set of samples is outside of the absolute values established by laboratory control charts
S- Spike recovery is outside of established method and/or laboratory control limits. Further explanation of the use of this qualifier should be included within a case narrative
X -Used to indicate that a value based on pattern identification is within the pattern range but not typical of the pattern found in standards. Further explanation may or may not be provided within the sample footnote and/or the case narrative.

Sample Receipt Checklist

Client Name: Tetra Tech Inc (HI)

Project Name: HDOH Red Hill

Work Order No.: 2112255

Date and Time Received: 12/21/2021 11:00:00AM

Received By: Kathie Evans

Physically Logged By: Helena Ueng

Checklist Completed By: Helena Ueng

Carrier Name: FedEx

Chain of Custody (COC) Information

Chain of custody present?	Yes
Chain of custody signed when relinquished and received?	Yes
Chain of custody agrees with sample labels?	Yes
Custody seals intact on sample bottles?	Not Present

Sample Receipt Information

Custody seals intact on shipping container/cooler?	Not Present
Shipping Container/Cooler In Good Condition?	Yes
Samples in proper container/bottle?	Yes
Samples containers intact?	Yes
Sufficient sample volume for indicated test?	Yes

Sample Preservation and Hold Time (HT) Information

All samples received within holding time?	Yes			
Container/Temp Blank temperature in compliance?	Yes	Temperature:	5.0	°C
Water-VOA vials have zero headspace?	No VOA vials submitted			
Water-pH acceptable upon receipt?	N/A			

pH Checked by: N/A

pH Adjusted by: N/A

Comments:

Login Summary Report

Client ID:	TL5162	Tetra Tech Inc (HI)	**QC Level:**	II
Project Name:	HDOH Red Hill		**TAT Requested:**	10 Day:10
Project # :	103S518817512		**Date Received:**	12/21/2021
Report Due Date:	1/6/2022		**Time Received:**	11:00 am

Comments:

Work Order # : ***2112255***

WO Sample ID	Client Sample ID	Collection Date/Time	Matrix	Scheduled Disposal	Sample On Hold	Test On Hold	Requested Tests	Subbed
2112255-001A	ERH2265 / RHMW2254-01	12/20/21 10:15	Water	02/03/22			PFAS_W_31	

Torrent LABORATORY, INC.

CHAIN-OF-CUSTODY RECORD

TETRA TECH

2112255

Client Name/Account #: TetraTech, Inc.
Address: 737 Bishop St., Suite 2340
City/State/Zip: Honolulu, HI 96813
Project Manager: Yvonne Parry
Telephone Number: (808)441-6617 Fax No.: (808) 836-1689
Sampler Name: (Print) Jason Tu-bay
Sampler Signature:

Report To: Yvonne Parry
Invoice To: Yvonne Parry
Project ID: HDOH Red Hill
Project #:

Sample ID / Description	Date Sampled	Time Sampled	No. of Containers Shipped	Grab	Composite	Multi-incremental Sample	Preservative: Ice	Preservative: HNO_3 (Red Label)	Preservative: HCl (Blue Label)	Preservative: NaOH (Orange Label)	Preservative: H_2SO_4 Plastic (Yellow Label)	Preservative: H_2SO_4 Glass(Yellow Label)	Preservative: None (Black Label)	Preservative: Other (one MeOH VOA)	Matrix: Groundwater	Matrix: Wastewater	Matrix: Drinking Water	Matrix: Sludge	Matrix: Soil	Matrix: Other (specify):	Analyze For: Analyses pending	Analyze For: PFAS	RUSH TAT (Pre-Schedule)	Standard TAT
ERH 2265/RHMW2254-0	12/20	1015	1	X			X															X		X

-001A

Special Instructions:

Method of Shipment: FEDEX

Laboratory Comments:
Temperature Upon Receipt:
VOCs Free of Headspace? Y N

Relinquished by:	Date	Time	Received by:	Date	Time
	12/20/21	1115	fedex	12/15/21	1115
Relinquished by:	Date	Time	Received by Laboratory:	Date	Time
			Kathie Cuo	12-21-21	1100

5.3°C

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