



AGRICULTURE & PRIORITY POLLUTANTS LABORATORIES

A METIRI GROUP COMPANY

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NELAP Certification Number: CA00046

DoD-ELAP Certification Number 4064.01

State Certification Number:

April 17, 2023

Watson Tanji
AECOM Honolulu
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

RE: Red Hill AFFF Assessment Sampling
23D0043

Enclosed are the results of analyses for samples received by our laboratory on 4/6/2023. If you have any questions concerning this report, please feel free to contact me.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. These test results meet all requirements of NELAC and DoD QSM. Release of the hard copy has been authorized by the Laboratory Manager or designee, as verified by the following signature.

Sincerely,

Karen Volpendesta
Project Manager

Table of Contents

Cover Letter	1
Case Narratives Analyses	3
Sample Results	4
Quality Assurance Results	13
Qualifiers and Definitions	18
Login Summary	19
Chain of Custody	21
Other Documents or Sub Lab Data	24

AECOM Honolulu
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

Project: Red Hill AFFF Assessment Sampling
Project Number: Red Hill AFFF Assessment Sampling / 60697810
Project Manager: Watson Tanji

Reported: 04/17/2023 11:30

Analysis Case Narrative

EPA 1633: Manual integrations were performed for this method in accordance with APPL's SOP. Chromatograms after manual integration are enclosed for specific samples and analytes. Abbreviated flags for technical justification are listed on the chromatogram.

The analytes PFHxA, 6:2FTS, and 3:3FTcA recovered above the upper control limit in the SC01502-LCV1.

Samples in this Report

Lab ID	Sample	Matrix	Date Sampled	Date Received
23D0043-01	AF-RHMW225401-WGN01B-2304W1	Water	04/05/2023 09:00	04/06/2023
23D0043-02	AF-HDMW225303-WGN01LF-2304W1	Water	04/04/2023 10:15	04/06/2023
23D0043-03	AF-RHMW10-WGN01LF-2304W1	Water	04/04/2023 13:00	04/06/2023
23D0043-04	AF-RHMW10-WGFD01LF-2304W1	Water	04/04/2023 13:00	04/06/2023

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Project: Red Hill AFFF Assessment Sampling
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Project Manager: Watson Tanji

Reported: 04/17/2023 11:30

Sample Results

Sample: AF-RHMW225401-WGN01B-2304W1
23D0043-01 (Water)

Per- and Polyfluoroalkyl Substances

Analyte	Result /Qual	LOQ	LOD	DL	Units	Date Analyzed	DF	Method	Prep Batch
PFBA	0.66 J	1.5	0.74	0.19	ng/L	04/14/23	1	EPA 1633	BCD0119
PFPEA	1.1	0.74	0.37	0.060	ng/L	04/14/23	1	EPA 1633	BCD0119
PFHXA	0.94	0.37	0.18	0.051	ng/L	04/14/23	1	EPA 1633	BCD0119
PFHPA	0.68	0.37	0.18	0.038	ng/L	04/14/23	1	EPA 1633	BCD0119
PFOA	0.96	0.37	0.28	0.14	ng/L	04/14/23	1	EPA 1633	BCD0119
PFNA	0.14 J	0.37	0.18	0.075	ng/L	04/14/23	1	EPA 1633	BCD0119
PFDA	0.18 U	0.37	0.18	0.093	ng/L	04/14/23	1	EPA 1633	BCD0119
PFUnA	0.28 U	0.37	0.28	0.15	ng/L	04/14/23	1	EPA 1633	BCD0119
PFDOA	0.18 U	0.37	0.18	0.10	ng/L	04/14/23	1	EPA 1633	BCD0119
PFTRDA	0.28 U	0.37	0.28	0.19	ng/L	04/14/23	1	EPA 1633	BCD0119
PFTEDA	0.28 U	0.37	0.28	0.18	ng/L	04/14/23	1	EPA 1633	BCD0119
PFBS	0.75	0.37	0.18	0.034	ng/L	04/14/23	1	EPA 1633	BCD0119
PFPEs	0.11 J	0.37	0.18	0.058	ng/L	04/14/23	1	EPA 1633	BCD0119
PFHXS	1.1	0.37	0.18	0.029	ng/L	04/14/23	1	EPA 1633	BCD0119
PFHPS	0.18 U	0.37	0.18	0.047	ng/L	04/14/23	1	EPA 1633	BCD0119
PFOS	1.1	0.37	0.18	0.058	ng/L	04/14/23	1	EPA 1633	BCD0119
PFNS	0.18 U	0.37	0.18	0.11	ng/L	04/14/23	1	EPA 1633	BCD0119
PFDS	0.28 U	0.37	0.28	0.14	ng/L	04/14/23	1	EPA 1633	BCD0119
PFDOS	0.18 U	0.37	0.18	0.11	ng/L	04/14/23	1	EPA 1633	BCD0119
4:2FTS	0.74 U	1.5	0.74	0.27	ng/L	04/14/23	1	EPA 1633	BCD0119
6:2FTS	0.74 U	1.5	0.74	0.29	ng/L	04/14/23	1	EPA 1633	BCD0119
8:2FTS	0.74 U	1.5	0.74	0.076	ng/L	04/14/23	1	EPA 1633	BCD0119
PFOSA	0.18 U	0.37	0.18	0.096	ng/L	04/14/23	1	EPA 1633	BCD0119
NMeFOSA	0.74 U	1.5	0.74	0.44	ng/L	04/14/23	1	EPA 1633	BCD0119
NEtFOSA	0.74 U	1.5	0.74	0.38	ng/L	04/14/23	1	EPA 1633	BCD0119
NMeFOSAA	0.18 U	0.37	0.18	0.097	ng/L	04/14/23	1	EPA 1633	BCD0119
NEtFOSAA	0.18 U	0.37	0.18	0.11	ng/L	04/14/23	1	EPA 1633	BCD0119
NMeFOSE	1.1 U	1.5	1.1	0.93	ng/L	04/14/23	1	EPA 1633	BCD0119
NEtFOSE	1.1 U	1.5	1.1	0.96	ng/L	04/14/23	1	EPA 1633	BCD0119
HFPO-DA	0.37 U	0.74	0.37	0.16	ng/L	04/14/23	1	EPA 1633	BCD0119
ADONA	0.37 U	0.74	0.37	0.11	ng/L	04/14/23	1	EPA 1633	BCD0119
PFEESA	0.37 U	0.74	0.37	0.10	ng/L	04/14/23	1	EPA 1633	BCD0119
PFMPA	0.37 U	0.74	0.37	0.050	ng/L	04/14/23	1	EPA 1633	BCD0119
PFMBA	0.37 U	0.74	0.37	0.083	ng/L	04/14/23	1	EPA 1633	BCD0119
NFDHA	0.37 U	0.74	0.37	0.28	ng/L	04/14/23	1	EPA 1633	BCD0119
9CL-PF3ONS	0.37 U	0.74	0.37	0.19	ng/L	04/14/23	1	EPA 1633	BCD0119
11CL-PF3OUDS	0.37 U	0.74	0.37	0.19	ng/L	04/14/23	1	EPA 1633	BCD0119
3:3FTCA	0.74 U	1.5	0.74	0.53	ng/L	04/14/23	1	EPA 1633	BCD0119
5:3FTCA	0.74 U	1.5	0.74	0.41	ng/L	04/14/23	1	EPA 1633	BCD0119
7:3FTCA	0.74 U	1.5	0.74	0.51	ng/L	04/14/23	1	EPA 1633	BCD0119
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Surrogate: 13C4-PFBA	88.9%		10-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C5-PFPEA	77.7%		35-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C5-PFHXA	84.0%		55-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C4-PFHPA	84.7%		55-150			04/14/23	1	EPA 1633	BCD0119

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Project Manager: Watson Tanji

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Sample Results (Continued)

Sample: AF-RHMW225401-WGN01B-2304W1 (Continued)
23D0043-01 (Water)

Per- and Polyfluoroalkyl Substances (Continued)

Analyte	Result /Qual	LOQ	LOD	DL	Units	Date Analyzed	DF	Method	Prep Batch
Surrogate: 13C8-PFOA	91.8%		60-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C9-PFNA	99.7%		55-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C6-PFDA	88.5%		50-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C7-PFUnA	98.3%		30-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-PFDOA	99.3%		10-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-PFTEDA	92.6%		10-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C3-PFBS	95.8%		55-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C3-PFHXS	92.3%		55-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C8-PFOS	88.9%		45-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-4:2FTS	153%		60-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-6:2FTS	126%		60-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-8:2FTS	132%		50-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C8-PFOA	65.1%		30-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: D3-NMEFOA	51.6%		15-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: D5-NETFOA	56.0%		10-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: D3-NMEFOSAA	89.3%		45-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: D5-NETFOSAA	107%		10-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: D7-NMEFOSE	59.1%		10-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: D9-NETFOSE	65.2%		10-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C3-HFPO-DA	81.6%		25-160			04/14/23	1	EPA 1633	BCD0119

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Reported: 04/17/2023 11:30

Sample Results (Continued)

**Sample: AF-HDMW225303-WGN01LF-2304W1
23D0043-02 (Water)**

Per- and Polyfluoroalkyl Substances

Analyte	Result /Qual	LOQ	LOD	DL	Units	Date Analyzed	DF	Method	Prep Batch
PFBA	0.77 U	1.5	0.77	0.20	ng/L	04/14/23	1	EPA 1633	BCD0119
PFPEA	0.38 U	0.77	0.38	0.062	ng/L	04/14/23	1	EPA 1633	BCD0119
PFHXA	0.088 J IR1,	0.38	0.19	0.053	ng/L	04/14/23	1	EPA 1633	BCD0119
PFHPA	0.097 J	0.38	0.19	0.039	ng/L	04/14/23	1	EPA 1633	BCD0119
PFOA	0.29 U IR2,	0.38	0.29	0.15	ng/L	04/14/23	1	EPA 1633	BCD0119
PFNA	0.19 U	0.38	0.19	0.079	ng/L	04/14/23	1	EPA 1633	BCD0119
PFDA	0.19 U	0.38	0.19	0.097	ng/L	04/14/23	1	EPA 1633	BCD0119
PFUnA	0.29 U	0.38	0.29	0.15	ng/L	04/14/23	1	EPA 1633	BCD0119
PFDOA	0.19 U	0.38	0.19	0.11	ng/L	04/14/23	1	EPA 1633	BCD0119
PFTRDA	0.29 U	0.38	0.29	0.20	ng/L	04/14/23	1	EPA 1633	BCD0119
PFTEDA	0.29 U	0.38	0.29	0.19	ng/L	04/14/23	1	EPA 1633	BCD0119
PFBS	0.19 U	0.38	0.19	0.035	ng/L	04/14/23	1	EPA 1633	BCD0119
PFPEs	0.19 U	0.38	0.19	0.060	ng/L	04/14/23	1	EPA 1633	BCD0119
PFHXS	0.037 J	0.38	0.19	0.030	ng/L	04/14/23	1	EPA 1633	BCD0119
PFHPS	0.19 U	0.38	0.19	0.049	ng/L	04/14/23	1	EPA 1633	BCD0119
PFOS	0.19 U	0.38	0.19	0.061	ng/L	04/14/23	1	EPA 1633	BCD0119
PFNS	0.19 U	0.38	0.19	0.12	ng/L	04/14/23	1	EPA 1633	BCD0119
PFDS	0.29 U	0.38	0.29	0.15	ng/L	04/14/23	1	EPA 1633	BCD0119
PFDOS	0.19 U	0.38	0.19	0.12	ng/L	04/14/23	1	EPA 1633	BCD0119
4:2FTS	0.77 U	1.5	0.77	0.28	ng/L	04/14/23	1	EPA 1633	BCD0119
6:2FTS	0.77 U	1.5	0.77	0.30	ng/L	04/14/23	1	EPA 1633	BCD0119
8:2FTS	0.77 U	1.5	0.77	0.079	ng/L	04/14/23	1	EPA 1633	BCD0119
PFOSA	0.19 U	0.38	0.19	0.10	ng/L	04/14/23	1	EPA 1633	BCD0119
NMeFOSA	0.77 U	1.5	0.77	0.45	ng/L	04/14/23	1	EPA 1633	BCD0119
NEtFOSA	0.77 U	1.5	0.77	0.40	ng/L	04/14/23	1	EPA 1633	BCD0119
NMeFOSAA	0.19 U	0.38	0.19	0.10	ng/L	04/14/23	1	EPA 1633	BCD0119
NEtFOSAA	0.19 U	0.38	0.19	0.11	ng/L	04/14/23	1	EPA 1633	BCD0119
NMeFOSE	1.2 U	1.5	1.2	0.97	ng/L	04/14/23	1	EPA 1633	BCD0119
NEtFOSE	1.2 U	1.5	1.2	1.0	ng/L	04/14/23	1	EPA 1633	BCD0119
HFPO-DA	0.38 U	0.77	0.38	0.17	ng/L	04/14/23	1	EPA 1633	BCD0119
ADONA	0.38 U	0.77	0.38	0.12	ng/L	04/14/23	1	EPA 1633	BCD0119
PFEESA	0.38 U	0.77	0.38	0.10	ng/L	04/14/23	1	EPA 1633	BCD0119
PFMPA	0.38 U	0.77	0.38	0.052	ng/L	04/14/23	1	EPA 1633	BCD0119
PFMBA	0.38 U	0.77	0.38	0.087	ng/L	04/14/23	1	EPA 1633	BCD0119
NFDHA	0.38 U	0.77	0.38	0.29	ng/L	04/14/23	1	EPA 1633	BCD0119
9CL-PF3ONS	0.38 U	0.77	0.38	0.20	ng/L	04/14/23	1	EPA 1633	BCD0119
11CL-PF3OUDS	0.38 U	0.77	0.38	0.20	ng/L	04/14/23	1	EPA 1633	BCD0119
3:3FTCA	0.77 U	1.5	0.77	0.55	ng/L	04/14/23	1	EPA 1633	BCD0119
5:3FTCA	0.77 U	1.5	0.77	0.43	ng/L	04/14/23	1	EPA 1633	BCD0119
7:3FTCA	0.77 U	1.5	0.77	0.53	ng/L	04/14/23	1	EPA 1633	BCD0119
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Surrogate: 13C4-PFBA	97.0%		10-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C5-PFPEA	85.1%		35-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C5-PFHXA	89.3%		55-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C4-PFHPA	93.9%		55-150			04/14/23	1	EPA 1633	BCD0119

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Sample Results (Continued)

Sample: AF-HDMW225303-WGN01LF-2304W1 (Continued)
23D0043-02 (Water)

Per- and Polyfluoroalkyl Substances (Continued)

Analyte	Result /Qual	LOQ	LOD	DL	Units	Date Analyzed	DF	Method	Prep Batch
Surrogate: 13C8-PFOA	89.7%		60-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C9-PFNA	101%		55-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C6-PFDA	96.9%		50-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C7-PFUnA	104%		30-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-PFDOA	98.0%		10-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-PFTEDA	91.6%		10-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C3-PFBS	93.7%		55-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C3-PFHXS	96.9%		55-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C8-PFOS	94.3%		45-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-4:2FTS	110%		60-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-6:2FTS	127%		60-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-8:2FTS	95.7%		50-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C8-PFOSA	83.4%		30-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: D3-NMEFOSA	48.6%		15-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: D5-NETFOSA	51.1%		10-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: D3-NMEFOSAA	87.5%		45-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: D5-NETFOSAA	85.1%		10-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: D7-NMEFOSE	75.5%		10-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: D9-NETFOSSE	82.8%		10-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C3-HFPO-DA	85.0%		25-160			04/14/23	1	EPA 1633	BCD0119

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Project Manager: Watson Tanji

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Sample Results (Continued)

**Sample: AF-RHMW10-WGN01LF-2304W1
23D0043-03 (Water)**

Per- and Polyfluoroalkyl Substances

Analyte	Result /Qual	LOQ	LOD	DL	Units	Date Analyzed	DF	Method	Prep Batch
PFBA	0.76 U	1.5	0.76	0.20	ng/L	04/14/23	1	EPA 1633	BCD0119
PFPEA	0.38 U	0.76	0.38	0.062	ng/L	04/14/23	1	EPA 1633	BCD0119
PFHXA	0.19 U	0.38	0.19	0.052	ng/L	04/14/23	1	EPA 1633	BCD0119
PFHPA	0.19 U	0.38	0.19	0.039	ng/L	04/14/23	1	EPA 1633	BCD0119
PFOA	0.29 U	0.38	0.29	0.15	ng/L	04/14/23	1	EPA 1633	BCD0119
PFNA	0.19 U	0.38	0.19	0.078	ng/L	04/14/23	1	EPA 1633	BCD0119
PFDA	0.19 U	0.38	0.19	0.097	ng/L	04/14/23	1	EPA 1633	BCD0119
PFUnA	0.29 U	0.38	0.29	0.15	ng/L	04/14/23	1	EPA 1633	BCD0119
PFDOA	0.19 U	0.38	0.19	0.11	ng/L	04/14/23	1	EPA 1633	BCD0119
PFTRDA	0.29 U	0.38	0.29	0.19	ng/L	04/14/23	1	EPA 1633	BCD0119
PFTEDA	0.29 U	0.38	0.29	0.19	ng/L	04/14/23	1	EPA 1633	BCD0119
PFBS	0.19 U	0.38	0.19	0.035	ng/L	04/14/23	1	EPA 1633	BCD0119
PFPEs	0.19 U	0.38	0.19	0.060	ng/L	04/14/23	1	EPA 1633	BCD0119
PFHXS	0.19 U	0.38	0.19	0.030	ng/L	04/14/23	1	EPA 1633	BCD0119
PFHPS	0.19 U	0.38	0.19	0.049	ng/L	04/14/23	1	EPA 1633	BCD0119
PFOS	0.19 U	0.38	0.19	0.061	ng/L	04/14/23	1	EPA 1633	BCD0119
PFNS	0.19 U	0.38	0.19	0.12	ng/L	04/14/23	1	EPA 1633	BCD0119
PFDS	0.29 U	0.38	0.29	0.14	ng/L	04/14/23	1	EPA 1633	BCD0119
PFDOS	0.19 U	0.38	0.19	0.12	ng/L	04/14/23	1	EPA 1633	BCD0119
4:2FTS	0.76 U	1.5	0.76	0.28	ng/L	04/14/23	1	EPA 1633	BCD0119
6:2FTS	0.76 U	1.5	0.76	0.30	ng/L	04/14/23	1	EPA 1633	BCD0119
8:2FTS	0.76 U	1.5	0.76	0.078	ng/L	04/14/23	1	EPA 1633	BCD0119
PFOSA	0.19 U	0.38	0.19	0.099	ng/L	04/14/23	1	EPA 1633	BCD0119
NMeFOSA	0.76 U	1.5	0.76	0.45	ng/L	04/14/23	1	EPA 1633	BCD0119
NEtFOSA	0.76 U	1.5	0.76	0.39	ng/L	04/14/23	1	EPA 1633	BCD0119
NMeFOSAA	0.19 U	0.38	0.19	0.10	ng/L	04/14/23	1	EPA 1633	BCD0119
NEtFOSAA	0.19 U	0.38	0.19	0.11	ng/L	04/14/23	1	EPA 1633	BCD0119
NMeFOSE	1.1 U	1.5	1.1	0.97	ng/L	04/14/23	1	EPA 1633	BCD0119
NEtFOSE	1.1 U	1.5	1.1	1.0	ng/L	04/14/23	1	EPA 1633	BCD0119
HFPO-DA	0.38 U	0.76	0.38	0.17	ng/L	04/14/23	1	EPA 1633	BCD0119
ADONA	0.38 U	0.76	0.38	0.12	ng/L	04/14/23	1	EPA 1633	BCD0119
PFEESA	0.38 U	0.76	0.38	0.10	ng/L	04/14/23	1	EPA 1633	BCD0119
PFMPA	0.38 U	0.76	0.38	0.052	ng/L	04/14/23	1	EPA 1633	BCD0119
PFMBA	0.38 U	0.76	0.38	0.087	ng/L	04/14/23	1	EPA 1633	BCD0119
NFDHA	0.38 U	0.76	0.38	0.29	ng/L	04/14/23	1	EPA 1633	BCD0119
9CL-PF3ONS	0.38 U	0.76	0.38	0.20	ng/L	04/14/23	1	EPA 1633	BCD0119
11CL-PF3OUDS	0.38 U	0.76	0.38	0.20	ng/L	04/14/23	1	EPA 1633	BCD0119
3:3FTCA	0.76 U	1.5	0.76	0.55	ng/L	04/14/23	1	EPA 1633	BCD0119
5:3FTCA	0.76 U	1.5	0.76	0.42	ng/L	04/14/23	1	EPA 1633	BCD0119
7:3FTCA	0.76 U	1.5	0.76	0.53	ng/L	04/14/23	1	EPA 1633	BCD0119
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Surrogate: 13C4-PFBA	93.8%		10-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C5-PFPEA	90.8%		35-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C5-PFHXA	89.6%		55-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C4-PFHPA	89.9%		55-150			04/14/23	1	EPA 1633	BCD0119

AECOM Honolulu
1001 Bishop Street, Suite 1600
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Project: Red Hill AFFF Assessment Sampling
Project Number: Red Hill AFFF Assessment Sampling / 60697810
Project Manager: Watson Tanji

Reported: 04/17/2023 11:30

Sample Results (Continued)

Sample: AF-RHMW10-WGN01LF-2304W1 (Continued)
23D0043-03 (Water)

Per- and Polyfluoroalkyl Substances (Continued)

Analyte	Result /Qual	LOQ	LOD	DL	Units	Date Analyzed	DF	Method	Prep Batch
Surrogate: 13C8-PFOA	89.6%		60-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C9-PFNA	92.9%		55-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C6-PFDA	84.8%		50-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C7-PFUnA	80.5%		30-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-PFDOA	84.8%		10-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-PFTEDA	78.2%		10-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C3-PFBS	76.1%		55-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C3-PFHXS	86.4%		55-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C8-PFOS	91.0%		45-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-4:2FTS	92.5%		60-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-6:2FTS	106%		60-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-8:2FTS	78.2%		50-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C8-PFOA	61.2%		30-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: D3-NMEFOA	35.6%		15-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: D5-NETFOA	28.8%		10-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: D3-NMEFOSAA	80.2%		45-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: D5-NETFOSAA	82.7%		10-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: D7-NMEFOSE	39.1%		10-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: D9-NETFOSE	44.0%		10-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C3-HFPO-DA	88.3%		25-160			04/14/23	1	EPA 1633	BCD0119

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Project: Red Hill AFFF Assessment Sampling
Project Number: Red Hill AFFF Assessment Sampling / 60697810
Project Manager: Watson Tanji

Reported: 04/17/2023 11:30

Sample Results (Continued)

**Sample: AF-RHMW10-WGFD01LF-2304W1
23D0043-04 (Water)**

Per- and Polyfluoroalkyl Substances

Analyte	Result /Qual	LOQ	LOD	DL	Units	Date Analyzed	DF	Method	Prep Batch
PFBA	0.74 U	1.5	0.74	0.19	ng/L	04/14/23	1	EPA 1633	BCD0119
PFPEA	0.37 U	0.74	0.37	0.060	ng/L	04/14/23	1	EPA 1633	BCD0119
PFHXA	0.18 U	0.37	0.18	0.050	ng/L	04/14/23	1	EPA 1633	BCD0119
PFHPA	0.18 U	0.37	0.18	0.038	ng/L	04/14/23	1	EPA 1633	BCD0119
PFOA	0.28 U	0.37	0.28	0.14	ng/L	04/14/23	1	EPA 1633	BCD0119
PFNA	0.18 U	0.37	0.18	0.075	ng/L	04/14/23	1	EPA 1633	BCD0119
PFDA	0.18 U	0.37	0.18	0.093	ng/L	04/14/23	1	EPA 1633	BCD0119
PFUnA	0.28 U	0.37	0.28	0.15	ng/L	04/14/23	1	EPA 1633	BCD0119
PFDOA	0.18 U	0.37	0.18	0.10	ng/L	04/14/23	1	EPA 1633	BCD0119
PFTRDA	0.28 U	0.37	0.28	0.19	ng/L	04/14/23	1	EPA 1633	BCD0119
PFTEDA	0.28 U	0.37	0.28	0.18	ng/L	04/14/23	1	EPA 1633	BCD0119
PFBS	0.18 U	0.37	0.18	0.034	ng/L	04/14/23	1	EPA 1633	BCD0119
PFPEs	0.18 U	0.37	0.18	0.058	ng/L	04/14/23	1	EPA 1633	BCD0119
PFHXS	0.18 U	0.37	0.18	0.029	ng/L	04/14/23	1	EPA 1633	BCD0119
PFHPS	0.18 U	0.37	0.18	0.047	ng/L	04/14/23	1	EPA 1633	BCD0119
PFOS	0.18 U	0.37	0.18	0.058	ng/L	04/14/23	1	EPA 1633	BCD0119
PFNS	0.18 U	0.37	0.18	0.11	ng/L	04/14/23	1	EPA 1633	BCD0119
PFDS	0.28 U	0.37	0.28	0.14	ng/L	04/14/23	1	EPA 1633	BCD0119
PFDOS	0.18 U	0.37	0.18	0.11	ng/L	04/14/23	1	EPA 1633	BCD0119
4:2FTS	0.74 U	1.5	0.74	0.27	ng/L	04/14/23	1	EPA 1633	BCD0119
6:2FTS	0.74 U	1.5	0.74	0.29	ng/L	04/14/23	1	EPA 1633	BCD0119
8:2FTS	0.74 U	1.5	0.74	0.075	ng/L	04/14/23	1	EPA 1633	BCD0119
PFOSA	0.18 U	0.37	0.18	0.096	ng/L	04/14/23	1	EPA 1633	BCD0119
NMeFOSA	0.74 U	1.5	0.74	0.43	ng/L	04/14/23	1	EPA 1633	BCD0119
NEtFOSA	0.74 U	1.5	0.74	0.38	ng/L	04/14/23	1	EPA 1633	BCD0119
NMeFOSAA	0.18 U	0.37	0.18	0.097	ng/L	04/14/23	1	EPA 1633	BCD0119
NEtFOSAA	0.18 U	0.37	0.18	0.11	ng/L	04/14/23	1	EPA 1633	BCD0119
NMeFOSE	1.1 U	1.5	1.1	0.93	ng/L	04/14/23	1	EPA 1633	BCD0119
NEtFOSE	1.1 U	1.5	1.1	0.96	ng/L	04/14/23	1	EPA 1633	BCD0119
HFPO-DA	0.37 U	0.74	0.37	0.16	ng/L	04/14/23	1	EPA 1633	BCD0119
ADONA	0.37 U	0.74	0.37	0.11	ng/L	04/14/23	1	EPA 1633	BCD0119
PFEESA	0.37 U	0.74	0.37	0.10	ng/L	04/14/23	1	EPA 1633	BCD0119
PFMPA	0.37 U	0.74	0.37	0.050	ng/L	04/14/23	1	EPA 1633	BCD0119
PFMBA	0.37 U	0.74	0.37	0.083	ng/L	04/14/23	1	EPA 1633	BCD0119
NFDHA	0.37 U	0.74	0.37	0.28	ng/L	04/14/23	1	EPA 1633	BCD0119
9CL-PF3ONS	0.37 U	0.74	0.37	0.19	ng/L	04/14/23	1	EPA 1633	BCD0119
11CL-PF3OUDS	0.37 U	0.74	0.37	0.19	ng/L	04/14/23	1	EPA 1633	BCD0119
3:3FTCA	0.74 U	1.5	0.74	0.53	ng/L	04/14/23	1	EPA 1633	BCD0119
5:3FTCA	0.74 U	1.5	0.74	0.41	ng/L	04/14/23	1	EPA 1633	BCD0119
7:3FTCA	0.74 U	1.5	0.74	0.51	ng/L	04/14/23	1	EPA 1633	BCD0119
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Surrogate: 13C4-PFBA	92.0%		10-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C5-PFPEA	95.7%		35-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C5-PFHXA	94.7%		55-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C4-PFHPA	96.6%		55-150			04/14/23	1	EPA 1633	BCD0119

AECOM Honolulu
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Honolulu, HI 96813

Project: Red Hill AFFF Assessment Sampling
Project Number: Red Hill AFFF Assessment Sampling / 60697810
Project Manager: Watson Tanji

Reported: 04/17/2023 11:30

Sample Results (Continued)

Sample: AF-RHMW10-WGFD01LF-2304W1 (Continued)
23D0043-04 (Water)

Per- and Polyfluoroalkyl Substances (Continued)

Analyte	Result /Qual	LOQ	LOD	DL	Units	Date Analyzed	DF	Method	Prep Batch
Surrogate: 13C8-PFOA	90.5%		60-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C9-PFNA	90.6%		55-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C6-PFDA	89.3%		50-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C7-PFUnA	89.7%		30-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-PFDOA	87.1%		10-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-PFTEDA	71.2%		10-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C3-PFBS	93.7%		55-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C3-PFHXS	97.7%		55-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C8-PFOS	85.3%		45-140			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-4:2FTS	113%		60-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-6:2FTS	116%		60-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C2-8:2FTS	87.6%		50-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C8-PFOA	69.3%		30-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: D3-NMEFOA	40.4%		15-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: D5-NETFOA	31.3%		10-130			04/14/23	1	EPA 1633	BCD0119
Surrogate: D3-NMEFOSAA	77.9%		45-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: D5-NETFOSAA	74.7%		10-200			04/14/23	1	EPA 1633	BCD0119
Surrogate: D7-NMEFOSE	46.6%		10-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: D9-NETFOSE	57.6%		10-150			04/14/23	1	EPA 1633	BCD0119
Surrogate: 13C3-HFPO-DA	86.9%		25-160			04/14/23	1	EPA 1633	BCD0119

AECOM Honolulu
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

Project: Red Hill AFFF Assessment Sampling
Project Number: Red Hill AFFF Assessment Sampling / 60697810
Project Manager: Watson Tanji

Reported: 04/17/2023 11:30

PREPARATION BATCH SUMMARY

EPA 1633

Laboratory: APPL, LLC

Client: AECOM

Batch: BCD0119 Batch Matrix: Water Preparation: EPA 1633

SAMPLE NAME	LAB SAMPLE ID	DATE PREPARED	INITIAL VOL./WEIGHT mL	FINAL VOL. mL
AF-RHMW225401-WGN01B-2304W1	23D0043-01	04/10/23 08:18	543.66	2.00
AF-HDMW225303-WGN01LF-2304W1	23D0043-02	04/10/23 08:18	521.29	2.00
AF-RHMW10-WGN01LF-2304W1	23D0043-03	04/10/23 08:18	523.27	2.00
AF-RHMW10-WGFD01LF-2304W1	23D0043-04	04/10/23 08:18	544.20	2.00
Blank	BCD0119-BLK1	04/10/23 08:18	500.00	2.00
LCS	BCD0119-BS1	04/10/23 08:18	500.00	2.00
MRL Check	BCD0119-MRL1	04/10/23 08:18	500.00	2.00

AECOM Honolulu 1001 Bishop Street, Suite 1600 Honolulu, HI 96813	Project: Red Hill AFFF Assessment Sampling Project Number: Red Hill AFFF Assessment Sampling / 60697810 Project Manager: Watson Tanji	Reported: 04/17/2023 11:30
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Quality Control

Per- and Polyfluoroalkyl Substances

Analyte	Result/Qual	LOQ	LOD	MDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
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Method: EPA 1633

Batch: BCD0119 - EPA 1633

	ng/L			
Blank (BCD0119-BLK1)				Prepared: 04/10/23 08:18 Analyzed: 04/14/23 15:47
PFBA	0.80 U	1.6	0.80	0.21
PFPEA	0.40 U	0.80	0.40	0.065
PFHXA	0.20 U	0.40	0.20	0.055
PFHPA	0.20 U	0.40	0.20	0.041
PFOA	0.30 U	0.40	0.30	0.15
PFNA	0.20 U	0.40	0.20	0.082
PFDA	0.20 U	0.40	0.20	0.10
PFUnA	0.30 U	0.40	0.30	0.16
PFDOA	0.20 U	0.40	0.20	0.11
PFTRDA	0.30 U	0.40	0.30	0.20
PFTEDA	0.30 U	0.40	0.30	0.20
PFBS	0.20 U	0.40	0.20	0.037
PFPEs	0.20 U	0.40	0.20	0.063
PFHXS	0.20 U	0.40	0.20	0.032
PFHPS	0.20 U	0.40	0.20	0.051
PFOS	0.166 J MIZ,	0.40	0.20	0.064
PFNS	0.20 U	0.40	0.20	0.12
PFDS	0.30 U	0.40	0.30	0.15
PFDOS	0.20 U	0.40	0.20	0.12
4:2FTS	0.80 U	1.6	0.80	0.29
6:2FTS	0.80 U	1.6	0.80	0.31
8:2FTS	0.80 U	1.6	0.80	0.082
PFOSA	0.20 U	0.40	0.20	0.10
NMeFOSA	0.80 U	1.6	0.80	0.47
NEtFOSA	0.80 U	1.6	0.80	0.41
NMeFOSAA	0.20 U	0.40	0.20	0.11
NEtFOSAA	0.20 U	0.40	0.20	0.11
NMeFOSE	1.2 U	1.6	1.2	1.0
NEtFOSE	1.2 U	1.6	1.2	1.0
HFPO-DA	0.40 U	0.80	0.40	0.17
ADONA	0.40 U	0.80	0.40	0.12
PFEESA	0.40 U	0.80	0.40	0.11
PFMPA	0.40 U	0.80	0.40	0.054
PFMBA	0.40 U	0.80	0.40	0.091
NFDHA	0.40 U	0.80	0.40	0.30
9CL-PF3ONS	0.40 U	0.80	0.40	0.21
11CL-PF3OUDS	0.40 U	0.80	0.40	0.21
3:3FTCA	0.80 U	1.6	0.80	0.57
5:3FTCA	0.80 U	1.6	0.80	0.44
7:3FTCA	0.80 U	1.6	0.80	0.55

Surrogates

13C4-PFBA	28.6	32.0	89.3	10-130
13C5-PFPEA	14.1	16.0	88.4	35-150
13C5-PFHXA	7.08	8.00	88.5	55-150

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Project: Red Hill AFFF Assessment Sampling
Project Number: Red Hill AFFF Assessment Sampling / 60697810
Project Manager: Watson Tanji

Reported: 04/17/2023 11:30

Quality Control (Continued)

Per- and Polyfluoroalkyl Substances (Continued)

Analyte	Result/Qual	LOQ	LOD	MDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
ng/L										
Blank (BCD0119-BLK1)					Prepared: 04/10/23 08:18 Analyzed: 04/14/23 15:47					
<i>Surrogates</i>										
13C4-PFHFA	7.72				8.00		96.5	55-150		
13C8-PFOA	7.13				8.00		89.2	60-140		
13C9-PFNA	3.40				4.00		84.9	55-140		
13C6-PFDA	3.06				4.00		76.6	50-140		
13C7-PFUnA	3.33				4.00		83.1	30-140		
13C2-PFDOA	3.21				4.00		80.2	10-150		
13C2-PFTEDA	2.63				4.00		65.7	10-130		
13C3-PFBS	6.14				8.00		76.8	55-150		
13C3-PFHXS	6.83				8.00		85.4	55-150		
13C8-PFOS	6.55				8.00		81.9	45-140		
13C2-4:2FTS	13.5				16.0		84.6	60-200		
13C2-6:2FTS	13.9				16.0		86.9	60-200		
13C2-8:2FTS	11.4				16.0		71.1	50-200		
13C8-PFOA	5.40				8.00		67.4	30-130		
D3-NMEFOSA	2.09				8.00		26.1	15-130		
D5-NETFOA	1.78				8.00		22.3	10-130		
D3-NMEFOSAA	11.2				16.0		69.8	45-200		
D5-NETFOSAA	10.5				16.0		65.9	10-200		
D7-NMEFOSE	37.1				80.0		46.3	10-150		
D9-NETFOSE	41.3				80.0		51.7	10-150		
13C3-HFPO-DA	25.8				32.0		80.5	25-160		

ng/L										
LCS (BCD0119-BS1)					Prepared: 04/10/23 08:18 Analyzed: 04/14/23 16:00					
PFBA	16.2				16.0		101	58-148		
PFPEA	7.80				8.00		97.5	54-152		
PFHXA	4.00				4.00		99.9	55-152		
PFHPA	4.25				4.00		106	54-154		
PFOA	4.07				4.00		102	52-161		
PFNA	4.03				4.00		101	59-149		
PFDA	3.70				4.00		92.6	52-147		
PFUnA	3.66				4.00		91.5	48-159		
PFDOA	4.35				4.00		109	64-142		
PFTRDA	3.99				4.00		99.8	49-148		
PFTEDA	4.44				4.00		111	47-161		
PFBS	3.43				3.54		96.8	62-144		
PFPEA	3.83				3.76		102	59-151		
PFHXS	3.64				3.66		99.5	57-146		
PFHPS	4.01				3.82		105	55-152		
PFOS	3.74				3.72		100	58-149		
PFNS	3.55				3.84		92.5	52-148		
PFDS	3.21				3.86		83.2	51-147		
PFDOS	3.19				3.88		82.1	36-145		
4:2FTS	14.4				15.0		96.1	67-146		
6:2FTS	17.2				15.2		113	61-151		
8:2FTS	14.9				15.4		97.0	63-152		
PFOSA	4.73				4.00		118	61-148		

AECOM Honolulu
 1001 Bishop Street, Suite 1600
 Honolulu, HI 96813

Project: Red Hill AFFF Assessment Sampling
 Project Number: Red Hill AFFF Assessment Sampling / 60697810
 Project Manager: Watson Tanji

Reported: 04/17/2023 11:30

Quality Control
 (Continued)

Per- and Polyfluoroalkyl Substances (Continued)

Analyte	Result/Qual	LOQ	LOD	MDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
LCS (BCD0119-BS1)		Prepared: 04/10/23 08:18 Analyzed: 04/14/23 16:00								
	ng/L									
NMeFOSA	15.6				16.0		97.7	63-145		
NETFOSA	15.4				16.0		96.6	65-139		
NMeFOSAA	3.67				4.00		91.8	58-144		
NETFOSAA	3.58				4.00		89.5	59-146		
NMeFOSE	17.2				16.0		107	71-136		
NETFOSE	15.7				16.0		97.9	69-137		
HFPO-DA	7.95				8.00		99.4	63-144		
ADONA	8.44				7.56		112	68-146		
PFEESA	6.95				7.12		97.6	56-151		
PFMPA	8.79				8.00		110	51-145		
PFMBA	7.79				8.00		97.3	55-148		
NFDHA	7.68				8.00		96.0	48-161		
9CL-PF3ONS	7.99				7.48		107	56-156		
11CL-PF3OUDS	7.13				7.56		94.3	46-156		
3:3FTCA	16.1				16.0		100	62-129		
5:3FTCA	14.8				16.0		92.7	63-134		
7:3FTCA	15.5				16.0		97.0	50-138		
Surrogates										
13C4-PFBA	31.0				32.0		97.0	10-130		
13C5-PFPEA	15.8				16.0		98.8	35-150		
13C5-PFHXA	7.79				8.00		97.4	55-150		
13C4-PFHFA	8.39				8.00		105	55-150		
13C8-PFOA	7.98				8.00		99.8	60-140		
13C9-PFNA	3.88				4.00		97.1	55-140		
13C6-PFDA	3.94				4.00		98.4	50-140		
13C7-PFUnA	4.37				4.00		109	30-140		
13C2-PFDOA	3.91				4.00		97.8	10-150		
13C2-PFTEDA	3.33				4.00		83.2	10-130		
13C3-PFBS	7.22				8.00		90.2	55-150		
13C3-PFHXS	7.61				8.00		95.1	55-150		
13C8-PFOS	7.11				8.00		88.9	45-140		
13C2-4:2FTS	15.1				16.0		94.3	60-200		
13C2-6:2FTS	15.8				16.0		98.5	60-200		
13C2-8:2FTS	14.9				16.0		93.3	50-200		
13C8-PFOSA	5.71				8.00		71.4	30-130		
D3-NMEFOSA	2.94				8.00		36.7	15-130		
D5-NETFOSA	3.10				8.00		38.8	10-130		
D3-NMEFOSAA	12.2				16.0		76.3	45-200		
D5-NETFOSAA	11.6				16.0		72.3	10-200		
D7-NMEFOSE	35.5				80.0		44.3	10-150		
D9-NETFOSSE	63.2				80.0		79.0	10-150		
13C3-HFPO-DA	29.1				32.0		90.8	25-160		

AECOM Honolulu
 1001 Bishop Street, Suite 1600
 Honolulu, HI 96813

Project: Red Hill AFFF Assessment Sampling
 Project Number: Red Hill AFFF Assessment Sampling / 60697810
 Project Manager: Watson Tanji

Reported: 04/17/2023 11:30

Quality Control
 (Continued)

Per- and Polyfluoroalkyl Substances (Continued)

Analyte	Result/Qual	LOQ	LOD	MDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
MRL Check (BCD0119-MRL1)		ng/L		Prepared: 04/10/23 08:18 Analyzed: 04/14/23 16:12						
PFBA	1.42 J				1.60		88.7	44-157		
PFPEA	0.746 J				0.800		93.3	57-148		
PFHXA	0.462				0.400		116	62-149		
PFHPA	0.483 IR2				0.400		121	56-150		
PFOA	0.523				0.400		131	57-161		
PFNA	0.440				0.400		110	53-157		
PFDA	0.477 IR1				0.400		119	43-158		
PFUnA	0.306 J				0.400		76.6	50-155		
PFDOA	0.412				0.400		103	60-141		
PFTRDA	0.365 J				0.400		91.3	52-140		
PFTEDA	0.406				0.400		101	52-156		
PFBS	0.309 J				0.354		87.4	63-145		
PFPEs	0.330 J				0.376		87.8	58-144		
PFHXS	0.384 J				0.366		105	44-158		
PFHPS	0.353 J				0.382		92.4	51-150		
PFOS	0.450 M12				0.372		121	43-162		
PFNS	0.340 J				0.384		88.5	46-151		
PFDS	0.324 J				0.386		83.9	50-144		
PFDOS	0.282 J				0.388		72.6	30-138		
4:2FTS	1.36 J				1.50		90.9	52-158		
6:2FTS	2.39				1.52		157	48-158		
8:2FTS	1.41 J				1.54		92.0	46-165		
PFOSA	0.498				0.400		125	47-163		
NMeFOSA	1.53 J				1.60		95.7	54-155		
NETFOSA	1.40 J				1.60		87.7	49-156		
NMeFOSAA	0.322 J				0.400		80.4	32-160		
NETFOSAA	0.348 J				0.400		86.9	51-154		
NMeFOSE	1.42 J				1.60		88.5	56-151		
NETFOSE	1.34 J				1.60		84.0	60-147		
HFPO-DA	0.742 J				0.800		92.8	58-154		
ADONA	0.761 J				0.756		101	61-148		
PFEESA	0.581 J				0.712		81.6	56-144		
PFMPA	0.802				0.800		100	48-150		
PFMBA	0.860				0.800		108	49-154		
NFDHA	0.650 J				0.800		81.2	47-160		
9CL-PF3ONS	0.615 J				0.748		82.2	44-167		
11CL-PF3OUDS	0.703 J				0.756		93.0	36-158		
3:3FTCA	1.39 J				1.60		86.8	32-161		
5:3FTCA	1.63				1.60		102	39-156		
7:3FTCA	1.61				1.60		101	36-149		
Surrogates										
13C4-PFBA	31.7				32.0		99.2	10-130		
13C5-PFPEA	15.8				16.0		98.7	35-150		
13C5-PFHXA	7.90				8.00		98.7	55-150		
13C4-PFHPA	8.14				8.00		102	55-150		
13C8-PFOA	7.52				8.00		94.0	60-140		
13C9-PFNA	3.46				4.00		86.5	55-140		

The contents of this report apply to the sample(s) analyzed in accordance with the chain of custody document. No duplication of this report is allowed, except in its entirety.

AECOM Honolulu
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

Project: Red Hill AFFF Assessment Sampling
Project Number: Red Hill AFFF Assessment Sampling / 60697810
Project Manager: Watson Tanji

Reported: 04/17/2023 11:30

Quality Control (Continued)

Per- and Polyfluoroalkyl Substances (Continued)

Analyte	Result/Qual	LOQ	LOD	MDL	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit
ng/L										
MRL Check (BCD0119-MRL1)							Prepared: 04/10/23 08:18	Analyzed: 04/14/23 16:12		
Surrogates										
13C6-PFDA	3.62				4.00		90.4	50-140		
13C7-PFUnA	3.90				4.00		97.5	30-140		
13C2-PFDOA	3.89				4.00		97.3	10-150		
13C2-PFTEDA	3.58				4.00		89.4	10-130		
13C3-PFBS	6.52				8.00		81.5	55-150		
13C3-PFHXS	7.64				8.00		95.5	55-150		
13C8-PFOS	7.08				8.00		88.5	45-140		
13C2-4:2FTS	15.2				16.0		94.9	60-200		
13C2-6:2FTS	15.9				16.0		99.6	60-200		
13C2-8:2FTS	13.3				16.0		83.1	50-200		
13C8-PFOA	5.82				8.00		72.8	30-130		
D3-NMEFOA	2.70				8.00		33.8	15-130		
D5-NETFOA	2.79				8.00		34.9	10-130		
D3-NMEFOA	13.0				16.0		81.3	45-200		
D5-NETFOA	12.1				16.0		75.4	10-200		
D7-NMEFOSE	51.0				80.0		63.8	10-150		
D9-NETFOSE	59.3				80.0		74.1	10-150		
13C3-HFPO-DA	30.4				32.0		94.9	25-160		

AECOM Honolulu
 1001 Bishop Street, Suite 1600
 Honolulu, HI 96813

Project: Red Hill AFFF Assessment Sampling
 Project Number: Red Hill AFFF Assessment Sampling / 60697810
 Project Manager: Watson Tanji

Reported: 04/17/2023 11:30

Notes and Definitions

Item	Definition
CV2	Calibration verification recovered above the upper control limit
E	Response exceeds linear range
IR1	Ion ratio below the lower control limit
IR2	Ion ratio above the upper control limit
IS1	Internal standard recovered below the lower control limit
J	Estimated value
MI2	Manual integration, non-target peak interference
S1	Surrogate recovered below the lower control limit
S2	Surrogate recovered above the upper control limit
U	Not detected
Dry	Sample results reported on a dry weight basis.
DF	Dilution Factor
LOD	Limit of Detection
LOQ	Limit of Quantitation
DL	Detection Limit
RPD	Relative Percent Difference
%REC	Percent Recovery
Source	Sample that was matrix spiked or duplicated.
LOQ, Limit of Quantitation = Method Reporting Limit (MRL).	

AECOM Honolulu
 1001 Bishop Street, Suite 1600
 Honolulu, HI 96813

Project: Red Hill AFFF Assessment Sampling
 Project Number: Red Hill AFFF Assessment Sampling / 60697810
 Project Manager: Watson Tanji

Reported: 04/17/2023 11:30



WORK ORDER

23D0043

Printed: 04/17/2023 11:31 am

Project: Red Hill AFFF Assessment Sampling
Project Number: Red Hill AFFF Assessment Sampling / 60697810
Project Manager: Karen Volpendesta
PO Number: 150712

Report To:

AECOM Honolulu
 Watson Tanji
 1001 Bishop Street, Suite 1600
 Honolulu, HI 96813
 Phone: (808) 954-4512
 Fax: (808) 523-8950

Invoice To:

AECOM Honolulu
 Watson Tanji
 1001 Bishop Street, Suite 1600
 Honolulu, HI 96813
 Phone: (808) 954-4512
 Fax: (808) 523-8950

Date Received: 04/06/2023 10:00 AM
 Date Due: 04/13/2023 (5.00 day TAT)

Logged In By: Megan Salata
 Received By: Megan Salata

Analysis	Comments
23D0043-01 AF-RHMW225401-WGN01B-2304W1 [Water] Sampled 4/5/2023 9:00:00AM 1633 NONE	"Report relevant surrogates"
23D0043-02 AF-HDMW225303-WGN01LF-2304W1 [Water] Sampled 4/4/2023 10:15:00AM 1633 NONE	"Report relevant surrogates"
23D0043-03 AF-RHMW10-WGN01LF-2304W1 [Water] Sampled 4/4/2023 1:00:00PM 1633 NONE	"Report relevant surrogates"
23D0043-04 AF-RHMW10-WGFD01LF-2304W1 [Water] Sampled 4/4/2023 1:00:00PM 1633 NONE	"Report relevant surrogates"

AECOM Honolulu
1001 Bishop Street, Suite 1600
Honolulu, HI 96813

Project: Red Hill AFFF Assessment Sampling
Project Number: Red Hill AFFF Assessment Sampling / 60697810
Project Manager: Watson Tanji

Reported: 04/17/2023 11:30

23D0043

Sample Receipt Log

Default Cooler

Samples Received at: **-0.3°C**

Custody Seals	Yes	Were all containers sealed in separate bags?	Yes
Containers Intact	Yes	Did all containers arrive in good condition?	Yes
COC/Labels Agree	Yes	Correct containers/preserv. for tests indicated?	Yes
Preservation Confirmed	No	Sufficient volume sent for tests requested?	Yes
Received On Ice	Yes	Were bubbles absent in volatile samples?	No
Was a chain of custody received?	Yes	Sufficient remaining holding time for analyses?	Yes
COCs complete/signed in the appropriate places?	Yes	pH of non-VOA preserved containers documented?	No
Sample labels complete? Sample ID, date/time, etc.	Yes	Unpreserved vials received for VOA analysis?	No
Did all container labels agree with COCs?	Yes	If "yes", are unpreserved VOA vials noted on ARF?	No



APPL, Inc.
 908 N Temperance Ave
 Clovis, CA 93611
 www.applinc.com

ELECTRONIC CHAIN OF CUSTODY RECORD
 Phone: (559) 275-2175
 Fax: (559) 275-4422
 coc@applinc.com C.O.C. 2304W1AFAL07

23D0043

Report to: PLEASE PRINT
 Company Name: **AECOM** Phone: 808-954-4512 / 303-796-4624
 Address: **1001 Bishop St ste1600**
Honolulu, HI 96813 Fax:
 Attn: **Watson Tanji / Katie Abbott**
 Email: **watson.tanji@aecom.com/katie.abbott@aecom.com**

Invoice to: PLEASE PRINT
 Company Name: **AECOM** Phone:
 Address: Fax:
 Attn: **Sheree Smith**
 Email: **USAPimaging@aecom.com**

Project Name/Number		Sampler (Print)			No. of Containers	Matrix			Analysis Requested/Method Number										Date Shipped:				
Purchase Order Number		Sampler (Signature)				Aq	Sed.	Soil	PFAS EPA Draft 1633											Carrier:	Waybill No.:		
Sample Identification	Location	Date Collected	Time Collected	Time Zone																			Comments:
CTO N6274223F0104 / 60697810	Nate Hogsten				2	✓			✓														EDMS upload database: JBPHE
AF-RHMMW225401-WGN01B-2304W1	RHMMW2254-01	4/5/23	0900	HST																			EDMS Coverage: AFFF Assessment Sampling GW
[Large handwritten scribble and signature]																							

Shuttle Temperature: **IRB 2.3/-0.3°C**
 Turnaround Requested: Check one
 Standard 2-3 wk One week 3 days 24/48 Hrs. Other: **5 day TAT**
 Sample Disposal: Return to client Disposal by Lab (30-day retention)
 Relinquished by sampler: **WA LS** Date: **4/5/23** Time: **1210** Received by: **Miranda DeCarro**
 Relinquished by: **Miranda DeCarro** Date: **4/5/23** Time: **1220** Received by:
 Relinquished by: Date: **4/6/23** Time: **1000** Received at lab by:

Note: The first sampled date of the ARF will be used as the COC number unless indicated otherwise.



APPL, Inc.
 908 N Temperance Ave
 Clovis, CA 93611
 www.applinc.com

ELECTRONIC CHAIN OF CUSTODY RECORD
 Phone: (559) 275-2175
 Fax: (559) 275-4422
 coc@applinc.com C.O.C. 2304W1AFAL04

Report to: PLEASE PRINT

Company Name: AECOM Phone: 808-954-4512 / 303-796-4624

Address: 1001 Bishop St ste1600
Honolulu, HI 96813 Fax: _____

Attn: Watson Tanji / Katie Abbott

Email: mark.kromis@aecom.com/katie.abbott@aecom.com

Invoice to: PLEASE PRINT

Company Name: AECOM Phone: _____

Address: _____ Fax: _____

Attn: Sheree Smith

Email: USAPimaging@aecom.com

Project Name/Number	Sampler (Print)	Analysis Requested/Method Number										Date Shipped: <u>4/5/23</u>						
		Purchase Order Number	Sampler (Signature)	No. of Containers	Matrix			PFAS EPA Draft 1633								Carrier: <u>FEDEX</u>		
Ag	Sed.				Soil								Waybill No.:					
Sample Identification	Location	Date Collected	Time Collected	Time Zone														
CTO N6274223F0104 / 60697810	TESSA MURPHY				2	<input checked="" type="checkbox"/>			<input checked="" type="checkbox"/>									
AF-HDMW225303-WGN01LF-2304W1	HDMW2253-03	4/4/23	1015	HST														
<i>TM 4/4/23</i>																		

Shuttle Temperature: _____ Turnaround Requested: Check one
 Standard 2-3 wk One week 3 days 24/48 Hrs. Other: 5 day TAT

Sample Disposal: Return to client Disposal by Lab (30-day retention)

Relinquished by sampler: <u>TESSA MURPHY</u>	Date: <u>4/4/23</u>	Time: <u>1530</u>	Received by: <u>James Mason</u>	Relinquished by: <u>James Mason</u>	Date: <u>4/5/23</u>	Time: <u>1220</u>	Received by: _____
Relinquished by: _____	Date: _____	Time: _____	Received by: _____	Relinquished by: _____	Date: <u>4/6/23</u>	Time: <u>1000</u>	Received at lab by: <u>[Signature]</u>

Note: The first sampled date of the ARF will be used as the COC number unless indicated otherwise.



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Clovis, CA 93611
www.applinc.com

ELECTRONIC CHAIN OF CUSTODY RECORD
Phone: (559) 275-2175
Fax: (559) 275-4422
coc@applinc.com C.O.C. 2304W1AFAL03

Report to: <u>PLEASE PRINT</u>	Invoice to: <u>PLEASE PRINT</u>
Company Name: <u>AECOM</u> Phone: <u>808-954-4512 / 303-796-4624</u>	Company Name: <u>AECOM</u> Phone: _____
Address: <u>1001 Bishop St ste1600</u>	Address: _____
<u>Honolulu, HI 96813</u> Fax: _____	Fax: _____
Attn: <u>Watson Tanji / Katie Abbott</u>	Attn: <u>Sheree Smith</u>
Email: <u>watson.tanji@aecom.com/katie.abbott@aecom.com</u>	Email: <u>USAPimaging@aecom.com</u>

Project Name/Number	Sampler (Print)	Analysis Requested/Method Number										Date Shipped: <u>4/5/23</u>											
		Purchase Order Number	Sampler (Signature)	No. of Containers	Matrix			PFAS EPA Draft 1633	Date Shipped:			Carrier: <u>FEDEX</u>											
Aq	Sed.				Soil	Waybill No.: <u>N/A</u>			Comments: <u>EDMS upload database: JBPHE</u>		EDMS Coverage: <u>AFFF Assessment Sampling GW</u>												
Sample Identification	Location	Date Collected	Time Collected	Time Zone																			
AF-RHMW10-WGN01LF-2304W1	RHMW10	4/4/23	1300	HST	2	✓			✓														
AF-RHMW10-WGFD01LF-2304W1	RHMW10	4/4/23	1300	HST	2	✓			✓														
<u>TM 4/4/23</u>																							

Shuttle Temperature: _____	Turnaround Requested: Check one <input type="checkbox"/> Standard 2-3 wk <input type="checkbox"/> One week <input type="checkbox"/> 3 days <input type="checkbox"/> 24/48 Hrs. <input checked="" type="checkbox"/> Other: <u>5 day TAT</u>										Sample Disposal: <input type="checkbox"/> Return to client <input type="checkbox"/> Disposal by Lab (30-day retention)											
Relinquished by sampler: <u>Tessa Murphy</u>	Date: <u>4/4/23</u>	Time: <u>1530</u>	Received by: <u>James Mason</u>	Relinquished by: <u>James Mason</u>	Date: <u>4/5/23</u>	Time: <u>1220</u>	Received by: _____															
Relinquished by: _____	Date: _____	Time: _____	Received by: _____	Relinquished by: _____	Date: <u>4/6/23</u>	Time: <u>1000</u>	Received at lab by: <u>[Signature]</u>															

Note: The first sampled date of the ARF will be used as the COC number unless indicated otherwise.

CUSTODY SEAL

AECOM (808)-521-3051

Initials: MD Date 4/5/23

1220