

ANALYTICAL REPORT

PREPARED FOR

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

Generated 5/30/2023 1:31:41 PM

JOB DESCRIPTION

Red Hill AFFF

JOB NUMBER

320-99812-2

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



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Authorized for release by
Karen Dahl, Senior Project Manager
Karen.Dahl@et.eurofinsus.com
(916)374-4384



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Definitions/Glossary

Client: Hawaii Department of Health
Project/Site: Red Hill AFFF

Job ID: 320-99812-2

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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

Case Narrative

Client: Hawaii Department of Health
Project/Site: Red Hill AFFF

Job ID: 320-99812-2

Job ID: 320-99812-2

Laboratory: Eurofins Sacramento

Narrative

Comments

No additional comments.

Receipt

The sample was received on 5/3/2023 10:00 AM. Unless otherwise noted below, the sample arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 16.3° C.

LCMS

Method ELLE SOP: Reporting limits were raised for the following sample due to interference from the sample matrix. RH-AFFF (320-99812-1).

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

Organic Prep

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

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Detection Summary

Client: Hawaii Department of Health
Project/Site: Red Hill AFFF

Job ID: 320-99812-2

Client Sample ID: RH-AFFF

Lab Sample ID: 320-99812-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Adsorbable Organic Fluorine (AOF)	12000000		2000000	1000000	ug/L	1		ELLE SOP	Total/NA

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This Detection Summary does not include radiochemical test results.

Eurofins Sacramento

Client Sample Results

Client: Hawaii Department of Health
Project/Site: Red Hill AFFF

Job ID: 320-99812-2

Client Sample ID: RH-AFFF

Lab Sample ID: 320-99812-1

Date Collected: 04/28/23 12:00

Matrix: Water

Date Received: 05/03/23 10:00

Method: ELLE - Lancaster ELLE SOP - Total or Organic Fluorine by Combustion Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Adsorbable Organic Fluorine (AOF)	12000000		2000000	1000000	ug/L		05/25/23 10:59	05/26/23 03:19	1

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QC Sample Results

Client: Hawaii Department of Health
 Project/Site: Red Hill AFFF

Job ID: 320-99812-2

Method: ELLE SOP - Total or Organic Fluorine by Combustion Ion Chromatography

Lab Sample ID: MB 410-379951/1-A
Matrix: Water
Analysis Batch: 380711

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 379951

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Adsorbable Organic Fluorine (AOF)	ND		2.0	1.0	ug/L		05/25/23 10:59	05/25/23 16:25	1

Lab Sample ID: LCS 410-379951/2-A
Matrix: Water
Analysis Batch: 380711

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 379951

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Adsorbable Organic Fluorine (AOF)	20.2	22.2		ug/L		110	50 - 150

Lab Sample ID: LCSD 410-379951/3-A
Matrix: Water
Analysis Batch: 380711

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 379951

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD Limit
Adsorbable Organic Fluorine (AOF)	20.2	22.2		ug/L		109	50 - 150	0 20



QC Association Summary

Client: Hawaii Department of Health
Project/Site: Red Hill AFFF

Job ID: 320-99812-2

LCMS

Prep Batch: 379951

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-99812-1	RH-AFFF	Total/NA	Water	NONE	
MB 410-379951/1-A	Method Blank	Total/NA	Water	NONE	
LCS 410-379951/2-A	Lab Control Sample	Total/NA	Water	NONE	
LCSD 410-379951/3-A	Lab Control Sample Dup	Total/NA	Water	NONE	

Analysis Batch: 380711

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
320-99812-1	RH-AFFF	Total/NA	Water	ELLE SOP	379951
MB 410-379951/1-A	Method Blank	Total/NA	Water	ELLE SOP	379951
LCS 410-379951/2-A	Lab Control Sample	Total/NA	Water	ELLE SOP	379951
LCSD 410-379951/3-A	Lab Control Sample Dup	Total/NA	Water	ELLE SOP	379951

Lab Chronicle

Client: Hawaii Department of Health
Project/Site: Red Hill AFFF

Job ID: 320-99812-2

Client Sample ID: RH-AFFF

Lab Sample ID: 320-99812-1

Date Collected: 04/28/23 12:00

Matrix: Water

Date Received: 05/03/23 10:00

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	NONE			0.0001 mL	0.2 mL	379951	05/25/23 10:59	QLP7	ELLE
Total/NA	Analysis	ELLE SOP		1			380711	05/26/23 03:19	F9DU	ELLE

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300



Accreditation/Certification Summary

Client: Hawaii Department of Health
 Project/Site: Red Hill AFFF

Job ID: 320-99812-2

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
A2LA	Dept. of Defense ELAP	0001.01	11-30-24
A2LA	ISO/IEC 17025	0001.01	11-30-24
Alabama	State	<cert No.>	01-31-24
Alaska	State	PA00009	06-30-23
Alaska (UST)	State	17-027	02-28-24
Arizona	State	AZ0780	03-12-24
Arkansas DEQ	State	88-00660	08-09-23
California	State	2792	11-30-23
Colorado	State	PA00009	06-30-23
Connecticut	State	PH-0746	06-30-23
DE Haz. Subst. Cleanup Act (HSCA)	State	019-006 (PA cert)	01-31-24
Delaware (DW)	State	N/A	01-31-24
Florida	NELAP	E87997	06-30-23
Georgia (DW)	State	C048	01-31-24
Hawaii	State	N/A	01-31-24
Illinois	NELAP	200027	01-31-24
Iowa	State	361	03-01-24
Kansas	NELAP	E-10151	10-31-23
Kentucky (DW)	State	KY90088	12-31-23
Kentucky (UST)	State	0001.01	11-30-24
Kentucky (WW)	State	KY90088	12-31-23
Louisiana (All)	NELAP	02055	06-30-23
Maine	State	2019012	03-12-25
Maryland	State	100	06-30-24
Massachusetts	State	M-PA009	06-30-24
Michigan	State	9930	01-31-24
Minnesota	NELAP	042-999-487	12-31-23
Mississippi	State	023	01-31-24
Missouri	State	450	01-31-25
Montana (DW)	State	0098	01-01-24
Nebraska	State	NE-OS-32-17	01-31-24
New Hampshire	NELAP	2730	01-10-24
New Jersey	NELAP	PA011	06-30-23
New York	NELAP	10670	04-01-24
North Carolina (DW)	State	42705	07-31-23
North Carolina (WW/SW)	State	521	12-31-23
North Dakota	State	R-205	01-31-24
Oklahoma	NELAP	R-205	08-31-23
Oregon	NELAP	PA200001	09-11-23
PALA	Canada	1978	09-16-24
Pennsylvania	NELAP	36-00037	01-31-24
Rhode Island	State	LAO00338	12-31-23
South Carolina	State	89002	01-31-24
Tennessee	State	02838	01-31-24
Texas	NELAP	T104704194-23-46	08-31-23
USDA	US Federal Programs	525-22-298-19481	10-25-25
Vermont	State	VT - 36037	10-28-23
Virginia	NELAP	460182	06-14-23
West Virginia (DW)	State	9906 C	12-31-23
West Virginia DEP	State	055	07-31-23

Accreditation/Certification Summary

Client: Hawaii Department of Health
Project/Site: Red Hill AFFF

Job ID: 320-99812-2

Laboratory: Eurofins Lancaster Laboratories Environment Testing, LLC (Continued)

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Wyoming	State	8TMS-L	01-31-24
Wyoming (UST)	A2LA	0001.01	11-30-24

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Method Summary

Client: Hawaii Department of Health
Project/Site: Red Hill AFFF

Job ID: 320-99812-2

Method	Method Description	Protocol	Laboratory
ELLE SOP	Total or Organic Fluorine by Combustion Ion Chromatography	ELLE - Lancaster	ELLE
NONE	Preparation, Fluorine	ELLE - Lancaster	ELLE

Protocol References:

ELLE - Lancaster = Eurofins Lancaster, Facility Standard Operating Procedure.

Laboratory References:

ELLE = Eurofins Lancaster Laboratories Environment Testing, LLC, 2425 New Holland Pike, Lancaster, PA 17601, TEL (717)656-2300



Sample Summary

Client: Hawaii Department of Health
Project/Site: Red Hill AFFF

Job ID: 320-99812-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
320-99812-1	RH-AFFF	Water	04/28/23 12:00	05/03/23 10:00

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Eurofins Sacramento

880 Riverside Parkway
West Sacramento, CA 95605-1500
phone 916.373.5600 fax 303.467.7248

Chain of Custody Record



Environment Testing
America

Eurofins Environment Testing Northern California, LLC

Regulatory Program: DW NPDES RCRA Other:

Project Manager: Roger Brewer

<p>Client Contact</p> <p>Roger Brewer HDOH 2385 Waimano Home Rd, Ste 100 Honolulu, HI 96872 (808) 586-4229 Phone</p> <p>Project Name: Red Hill AFFF Site: Red Hill, HI Project ID: 103S864023110.02</p>		<p>INVOICE & Lab Report CC:</p> <p>Eric Jensen, Tetra Tech, Inc. eric.jensen@tetratech.com 808.441.4784</p> <p>Date: _____</p> <p>Carrier: _____</p>		<p>COC No: _____ of _____ COCS</p>	
<p>Analysis Turnaround Time</p> <p><input type="checkbox"/> CALENDAR DAYS <input checked="" type="checkbox"/> WORKING DAYS</p> <p>TAT if different from Below ____ 30</p> <p><input type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input checked="" type="checkbox"/> 1 day</p>		<p>Lab Contact:</p> <p>ELLE SOP Adsorbable Organic Fluorine</p> <p>Pre-Analysits, Oxidation & Post-Analysits</p> <p>Mejod 537/TOP Assay-</p> <p>Perform MS / MSD (Y / N)</p> <p>Filtered Sample (Y / N)</p>		<p>TALS Project #: _____</p> <p>Sampler: _____</p> <p>For Lab Use Only: Walk-in Client: _____ Lab Sampling: _____</p> <p>Job / SDG No.: _____</p>	
<p>Sample Identification</p> <p>RH-AFFF</p>		<p>Sample Date: _____</p> <p>Sample Time: _____</p> <p>Sample Type (C=Comp, G=Grab): G</p> <p>Matrix: Liquid</p> <p># of Cont: 2</p>		<p>Sample Specific Notes:</p> <p>Concentrated AFFF Product (SDS Attached)</p>	
<p>Preservation Used: 1</p> <p>Possible Hazard Identification: 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.</p> <p><input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Non-Hazard <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown</p>		<p>Special Instructions/QC Requirements & Comments:</p> <p>This is a sample of undiluted, Ansilite AFFF Concentrate. High PFAS concentrations anticipated.</p> <p>Reports to : DOH (Roger Brewer) roger.brewer@doh.hawaii.gov and Tetra Tech (Eric Jensen) eric.jensen@tetratech.com</p> <p>Invoices to: Tetra Tech (Eric Jensen) eric.jensen@tetratech.com</p>		<p>320-99812 Chain of Custody</p>	
<p>Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No</p> <p>Relinquished by: <i>Progs B</i></p>		<p><input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal by Lab <input type="checkbox"/> Archive for _____ Months</p>		<p>Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)</p>	
<p>Relinquished by: _____</p>		<p>Company: H I DOH</p>		<p>Therm ID No.: _____</p>	
<p>Relinquished by: _____</p>		<p>Company: _____</p>		<p>Date/Time: 5/23/23 12:00</p>	
<p>Relinquished by: _____</p>		<p>Company: _____</p>		<p>Date/Time: _____</p>	
<p>Relinquished by: _____</p>		<p>Company: _____</p>		<p>Date/Time: _____</p>	



Login Sample Receipt Checklist

Client: Hawaii Department of Health

Job Number: 320-99812-2

Login Number: 99812

List Source: Eurofins Sacramento

List Number: 1

Creator: Pratali, Sandra A

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



Login Sample Receipt Checklist

Client: Hawaii Department of Health

Job Number: 320-99812-2

Login Number: 99812

List Source: Eurofins Lancaster Laboratories Environment Testing, LLC

List Number: 2

List Creation: 05/05/23 05:52 PM

Creator: Foreman, Leah M

Question	Answer	Comment
The cooler's custody seal is intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable ($\leq 6^{\circ}\text{C}$, not frozen).	True	
Cooler Temperature is recorded.	True	
WV: Container Temperature is acceptable ($\leq 6^{\circ}\text{C}$, not frozen).	N/A	
WV: Container Temperature is recorded.	N/A	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
There are no discrepancies between the containers received and the COC.	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
There is sufficient vol. for all requested analyses.	True	
Is the Field Sampler's name present on COC?	False	Received project as a subcontract.
Sample custody seals are intact.	N/A	
VOA sample vials do not have headspace $>6\text{mm}$ in diameter (none, if from WV)?	N/A	