

 **ANALYTICAL REPORT****PREPARED FOR**

Attn: Terri Choy
AECOM
1001 Bishop Street
Honolulu, Hawaii 96813
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JOB DESCRIPTION

Red Hill - AFFF Assessment Sampling

JOB NUMBER

580-123350-1

Job Notes

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The data in the report relate to the field sample(s) as received by the laboratory and associated QC. All results have been reviewed and have been found to be compliant with laboratory and accreditation requirements, with the exception of the noted deviation(s). For questions, please contact the Project Manager.

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 Northwest, LLC Project Manager.

Authorization



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Table of Contents

Cover Page	1
Table of Contents	3
Case Narrative	4
Definitions	5
Client Sample Results	6
QC Sample Results	9
Chronicle	10
Certification Summary	11
Sample Summary	12
Chain of Custody	13
Receipt Checklists	15

Case Narrative

Client: AECOM
Project/Site: Red Hill - AFFF Assessment Sampling

Job ID: 580-123350-1

Job ID: 580-123350-1

Laboratory: Eurofins Seattle

Narrative

CASE NARRATIVE

Client: AECOM

Project: Red Hill - AFFF Assessment Sampling

Report Number: 580-123350-1

This case narrative is in the form of an exception report, where only the anomalies related to this report, method specific performance and/or QA/QC issues are discussed. If there are no issues to report, this narrative will include a statement that documents that there are no relevant data issues.

It should be noted that samples with elevated Reporting Limits (RLs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the RLs are an unavoidable but acceptable consequence of sample dilution that enables quantification of target analytes within the calibration range of the instrument or that reduces the interferences thereby enabling the quantification of target analytes.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

RECEIPT

Three samples were received on 2/9/2023 11:00 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 5.7° C.

Note: All samples which require thermal preservation are considered acceptable if the arrival temperature is within 2C of the required temperature or method specified range. For samples with a specified temperature of 4C, samples with a temperature ranging from just above freezing temperature of water to 6C shall be acceptable. Samples that are hand delivered immediately following collection may not meet these criteria, however they will be deemed acceptable according to NELAC standards, if there is evidence that the chilling process has begun, such as arrival on ice, etc.

GLYCOLS

Samples AF-HDMW225303-WGN01LF-2302W1 (580-123350-1), AF-RHMW10-WGN01LF-2302W1 (580-123350-2) and AF-RHMW10-WGFD01LF-2302W1 (580-123350-3) were analyzed for glycols in accordance with EPA SW-846 Method 8015B - DAI. The samples were analyzed on 02/14/2023.

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

Definitions/Glossary

Client: AECOM

Job ID: 580-123350-1

Project/Site: Red Hill - AFFF Assessment Sampling

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
M	Manual integrated compound.
U	Undetected at the Limit of Detection.

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

Client Sample Results

Client: AECOM
Project/Site: Red Hill - AFFF Assessment Sampling

Job ID: 580-123350-1

Client Sample ID: AF-HDMW225303-WGN01LF-2302W1

Lab Sample ID: 580-123350-1

Date Collected: 02/07/23 10:00

Matrix: Water

Date Received: 02/09/23 11:00

Method: SW846 8015C GLY - Glycols- Direct Injection (GC/FID)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2-(2-Butoxyethoxy)ethanol	3.0	U M	5.0	1.1	mg/L			02/14/23 00:30	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11

Client Sample Results

Client: AECOM
Project/Site: Red Hill - AFFF Assessment Sampling

Job ID: 580-123350-1

Client Sample ID: AF-RHMW10-WGN01LF-2302W1

Lab Sample ID: 580-123350-2

Date Collected: 02/07/23 12:05

Matrix: Water

Date Received: 02/09/23 11:00

Method: SW846 8015C GLY - Glycols- Direct Injection (GC/FID)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2-(2-Butoxyethoxy)ethanol	3.0	U	5.0	1.1	mg/L			02/14/23 01:40	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11

Client Sample Results

Client: AECOM
Project/Site: Red Hill - AFFF Assessment Sampling

Job ID: 580-123350-1

Client Sample ID: AF-RHMW10-WGFD01LF-2302W1

Lab Sample ID: 580-123350-3

Date Collected: 02/07/23 12:05

Matrix: Water

Date Received: 02/09/23 11:00

Method: SW846 8015C GLY - Glycols- Direct Injection (GC/FID)

Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2-(2-Butoxyethoxy)ethanol	3.0	U	5.0	1.1	mg/L			02/14/23 04:46	1

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11

QC Sample Results

Client: AECOM
 Project/Site: Red Hill - AFFF Assessment Sampling

Job ID: 580-123350-1

Method: 8015C GLY - Glycols- Direct Injection (GC/FID)

Lab Sample ID: MB 680-763222/10
Matrix: Water
Analysis Batch: 763222

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

Analyte	MB Result	MB Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac
2-(2-Butoxyethoxy)ethanol	3.0	U M	5.0	1.1	mg/L			02/13/23 21:24	1

Lab Sample ID: LCS 680-763222/6
Matrix: Water
Analysis Batch: 763222

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
2-(2-Butoxyethoxy)ethanol	20.0	17.3		mg/L		86	50 - 150

Lab Sample ID: LCSD 680-763222/7
Matrix: Water
Analysis Batch: 763222

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
2-(2-Butoxyethoxy)ethanol	20.0	17.1		mg/L		86	50 - 150	1	50

Lab Sample ID: 580-123350-1 MS
Matrix: Water
Analysis Batch: 763222

Client Sample ID: AF-HDMW225303-WGN01LF-2302W1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
2-(2-Butoxyethoxy)ethanol	3.0	U M	20.0	17.6		mg/L		88	50 - 150

Lab Sample ID: 580-123350-1 MSD
Matrix: Water
Analysis Batch: 763222

Client Sample ID: AF-HDMW225303-WGN01LF-2302W1
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
2-(2-Butoxyethoxy)ethanol	3.0	U M	20.0	18.7		mg/L		93	50 - 150	6	50

Lab Chronicle

Client: AECOM

Job ID: 580-123350-1

Project/Site: Red Hill - AFFF Assessment Sampling

Client Sample ID: AF-HDMW225303-WGN01LF-2302W1

Lab Sample ID: 580-123350-1

Date Collected: 02/07/23 10:00

Matrix: Water

Date Received: 02/09/23 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	763222	GEM	EET SAV	02/14/23 00:30

Client Sample ID: AF-RHMW10-WGN01LF-2302W1

Lab Sample ID: 580-123350-2

Date Collected: 02/07/23 12:05

Matrix: Water

Date Received: 02/09/23 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	763222	GEM	EET SAV	02/14/23 01:40

Client Sample ID: AF-RHMW10-WGFD01LF-2302W1

Lab Sample ID: 580-123350-3

Date Collected: 02/07/23 12:05

Matrix: Water

Date Received: 02/09/23 11:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	763222	GEM	EET SAV	02/14/23 04:46

Laboratory References:

EET SAV = Eurofins Savannah, 5102 LaRoche Avenue, Savannah, GA 31404, TEL (912)354-7858

Accreditation/Certification Summary

Client: AECOM
Project/Site: Red Hill - AFFF Assessment Sampling

Job ID: 580-123350-1

Laboratory: Eurofins Savannah

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

Authority	Program	Identification Number	Expiration Date
ANAB	Dept. of Defense ELAP	L2463	09-22-24

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
8015C GLY		Water	2-(2-Butoxyethoxy)ethanol



Sample Summary

Client: AECOM

Job ID: 580-123350-1

Project/Site: Red Hill - AFFF Assessment Sampling

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-123350-1	AF-HDMW225303-WGN01LF-2302W1	Water	02/07/23 10:00	02/09/23 11:00
580-123350-2	AF-RHMW10-WGN01LF-2302W1	Water	02/07/23 12:05	02/09/23 11:00
580-123350-3	AF-RHMW10-WGFD01LF-2302W1	Water	02/07/23 12:05	02/09/23 11:00

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Chain of Custody Record

Client Information		Samples: <u>Matt Yin</u>		Lab P/N: <u>Elaine Walker</u>	Carrier Tracking No(s): <u>FedEx</u>	COC No: <u>2302W1AFE04</u>	
Client Contact:		Phone: <u>808-349-4738</u>	E-Mail: <u>M.Elaine.Walker@EurofinsET.com</u>	State of Origin: <u>Hawaii</u>	Page: <u>Page 1 of 1</u>		
Company: <u>AECOM</u>		PWSID:		Job #:			
Address: <u>1001 Bishop St. Suite 1600</u>		Due Date Requested: <u>see subcontract</u>		Analysis Requested:			
City: <u>Honolulu</u>		TAT Requested (days): <u>Rush - ASAP</u>		Preservation Codes:			
State, Zip: <u>Hawaii 96813</u>		Compliance Project: <u>Δ Yes Δ No</u>		M - Hexane A - HCL N - None O - AshNaO2 P - NaZSO4 Q - NaZSO3 R - NaZSO3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4.5 Z - other (specify)			
Phone: <u>808-954-4512 / 770-331-0794</u>		PO #:		Other:			
Email: <u>Watson.Tanji@eurofins.com / Mark.Kromis@eurofins.com</u>		WO #:		Total Number of Containers			
Project Name: <u>CTO N6274223F0104</u>		Project #: <u>60697810</u>		Special Instructions/Note:			
Site: <u>RHSF</u>		SSOW#:		3			
Sample Identification		Sample Date	Sample Time	Sample Type	Matrix	Field Filtered Sample (Yes or No)	
AF-HDMW225303-WGN01LF-2302W1		<u>2/7/23</u>	<u>1000</u>	<u>G</u>	<u>W</u>	<u>N</u>	
Possible Hazard Identification		Preservation Code:		Perform MS/MSD (Yes or No)		Special Instructions/Note:	
<input type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Date:		Date/Time:		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)	
Deliverable Requested: I, II, III, IV, Other (specify)		Date:		Date/Time:		<input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months	
Empty Kit Relinquished by:		Date:		Date/Time:		Special Instructions/QC Requirements: <u>DOD QSM project</u>	
Relinquished by: <u>Matt Yin</u>		Date/Time: <u>2/7/23 1310</u>		Date/Time: <u>2/7/23 1310</u>		Method of Shipment:	
Relinquished by: <u>Miranda DeGerme</u>		Date/Time: <u>2/7/23 1330</u>		Date/Time: <u>2/9/23 1100</u>		Received by: <u>Miranda DeGerme</u> Company: <u>AECOM</u>	
Relinquished by:		Date/Time:		Date/Time:		Received by: _____ Company: _____	
Custody Seals Intact: <u>Δ Yes Δ No</u>		Custody Seal No.:		Cooler Temperature(s) °C and Other Remarks: <u>5.7 / 5.7</u>		Company: _____	



Chain of Custody Record

Client Information Company: AECOM Address: 1001 Bishop St. Suite 1600 City: Honolulu State, Zip: Hawaii 96813 Phone: 808-954-4512 / 770-331-0794 Email: Watson.Tanji@aecom.com / Mark.Kromis@aecom.com Project Name: CTO N6274223F0104 Site: RHSF		Lab PM: Elaine Walker E-Mail: M.Elaine.Walker@EurofinsET.com Carrier Tracking No(s): FedEx State of Origin: Hawaii Job #: Page 1 of 1	
Due Date Requested: see subcontract TAT Requested (days): Rush - ASAP Compliance Project: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No PO #: WO #: Project #: 60697810 SOW#:		Analysis Requested Total Number of containers: Preservation Codes: A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDTA Other:	
Sample Identification Sample ID: AF-RHMW10-WGN01LF-2302W1 Sample ID: AF-RHMW10-WGFD01LF-2302W1		Perform MS/MSD (Yes or No) <input checked="" type="checkbox"/> A Field Filtered Sample (Yes or No) <input checked="" type="checkbox"/> N 805C_DAL_GL_DS/2-(2-butoxyethoxy)-ethanol <input checked="" type="checkbox"/> X Special Instructions/Note:	
Sample Date: 2/7/23 Sample Time: 12:05 Sample Type: G Matrix: (W=water, S=solid, O=oil, BT=biomass, other)		Date/Time: 2/7/23 1310 Date/Time: 2/7/23 1330	
Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological		Sample Disposal (A fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return To Client <input type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months	
Deliverable Requested: I, II, III, IV, Other (specify)		Special Instructions/QC Requirements: DOD QSM project 4 report standard TAT - AECOM EQUIS EDD.	
Relinquished by: Matt Yin Date/Time: 2/7/23 1310		Received by: Miranda DeGarmo Date/Time: 2/7/23 1310	
Relinquished by:		Received by:	
Relinquished by:		Received by:	
Custody Seals Intact: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Cooler Temperature(s) °C and Other Remarks: 5.7 / 5.7	



Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-123350-1

Login Number: 123350

List Number: 2

Creator: Meincke, Griffin E

List Source: Eurofins Savannah

List Creation: 02/13/23 12:25 PM

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