



ANALYTICAL REPORT

PREPARED FOR

Attn: Terri Choy
AECOM
1001 Bishop Street
Honolulu, Hawaii 96813
Generated 3/9/2023 3:41:56 PM

JOB DESCRIPTION

Red Hill - AFFF Assessment Sampling

JOB NUMBER

580-124266-1

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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Authorized for release by
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Case Narrative

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

Job ID: 580-124266-1

Job ID: 580-124266-1

Laboratory: Eurofins Seattle

Narrative

CASE NARRATIVE

Client: AECOM

Project: Red Hill - AFFF Assessment Sampling

Report Number: 580-124266-1

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

Two samples were received on 3/4/2023 9:00 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 5.9° 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-RHMW03-WGN01LF-2302W4 (580-124266-1) and AF-RHMW02-WGN01LF-2302W4 (580-124266-2) were analyzed for glycols in accordance with EPA SW-846 Method 8015B - DAI. The samples were analyzed on 03/08/2023.

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

Definitions/Glossary

Client: AECOM

Job ID: 580-124266-1

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: 580-124266-1

Client Sample ID: AF-RHMW03-WGN01LF-2302W4

Lab Sample ID: 580-124266-1

Date Collected: 03/02/23 12:45

Matrix: Water

Date Received: 03/04/23 09:00

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			03/08/23 05:18	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: 580-124266-1

Client Sample ID: AF-RHMW02-WGN01LF-2302W4

Lab Sample ID: 580-124266-2

Date Collected: 03/02/23 11:10

Matrix: Water

Date Received: 03/04/23 09:00

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			03/08/23 05:42	1

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

QC Sample Results

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

Job ID: 580-124266-1

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

Lab Sample ID: MB 680-766428/17
Matrix: Water
Analysis Batch: 766428

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			03/07/23 22:18	1

Lab Sample ID: LCS 680-766428/13
Matrix: Water
Analysis Batch: 766428

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	21.5		mg/L		107	50 - 150

Lab Sample ID: LCSD 680-766428/14
Matrix: Water
Analysis Batch: 766428

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	23.1		mg/L		116	50 - 150	7	50

Lab Sample ID: 580-124266-2 MS
Matrix: Water
Analysis Batch: 766428

Client Sample ID: AF-RHMW02-WGN01LF-2302W4
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	26.0		mg/L		130	50 - 150

Lab Sample ID: 580-124266-2 MSD
Matrix: Water
Analysis Batch: 766428

Client Sample ID: AF-RHMW02-WGN01LF-2302W4
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	28.2		mg/L		141	50 - 150	8	50

Lab Chronicle

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

Job ID: 580-124266-1

Client Sample ID: AF-RHMW03-WGN01LF-2302W4

Lab Sample ID: 580-124266-1

Date Collected: 03/02/23 12:45

Matrix: Water

Date Received: 03/04/23 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	766428	JCK	EET SAV	03/08/23 05:18

Client Sample ID: AF-RHMW02-WGN01LF-2302W4

Lab Sample ID: 580-124266-2

Date Collected: 03/02/23 11:10

Matrix: Water

Date Received: 03/04/23 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	766428	JCK	EET SAV	03/08/23 05:42

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: 580-124266-1

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
Project/Site: Red Hill - AFFF Assessment Sampling

Job ID: 580-124266-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-124266-1	AF-RHMW03-WGN01LF-2302W4	Water	03/02/23 12:45	03/04/23 09:00
580-124266-2	AF-RHMW02-WGN01LF-2302W4	Water	03/02/23 11:10	03/04/23 09:00

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Chain of Custody Record

Client Information Client Contact: <i>Andy Young</i> Phone: <i>402-871-5712</i> PWSID:		Lab PM: <i>Elaine Walker</i> E-Mail: <i>M.Elaine.Walker@EurofinsET.com</i> Carrier Tracking No(s): <i>2302W4FEA01</i> FedEx State of Origin: <i>Hawaii</i> Page 1 of 1 Job #:	
Due Date Requested: see subcontract TAT Requested (days): <i>Rush - ASAP</i>		Analysis Requested 805C_DAI_GL_DS/2-(2-butoxyethoxy)-ethanol Total Number of Containers: <i>3</i>	
Compliance Project: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No PO #: _____ WO #: _____ Project #: <i>60697810</i> SSOW#: _____		Preservation Codes: M - Hexane 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 - EDA Other: _____ Special Instructions/Note: _____	
Address: 1001 Bishop St. Suite 1600 City: Honolulu State, Zip: Hawaii 96813 Phone: 808-954-4512 / 770-331-0794 Email: <i>watson.tani@aecom.com / Mark.Kromis@aecom.com</i> Project Name: <i>CTO N6274223F0104</i> Site: <i>RHSF</i>		Matrix (W=water, S=solid, O=oil, A=air) Sample Type (C=Comp, G=grab) Sample Date: <i>3/2/23</i> Sample Time: <i>1100</i> Preservation Code: <i>G W</i> Field Filtered Sample (Yes or No): <i>N N</i> Perform MS/MSD (Yes or No): <i>X X</i>	
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 Deliverable Requested: I, II, III, IV, Other (specify) _____			
Empty Kit Relinquished by: _____ Relinquished by: <i>Andy Young</i> Relinquished by: <i>James Mason</i> Relinquished by: _____ Date: _____ Date/Time: <i>3/2/23 1400</i> Date/Time: <i>3/2/23 1415</i> Date/Time: _____ Company: <i>AECOM</i> Company: <i>AECOM</i> Company: _____			
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 Special Instructions/QC Requirements: <i>DOD QSM project.</i>			
Cooler Temperature(s) °C and Other Remarks: <i>5.9 / 5.9</i> Custody Seal No.: _____ Ver: 01/16/2019			



Chain of Custody Record

Client Information	Sampler: <u>Matt Jim</u> Lab PIV: <u>Elaine Walker</u> Carrier Tracking No(s): <u>FedEx</u> Client Contact: <u>808-349-4737</u> Phone: <u>808-349-4737</u> E-Mail: <u>M.Elaine.Walker@EurofinsET.com</u> State of Origin: <u>Hawaii</u>		
Company: <u>AECOM</u>	COC No: <u>2302W4FEA02</u> Page: <u>Page 1 of 1</u> Job #:		
Analysis Requested			
Address: <u>1001 Bishop St. Suite 1600</u>	Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 F - MeOH Q - Na2SO3 R - Na2S2O3 S - H2SO4 G - Amchlor H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA L - EDA W - pH 4-5 Z - other (specify)		
City: <u>Honolulu</u>	Total Number of containers: <u>3</u>		
State Zip: <u>Hawaii 96813</u>	81501_DAL_GL_DS/2-(2-butloxyethoxy)-ethanol		
Phone: <u>808-954-4512 / 770-331-0794</u>	Field Filtered Sample (Yes or No)		
Honolulu 96813	Perform MS/MSD (Yes or No)		
Project Name: <u>Watson Tanji (watson.tanji@aecom.com) / Mark Kromis (mark.kromis@aecom.com)</u>	Sample Date: <u>3/2/23</u> Sample Time: <u>1245</u> Sample Type (C=Comp, G=grab): <u>G</u> Matrix (Water, Solid, Other): <u>W</u> Preservation Code: <u>W</u>		
PO #: <u>60697810</u>	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		
Site: <u>RHSF</u>	Deliverable Requested I III IV Other (specify)		
Empty Kit Relinquished by			
Relinquished by <u>Matt Jim</u> Date/Time: <u>3/2/23 1400</u> Company: <u>AECOM</u>			
Relinquished by <u>James Mason</u> Date/Time: <u>3/2/23 1415</u> Company: <u>AECOM</u>			
Relinquished by _____ Date/Time: _____ Company: _____			
Custody Seals Intact: <u>Yes</u>			
Cooler Temperature(s) °C and Other Remarks: <u>5.9/5.9</u>			



Chain of Custody Record

Client Information		Sampler: <u>Andy Young</u>		Lab PM: <u>Elaine Walker</u>		Carrier Tracking No(s): <u>2302W4AFE01</u>		COC No: <u>2302W4AFE01</u>	
Client Contact:		Phone: <u>402-871-5712</u>		E-Mail: <u>M.Elaine.Walker@EurofinsET.com</u>		State of Origin: <u>Hawaii</u>		Page 1 of 1	
Company: <u>AECOM</u>		PWSID:		Analysis Requested:		Job #:		Preservation Codes:	
Address: <u>1001 Bishop St. Suite 1600</u>		Due Date Requested: see subcontract		TAT Requested (days): <u>Rush - ASAP</u>		Total Number of Containers: <u>3</u>		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 - EDA Other:	
City: <u>Honolulu</u>		Compliance Project: <u>△ Yes △ No</u>		Field Filtered Sample (Yes or No): <u>X</u>		Perform MS/MSD (Yes or No): <u>X</u>		Special Instructions/Note:	
State, Zip: <u>Hawaii 96813</u>		PO #:		Sample Date: <u>3/2/23</u>		Sample Time: <u>1100</u>		M - Hexane N - None O - ASH02 P - NaZnOS Q - NaZSO3 R - H2SO4 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 X - EDTA Y - EDA Z - other (specify)	
Phone: <u>808-954-4512 / 770-331-0794</u>		WO #:		Matrix (W=water, S=solid, O=swab/roll, BI=Tissue, ADU)		Sample Type (C=Comp, G=grab)		Preservation Code: <u>W</u>	
Email: <u>Watson.Tanji@aeocom.com / Mark.Kromis@aeocom.com</u>		Project #: <u>60697810</u>		Sample Date: <u>3/2/23</u>		Sample Time: <u>1100</u>		Sample Date: <u>3/2/23</u>	
Site: <u>RHSF</u>		SSOW#:		Sample Date: <u>3/2/23</u>		Sample Time: <u>1100</u>		Sample Date: <u>3/2/23</u>	
AF-RHMW02-WGN01LF-2302W4		Project Name: <u>CTO N6274223F0104</u>		Sample Date: <u>3/2/23</u>		Sample Time: <u>1100</u>		Sample Date: <u>3/2/23</u>	
Possible Hazard Identification		Unknown <input type="checkbox"/> Radiologic <input type="checkbox"/>		Sample Date: <u>3/2/23</u>		Sample Time: <u>1100</u>		Sample Date: <u>3/2/23</u>	
Deliverable Requested: I, II, III, IV, Other (specify)		Polison B <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Flammable <input type="checkbox"/> Non-Hazard <input type="checkbox"/>		Sample Date: <u>3/2/23</u>		Sample Time: <u>1100</u>		Sample Date: <u>3/2/23</u>	
Empty Kit Relinquished by:		Empty Kit Relinquished by:		Sample Date: <u>3/2/23</u>		Sample Time: <u>1100</u>		Sample Date: <u>3/2/23</u>	
Relinquished by: <u>Andy Young agf</u>		Relinquished by: <u>James Mason</u>		Date/Time: <u>3/2/23 1400</u>		Date/Time: <u>3/2/23 1415</u>		Date/Time: <u>3/2/23 1400</u>	
Relinquished by: <u>James Mason</u>		Relinquished by: <u>James Mason</u>		Date/Time: <u>3/2/23 1415</u>		Date/Time: <u>3/2/23 1415</u>		Date/Time: <u>3/2/23 1400</u>	
Relinquished by:		Relinquished by:		Date/Time: <u>3/2/23 1415</u>		Date/Time: <u>3/2/23 1415</u>		Date/Time: <u>3/2/23 1400</u>	
Custody Seals Intact <u>△ Yes △ No</u>		Custody Seal No		Date/Time: <u>3/2/23 1415</u>		Date/Time: <u>3/2/23 1415</u>		Date/Time: <u>3/2/23 1400</u>	
Cooler Temperature(s) °C and Other Remarks: <u>5.9 / 5.9</u>		Cooler Temperature(s) °C and Other Remarks:		Date/Time: <u>3/2/23 1415</u>		Date/Time: <u>3/2/23 1415</u>		Date/Time: <u>3/2/23 1400</u>	



Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-124266-1

Login Number: 124266

List Number: 1

Creator: Presley, Kim A

List Source: Eurofins Seattle

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



Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-124266-1

Login Number: 124266

List Number: 2

Creator: Meincke, Griffin E

List Source: Eurofins Savannah

List Creation: 03/07/23 01:20 PM

Question	Answer	Comment
Radioactivity wasn't checked or is \leq 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 $<6\text{mm}$ (1/4").		
Multiphasic samples are not present.		
Samples do not require splitting or compositing.		
Residual Chlorine Checked.		