



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

580-133711-1

Eurofins Seattle

Job Notes

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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
Tracy Dutton, Client Relations Manager
Tracy.Dutton@et.eurofinsus.com
(253)248-4970



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Case Narrative

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

Job ID: 580-133711-1

Job ID: 580-133711-1

Laboratory: Eurofins Seattle

Narrative

Job Narrative 580-133711-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method. Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Receipt

The samples were received on 11/10/2023 5:00 PM. 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 time was 2.3°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.

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

Samples AF-RHMW12A-WGFD01LF-2311 (133711-7), AF-RHMW12A-WGN01LF-2311 (133711-6), AF-RHMW17D-WGN01LF-2311 (133711-2), AF-RHMW17D-WQFB01-2311 (133711-3), AF-RHMW17S-WGN01LF-2311 (133711-4), AF-RHMW17S-WQEB01-2311 (133711-5) and AF-RHMW17-WGN01LF-2311 (133711-1) were analyzed for Glycols- Direct Injection (GC/FID). The samples were analyzed on 11/17/2023.

The continuing calibration verification (CCV) associated with batch 680-808697 recovered above the upper control limit for 2-(2-Butoxyethoxy)ethanol. The samples associated with this CCV were non-detects for the affected analyte; therefore, the data has been reported.

Definitions/Glossary

Client: AECOM

Job ID: 580-133711-1

Project/Site: Red Hill - AFFF Assessment Sampling

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
Q	One or more quality control criteria failed.
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: 580-133711-1

Client Sample ID: AF-RHMW17-WGN01LF-2311

Lab Sample ID: 580-133711-1

Date Collected: 11/08/23 09:05

Matrix: Water

Date Received: 11/10/23 17:00

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 Q	5.0	1.1	mg/L			11/17/23 01:35	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: 580-133711-1

Client Sample ID: AF-RHMW17D-WGN01LF-2311

Lab Sample ID: 580-133711-2

Date Collected: 11/08/23 11:35

Matrix: Water

Date Received: 11/10/23 17:00

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 Q	5.0	1.1	mg/L			11/17/23 01:58	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: 580-133711-1

Client Sample ID: AF-RHMW17D-WQFB01-2311

Lab Sample ID: 580-133711-3

Date Collected: 11/08/23 10:05

Matrix: Water

Date Received: 11/10/23 17:00

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 Q	5.0	1.1	mg/L			11/17/23 02:21	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: 580-133711-1

Client Sample ID: AF-RHMW17S-WGN01LF-2311

Lab Sample ID: 580-133711-4

Date Collected: 11/08/23 12:35

Matrix: Water

Date Received: 11/10/23 17:00

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 Q	5.0	1.1	mg/L			11/17/23 02:45	1

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

Client Sample Results

Client: AECOM

Job ID: 580-133711-1

Project/Site: Red Hill - AFFF Assessment Sampling

Client Sample ID: AF-RHMW17S-WQEB01-2311

Lab Sample ID: 580-133711-5

Date Collected: 11/08/23 11:20

Matrix: Water

Date Received: 11/10/23 17:00

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 Q	5.0	1.1	mg/L			11/17/23 03:08	1

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

Client Sample Results

Client: AECOM

Job ID: 580-133711-1

Project/Site: Red Hill - AFFF Assessment Sampling

Client Sample ID: AF-RHMW12A-WGN01LF-2311

Lab Sample ID: 580-133711-6

Date Collected: 11/09/23 09:20

Matrix: Water

Date Received: 11/10/23 17:00

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 Q	5.0	1.1	mg/L			11/17/23 03:32	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: 580-133711-1

Client Sample ID: AF-RHMW12A-WGFD01LF-2311

Lab Sample ID: 580-133711-7

Date Collected: 11/09/23 09:20

Matrix: Water

Date Received: 11/10/23 17:00

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 Q	5.0	1.1	mg/L			11/17/23 03:55	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: 580-133711-1

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

Lab Sample ID: MB 680-808697/11
Matrix: Water
Analysis Batch: 808697

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	5.0	1.1	mg/L			11/16/23 20:07	1

Lab Sample ID: LCS 680-808697/1007
Matrix: Water
Analysis Batch: 808697

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	23.2		mg/L		116	50 - 150

Lab Sample ID: LCSD 680-808697/8
Matrix: Water
Analysis Batch: 808697

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	23.6		mg/L		118	50 - 150	2	50

Lab Sample ID: 580-133711-1 MS
Matrix: Water
Analysis Batch: 808697

Client Sample ID: AF-RHMW17-WGN01LF-2311
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 Q	20.0	22.2		mg/L		111	50 - 150

Lab Sample ID: 580-133711-1 MSD
Matrix: Water
Analysis Batch: 808697

Client Sample ID: AF-RHMW17-WGN01LF-2311
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 Q	20.0	24.8		mg/L		124	50 - 150	11	50

Lab Chronicle

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

Job ID: 580-133711-1

Client Sample ID: AF-RHMW17-WGN01LF-2311

Lab Sample ID: 580-133711-1

Date Collected: 11/08/23 09:05

Matrix: Water

Date Received: 11/10/23 17:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	808697	DBM	EET SAV	11/17/23 01:35

Client Sample ID: AF-RHMW17D-WGN01LF-2311

Lab Sample ID: 580-133711-2

Date Collected: 11/08/23 11:35

Matrix: Water

Date Received: 11/10/23 17:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	808697	DBM	EET SAV	11/17/23 01:58

Client Sample ID: AF-RHMW17D-WQFB01-2311

Lab Sample ID: 580-133711-3

Date Collected: 11/08/23 10:05

Matrix: Water

Date Received: 11/10/23 17:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	808697	DBM	EET SAV	11/17/23 02:21

Client Sample ID: AF-RHMW17S-WGN01LF-2311

Lab Sample ID: 580-133711-4

Date Collected: 11/08/23 12:35

Matrix: Water

Date Received: 11/10/23 17:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	808697	DBM	EET SAV	11/17/23 02:45

Client Sample ID: AF-RHMW17S-WQEB01-2311

Lab Sample ID: 580-133711-5

Date Collected: 11/08/23 11:20

Matrix: Water

Date Received: 11/10/23 17:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	808697	DBM	EET SAV	11/17/23 03:08

Client Sample ID: AF-RHMW12A-WGN01LF-2311

Lab Sample ID: 580-133711-6

Date Collected: 11/09/23 09:20

Matrix: Water

Date Received: 11/10/23 17:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	808697	DBM	EET SAV	11/17/23 03:32

Client Sample ID: AF-RHMW12A-WGFD01LF-2311

Lab Sample ID: 580-133711-7

Date Collected: 11/09/23 09:20

Matrix: Water

Date Received: 11/10/23 17:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015C GLY		1	808697	DBM	EET SAV	11/17/23 03:55

Laboratory References:

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

Eurofins Seattle

Accreditation/Certification Summary

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

Job ID: 580-133711-1

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: 580-133711-1

Project/Site: Red Hill - AFFF Assessment Sampling

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-133711-1	AF-RHMW17-WGN01LF-2311	Water	11/08/23 09:05	11/10/23 17:00
580-133711-2	AF-RHMW17D-WGN01LF-2311	Water	11/08/23 11:35	11/10/23 17:00
580-133711-3	AF-RHMW17D-WQFB01-2311	Water	11/08/23 10:05	11/10/23 17:00
580-133711-4	AF-RHMW17S-WGN01LF-2311	Water	11/08/23 12:35	11/10/23 17:00
580-133711-5	AF-RHMW17S-WQEB01-2311	Water	11/08/23 11:20	11/10/23 17:00
580-133711-6	AF-RHMW12A-WGN01LF-2311	Water	11/09/23 09:20	11/10/23 17:00
580-133711-7	AF-RHMW12A-WGFD01LF-2311	Water	11/09/23 09:20	11/10/23 17:00

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Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-133711-1

Login Number: 133711

List Number: 1

Creator: Johnson, Corey M

List Source: Eurofins Seattle

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are 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.	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.	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").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

