



ANALYTICAL REPORT

PREPARED FOR

Attn: Terri Choy
AECOM
1001 Bishop Street
Honolulu, Hawaii 96813
Generated 3/1/2023 6:00:04 PM

JOB DESCRIPTION

Red Hill - AFFF Assessment Sampling

JOB NUMBER

580-123908-1

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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Case Narrative

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

Job ID: 580-123908-1

Job ID: 580-123908-1

Laboratory: Eurofins Seattle

Narrative

CASE NARRATIVE

Client: AECOM
Project: Red Hill - AFFF Assessment Sampling
Report Number: 580-123908-1

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.

Following DoD QSM guidelines, manual integrations were performed only when necessary and are in compliance with the laboratory's standard operating procedure, Acceptable Manual Integration Practices, SOP No.: Q-S-002. The reason(s) for manual integration have been documented on the affected chromatogram(s), which is/are provided in the raw data package. The raw data also includes the original chromatogram(s) prior to any manual integration being performed. Manual integrations are detailed in the manual integration summary forms following this narrative.

It should be noted that samples with elevated Limits of Quantitation (LOQs) resulting from a dilution may not be able to satisfy customer reporting limits in some cases. Such increases in the LOQs 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

The samples were received on 02/22/2023; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 2.1 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-2302W2 (580-123908-1), AF-RHMW02-WGN01LF-2302W2 (580-123908-2), AF-RHMW17D-WGN01LF-2302W2 (580-123908-3), AF-RHMW17D-WQFB01-2302W2 (580-123908-4) and AF-RHMW17-WGN01LF-2302W2 (580-123908-6) were analyzed for glycols in accordance with EPA SW-846 Method 8015B - DAI. The samples were analyzed on 02/28/2023.

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

Definitions/Glossary

Client: AECOM

Job ID: 580-123908-1

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: 580-123908-1

Client Sample ID: AF-RHMW03-WGN01LF-2302W2

Lab Sample ID: 580-123908-1

Date Collected: 02/16/23 13:25

Matrix: Water

Date Received: 02/22/23 10:30

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 | | | 02/28/23 17:01 | 1 |

- 1
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Client Sample Results

Client: AECOM

Job ID: 580-123908-1

Project/Site: Red Hill - AFFF Assessment Sampling

Client Sample ID: AF-RHMW02-WGN01LF-2302W2

Lab Sample ID: 580-123908-2

Date Collected: 02/16/23 11:40

Matrix: Water

Date Received: 02/22/23 10:30

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 | | | 02/28/23 18:11 | 1 |

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- 10
- 11

Client Sample Results

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

Job ID: 580-123908-1

Client Sample ID: AF-RHMW17D-WGN01LF-2302W2

Lab Sample ID: 580-123908-3

Date Collected: 02/17/23 11:45

Matrix: Water

Date Received: 02/22/23 10:30

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 | | | 02/28/23 18:35 | 1 |

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Client Sample Results

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

Job ID: 580-123908-1

Client Sample ID: AF-RHMW17D-WQFB01-2302W2

Lab Sample ID: 580-123908-4

Date Collected: 02/17/23 10:45

Matrix: Water

Date Received: 02/22/23 10:30

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 | | | 02/28/23 18:58 | 1 |

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Client Sample Results

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

Job ID: 580-123908-1

Client Sample ID: AF-RHMW17-WGN01LF-2302W2

Lab Sample ID: 580-123908-6

Date Collected: 02/17/23 10:10

Matrix: Water

Date Received: 02/22/23 10:30

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 | | | 02/28/23 19:45 | 1 |

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QC Sample Results

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

Job ID: 580-123908-1

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

Lab Sample ID: MB 680-765364/10
Matrix: Water
Analysis Batch: 765364

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 | | | 02/28/23 16:37 | 1 |

Lab Sample ID: LCS 680-765364/6
Matrix: Water
Analysis Batch: 765364

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 | 22.7 | | mg/L | | 114 | 50 - 150 |

Lab Sample ID: LCSD 680-765364/7
Matrix: Water
Analysis Batch: 765364

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 | 20.0 | | mg/L | | 100 | 50 - 150 | 13 | 50 |

Lab Sample ID: 580-123908-1 MS
Matrix: Water
Analysis Batch: 765364

Client Sample ID: AF-RHMW03-WGN01LF-2302W2
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 | 21.3 | | mg/L | | 107 | 50 - 150 |

Lab Sample ID: 580-123908-1 MSD
Matrix: Water
Analysis Batch: 765364

Client Sample ID: AF-RHMW03-WGN01LF-2302W2
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 | 25.3 | | mg/L | | 127 | 50 - 150 | 17 | 50 |

Lab Chronicle

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

Job ID: 580-123908-1

Client Sample ID: AF-RHMW03-WGN01LF-2302W2

Lab Sample ID: 580-123908-1

Date Collected: 02/16/23 13:25

Matrix: Water

Date Received: 02/22/23 10:30

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Analyst | Lab | Prepared or Analyzed |
|-----------|------------|--------------|-----|-----------------|--------------|---------|---------|----------------------|
| Total/NA | Analysis | 8015C GLY | | 1 | 765364 | GEM | EET SAV | 02/28/23 17:01 |

Client Sample ID: AF-RHMW02-WGN01LF-2302W2

Lab Sample ID: 580-123908-2

Date Collected: 02/16/23 11:40

Matrix: Water

Date Received: 02/22/23 10:30

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Analyst | Lab | Prepared or Analyzed |
|-----------|------------|--------------|-----|-----------------|--------------|---------|---------|----------------------|
| Total/NA | Analysis | 8015C GLY | | 1 | 765364 | GEM | EET SAV | 02/28/23 18:11 |

Client Sample ID: AF-RHMW17D-WGN01LF-2302W2

Lab Sample ID: 580-123908-3

Date Collected: 02/17/23 11:45

Matrix: Water

Date Received: 02/22/23 10:30

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Analyst | Lab | Prepared or Analyzed |
|-----------|------------|--------------|-----|-----------------|--------------|---------|---------|----------------------|
| Total/NA | Analysis | 8015C GLY | | 1 | 765364 | GEM | EET SAV | 02/28/23 18:35 |

Client Sample ID: AF-RHMW17D-WQFB01-2302W2

Lab Sample ID: 580-123908-4

Date Collected: 02/17/23 10:45

Matrix: Water

Date Received: 02/22/23 10:30

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Analyst | Lab | Prepared or Analyzed |
|-----------|------------|--------------|-----|-----------------|--------------|---------|---------|----------------------|
| Total/NA | Analysis | 8015C GLY | | 1 | 765364 | GEM | EET SAV | 02/28/23 18:58 |

Client Sample ID: AF-RHMW17-WGN01LF-2302W2

Lab Sample ID: 580-123908-6

Date Collected: 02/17/23 10:10

Matrix: Water

Date Received: 02/22/23 10:30

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Analyst | Lab | Prepared or Analyzed |
|-----------|------------|--------------|-----|-----------------|--------------|---------|---------|----------------------|
| Total/NA | Analysis | 8015C GLY | | 1 | 765364 | GEM | EET SAV | 02/28/23 19:45 |

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: 580-123908-1

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 |

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Sample Summary

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

Job ID: 580-123908-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---------------|---------------------------|--------|----------------|----------------|
| 580-123908-1 | AF-RHMW03-WGN01LF-2302W2 | Water | 02/16/23 13:25 | 02/22/23 10:30 |
| 580-123908-2 | AF-RHMW02-WGN01LF-2302W2 | Water | 02/16/23 11:40 | 02/22/23 10:30 |
| 580-123908-3 | AF-RHMW17D-WGN01LF-2302W2 | Water | 02/17/23 11:45 | 02/22/23 10:30 |
| 580-123908-4 | AF-RHMW17D-WQFB01-2302W2 | Water | 02/17/23 10:45 | 02/22/23 10:30 |
| 580-123908-6 | AF-RHMW17-WGN01LF-2302W2 | Water | 02/17/23 10:10 | 02/22/23 10:30 |

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Chain of Custody Record

| | | | | | | | | | | |
|--|--|--|---|--|--|--|---------------------|---|--|-----------------------|
| Client Information | | Sample: GABRIEL ALLEN | | Lab PM: Elaine Walker | | Carrier Tracking No(s): FedEx | | COC No: 2302W2AFE02 | | |
| Client Contact: | | Phone: 8086498434 | | E-Mail: M.Elaine.Walker@EurofinsET.com | | State of Origin: Hawaii | | Page: Page 1 of 1 | | |
| Company: AECOM | | PWSID: | | Analysis Requested | | | | Job #: 123 908 | | |
| Address: 1001 Bishop St. Suite 1600 | | Due Date Requested: see subcontract | | | | | | Preservation Codes: A - HCL M - Hexane B - NaOH N - None C - Zn Acetate O - AsNaO2 D - Nitric Acid P - Na2O4S E - NaHSO4 Q - Na2SO3 F - MeOH R - Na2S2O3 G - Amchlor S - H2SO4 H - Ascorbic Acid T - TSP Dodecahydrate I - Ice U - Acetone J - DI Water V - MCAA K - EDTA W - pH 4-5 L - EDA Z - other (specify) Other: | | |
| City: Honolulu | | TAT Requested (days): Rush - ASAP | | | | | | | | |
| State, Zip: Hawaii 96813 | | Compliance Project: <input type="checkbox"/> Yes <input type="checkbox"/> No | | | | | | | | |
| Phone: 808-954-4512 / 770-331-0794 | | PO #: | | | | | | | | |
| Email: Watson Tanji (watson.tanji@aecom.com) / Mark Kromis (mark.kromis@aecom.com) | | WO #: | | | | | | | | |
| Project Name: CTO N6274223F0104 | | Project #: 60697810 | | Sample Type (C=comp, G=grab) | | Matrix (W=Water, S=solid, O=Other, BT=Thru, AA=As) | | Special Instructions/Note: | | |
| Site: RHSF | | SSOW#: | | Sample Date | | Sample Time | | | | |
| Sample Identification | | | | | | | | | | |
| AF-RHMW03-WGN01LF-2302W2 | | 2/16/23 | | 1325 | | G W | | N N X | | |
| 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 checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months | | | | | |
| Deliverable Requested: I, II, III, IV, Other (specify) | | | Prelim data (Level 1or2)=see TAT above. DoD Stage 4 report standard TAT. AECOM.EQU(S.EDD. | | | Special Instructions/QC Requirements: DOD QSM project. | | | | |
| Empty Kit Relinquished by: | | | Date: | | Time: | | Method of Shipment: | | | |
| Relinquished by: GABRIEL ALLEN | | Date/Time: 2/16/23 11445 | | Company: AECOM | | Received by: Miranda DeFarno | | Date/Time: 2/16/23 1445 | | Company: AECOM |
| Relinquished by: Miranda DeFarno | | Date/Time: 2/20/23 1250 | | Company: AECOM | | Received by: [Signature] | | Date/Time: 2/22/23 1030 | | Company: _____ |
| Relinquished by: _____ | | Date/Time: 1316 | | Company: _____ | | Received by: _____ | | Date/Time: _____ | | Company: _____ |
| Custody Seals Intact: <input type="checkbox"/> Yes <input type="checkbox"/> No | | Custody Seal No.: | | Cooler Temperature(s) °C and Other Remarks: 2.1/2.1 | | | | | | |

Login Sample Receipt Checklist

Client: AECOM

Job Number: 580-123908-1

Login Number: 123908

List Number: 2

Creator: Meincke, Griffin E

List Source: Eurofins Savannah

List Creation: 02/28/23 11:41 AM

| 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. | | |