

Environment Testing

ANALYTICAL REPORT

PREPARED FOR

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Attn: Terri Choy AECOM 1001 Bishop Street Honolulu, Hawaii 96813 Generated 12/27/2022 5:21:28 PM

JOB DESCRIPTION

Red Hill - AFFF Assessment Sampling

JOB NUMBER

580-121385-1

Eurofins Seattle 5755 8th Street East Tacoma WA 98424



Eurofins Seattle

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 Tracy Dutton, Client Relations Manager <u>Tracy.Dutton@et.eurofinsus.com</u> Designee for Marie Walker, Senior Project Manager <u>M.Elaine.Walker@et.eurofinsus.com</u> (253)248-4972 Generated 12/27/2022 5:21:28 PM

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Job ID: 580-121385-1

Laboratory: Eurofins Seattle

Narrative

CASE NARRATIVE

Case Narrative

Client: AECOM Project: Red Hill - AFFF Assessment Sampling Report Number: 580-121385-1

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 12/17/2022; the samples arrived in good condition, properly preserved and on ice. The temperature of the coolers at receipt was 4.4 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-RHMW12A-WGN01B-2212W2 (580-121385-1) and AF-RHMW06-WGN01B-2212W2 (580-121385-2) were analyzed for glycols in accordance with EPA SW-846 Method 8015B - DAI. The samples were analyzed on 12/21/2022.

The continuing calibration verification (CCV) associated with batch 680-756409 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.

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

Definitions/Glossary

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

Decision Level Concentration (Radiochemistry)

EPA recommended "Maximum Contaminant Level"

Minimum Detectable Concentration (Radiochemistry)

Not Detected at the reporting limit (or MDL or EDL if shown)

Minimum Detectable Activity (Radiochemistry)

Estimated Detection Limit (Dioxin)

Limit of Detection (DoD/DOE)

Method Detection Limit

Minimum Level (Dioxin)

Most Probable Number

Not Calculated

Negative / Absent

Positive / Present

Presumptive **Quality Control**

Method Quantitation Limit

Practical Quantitation Limit

Relative Error Ratio (Radiochemistry)

Toxicity Equivalent Factor (Dioxin)

Too Numerous To Count

Toxicity Equivalent Quotient (Dioxin)

Reporting Limit or Requested Limit (Radiochemistry)

Relative Percent Difference, a measure of the relative difference between two points

Limit of Quantitation (DoD/DOE)

Job ID: 580-121385-1

Qualifiers

DL, RA, RE, IN

DLC

EDL

LOD

LOQ

MCL

MDA

MDC

MDL

ML MPN

MQL

NC

ND

NEG

POS

PQL PRES

QC RER

RL RPD

TEF TEQ

TNTC

GC Semi VOA Qualifier 4 **Qualifier Description** Μ Manual integrated compound. 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. ¤ 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 Duplicate Error Ratio (normalized absolute difference) DER Dil Fac **Dilution Factor** Detection Limit (DoD/DOE) DL

Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample

Client Sample Results

Job ID: 580-121385-1

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

Client Sample ID: AF-RHMW12A-WGN01B-2212W2 Lab Sample ID: 580-121385-1 Date Collected: 12/14/22 12:50 Matrix: Water Date Received: 12/17/22 11:45 Method: SW846 8015C GLY - Glycols- Direct Injection (GC/FID) Result Qualifier Analyte LOQ DL Unit D Prepared Analyzed Dil Fac 3.0 UMQ 2-(2-Butoxyethoxy)ethanol 5.0 1.1 mg/L 12/21/22 22:05

Client Sample Results

Job ID: 580-121385-1

Matrix: Water

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Lab Sample ID: 580-121385-2

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

Client Sample ID: AF-RHMW06-WGN01B-2212W2 Date Collected: 12/14/22 17:25 Date Received: 12/17/22 11:45

Method: SW846 8015C GLY -		act Inicatio								
	-	-								
Analyte	Result	Qualifier	LOQ	DL	Unit	D	Prepared	Analyzed	Dil Fac	
2-(2-Butoxyethoxy)ethanol	3.0	UQ	5.0	1.1	mg/L			12/21/22 22:28	1	

Eurofins Seattle

QC Sample Results

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

Job ID: 580-121385-1

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

Lab Sample ID: MB 680-7564 Matrix: Water	09/10						Cli	ent Sam	ple ID: Me Prep Typ		
Analysis Batch: 756409											
	ľ	MB MB									
Analyte	Res	sult Qualifie	er	LOQ	DL Unit		DF	Prepared	Analyze	d l	Dil Fac
2-(2-Butoxyethoxy)ethanol		3.0 U		5.0	1.1 mg/L				12/21/22 1	9:50	1
Lab Sample ID: LCS 680-7564	409/6					Clie	nt Sa	mple ID	: Lab Cont	rol Sa	mple
Matrix: Water									Prep Typ	e: Tot	al/N/
Analysis Batch: 756409											
-			Spike	LCS	LCS				%Rec		
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits		
2-(2-Butoxyethoxy)ethanol			20.0	26.2		mg/L		131	50 - 150		
Lab Sample ID: LCSD 680-75	6409/7				C	lient Sa	ample	ID: Lab	Control S	ample	e Dur
Matrix: Water									Prep Typ		
Analysis Batch: 756409											
· · · · · · · · · · · · · · · · · · ·			Spike	LCSD	LCSD				%Rec		RPD
Analyte			Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limi
2-(2-Butoxyethoxy)ethanol			20.0	24.6		mg/L		123	50 - 150	6	50
Lab Sample ID: 580-121385-2	MS				Client S	Sample	D: A	-RHMM	/06-WGN0 [/]	1B-22 [,]	12W2
Lab Sample ID: 580-121385-2 Matrix: Water	2 MS				Client S	Sample	ID: AI	-RHMV	/06-WGN0 [/] Prep Typ		
-	? MS				Client S	Sample	ID: AI	-RHMV			
Matrix: Water	2 MS Sample	Sample	Spike	MS		Sample	ID: AI	-RHMV			
Matrix: Water Analysis Batch: 756409	Sample	Sample Qualifier	Spike Added	_		Sample Unit	ID: AI D		Prep Typ		
Matrix: Water Analysis Batch: 756409 Analyte	Sample	Qualifier	•	_	MS				Prep Typ %Rec		
Matrix: Water Analysis Batch: 756409 Analyte 2-(2-Butoxyethoxy)ethanol	Sample Result 3.0	Qualifier	Added	Result	MS Qualifier	Unit mg/L	<u>D</u>	%Rec	Prep Typ %Rec Limits 50 - 150	e: Tot	al/N/
Matrix: Water Analysis Batch: 756409 Analyte	Sample Result 3.0	Qualifier	Added	Result	MS Qualifier	Unit mg/L	<u>D</u>	%Rec	Prep Typ %Rec Limits 50 - 150	e: Tot 1B-22 [·]	al/N/
Matrix: Water Analysis Batch: 756409 Analyte 2-(2-Butoxyethoxy)ethanol Lab Sample ID: 580-121385-2 Matrix: Water	Sample Result 3.0	Qualifier	Added	Result	MS Qualifier	Unit mg/L	<u>D</u>	%Rec	Prep Typ %Rec Limits 50 - 150	e: Tot 1B-22 [·]	al/N/
Matrix: Water Analysis Batch: 756409 Analyte 2-(2-Butoxyethoxy)ethanol Lab Sample ID: 580-121385-2	Sample Result 3.0	Qualifier U Q	Added	Result 21.3	MS Qualifier	Unit mg/L	<u>D</u>	%Rec	Prep Typ %Rec Limits 50 - 150	e: Tot 1B-22 [·]	al/N/ 12W2 al/N/
Matrix: Water Analysis Batch: 756409 Analyte 2-(2-Butoxyethoxy)ethanol Lab Sample ID: 580-121385-2 Matrix: Water	Sample Result 3.0 2 MSD Sample	Qualifier U Q	Added 20.0	Result 21.3 MSD	MS Qualifier Client S	Unit mg/L	<u>D</u>	<u>%Rec</u> 106 -RHMW	Prep Typ %Rec Limits 50 - 150 /06-WGN07 Prep Typ	e: Tot 1B-22 [·]	al/NA

Client: AECON	-							Job I	D: 580-121385-1
	o le ID: AF- d: 12/14/22 1			2212W2			Lab	Sample ID:	580-121385-1 Matrix: Water
_	Batch	Batch		Dilution	Batch			Prepared	
Prep Type	Туре	Method	Run	Factor	Number	Analyst	Lab	or Analyzed	
Total/NA	Analysis	8015C GLY		1	756409	GEM	EET SAV	12/21/22 22:05	
Client Sam		RHMW06-W0 7:25	GN01B-2	212W2			Lab	Sample ID:	580-121385-2 Matrix: Water
Date Received	d: 12/17/22 1	1:45							
	Batch	Batch		Dilution	Batch			Prepared	

Lab Chronicle

	Batch	Batch		Dilution	Batch			
Prep Type	Туре	Method	Run	Factor	Number	Analyst	Lab	
Total/NA	Analysis	8015C GLY		1	756409	GEM	EET SAV	-

Laboratory References:

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

or Analyzed 12/21/22 22:28

Accreditation/Certification Summary

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

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Laboratory: Eurofins Savannah

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

Authority ANAB	Program Dept. of Defense ELAP	Identification Number	Expiration Date 09-22-24
The following analytes are included in this the agency does not offer certification.	report, but the laboratory is not certified t	by the governing authority.	This list may include analytes for which

 Analysis Method
 Prep Method
 Matrix
 Analyte

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

Eurofins Seattle

Sample Summary

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

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
580-121385-1	AF-RHMW12A-WGN01B-2212W2	Water	12/14/22 12:50	12/17/22 11:45
580-121385-2	AF-RHMW06-WGN01B-2212W2	Water	12/14/22 17:25	12/17/22 11:45

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Environment Testing

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ore ALL samples until notified by client	240			14010000	a satura d	and	697 686	97 H.S.A.B		and at the	20030				Ð	0521	cuprife			SW2122-810N	OW-ASI WMH
Special Instructions/Note:	-					n an	ter lige	a ging				∀ 8	\mathbb{A}	V.	Preservati	Time	Sample Date			uo	ple Identificati
	otal h										1	15C	BILO	(W=water, ⊔ S=solid, Z=waste/oil,	C=comp,) siqms2					
	L M					1				T		DAI	m Mi	Matrix	Sample 5						
	Total Number of							A	₹			8015C_DAI_GL_D5/ 2-(2-butoxyethoxy)-ethanol	Perform MS/MSD (Yes or No)	0							E
								10				5/2-(:#MOSS				
EDA W - PH 4-5 EDA Z - other (specify)	containers											2-bu	es o	2			50697810 20697810			70	# Name: N6274223F01
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Harchlor S - H2SO4 Ascorbic Acid T - TSP Dodecahydrate	H					~						thox		5						-366-5311	964-4512 / 808
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		12/27/2022
		12/21/2022

5755 8th Street East

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SDinemA Environment Testing sniforus 💱

Ver: 01/16/2019 ON V SOY A cooler Temperature(s) °C and Other Remarks: Custody Seal No .: Custody Seals Intact: (uedwo) :emil/etsc eceived by: Lompany :emil/ete(:Aq paysinbuilar Deligino Witanda MONELA 271512 Shil 0411 :ami /aja E Received by: :Ad benavising by: :emiT\etsC vingany. MO) = H ound 3263617 try LISTOFA) Muran 0231 QEB1 22111/21 72-4-21 /ECOW seceived by: Company :Ad benzinpriles :em[T\efactorial :emiT\etsQ Method of Shipment: :emiT :916C Empty Kit Relinquished by: report standard TAT. AECOM FOUIS EDD. Prelim data (Level 1or2)=see TAT above. DoD Stage 4 Special Instructions/QC Requirements: DOD QSM project. Deliverable Requested: I, II, III, IV, Other (specify) Archive For Disposal By Lab Skin Imtant eldsmmsl⁻¹ Return To Client 8 nosio4 Von-Hazard Radiological приломи stinoM (ntnom t nent represented if services are retained longer than t month) (ntnom t nent and being and being a service of the ser noiteoititnebl brezeH eldisso9 271 MAI ı ~ əsodsi STL 22-+1-21 Х N Ð N Μ AF-RHMW06-WGN01B-2212W2 Store ALL samples until notified by client to ¥ XX Preservation Code: (drage de la constante de la c Sample Date Special Instructions/Note: Total 8015C əmiT Sample Identification Field Filtered Sample (Yes or Perform MS/MSD (Yes or No) (C=comb, Sample MEMBER' 2=80 **Number** xintsM Type _DAI_GL_D5/ 2-(2-butoxyethoxy)-ethanol Sample 0 **JSHR** 00 Cther: :#MOS :211 01826909 CTO N6274223F0104 Z - other (specify) YO3 -Iners roject #: roject Name: S-4 Hq - W <- EDTA (mos.mosse@areansing kant Landers @inst.nostew) iinsT nostew V-MCAA - DI Water 9not90A - U 901 :# OA :lism: T - TSP Dodecahydrate H - Ascorbic Acid 1162-956-808/2124-456-808 S - H2SO4 G - Amchlor :# C :auoy, R - Na2S203 HOPW - : E1886 iisweh Compliance Project: A Yes A No COSCEN - D +OSHEN - 3 15'N bioA oithin - C :qiX ,etat P-Na204S C - Zn Acetate SOBNRA - O **9A2A - Heufi** ninionoh 22) **auon - N** HOBN - E :(sysb) betseupeR TA :Air ensxeH - M V-HCL 1001 Bishop St. Suite 1600 see subcontract reservation Codes: :beite Requested: :ssaupp Analysis Requested AECOM :Auedwog :# qq alsm Page 1 of 1 M.Elaine.Walker@EurofinsET.com IIBWBH E665-652=252 :ə6e iniginO to state :euol Contact: :lisM-STIDSAL AWTRISISH Client Information 2212W2EU-13 Elaine Walker x=pa_ Sarrier Tracking No(s): :ON DOC :MY da. : Iaidura Tacoma, WA 98424 Chain of Custody Record

h-h/h-h

Login Sample Receipt Checklist

Client: AECOM

Login Number: 121385 List Number: 2 Creator: Padayao, Abigail

Question	Answer	Comment
Radioactivity wasn't checked or is = background as measured by a survey meter.</td <td>N/A</td> <td></td>	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?	N/A	
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.	N/A	
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 <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

List Source: Eurofins Savannah

List Creation: 12/20/22 09:57 AM