

ANALYTICAL REPORT

PREPARED FOR

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Honolulu, Hawaii 96843

Generated 11/22/2023 7:56:22 AM

JOB DESCRIPTION

RED-HILL

JOB NUMBER

380-59480-2

Eurofins Eaton Analytical Pomona

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and 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 Eaton Analytical, LLC Project Manager.

Compliance Statement

1. Laboratory is accredited in accordance with TNI 2016 Standards and ISO/IEC 17025:2017.
2. Laboratory certifies that the test results meet all TNI 2016 and ISO/IEC 17025:2017 requirements unless noted under the individual analysis
3. Test results relate only to the sample(s) tested.
4. This report shall not be reproduced except in full, without the written approval of the laboratory.
5. Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below. (DW, Water matrices)

Authorization



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Definitions/Glossary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-59480-2

Qualifiers

Subcontract

Qualifier	Qualifier Description
U	This analyte was not detected.

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

Case Narrative

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-59480-2

Job ID: 380-59480-2

Laboratory: Eurofins Eaton Analytical Pomona

Narrative

Job Narrative 380-59480-2

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.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt

The samples were received on 8/17/2023 9:39 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 0.4°C and 3.1°C

Subcontract Work

Methods 8015 Gas (Purgeable) LL (EAL), 8015 LL DRO/MRO/JP5/JP8: These methods were subcontracted to EMAX Laboratories Inc. The subcontract laboratory certifications are different from that of the facility issuing the final report. The subcontract report is appended in its entirety.

Method 625 PAH Physis LL (EAL) + TICs: This method was subcontracted to Physis Environmental Laboratories. The subcontract laboratory certification is different from that of the facility issuing the final report. The subcontract report is appended in its entirety.

Detection Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-59480-2

Client Sample ID: MOANALUA WELLS Pump 2 **Lab Sample ID: 380-59480-1**

No Detections.

Client Sample ID: HALAWA WELLS UNITS 1 & 2 Pump 1 **Lab Sample ID: 380-59480-2**

No Detections.

Client Sample ID: TB MOANALUA WELLS **Lab Sample ID: 380-59480-3**

No Detections.

Client Sample ID: TB HALAWA WELLS UNITS 1 & 2 **Lab Sample ID: 380-59480-4**

No Detections.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

This Detection Summary does not include radiochemical test results.

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Client Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-59480-2

Client Sample ID: MOANALUA WELLS Pump 2

Lab Sample ID: 380-59480-1

Date Collected: 08/15/23 11:00

Matrix: Drinking Water

Date Received: 08/17/23 09:39

Method: 625 PAH Physis LL (EAL) + TICs - EPA 625 Base/Neutral and Acid Organics i

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
1-Methylphenanthrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
2,3,5-Trimethylnaphthalene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
2,6-Dimethylnaphthalene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
2-Methylnaphthalene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Acenaphthene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Acenaphthylene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Anthracene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Benz[a]anthracene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Benzo[a]pyrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Benzo[b]fluoranthene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Benzo[e]pyrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Benzo[g,h,i]perylene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Benzo[k]fluoranthene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Biphenyl	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Chrysene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Dibenz[a,h]anthracene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Dibenzo[a,l]pyrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Dibenzothiophene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Disalicylidenepropanediamine	ND		0.1	0.05	µg/L		08/21/23 00:00	09/24/23 08:08	1
Fluoranthene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Fluorene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Indeno[1,2,3-cd]pyrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Naphthalene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Perylene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Phenanthrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1
Pyrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 08:08	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
(d10-Acenaphthene)	80		27 - 133	08/21/23 00:00	09/24/23 08:08	1
(d10-Phenanthrene)	87		43 - 129	08/21/23 00:00	09/24/23 08:08	1
(d12-Chrysene)	84		52 - 144	08/21/23 00:00	09/24/23 08:08	1
(d12-Perylene)	85		36 - 161	08/21/23 00:00	09/24/23 08:08	1
(d8-Naphthalene)	72		25 - 125	08/21/23 00:00	09/24/23 08:08	1

Method: 8015 Gas (Purgeable) LL (EAL) - SW846 8015B Gasoline Range Organics

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GASOLINE	ND	U	0.02		mg/L			08/21/23 14:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
BROMOFLUOROBENZENE	81		60 - 140		08/21/23 14:32	1

Method: 8015 LL DRO/MRO/JP5/JP8 - 8015 - TPH DRO/ORO

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DIESEL	ND	U	0.025		mg/L			08/28/23 22:09	1
JP5	ND	U	0.049		mg/L			08/28/23 22:09	1
JP8	ND	U	0.049		mg/L			08/28/23 22:09	1
MOTOR OIL	ND	U	0.049		mg/L			08/28/23 22:09	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
BROMOBENZENE	67		60 - 130		08/28/23 22:09	1

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Client Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-59480-2

Client Sample ID: MOANALUA WELLS Pump 2

Lab Sample ID: 380-59480-1

Date Collected: 08/15/23 11:00

Matrix: Drinking Water

Date Received: 08/17/23 09:39

Method: 8015 LL DRO/MRO/JP5/JP8 - 8015 - TPH DRO/ORO (Continued)

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
HEXACOSANE	88		60 - 130		08/28/23 22:09	1

Client Sample ID: HALAWA WELLS UNITS 1 & 2 Pump 1

Lab Sample ID: 380-59480-2

Date Collected: 08/15/23 10:00

Matrix: Drinking Water

Date Received: 08/17/23 09:39

Method: 625 PAH Physis LL (EAL) + TICs - EPA 625 Base/Neutral and Acid Organics I

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
1-Methylphenanthrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
2,3,5-Trimethylnaphthalene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
2,6-Dimethylnaphthalene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
2-Methylnaphthalene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Acenaphthene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Acenaphthylene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Anthracene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Benz[a]anthracene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Benzo[a]pyrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Benzo[b]fluoranthene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Benzo[e]pyrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Benzo[g,h,i]perylene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Benzo[k]fluoranthene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Biphenyl	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Chrysene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Dibenz[a,h]anthracene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Dibenzo[a,l]pyrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Dibenzothiophene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Disalicylidenepropanediamine	ND		0.1	0.05	µg/L		08/21/23 00:00	09/24/23 09:56	1
Fluoranthene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Fluorene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Indeno[1,2,3-cd]pyrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Naphthalene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Perylene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Phenanthrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1
Pyrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/24/23 09:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
(d10-Acenaphthene)	75		27 - 133	08/21/23 00:00	09/24/23 09:56	1
(d10-Phenanthrene)	85		43 - 129	08/21/23 00:00	09/24/23 09:56	1
(d12-Chrysene)	84		52 - 144	08/21/23 00:00	09/24/23 09:56	1
(d12-Perylene)	88		36 - 161	08/21/23 00:00	09/24/23 09:56	1
(d8-Naphthalene)	67		25 - 125	08/21/23 00:00	09/24/23 09:56	1

Method: 8015 Gas (Purgeable) LL (EAL) - SW846 8015B Gasoline Range Organics

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GASOLINE	ND	U	0.02		mg/L			08/21/23 16:24	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
BROMOFLUOROBENZENE	82		60 - 140		08/21/23 16:24	1

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Client Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-59480-2

Client Sample ID: HALAWA WELLS UNITS 1 & 2 Pump 1

Lab Sample ID: 380-59480-2

Date Collected: 08/15/23 10:00

Matrix: Drinking Water

Date Received: 08/17/23 09:39

Method: 8015 LL DRO/MRO/JP5/JP8 - 8015 - TPH DRO/ORO

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DIESEL	ND	U	0.025		mg/L			08/28/23 22:27	1
JP5	ND	U	0.05		mg/L			08/28/23 22:27	1
JP8	ND	U	0.05		mg/L			08/28/23 22:27	1
MOTOR OIL	ND	U	0.05		mg/L			08/28/23 22:27	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
BROMOBENZENE	68		60 - 130					08/28/23 22:27	1
HEXACOSANE	83		60 - 130					08/28/23 22:27	1

Client Sample ID: TB MOANALUA WELLS

Lab Sample ID: 380-59480-3

Date Collected: 08/15/23 11:00

Matrix: Water

Date Received: 08/17/23 09:39

Method: 8015 Gas (Purgeable) LL (EAL) - SW846 8015B Gasoline Range Organics

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GASOLINE	ND	U	0.02		mg/L			08/21/23 17:01	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
BROMOFLUOROBENZENE	80		60 - 140					08/21/23 17:01	1

Client Sample ID: TB HALAWA WELLS UNITS 1 & 2

Lab Sample ID: 380-59480-4

Date Collected: 08/15/23 10:00

Matrix: Water

Date Received: 08/17/23 09:39

Method: 8015 Gas (Purgeable) LL (EAL) - SW846 8015B Gasoline Range Organics

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GASOLINE	ND	U	0.02		mg/L			08/21/23 17:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
BROMOFLUOROBENZENE	82		60 - 140					08/21/23 17:38	1

Surrogate Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-59480-2

Method: 625 PAH Physis LL (EAL) + TICs - EPA 625 Base/Neutral and Acid Organics i

Matrix: BlankMatrix

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)				
		Acenaphtl (27-133)	Phenanth (43-129)	CRY (52-144)	NPT (25-125)	PRY (36-161)
109956-B1	Method Blank	88	95	92	79	92
109956-BS1	Lab Control Sample	90	95	94	84	96
109956-BS2	Lab Control Sample Dup	94	100	98	87	99

Surrogate Legend

(d10-Acenaphthene) = (d10-Acenaphthene)

(d10-Phenanthrene) = (d10-Phenanthrene)

CRY = (d12-Chrysene)

NPT = (d8-Naphthalene)

PRY = (d12-Perylene)

Method: 625 PAH Physis LL (EAL) + TICs - EPA 625 Base/Neutral and Acid Organics i

Matrix: Drinking Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)				
		Acenaphtl (27-133)	Phenanth (43-129)	CRY (52-144)	NPT (25-125)	PRY (36-161)
380-59480-1	MOANALUA WELLS Pump 2	80	87	84	72	85
380-59480-2	HALAWA WELLS UNITS 1 & 2 Pump 1	75	85	84	67	88

Surrogate Legend

(d10-Acenaphthene) = (d10-Acenaphthene)

(d10-Phenanthrene) = (d10-Phenanthrene)

CRY = (d12-Chrysene)

NPT = (d8-Naphthalene)

PRY = (d12-Perylene)

Method: 8015 Gas (Purgeable) LL (EAL) - SW846 8015B Gasoline Range Organics

Matrix: Drinking Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)
		BFB (60-140)
380-59480-1	MOANALUA WELLS Pump 2	81
380-59480-2	HALAWA WELLS UNITS 1 & 2 Pump 1	82

Surrogate Legend

BFB = BROMOFLUOROBENZENE

Method: 8015 Gas (Purgeable) LL (EAL) - SW846 8015B Gasoline Range Organics

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)
		BFB (60-140)
380-59480-3	TB MOANALUA WELLS	80
380-59480-4	TB HALAWA WELLS UNITS 1 & 2	82

Surrogate Legend

BFB = BROMOFLUOROBENZENE

Surrogate Summary

Client: City & County of Honolulu
 Project/Site: RED-HILL

Job ID: 380-59480-2

Method: 8015 Gas (Purgeable) LL (EAL) - SW846 8015B Gasoline Range Organics

Matrix: WATER

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BFB (60-140)
23H149-01M	Matrix Spike	104
23H149-01S	Matrix Spike Duplicate	107

Surrogate Legend

BFB = BROMOFLUOROBENZENE

Method: 8015 Gas (Purgeable) LL (EAL) - SW846 8015B Gasoline Range Organics

Matrix: WATER

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BFB
23VG39H07B	Method Blank	

Surrogate Legend

BFB = BROMOFLUOROBENZENE

Method: 8015 Gas (Purgeable) LL (EAL) - SW846 8015B Gasoline Range Organics

Matrix: WATER

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BFB (70-130)
23VG39H07C	LCD	101
23VG39H07L	Lab Control Sample	104

Surrogate Legend

BFB = BROMOFLUOROBENZENE

Method: 8015 LL DRO/MRO/JP5/JP8 - 8015 - TPH DRO/ORO

Matrix: Drinking Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BB (60-130)	XACOSAI (60-130)
380-59480-1	MOANALUA WELLS Pump 2	67	88
380-59480-2	HALAWA WELLS UNITS 1 & 2 Pump 1	68	83

Surrogate Legend

BB = BROMOBENZENE

HEXACOSANE = HEXACOSANE

Method: 8015 LL DRO/MRO/JP5/JP8 - 8015 - TPH DRO/ORO

Matrix: WATER

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BB	XACOSAI
23DSH028WB	Method Blank		

Surrogate Legend

BB = BROMOBENZENE

HEXACOSANE = HEXACOSANE

Surrogate Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-59480-2

Method: 8015 LL DRO/MRO/JP5/JP8 - 8015 - TPH DRO/ORO

Matrix: WATER

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)	
		BB (60-130)	HEXACOSANE (60-130)
23DSH028WC	LCD	67	78
23DSH028WL	Lab Control Sample	72	84
23J5H028WC	LCD	77	84
23J5H028WL	Lab Control Sample	68	79
23J8H028WC	LCD	79	72
23J8H028WL	Lab Control Sample	92	81

Surrogate Legend

BB = BROMOBENZENE

HEXACOSANE = HEXACOSANE

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-59480-2

Method: 625 PAH Physis LL (EAL) + TICs - EPA 625 Base/Neutral and Acid Organics i

Lab Sample ID: 109956-B1
Matrix: BlankMatrix
Analysis Batch: O-42060

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: O-42060_P

Analyte	Blank Result	Blank Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1-Methylnaphthalene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
1-Methylphenanthrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
2,3,5-Trimethylnaphthalene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
2,6-Dimethylnaphthalene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
2-Methylnaphthalene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Acenaphthene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Acenaphthylene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Anthracene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Benz[a]anthracene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Benzo[a]pyrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Benzo[b]fluoranthene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Benzo[e]pyrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Benzo[g,h,i]perylene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Benzo[k]fluoranthene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Biphenyl	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Chrysene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Dibenz[a,h]anthracene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Dibenzo[a,l]pyrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Dibenzothiophene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Disalicylidenepropanediamine	ND		0.1	0.05	µg/L		08/21/23 00:00	09/23/23 23:07	1
Fluoranthene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Fluorene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Indeno[1,2,3-cd]pyrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Naphthalene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Perylene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Phenanthrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Pyrene	ND		0.005	0.001	µg/L		08/21/23 00:00	09/23/23 23:07	1
Surrogate	Blank %Recovery	Blank Qualifier	Limits				Prepared	Analyzed	Dil Fac
(d10-Acenaphthene)	88		27 - 133				08/21/23 00:00	09/23/23 23:07	1
(d10-Phenanthrene)	95		43 - 129				08/21/23 00:00	09/23/23 23:07	1
(d12-Chrysene)	92		52 - 144				08/21/23 00:00	09/23/23 23:07	1
(d12-Perylene)	92		36 - 161				08/21/23 00:00	09/23/23 23:07	1
(d8-Naphthalene)	79		25 - 125				08/21/23 00:00	09/23/23 23:07	1

Lab Sample ID: 109956-BS1
Matrix: BlankMatrix
Analysis Batch: O-42060

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: O-42060_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1-Methylnaphthalene	0.5	0.431		µg/L		86	31 - 128
1-Methylphenanthrene	0.5	0.46		µg/L		92	66 - 127
2,3,5-Trimethylnaphthalene	0.5	0.451		µg/L		90	55 - 122
2,6-Dimethylnaphthalene	0.5	0.451		µg/L		90	48 - 120
2-Methylnaphthalene	0.5	0.436		µg/L		87	47 - 130
Acenaphthene	0.5	0.451		µg/L		90	53 - 131
Acenaphthylene	0.5	0.455		µg/L		91	43 - 140
Anthracene	0.5	0.402		µg/L		80	58 - 135

Eurofins Eaton Analytical Pomona

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-59480-2

Method: 625 PAH Physis LL (EAL) + TICs - EPA 625 Base/Neutral and Acid Organics i (Continued)

Lab Sample ID: 109956-BS1
Matrix: BlankMatrix
Analysis Batch: O-42060

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: O-42060_P

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Benz[a]anthracene	0.5	0.447		µg/L		89	55 - 145
Benzo[a]pyrene	0.5	0.477		µg/L		95	51 - 143
Benzo[b]fluoranthene	0.5	0.435		µg/L		87	46 - 165
Benzo[e]pyrene	0.5	0.421		µg/L		84	42 - 152
Benzo[g,h,i]perylene	0.5	0.462		µg/L		92	63 - 133
Benzo[k]fluoranthene	0.5	0.454		µg/L		91	56 - 145
Biphenyl	0.5	0.457		µg/L		91	56 - 119
Chrysene	0.5	0.442		µg/L		88	56 - 141
Dibenz[a,h]anthracene	0.5	0.427		µg/L		85	55 - 150
Dibenzo[a,l]pyrene	0.5	0.544		µg/L		109	50 - 150
Dibenzothiophene	0.5	0.472		µg/L		94	46 - 126
Disalicylidenepropanediamine	50	40.5		µg/L		81	50 - 150
Fluoranthene	0.5	0.462		µg/L		92	60 - 146
Fluorene	0.5	0.451		µg/L		90	58 - 131
Indeno[1,2,3-cd]pyrene	0.5	0.365		µg/L		73	50 - 151
Naphthalene	0.5	0.437		µg/L		87	41 - 126
Perylene	0.5	0.426		µg/L		85	48 - 141
Phenanthrene	0.5	0.464		µg/L		93	67 - 127
Pyrene	0.5	0.453		µg/L		91	54 - 156

Surrogate	LCS %Recovery	LCS Qualifier	Limits
(d10-Acenaphthene)	90		27 - 133
(d10-Phenanthrene)	95		43 - 129
(d12-Chrysene)	94		52 - 144
(d12-Perylene)	96		36 - 161
(d8-Naphthalene)	84		25 - 125

Lab Sample ID: 109956-BS2
Matrix: BlankMatrix
Analysis Batch: O-42060

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: O-42060_P

Analyte	Spike Added	LCS DUP Result	LCS DUP Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1-Methylnaphthalene	0.5	0.453		µg/L		91	31 - 128	6	30
1-Methylphenanthrene	0.5	0.463		µg/L		93	66 - 127	1	30
2,3,5-Trimethylnaphthalene	0.5	0.459		µg/L		92	55 - 122	2	30
2,6-Dimethylnaphthalene	0.5	0.453		µg/L		91	48 - 120	1	30
2-Methylnaphthalene	0.5	0.44		µg/L		88	47 - 130	1	30
Acenaphthene	0.5	0.457		µg/L		91	53 - 131	1	30
Acenaphthylene	0.5	0.464		µg/L		93	43 - 140	2	30
Anthracene	0.5	0.457		µg/L		91	58 - 135	13	30
Benz[a]anthracene	0.5	0.451		µg/L		90	55 - 145	1	30
Benzo[a]pyrene	0.5	0.48		µg/L		96	51 - 143	1	30
Benzo[b]fluoranthene	0.5	0.438		µg/L		88	46 - 165	1	30
Benzo[e]pyrene	0.5	0.434		µg/L		87	42 - 152	4	30
Benzo[g,h,i]perylene	0.5	0.458		µg/L		92	63 - 133	0	30
Benzo[k]fluoranthene	0.5	0.448		µg/L		90	56 - 145	1	30
Biphenyl	0.5	0.465		µg/L		93	56 - 119	2	30
Chrysene	0.5	0.443		µg/L		89	56 - 141	1	30

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QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-59480-2

Method: 625 PAH Physis LL (EAL) + TICs - EPA 625 Base/Neutral and Acid Organics i (Continued)

Lab Sample ID: 109956-BS2
Matrix: BlankMatrix
Analysis Batch: O-42060

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: O-42060_P

Analyte	Spike Added	LCS DUP Result	LCS DUP Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Dibenz[a,h]anthracene	0.5	0.452		µg/L		90	55 - 150	6	30
Dibenzo[a,l]pyrene	0.5	0.544		µg/L		109	50 - 150	0	30
Dibenzothiophene	0.5	0.476		µg/L		95	46 - 126	1	30
Disalicylidenepropanediamine	50	43.3		µg/L		87	50 - 150	7	30
Fluoranthene	0.5	0.475		µg/L		95	60 - 146	3	30
Fluorene	0.5	0.462		µg/L		92	58 - 131	2	30
Indeno[1,2,3-cd]pyrene	0.5	0.37		µg/L		74	50 - 151	1	30
Naphthalene	0.5	0.436		µg/L		87	41 - 126	0	30
Perylene	0.5	0.426		µg/L		85	48 - 141	0	30
Phenanthrene	0.5	0.473		µg/L		95	67 - 127	2	30
Pyrene	0.5	0.462		µg/L		92	54 - 156	1	30

Surrogate	LCS DUP %Recovery	LCS DUP Qualifier	Limits
(d10-Acenaphthene)	94		27 - 133
(d10-Phenanthrene)	100		43 - 129
(d12-Chrysene)	98		52 - 144
(d12-Perylene)	99		36 - 161
(d8-Naphthalene)	87		25 - 125

Method: 8015 Gas (Purgeable) LL (EAL) - SW846 8015B Gasoline Range Organics

Lab Sample ID: 23VG39H07B
Matrix: WATER
Analysis Batch: 23VG39H07

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
GASOLINE	ND	U	0.02		mg/L			08/21/23 12:41	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
BROMOFLUOROBENZENE					08/21/23 12:41	1

Lab Sample ID: 23VG39H07L
Matrix: WATER
Analysis Batch: 23VG39H07

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
GASOLINE	0.5	0.476		mg/L		95	60 - 130

Surrogate	LCS %Recovery	LCS Qualifier	Limits
BROMOFLUOROBENZENE	104		70 - 130

Lab Sample ID: 23H149-01M
Matrix: WATER
Analysis Batch: 23VG39H07

Client Sample ID: Matrix Spike
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
GASOLINE	ND		0.5	0.461		mg/L		92	50 - 130

Eurofins Eaton Analytical Pomona

QC Sample Results

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-59480-2

Method: 8015 Gas (Purgeable) LL (EAL) - SW846 8015B Gasoline Range Organics (Continued)

Lab Sample ID: 23H149-01M
Matrix: WATER
Analysis Batch: 23VG39H07

Client Sample ID: Matrix Spike
Prep Type: Total/NA

	MS	MS	
Surrogate	%Recovery	Qualifier	Limits
BROMOFLUOROBENZENE	104		60 - 140

Lab Sample ID: 23H149-01S
Matrix: WATER
Analysis Batch: 23VG39H07

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
GASOLINE	ND		0.5	0.463		mg/L		93	50 - 130	0	30

	MSD	MSD	
Surrogate	%Recovery	Qualifier	Limits
BROMOFLUOROBENZENE	107		60 - 140

Method: 8015 LL DRO/MRO/JP5/JP8 - 8015 - TPH DRO/ORO

Lab Sample ID: 23DSH028WB
Matrix: WATER
Analysis Batch: 23DSH028W

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
DIESEL	ND	U	0.025		mg/L			08/28/23 19:20	1
JP5	ND	U	0.05		mg/L			08/28/23 19:20	1
JP8	ND	U	0.05		mg/L			08/28/23 19:20	1
MOTOR OIL	ND	U	0.05		mg/L			08/28/23 19:20	1

	MB	MB			
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed
BROMOBENZENE					08/28/23 19:20
HEXACOSANE					08/28/23 19:20

Lab Sample ID: 23DSH028WL
Matrix: WATER
Analysis Batch: 23DSH028W

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
DIESEL	2.5	1.89		mg/L		76	50 - 130

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
BROMOBENZENE	72		60 - 130
HEXACOSANE	84		60 - 130

Lab Sample ID: 23J5H028WL
Matrix: WATER
Analysis Batch: 23DSH028W

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
JP5	2.5	1.55		mg/L		62	30 - 160

QC Sample Results

Client: City & County of Honolulu
 Project/Site: RED-HILL

Job ID: 380-59480-2

Method: 8015 LL DRO/MRO/JP5/JP8 - 8015 - TPH DRO/ORO (Continued)

Lab Sample ID: 23J5H028WL
Matrix: WATER
Analysis Batch: 23DSH028W

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

<i>Surrogate</i>	<i>LCS</i> <i>%Recovery</i>	<i>LCS</i> <i>Qualifier</i>	<i>Limits</i>
BROMOBENZENE	68		60 - 130
HEXACOSANE	79		60 - 130

Lab Sample ID: 23J8H028WL
Matrix: WATER
Analysis Batch: 23DSH028W

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

<i>Analyte</i>	<i>Spike</i> <i>Added</i>	<i>LCS</i> <i>Result</i>	<i>LCS</i> <i>Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec</i> <i>Limits</i>
JP8	2.5	2.63		mg/L		105	30 - 160

<i>Surrogate</i>	<i>LCS</i> <i>%Recovery</i>	<i>LCS</i> <i>Qualifier</i>	<i>Limits</i>
BROMOBENZENE	92		60 - 130
HEXACOSANE	81		60 - 130

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QC Association Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-59480-2

Subcontract

Analysis Batch: O-42060

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-59480-1	MOANALUA WELLS Pump 2	Total/NA	Drinking Water	625 PAH Physis LL (EAL) + TICs	O-42060_P
380-59480-2	HALAWA WELLS UNITS 1 & 2 Pump 1	Total/NA	Drinking Water	625 PAH Physis LL (EAL) + TICs	O-42060_P
109956-B1	Method Blank	Total/NA	BlankMatrix	625 PAH Physis LL (EAL) + TICs	O-42060_P
109956-BS1	Lab Control Sample	Total/NA	BlankMatrix	625 PAH Physis LL (EAL) + TICs	O-42060_P
109956-BS2	Lab Control Sample Dup	Total/NA	BlankMatrix	625 PAH Physis LL (EAL) + TICs	O-42060_P

Analysis Batch: 23DSH028W

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-59480-1	MOANALUA WELLS Pump 2	Total/NA	Drinking Water	8015 LL DRO/MRO/JP5/J P8	
380-59480-2	HALAWA WELLS UNITS 1 & 2 Pump 1	Total/NA	Drinking Water	8015 LL DRO/MRO/JP5/J P8	
23DSH028WB	Method Blank	Total/NA	WATER	8015 LL DRO/MRO/JP5/J P8	
23DSH028WL	Lab Control Sample	Total/NA	WATER	8015 LL DRO/MRO/JP5/J P8	
23J5H028WL	Lab Control Sample	Total/NA	WATER	8015 LL DRO/MRO/JP5/J P8	
23J8H028WL	Lab Control Sample	Total/NA	WATER	8015 LL DRO/MRO/JP5/J P8	

Analysis Batch: 23VG39H07

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-59480-1	MOANALUA WELLS Pump 2	Total/NA	Drinking Water	8015 Gas (Purgeable) LL (EAL)	
380-59480-2	HALAWA WELLS UNITS 1 & 2 Pump 1	Total/NA	Drinking Water	8015 Gas (Purgeable) LL (EAL)	
380-59480-3	TB MOANALUA WELLS	Total/NA	Water	8015 Gas (Purgeable) LL (EAL)	
380-59480-4	TB HALAWA WELLS UNITS 1 & 2	Total/NA	Water	8015 Gas (Purgeable) LL (EAL)	
23VG39H07B	Method Blank	Total/NA	WATER	8015 Gas (Purgeable) LL (EAL)	
23VG39H07L	Lab Control Sample	Total/NA	WATER	8015 Gas (Purgeable) LL (EAL)	
23H149-01M	Matrix Spike	Total/NA	WATER	8015 Gas (Purgeable) LL (EAL)	
23H149-01S	Matrix Spike Duplicate	Total/NA	WATER	8015 Gas (Purgeable) LL (EAL)	

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QC Association Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-59480-2

Subcontract

Prep Batch: O-42060_P

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
380-59480-1	MOANALUA WELLS Pump 2	Total/NA	Drinking Water	EPA_625	
380-59480-2	HALAWA WELLS UNITS 1 & 2 Pump 1	Total/NA	Drinking Water	EPA_625	
109956-B1	Method Blank	Total/NA	BlankMatrix	EPA_625	
109956-BS1	Lab Control Sample	Total/NA	BlankMatrix	EPA_625	
109956-BS2	Lab Control Sample Dup	Total/NA	BlankMatrix	EPA_625	

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Lab Chronicle

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-59480-2

Client Sample ID: MOANALUA WELLS Pump 2

Lab Sample ID: 380-59480-1

Date Collected: 08/15/23 11:00

Matrix: Drinking Water

Date Received: 08/17/23 09:39

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	EPA_625		1	O-42060_P			08/21/23 00:00
Total/NA	Analysis	625 PAH Physis LL (EAL) + TICs		1	O-42060	YC		09/24/23 08:08
Total/NA	Analysis	8015 Gas (Purgeable) LL (EAL)		1	23VG39H07	SCerva		08/21/23 14:32
Total/NA	Analysis	8015 LL DRO/MRO/JP5/JP8		1	23DSH028W	SDees		08/28/23 22:09

Client Sample ID: HALAWA WELLS UNITS 1 & 2 Pump 1

Lab Sample ID: 380-59480-2

Date Collected: 08/15/23 10:00

Matrix: Drinking Water

Date Received: 08/17/23 09:39

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	EPA_625		1	O-42060_P			08/21/23 00:00
Total/NA	Analysis	625 PAH Physis LL (EAL) + TICs		1	O-42060	YC		09/24/23 09:56
Total/NA	Analysis	8015 Gas (Purgeable) LL (EAL)		1	23VG39H07	SCerva		08/21/23 16:24
Total/NA	Analysis	8015 LL DRO/MRO/JP5/JP8		1	23DSH028W	SDees		08/28/23 22:27

Client Sample ID: TB MOANALUA WELLS

Lab Sample ID: 380-59480-3

Date Collected: 08/15/23 11:00

Matrix: Water

Date Received: 08/17/23 09:39

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015 Gas (Purgeable) LL (EAL)		1	23VG39H07	SCerva		08/21/23 17:01

Client Sample ID: TB HALAWA WELLS UNITS 1 & 2

Lab Sample ID: 380-59480-4

Date Collected: 08/15/23 10:00

Matrix: Water

Date Received: 08/17/23 09:39

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	8015 Gas (Purgeable) LL (EAL)		1	23VG39H07	SCerva		08/21/23 17:38

Laboratory References:

= Physis Environmental Laboratories, 1904 Wright Circle, Anaheim, CA 92806

Method Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-59480-2

Method	Method Description	Protocol	Laboratory
625	EPA 625 Base/Neutral and Acid Organics i	EPA	
8015	8015 - TPH DRO/ORO	EPA	
8015B	SW846 8015B Gasoline Range Organics	SW846	

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

= Physis Environmental Laboratories, 1904 Wright Circle, Anaheim, CA 92806



Sample Summary

Client: City & County of Honolulu
Project/Site: RED-HILL

Job ID: 380-59480-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
380-59480-1	MOANALUA WELLS Pump 2	Drinking Water	08/15/23 11:00	08/17/23 09:39
380-59480-2	HALAWA WELLS UNITS 1 & 2 Pump 1	Drinking Water	08/15/23 10:00	08/17/23 09:39
380-59480-3	TB MOANALUA WELLS	Water	08/15/23 11:00	08/17/23 09:39
380-59480-4	TB HALAWA WELLS UNITS 1 & 2	Water	08/15/23 10:00	08/17/23 09:39

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EMAX
LABORATORIES, INC.
3051 Fujita Street
Torrance, CA 90505
Tel: (310)-618-8889

Date: 09-13-2023
EMAX Batch No.: 23H149

Attn: Jackie Contreras

Eurofins Eaton Analytical
750 Royal Oaks Dr., Suite 100
Monrovia, CA 91016-3629

Subject: Laboratory Report
Project: 380-59480

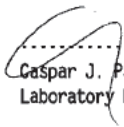
Enclosed is the Laboratory report for samples received on 08/18/23.
The data reported relate only to samples listed below :

Sample ID	Control #	Col Date	Matrix	Analysis
380-59480-1	H149-01	08/15/23	WATER	TPH GASOLINE TPH
380-59480-2	H149-02	08/15/23	WATER	TPH GASOLINE TPH
380-59480-3	H149-03	08/15/23	WATER	TPH GASOLINE
380-59480-4	H149-04	08/15/23	WATER	TPH GASOLINE
380-59480-1MS	H149-01M	08/15/23	WATER	TPH GASOLINE
380-59480-1MSD	H149-01S	08/15/23	WATER	TPH GASOLINE

The results are summarized on the following pages.

Please feel free to call if you have any questions concerning these results.

Sincerely yours,


Gaspar J. Pang
Laboratory Director

This report is confidential and intended solely for the use of the individual or entity to whom it is addressed. This report shall not be reproduced except in full or without the written approval of EMAX.

EMAX certifies that results included in this report meets all TNI & DOD requirements unless noted in the Case Narrative.

NELAP Accredited Certificate Number CA002912022-24
ANAB Accredited DoD ELAP and ISO/IEC 17025 Certificate Number L2278 Testing
California ELAP Accredited Certificate Number 2672



Client Information (Sub Contract Lab)

Client Contact: **EMAX Laboratories Inc** | Ship/ing/Receiving: **EMAX Laboratories Inc** | Lab PM: **Arada, Rachelle** | Carrier Tracking No(s): **380-71676-1**
 Phone: **3051 Fujita Street, Torrance, CA 90505** | Phone: **8/26/2023** | E-Mail: **Rachelle.Arada@eurofins.com** | State of Origin: **Hawaii** | Page: **1 of 1**
 Company: **EMAX Laboratories Inc** | Address: **3051 Fujita Street, Torrance, CA 90505** | Accreditations Required (See note): **State - Hawaii** | Job #: **380-59480-1**

Due Date Requested: **8/26/2023** | TAT Requested (days): **7** | Analysis Requested: **SUB (8015 Gas (Purgeable) LL (EAL))/ 8015 Gas (Purgeable) LL (EAL)**
SUB (8015 LL DROMRO/JP5/JP8)/ 8015 LL DROMRO/JP5/JP8

Project Name: **RED-HILL** | Project #: **38001111** | Field Filtered Sample (Yes or No): **Yes**
 Site: **Honolulu BWS Sites** | SSSOW#: **SSOW#** | Perform MS/MSD (Yes or No): **Yes**

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (Metal, Organic, Inorganic, A&A)	Preservation Code	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Analysis Requested	Total Number of containers	Special Instructions/Note
1 MOANALUA WELLS (380-59480-1)	8/15/23	11:00		Water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		6	See Attached Instructions
2 HALAWA WELLS UNITS 1 & 2 (380-59480-2)	8/15/23	10:00		Water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		6	See Attached Instructions
3 TB MOANALUA WELLS (380-59480-3)	8/15/23	11:00		Water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		2	See Attached Instructions
4 TB HALAWA WELLS UNITS 1 & 2 (380-59480-4)	8/15/23	10:00		Water		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		2	See Attached Instructions

Note: Since laboratory accreditations are subject to change, Eurofins Eaton Analytical, LLC places the ownership of method, analyze & accreditation compliance upon our subcontracted laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/matrix being analyzed, the samples must be shipped back to the Eurofins Eaton Analytical, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Eaton Analytical, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Eaton Analytical, LLC.

Possible Hazard Identification

Unconfirmed: **Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)**
 Deliverable Requested: I, II, III, IV, Other (specify) **Primary Deliverable Rank: 2** | Special Instructions/QC Requirements: Return To Client | Disposal By Lab | Archive For **Months**

Empty Kit Relinquished by: **Date:** **Time:** **Method of Shipment:**

Relinquished by: **Date/Time:** **Company:** **Received by:** **Date/Time:** **Company:**

Relinquished by: **Date/Time:** **Company:** **Received by:** **Date/Time:** **Company:**

Custody Seals Intact: **Custody Seal No.:** **Cooler Temperature(s) °C and Other Remarks:**

- LEGEND:
- D1 Analysis is not indicated in
 - D2 Analysis mismatch COC vs label
 - D3 Sample ID mismatch COC vs label
 - D4 Sample ID is not indicated in
 - D5 Container - (improper) [leaking] [broken]
 - D6 Date/Time is not indicated in
 - D7 Date/Time mismatch COC vs label
 - D8 Sample listed in COC is not received
 - D9 Sample received is not listed in COC
 - D10 No initial/date on corrections in COC/label
 - D11 Container count mismatch COC vs received
 - D12 Container size mismatch COC vs received

- Code Description-Sample Management
- D13 Out of Holding Time
 - D14 Bubble is >6mm
 - D15 No trip blank in cooler
 - D16 Preservation not indicated in
 - D17 Preservation mismatch COC vs label
 - D18 Insufficient chemical preservative
 - D19 Insufficient Sample
 - D20 No filtration info for dissolved analysis
 - D21 No sample for moisture determination
 - D22
 - D23
 - D24

- Code Description-Sample Management
- R1 Proceed as indicated in COC Label
 - R2 Refer to attached instruction
 - R3 Cancel the analysis
 - R4 Use vial with smallest bubble first
 - R5 Log-in with latest sampling date and time+ 1 min
 - R6 Adjust pH as necessary
 - R7 Filter and preserved as necessary
 - R8 Informed Client
 - R9
 - R10
 - R11
 - R12

Sample Labeling
Date 08/18/23
Sofia-Ramirez
Jocelyn
Date 8/18/23

SRF
Date 8/18/23
Date 8/22/23
PM
MS

REVIEWS:

SAMPLE MATRIX IS DRINKING WATER? YES NO

NOTES/OBSERVATIONS:

pH holding time requirement for water samples is 15 mins. Water samples for pH analysis are received beyond 15 minutes from sampling time.

MS 8/22/23

LabSampleID	LabSampleContainerID	Code	ClientSample Label ID / Information	Corrective Action
12	516,112	D2	JPS/JPS not indicated on label	R8
34	1416	D7	two dates on label - 8/15/23 & 8/17/23	R1

DISCREPANCIES

Note:

Comments: Temperature is out of range. PM was informed IMMEDIATELY.

Thermometer: (Cool, 56 °C, but not frozen)

Temperatures

Condition Correction factor: -0.1

PACKAGING INSPECTION

- Container
- Cooler
- Box
- Intact
- Syrofoam
- Damaged
- Popcorn
- Sufficient
- Other

Note:

Safety Issues (if any)

High concentrations expected

From Superfund Site

Rad screening required

COC INSPECTION

- Client Name
- Client PM/FIC
- Tel # / Fax #
- Address
- Sampling Date/Time
- Sample ID
- Matrix
- Analysis Required
- Preservative (if any)
- TAT

Type of Delivery	<input type="checkbox"/> EMSX Courier <input checked="" type="checkbox"/> Client Delivery
ECN 23H149	Recipient VHOWIN ZAMORA
Arb/Tr/Tracking Number	Date 08/18/23
	Time 1203



SAMPLE RECEIPT FORM 1

REFERENCE: EMAX-SM02 Rev. 12

REPORTING CONVENTIONS

DATA QUALIFIERS:

Lab Qualifier	AFCEE Qualifier	Description
J	F	Indicates that the analyte is positively identified and the result is less than RL but greater than MDL.
N		Indicates presumptive evidence of a compound.
B	B	Indicates that the analyte is found in the associated method blank as well as in the sample at above QC level.
E	J	Indicates that the result is above the maximum calibration range or estimated value.
*	*	Out of QC limit.

Note: The above qualifiers are used to flag the results unless the project requires a different set of qualification criteria.

ACRONYMS AND ABBREVIATIONS:

CRDL	Contract Required Detection Limit
RL	Reporting Limit
MRL	Method Reporting Limit
PQL	Practical Quantitation Limit
MDL	Method Detection Limit
DO	Diluted out

DATES

The date and time information for leaching and preparation reflect the beginning date and time of the procedure unless the method, protocol, or project specifically requires otherwise.

LABORATORY REPORT FOR

EUROFINS EATON ANALYTICAL

380-59480

METHOD 5030B/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

SDG#: 23H149

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CASE NARRATIVE

Client : EUROFINS EATON ANALYTICAL

Project: 380-59480

SDG : 23H149

METHOD 5030B/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

A total of four(4) water samples were received on 08/18/23 to be analyzed for Total Petroleum Hydrocarbons by Purge and Trap in accordance with Method 5030B/8015B and project specific requirements.

Holding Time

Samples were analyzed within the prescribed holding time.

Calibration

Multi-calibration points were generated to establish initial calibration (ICAL). ICAL was verified using a secondary source (ICV). Continuing calibration (CCV) verifications were carried out on a frequency specified by the project. All calibration requirements were within acceptance criteria. Refer to calibration summary forms of ICAL, ICV and CCV for details. MRL was analyzed as required by the project. Refer to MRL summary form for details.

Method Blank

Method blank was prepared and analyzed at the frequency required by the project. For this SDG, one(1) method blank was analyzed. VG39H07B - result was compliant to project requirement. Refer to sample result summary form for details.

Lab Control Sample

Lab control sample was prepared and analyzed at a frequency required by the project. For this SDG, one(1) set of LCS/LCD was analyzed. VG39H07L/VG39H07C were within LCS limits. Refer to LCS summary form for details.

Matrix QC Sample

Matrix spike sample was prepared and analyzed at a frequency required by the project. For this SDG, one(1) set of MS/MSD was analyzed. Gasoline was within MS QC limits in H149-01M/H149-01S. Refer to Matrix QC summary form for details.

Surrogate

Surrogate was added on QC and field samples. All surrogate recoveries were within QC limits. Refer to sample result summary forms for details.

Sample Analysis

Samples were analyzed according to prescribed analytical procedures. Results were evaluated in accordance to project requirements. For this SDG, all quality control requirements were met.

LAB CHRONICLE
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client : EUROFINS EATON ANALYTICAL
 Project : 380-59480
 SDG NO. : 23H149
 Instrument ID : GCT039

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis DateTime	Extraction DateTime	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
									WATER
MBLK1W	VG39H07B	1	NA	08/21/2312:41	08/21/2312:41	EH21005A	EH21003A	23VG39H07	Method Blank
LCS1W	VG39H07L	1	NA	08/21/2313:18	08/21/2313:18	EH21006A	EH21003A	23VG39H07	Lab Control Sample (LCS)
LCD1W	VG39H07C	1	NA	08/21/2313:55	08/21/2313:55	EH21007A	EH21003A	23VG39H07	LCS Duplicate
380-59480-1	H149-01	1	NA	08/21/2314:32	08/21/2314:32	EH21008A	EH21003A	23VG39H07	Field Sample
380-59480-1MS	H149-01M	1	NA	08/21/2315:09	08/21/2315:09	EH21009A	EH21003A	23VG39H07	Matrix Spike Sample (MS)
380-59480-2	H149-01S	1	NA	08/21/2315:47	08/21/2315:47	EH21010A	EH21003A	23VG39H07	MS Duplicate (MSD)
380-59480-3	H149-02	1	NA	08/21/2316:24	08/21/2316:24	EH21011A	EH21003A	23VG39H07	Field Sample
380-59480-4	H149-03	1	NA	08/21/2317:01	08/21/2317:01	EH21012A	EH21003A	23VG39H07	Field Sample
	H149-04	1	NA	08/21/2317:38	08/21/2317:38	EH21013A	EH21003A	23VG39H07	Field Sample

FN - Filename
 % Moist - Percent Moisture



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SAMPLE RESULTS

METHOD 5030B/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client : EUROFINS EATON ANALYTICAL	Date Collected: 08/15/23 11:00
Project : 380-59480	Date Received: 08/18/23
Batch No. : 23H149	Date Extracted: 08/21/23 14:32
Sample ID : 380-59480-1	Date Analyzed: 08/21/23 14:32
Lab Samp ID: H149-01	Dilution Factor: 1
Lab File ID: EH21008A	Matrix: WATER
Ext Btch ID: 23VG39H07	% Moisture: NA
Calib. Ref.: EH21003A	Instrument ID: 39

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)	
GASOLINE	ND	0.020	0.010	
SURROGATE PARAMETERS	RESULT	SPK_AMT	%RECOVERY	QC LIMIT
Bromofluorobenzene	0.0323	0.0400	81	60-140

Notes:

Parameter H-C Range
Gasoline C6-C10
Reported ND at RL quantitated per pattern recognition.

Detection limits are reported relative to sample result significant figures.

Sample Amount : 5ml	Final Volume : 5ml
Prepared by : SCerva	Analyzed by : SCerva

METHOD 5030B/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client : EUROFINS EATON ANALYTICAL	Date Collected: 08/15/23 10:00
Project : 380-59480	Date Received: 08/18/23
Batch No. : 23H149	Date Extracted: 08/21/23 16:24
Sample ID : 380-59480-2	Date Analyzed: 08/21/23 16:24
Lab Samp ID: H149-02	Dilution Factor: 1
Lab File ID: EH21011A	Matrix: WATER
Ext Btch ID: 23VG39H07	% Moisture: NA
Calib. Ref.: EH21003A	Instrument ID: 39

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
----- GASOLINE	ND	0.020	0.010
SURROGATE PARAMETERS	RESULT	SPK_AMT	%RECOVERY QC LIMIT
----- Bromofluorobenzene	0.0328	0.0400	82 60-140

Notes:

Parameter H-C Range

Gasoline C6-C10

Reported ND at RL quantitated per pattern recognition.

Detection limits are reported relative to sample result significant figures.

Sample Amount : 5ml

Final Volume : 5ml

Prepared by : SCerva

Analyzed by : SCerva

METHOD 5030B/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client	: EUROFINS EATON ANALYTICAL	Date Collected:	08/15/23 11:00
Project	: 380-59480	Date Received:	08/18/23
Batch No.	: 23H149	Date Extracted:	08/21/23 17:01
Sample ID	: 380-59480-3	Date Analyzed:	08/21/23 17:01
Lab Samp ID:	H149-03	Dilution Factor:	1
Lab File ID:	EH21012A	Matrix:	WATER
Ext Btch ID:	23VG39H07	% Moisture:	NA
Calib. Ref.:	EH21003A	Instrument ID:	39

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)	
GASOLINE	ND	0.020	0.010	
SURROGATE PARAMETERS	RESULT	SPK_AMT	%RECOVERY	QC LIMIT
Bromofluorobenzene	0.0319	0.0400	80	60-140

Notes:

Parameter H-C Range
Gasoline C6-C10

Reported ND at RL quantitated per pattern recognition.

Detection limits are reported relative to sample result significant figures.

Sample Amount : 5ml Final Volume : 5ml
Prepared by : SCerva Analyzed by : SCerva

METHOD 5030B/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client : EUROFINS EATON ANALYTICAL	Date Collected: 08/15/23 10:00
Project : 380-59480	Date Received: 08/18/23
Batch No. : 23H149	Date Extracted: 08/21/23 17:38
Sample ID : 380-59480-4	Date Analyzed: 08/21/23 17:38
Lab Samp ID: H149-04	Dilution Factor: 1
Lab File ID: EH21013A	Matrix: WATER
Ext Btch ID: 23VG39H07	% Moisture: NA
Calib. Ref.: EH21003A	Instrument ID: 39

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)	
GASOLINE	ND	0.020	0.010	
SURROGATE PARAMETERS	RESULT	SPK_AMT	%RECOVERY	QC LIMIT
Bromofluorobenzene	0.0328	0.0400	82	60-140

Notes:

Parameter H-C Range

Gasoline C6-C10

Reported ND at RL quantitated per pattern recognition.

Detection limits are reported relative to sample result significant figures.

Sample Amount : 5ml

Final Volume : 5ml

Prepared by : SCerva

Analyzed by : SCerva

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QC SUMMARIES

METHOD 5030B/8015B
TOTAL PETROLEUM HYDROCARBONS BY PURGE AND TRAP

Client : EUROFINS EATON ANALYTICAL	Date Collected: 08/21/23 12:41
Project : 380-59480	Date Received: 08/21/23
Batch No. : 23H149	Date Extracted: 08/21/23 12:41
Sample ID : MBLK1W	Date Analyzed: 08/21/23 12:41
Lab Samp ID: VG39H07B	Dilution Factor: 1
Lab File ID: EH21005A	Matrix: WATER
Ext Btch ID: 23VG39H07	% Moisture: NA
Calib. Ref.: EH21003A	Instrument ID: 39

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
GASOLINE	ND	0.020	0.010

SURROGATE PARAMETERS	RESULT	SPK_AMT	%RECOVERY	QC LIMIT
Bromofluorobenzene	0.0322	0.0400	81	60-140

Notes:

Parameter H-C Range
Gasoline C6-C10

Reported ND at RL quantitated per pattern recognition.

Detection limits are reported relative to sample result significant figures.

Sample Amount : 5ml	Final Volume : 5ml
Prepared by : SCerva	Analyzed by : SCerva

EMAX QUALITY CONTROL DATA
LAB CONTROL SAMPLE ANALYSIS

CLIENT : EUROFINS EATON ANALYTICAL
PROJECT : 380-59480
BATCH NO. : 23H149
METHOD : 5030B/8015B

MATRIX	: WATER		% MOISTURE:NA
DILUTION FACTOR:	1	1	1
SAMPLE ID	: MBLK1W	LCS1W	LCD1W
LAB SAMPLE ID	: VG39H07B	VG39H07L	VG39H07C
LAB FILE ID	: EH21005A	EH21006A	EH21007A
DATE PREPARED	: 08/21/23 12:41	08/21/23 13:18	08/21/23 13:55
DATE ANALYZED	: 08/21/23 12:41	08/21/23 13:18	08/21/23 13:55
PREP BATCH	: 23VG39H07	23VG39H07	23VG39H07
CALIBRATION REF:	EH21003A	EH21003A	EH21003A

ACCESSION:

PARAMETERS	MBResult (mg/L)	SpikeAmt (mg/L)	LCSResult (mg/L)	LCSRec (%)	SpikeAmt (mg/L)	LCDResult (mg/L)	LCDRec (%)	RPD (%)	QCLimit (%)	MaxRPD (%)
Gasoline	ND	0.500	0.476	95	0.500	0.449	90	6	60-130	30

SURROGATE PARAMETER	SpikeAmt (mg/L)	LCSResult (mg/L)	LCSRec (%)	SpikeAmt (mg/L)	LCDResult (mg/L)	LCDRec (%)	QCLimit (%)
Bromofluorobenzene	0.0400	0.0416	104	0.0400	0.0404	101	70-130

MB: Method Blank sample LCS: Lab Control Sample LCD: Lab Control Sample Duplicate

EMAX QUALITY CONTROL DATA
MS/MSD ANALYSIS

CLIENT : EUROFINS EATON ANALYTICAL
PROJECT : 380-59480
BATCH NO. : 23H149
METHOD : 5030B/8015B

MATRIX	: WATER		% MOISTURE:NA
DILUTION FACTOR:	1	1	1
SAMPLE ID	: 380-59480-1	380-59480-1MS	380-59480-1MSD
LAB SAMPLE ID	: H149-01	H149-01M	H149-01S
LAB FILE ID	: EH21008A	EH21009A	EH21010A
DATE PREPARED	: 08/21/23 14:32	08/21/23 15:09	08/21/23 15:47
DATE ANALYZED	: 08/21/23 14:32	08/21/23 15:09	08/21/23 15:47
PREP BATCH	: 23VG39H07	23VG39H07	23VG39H07
CALIBRATION REF:	EH21003A	EH21003A	EH21003A

ACCESSION:

PARAMETERS	PSResult (mg/L)	SpikeAmt (mg/L)	MSResult (mg/L)	MSRec (%)	SpikeAmt (mg/L)	MSDResult (mg/L)	MSDRec (%)	RPD (%)	QCLimit (%)	MaxRPD (%)
Gasoline	ND	0.500	0.461	92	0.500	0.463	93	0	50-130	30

SURROGATE PARAMETER	SpikeAmt (mg/L)	MSResult (mg/L)	MSRec (%)	SpikeAmt (mg/L)	MSDResult (mg/L)	MSDRec (%)	QCLimit (%)
Bromofluorobenzene	0.0400	0.0415	104	0.0400	0.0429	107	60-140

PS: Parent Sample MS: Matrix Spike MSD: Matrix Spike Duplicate

LABORATORY REPORT FOR

EUROFINS EATON ANALYTICAL

380-59480

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

SDG#: 23H149

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CASE NARRATIVE

Client : EUROFINS EATON ANALYTICAL

Project: 380-59480

SDG : 23H149

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

A total of two(2) water samples were received on 08/18/23 to be analyzed for Total Petroleum Hydrocarbons by Extraction in accordance with Method 3520C/8015B and project specific requirements.

Holding Time

Samples were analyzed within the prescribed holding time.

Calibration

Multi-calibration points were generated to establish initial calibration (ICAL). ICAL was verified using a secondary source (ICV). Continuing calibration (CCV) verifications were carried out on a frequency specified by the project. All calibration requirements were within acceptance criteria. Refer to calibration summary forms of ICAL, ICV and CCV for details. MRL was analyzed as required by the project. Refer to MRL summary form for details.

Method Blank

Method blank was prepared and analyzed at the frequency required by the project. For this SDG, one(1) method blank was analyzed. DSH028WB - result was compliant to project requirement. Refer to sample result summary form for details.

Lab Control Sample

Lab control sample was prepared and analyzed at a frequency required by the project. For this SDG, one(1) set of LCS/LCD was analyzed. DSH028WL/DSH028WC were within LCS limits. Refer to LCS summary form for details.

Matrix QC Sample

No matrix QC sample was provided on this SDG.

Surrogate

Surrogates were added on QC and field samples. All surrogate recoveries were within QC limits. Refer to sample result summary forms for details.

Sample Analysis

Samples were analyzed according to prescribed analytical procedures. Results were evaluated in accordance to project requirements. For this SDG, all quality control requirements were met.

CASE NARRATIVE

Client : EUROFINS EATON ANALYTICAL

Project: 380-59480

SDG : 23H149

METHOD 3520C/8015B
PETROLEUM HYDROCARBONS BY EXTRACTION

A total of two(2) water samples were received on 08/18/23 to be analyzed for Petroleum Hydrocarbons by Extraction in accordance with Method 3520C/8015B and project specific requirements.

Holding Time

Samples were analyzed within the prescribed holding time.

Calibration

Multi-calibration points were generated to establish initial calibration (ICAL). ICAL was verified using a secondary source (ICV). Continuing calibration (CCV) verifications were carried out on a frequency specified by the project. All calibration requirements were within acceptance criteria. Refer to calibration summary forms of ICAL, ICV and CCV for details. MRL was analyzed as required by the project. Refer to MRL summary form for details.

Method Blank

Method blank was prepared and analyzed at the frequency required by the project. For this SDG, one(1) method blank was analyzed. DSH028WB - result was compliant to project requirement. Refer to sample result summary form for details.

Lab Control Sample

Lab control sample was prepared and analyzed at a frequency required by the project. For this SDG, one(1) set of LCS/LCD was analyzed. J5H028WL/J5H028WC were within LCS limits. Refer to LCS summary form for details.

Matrix QC Sample

No matrix QC sample was provided on this SDG.

Surrogate

Surrogates were added on QC and field samples. All surrogate recoveries were within QC limits. Refer to sample result summary forms for details.

Sample Analysis

Samples were analyzed according to prescribed analytical procedures. Results were evaluated in accordance to project requirements. For this SDG, all quality control requirements were met.

CASE NARRATIVE

Client : EUROFINS EATON ANALYTICAL

Project: 380-59480

SDG : 23H149

METHOD 3520C/8015B
PETROLEUM HYDROCARBONS BY EXTRACTION

A total of two(2) water samples were received on 08/18/23 to be analyzed for Petroleum Hydrocarbons by Extraction in accordance with Method 3520C/8015B and project specific requirements.

Holding Time

Samples were analyzed within the prescribed holding time.

Calibration

Multi-calibration points were generated to establish initial calibration (ICAL). ICAL was verified using a secondary source (ICV). Continuing calibration (CCV) verifications were carried out on a frequency specified by the project. All calibration requirements were within acceptance criteria. Refer to calibration summary forms of ICAL, ICV and CCV for details. MRL was analyzed as required by the project. Refer to MRL summary form for details.

Method Blank

Method blank was prepared and analyzed at the frequency required by the project. For this SDG, one(1) method blank was analyzed. DSH028WB - result was compliant to project requirement. Refer to sample result summary form for details.

Lab Control Sample

Lab control sample was prepared and analyzed at a frequency required by the project. For this SDG, one(1) set of LCS/LCD was analyzed. J8H028WL/J8H028WC were within LCS limits. Refer to LCS summary form for details.

Matrix QC Sample

No matrix QC sample was provided on this SDG.

Surrogate

Surrogates were added on QC and field samples. All surrogate recoveries were within QC limits. Refer to sample result summary forms for details.

Sample Analysis

Samples were analyzed according to prescribed analytical procedures. Results were evaluated in accordance to project requirements. For this SDG, all quality control requirements were met.

LAB CHRONICLE
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client : EUROFINS EATON ANALYTICAL
Project : 380-59480

SDG NO. : 23H149
Instrument ID : D5

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis DateTime	Extraction DateTime	Sample Data FN	Calibration Data FN	Prep. Batch	Notes
MBLK1W	DSH028WB	1	NA	08/28/2319:20	08/24/2314:00	LH28009A	LH28003A	23DSH028W	Method Blank
LCS1W	DSH028WL	1	NA	08/28/2319:39	08/24/2314:00	LH28010A	LH28003A	23DSH028W	Lab Control Sample (LCS)
LCD1W	DSH028WC	1	NA	08/28/2319:57	08/24/2314:00	LH28011A	LH28003A	23DSH028W	LCS Duplicate
380-59480-1	H149-01	1	NA	08/28/2322:09	08/24/2314:00	LH28018A	LH28003A	23DSH028W	Field Sample
380-59480-2	H149-02	1	NA	08/28/2322:27	08/24/2314:00	LH28019A	LH28003A	23DSH028W	Field Sample

FN - Filename
& Moist - Percent Moisture

LAB CHRONICLE
PETROLEUM HYDROCARBONS BY EXTRACTION

Client : EUROFINS EATON ANALYTICAL	SDG NO. : 23H149
Project : 380-59480	Instrument ID : D5

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis Date/Time	Extraction Date/Time	Sample Data FN	Calibration Data FN	Prep. Batch	Notes

WATER

FN - Filename
% Moist - Percent Moisture



LAB CHRONICLE
 PETROLEUM HYDROCARBONS BY EXTRACTION

Client : EUROFINS EATON ANALYTICAL
 Project : 380-59480

SDG NO. : 23H149
 Instrument ID : D5

Client Sample ID	Laboratory Sample ID	Dilution Factor	% Moist	Analysis DateTime	Extraction DateTime	Sample Data FN	Calibration Data FN	Prep. Batch	Notes

FN - Filename
 % Moist - Percent Moisture



- 1
- 2
- 3
- 4
- 5
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- 10
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- 12
- 13
- 14
- 15

SAMPLE RESULTS

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: EUROFINS EATON ANALYTICAL	Date Collected:	08/15/23 11:00
Project	: 380-59480	Date Received:	08/18/23
Batch No.	: 23H149	Date Extracted:	08/24/23 14:00
Sample ID	: 380-59480-1	Date Analyzed:	08/28/23 22:09
Lab Samp ID:	23H149-01	Dilution Factor:	1
Lab File ID:	LH28018A	Matrix:	WATER
Ext Btch ID:	23DSH028W	% Moisture:	NA
Calib. Ref.:	LH28003A	Instrument ID:	D5

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)
Diesel	ND	0.025	0.012
Motor Oil	ND	0.049	0.025

SURROGATE PARAMETERS	RESULT	SPK_AMT	%RECOVERY	QC LIMIT
Bromobenzene	0.330	0.490	67	60-130
Hexacosane	0.107	0.123	88	60-130

Notes:

Parameter	H-C Range
Diesel	C10-C24
Motor Oil	C24-C36

Reported ND at RL quantitated per pattern recognition.

Detection limits are reported relative to sample result significant figures.

Sample Amount	: 1020ml	Final Volume	: 5ml
Prepared by	: RGalan	Analyzed by	: SDeeso

METHOD 3520C/8015B
 PETROLEUM HYDROCARBONS BY EXTRACTION

Client : EUROFINS EATON ANALYTICAL	Date Collected: 08/15/23 11:00
Project : 380-59480	Date Received: 08/18/23
Batch No. : 23H149	Date Extracted: 08/24/23 14:00
Sample ID : 380-59480-1	Date Analyzed: 08/28/23 22:09
Lab Samp ID: 23H149-01	Dilution Factor: 1
Lab File ID: LH28018A	Matrix: WATER
Ext Btch ID: 23DSH028W	% Moisture: NA
Calib. Ref.: LH28004A	Instrument ID: D5

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)	
JP5	ND	0.049	0.025	
SURROGATE PARAMETERS	RESULT	SPK_AMT	%RECOVERY	QC LIMIT
Bromobenzene	0.330	0.490	67	60-130
Hexacosane	0.107	0.123	88	60-130

Notes:

RL : Reporting Limit
 Parameter H-C Range
 JP5 C8-C18

Reported ND at RL quantitated per pattern recognition.

Detection limits are reported relative to sample result significant figures.

Sample Amount : 1020ml Final Volume : 5ml
 Prepared by : RGalan Analyzed by : SDeeso

METHOD 3520C/8015B
 PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: EUROFINS EATON ANALYTICAL	Date Collected:	08/15/23 11:00
Project	: 380-59480	Date Received:	08/18/23
Batch No.	: 23H149	Date Extracted:	08/24/23 14:00
Sample ID	: 380-59480-1	Date Analyzed:	08/28/23 22:09
Lab Samp ID:	23H149-01	Dilution Factor:	1
Lab File ID:	LH28018A	Matrix:	WATER
Ext Btch ID:	23DSH028W	% Moisture:	NA
Calib. Ref.:	LH28005A	Instrument ID:	D5

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)	
JP8	ND	0.049	0.025	
SURROGATE PARAMETERS	RESULT	SPK_AMT	%RECOVERY	QC LIMIT
Bromobenzene	0.330	0.490	67	60-130
Hexacosane	0.107	0.123	88	60-130

Notes:

RL : Reporting Limit

Parameter H-C Range

JP8 C8-C18

Reported ND at RL quantitated per pattern recognition.

Detection limits are reported relative to sample result significant figures.

Sample Amount : 1020ml

Final Volume : 5ml

Prepared by : RGalan

Analyzed by : SDeeso

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client : EUROFINS EATON ANALYTICAL	Date Collected: 08/15/23 10:00
Project : 380-59480	Date Received: 08/18/23
Batch No. : 23H149	Date Extracted: 08/24/23 14:00
Sample ID : 380-59480-2	Date Analyzed: 08/28/23 22:27
Lab Samp ID: 23H149-02	Dilution Factor: 1
Lab File ID: LH28019A	Matrix: WATER
Ext Btch ID: 23DSH028W	% Moisture: NA
Calib. Ref.: LH28003A	Instrument ID: D5

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)	
Diesel	ND	0.025	0.012	
Motor Oil	ND	0.050	0.025	
SURROGATE PARAMETERS	RESULT	SPK_AMT	%RECOVERY	QC LIMIT
Bromobenzene	0.337	0.495	68	60-130
Hexacosane	0.102	0.124	83	60-130

Notes:

Parameter	H-C Range
Diesel	C10-C24
Motor Oil	C24-C36

Reported ND at RL quantitated per pattern recognition.

Detection limits are reported relative to sample result significant figures.

Sample Amount : 1010ml	Final Volume : 5ml
Prepared by : RGalan	Analyzed by : SDeeso

METHOD 3520C/8015B
 PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: EUROFINS EATON ANALYTICAL	Date Collected:	08/15/23 10:00
Project	: 380-59480	Date Received:	08/18/23
Batch No.	: 23H149	Date Extracted:	08/24/23 14:00
Sample ID	: 380-59480-2	Date Analyzed:	08/28/23 22:27
Lab Samp ID:	23H149-02	Dilution Factor:	1
Lab File ID:	LH28019A	Matrix:	WATER
Ext Btch ID:	23DSH028W	% Moisture:	NA
Calib. Ref.:	LH28004A	Instrument ID:	D5

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)	
JP5	ND	0.050	0.025	
SURROGATE PARAMETERS	RESULT	SPK_AMT	%RECOVERY	QC LIMIT
Bromobenzene	0.337	0.495	68	60-130
Hexacosane	0.102	0.124	83	60-130

Notes:

RL : Reporting Limit

Parameter H-C Range

JP5 C8-C18

Reported ND at RL quantitated per pattern recognition.

Detection limits are reported relative to sample result significant figures.

Sample Amount : 1010ml

Final Volume : 5ml

Prepared by : RGalan

Analyzed by : SDeeso

METHOD 3520C/8015B
 PETROLEUM HYDROCARBONS BY EXTRACTION

Client : EUROFINS EATON ANALYTICAL	Date Collected: 08/15/23 10:00
Project : 380-59480	Date Received: 08/18/23
Batch No. : 23H149	Date Extracted: 08/24/23 14:00
Sample ID : 380-59480-2	Date Analyzed: 08/28/23 22:27
Lab Samp ID: 23H149-02	Dilution Factor: 1
Lab File ID: LH28019A	Matrix: WATER
Ext Btch ID: 23DSH028W	% Moisture: NA
Calib. Ref.: LH28005A	Instrument ID: D5

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)	
JP8	ND	0.050	0.025	
SURROGATE PARAMETERS	RESULT	SPK_AMT	%RECOVERY	QC LIMIT
Bromobenzene	0.337	0.495	68	60-130
Hexacosane	0.102	0.124	83	60-130

Notes:

RL : Reporting Limit

Parameter H-C Range

JP8 C8-C18

Reported ND at RL quantitated per pattern recognition.

Detection limits are reported relative to sample result significant figures.

Sample Amount : 1010ml

Final Volume : 5ml

Prepared by : RGalan

Analyzed by : SDeeso

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QC SUMMARIES

METHOD 3520C/8015B
TOTAL PETROLEUM HYDROCARBONS BY EXTRACTION

Client	: EUROFINS EATON ANALYTICAL	Date Collected:	08/24/23 14:00
Project	: 380-59480	Date Received:	08/24/23
Batch No.	: 23H149	Date Extracted:	08/24/23 14:00
Sample ID	: MBLK1W	Date Analyzed:	08/28/23 19:20
Lab Samp ID:	DSH028WB	Dilution Factor:	1
Lab File ID:	LH28009A	Matrix:	WATER
Ext Btch ID:	23DSH028W	% Moisture:	NA
Calib. Ref.:	LH28003A	Instrument ID:	D5

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)	
Diesel	ND	0.025	0.012	
Motor Oil	ND	0.050	0.025	
SURROGATE PARAMETERS	RESULT	SPK_AMT	%RECOVERY	QC LIMIT
Bromobenzene	0.370	0.500	74	60-130
Hexacosane	0.0946	0.125	76	60-130

Notes:

Parameter	H-C Range
Diesel	C10-C24
Motor Oil	C24-C36

Reported ND at RL quantitated per pattern recognition.

Detection limits are reported relative to sample result significant figures.

Sample Amount	: 1000ml	Final Volume	: 5ml
Prepared by	: RGalan	Analyzed by	: SDeeso

EMAX QUALITY CONTROL DATA
LAB CONTROL SAMPLE ANALYSIS

CLIENT : EUROFINS EATON ANALYTICAL
PROJECT : 380-59480
BATCH NO. : 23H149
METHOD : 3520C/8015B

MATRIX	: WATER		% MOISTURE:NA
DILUTION FACTOR:	1	1	1
SAMPLE ID	: MBLK1W	LCS1W	LCD1W
LAB SAMPLE ID	: DSH028WB	DSH028WL	DSH028WC
LAB FILE ID	: LH28009A	LH28010A	LH28011A
DATE PREPARED	: 08/24/23 14:00	08/24/23 14:00	08/24/23 14:00
DATE ANALYZED	: 08/28/23 19:20	08/28/23 19:39	08/28/23 19:57
PREP BATCH	: 23DSH028W	23DSH028W	23DSH028W
CALIBRATION REF:	LH28003A	LH28003A	LH28003A

ACCESSION:

PARAMETERS	MBResult (mg/L)	SpikeAmt (mg/L)	LCSResult (mg/L)	LCSRec (%)	SpikeAmt (mg/L)	LCDResult (mg/L)	LCDRec (%)	RPD (%)	QCLimit (%)	MaxRPD (%)
Diesel	ND	2.50	1.89	76	2.50	1.85	74	2	50-130	30

SURROGATE PARAMETERS	SpikeAmt (mg/L)	LCSResult (mg/L)	LCSRec (%)	SpikeAmt (mg/L)	LCDResult (mg/L)	LCDRec (%)	QCLimit (%)
Bromobenzene	0.500	0.360	72	0.500	0.336	67	60-130
Hexacosane	0.125	0.105	84	0.125	0.0977	78	60-130

MB: Method Blank sample LCS: Lab Control Sample LCD: Lab Control Sample Duplicate

METHOD 3520C/8015B
 PETROLEUM HYDROCARBONS BY EXTRACTION

Client : EUROFINs EATON ANALYTICAL	Date Collected: 08/24/23 14:00
Project : 380-59480	Date Received: 08/24/23
Batch No. : 23H149	Date Extracted: 08/24/23 14:00
Sample ID : MBLK1W	Date Analyzed: 08/28/23 19:20
Lab Samp ID: DSH028WB	Dilution Factor: 1
Lab File ID: LH28009A	Matrix: WATER
Ext Btch ID: 23DSH028W	% Moisture: NA
Calib. Ref.: LH28004A	Instrument ID: D5

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)	
JP5	ND	0.050	0.025	
SURROGATE PARAMETERS	RESULT	SPK_AMT	%RECOVERY	QC LIMIT
Bromobenzene	0.370	0.500	74	60-130
Hexacosane	0.0946	0.125	76	60-130

Notes:

RL : Reporting Limit

Parameter H-C Range

JP5 C8-C18

Reported ND at RL quantitated per pattern recognition.

Detection limits are reported relative to sample result significant figures.

Sample Amount : 1000ml

Final Volume : 5ml

Prepared by : RGalan

Analyzed by : SDeeso

EMAX QUALITY CONTROL DATA
LAB CONTROL SAMPLE ANALYSIS

CLIENT : EUROFINS EATON ANALYTICAL
PROJECT : 380-59480
BATCH NO. : 23H149
METHOD : 3520C/8015B

MATRIX	: WATER		% MOISTURE:NA
DILUTION FACTOR:	1	1	1
SAMPLE ID	: MBLK1W	LCS1W	LCD1W
LAB SAMPLE ID	: DSH028WB	J5H028WL	J5H028WC
LAB FILE ID	: LH28009A	LH28012A	LH28013A
DATE PREPARED	: 08/24/23 14:00	08/24/23 14:00	08/24/23 14:00
DATE ANALYZED	: 08/28/23 19:20	08/28/23 20:16	08/28/23 20:35
PREP BATCH	: 23DSH028W	23DSH028W	23DSH028W
CALIBRATION REF:	LH28004A	LH28004A	LH28004A

ACCESSION:

PARAMETERS	MBResult (mg/L)	SpikeAmt (mg/L)	LCSResult (mg/L)	LCSRec (%)	SpikeAmt (mg/L)	LCDResult (mg/L)	LCDRec (%)	RPD (%)	QCLimit (%)	MaxRPD (%)
JP5	ND	2.50	1.55	62	2.50	1.81	72	15	30-160	30

SURROGATE PARAMETERS	SpikeAmt (mg/L)	LCSResult (mg/L)	LCSRec (%)	SpikeAmt (mg/L)	LCDResult (mg/L)	LCDRec (%)	QCLimit (%)
Bromobenzene	0.500	0.341	68	0.500	0.384	77	60-130
Hexacosane	0.125	0.0984	79	0.125	0.105	84	60-130

MB: Method Blank sample LCS: Lab Control Sample LCD: Lab Control Sample Duplicate

METHOD 3520C/8015B
 PETROLEUM HYDROCARBONS BY EXTRACTION

Client : EUROFINS EATON ANALYTICAL	Date Collected: 08/24/23 14:00
Project : 380-59480	Date Received: 08/24/23
Batch No. : 23H149	Date Extracted: 08/24/23 14:00
Sample ID : MBLK1W	Date Analyzed: 08/28/23 19:20
Lab Samp ID: DSH028WB	Dilution Factor: 1
Lab File ID: LH28009A	Matrix: WATER
Ext Btch ID: 23DSH028W	% Moisture: NA
Calib. Ref.: LH28005A	Instrument ID: D5

PARAMETERS	RESULTS (mg/L)	RL (mg/L)	MDL (mg/L)	
JP8	ND	0.050	0.025	
SURROGATE PARAMETERS	RESULT	SPK_AMT	%RECOVERY	QC LIMIT
Bromobenzene	0.370	0.500	74	60-130
Hexacosane	0.0946	0.125	76	60-130

Notes:

RL : Reporting Limit
 Parameter H-C Range
 JP8 C8-C18

Reported ND at RL quantitated per pattern recognition.

Detection limits are reported relative to sample result significant figures.

Sample Amount : 1000ml Final Volume : 5ml
 Prepared by : RGalan Analyzed by : SDeeso

EMAX QUALITY CONTROL DATA
LAB CONTROL SAMPLE ANALYSIS

CLIENT : EUROFINS EATON ANALYTICAL
PROJECT : 380-59480
BATCH NO. : 23H149
METHOD : 3520C/8015B

MATRIX : WATER % MOISTURE:NA
DILUTION FACTOR: 1 1
SAMPLE ID : MBLK1W LCS1W LCD1W
LAB SAMPLE ID : DSH028WB J8H028WL J8H028WC
LAB FILE ID : LH28009A LH28014A LH28015A
DATE PREPARED : 08/24/23 14:00 08/24/23 14:00 08/24/23 14:00
DATE ANALYZED : 08/28/23 19:20 08/28/23 20:53 08/28/23 21:12
PREP BATCH : 23DSH028W 23DSH028W 23DSH028W
CALIBRATION REF: LH28005A LH28005A LH28005A

ACCESSION:

PARAMETERS	MBResult (mg/L)	SpikeAmt (mg/L)	LCSResult (mg/L)	LCSRec (%)	SpikeAmt (mg/L)	LCDResult (mg/L)	LCDRec (%)	RPD (%)	QCLimit (%)	MaxRPD (%)
JP8	ND	2.50	2.63	105	2.50	2.31	92	13	30-160	30

SURROGATE PARAMETERS	SpikeAmt (mg/L)	LCSResult (mg/L)	LCSRec (%)	SpikeAmt (mg/L)	LCDResult (mg/L)	LCDRec (%)	QCLimit (%)
Bromobenzene	0.500	0.461	92	0.500	0.396	79	60-130
Hexacosane	0.125	0.101	81	0.125	0.0901	72	60-130

MB: Method Blank sample LCS: Lab Control Sample LCD: Lab Control Sample Duplicate

September 25, 2023

Rachelle Arada
 Eurofins Eaton Analytical
 750 Royal Oaks Drive
 Suite 100
 Monrovia, CA 91016-

Project Name: Red-HILL Project # 38001111 Job # 380-59480-1
 Physis Project ID: 1407003-437

Dear Rachelle,

Enclosed are the analytical results for samples submitted to PHYSIS Environmental Laboratories, Inc. (PHYSIS) on 8/18/2023. A total of 2 samples were received for analysis in accordance with the attached chain of custody (COC). Per the COC, the samples were analyzed for:

Organics
Polynuclear Aromatic Hydrocarbons by EPA 625.1
Disalicylidenepropanediamine by EPA 625.1
Dibenzo [a,l] Pyrene w/ PAHs by EPA 625.1

Analytical results in this report apply only to samples submitted to PHYSIS in accordance with the COC and are intended to be considered in their entirety.

Please feel free to contact me at any time with any questions. PHYSIS appreciates the opportunity to provide you with our analytical and support services.

Regards,

Rachel Hansen
 714 602-5320
 Extension 203
 rachelhansen@physislabs.com



PROJECT SAMPLE LIST

Eurofins Eaton Analytical

PHYSIS Project ID: 1407003-437

Red-HILL Project # 38001111 Job # 380-59480-1

Total Samples: 2

PHYSIS ID	Sample ID	Description	Date	Time	Matrix	Sample Type
109957	MOANALUA WELLS	380-59480-1	8/15/2023	11:00	Samplewater	Grab
109958	HALAWA WELLS UNITS 1 & 2	380-59480-2	8/15/2023	10:00	Samplewater	Grab



ABBREVIATIONS and ACRONYMS

QM	Quality Manual
QA	Quality Assurance
QC	Quality Control
MDL	method detection limit
RL	reporting limit
R1	project sample
R2	project sample replicate
MS1	matrix spike
MS2	matrix spike replicate
B1	procedural blank
B2	procedural blank replicate
BS1	blank spike
BS2	blank spike replicate
LCS1	laboratory control spike
LCS2	laboratory control spike replicate
LCM1	laboratory control material
LCM2	laboratory control material replicate
CRM1	certified reference material
CRM2	certified reference material replicate
RPD	relative percent difference
LMW	low molecular weight
HMW	high molecular weight

QUALITY ASSURANCE SUMMARY

LABORATORY BATCH: Physis' QM defines a laboratory batch as a group of 20 or fewer project samples of similar matrix, processed together under the same conditions and with the same reagents. QC samples are associated with each batch and were used to assess the validity of the sample analyses.

PROCEDURAL BLANK: Laboratory contamination introduced during method use is assessed through the preparation and analysis of procedural blanks is provided at a minimum frequency of one per batch.

ACCURACY: Accuracy of analytical measurements is the degree of closeness based on percent recovery calculations between measured values and the actual or true value and includes a combination of reproducibility error and systematic bias due to sampling and analytical operations. Accuracy of the project data was indicated by analysis of MS, BS, LCS, LCM, CRM, and/or surrogate spikes on a minimum frequency of one per batch. Physis' QM requires that 95% of the target compounds greater than 10 times the MDL be within the specified acceptance limits.

PRECISION: Precision is the agreement among a set of replicate measurements without assumption of knowledge of the true value and is based on RPD calculations between repeated values. Precision of the project data was determined by analysis of replicate MS₁/MS₂, BS₁/BS₂, LCS₁/LCS₂, LCM₁/LCM₂, CRM₁/CRM₂, surrogate spikes and/or replicate project sample analysis (R₁/R₂) on a minimum frequency of one per batch. Physis' QM requires that for 95% of the compounds greater than 10 times the MDL, the percent RPD should be within the specified acceptance range.

BLANK SPIKES: BS is the introduction of a known concentration of analyte into the procedural blank. BS demonstrates performance of the preparation and analytical methods on a clean matrix void of potential matrix related interferences. The BS is performed in laboratory deionized water, making these recoveries a better indicator of the efficiency of the laboratory method per se.

MATRIX SPIKES: MS is the introduction of a known concentration of analyte into a sample. MS samples demonstrate the effect a particular project sample matrix has on the accuracy of a measurement. Individually, MS samples also indicate the bias of analytical measurements due to chemical interferences inherent in the in the specific project sample spiked. Intrinsic target analyte concentration in the specific project sample can also significantly impact MS recovery.

CERTIFIED REFERENCE MATERIALS: CRMs are materials of various matrices for which analytical information has been determined and certified by a recognized authority. These are used to provide a quantitative assessment of the accuracy of an analytical method. CRMs provide evidence that the laboratory preparation and analysis produces results that are comparable to those obtained by an independent organization.

LABORATORY CONTROL MATERIAL: LCM is provided because a suitable natural seawater CRM is not available and can be used to indicate accuracy of the method. Physis' internal LCM is seawater collected at ~800 meters in the Southern California San Pedro Basin and can be used as a reference for background concentrations in clean, natural seawater for comparison to project samples.

LABORATORY CONTROL SPIKES: LCS is the introduction of a known concentration of analyte into Physis' LCM. LCS samples were employed to assess the effect the seawater matrix has on the accuracy of a measurement. LCS also indicate the bias of this method due to chemical interferences inherent in the in the seawater matrix. Intrinsic LCM concentration can also significantly impact LCS recovery.

SURROGATES: A surrogate is a pure analyte unlikely to be found in any project sample, behaves similarly to the target analyte and most often used with organic analytical procedures. Surrogates are added in known concentration to all samples and are measured to indicate overall efficiency of the method including processing and analyses.

HOLDING TIME: Method recommended holding times are the length of time a project sample can be stored under specific conditions after collection and prior to analysis without significantly affecting the analyte's concentration. Holding times can be extended if preservation techniques are employed to reduce biodegradation, volatilization, oxidation, sorption, precipitation, and other physical and chemical processes.

SAMPLE STORAGE/RETENTION: In order to maintain chemical integrity prior to analysis, all samples submitted to Physis are refrigerated (liquids) or frozen (solids) upon receipt unless otherwise recommended by applicable methods. Solid samples are retained for 1 year from collection while liquid samples are retained until method recommended holding times elapse.

TOTAL/DISSOLVED FRACTION: In some instances, the results for the dissolved fraction may be higher than the total fraction for a particular analyte (e.g. trace metals). This is typically caused by the analytical variation for each result and indicates that the target analyte is primarily in the dissolved phase, within the sample.

PHYSIS QUALIFIER CODES

CODE	DEFINITION
#	see Case Narrative
ND	analyte not detected at or above the MDL
B	analyte was detected in the procedural blank greater than 10 times the MDL
E	analyte concentration exceeds the upper limit of the linear calibration range, reported value is estimated
H	sample received and/or analyzed past the recommended holding time
J	analyte was detected at a concentration below the RL and above the MDL, reported value is estimated
N	insufficient sample, analysis could not be performed
M	analyte was outside the specified accuracy and/or precision acceptance limits due to matrix interference. The associated B/BS were within limits, therefore the sample data was reported without further clarification
SH	analyte concentration in the project sample exceeded the spike concentration, therefore accuracy and/or precision acceptance limits do not apply
SL	analyte results were lower than 10 times the MDL, therefore accuracy and/or precision acceptance limits do not apply
NH	project sample was heterogeneous and sample homogeneity could not be readily achieved using routine laboratory practices, therefore accuracy and/or precision acceptance limits do not apply
Q	analyte was outside the specified QAPP acceptance limits for precision and/or accuracy but within Physis derived acceptance limits, therefore the sample data was reported without further clarification
R	Physis' QM allows for 5% of the target compounds greater than 10 times the MDL to be outside the specified acceptance limits for precision and/or accuracy. This is often due to random error and does not indicate any significant problems with the analysis of these project samples

CASE NARRATIVE

QUALIFIER NOTES

In addition to the use of analyte specific Physis Qualifier Codes where applicable, the following were also noted.

ND

MDL is listed due to report format restrictions; it is not used in reporting. Analytical results reported are ND at the RL.

BIANALYTICALS

REPORT

TERRA AURA
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Base/Neutral Extractable Compounds

ANALYTE	Method	Units	RESULT	DF	MDL	RL	Fraction	QA CODE	Batch ID	Date Processed	Date Analyzed
Sample ID: 109957-R1	MOANALUA WELLS 380-59480-1		Matrix: Samplewater					Sampled: 15-Aug-23 11:00		Received: 18-Aug-23	
Disalicylidenepropanediamine	EPA 625.1	µg/L	ND	1	0.05	0.1	Total		O-42060	21-Aug-23	24-Sep-23
Sample ID: 109958-R1	HALAWA WELLS UNITS 1 & 2 380-5		Matrix: Samplewater					Sampled: 15-Aug-23 10:00		Received: 18-Aug-23	
Disalicylidenepropanediamine	EPA 625.1	µg/L	ND	1	0.05	0.1	Total		O-42060	21-Aug-23	24-Sep-23



Polynuclear Aromatic Hydrocarbons

ANALYTE	Method	Units	RESULT	DF	MDL	RL	Fraction	QA CODE	Batch ID	Date Processed	Date Analyzed
Sample ID: 109957-R1	MOANALUA WELLS 380-59480-1	Matrix: Samplewater					Sampled:	15-Aug-23 11:00		Received:	18-Aug-23
(d10-Acenaphthene)	EPA 625.1	% Recovery	80	1			Total		O-42060	21-Aug-23	24-Sep-23
(d10-Phenanthrene)	EPA 625.1	% Recovery	87	1			Total		O-42060	21-Aug-23	24-Sep-23
(d12-Chrysene)	EPA 625.1	% Recovery	84	1			Total		O-42060	21-Aug-23	24-Sep-23
(d12-Perylene)	EPA 625.1	% Recovery	85	1			Total		O-42060	21-Aug-23	24-Sep-23
(d8-Naphthalene)	EPA 625.1	% Recovery	72	1			Total		O-42060	21-Aug-23	24-Sep-23
1-Methylnaphthalene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
1-Methylphenanthrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
2,3,5-Trimethylnaphthalene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
2,6-Dimethylnaphthalene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
2-Methylnaphthalene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Acenaphthene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Acenaphthylene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Anthracene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Benz[a]anthracene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Benzo[a]pyrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Benzo[b]fluoranthene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Benzo[e]pyrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Benzo[g,h,i]perylene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Benzo[k]fluoranthene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Biphenyl	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Chrysene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Dibenz[a,h]anthracene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Dibenzo[a,l]pyrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Dibenzothiophene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23

Polynuclear Aromatic Hydrocarbons

ANALYTE	Method	Units	RESULT	DF	MDL	RL	Fraction	QA CODE	Batch ID	Date Processed	Date Analyzed
Fluoranthene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Fluorene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Indeno[1,2,3-cd]pyrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Naphthalene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Perylene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Phenanthrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Pyrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23



Polynuclear Aromatic Hydrocarbons

ANALYTE	Method	Units	RESULT	DF	MDL	RL	Fraction	QA CODE	Batch ID	Date Processed	Date Analyzed
Sample ID: 109958-R1	HALAWA WELLS UNITS 1 & 2 380-5 Matrix: Samplewater						Sampled:	15-Aug-23 10:00	Received:	18-Aug-23	
(d10-Acenaphthene)	EPA 625.1	% Recovery	75	1			Total		O-42060	21-Aug-23	24-Sep-23
(d10-Phenanthrene)	EPA 625.1	% Recovery	85	1			Total		O-42060	21-Aug-23	24-Sep-23
(d12-Chrysene)	EPA 625.1	% Recovery	84	1			Total		O-42060	21-Aug-23	24-Sep-23
(d12-Perylene)	EPA 625.1	% Recovery	88	1			Total		O-42060	21-Aug-23	24-Sep-23
(d8-Naphthalene)	EPA 625.1	% Recovery	67	1			Total		O-42060	21-Aug-23	24-Sep-23
1-Methylnaphthalene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
1-Methylphenanthrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
2,3,5-Trimethylnaphthalene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
2,6-Dimethylnaphthalene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
2-Methylnaphthalene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Acenaphthene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Acenaphthylene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Anthracene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Benz[a]anthracene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Benzo[a]pyrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Benzo[b]fluoranthene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Benzo[e]pyrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Benzo[g,h,i]perylene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Benzo[k]fluoranthene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Biphenyl	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Chrysene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Dibenz[a,h]anthracene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Dibenzo[a,l]pyrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Dibenzothiophene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23

Polynuclear Aromatic Hydrocarbons

ANALYTE	Method	Units	RESULT	DF	MDL	RL	Fraction	QA CODE	Batch ID	Date Processed	Date Analyzed
Fluoranthene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Fluorene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Indeno[1,2,3-cd]pyrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Naphthalene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Perylene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Phenanthrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23
Pyrene	EPA 625.1	µg/L	ND	1	0.001	0.005	Total		O-42060	21-Aug-23	24-Sep-23



QUALITY CONTROL REPORT

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Base/Neutral Extractable Compounds

QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	DF	MDL	RL	UNITS	SPIKE		ACCURACY		PRECISION		QA CODEc
							LEVEL	RESULT	%	LIMITS	%	LIMITS	
Sample ID: 109956-B1		QAQC Procedural Blank			Matrix: BlankMatrix		Sampled:		Received:				
		Method: EPA 625.1		Batch ID: O-42060		Prepared: 21-Aug-23		Analyzed: 23-Sep-23					
Disalicylidenepropanediamine	Total	ND	1	0.05	0.1	µg/L							
Sample ID: 109956-BS1		QAQC Procedural Blank			Matrix: BlankMatrix		Sampled:		Received:				
		Method: EPA 625.1		Batch ID: O-42060		Prepared: 21-Aug-23		Analyzed: 24-Sep-23					
Disalicylidenepropanediamine	Total	40.5	1	0.05	0.1	µg/L	50	0	81	50 - 150%	PASS		
Sample ID: 109956-BS2		QAQC Procedural Blank			Matrix: BlankMatrix		Sampled:		Received:				
		Method: EPA 625.1		Batch ID: O-42060		Prepared: 21-Aug-23		Analyzed: 24-Sep-23					
Disalicylidenepropanediamine	Total	43.3	1	0.05	0.1	µg/L	50	0	87	50 - 150%	PASS	7	30 PASS

Polynuclear Aromatic Hydrocarbons

QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	DF	MDL	RL	UNITS	SPIKE	SOURCE	ACCURACY	PRECISION	QA CODEc	
							LEVEL	RESULT	%	LIMITS	%	LIMITS
Sample ID: 109956-B1		QAQC Procedural Blank				Matrix: BlankMatrix		Sampled:		Received:		
		Method: EPA 625.1				Batch ID: O-42060		Prepared: 21-Aug-23		Analyzed: 23-Sep-23		
(d10-Acenaphthene)	Total	88	1				% Recovery	100	88	27 - 133%	PASS	
(d10-Phenanthrene)	Total	95	1				% Recovery	100	95	43 - 129%	PASS	
(d12-Chrysene)	Total	92	1				% Recovery	100	92	52 - 144%	PASS	
(d12-Perylene)	Total	92	1				% Recovery	100	92	36 - 161%	PASS	
(d8-Naphthalene)	Total	79	1				% Recovery	100	79	25 - 125%	PASS	
1-Methylnaphthalene	Total	ND	1	0.001	0.005	µg/L						
1-Methylphenanthrene	Total	ND	1	0.001	0.005	µg/L						
2,3,5-Trimethylnaphthalene	Total	ND	1	0.001	0.005	µg/L						
2,6-Dimethylnaphthalene	Total	ND	1	0.001	0.005	µg/L						
2-Methylnaphthalene	Total	ND	1	0.001	0.005	µg/L						
Acenaphthene	Total	ND	1	0.001	0.005	µg/L						
Acenaphthylene	Total	ND	1	0.001	0.005	µg/L						
Anthracene	Total	ND	1	0.001	0.005	µg/L						
Benz[a]anthracene	Total	ND	1	0.001	0.005	µg/L						
Benzo[a]pyrene	Total	ND	1	0.001	0.005	µg/L						
Benzo[b]fluoranthene	Total	ND	1	0.001	0.005	µg/L						
Benzo[e]pyrene	Total	ND	1	0.001	0.005	µg/L						
Benzo[g,h,i]perylene	Total	ND	1	0.001	0.005	µg/L						
Benzo[k]fluoranthene	Total	ND	1	0.001	0.005	µg/L						
Biphenyl	Total	ND	1	0.001	0.005	µg/L						
Chrysene	Total	ND	1	0.001	0.005	µg/L						
Dibenz[a,h]anthracene	Total	ND	1	0.001	0.005	µg/L						
Dibenzo[a,l]pyrene	Total	ND	1	0.001	0.005	µg/L						



Polynuclear Aromatic Hydrocarbons

QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	DF	MDL	RL	UNITS	SPIKE	SOURCE	ACCURACY		PRECISION		QA CODEc
							LEVEL	RESULT	%	LIMITS	%	LIMITS	
Dibenzothiophene	Total	ND	1	0.001	0.005	µg/L							
Fluoranthene	Total	ND	1	0.001	0.005	µg/L							
Fluorene	Total	ND	1	0.001	0.005	µg/L							
Indeno[1,2,3-cd]pyrene	Total	ND	1	0.001	0.005	µg/L							
Naphthalene	Total	ND	1	0.001	0.005	µg/L							
Perylene	Total	ND	1	0.001	0.005	µg/L							
Phenanthrene	Total	ND	1	0.001	0.005	µg/L							
Pyrene	Total	ND	1	0.001	0.005	µg/L							

Polynuclear Aromatic Hydrocarbons

QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	DF	MDL	RL	UNITS	SPIKE	SOURCE	ACCURACY		PRECISION		QA CODEc
							LEVEL	RESULT	%	LIMITS	%	LIMITS	
Sample ID: 109956-BS1		QAQC Procedural Blank			Matrix: BlankMatrix			Sampled:		Received:			
Method: EPA 625.1		Batch ID: O-42060			Prepared: 21-Aug-23		Analyzed: 24-Sep-23						
(d10-Acenaphthene)	Total	90	1			% Recovery	100	0	90	27 - 133%	PASS		
(d10-Phenanthrene)	Total	95	1			% Recovery	100	0	95	43 - 129%	PASS		
(d12-Chrysene)	Total	94	1			% Recovery	100	0	94	52 - 144%	PASS		
(d12-Perylene)	Total	96	1			% Recovery	100	0	96	36 - 161%	PASS		
(d8-Naphthalene)	Total	84	1			% Recovery	100	0	84	25 - 125%	PASS		
1-Methylnaphthalene	Total	0.431	1	0.001	0.005	µg/L	0.5	0	86	31 - 128%	PASS		
1-Methylphenanthrene	Total	0.46	1	0.001	0.005	µg/L	0.5	0	92	66 - 127%	PASS		
2,3,5-Trimethylnaphthalene	Total	0.451	1	0.001	0.005	µg/L	0.5	0	90	55 - 122%	PASS		
2,6-Dimethylnaphthalene	Total	0.451	1	0.001	0.005	µg/L	0.5	0	90	48 - 120%	PASS		
2-Methylnaphthalene	Total	0.436	1	0.001	0.005	µg/L	0.5	0	87	47 - 130%	PASS		
Acenaphthene	Total	0.451	1	0.001	0.005	µg/L	0.5	0	90	53 - 131%	PASS		
Acenaphthylene	Total	0.455	1	0.001	0.005	µg/L	0.5	0	91	43 - 140%	PASS		
Anthracene	Total	0.402	1	0.001	0.005	µg/L	0.5	0	80	58 - 135%	PASS		
Benz[a]anthracene	Total	0.447	1	0.001	0.005	µg/L	0.5	0	89	55 - 145%	PASS		
Benzo[a]pyrene	Total	0.477	1	0.001	0.005	µg/L	0.5	0	95	51 - 143%	PASS		
Benzo[b]fluoranthene	Total	0.435	1	0.001	0.005	µg/L	0.5	0	87	46 - 165%	PASS		
Benzo[e]pyrene	Total	0.421	1	0.001	0.005	µg/L	0.5	0	84	42 - 152%	PASS		
Benzo[g,h,i]perylene	Total	0.462	1	0.001	0.005	µg/L	0.5	0	92	63 - 133%	PASS		
Benzo[k]fluoranthene	Total	0.454	1	0.001	0.005	µg/L	0.5	0	91	56 - 145%	PASS		
Biphenyl	Total	0.457	1	0.001	0.005	µg/L	0.5	0	91	56 - 119%	PASS		
Chrysene	Total	0.442	1	0.001	0.005	µg/L	0.5	0	88	56 - 141%	PASS		
Dibenz[a,h]anthracene	Total	0.427	1	0.001	0.005	µg/L	0.5	0	85	55 - 150%	PASS		
Dibenzo[a,l]pyrene	Total	0.544	1	0.001	0.005	µg/L	0.5	0	109	50 - 150%	PASS		

Polynuclear Aromatic Hydrocarbons

QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	DF	MDL	RL	UNITS	SPIKE	SOURCE	ACCURACY		PRECISION		QA CODE ^c
							LEVEL	RESULT	%	LIMITS	%	LIMITS	
Dibenzothiophene	Total	0.472	1	0.001	0.005	µg/L	0.5	0	94	46 - 126%	PASS		
Fluoranthene	Total	0.462	1	0.001	0.005	µg/L	0.5	0	92	60 - 146%	PASS		
Fluorene	Total	0.451	1	0.001	0.005	µg/L	0.5	0	90	58 - 131%	PASS		
Indeno[1,2,3-cd]pyrene	Total	0.365	1	0.001	0.005	µg/L	0.5	0	73	50 - 151%	PASS		
Naphthalene	Total	0.437	1	0.001	0.005	µg/L	0.5	0	87	41 - 126%	PASS		
Perylene	Total	0.426	1	0.001	0.005	µg/L	0.5	0	85	48 - 141%	PASS		
Phenanthrene	Total	0.464	1	0.001	0.005	µg/L	0.5	0	93	67 - 127%	PASS		
Pyrene	Total	0.453	1	0.001	0.005	µg/L	0.5	0	91	54 - 156%	PASS		

Polynuclear Aromatic Hydrocarbons

QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	DF	MDL	RL	UNITS	SPIKE		ACCURACY		PRECISION		QA CODEc		
							LEVEL	RESULT	%	LIMITS	%	LIMITS			
Sample ID: 109956-BS2		QAQC Procedural Blank			Matrix: BlankMatrix			Sampled:		Received:					
		Method: EPA 625.1			Batch ID: O-42060			Prepared: 21-Aug-23		Analyzed: 24-Sep-23					
(d10-Acenaphthene)	Total	94	1				% Recovery	100	0	94	27 - 133%	PASS	4	30	PASS
(d10-Phenanthrene)	Total	100	1				% Recovery	100	0	100	43 - 129%	PASS	5	30	PASS
(d12-Chrysene)	Total	98	1				% Recovery	100	0	98	52 - 144%	PASS	4	30	PASS
(d12-Perylene)	Total	99	1				% Recovery	100	0	99	36 - 161%	PASS	3	30	PASS
(d8-Naphthalene)	Total	87	1				% Recovery	100	0	87	25 - 125%	PASS	4	30	PASS
1-Methylnaphthalene	Total	0.453	1	0.001	0.005	µg/L		0.5	0	91	31 - 128%	PASS	6	30	PASS
1-Methylphenanthrene	Total	0.463	1	0.001	0.005	µg/L		0.5	0	93	66 - 127%	PASS	1	30	PASS
2,3,5-Trimethylnaphthalene	Total	0.459	1	0.001	0.005	µg/L		0.5	0	92	55 - 122%	PASS	2	30	PASS
2,6-Dimethylnaphthalene	Total	0.453	1	0.001	0.005	µg/L		0.5	0	91	48 - 120%	PASS	1	30	PASS
2-Methylnaphthalene	Total	0.44	1	0.001	0.005	µg/L		0.5	0	88	47 - 130%	PASS	1	30	PASS
Acenaphthene	Total	0.457	1	0.001	0.005	µg/L		0.5	0	91	53 - 131%	PASS	1	30	PASS
Acenaphthylene	Total	0.464	1	0.001	0.005	µg/L		0.5	0	93	43 - 140%	PASS	2	30	PASS
Anthracene	Total	0.457	1	0.001	0.005	µg/L		0.5	0	91	58 - 135%	PASS	13	30	PASS
Benz[a]anthracene	Total	0.451	1	0.001	0.005	µg/L		0.5	0	90	55 - 145%	PASS	1	30	PASS
Benzo[a]pyrene	Total	0.48	1	0.001	0.005	µg/L		0.5	0	96	51 - 143%	PASS	1	30	PASS
Benzo[b]fluoranthene	Total	0.438	1	0.001	0.005	µg/L		0.5	0	88	46 - 165%	PASS	1	30	PASS
Benzo[e]pyrene	Total	0.434	1	0.001	0.005	µg/L		0.5	0	87	42 - 152%	PASS	4	30	PASS
Benzo[g,h,i]perylene	Total	0.458	1	0.001	0.005	µg/L		0.5	0	92	63 - 133%	PASS	0	30	PASS
Benzo[k]fluoranthene	Total	0.448	1	0.001	0.005	µg/L		0.5	0	90	56 - 145%	PASS	1	30	PASS
Biphenyl	Total	0.465	1	0.001	0.005	µg/L		0.5	0	93	56 - 119%	PASS	2	30	PASS
Chrysene	Total	0.443	1	0.001	0.005	µg/L		0.5	0	89	56 - 141%	PASS	1	30	PASS
Dibenz[a,h]anthracene	Total	0.452	1	0.001	0.005	µg/L		0.5	0	90	55 - 150%	PASS	6	30	PASS
Dibenzo[a,l]pyrene	Total	0.544	1	0.001	0.005	µg/L		0.5	0	109	50 - 150%	PASS	0	30	PASS

Polynuclear Aromatic Hydrocarbons

QUALITY CONTROL REPORT

ANALYTE	FRACTION	RESULT	DF	MDL	RL	UNITS	SPIKE	SOURCE	ACCURACY		PRECISION		QA CODEc	
							LEVEL	RESULT	%	LIMITS	%	LIMITS		
Dibenzothiophene	Total	0.476	1	0.001	0.005	µg/L	0.5	0	95	46 - 126%	PASS	1	30	PASS
Fluoranthene	Total	0.475	1	0.001	0.005	µg/L	0.5	0	95	60 - 146%	PASS	3	30	PASS
Fluorene	Total	0.462	1	0.001	0.005	µg/L	0.5	0	92	58 - 131%	PASS	2	30	PASS
Indeno[1,2,3-cd]pyrene	Total	0.37	1	0.001	0.005	µg/L	0.5	0	74	50 - 151%	PASS	1	30	PASS
Naphthalene	Total	0.436	1	0.001	0.005	µg/L	0.5	0	87	41 - 126%	PASS	0	30	PASS
Perylene	Total	0.426	1	0.001	0.005	µg/L	0.5	0	85	48 - 141%	PASS	0	30	PASS
Phenanthrene	Total	0.473	1	0.001	0.005	µg/L	0.5	0	95	67 - 127%	PASS	2	30	PASS
Pyrene	Total	0.462	1	0.001	0.005	µg/L	0.5	0	92	54 - 156%	PASS	1	30	PASS

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PHYSIS

TENTATIVELY IDENTIFIED COMPOUNDS

ENVIRONMENTAL LABORATORIES, INC.

Innovative Solutions for Nature

Sample ID: Lab Blank B1_42060

Retention Time	Area (% of total)	Concentration (ng/L)	Library/ID	Cas Number	Match Quality (%)
33.3045	5.7776	1111	Anthracene-D10-	1517-22-2	95
22.6704	9.8939	1903	Butylated Hydroxytoluene	128-37-0	98
10.0543	3.0543	587	1,5-Heptadien-4-one, 3,3,6-trimethyl-	546-49-6	89
21.1522	2.5444	489	2,6-Di-tert-butyl-4-hydroxy-4-methylcyclohexa-2,5-dien-1-one	10396-80-2	91
48.1120	2.5355	488	Eicosyl acetate	822-24-2	90
27.7666	0.6990	134	Hexanoic acid, 3,5,5-trimethyl-, 2-ethylhexyl ester	1000406-82-2	96

Concentration estimated using the response for Anthracene-d10

Sample ID: 109958

Retention Time	Area (% of total)	Concentration (ng/L)	Library/ID	Cas Number	Match Quality (%)
33.2977	6.7048	1111	Anthracene-D10-	1719-06-8	96
10.0567	6.2975	1044	1,5-Heptadien-4-one, 3,3,6-trimethyl-	546-49-6	89
10.3717	0.9042	150	3,3-Diethoxy-1-propyne	10160-87-9	94
27.7635	0.7765	129	Hexanoic acid, 3,5,5-trimethyl-, 2-ethylhexyl ester	1000406-82-2	96

Concentration estimated using the response for Anthracene-d10

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Sample ID: 109957

Retention Time	Area (% of total)	Concentration (ng/L)	Library/ID	Cas Number	Match Quality (%)
33.3002	7.3568	1111	Anthracene-D10-	1517-22-2	94
10.0565	5.6324	851	1,5-Heptadien-4-one, 3,3,6-trimethyl-	546-49-6	89
22.6669	2.9323	443	Butylated Hydroxytoluene	128-37-0	96
27.7635	0.9631	145	Hexanoic acid, 3,5,5-trimethyl-, 2-ethylhexyl ester	1000406-82-2	96
21.1523	0.7425	112	2,6-Di-tert-butyl-4-hydroxy-4-methylcyclohexa-2,5-dien-1-one	10396-80-2	84

Concentration estimated using the response for Anthracene-d10

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PERFORMANCE CHAIN OF CUSTODY

TERRA ENVIRONMENTAL LABORATORIES, INC. AURA

Innovative Solutions for Nature

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Eurofins Eaton Analytical Pomona

941 Corporate Center Drive
Pomona, CA 91768-2642
Phone: 626-396-1100

Chain of Custody Record



Environment Testing

Client Information (Sub Contract Lab)

Client Contact: **Shpring/Receiving** Phone: _____
 Company: **Physis Environmental Laboratories**
 Address: **1904 Wright Circle,**
 City: **Anaheim**
 State, Zip: **CA, 92808**
 Phone: _____
 Email: _____
 Project Name: **RED-HILL** Project #: **38001111**
 Site: **Honolulu BWS Sites** SSON#: _____

Lab P#1: **Arada, Rachelle**
 E-Mail: **Rachelle.Arada@et.eurofins.com**
 State of Origin: **Hawaii**
 Accreditation Required (See note): **State - Hawaii**

Carrier Tracking No(s): _____
 Page: **Page 1 of 1**
 Job #: **380-59480-1**

Due Date Requested: **8/28/2023**
 TAT Requested (days): _____

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=Water, S=Soil, O=Other, G=Gas)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Total Number of containers	Special Instructions/Note:
MOANALUA WELLS (380-59480-1)	8/15/23	11:00		Water		X	2	See Attached Instructions
HALAWA WELLS UNITS 1 & 2 (380-59480-2)	8/15/23	10:00		Water		X	2	See Attached Instructions

Field Filtered Sample (Yes or No)

Perform MS/MSD (Yes or No)

SUB (626 PAH Physis LL (EAL) + TICs) / 626 PAH Physis LL (EAL) + TICs

Preservation Codes:

- A - HCL
- B - NiOH
- C - Zn Acetate
- D - Nitric Acid
- E - NaHSO4
- F - MeOH
- G - Amchlor
- H - Ascorbic Acid
- I - Ice
- J - DI Water
- K - EDTA
- L - EDTA
- M - Hexane
- N - None
- O - AsNAO2
- P - Na2O4S
- Q - Na2SO3
- R - Na2S2O3
- S - H2SO4
- T - TSP Dodecahydrate
- U - Acetone
- V - MCAA
- W - pH 4.5
- X - Trizma
- Z - other (specify)

Uncollected

Deliverable Requested: I, II, III, IV, Other (specify) _____

Primary Deliverable Rank: 2

Special Instructions/QC Requirements: _____

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

Return To Client Disposal By Lab Archive For _____ Months

Relinquished by: _____ Date/Time: **8/18/23** Company: **PHYSIS**

Relinquished by: _____ Date/Time: _____ Company: _____

Relinquished by: _____ Date/Time: _____ Company: _____

Custody Seals Intact: Yes No

Custody Seal No.: _____

Cooler Temperature(s) °C and Other Remarks: _____



Project Iteration ID: 1407003-437
 Client Name: Eurofins Eaton Analytical
 Project Name: Red-HILL Project # 38001111 Job # 380-59480-1
 COC Page Number: 2 of 2
 Bottle Label Color: NA

Sample Receipt Summary

Receiving Info

- Initials Received By: CN
- Date Received: 8/18/23
- Time Received: 12:30
- Client Name: EUROFINS
- Courier Information: (Please circle)
 - Client
 - UPS
 - Area Fast
 - DRS
 - FedEx
 - GSO/GLS
 - Ontrac
 - PAMS
 - PHYSIS Driver:
 - i. Start Time: _____
 - iii. Total Mileage: _____
 - ii. End Time: _____
 - iv. Number of Pickups: _____
- Container Information: (Please put the # of containers or circle none)
 - 1 Cooler
 - ___ Styrofoam Cooler
 - ___ Boxes
 - None
 - ___ Carboy(s)
 - ___ Carboy Trash Can(s)
 - ___ Carboy Cap(s)
 - Other _____
- What type of ice was used: (Please circle any that apply)
 - Wet Ice
 - Blue Ice
 - Dry Ice
 - Water
 - None
- Randomly Selected Samples Temperature (°C): 7.5
 Used I/R Thermometer # 1

Inspection Info

- Initials Inspected By: RJ

Sample Integrity Upon Receipt:

- COC(s) included and completely filled out..... Yes / No
- All sample containers arrived intact..... Yes / No
- All samples listed on COC(s) are present..... Yes / No
- Information on containers consistent with information on COC(s)..... Yes / No
- Correct containers and volume for all analyses indicated..... Yes / No
- All samples received within method holding time..... Yes / No
- Correct preservation used for all analyses indicated..... Yes / No
- Name of sampler included on COC(s)..... Yes / No

Notes:

Chain of Custody Record



Environment Testing
 Americas

Client Information		Lab PM Arada, Rachelle		Carrier Tracking No(s)		COC No 380-27941-2757 2	
Client Contact: Dr Ron Fenstermacher		E-Mail Rachelle.Arada@et.eurofins.com		State of Origin		Page Page 2 of 2	
Company City & County of Honolulu		PWSID		Analysis Requested		Job #	
Address: 630 South Beretania Street, Chemistry Lab		Due Date Requested:		533 - All Analytes		Preservation Codes:	
City Honolulu		TAT Requested (days):		537.1_DW_PREC - 537.1 Full List		M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2SO4 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4-5 Y - Trizma Z - other (specify)	
State, Zip HI, 96843		Compliance Project: Δ No		525.2_PREC - (MOD) 525plus PLUS TICS		Other:	
Phone 808-748-5091 (tel)		PO # C20525101 exp 05312023		SUBCONTRACT - 8015 Gas (Purgable) LL (EAL)			
Email r Fenstermacher@hbws.org		W/O #		SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil			
Project # 38001111		Project Name RED-HILL/HBWS sites Event Desc RUSH Weekly Red Hill		SUBCONTRACT - 625 PAH Physis LL (EAL) + TICS			
Site SSOW#		Field Filtered Sample (Yes or No)		SUBCONTRACT - 625 PAH Physis LL (EAL) + TICS			
Sample Identification		Field Filtered Sample (Yes or No)		SUBCONTRACT - 8015 Gas (Purgable) LL (EAL)			
MOANALUA WELLS		Sample Date		SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil			
AIEA GULCH WELLS PUMP2		Sample Time		SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil			
AIEA WELLS PUMPS 1&2 (260)		Sample Time		SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil			
HALAWA WELLS UNITS 1&2		Sample Time		SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil			
FB MOANALUA WELLS		Sample Date		SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil			
FB AIEA GULCH WELLS PUMP2		Sample Date		SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil			
FB AIEA WELLS PUMPS 1&2 (260)		Sample Date		SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil			
FB HALAWA WELLS UNITS 1&2		Sample Date		SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil			
Possible Hazard Identification		Sample Date		SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil			
<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		Sample Date		SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil			
Deliverable Requested: I, II, III, IV, Other (specify)		Sample Date		SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil			
Empty Kit Relinquished by:		Date:		SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil			
Relinquished by		Date/Time		SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil			
Relinquished by		Date/Time		SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil			
Relinquished by		Date/Time		SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil			
Custody Seals Intact: Δ Yes Δ No		Custody Seal No.:		SUBCONTRACT - 8915 Diesel LL (EAL) and Motor Oil			



Login Sample Receipt Checklist

Client: City & County of Honolulu

Job Number: 380-59480-2

Login Number: 59480
List Number: 1
Creator: Elyas, Matthew

List Source: Eurofins Eaton Analytical Pomona

Question	Answer	Comment
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	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	
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	
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	
Samples do not require splitting or compositing.	True	
Container provided by EEA	True	

