ALS Environmental
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Table of Contents

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
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Client: Univeristy of Hawai'i at Manoa
Project: Arsenic Sepciation
Sample Matrix: Animal Tissue

Service Request: K2111718
Date Received: 04/20/2021

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier II level requested by the client.

Sample Receipt:

Fifty six animal tissue samples were received for analysis at ALS Environmental on 04/20/2021. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The samples were stored at minimum in accordance with the analytical method requirements.

Metals:

Method 1632, 11/03/2021: The matrix spike recoveries of Arsenic (III) for samples Composite 8 and composite 10 were outside control criteria. Recovery in the Ongoing Precision and Recovery (OPR) was acceptable, which indicated the analytical batch was in control. The matrix spike outlier suggested a potential high bias in this matrix. No further corrective action was appropriate.

Approved by Noe D. Oani Date 11/05/2021

Chain of Custody

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K2111718

Rec 4/20/21 0945

Sample ID	Matrix	Comments	ALS ID	COMPOSITE	COMPOSITE #
KWEPPO-1	Tissue	Epinephelus polyphekadion	K2104151-013	KWEPPO	1
KWEPPO-2	Tissue	Epinephelus polyphekadion	K2104151-014	KWEPPO	1
KWEPPO-3	Tissue	Epinephelus polyphekadion	K2104166-019	KWEPPO	1
KWKAPE-1	Tissue	Katsuwonus pelamis	K2104145-001	KWKAPE	2
KWKAPE-2	Tissue	Katsuwonus pelamis	K2104145-002	KWKAPE	2
KWKAPE-3	Tissue	Katsuwonus pelamis	K2104145-003	KWKAPE	2
KWLUGI-1	Tissue	Lutjanus gibbus	K2104151-011	KWLUGI	3
KWLUGI-2	Tissue	Lutjanus gibbus	K2104151-012	KWLUGI	3
KWLUGI-5	Tissue	Lutjanus gibbus	K2104157-018	KWLUGI	3
KWNALI-2	Tissue	Naso lituratus	K2104168-012	KWNALI	4
KWNALI-5	Tissue	Naso lituratus	K2104166-020	KWNALI	4
KWNALI-6	Tissue	Naso lituratus	K2104168-001	KWNALI	4
KWCHSO-1	Tissue	Chlorurus sordidus	K2104151-004	KWCHSO	5
KWCHSO-3	Tissue	Chlorurus sordidus	K2104168-011	KWCHSO	5
KWCHSO-5	Tissue	Chlorurus sordidus	K2104157-019	KWCHSO	5
JAEPPO-1	Tissue	Epinephelus polyphekadion	K2104151-003	JAEPPO	6
JAEPPO-10	Tissue	Epinephelus polyphekadion	K2104168-007	JAEPPO	6
JAEPPO-4	Tissue	Epinephelus polyphekadion	K2104162-012	JAEPPO	6
JATHAL-1	Tissue	Thunnus albacares	K2104166-016	JATHAL	7
JATHAL-2	Tissue	Thunnus albacares	K2104166-015	JATHAL	7
JATHAL-3	Tissue	Thunnus albacares	K2104166-014	JATHAL	7
JALUGI-4	Tissue	Lutjanus gibbus	K2104151-009	JALUGI	8
JALUGI-5	Tissue	Lutjanus gibbus	K2104151-010	JALUGI	8
JALUGI-6	Tissue	Lutjanus gibbus	K2104168-006	JALUGI	8
JANALI-1	Tissue	Naso lituratus	K2104157-015	JANALI	9
JANALI-2	Tissue	Naso lituratus	K2104157-016	JANALI	9
JANALI-4	Tissue	Naso lituratus	K2104157-017	JANALI	9
UTEPPO-1	Tissue	Epinephelus polyphekadion	K2104151-006	UTEPPO	10
UTEPPO-5	Tissue	Epinephelus polyphekadion	K2104151-018	UTEPPO	10
UTEPPO-7	Tissue	Epinephelus polyphekadion	K2104151-019	UTEPPO	10
UTTHAL-1A	Tissue	Thunnus albacares	K2104145-015	UTTHAL	11
UTTHAL-2A	Tissue	Thunnus albacares	K2104145-016	UTTHAL	11

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UTTHAL-3A	Tissue	Thunnus albacares	K2104145-017	UTTHAL	11
UTTHAL-4A	Tissue	Thunnus albacares	K2104145-018	UTTHAL	11
UTCHSO-1	Tissue	Chlorurus sordidus	K2104151-005	UTCHSO	12
UTCHSO-2	Tissue	Chlorurus sordidus	K2104168-015	UTCHSO	12
UTCHSO-3	Tissue	Chlorurus sordidus	K2104162-015	UTCHSO	12
UTNALI-1	Tissue	Naso lituratus	K2104166-010	UTNALI	13
UTNALI-4	Tissue	Naso lituratus	K2104162-011	UTNALI	13
UTNALI-5	Tissue	Naso lituratus	K2104157-014	UTNALI	13
UTLUGI-1	Tissue	Lutjanus gibbus	K2104166-009	UTLUGI	14
UTLUGI-2	Tissue	Lutjanus gibbus	K2104175-007	UTLUGI	14

Metals

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Analytical Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
Sample Matrix:	Animal tissue	**Date Received:**	04/20/21

Total Metals

Sample Name:	Composite 1	Units:	ug/g
Lab Code:	K2111718-004	Basis:	As Received
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.02	1	11/02/21	11/03/21	ND	
Arsenic (V)	1632A	1632A	0.02	1	NA	NA	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	11/02/21	11/04/21	ND	

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Analytical Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
Sample Matrix:	Animal tissue	**Date Received:**	04/20/21

Total Metals

Sample Name:	Composite 2	Units:	ug/g
Lab Code:	K2111718-008	Basis:	As Received
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.02	1	11/02/21	11/03/21	ND	
Arsenic (V)	1632A	1632A	0.02	1	NA	NA	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	11/02/21	11/04/21	ND	

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Analytical Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
Sample Matrix:	Animal tissue	**Date Received:**	04/20/21

Total Metals

Sample Name:	Composite 3	Units:	ug/g
Lab Code:	K2111718-012	Basis:	As Received
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.02	1	11/02/21	11/03/21	0.031	
Arsenic (V)	1632A	1632A	0.02	1	NA	NA	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	11/02/21	11/04/21	0.032	

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Analytical Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
Sample Matrix:	Animal tissue	**Date Received:**	04/20/21

Total Metals

Sample Name:	Composite 4	Units:	ug/g
Lab Code:	K2111718-016	Basis:	As Received
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.02	1	11/02/21	11/03/21	0.071	
Arsenic (V)	1632A	1632A	0.02	1	NA	NA	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	11/02/21	11/04/21	0.060	

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Analytical Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
Sample Matrix:	Animal tissue	**Date Received:**	04/20/21

Total Metals

Sample Name:	Composite 5	Units:	ug/g
Lab Code:	K2111718-020	Basis:	As Received
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.02	1	11/02/21	11/03/21	0.211	
Arsenic (V)	1632A	1632A	0.02	1	NA	NA	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	11/02/21	11/04/21	0.191	

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Analytical Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
Sample Matrix:	Animal tissue	**Date Received:**	04/20/21

Total Metals

Sample Name:	Composite 6	Units:	ug/g
Lab Code:	K2111718-024	Basis:	As Received
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.02	1	11/02/21	11/03/21	ND	
Arsenic (V)	1632A	1632A	0.02	1	NA	NA	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	11/02/21	11/04/21	ND	

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Analytical Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
Sample Matrix:	Animal tissue	**Date Received:**	04/20/21

Total Metals

Sample Name:	Composite 7	Units:	ug/g
Lab Code:	K2111718-028	Basis:	As Received
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.02	1	11/02/21	11/03/21	ND	
Arsenic (V)	1632A	1632A	0.02	1	NA	NA	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	11/02/21	11/04/21	ND	

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Analytical Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
Sample Matrix:	Animal tissue	**Date Received:**	04/20/21

Total Metals

Sample Name:	Composite 8	Units:	ug/g
Lab Code:	K2111718-032	Basis:	As Received
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.02	1	11/02/21	11/03/21	ND	
Arsenic (V)	1632A	1632A	0.02	1	NA	NA	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	11/02/21	11/04/21	ND	

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Analytical Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
Sample Matrix:	Animal tissue	**Date Received:**	04/20/21

Total Metals

Sample Name:	Composite 9	Units:	ug/g
Lab Code:	K2111718-036	Basis:	As Received
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.02	1	11/02/21	11/03/21	0.044	
Arsenic (V)	1632A	1632A	0.02	1	NA	NA	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	11/02/21	11/04/21	0.040	

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Analytical Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
Sample Matrix:	Animal tissue	**Date Received:**	04/20/21

Total Metals

Sample Name:	Composite 10	Units:	ug/g
Lab Code:	K2111718-040	Basis:	As Received
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.02	1	11/02/21	11/03/21	ND	
Arsenic (V)	1632A	1632A	0.02	1	NA	NA	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	11/02/21	11/04/21	ND	

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Analytical Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
Sample Matrix:	Animal tissue	**Date Received:**	04/20/21

Total Metals

Sample Name:	Composite 11	Units:	ug/g
Lab Code:	K2111718-045	Basis:	As Received
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.02	1	11/02/21	11/03/21	ND	
Arsenic (V)	1632A	1632A	0.02	1	NA	NA	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	11/02/21	11/04/21	ND	

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Analytical Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
Sample Matrix:	Animal tissue	**Date Received:**	04/20/21

Total Metals

Sample Name:	Composite 12	Units:	ug/g
Lab Code:	K2111718-049	Basis:	As Received
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.02	1	11/02/21	11/03/21	0.102	
Arsenic (V)	1632A	1632A	0.02	1	NA	NA	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	11/02/21	11/04/21	0.078	

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Analytical Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
Sample Matrix:	Animal tissue	**Date Received:**	04/20/21

Total Metals

Sample Name:	Composite 13	Units:	ug/g
Lab Code:	K2111718-053	Basis:	As Received
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.02	1	11/02/21	11/03/21	0.086	
Arsenic (V)	1632A	1632A	0.02	1	NA	NA	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	11/02/21	11/04/21	0.068	

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Analytical Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
Sample Matrix:	Animal tissue	**Date Received:**	04/20/21

Total Metals

Sample Name:	Composite 14	Units:	ug/g
Lab Code:	K2111718-056	Basis:	As Received
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.02	1	11/02/21	11/03/21	0.026	
Arsenic (V)	1632A	1632A	0.02	1	NA	NA	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	11/02/21	11/04/21	0.024	

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Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
Sample Matrix:	Animal tissue	**Date Received:**	04/20/21

Total Metals

Sample Name:	Method Blank 1	Units:	ug/g
Lab Code:	K2111718-MB1	Basis:	As Received
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.02	1	11/02/21	11/03/21	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	11/02/21	11/04/21	ND	

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dba ALS Environmental
Analytical Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
Sample Matrix:	Animal tissue	**Date Received:**	04/20/21

Total Metals

Sample Name:	Method Blank 2	Units:	ug/g
Lab Code:	K2111718-MB2	Basis:	As Received
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.02	1	11/02/21	11/03/21	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	11/02/21	11/04/21	ND	

ALS Group USA, Corp.
dba ALS Environmental
Analytical Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
Sample Matrix:	Animal tissue	**Date Received:**	04/20/21

Total Metals

Sample Name:	Method Blank 3	Units:	ug/g
Lab Code:	K2111718-MB3	Basis:	As Received
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Dilution Factor	Date Extracted	Date Analyzed	Result	Result Notes
Arsenic (III)	1632A	1632A	0.02	1	11/02/21	11/03/21	ND	
Inorganic Arsenic	1632A	1632A	0.02	1	11/02/21	11/04/21	ND	

ALS Group USA, Corp.
dba ALS Environmental
QA/QC Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
Sample Matrix:	Animal tissue	**Date Received:**	04/20/21
		Date Extracted:	11/02/21
		Date Analyzed:	11/03,04/21

Matrix Spike/Duplicate Matrix Spike Summary
Total Metals

Sample Name:	Composite 8	Units:	ug/g
Lab Code:	K2111718-032MS, K2111718-032DMS	Basis:	As Received
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	ALS Percent Recovery MS	ALS Percent Recovery DMS	ALS Percent Recovery Acceptance Limits	Relative Percent Difference	Result Notes
Arsenic (III)	1632A	1632A	0.08	0.298	0.297	ND	0.507	0.536	171	180	30-170	6	N
Inorganic Arsenic	1632A	1632A	0.08	0.597	0.595	ND	0.536	0.532	90	89	50-150	<1	

ALS Group USA, Corp.
dba ALS Environmental
QA/QC Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
Sample Matrix:	Animal tissue	**Date Received:**	04/20/21
		Date Extracted:	11/02/21
		Date Analyzed:	11/03,04/21

Matrix Spike/Duplicate Matrix Spike Summary
Total Metals

Sample Name:	Composite 10	Units:	ug/g
Lab Code:	K2111718-040MS, K2111718-040DMS	Basis:	As Received
Test Notes:			

Analyte	Prep Method	Analysis Method	MRL	Spike Level MS	Spike Level DMS	Sample Result	Spike Result MS	Spike Result DMS	ALS Percent Recovery MS	ALS Percent Recovery DMS	ALS Percent Recovery Acceptance Limits	Relative Percent Difference	Result Notes
Arsenic (III)	1632A	1632A	0.08	0.298	0.297	ND	0.549	0.481	185	162	30-170	13	N
Inorganic Arsenic	1632A	1632A	0.08	0.595	0.595	ND	0.483	0.482	81	81	50-150	<1	

ALS Group USA, Corp.
dba ALS Environmental
QA/QC Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	11/02/21
		Date Analyzed:	11/03,04/21

Ongoing Precision and Recovery (OPR) Sample Summary
Total Metals

Sample Name: Ongoing Precision and Recovery

Units: ug/g
Basis: NA

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	ALS Percent Recovery Acceptance Limits	Result Notes
Arsenic (III)	Method	1632A	0.100	0.061	61	30-170	
Inorganic Arsenic	Method	1632A	0.200	0.166	83	50-150	

ALS Group USA, Corp.
dba ALS Environmental
QA/QC Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	11/03,04/21

Calibration Verification (CALVER) Sample Summary
Total Metals

Sample Name: CALVER 1 Units: ug/L
Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	ALS Percent Recovery Acceptance Limits	Result Notes
Arsenic (III)	NA	1632A	0.20	0.210	105	70-130	
Inorganic Arsenic	NA	1632A	0.20	0.189	94	80-120	

ALS Group USA, Corp.
dba ALS Environmental
QA/QC Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	11/03,04/21

Calibration Verification (CALVER) Sample Summary
Total Metals

Sample Name: CALVER 2 — Units: ug/L
Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	ALS Percent Recovery Acceptance Limits	Result Notes
Arsenic (III)	NA	1632A	0.20	0.237	118	70-130	
Inorganic Arsenic	NA	1632A	0.20	0.190	95	80-120	

ALS Group USA, Corp.
dba ALS Environmental
QA/QC Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	11/03,04/21

Calibration Verification (CALVER) Sample Summary
Total Metals

Sample Name: CALVER 3 — Units: ug/L
Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	ALS Percent Recovery Acceptance Limits	Result Notes
Arsenic (III)	NA	1632A	0.20	0.226	113	70-130	
Inorganic Arsenic	NA	1632A	0.20	0.191	96	80-120	

ALS Group USA, Corp.
dba ALS Environmental
QA/QC Report

Client:	Univeristy of Hawai'i at Manoa	**Service Request:**	K2111718
Project:	Arsenic Sepciation	**Date Collected:**	NA
LCS Matrix:	Water	**Date Received:**	NA
		Date Extracted:	NA
		Date Analyzed:	11/03,04/21

Calibration Verification (CALVER) Sample Summary
Total Metals

Sample Name: CALVER 4 — Units: ug/L
Basis: NA

Test Notes:

Analyte	Prep Method	Analysis Method	True Value	Result	Percent Recovery	ALS Percent Recovery Acceptance Limits	Result Notes
Arsenic (III)	NA	1632A	0.20	0.230	115	70-130	
Inorganic Arsenic	NA	1632A	0.20	0.192	96	80-120	