DALTON
OLMSTED
FUGLEVAND

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TECHNICAL MEMORANDUM

TO: Scott Hooton – Port of Tacoma

FROM: David Cooper

DATE: March 16, 2018

SUBJECT: 2017 Annual Monitoring Summary Report
Former Arkema 3009 Taylor Way site
Tacoma, Washington

REF. NO: POT-002

CC: Paul Fuglevand - DOF

This data report presents the results of the first year (2017) post-remedial action groundwater monitoring program being conducted at the Former Arkema 3009 Taylor Way site (aka Former Dunlap Mound) in Tacoma, Washington (Figure 1). The performance monitoring is being conducted to fulfill the requirements of Agreed Order No. DE 13124 between the Washington State Department of Ecology (Ecology) and the Port of Tacoma (Port), and the Draft Cleanup Action Plan (DCAP, DOF 2015b).

The purpose of the monitoring is to assess the performance of source control interim actions completed at the former Arkema Mound site and to confirm that groundwater cleanup levels (CULs) have been achieved for dissolved arsenic, copper and zinc in groundwater that ultimately discharges to the Hylebos Waterway. A supplemental interim action (SIA) was completed between August 2013 and February 2015. The primary goals of the SIA was to meet the industrial soil contact CUL (88 mg/kg) for arsenic and to prevent the erosion and migration of soil containing arsenic above the Commencement Bay Sediment Quality Objective (57 mg/kg) into the Hylebos Waterway. Approximately 24,560 tons of arsenic containing soil were removed from three areas of the Site and disposed in the LRI landfill. The SIA included the construction of an engineered cover, stabilization of the Hylebos shoreline, and the installation of certain utilities.

Performance/confirmation groundwater monitoring is being conducted in general accordance with the Ecology approved Performance / Confirmation Groundwater Monitoring Plan (DOF 2015c). The primary objective of the monitoring is to assess whether Upper Aquifer dissolved arsenic concentrations are below CULs at the point

where groundwater discharges to surface water (points of compliance) within two general areas of the site including:

- Along the Hylebos shoreline within the Northeast Area, and
- Along the western/southern site boundary at the head of the Kaiser Ditch.

MONITORING WELL INSTALLATION

New monitoring wells were installed at three locations as described below and shown on Figure 2:

- Northeast Area – One monitoring well installed in the Upper Aquifer at the approximate former location of well MW-H. This well is designated "MW-H(R)".
- Southwestern Site Boundary (downgradient of areas P10 and SB7 – near head of Kaiser Ditch) – Two monitoring wells located along the site boundary in the vicinity of former wells MW-1 and MW-E. These wells were designated "MW-1(R)" and "MW-E(R)".

The monitoring wells were installed using a direct-push probe rig in November 2016. The work was documented by David Cooper, a licensed geologist/hydrogeologist with DOF. New well installations were completed by Holt Drilling, a licensed Washington State drilling contractor, consistent with the requirements of Chapter 173-160 WAC (Minimum Standards for Construction and Maintenance of Wells).

- Well depths ranged from 10 to 13 feet below ground surface.
- During drilling, soil samples were collected continuously to determine stratigraphy using a dual-tube or macro sampler. Soils were described using ASTM-D2488 as a general guide.
- Once the drilling depth was determined to reach the top of the Upper Aquitard, a 2-inch diameter pre-packaged screen/sand pack PVC screen (5-feet long) and riser pipe were installed through the casing center.
- The wells were completed with a surface seal and flush-to-ground monuments within a concrete pad and identified by a single pipe bollard.
- The wells were subsequently developed by pumping until the pumped water visually cleared using a battery powered submersible pump.
- Well construction as-built details are included on the geologic and well construction logs presented in Attachment A.

After the wells were installed and developed, the wells were surveyed to determine the horizontal coordinates using a differential GPS (NAD83 State Plane System). Top of casing elevations were determined by differential levelling techniques to an accuracy 0.01 feet, using Arkema Manufacturing Site monitoring well # 8F2-2(R) top of casing as a datum (MLLW).

SAMPLING PROCEDURES, HANDLING

Groundwater samples were collected with a peristaltic pump and dedicated downhole polyethylene tubing. Low flow sampling procedures were used to minimize particulates being entrained in the samples submitted to the laboratory. Sampling was conducted at lower tidal levels when groundwater flow was towards surface water. The depth to water was initially measured using an electric well probe. Purging was completed at a flow rate of less than 0.5 liters/minute. During purging, field parameters were monitored for pH, temperature, dissolved oxygen, conductivity, Eh, ferrous iron and turbidity. Parameters recorded are included in Table 1.

Samples were pumped directly into containers provided by the receiving laboratory, Analytical Resources Inc. (ARI), Tukwila, WA. Samples for dissolved metals analysis were field filtered using an in-line 0.45 micron filter. Once the containers were filled, they were placed in chilled coolers that were delivered to the laboratory within 24 hours of collection. Sample handling was documented using standard chain-of-custody (COC) procedures.

GROUNDWATER CONCENTRATIONS AND COMPARISON TO CLEANUP LEVELS

Laboratory analyses were conducted for the following dissolved and total metals:

- Arsenic – All wells
- Copper – Northeast Area well MW-H(R)
- Zinc - Northeast Area well MW-H(R)

The Monitoring Plan stipulated that at the end of the initial two quarters of monitoring, if dissolved copper and zinc are below the CULs in well MW-H(R), these constituents would be eliminated from the monitoring program.

ARI, a Washington State Certified Laboratory, completed the analyses using Ecology approved methods by Inductively Coupled Plasma Triple Quadrupole Mass Spectrometry (ICP-QQQ-MS).

Groundwater analytical data are summarized in attached Table 1. Laboratory data reprots are included as Attachment B. CULs are presented and discussed in the DCAP and are summarized in Table 2 below.

Table 2. Groundwater CULs

Constituent	Cleanup Level (ug/l)
Dissolved Arsenic	5
Dissolved Copper	3.1
Dissolved Zinc	81

The following observations are noted based on review of the 2017 analytical data;

- Well MW-1(R) - Dissolved arsenic concentrations ranged from 0.35 to 4.0 ug/l, below the CUL

- MW-E(R) - Dissolved arsenic concentrations ranged from 8.0 to 30.3 ug/l, above the CUL

- Well MW-H(R)
    - Total and dissolved zinc and copper concentrations were below method detection limits in samples collected during the first two quarters. These concentrations were below the CULs and therefore dropped from the monitoring program.

    - Dissolved arsenic concentrations ranged from 47 to 90 ug/l, above the CUL.

MONITORING SCHEDULE FOR 2018

The performance monitoring plan stipulated that monitoring would be required for two years after the interim action and that modifications to the future monitoring program (locations, frequency etc.), would be proposed should additional monitoring be required. Monitoring will be conducted in 2018 as follows:

Monitoring Program: As summarized in Table 3.

Table 3 – 2018 Monitoring Schedule

Period
January 2018 (included in this report)
April 2018
July 2018
October 2018

Reporting: Submit 2018 annual report to Ecology during the first quarter of 2019.

REFERENCES

DOF. 2015a. Remedial Investigation, Former Arkema Mound Site, 3009 Taylor Way, Prepared
for the Port of Tacoma. September 2015.

DOF. 2015b, Draft Cleanup Action Plan, 3009 Taylor Way Site, Tacoma, Washington. Prepared for the Port of Tacoma, November 20, 2015.

DOF. 2015c, Performance Confirmation Monitoring Plan, 3009 Taylor Way Site, Tacoma, Washington. Prepared for the Port of Tacoma, November 20, 2015.

Attachments

Table 2 – Groundwater Analytical Data – January 2017 to January 2018

Figure 1 – Vicinity Map
Figure 2 – Interim Action Remedial Area and Monitoring Well Locations

Attachment A – Monitoring Well Logs

Attachment B – Laboratory Data Sheets

Attachment C – Sample Collection Forms

TABLE 1 - Groundwater Quality Data, Former Arkema Mound Site, 3009 Taylor Way, Tacoma, WA

Well Number - Aquifer	MW-1(R)					Old MW-1	MW-E(R)					Old MW-E	MW-H (R)					Old MW-H	CUL
Date Sampled	**1/12/17**	**4/25/17**	**7/28/17**	**10/26/17**	**1/31/18**	*2/3/11*	**1/12/17**	**4/25/17**	**7/28/17**	**10/26/17**	**1/31/18**	*2/3/11*	**1/12/17**	**4/25/17**	**7/28/17**	**10/26/17**	**1/31/18**	*2/3/11*	
Field Parameters																			
pH	**6.7**	**6.7**	**6.4**	**6.7**	**6.7**	*6.6*	**6.4**	**6.7**	**6.2**	**6.4**	**6.4**	*6.0*	**6.4**	**6.5**	**6.1**	**6.0**	**6.4**	*6.5*	
Conductivity (uS/cm)	**828**	**853**	**1010**	**834**	**1176**	*203*	**1261**	**646**	**2216**	**1845**	**612**	*562*	**13538**	**9242**	**11311**	**23373**	**12883**	*1101*	
Temperature (C)	**10.6**	**11.7**	**17.2**	**15.0**	**9.3**	*9.6*	**12.5**	**10.3**	**17.8**	**16.3**	**10.0**	*9.4*	**11.5**	**11.5**	**18.6**	**16.1**	**10.1**	*11.3*	
Turbidity (NTU)	**73.1**	**51.2**	**4.0**	**5.6**	**43.5**	*5.2*	**60.5**	**45.6**	**2.6**	**6.2**	**4.8**	*3.2*	**12.1**	**14.6**	**4.3**	**21.8**	**4.6**	*22.5*	
Dissolved oxygen (mg/l)	**0.3**	**0.1**	**0.9**	**0.7**	**0.4**		**0.4**	**0.3**	**1.0**	**0.4**	**0.3**		**0.5**	**0.6**	**1.4**	**0.4**	**2.1**		
ORP (mv)	**-12.9**	**-1.3**	**-26.3**	**-8.9**	**-34.3**		**-57.0**	**17.2**	**-13.9**	**-30.7**	**-10.9**		**18.1**	**-0.2**	**-20.1**	**15.8**	**-28.2**		
Ferrous Iron (mg/l)	**4.5**	**2.8**	**4.0**	**6.9**	**2.8**	*0.2*	**4.5**	**5.5**	**6.5**	**3.7**	**2.8**	*5.6*	**5.0**	**4.3**	**6.0**	**5.8**	**2.2**	*4.6*	
Metals (Dissolved)																			
Arsenic (ug/l)	**0.956** D	**0.399** D	**4.03**	**0.825**	**0.349**	*43* D	**15.7** D	**7.96** D	**30.3**	**25.1**	**5.36**	*23.4* D	**67.5** D	**46.7** D	**90.2**	**50.5** D	**50.9** D	*45.5* D	**5**
Copper (ug/l)	---	---	---	---	---	*<0.50* U	---	---	---	---	---	*<0.50* U	<2.5 U	<2.50 U	---	---	---	*0.8* D	**3.1**
Zinc (ug/l)	---	---	---	---	---	*<4.00* U	---	---	---	---	---	*<4.00* U	<20.0 U	<20.0 U	---	---	---	*<4.00* U	**81.0**
Metals (Total)																			
Arsenic (ug/l)	**0.954**	**0.404**	**1.46**	**2.32**	**0.682**		**22.9**	**35.5**	**14.4**	**26.1** D	**2.07**	*0.002* D	**72.2**	**55.3**	**81.6**	**60.3** D	**55.7** D		
Copper (ug/l)	---	---	---	---	---		---	---	---	---	---	*39.1* D	<2.50 U	<2.50 U	---	---	---		
Zinc (ug/l)	---	---	---	---	---		---	---	---	---	---	*32.7* D	<20.0 U	<20.0 U	---	---	---		
Water Table																			
Date Measured	1/12/17	4/25/17	7/28/17	10/26/17	1/31/18		1/12/17	4/25/17	7/28/17	10/26/17	1/31/18	*2/1/11*	1/12/17	4/25/17	7/28/17	10/26/17	1/31/18	*2/1/11*	
Time	1430	1136	1243	0934	1025		1330	1133	1246	0940	10:30	*1556*	1230	1131	1240	0930	10:35	*1530*	
Well depth	10.2	10.2	10.2	10.2	10.2		10.0	10.0	10.0	10.0	10.0		13.1	13.1	13.1	13.1	13.1		
Depth to water (ft.)	2.6	1.81	4.36	2.71	1.55		6.53	6.15	7.37	7	4.75	*5.10*	7.15	7.20	7.36	7.85	7.09	*5.68*	
Elevation (ft. MLLW)	13.35	14.14	11.59	13.24	14.40		10.00	10.38	9.16	9.53	11.78	*10.89*	11.81	11.76	11.60	11.11	11.87	*11.18*	

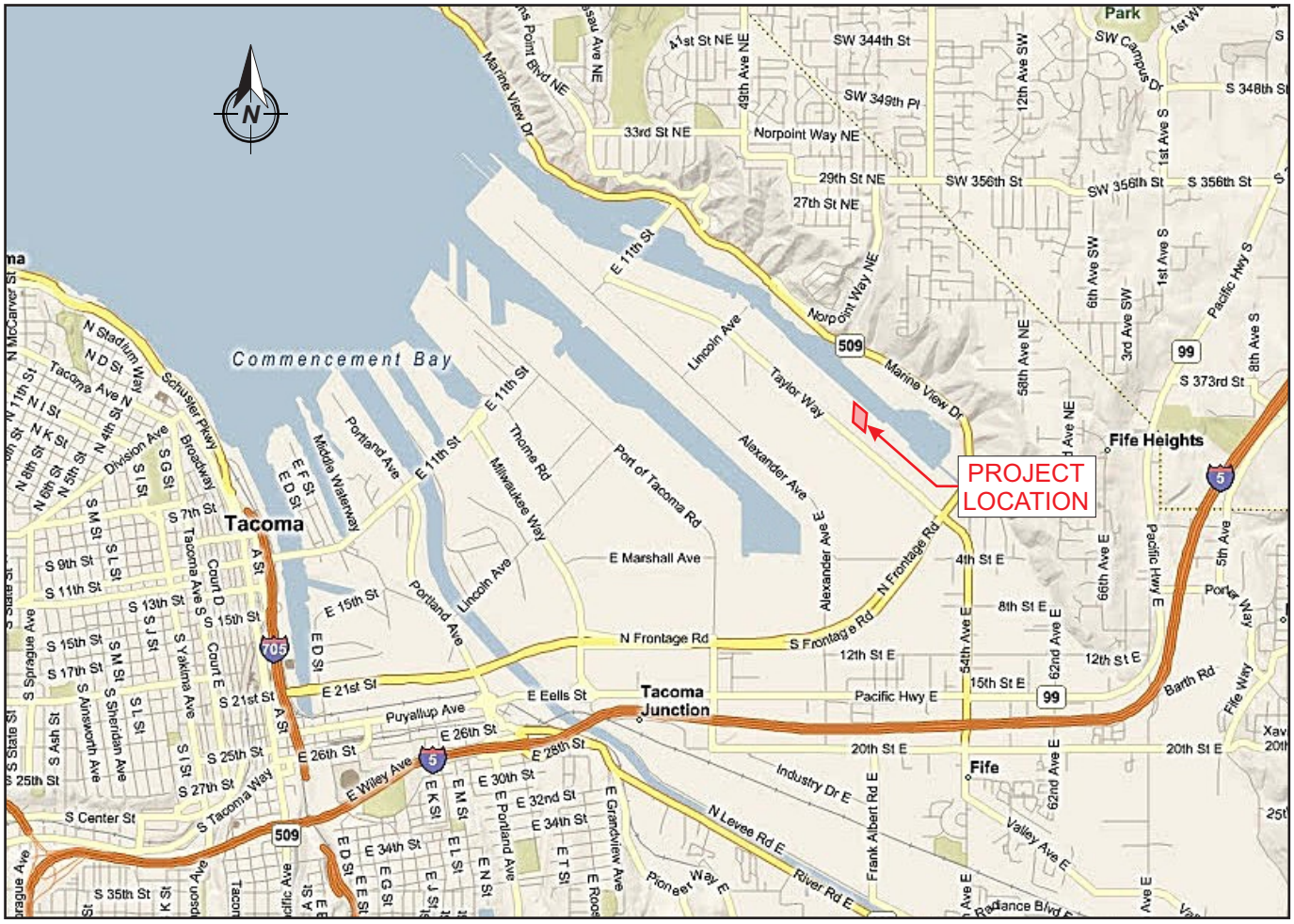
Shading of Metals Results by CUL

Shade	
	< CUL
	> CUL

Notes

D = Dissolved concentration, field filtered 0.45um
- - - = Not measured-well and/or analyte not on monitoring schedule
U = Not detected at indicated detection limit
J = Estimated concentration
N.R. = Not Reported

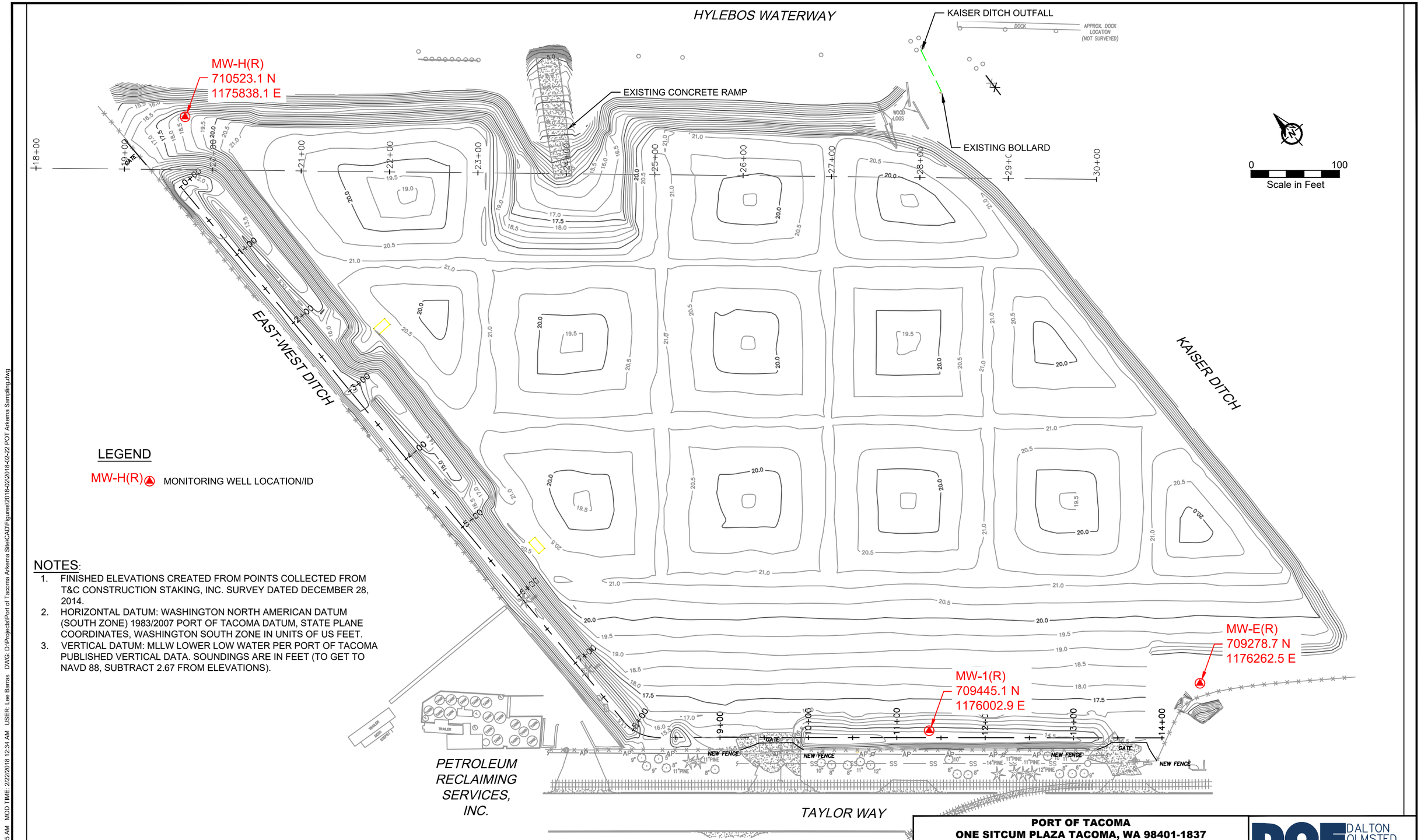
Not to Scale



Not To Scale

General Note:
Vicinity map images come from
Microsoft Virtual Earth web site.

Port of Tacoma Tacoma, Washington		
Former Dunlap Mound 3009 Taylor Way, Tacoma WA **VICINITY MAP**		**FIGURE 1**
Dalton, Olmsted & Fuglevand, Inc.		February 2018



LEGEND

MW-H(R) MONITORING WELL LOCATION/ID

NOTES:

1. FINISHED ELEVATIONS CREATED FROM POINTS COLLECTED FROM T&C CONSTRUCTION STAKING, INC. SURVEY DATED DECEMBER 28, 2014.
2. HORIZONTAL DATUM: WASHINGTON NORTH AMERICAN DATUM (SOUTH ZONE) 1983/2007 PORT OF TACOMA DATUM, STATE PLANE COORDINATES, WASHINGTON SOUTH ZONE IN UNITS OF US FEET.
3. VERTICAL DATUM: MLLW LOWER LOW WATER PER PORT OF TACOMA PUBLISHED VERTICAL DATA. SOUNDINGS ARE IN FEET (TO GET TO NAVD 88, SUBTRACT 2.67 FROM ELEVATIONS).

PORT OF TACOMA
ONE SITCUM PLAZA TACOMA, WA 98401-1837

3009 TAYLOR WAY MTCA INTERIM ACTION - ECOLOGY AGREED ORDER DE 6129

SITE PLAN
WITH MONITORING WELL LOCATIONS

DOF DALTON OLMSTED FUGLEVAND

FIGURE 2

FEB. 22, 2018

PLOT TIME: 2/22/2018 12:35 AM MOD TIME: 2/22/2018 12:34 AM USER: Lee Barras DWG: D:\Projects\Port of Tacoma Arkema Site\CAD\Figures\2018-02\2018-02-22 POT Arkema Sampling.dwg

ATTACHMENT A

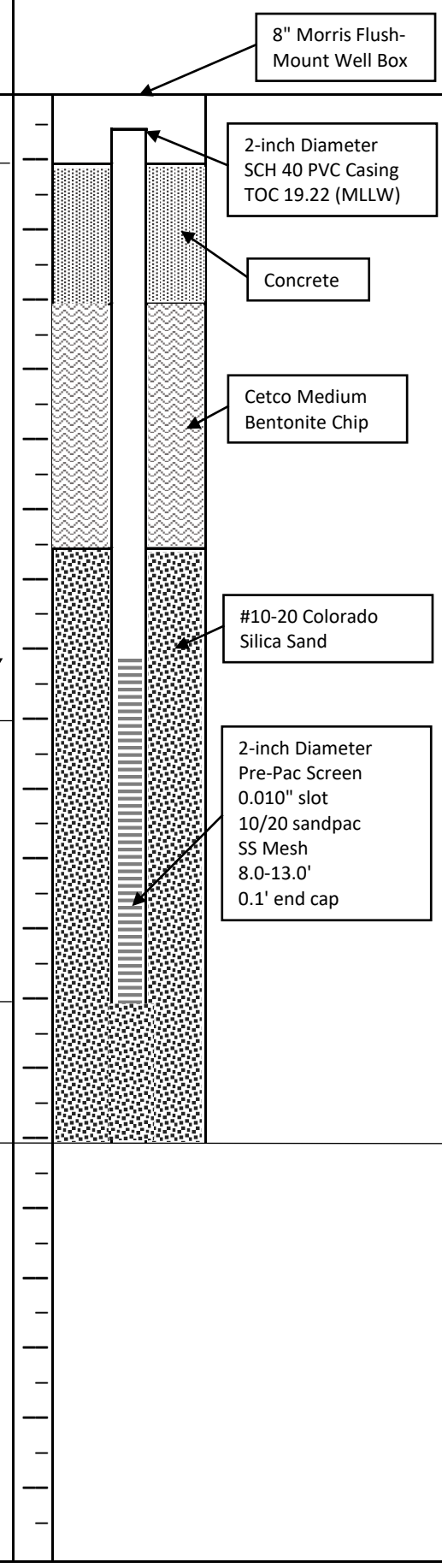
Monitoring Well Logs / As- Builts
Former Arkema 3009 Taylor Way Site
Tacoma, Washington

DALTON OLMSTED FUGLEVAND

LOG OF MW-H(R)

PROJECT: Former Dunlap Mound	COORDINATES: 710523.1**N** 1175838.0**E** (NAD83)	
LOCATION: Tacoma, WA	SURFACE ELEVATION: 19.2 (MLLW)	
DRILLING CONTRACTOR: Holt	DATE: 11/10/16	
DRILLING EQUIPMENT: Geoprobe 7822DT	TOTAL DEPTH OF BORING: 15.0'	ECOLOGY ID: BKY-352
DRILLING METHOD: Direct-Push	LOGGED BY: D. Cooper	
SAMPLING METHOD: 2" dia. Macro w/acrylic liner	RESPONSIBLE PROF.: D. Cooper	REG. NO.: 1600
NOTES: Well box marked with single bollard painted yellow		

DEPTH (feet)	SAMPLES: Lab Sample	SAMPLES: Sample Recovery	SAMPLES: Blow Counts	SAMPLES: PID (ppm)	VISUAL SOIL DESCRIPTION Soil Group Name (USCS): color, moisture, density/consistency, grain size, other discriptors
0					3/4" - Minus Crushed Rock
5					POORLY GRADED SAND WITH GRAVEL (SP): brown (7.5YR-5/3), moist to wet, 20% gravel, 60% sand, 20% silt
10					POORLY GRADED SAND (SP): gray (7.5YR-5/1), saturated, 100% fine sand with silty interbeds
13					SILT (ML): gray (7.5YR-6/1), wet, 100% silt, with scattered organics
15					Bottom of Boring 15.0 feet



Note: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

DOF DALTON OLMSTED FUGLEVAND

LOG OF MW-1(R)

PROJECT: Former Dunlap Mound	COORDINATES: 709445.1**N** 1176002.9**E** (NAD83)	
LOCATION: Tacoma, WA	SURFACE ELEVATION: 16.2 (MLLW)	
DRILLING CONTRACTOR: Holt	DATE: 11/10/16	
DRILLING EQUIPMENT: Geoprobe 7822DT	TOTAL DEPTH OF BORING: 10.0'	ECOLOGY ID: BKY-351
DRILLING METHOD: Direct-Push	LOGGED BY: D. Cooper	
SAMPLING METHOD: 2" dia. Macro w/acrylic liner	RESPONSIBLE PROF.: D. Cooper	REG. NO.: 1600
NOTES: Well box marked with single bollard painted yellow		

DEPTH (feet)	SAMPLES: Lab Sample	SAMPLES: Sample Recovery	SAMPLES: Blow Counts	SAMPLES: PID (ppm)	VISUAL SOIL DESCRIPTION Soil Group Name (USCS): color, moisture, density/consistency, grain size, other discriptors	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
0						8" Morris Flush-Mount Well Box
1					POORLY GRADED SAND WITH GRAVEL (SP): brown (7.5YR-5/3), moist to wet, 20% gravel, 60% sand, 20% silt	2-inch Diameter SCH 40 PVC Casing TOC 15.95 (MLLW)
2						Concrete
3						Cetco Medium Bentonite Chip
4						
5					POORLY GRADED SAND (SP): gray (7.5YR-5/1), saturated, 100% fine sand with silt clasts ▽	#10-20 Colorado Silica Sand
6						
7						2-inch Diameter Pre-Pac Screen 0.010" slot 10/20 sandpac SS Mesh 5.0-10.0' 0.1' end cap
8						
9						
10					SILT (ML): gray (7.5YR-6/1), wet, 100% silt	
					Bottom of Boring 10.0 feet	
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

Note: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

DALTON OLMSTED FUGLEVAND

LOG OF MW-E(R)

PROJECT: Former Dunlap Mound	COORDINATES: 709278.7**N** 1176262.5**E** (NAD83)	
LOCATION: Tacoma, WA	SURFACE ELEVATION: 16.9 (MLLW)	
DRILLING CONTRACTOR: Holt	DATE: 11/10/16	
DRILLING EQUIPMENT: Geoprobe 7822DT	TOTAL DEPTH OF BORING: 10.0'	ECOLOGY ID: BKY-350
DRILLING METHOD: Direct-Push	LOGGED BY: D. Cooper	
SAMPLING METHOD: 2" dia. Macro w/acrylic liner	RESPONSIBLE PROF.: D. Cooper	REG. NO.: 1600
NOTES: Well box marked with single bollard painted yellow		

DEPTH (feet)	SAMPLES: Lab Sample	SAMPLES: Sample Recovery	SAMPLES: Blow Counts	SAMPLES: PID (ppm)	VISUAL SOIL DESCRIPTION Soil Group Name (USCS): color, moisture, density/consistency, grain size, other discriptors	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
1					POORLY GRADED SAND WITH GRAVEL (SP): brown (7.5YR-5/3), moist to wet, 20% gravel, 60% sand, 20% silt	8" Morris Flush-Mount Well Box 2-inch Diameter SCH 40 PVC Casing TOC 16.53 (MLLW) Concrete
2						
3						Cetco Medium Bentonite Chip
4						
5					POORLY GRADED SAND (SP): gray (7.5YR-5/1), saturated, 100% fine sand ▽	#10-20 Colorado Silica Sand
6						
7						2-inch Diameter Pre-Pac Screen 0.010" slot 10/20 sandpac SS Mesh 5.0-10.0' 0.1' end cap
8						
9						
10					SILT (ML): gray (7.5YR-6/1), wet, 100% silt, with organics Bottom of Boring 10.0 feet	
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						

Note: The summary log is an interpretation based on samples, drill action, and interpolation. Variations between what is shown and actual conditions should be anticipated.

ATTACHMENT B

Laboratory Data Sheets
Post-Interim Action Groundwater Sample Analyses January 2017 to January 2018
Former Arkema 3009 Taylor Way Site
Tacoma, Washington

Sample Dates

- January 12, 2017
- April 25, 2017
- July 28, 2017
- October 26, 2017
- January 31, 2017

Analytical Resources, Incorporated
Analytical Chemists and Consultants

26 January 2017

Dave Cooper
Dalton, Olmsted & Fuglevand, Inc
10827 NE 68th Street Suite B
Kirkland, WA 98033-4400

RE: POT-Former Dunlap Mound

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
17A0121	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the reqirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Amanda Volgardsen, Project Management Assistant

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006

PJLA Testing
Accreditation # 66169

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 17A0121	Turn-around Requested: NORMAL	Page: 1 of 1	
ARI Client Company: DOF	Phone: 206-660-3466	Date: 1/13/17	Ice Present?
Client Contact: DAVID COOPER		No. of Coolers:	Cooler Temps:
Client Project Name: POT FORMER DUNLAP MOUND			
Client Project #: POT-002	Samplers: DG COOPER		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: TOTAL METALS As	DISS METALS As *	TOTAL METALS Cu, Zn	DISS METALS Cu, Zn *					Notes/Comments
MW-1(R)	1/12/17	1430	WATER	2	X	X							ALL METALS BY
MW-E(R)	"	1330	"	"	X	X							ICP-QQQ-MS
MW-H(R)	"	1230	"	"	X	X	X	X					"
DUPL-1	"	1435	"	"	X	X							"

Comments/Special Instructions
* DISSOLVED METALS SAMPLES FIELD FILTERED 0.45µm

Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
Printed Name: DG COOPER	Printed Name: Justin Meyer	Printed Name:	Printed Name:
Company: DOF	Company: ARI	Company:	Company:
Date & Time: 1/13/17 0745	Date & Time: 1/13/17 0745	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: DOF

Project Name: POT Former Dunlap Mound

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier (Hand Delivered) Other: _____

Assigned ARI Job No: 17A0121

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 0.3

Time: _____

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: D00527G

Cooler Accepted by: JM Date: 1/13/17 Time: 0745

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used? ... Bubble Wrap (Wet Ice) Gel Packs Baggies Foam Block Paper Other: _____			
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	NA	(YES)	NO
Were all VOC vials free of air bubbles?	(NA)	YES	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	(NA)		_____

Was Sample Split by ARI : (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

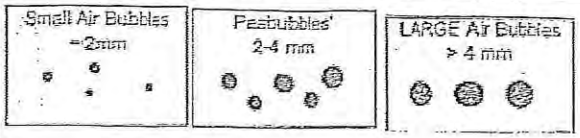
Samples Logged by: JM Date: 1/13/17 Time: 8:02

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:



Small → "sm" (< 2 mm)
Peabubbles → "pb" (2 to < 4 mm)
Large → "lg" (4 to < 6 mm)
Headspace → "hs" (> 6 mm)

WORK ORDER

17A0121

Client: Dalton, Olmsted & Fuglevand, Inc
Project Manager: Amanda Volgardsen
Project: POT-Former Dunlap Mound
Project Number: POT-Former Dunlap Mound

Analysis	Due	TAT	Expires	Comments
17A0121-07 MW-H (R) [Water] Sampled 12-Jan-2017 13:30 (GMT-08:00) Pacific Time (US &				
Met Diss 200.8 - Zn UCT	27-Jan-2017 15:00	10	11-Jul-2017 13:30	
Met Diss 200.8 - Cu UCT	27-Jan-2017 15:00	10	11-Jul-2017 13:30	
Met Diss 200.8 - As UCT	27-Jan-2017 15:00	10	11-Jul-2017 13:30	
17A0121-08 DUPL-1 [Water] Sampled 12-Jan-2017 14:35 (GMT-08:00) Pacific Time (US &				
Met Diss 200.8 - As UCT	27-Jan-2017 15:00	10	11-Jul-2017 14:35	

Preservation Confirmation

Container ID	Container Type	pH
17A0121-01 A	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
17A0121-02 A	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
17A0121-03 A	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
17A0121-04 A	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
17A0121-05 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 pass
17A0121-06 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 pass
17A0121-07 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 pass
17A0121-08 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 pass

B. H
Preservation Confirmed By

1/13/17
Date

B. H
Reviewed By

1/13/17
Date

Analytical Report

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-Former Dunlap Mound	**Reported:**
Kirkland, WA 98033-4400	Project Manager: Dave Cooper	26-Jan-2017 16:21

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1 (R)	17A0121-01	Water	12-Jan-2017 14:30	13-Jan-2017 07:45
MW-E (R)	17A0121-02	Water	12-Jan-2017 13:30	13-Jan-2017 07:45
MW-H (R)	17A0121-03	Water	12-Jan-2017 12:30	13-Jan-2017 07:45
DUPL-1	17A0121-04	Water	12-Jan-2017 14:35	13-Jan-2017 07:45
MW-1 (R)	17A0121-05	Water	12-Jan-2017 14:30	13-Jan-2017 07:45
MW-E (R)	17A0121-06	Water	12-Jan-2017 13:30	13-Jan-2017 07:45
MW-H (R)	17A0121-07	Water	12-Jan-2017 12:30	13-Jan-2017 07:45
DUPL-1	17A0121-08	Water	12-Jan-2017 14:35	13-Jan-2017 07:45

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-Former Dunlap Mound	**Reported:**
Kirkland, WA 98033-4400	Project Manager: Dave Cooper	26-Jan-2017 16:21

Case Narrative

Sample receipt

Four samples were received January 13, 2017 under ARI workorder 17A0121. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Total and Dissolved Metals - EPA Method 200.8

There were no analytical complications noted.

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-Former Dunlap Mound	**Reported:**
Kirkland, WA 98033-4400	Project Manager: Dave Cooper	26-Jan-2017 16:21

MW-1 (R)

17A0121-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 01/12/2017 14:30
Analyzed: 01/17/2017 16:45

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFA0228 Sample Size: 25 mL
Prepared: 01/16/2017 06:10 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.200	**0.954**	ug/L	

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-Former Dunlap Mound	**Reported:**
Kirkland, WA 98033-4400	Project Manager: Dave Cooper	26-Jan-2017 16:21

MW-E (R)

17A0121-02 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 01/12/2017 13:30
Instrument: ICPMS2 — Analyzed: 01/17/2017 16:50

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFA0228 — Sample Size: 25 mL
Prepared: 01/16/2017 06:10 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.200	**22.9**	ug/L	

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-Former Dunlap Mound	**Reported:**
Kirkland, WA 98033-4400	Project Manager: Dave Cooper	26-Jan-2017 16:21

MW-H (R)

17A0121-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 01/12/2017 12:30
Analyzed: 01/19/2017 18:39

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFA0228 Sample Size: 25 mL
Prepared: 01/16/2017 06:10 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	5	1.00	**72.2**	ug/L	D
Copper	7440-50-8	5	2.50	ND	ug/L	U
Zinc	7440-66-6	5	20.0	ND	ug/L	U

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-Former Dunlap Mound	**Reported:**
Kirkland, WA 98033-4400	Project Manager: Dave Cooper	26-Jan-2017 16:21

DUPL-1

17A0121-04 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 01/12/2017 14:35
Analyzed: 01/17/2017 16:59

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFA0228 Sample Size: 25 mL
Prepared: 01/16/2017 06:10 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.200	**1.05**	ug/L	

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-Former Dunlap Mound	**Reported:**
Kirkland, WA 98033-4400	Project Manager: Dave Cooper	26-Jan-2017 16:21

MW-1 (R)

17A0121-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 01/12/2017 14:30
Instrument: ICPMS1 — Analyzed: 01/18/2017 18:16

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFA0230 — Sample Size: 25 mL
Prepared: 01/16/2017 07:24 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	**0.956**	ug/L	

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-Former Dunlap Mound	**Reported:**
Kirkland, WA 98033-4400	Project Manager: Dave Cooper	26-Jan-2017 16:21

MW-E (R)

17A0121-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 01/12/2017 13:30
Instrument: ICPMS1 — Analyzed: 01/18/2017 18:40

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFA0230 — Sample Size: 25 mL
Prepared: 01/16/2017 07:24 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	2	0.400	**15.7**	ug/L	D

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-Former Dunlap Mound	**Reported:**
Kirkland, WA 98033-4400	Project Manager: Dave Cooper	26-Jan-2017 16:21

MW-H (R)

17A0121-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 01/12/2017 12:30
Analyzed: 01/19/2017 18:34

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFA0230 Sample Size: 25 mL
Prepared: 01/16/2017 07:24 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	5	1.00	**67.5**	ug/L	D
Copper, Dissolved	7440-50-8	5	2.50	ND	ug/L	U
Zinc, Dissolved	7440-66-6	5	20.0	ND	ug/L	U

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-Former Dunlap Mound	**Reported:**
Kirkland, WA 98033-4400	Project Manager: Dave Cooper	26-Jan-2017 16:21

DUPL-1

17A0121-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS1

Sampled: 01/12/2017 14:35
Analyzed: 01/18/2017 18:44

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFA0230 Sample Size: 25 mL
Prepared: 01/16/2017 07:24 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	**0.924**	ug/L	

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-Former Dunlap Mound	**Reported:**
Kirkland, WA 98033-4400	Project Manager: Dave Cooper	26-Jan-2017 16:21

Metals and Metallic Compounds - Quality Control

Batch BFA0228 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFA0228-BLK1)				Prepared: 16-Jan-2017 Analyzed: 17-Jan-2017 13:54							
Arsenic		ND	0.200	ug/L							U
Copper		ND	0.500	ug/L							U
Zinc		ND	4.00	ug/L							U
LCS (BFA0228-BS1)				Prepared: 16-Jan-2017 Analyzed: 17-Jan-2017 14:14							
Arsenic		23.7	0.200	ug/L	25.0		94.8 %	80-120			
Copper		27.2	0.500	ug/L	25.0		109 %	80-120			
Zinc		77.9	4.00	ug/L	80.0		97.3 %	80-120			

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-Former Dunlap Mound	**Reported:**
Kirkland, WA 98033-4400	Project Manager: Dave Cooper	26-Jan-2017 16:21

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFA0230 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFA0230-BLK1)				Prepared: 16-Jan-2017 Analyzed: 18-Jan-2017 18:08							
Arsenic		ND	0.200	ug/L							U
Copper		ND	0.500	ug/L							U
Zinc		ND	4.00	ug/L							U
LCS (BFA0230-BS1)				Prepared: 16-Jan-2017 Analyzed: 18-Jan-2017 18:26							
Arsenic		24.0	0.200	ug/L	25.0		96.1 %	80-120			
Copper		27.0	0.500	ug/L	25.0		108 %	80-120			
Zinc		74.9	4.00	ug/L	80.0		93.7 %	80-120			
Duplicate (BFA0230-DUP1)		**Source: 17A0121-05**		Prepared: 16-Jan-2017 Analyzed: 18-Jan-2017 18:12							
Arsenic		0.909	0.200	ug/L		0.956			5.04	20	
Copper		ND	0.500	ug/L		0.352				20	U
Zinc		ND	4.00	ug/L		1.59			15.90	20	U
Matrix Spike (BFA0230-MS1)		**Source: 17A0121-05**		Prepared: 16-Jan-2017 Analyzed: 18-Jan-2017 18:20							
Arsenic		25.4	0.200	ug/L	25.0	0.956	97.9 %	75-125			
Copper		25.3	0.500	ug/L	25.0	0.352	99.9 %	75-125			
Zinc		69.1	4.00	ug/L	80.0	1.59	84.4 %	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-Former Dunlap Mound	**Reported:**
Kirkland, WA 98033-4400	Project Manager: Dave Cooper	26-Jan-2017 16:21

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/06/2017
CALAP	California Department of Public Health CAELAP	2748	02/28/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	03/30/2017
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2017
WADOE	WA Dept of Ecology	C558	06/30/2017
WA-DW	Ecology - Drinking Water	C558	06/30/2017

Analytical Report

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-Former Dunlap Mound	**Reported:**
Kirkland, WA 98033-4400	Project Manager: Dave Cooper	26-Jan-2017 16:21

Notes and Definitions

D	The reported value is from a dilution
J	Estimated concentration value detected below the reporting limit.
U	This analyte is not detected above the applicable reporting or detection limit.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

10 May 2017

Dave Cooper
Dalton, Olmsted & Fuglevand, Inc
10827 NE 68th Street Suite B
Kirkland, WA 98033-4400

RE: POT-Former Dunlap Mound

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
17D0422	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the reqirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

Amanda Volgardsen, Project Management Assistant

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006

PJLA Testing
Accreditation # 66169

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 17D0422	Turn-around Requested: NORMAL	Page: 1 of 1	
ARI Client Company: DOF	Phone: 206-660-3466	Date: 4/26/17	Ice Present?
Client Contact: David Cooper		No. of Coolers:	Cooler Temps:
Client Project Name: PGT - FORMER DUNLAP MOLDED			
Client Project #: PGT-00	Samplers: DC Cooper		

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)
www.arilabs.com

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: TOTAL METALS As	* DISSOLVED METALS As	TOTAL METALS Cu, Zn	* DISSOLVED METALS Cu, Zn					Notes/Comments
MW-1 (R)	4/25/17	1345	WATER	2	X	X							ALL METALS BY ICP-QQQ-MS
MW-E (R)		1255			X	X							
MW-H (R)		1150			X	X	X	X					
DUPL		1350			X	X							

Comments/Special Instructions
* DISSOLVED METALS FIELD FILTERED 0.45 µm

Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
Printed Name: DC Cooper	Printed Name: Brittney Hall	Printed Name:	Printed Name:
Company: DOF	Company: ARI	Company:	Company:
Date & Time: 4/26/17 1315	Date & Time: 4/26/17 1315	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: All samples submitted to ARI will be appropriately discarded no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer, unless alternate retention schedules have been established by work-order or contract.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: DOF

Project Name: POT-Former Dunlap Mound

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier (Hand Delivered) Other: _____

Assigned ARI Job No: 17D0422

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 4.9

Time: 1315

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: D0052016

Cooler Accepted by: B.H. Date: 4/26/17 Time: 1315

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used? ...	Bubble Wrap (Wet Ice) Gel Packs Baggies Foam Block Paper Other: _____		
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		YES	(NO)
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		YES	(NO)
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	NA	(YES)	NO
Were all VOC vials free of air bubbles?	(NA)	YES	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	(NA)		

Was Sample Split by ARI : (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: B.H. Date: 4/27/17 Time: 6:07

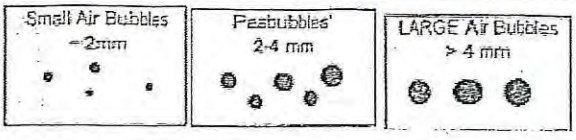
*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

Sampling year missing from 5 bottle labels.

By: B.H. Date: 4/27/17



Small → "sm"	(< 2 mm)
Peabubbles → "pb"	(2 to < 4 mm)
Large → "lg"	(4 to < 6 mm)
Headspace → "hs"	(> 6 mm)

WORK ORDER

17D0422

Client: Dalton, Olmsted & Fuglevand, Inc
Project Manager: Amanda Volgardsen
Project: POT-Former Dunlap Mound
Project Number: POT-00

Preservation Confirmation

Container ID	Container Type	pH
17D0422-01 A	HDPE NM, 500 mL, 1:1 HNO3	<2 Pass
17D0422-02 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 Pass
17D0422-03 A	HDPE NM, 500 mL, 1:1 HNO3	<2 Pass
17D0422-04 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 Pass
17D0422-05 A	HDPE NM, 500 mL, 1:1 HNO3	<2 Pass
17D0422-06 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 Pass
17D0422-07 A	HDPE NM, 500 mL, 1:1 HNO3	<2 Pass
17D0422-08 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 Pass

B.H.
Preservation Confirmed By

4/27/17
Date

B.H.
Reviewed By

4/27/17
Date

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-May-2017 15:20

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1 (R)	17D0422-01	Water	25-Apr-2017 13:45	26-Apr-2017 13:15
MW-1 (R)	17D0422-02	Water	25-Apr-2017 13:45	26-Apr-2017 13:15
MW-E (R)	17D0422-03	Water	25-Apr-2017 12:55	26-Apr-2017 13:15
MW-E (R)	17D0422-04	Water	25-Apr-2017 12:55	26-Apr-2017 13:15
MW-H (R)	17D0422-05	Water	25-Apr-2017 11:50	26-Apr-2017 13:15
MW-H (R)	17D0422-06	Water	25-Apr-2017 11:50	26-Apr-2017 13:15
DUPL	17D0422-07	Water	25-Apr-2017 13:50	26-Apr-2017 13:15
DUPL	17D0422-08	Water	25-Apr-2017 13:50	26-Apr-2017 13:15

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-May-2017 15:20

Case Narrative

Sample receipt

Samples as listed on the preceding page were received April 26, 2017 under ARI workorder 17D0422. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Total and Dissolved Metals - EPA Method 200.8

The samples were digested and analyzed within the recommended holding times.

There were no target compounds detected in the method blanks.

The LCS percent recoveries were within control limits.

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-May-2017 15:20

MW-1 (R)

17D0422-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 04/25/2017 13:45

Instrument: ICPMS1 — Analyzed: 01-May-2017 16:09

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFE0001 — Sample Size: 25 mL
Prepared: 01-May-2017 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.200	**0.404**	ug/L	

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-May-2017 15:20

MW-1 (R)

17D0422-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 04/25/2017 13:45

Instrument: ICPMS1 — Analyzed: 02-May-2017 18:09

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFD0735 — Sample Size: 25 mL
Prepared: 28-Apr-2017 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.200	**0.399**	ug/L	

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-May-2017 15:20

MW-E (R)

17D0422-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 04/25/2017 12:55

Instrument: ICPMS1 — Analyzed: 03-May-2017 18:31

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFE0001 — Sample Size: 25 mL
Prepared: 01-May-2017 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	10	2.00	**35.5**	ug/L	D

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-May-2017 15:20

MW-E (R)

17D0422-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 04/25/2017 12:55

Instrument: ICPMS1 — Analyzed: 02-May-2017 18:31

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFD0735 — Sample Size: 25 mL
Prepared: 28-Apr-2017 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.200	**7.96**	ug/L	

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-May-2017 15:20

MW-H (R)

17D0422-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 04/25/2017 11:50

Instrument: ICPMS1 — Analyzed: 03-May-2017 16:42

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFE0001 — Sample Size: 25 mL
Prepared: 01-May-2017 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	5	1.00	**55.3**	ug/L	D
Copper	7440-50-8	5	2.50	ND	ug/L	U
Zinc	7440-66-6	5	20.0	ND	ug/L	U

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-May-2017 15:20

MW-H (R)

17D0422-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 04/25/2017 11:50

Instrument: ICPMS2 — Analyzed: 04-May-2017 14:35

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFD0735 — Sample Size: 25 mL
Prepared: 28-Apr-2017 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	5	1.00	**46.7**	ug/L	D
Copper	7440-50-8	5	2.50	ND	ug/L	U
Zinc	7440-66-6	5	20.0	ND	ug/L	U

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-May-2017 15:20

DUPL

17D0422-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 04/25/2017 13:50

Instrument: ICPMS1 — Analyzed: 01-May-2017 16:22

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFE0001 — Sample Size: 25 mL
Prepared: 01-May-2017 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.200	**0.394**	ug/L	

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-May-2017 15:20

DUPL

17D0422-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 04/25/2017 13:50

Instrument: ICPMS1 — Analyzed: 02-May-2017 18:40

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFD0735 — Sample Size: 25 mL
Prepared: 28-Apr-2017 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.200	**0.515**	ug/L	

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-May-2017 15:20

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFD0735 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1

Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFD0735-BLK1)				Prepared: 28-Apr-2017 Analyzed: 02-May-2017 17:32							
Arsenic, Dissolved		ND	0.200	ug/L							U
Copper, Dissolved	63	ND	0.500	ug/L							U
Copper, Dissolved	65	ND	0.500	ug/L							U
Zinc, Dissolved	66	ND	4.00	ug/L							U
Zinc, Dissolved	67	ND	4.00	ug/L							U
LCS (BFD0735-BS1)				Prepared: 28-Apr-2017 Analyzed: 02-May-2017 18:13							
Arsenic, Dissolved		25.6	0.200	ug/L	25.0		102	80-120			
Copper, Dissolved	63	27.2	0.500	ug/L	25.0		109	80-120			
Copper, Dissolved	65	27.0	0.500	ug/L	25.0		108	80-120			
Zinc, Dissolved	66	84.4	4.00	ug/L	80.0		105	80-120			
Zinc, Dissolved	67	82.3	4.00	ug/L	80.0		103	80-120			

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-May-2017 15:20

Metals and Metallic Compounds - Quality Control

Batch BFE0001 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1

Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFE0001-BLK1)				Prepared: 01-May-2017 Analyzed: 01-May-2017 14:07							
Arsenic		ND	0.200	ug/L							U
Copper	63	ND	0.500	ug/L							U
Copper	65	ND	0.500	ug/L							U
Zinc	66	ND	4.00	ug/L							U
Zinc	67	ND	4.00	ug/L							U
LCS (BFE0001-BS1)				Prepared: 01-May-2017 Analyzed: 01-May-2017 14:47							
Arsenic		26.1	0.200	ug/L	25.0		105	80-120			
Copper	63	27.2	0.500	ug/L	25.0		109	80-120			
Copper	65	26.9	0.500	ug/L	25.0		108	80-120			
Zinc	66	89.9	4.00	ug/L	80.0		112	80-120			
Zinc	67	87.7	4.00	ug/L	80.0		110	80-120			

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-May-2017 15:20

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-63	NELAP,WADOE,WA-DW,DoD-ELAP
Copper-65	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-66	NELAP,WADOE,WA-DW,DoD-ELAP
Zinc-67	NELAP,WADOE,WA-DW,DoD-ELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/06/2017
CALAP	California Department of Public Health CAELAP	2748	02/28/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	03/30/2017
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2017
WADOE	WA Dept of Ecology	C558	06/30/2017
WA-DW	Ecology - Drinking Water	C558	06/30/2017

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-May-2017 15:20

Notes and Definitions

U	This analyte is not detected above the applicable reporting or detection limit.
J	Estimated concentration value detected below the reporting limit.
D	The reported value is from a dilution
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

10 August 2017

Dave Cooper
Dalton, Olmsted & Fuglevand, Inc
10827 NE 68th Street Suite B
Kirkland, WA 98033-4400

RE: POT-Former Dunlap Mound

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
17G0339	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the reqirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in it entirety.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006

PJLA Testing
Accreditation # 66169

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 1760339	Turn-around Requested: NORMAL
ARI Client Company: DOF	Phone: 206-660-3466
Client Contact: DAVID COOPER	
Client Project Name: POT- FORMER DUNCAP MOUND	
Client Project #: POT-00	Samplers: D Cooper C Kleene

Page: 1 of 1	
Date: 7/28/17	Ice Present?
No. of Coolers:	Cooler Temps:

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Analytical Chemists and Consultants
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206-695-6200 206-695-6201 (fax)
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Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: Total metals As	Dissolved metals As *	[redacted]	Dissolved Metals Cu, Zn *					Notes/Comments
MW-1 (R)	7/28/17	1400	WATER	2	X	X							ALL METALS BY
MW-E (R)	"	1330	"	"	X	X							ICP-AAA-MS
MW-H (R)	"	1430	"	"	X	X							
DUPL-1	"	1405	"	"	X	X							

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
* DISSOLVED METALS FIELD FILTERED 0.45 µm	Printed Name: D. COOPER	Printed Name: Paul Mark	Printed Name:	Printed Name:
	Company: DOF	Company: ARI	Company:	Company:
	Date & Time: 7/28/17 1550	Date & Time: 7/28/2017 15:50	Date & Time:	Date & Time:

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: DOF

Project Name: POT- Former Duncap Mound

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 1760339

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 6.6

Time: _____

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: D005206

Cooler Accepted by: PM Date: 7/28/2017 Time: 15:50

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used? ...	Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____		
Was sufficient ice used (if appropriate)?	B.H. (NA)	YES	(NO)
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?	B.H.	(YES)	(NO)
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	NA	(YES)	NO
Were all VOC vials free of air bubbles?	(NA)	YES	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	(NA)	_____	

Was Sample Split by ARI : (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: B.H. Date: 7/31/17 Time: 6:30

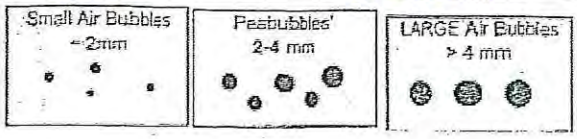
*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

B.H. *Additional Notes, Discrepancies, & Resolutions:*

~~Missing one bottle of MW-1(R).~~

By: B.H. Date: 7/31/17



Small → "sm"	(< 2 mm)
Peabubbles → "pb"	(2 to < 4 mm)
Large → "lg"	(4 to < 6 mm)
Headspace → "hs"	(> 6 mm)

WORK ORDER

17G0339

Client: Dalton, Olmsted & Fuglevand, Inc **Project Manager:** Amanda Volgardsen

Project: POT-Former Dunlap Mound **Project Number:** POT-00

Analysis	Due	TAT	Expires	Comments
17G0339-07 DUPL-1 [Water] Sampled 28-Jul-2017 14:05 (GMT-08:00) Pacific Time (US &				
Met Diss 200.8 - As UCT	14-Aug-2017 15:00	10	24-Jan-2018 14:05	
17G0339-08 MW-1 (R) [Water] Sampled 28-Jul-2017 14:00 (GMT-08:00) Pacific Time (US &				
Met Diss 200.8 - As UCT	14-Aug-2017 15:00	10	24-Jan-2018 14:00	

Preservation Confirmation

Container ID	Container Type	pH
17G0339-01 A	HDPE NM, 500 mL, 1:1 HNO3	< 2 Pass
17G0339-02 A	HDPE NM, 500 mL, 1:1 HNO3	
17G0339-03 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	
17G0339-04 A	HDPE NM, 500 mL, 1:1 HNO3	
17G0339-05 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	
17G0339-06 A	HDPE NM, 500 mL, 1:1 HNO3	
17G0339-07 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	
17G0339-08 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	

B. H. — Preservation Confirmed By

7/31/17 — Date

B. H. — Reviewed By

7/31/17 — Date

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Aug-2017 17:41

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1 (R)	17G0339-01	Water	28-Jul-2017 14:00	28-Jul-2017 15:50
MW-E (R)	17G0339-02	Water	28-Jul-2017 13:30	28-Jul-2017 15:50
MW-E (R)	17G0339-03	Water	28-Jul-2017 13:30	28-Jul-2017 15:50
MW-H (R)	17G0339-04	Water	28-Jul-2017 14:30	28-Jul-2017 15:50
MW-H (R)	17G0339-05	Water	28-Jul-2017 14:30	28-Jul-2017 15:50
DUPL-1	17G0339-06	Water	28-Jul-2017 14:05	28-Jul-2017 15:50
DUPL-1	17G0339-07	Water	28-Jul-2017 14:05	28-Jul-2017 15:50
MW-1 (R)	17G0339-08	Water	28-Jul-2017 14:00	28-Jul-2017 15:50

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Aug-2017 17:41

Case Narrative

Sample receipt

Samples as listed on the preceding page were received July 28, 2017 under ARI workorder 17G0339. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Total and Dissolved Arsenic - EPA Method 200.8

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

A total matrix spike and duplicate were prepared in conjunction with sample MW-1(R). A dissolved matrix spike and duplicate were prepared in conjunction with sample MW-H(R). The matrix spike percent recoveries and duplicate RPD were within QC limits.

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Analytical Resources, Incorporated
Analytical Chemists and Consultants

Analytical Report

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Aug-2017 17:41

MW-1 (R)

17G0339-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 07/28/2017 14:00

Instrument: ICPMS2 — Analyzed: 01-Aug-2017 15:44

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFH0002 — Sample Size: 25 mL
Prepared: 01-Aug-2017 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.200	**1.46**	ug/L	

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Analytical Report

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Aug-2017 17:41

MW-E (R)

17G0339-02 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 07/28/2017 13:30

Instrument: ICPMS2 — Analyzed: 01-Aug-2017 18:02

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFH0002 — Sample Size: 25 mL
Prepared: 01-Aug-2017 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.200	**14.4**	ug/L	

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Analytical Chemists and Consultants

Analytical Report

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Aug-2017 17:41

MW-E (R)

17G0339-03 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 07/28/2017 13:30

Instrument: ICPMS2 — Analyzed: 08-Aug-2017 17:30

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFH0001 — Sample Size: 25 mL
Prepared: 01-Aug-2017 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	**30.3**	ug/L	

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Analytical Report

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Aug-2017 17:41

MW-H (R)

17G0339-04 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 07/28/2017 14:30

Instrument: ICPMS2 — Analyzed: 01-Aug-2017 17:58

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFH0002 — Sample Size: 25 mL
Prepared: 01-Aug-2017 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	5	1.00	**81.6**	ug/L	D

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Aug-2017 17:41

MW-H (R)

17G0339-05 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 07/28/2017 14:30

Instrument: ICPMS2 — Analyzed: 08-Aug-2017 17:49

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFH0001 — Sample Size: 25 mL
Prepared: 01-Aug-2017 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	5	1.00	**90.2**	ug/L	D

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Analytical Report

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Aug-2017 17:41

DUPL-1

17G0339-06 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED — Sampled: 07/28/2017 14:05
Instrument: ICPMS2 — Analyzed: 01-Aug-2017 18:07

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFH0002 — Sample Size: 25 mL
Prepared: 01-Aug-2017 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.200	**2.94**	ug/L	

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Aug-2017 17:41

DUPL-1

17G0339-07 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 07/28/2017 14:05

Instrument: ICPMS2 — Analyzed: 09-Aug-2017 15:31

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFH0001 — Sample Size: 25 mL
Prepared: 01-Aug-2017 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	2	0.400	**4.41**	ug/L	D

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Aug-2017 17:41

MW-1 (R)

17G0339-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED — Sampled: 07/28/2017 14:00

Instrument: ICPMS2 — Analyzed: 08-Aug-2017 17:39

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFH0001 — Sample Size: 25 mL
Prepared: 01-Aug-2017 — Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	**4.03**	ug/L	

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Aug-2017 17:41

Metals and Metallic Compounds - Quality Control

Batch BFH0002 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFH0002-BLK1)				Prepared: 01-Aug-2017 Analyzed: 01-Aug-2017 14:33							
Arsenic	75a	ND	0.200	ug/L							U
LCS (BFH0002-BS1)				Prepared: 01-Aug-2017 Analyzed: 01-Aug-2017 14:38							
Arsenic	75a	25.8	0.200	ug/L	25.0		103	80-120			
Duplicate (BFH0002-DUP1)		**Source: 17G0339-01**		Prepared: 01-Aug-2017 Analyzed: 01-Aug-2017 15:39							
Arsenic	75a	1.52	0.200	ug/L		1.46			4.24	20	
Matrix Spike (BFH0002-MS1)		**Source: 17G0339-01**		Prepared: 01-Aug-2017 Analyzed: 01-Aug-2017 15:49							
Arsenic	75a	27.4	0.200	ug/L	25.0	1.46	104	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Aug-2017 17:41

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFH0001 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFH0001-BLK1)				Prepared: 01-Aug-2017 Analyzed: 08-Aug-2017 17:25							
Arsenic, Dissolved	75a	ND	0.200	ug/L							U
LCS (BFH0001-BS1)				Prepared: 01-Aug-2017 Analyzed: 08-Aug-2017 17:59							
Arsenic, Dissolved	75a	25.5	0.200	ug/L	25.0		102	80-120			
Duplicate (BFH0001-DUP1)		**Source: 17G0339-05**		Prepared: 01-Aug-2017 Analyzed: 08-Aug-2017 17:44							
Arsenic, Dissolved	75a	85.8	1.00	ug/L		90.2			5.09	20	D
Matrix Spike (BFH0001-MS1)		**Source: 17G0339-05**		Prepared: 01-Aug-2017 Analyzed: 08-Aug-2017 17:54							
Arsenic, Dissolved	75a	111	1.00	ug/L	25.0	90.2	82.7	75-125			D

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Aug-2017 17:41

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	09/01/2017
CALAP	California Department of Public Health CAELAP	2748	02/28/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

Analytical Report

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-00	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Aug-2017 17:41

Notes and Definitions

U	This analyte is not detected above the applicable reporting or detection limit.
J	Estimated concentration value detected below the reporting limit.
D	The reported value is from a dilution
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

10 November 2017

Dave Cooper
Dalton, Olmsted & Fuglevand, Inc
10827 NE 68th Street Suite B
Kirkland, WA 98033-4400

RE: POT-Former Dunlap Mound

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
17J0522	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the reqirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in it" entirety.

ACCREDITED IN ACCORDANCE WITH nelac
Cert# 100006

PJLA Testing
Accreditation # 66169

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 1710522	Turn-around Requested: Normal	Date: 10/26/17	
ARI Client Company: Dalton Olmsted & Fuglevand	Phone: 206-660-3466	Page: 1 of 1	
Client Contact: Dave Cooper		No. of Coolers:	Cooler Temps: 13.8°C
Client Project Name: Former Dunlap Mound			
Client Project #: POT-002	Samplers: DG Cooper L.Kerr D.Baning		

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Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: Total Metals - As	Analysis Requested: Dissolved Metals - As	Notes/Comments
GW MW-1(R)	10/26/17	10:15	water	2	X	X	MS/MSD
GW MW-E(R)	"	10:45	water	2	"	"	
GW MW-H(R)	"	9:20	water	2	"	"	
GW DUPL-1	"	9:30	water	2	"	"	

Comments/Special Instructions	Relinquished by: (Signature)	Received by: (Signature)	Relinquished by: (Signature)	Received by: (Signature)
* Dissolved metals field filtered 0.45um	Printed Name: ~~DG Cooper~~ C. Kerr	Printed Name: Jacob Walter	Printed Name:	Printed Name:
** All metals by ICP-QQQ-MS	Company: DOF	Company: ARI	Company:	Company:
	Date & Time: 10-26-17 14:15	Date & Time: 10/26/17 1415	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: Unless specified by workorder or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.

WORK ORDER

17J0522

Client: Dalton, Olmsted & Fuglevand, Inc **Project Manager:** Amanda Volgardsen

Project: POT-Former Dunlap Mound **Project Number:** POT-Former Dunlap Mound

Analysis	Due	TAT	Expires	Comments
17J0522-06 GW MW-H(R) [Water] Sampled 26-Oct-2017 09:20 (GMT-08:00) Pacific Time (US & Canada)				
Met Diss 200.8 - As UCT	09-Nov-2017 15:00	10	24-Apr-2018 09:20	
Filter 0.45 micron	09-Nov-2017 15:00	10	27-Oct-2017 14:15	
17J0522-07 GW DUPL-1 [Water] Sampled 26-Oct-2017 09:30 (GMT-08:00) Pacific Time (US & Canada)				
Met 200.8 - As UCT	09-Nov-2017 15:00	10	24-Apr-2018 09:30	
17J0522-08 GW DUPL-1 [Water] Sampled 26-Oct-2017 09:30 (GMT-08:00) Pacific Time (US & Canada)				
Met Diss 200.8 - As UCT	09-Nov-2017 15:00	10	24-Apr-2018 09:30	
Filter 0.45 micron	09-Nov-2017 15:00	10	27-Oct-2017 14:15	

Preservation Confirmation

Container ID	Container Type	pH	
17J0522-01 A	HDPE NM, 500 mL, 1:1 HNO3	< 2	pass
17J0522-02 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	< 2	pass
17J0522-03 A	HDPE NM, 500 mL, 1:1 HNO3	< 2	pass
17J0522-04 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	< 2	pass
17J0522-05 A	HDPE NM, 500 mL, 1:1 HNO3	< 2	pass
17J0522-06 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	< 2	pass
17J0522-07 A	HDPE NM, 500 mL, 1:1 HNO3	< 2	pass
17J0522-08 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	< 2	pass

BF
Preservation Confirmed By

10/27/17
Date

Reviewed By

Date

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Dalton Olmsted & Fuglevand

Project Name: JBV Former Dunlap DOT-002 Mound

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 17J0522

Tracking No: _____ NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 13.8

Time: 1415

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: D0005206

Cooler Accepted by: JBV Date: 10/26/2017 Time: 1415

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used? ...	Bubble Wrap (Wet Ice) Gel Packs Baggies Foam Block Paper Other: _____		
Was sufficient ice used (if appropriate)?	NA	YES	(NO)
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		YES	(NO)
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	NA	(YES)	NO
Were all VOC vials free of air bubbles?	(NA)	YES	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	(NA)		

Was Sample Split by ARI : (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

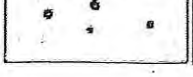
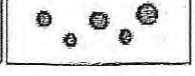
Samples Logged by: BF Date: 10/27/17 Time: 1557

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC
GWMWH-1(R)	GWMW-H(R)		

Additional Notes, Discrepancies, & Resolutions:

By: BF Date: 10/27/17

Small Air Bubbles ~2mm	Peabubbles 2-4 mm	LARGE Air Bubbles > 4 mm
		

Small → "sm" (< 2 mm)

Peabubbles → "pb" (2 to < 4 mm)

Large → "lg" (4 to < 6 mm)

Headspace → "hs" (> 6 mm)

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Cooler Temperature Compliance Form

Cooler#:	Temperature(°C): 13.8°C	
Sample ID	Bottle Count	Bottle Type
Sample recieved about	6°C	

Cooler#:	Temperature(°C):	
Sample ID	Bottle Count	Bottle Type

Cooler#:	Temperature(°C):	
Sample ID	Bottle Count	Bottle Type

Cooler#:	Temperature(°C):	
Sample ID	Bottle Count	Bottle Type

Completed by: JBW Date: 10/26/2017 Time: 1417

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-002	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Nov-2017 17:01

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GW MW-1(R)	17J0522-01	Water	26-Oct-2017 10:15	26-Oct-2017 14:15
GW MW-1(R)	17J0522-02	Water	26-Oct-2017 10:15	26-Oct-2017 14:15
GW MW-E(R)	17J0522-03	Water	26-Oct-2017 10:45	26-Oct-2017 14:15
GW MW-E(R)	17J0522-04	Water	26-Oct-2017 10:45	26-Oct-2017 14:15
GW MW-H(R)	17J0522-05	Water	26-Oct-2017 09:20	26-Oct-2017 14:15
GW MW-H(R)	17J0522-06	Water	26-Oct-2017 09:20	26-Oct-2017 14:15
GW DUPL-1	17J0522-07	Water	26-Oct-2017 09:30	26-Oct-2017 14:15
GW DUPL-1	17J0522-08	Water	26-Oct-2017 09:30	26-Oct-2017 14:15

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-002	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Nov-2017 17:01

Case Narrative

Sample receipt

Samples as listed on the preceding page were received October 26, 2017 under ARI workorder 17J0522. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Total and Dissolved Arsenic - EPA Method 200.8

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

There were no target compounds detected in the method blanks.

The LCS percent recoveries were within control limits.

A total matrix spike and duplicate were prepared in conjunction with sample GW MW-1(R). The matrix spike percent recovery and duplicate RPD were within QC limits.

A dissolved duplicate was prepared in conjunction with sample GW MW-1(R). The duplicate RPD was within QC limits.

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-002	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Nov-2017 17:01

GW MW-1(R)

17J0522-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 10/26/2017 10:15
Analyzed: 09-Nov-2017 20:28

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFK0045 Sample Size: 25 mL
Prepared: 02-Nov-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.200	**2.32**	ug/L	

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-002	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Nov-2017 17:01

GW MW-1(R)

17J0522-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 10/26/2017 10:15
Analyzed: 07-Nov-2017 22:11

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFK0037 Sample Size: 25 mL
Prepared: 02-Nov-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	**0.825**	ug/L	

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-002	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Nov-2017 17:01

GW MW-E(R)

17J0522-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 10/26/2017 10:45
Analyzed: 09-Nov-2017 20:08

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFK0045 Sample Size: 25 mL
Prepared: 02-Nov-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	10	2.00	**26.1**	ug/L	D

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-002	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Nov-2017 17:01

GW MW-E(R)

17J0522-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 10/26/2017 10:45
Analyzed: 07-Nov-2017 21:51

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFK0037 Sample Size: 25 mL
Prepared: 02-Nov-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	**25.1**	ug/L	

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-002	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Nov-2017 17:01

GW MW-H(R)

17J0522-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 10/26/2017 09:20
Analyzed: 09-Nov-2017 20:13

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFK0045 Sample Size: 25 mL
Prepared: 02-Nov-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	10	2.00	**60.3**	ug/L	D

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-002	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Nov-2017 17:01

GW MW-H(R)

17J0522-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 10/26/2017 09:20
Analyzed: 08-Nov-2017 22:26

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFK0037 Sample Size: 25 mL
Prepared: 02-Nov-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	10	2.00	**50.5**	ug/L	D

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-002	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Nov-2017 17:01

GW DUPL-1

17J0522-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 10/26/2017 09:30
Analyzed: 09-Nov-2017 20:18

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFK0045 Sample Size: 25 mL
Prepared: 02-Nov-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	10	2.00	**60.3**	ug/L	D

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-002	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Nov-2017 17:01

GW DUPL-1

17J0522-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 10/26/2017 09:30
Analyzed: 08-Nov-2017 22:31

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BFK0037 Sample Size: 25 mL
Prepared: 02-Nov-2017 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	10	2.00	**51.7**	ug/L	D

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-002	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Nov-2017 17:01

Metals and Metallic Compounds - Quality Control

Batch BFK0045 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0045-BLK1)					Prepared: 02-Nov-2017 Analyzed: 09-Nov-2017 01:51						
Arsenic	75a	ND	0.200	ug/L							U
LCS (BFK0045-BS1)					Prepared: 02-Nov-2017 Analyzed: 09-Nov-2017 02:39						
Arsenic	75a	25.0	0.200	ug/L	25.0		100	80-120			
Duplicate (BFK0045-DUP2)		**Source: 17J0522-01**			Prepared: 02-Nov-2017 Analyzed: 09-Nov-2017 20:23						
Arsenic	75a	2.04	0.200	ug/L		2.32			12.80	20	
Matrix Spike (BFK0045-MS2)		**Source: 17J0522-01**			Prepared: 02-Nov-2017 Analyzed: 09-Nov-2017 20:33						
Arsenic	75a	27.7	0.200	ug/L	25.0	2.32	102	75-125			

Recovery limits for target analytes in MS/MSD QC samples are advisory only.

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-002	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Nov-2017 17:01

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BFK0037 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BFK0037-BLK1)				Prepared: 02-Nov-2017 Analyzed: 06-Nov-2017 18:41							
Arsenic, Dissolved	75a	ND	0.200	ug/L							U
LCS (BFK0037-BS1)				Prepared: 02-Nov-2017 Analyzed: 06-Nov-2017 19:02							
Arsenic, Dissolved	75a	28.2	0.200	ug/L	25.0		113	80-120			
Duplicate (BFK0037-DUP2)		**Source: 17J0522-02**		Prepared: 02-Nov-2017 Analyzed: 07-Nov-2017 22:06							
Arsenic, Dissolved	75a	0.890	0.200	ug/L		0.825			7.58	20	

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-002	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Nov-2017 17:01

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	09/01/2017
CALAP	California Department of Public Health CAELAP	2748	02/28/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
10827 NE 68th Street Suite B	Project Number: POT-002	**Reported:**
Kirkland WA, 98033-4400	Project Manager: Dave Cooper	10-Nov-2017 17:01

Notes and Definitions

U	This analyte is not detected above the applicable reporting or detection limit.
J	Estimated concentration value detected below the reporting limit.
D	The reported value is from a dilution
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

Analytical Resources, Incorporated
Analytical Chemists and Consultants

06 February 2018

Dave Cooper
Dalton, Olmsted & Fuglevand, Inc
1420 - 156th Ave., NE STE C1
Bellevue, WA 98007

RE: POT-Former Dunlap Mound

Please find enclosed sample receipt documentation and analytical results for samples from the project referenced above.

Sample analyses were performed according to ARI's Quality Assurance Plan and any provided project specific Quality Assurance Plan. Each analytical section of this report has been approved and reviewed by an analytical peer, the appropriate Laboratory Supervisor or qualified substitute, and a technical reviewer.

Should you have any questions or problems, please feel free to contact us at your convenience.

Associated Work Order(s)	Associated SDG ID(s)
18A0469	N/A

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed in the enclose Narrative. ARI, an accredited laboratory, certifies that the report results for which ARI is accredited meets all the requirements of the accrediting body. A list of certified analyses, accreditations, and expiration dates is included in this report.

Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature.

Analytical Resources, Inc.

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number:	Turn-around Requested:	Date:
18A0469	Normal	01-31-2018
ARI Client Company:	Phone:	Page: 1 of 1
Dalton Olmsted & Fuglevand	206-660-3466	
Client Contact:		No. of Coolers: / Cooler Temps:
Dave Cooper		
Client Project Name:		
Former Dunlap Mound		
Client Project #:	Samplers:	
POT-002	DG Cooper L Kerner 708-316-7773	

Analytical Resources, Incorporated
Analytical Chemists and Consultants
4611 South 134th Place, Suite 100
Tukwila, WA 98168
206-695-6200 206-695-6201 (fax)

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: Total Metals - As	Dissolved Metals - As										Notes/Comments
MW-1(R)	01-31-18	1050	water	2	X	X										
MW-E(R)		1145	water	2	X	X										
MW-H(R)		1110	water	2	X	X										
DUPL-1		1055	water	2	X	X										

Comments/Special Instructions	Relinquished by:	Received by:	Relinquished by:	Received by:
* Dissolved metals field filtered 0.45um	(Signature)	(Signature)	(Signature)	(Signature)
** All metals by ICP-QQQ-MS	Printed Name: Luke Kerner	Printed Name: Stephanie Fisher	Printed Name:	Printed Name:
	Company: DOF	Company: ARI	Company:	Company:
	Date & Time: 01-31-2018 1327	Date & Time: 1/31/18 1327	Date & Time:	Date & Time:

Limits of Liability: *ARI will perform all requested services in accordance with appropriate methodology following ARI Standard Operating Procedures and the ARI Quality Assurance Program. This program meets standards for the industry. The total liability of ARI, its officers, agents, employees, or successors, arising out of or in connection with the requested services, shall not exceed the Invoiced amount for said services. The acceptance by the client of a proposal for services by ARI release ARI from any liability in excess thereof, not withstanding any provision to the contrary in any contract, purchase order or co-signed agreement between ARI and the Client.*

Sample Retention Policy: Unless specified by workorder or contract, all water/soil samples submitted to ARI will be discarded or returned, no sooner than 90 days after receipt or 60 days after submission of hardcopy data, whichever is longer. Sediment samples submitted under PSDDA/PSEP/SMS protocol will be stored frozen for up to one year and then discarded.

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
1420 - 156th Ave., NE STE C1	Project Number: POT-002	**Reported:**
Bellevue WA, 98007	Project Manager: Dave Cooper	06-Feb-2018 12:13

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
MW-1(R)	18A0469-01	Water	31-Jan-2018 10:50	31-Jan-2018 13:27
MW-1(R)	18A0469-02	Water	31-Jan-2018 10:50	31-Jan-2018 13:27
MW-E(R)	18A0469-03	Water	31-Jan-2018 11:45	31-Jan-2018 13:27
MW-E(R)	18A0469-04	Water	31-Jan-2018 11:45	31-Jan-2018 13:27
MW-H(R)	18A0469-05	Water	31-Jan-2018 11:10	31-Jan-2018 13:27
MW-H(R)	18A0469-06	Water	31-Jan-2018 11:10	31-Jan-2018 13:27
DUPL-1	18A0469-07	Water	31-Jan-2018 10:55	31-Jan-2018 13:27
DUPL-1	18A0469-08	Water	31-Jan-2018 10:55	31-Jan-2018 13:27

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
1420 - 156th Ave., NE STE C1	Project Number: POT-002	**Reported:**
Bellevue WA, 98007	Project Manager: Dave Cooper	06-Feb-2018 12:13

Case Narrative

Sample receipt

Samples as listed on the preceding page were received January 31, 2018 under ARI workorder 18A0469. For details regarding sample receipt, please refer to the Cooler Receipt Form.

Total and Dissolved Arsenic - EPA Method 200.8

The samples were digested and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

The method blanks were clean at the reporting limits.

The LCS percent recoveries were within control limits.

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WORK ORDER

18A0469

Client: Dalton, Olmsted & Fuglevand, Inc **Project Manager:** Amanda Volgardsen

Project: POT-Former Dunlap Mound **Project Number:** POT-002

Analysis	Due	TAT	Expires	Comments
18A0469-06 MW-H(R) [Water] Sampled 31-Jan-2018 11:10 (GMT-08:00) Pacific Time (US & Canada)				
Met Diss 200.8 - As UCT	14-Feb-2018 15:00	10	30-Jul-2018 11:10	
Filter 0.45 micron	14-Feb-2018 15:00	10	01-Feb-2018 13:27	
18A0469-07 DUPL-1 [Water] Sampled 31-Jan-2018 10:55 (GMT-08:00) Pacific Time (US & Canada)				
Met 200.8 - As UCT	14-Feb-2018 15:00	10	30-Jul-2018 10:55	
18A0469-08 DUPL-1 [Water] Sampled 31-Jan-2018 10:55 (GMT-08:00) Pacific Time (US & Canada)				
Met Diss 200.8 - As UCT	14-Feb-2018 15:00	10	30-Jul-2018 10:55	
Filter 0.45 micron	14-Feb-2018 15:00	10	01-Feb-2018 13:27	

Preservation Confirmation

Container ID	Container Type	pH
18A0469-01 A	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
18A0469-02 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 pass
18A0469-03 A	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
18A0469-04 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 pass
18A0469-05 A	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
18A0469-06 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 pass
18A0469-07 A	HDPE NM, 500 mL, 1:1 HNO3	<2 pass
18A0469-08 A	HDPE NM, 500 mL, 1:1 HNO3 (FF)	<2 pass

SEF
Preservation Confirmed By

1/31/18
Date

Reviewed By

Date

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: DOF

Project Name: Former Dunlap Mound

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier (Hand Delivered) Other: _____

Assigned ARI Job No: 18A0469

Tracking No: _____ (NA)

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler?	YES	(NO)
Were custody papers included with the cooler?	(YES)	NO
Were custody papers properly filled out (ink, signed, etc.)	(YES)	NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry): 3.3

Time: _____

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: D00256S

Cooler Accepted by: SEF Date: 1/31/18 Time: 1327

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler?		YES	(NO)
What kind of packing material was used? ... Bubble Wrap (Wet Ice) Gel Packs Baggies Foam Block Paper Other: _____			
Was sufficient ice used (if appropriate)?	NA	(YES)	NO
Were all bottles sealed in individual plastic bags?		YES	(NO)
Did all bottles arrive in good condition (unbroken)?		(YES)	NO
Were all bottle labels complete and legible?		(YES)	NO
Did the number of containers listed on COC match with the number of containers received?		(YES)	NO
Did all bottle labels and tags agree with custody papers?		(YES)	NO
Were all bottles used correct for the requested analyses?		(YES)	NO
Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)...	NA	(YES)	NO
Were all VOC vials free of air bubbles?	(NA)	YES	NO
Was sufficient amount of sample sent in each bottle?		(YES)	NO
Date VOC Trip Blank was made at ARI	(NA)		

Was Sample Split by ARI : (NA) YES Date/Time: _____ Equipment: _____ Split by: _____

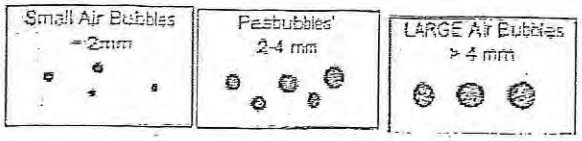
Samples Logged by: SEF Date: 1/31/18 Time: 1650

*** Notify Project Manager of discrepancies or concerns ***

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: Date:



Small → "sm" (< 2 mm)
Peabubbles → "pb" (2 to < 4 mm)
Large → "lg" (4 to < 6 mm)
Headspace → "hs" (> 6 mm)

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
1420 - 156th Ave., NE STE C1	Project Number: POT-002	**Reported:**
Bellevue WA, 98007	Project Manager: Dave Cooper	06-Feb-2018 12:13

MW-1(R)

18A0469-01 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED
Instrument: ICPMS1

Sampled: 01/31/2018 10:50
Analyzed: 01-Feb-2018 16:09

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGB0001 Sample Size: 25 mL
Prepared: 01-Feb-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.200	**0.682**	ug/L	

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
1420 - 156th Ave., NE STE C1	Project Number: POT-002	**Reported:**
Bellevue WA, 98007	Project Manager: Dave Cooper	06-Feb-2018 12:13

MW-1(R)

18A0469-02 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 01/31/2018 10:50
Analyzed: 02-Feb-2018 17:59

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGB0031 Sample Size: 25 mL
Prepared: 02-Feb-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	**0.349**	ug/L	

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
1420 - 156th Ave., NE STE C1	Project Number: POT-002	**Reported:**
Bellevue WA, 98007	Project Manager: Dave Cooper	06-Feb-2018 12:13

MW-E(R)

18A0469-03 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED
Instrument: ICPMS1

Sampled: 01/31/2018 11:45
Analyzed: 01-Feb-2018 16:13

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGB0001 Sample Size: 25 mL
Prepared: 01-Feb-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.200	**2.07**	ug/L	

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
1420 - 156th Ave., NE STE C1	Project Number: POT-002	**Reported:**
Bellevue WA, 98007	Project Manager: Dave Cooper	06-Feb-2018 12:13

MW-E(R)

18A0469-04 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 01/31/2018 11:45
Analyzed: 02-Feb-2018 18:03

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGB0031 Sample Size: 25 mL
Prepared: 02-Feb-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	**5.36**	ug/L	

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
1420 - 156th Ave., NE STE C1	Project Number: POT-002	**Reported:**
Bellevue WA, 98007	Project Manager: Dave Cooper	06-Feb-2018 12:13

MW-H(R)

18A0469-05 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 01/31/2018 11:10
Analyzed: 02-Feb-2018 18:31

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGB0001 Sample Size: 25 mL
Prepared: 01-Feb-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	20	4.00	**55.7**	ug/L	D

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
1420 - 156th Ave., NE STE C1	Project Number: POT-002	**Reported:**
Bellevue WA, 98007	Project Manager: Dave Cooper	06-Feb-2018 12:13

MW-H(R)

18A0469-06 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 01/31/2018 11:10
Analyzed: 02-Feb-2018 18:27

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGB0031 Sample Size: 25 mL
Prepared: 02-Feb-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	20	4.00	**50.9**	ug/L	D

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
1420 - 156th Ave., NE STE C1	Project Number: POT-002	**Reported:**
Bellevue WA, 98007	Project Manager: Dave Cooper	06-Feb-2018 12:13

DUPL-1

18A0469-07 (Water)

Metals and Metallic Compounds

Method: EPA 200.8 UCT-KED
Instrument: ICPMS1

Sampled: 01/31/2018 10:55
Analyzed: 01-Feb-2018 16:22

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGB0001 Sample Size: 25 mL
Prepared: 01-Feb-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic	7440-38-2	1	0.200	**0.929**	ug/L	

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
1420 - 156th Ave., NE STE C1	Project Number: POT-002	**Reported:**
Bellevue WA, 98007	Project Manager: Dave Cooper	06-Feb-2018 12:13

DUPL-1

18A0469-08 (Water)

Metals and Metallic Compounds (dissolved)

Method: EPA 200.8 UCT-KED
Instrument: ICPMS2

Sampled: 01/31/2018 10:55
Analyzed: 02-Feb-2018 18:36

Sample Preparation: Preparation Method: REN EPA 600/4-79-020 4.1.4 HNO3 matrix
Preparation Batch: BGB0031 Sample Size: 25 mL
Prepared: 02-Feb-2018 Final Volume: 25 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
Arsenic, Dissolved	7440-38-2	1	0.200	**0.329**	ug/L	

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
1420 - 156th Ave., NE STE C1	Project Number: POT-002	**Reported:**
Bellevue WA, 98007	Project Manager: Dave Cooper	06-Feb-2018 12:13

Metals and Metallic Compounds - Quality Control

Batch BGB0001 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS1 Analyst: TCH

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGB0001-BLK1)				Prepared: 01-Feb-2018 Analyzed: 01-Feb-2018 14:09							
Arsenic	75a	ND	0.200	ug/L							U
LCS (BGB0001-BS1)				Prepared: 01-Feb-2018 Analyzed: 01-Feb-2018 14:49							
Arsenic	75a	27.5	0.200	ug/L	25.0		110	80-120			

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
1420 - 156th Ave., NE STE C1	Project Number: POT-002	**Reported:**
Bellevue WA, 98007	Project Manager: Dave Cooper	06-Feb-2018 12:13

Metals and Metallic Compounds (dissolved) - Quality Control

Batch BGB0031 - REN EPA 600/4-79-020 4.1.4 HNO3 matrix

Instrument: ICPMS2 Analyst: CC

QC Sample/Analyte	Isotope	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGB0031-BLK1)				Prepared: 02-Feb-2018 Analyzed: 02-Feb-2018 17:23							
Arsenic, Dissolved	75a	ND	0.200	ug/L							U
LCS (BGB0031-BS1)				Prepared: 02-Feb-2018 Analyzed: 02-Feb-2018 17:44							
Arsenic, Dissolved	75a	25.3	0.200	ug/L	25.0		101	80-120			

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Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
1420 - 156th Ave., NE STE C1	Project Number: POT-002	**Reported:**
Bellevue WA, 98007	Project Manager: Dave Cooper	06-Feb-2018 12:13

Certified Analyses included in this Report

Analyte	Certifications
EPA 200.8 UCT-KED in Water	
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP
Arsenic-75a	NELAP,WADOE,WA-DW,DoD-ELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	UST-033	05/11/2018
CALAP	California Department of Public Health CAELAP	2748	02/28/2018
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006	05/11/2018
WADOE	WA Dept of Ecology	C558	06/30/2018
WA-DW	Ecology - Drinking Water	C558	06/30/2018

Dalton, Olmsted & Fuglevand, Inc	Project: POT-Former Dunlap Mound	
1420 - 156th Ave., NE STE C1	Project Number: POT-002	**Reported:**
Bellevue WA, 98007	Project Manager: Dave Cooper	06-Feb-2018 12:13

Notes and Definitions

U	This analyte is not detected above the applicable reporting or detection limit.
J	Estimated concentration value detected below the reporting limit.
D	The reported value is from a dilution
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.

ATTACHMENT C

2017 Sample Collection Forms
Former Arkema 3009 Taylor Way Site
Tacoma, Washington

Dalton, Olmsted & Fuglevand, I — **WATER SAMPLING RECORD**

Client/Project: FORMER DUNLAP MOUND
Job No.: AOT-002
Sampled by: DGC

LOCATION / DATA

DateSampled	1/12/17	1/12/17	1/12/17	1/12/17		
Well No.	MW-H(R)	MW-E(R)	MW-I(R)	DUPLICATE		
well depth	13.1	10.0	10.2	OF		
water level	7.15	6.53	2.60	MW-I(R)		
water depth	5.9	3.4	7.6			
Casing/Volume						
type: PVC	2" ∅	2"	2"	2		
vol/ft						
tot. vol						
3 x vol	2.9	1.7	3.8			
Purge Volume						
gallons purged	1.5	1	2			
purge/bail/type	PURGE/BAIL	→	→			
Water Sample		PURGE/BAIL				
Sample No.	MW-H(R)	MW-E(R)	MW-I(R)	DUP-1		
Sample Method	PURGE/BAIL	→	→	→		
Time	1230	1330	1430	1435		
No. Cont.	2	→	→	→		
Cont. Type	2P	→	→	→		
Initials	AGL	AGL	AGL	AGL		
Temperature						
value (Degrees C.)	11.5	12.5	10.6			
Sp Cond						
value (uS/cm)	13,538	1261	828			
Dissolved Oxygen						
value (mg/l)	0.47	0.40	0.29			
pH						
value	6.3	6.4	6.7			
ORP						
value (mv)	18.1	-57.0	-12.9			
Turbidity						
value (NTU's)	12.1	60.5	73.1			
Alkalinity						
Total - mg/l	—	—	—			
Ferrous Iron						
mg/l	5.0	4.5	4.5			

Calibrations		Comments
pH		DISSOLVED METALS FIELD FILTERED 0.45 µm
Conductivity		
DO		
ORP - mv		
Turbidity		

Note: 2" dia. PVC has 0.164 gal/ft; bail 0.5 gal/ft for 3 casing volumes

Dalton, Olmsted Fuglevand, Inc.

Water Sampling Record

Project: FORMER DUNLAP MOUNDS
Sampled by: N. COOPER
Date: 4/25/17

Well No.	MW-H(R)	MW-E(R)	MW-I(R)	DUPLICATE		
well depth (top PVC)	13.1	10.0	10.2	DUPLICATE		
water level(top PVC)	7.20	~~6.81~~ 6.15	~~6.45~~ 1.81	OF		
water height	5.9	3.8	8.3	MW-I(R)		
time	1131	1133	1136			
Casing/Volume						
type:	2"	〃	〃			
type: other	SCH 40 PVC	〃	〃			
vol/ft						
tot. vol						
3 x vol	3.9	1.9	4.1			
Purge Volume						
gallons purged	2	1	2			
purge/bail/type	PERISTALTIC	〃	〃			
Water Sample						
Sample No.	MW-H(R)	MW-E(R)	MW-I(R)	DUPL		
Sample Method	PERISTALTIC	〃	〃			
Time	1150	1255	1345	1350		
No. Cont.	2	2	2	2		
Initials	NC	NC	DC	DC		
pH						
value	6.45	6.66	6.75			
time						
Conductivity (S/cm)						
value	9242	646	853			
time						
Temp. (Celsius)						
value	11.5	10.3	11.7			
time						
DO (mg/l)						
value	0.60	0.30	0.11			
time						
ORP (mV)						
value	-0.2	17.2	-1.3			
time						
Ferrous Iron (mg/l)						
value	4.2	5.5	2.8			
time						
Turbidity (ntu)						
value	14.6	45.6	51.2			
time						

COMMENTS:

ALL WATER LEVELS MEASURED IN 10-MINUTE PERIOD AFTER EQUILIBRATION

DISSOLVED METALS FIELD FILTERED 0.45 µm

VIEW RISE 0.3' @ 1102AM

Well Volumes:
2" = 0.163 gal/ft x 3 = 0.5
4" = 0.653 gal/ft x 3 = 2.0

Dalton, Olmsted Fuglevand, Inc.
Project: FORMER DUNLAP FARM
Sampled by: DGOSPER
Date: 7/28/17

Water Sampling Record

Well No.	MW-H(R)	MW-E(R)	MW-1(R)	DUPL-1		
well depth (top PVC)	13.1	10.0	10.2	DUPLICATE		
water level(top PVC)	7.36	7.37	4.36	OF		
water height	5.2	2.4	5.9	MW-1(R)		
time	1240	1246	1243			
Casing/Volume						
type:	2"	→	→			
type: other	SCH 40 PVC	→	→			
vol/ft						
tot. vol						
3 x vol	2.6	1.2	2.9			
Purge Volume						
gallons purged	1.5	0.5	1.5			
purge/bail/type	PERISTALTIC	→	→			
Water Sample						
Sample No.	MW-H(R)	MW-E(R)	MW-1(R)	DUPL-1		
Sample Method	PERISTALTIC	→	→			
Time	~~1300~~ 1430	~~1300~~ 1330	1400	1405		
No. Cont.	2	2	2	2		
Initials	DGC	DGC	DGC	DGC		
Temp. (Celsius)						
value	18.6	17.8	17.18			
time						
Conductivity (uS/cm)						
value	11,311	2216	1010			
time						
pH						
value	6.08	6.21	6.39			
time						
DO (mg/l)						
value	1.37	1.01	0.87			
time						
ORP (mV)						
value	-20.1	-13.9	-26.3			
time						
Ferrous Iron (mg/l)						
value	6.0	6.5	6.0			
time						
Turbidity (ntu)						
value	4.3	2.6	4.0			
time						

COMMENTS:

LOW TIDE 1.6' @ 1518 PM
ALL WATER LEVELS MEASURED WITHIN 10-MINUTE PERIOD FOLLOWING EQUILIBRATION
DISSOLVED METALS FIELD FILTERED 0.45 µm

Well Volumes:
2" = 0.163 gal/ft x 3 = 0.5
4" = 0.653 gal/ft x 3 = 2.0

Dalton, Olmsted Fuglevand, Inc.

Water Sampling Record

Former ~~Arkema Manufacturing~~ Dunlap Mound
Tacoma, WA

Sampled by: JKerner, P. Browning
Date: 10-26-17

Well No.	MW-4(R)	MW-E(R)	MW-1(R)	DUPL-1		
well depth (top PVC)	13.1'	10.0'	10.2'	Duplicate		
water level(top PVC)	~~8.65~~ 7.85	7.0'	2.71			
water height	5.25	3'	7.49	MW-4(R)		
time	9:30	~~9:40~~ 9:40	9:34			
Casing/Volume						
type:	2"	→	→	→		
type: other	SCH 40 PVC	→	→	→		
vol/ft	.163 gal/ft	→	→			
tot. vol	0.85 gal	0.489	1.22087			
3 x vol	2.56 gal	1.467	3.66			
Purge Volume						
gallons purged	1.5 gall	0.5 gal	1.5 gal	"		
purge/bail/type	Peristaltic	→	→	→		
Water Sample						
Sample No.	GW MW4R-1	GWMW-E(R)	GWMW-1(R)	GW DUPL-1		
Sample Method	Peristaltic	→	→	→		
Time	9:20	1046	~~10:15~~	930		
No. Cont.	2		2	2		
Initials	JNK		JNK	JNK		
pH						
value	6.02	6.43	~~6.74~~ 6.74			
time						
Conductivity (S/cm)						
value	23,373 uS/cm	1845.6	~~836~~ 834			
time						
Temp. (Celsius)						
value	16.11	16.30	15.03			
time						
DO (mg/l)						
value	0.35	0.39	0.67			
time						
ORP (mV)						
value	15.8	-30.7	-8.9			
time						
TDS (ppt)						
value	15	1	1			
time						
Turbidity (ntu)						
value	21.8	6.21	5.64			
time						
Ferrous Iron (mg/l)						
value ←	57.75 D	36.75	6.9			
time						
Sulfide (mg/l)						
value						
time						

COMMENTS:
- D: Dissolved Metals Field Filtered 0.45µm
- All water levels Measured min 10 minutes following Equilibration
- Low Tide @ 3:20 am 0.8'

Well Volumes:
2" = 0.163 gal/ft x 3 = 0.5
4" = 0.653 gal/ft x 3 = 2.0

Dalton, Olmsted & Fuglevand, Inc. **WATER SAMPLING RECORD**

Client/Project: Arkema/ Former Dun. .ound

Sampled by: Luke Kerner 01/31/18

DateSampled	1-31-18	1-31-18	1-31-18			
Well No.	MW-H (R)	MW- E (R)	MW- 1 (R)	DUPL-1		
well depth	13.1	10	10.2	DUPLICATE		
water level	7.09	4.75	1.55	of		
water height				MW-1 (R)		
time	10:35	10:30	10.25			
Casing/Volume						
type: PVC	2"	2"	2"			
Type: other	SCH 40 PVC	SCH 40 PVC	SCH 40 PVC			
vol/ft	.163 gal/ft	.163 gal/ft	.163 gal/ft			
tot. vol						
3 x vol						
Purge Volume						
gallons purged	1.5gal	0.5gal	1.5gal			
purge/bail/type	Peristaltic	Peristaltic	Peristaltic			
Water Sample						
Sample No.	MW-H (R)	MW- E (R)	MW- 1 (R)	DUPL-1		
Sample Method	Peristaltic	Peristaltic	Peristaltic			
Time	11:10	1145	10:50	10:55		
No. Cont.	2	2	2	2		
Initials	JNK	JNK	JNK	JNK		
Temperature						
value (Degrees C.)	10.14	10.01	9.31			
Sp Cond						
value	12,883	612	11716			
pH						
value	6.37	6.42	6.69			
Dissolved Oxygen						
value (mg/l)	2.08	0.27	0.40			
ORP						
value (mv)	-28.2	-109	-34.3			
Turbidity						
value (NTU's)	4.64	4.77	43.5			
Ferrous Iron						
mg/l	2.2	2.8	2.8			
Calibrations						
pH						
Conductivity						
DO	Calibrated By GEOTECH			01-30-2018		
ORP - mv						
Turbidity	S: 0.02 R: 0.02	S: 20 R: 1999		S: 100 R: 99.3	S: 800 R: 798	

Comments:

Low Tide 6.5' @ 10:56am

All Water Levels Measured within 15 minutes period following 1/2 hour Equilibrium

Dissolved Metals Field Filtered 0.45µm

*TOTAL & Dissolved Arsenic"