Ethan Berkowitz, Mayor

2018 Pesticide Screening Report

APDES Permit No. AKS052558

Document No.

FINAL REPORT

December 2018

MUNICIPALITY OF ANCHORAGE

WATERSHED MANAGEMENT PROGRAM

Prepared for: Municipality of Anchorage
Project Management and Engineering Department
Watershed Management Services

Prepared by: HDR Alaska, Inc.
2525 C Street, Suite 500
Anchorage, AK 99503

WATERSHED MANAGEMENT

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1.0 Introduction

The Alaska Department of Environmental Conservation (ADEC) reissued the joint Municipal Separate Storm Sewer System (MS4) permit in August 2015 to the Municipality of Anchorage (MOA) and the Alaska State Department of Transportation and Public Facilities (ADOT&PF; Permit number AKS052558). Section 4.1.6 of the permit requires continued sampling of Lake Otis, Hideaway Lake, and Little Campbell Lake as a continuation of the previous permit's pesticide screening program. This report provides the results of the 2018 sampling event.

1.1 Pesticide Definition

The term pesticide is defined by ADEC to be "a chemical or biological agent intended to prevent, destroy, repel, or mitigate plant or animal life, and any substance intended for use as a plant regulatory, defoliant, or desiccant, including insecticides, fungicides, rodenticides, herbicides, nematocides, and biocides." For the purposes of the MOA water quality program, the term pesticide includes herbicides, insecticides, and fungicides (MOA 2000).

1.2 Background

Pesticides have received widespread attention because of their potential adverse effects on humans and aquatic life. Adverse impacts from exposure can include acute and chronic toxicity, carcinogenicity, reproductive and nervous system disorders, and endocrine disruption. For these reasons, pesticides have been studied in the Anchorage basin for a number of years by the MOA and the U.S. Geological Survey (USGS).

The U.S. Environmental Protection Agency (EPA) issued the MOA and the ADOT&PF a MS4 permit under the National Pollutant Discharge Elimination System (NPDES) in 1999. To meet the requirements of the permit, the MOA conducted pesticide screening studies beginning in 2000 (MOA 2000). The EPA re-issued the permit in 2009 prior to the State of Alaska receiving primacy to operate the NPDES program. The re-issued permit became effective February 1, 2010, under the administration of the ADEC as an Alaska Pollutant Discharge Elimination System (APDES) MS4 permit. The permit expired on January 31, 2015, and ADEC re-issued the permit with revisions, effective August 1, 2015 (APDES Permit No. AKS052558). The expiration date of the current permit is July 31, 2020.

The 2009 permit required that the MOA continue pesticide screening conducted on three lakes in 2000 and 2002. Pesticide sampling occurred for the 2009 permit cycle in 2011 and 2013. The 2015 permit requires continued pesticide screening in years two and four (2016 and 2018) of the current permit.

The MOA does not contain a large amount of agricultural land; pesticide use is predominantly home application for lawn and garden care, golf course maintenance, industrial application within utility corridors, and municipal maintenance (landscape, right-of-way, and parks). All of

these areas tend to be close to local waterways. The pesticides used in the Anchorage area include broadcast pesticides applied by homeowners and localized pesticides applied along roads and trails by agencies.

Factors influencing the vulnerability of surface water to contamination by pesticides include the quantity and timing of pesticide application, type of soil, topography, and buffer area between the site of application and the water body. Pesticide application typically occurs in the spring and summer months. This coincides with the heaviest rainfall period and the greatest likelihood of chemicals being washed into local streams and lakes. Unless direct application to a water body is made, stormwater runoff serves as the conveyance mechanism. Water bodies that are located closer to a pesticide application site are more likely to receive direct runoff from a post-application rain event than a more distant water body. Pesticides that are not washed off may be transported into groundwater through infiltration, and these may be subsequently discharged as base flow to streams. This conveyance mechanism likely results in lower concentrations of pesticides in the receiving water since pesticides are retained within the soil matrix (MOA 1999).

The MOA conducted a pesticide use survey in 1999 (MOA 1999) and found seven pesticides were used most prevalently, two of which were selected for screening (MOA 2000). These two pesticides are Sevin FL (Carbaryl), which is used in the summer for aphid and spruce beetle control, and 2,4-D, a broadcast herbicide used by homeowners for lawn care and aquatic vegetation control.

The pesticide screening program was originally designed to collect screening data within areas that are most likely to accumulate pesticides. The EPA and ADEC suggested that sampling the water column of closed-basin lakes (lakes without defined surface water outlets) would meet the criteria. Three closed-basin lakes, Lake Otis, Hideaway Lake, and Little Campbell Lake, were sampled in 2011, 2013, and 2016. Grab samples were collected from the water column at least 10 meters offshore of each lake. Samples were analyzed for 2,4-D and Carbaryl. The monitoring revealed detectable levels of 2,4-D in Hideaway Lake and Lake Otis in the 2013 water samples (MOA 2013). These samples were the first in the history of the sampling program to find detectable levels of pesticides, though much lower than the ADEC drinking water standard. Since detection of 2,4-D had never occurred in either lake before, a second sampling event was completed in August 2013. The repeated sampling confirmed that 2,4-D was present in concentrations over the method detection limit in both lakes. In 2016, samples from all three lakes showed results of non-detect, bringing the levels of 2,4-D back down to the pre-2013 levels (MOA 2017).

2.0 Screening Program

The goal of the pesticide screening program is to determine whether two pesticides commonly used in the Anchorage area persist in three closed-basin lakes selected for screening: Lake Otis, Hideaway Lake, and Little Campbell Lake (Figure 1). To meet this goal, MOA sampled for 2,4-

D and Carbaryl, as representative pesticides, in each of the three lakes. Lake Otis and Hideaway Lake are surrounded by residential development while the area around Little Campbell Lake remains undeveloped. Little Campbell Lake is used as a control for this study.

The 2009 APDES permit specified that pesticides are to be screened using a field immunoassay kit and any positive readings will be verified by a laboratory sample. However, immunoassay kits are no longer available for Carbaryl. Therefore, the sampling design was modified (in the updated Monitoring, Evaluation, and Quality Assurance Plan [QAP]; MOA 2016) to include laboratory sampling. In 2016 and 2018, ALS Environmental (ALS) in Kelso, Washington (subcontracted by SGS North America, Inc. [SGS] in Anchorage) provided sampling containers and preformed the laboratory analysis (EPA method 8231B).

2.1 Sampling Locations

Pesticide sampling was conducted at Lake Otis, Hideaway Lake, and Little Campbell Lake on September 25, 2018. Water samples were collected from approximately the deepest portions of Lake Otis, Hideaway Lake, and Little Campbell Lake, at least 10 meters from the shore. The locations coincide with those sampled under the previous permit and provide a sample representative of the overall water quality of the lake. Specific sample locations are shown in Figures 2, 3 and 4. GPS coordinates are provided on the figures.

Figure 1. Area Location Map

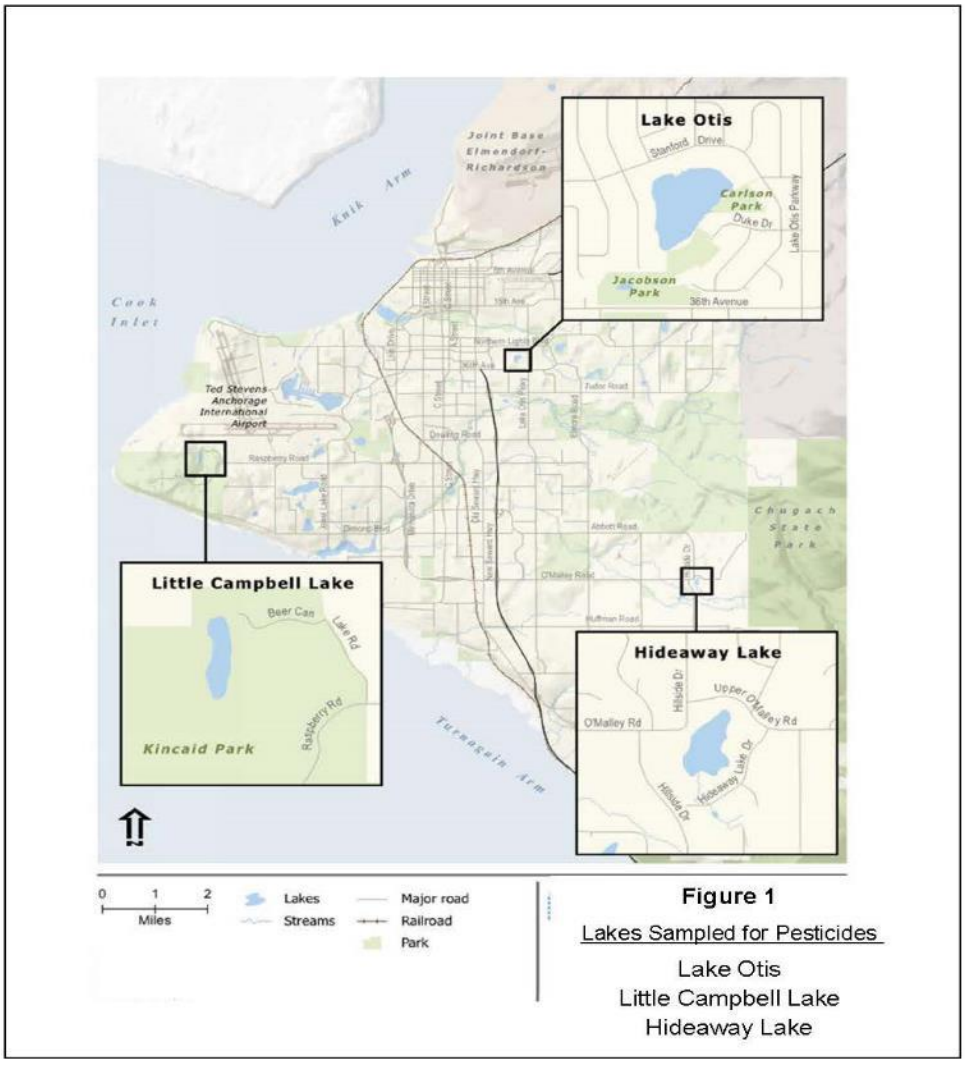

Figure 2. Hideaway Lake Pesticide Sampling Location

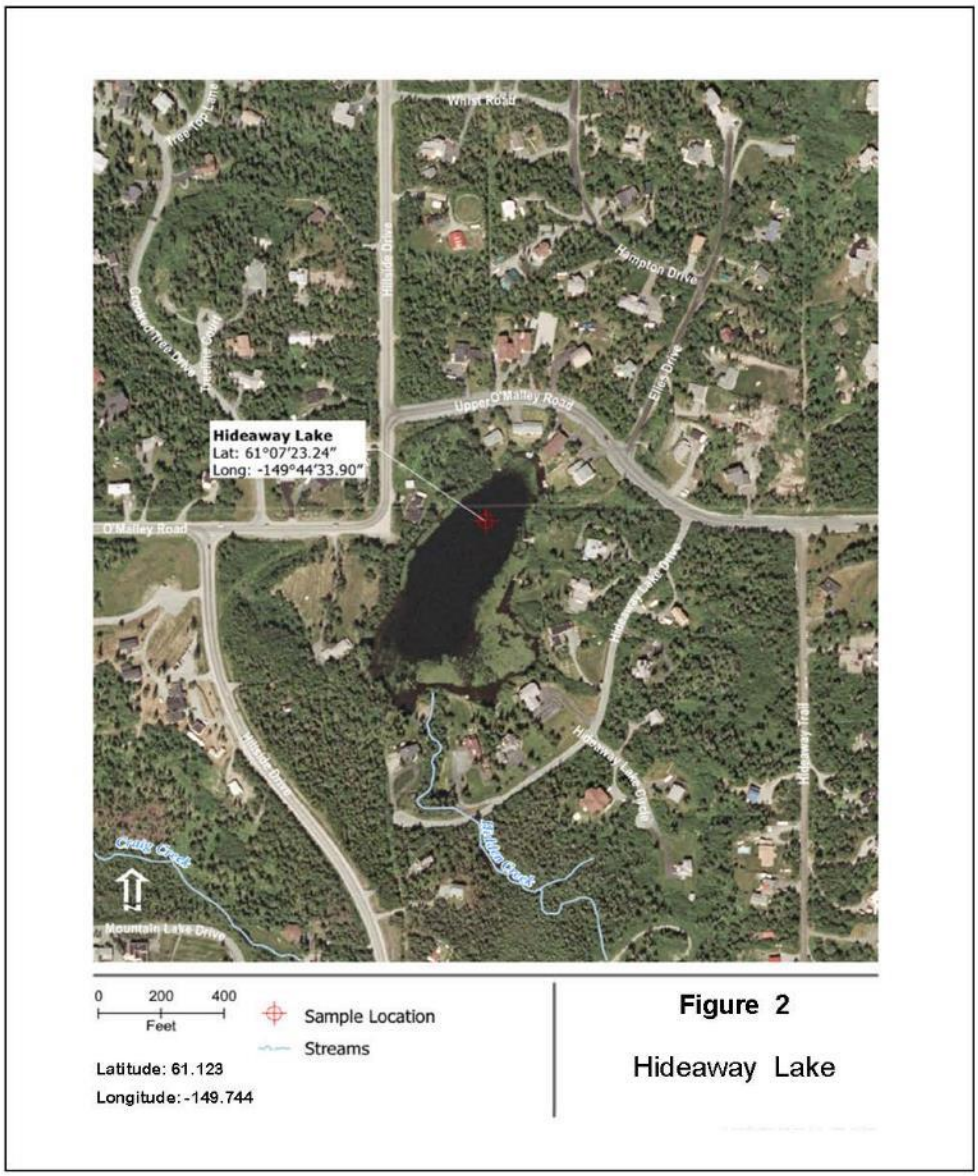

Figure 3. Lake Otis Pesticide Sampling Location

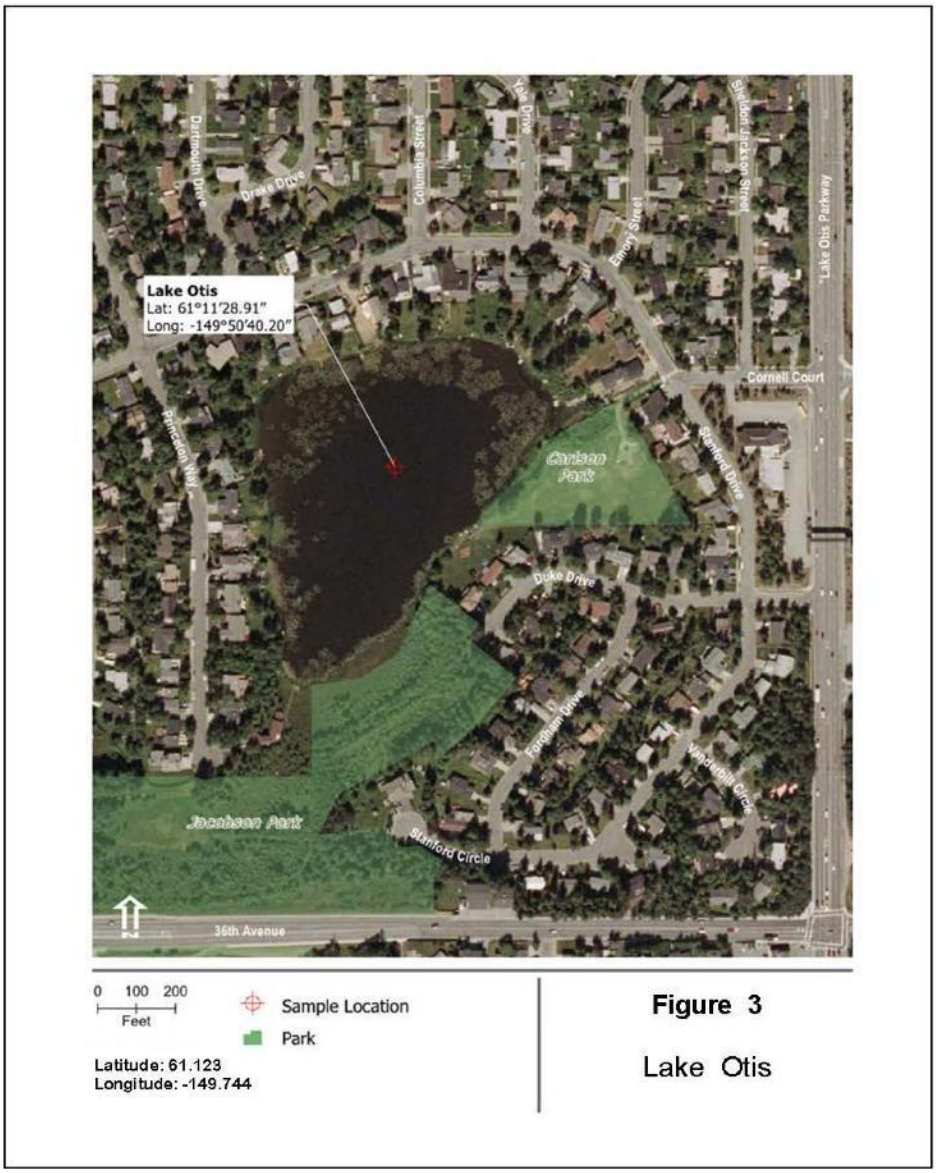

Figure 4. Little Campbell Lake Pesticide Sampling Location

2.2 Measured Parameters

Table 1 lists the parameters and methods that were used to measure each parameter, as well as the associated ranges.

Table 1. Parameters and Methods of Analysis

Parameter	Method	Range
Temperature (°C)	SM 2550 B YSI 556 hand-held probe	-5°-45°C
pH	EPA 150.2 YSI 556 hand-held probe	0-14 STD
2,4-D	EPA 8151A	NA
Carbaryl	EPA 8321B	NA

3.0 Methods

3.1 Sample Collection Procedures

Table 2 shows the precipitation in the 16 days before the sampling event. The QAP states that "ideally, sampling should occur following a rain event that follows a period of at least 48 hours of dry weather" (MOA 2016). Samples could not be collected during the rain event on September 21 and 22 because samples could not be delivered to SGS over the weekend. The contractor QA Officer determined that samples collected on September 25 would likely contain any pesticides carried during runoff from the recent rain, and that sampling was in compliance with the QAP.

Table 2. Precipitation Data for Anchorage for 16 Days Prior to Sampling

Date (2018)	Precipitation (inches)	Date	Precipitation (inches)
September 9	0.0	September 17	0.0
September 10	0.0	September18	0.0
September 11	0.0	September 19	0.0
September 12	0.0	September 20	T
September 13	0.0	September 21	0.27
September 14	0.0	September 22	0.22
September 15	0.0	September 23	0.01
September 16	0.0	September 24	0.08

Source: NOAA 2018
T = trace

The sampling equipment is calibrated in the morning of a sampling event. For the 2018 event the team used a YSI 556 hand-held multimeter provided and calibrated the day of the sampling event by TTT Environmental. All sampling equipment went through a complete decontamination procedure at each site using Alconox followed by a triple rinse with deionized water.

The crew collected a single water column sample from 1 to 2 meters below the water surface using a DH-81 Integrated Depth Sampler (See Section 3.4 Deviations from the QAP). The water column temperature and pH values were collected using the YSI 556 hand-held multimeter. GPS waypoints were recorded using a hand-held GPS. The DH-81 Integrated Depth Sampler was lowered into the water column to a depth of 1 meter, and a water column sample was collected. The DH-81 sampling container was poured into a decontaminated five gallon bucket; this procedure was repeated until the necessary sample volume had been collected. The collected sample was poured into laboratory-provided bottles with appropriate preservative on shore. Sample bottles were labeled with the project name, site and sample identification numbers, sample date and time, and name of sampler. The samples were preserved on ice and transported to the SGS laboratory in Anchorage. SGS prepared and shipped the samples to ALS.

Photographs of the sampling event are provided in Appendix A.

3.2 Laboratory Sampling Parameters

All samples were analyzed by laboratory analysis using EPA method 8151A for 2,4-D, and EPA method 8321B for Carbaryl. ALS provided proper sample containers for Carbaryl. SGS provided sample containers for 2,4-D, ice, coolers, and chain of custody forms. Samples for Little Campbell Lake were stored in a cooler with frozen gel ice until they were signed over to SGS at 12:29 on the same day they were collected. Samples for Lake Otis and Hideaway Lake were stored in a cooler with frozen gel ice and remained in the custody of the sampler (Lynn Spencer, HDR) overnight and delivered to SGS on the September 26, 2018 at 13:42. At SGS samples were refrigerated until shipment to ALS.

ALS is certified by the EPA and has an approved Quality Assurance and Quality Control (QA/QC) program. Analytical methods and testing procedures were in adherence with EPA-approved protocols and guidelines.

3.3 Chain of Custody

The chain of custody form was completed in the field by the field crew team leader for sample tracking. The original form was sent with the samples and delivered to SGS and transferred with the samples to ALS. Copies of the chains of custody are provided in Appendix B.

3.4 Deviation from the QAP

The sample locations for Lake Otis, Hideaway Lake, and Little Campbell Lake were consistent with previous sampling events and as specified in the QAP (MOA 2016). The 2018 samples

were collected from the lakes using a DH-81 Integrated Depth Sampler in place of the Niskin Sampler. The DH-81 is less bulky than a Niskin sampler, is more easily used by one person in a boat, and is used for the shallow depth (one meter) collection required for this sampling program. Other sampling protocols specified in the current QAP were followed and no other deviations were used in the sampling event.

3.5 QA/QC and Data Validation

QA/QC procedures were followed according to the QAP (MOA 2016). The procedures included analytical checks (field replicates, equipment blanks, matrix spike/matrix spike duplicate [MS/MSD]); instrument calibration; and procedures to assess data for precision, accuracy, representativeness, comparability, and completeness.

Verification analyses for both parameters were conducted by ALS Laboratories. The data review was focused on criteria for the following QA and QC parameters and their overall effects on the data:

- Sample handling (chain of custody)
- Temperature blank
- Holding time compliance
- MS/MSD
- Field replicate comparison
- Data validation.

Sample custody was adequately maintained for the samples. The internal temperature of the cooler transporting the samples collected at Little Campbell Lake was recorded at the SGS lab at 7.7^{o} C (above the allowable limit of 4 ^{o} C). This exception is permitted if the samples were chilled after collection and collected < 8 hours before delivery to the lab. The Little Campbell Lake samples were collected at 10:45 in the morning and delivered to the lab at 12:29 the same day. The holding times of 7 days prior to extraction for Carbaryl and 14 days for 2,4-D, were met as samples were collected on September 25 and received at ALS in Kelso on September 28. 2,4-D was extracted on October 1, and analyzed on October 10, and Carbaryl was extracted on September 28 and analyzed on October 19.

Laboratory precision was determined using MS/MSD and was within the 30% relative percent difference (RPD) limits. The RPD for 2,4-D was 4%, and the RPD for Carbaryl was 2%. Laboratory accuracy was measured by adding a known quantity of the target chemical and measuring recovery. For Carbaryl, the recovery average was 124%, well within the limits of 70 to 130% specified by EPA method 8321B. For 2,4-D, the recovery average was 47%, within the 17 to 113% range specified by EPA method 8151A.

Lake samples were taken from the water column one meter below the surface in the deepest portion of each lake representing general lake quality. Field replicates were taken at Little Campbell Lake for the confirmation sampling to determine precision. Both the sample and the replicate were reported as not detected for Carbaryl, yielding a RPD of 0% and meeting the precision requirements of 40 RPD specified in the QAP. The 2,4-D replicate samples had a RPD of 2%. The equipment blank sample identified no contamination of the field equipment. One hundred percent of the sample results are valid values.

4.0 Results

The results of September 25, 2018 pesticide screening in the three lakes are provided in Table 3. Complete laboratory results are provided in Appendix C. None of the lakes had detections of Carbaryl or 2,4-D above the limit of detection (LOD).

Table 3. Sample Results for Field Parameters and Laboratory Analyses

Site	Time of Sample	Temperature °C	pH	2,4-D (ug/L)/LOD	Carbaryl (ug/L)/LOD
Little Campbell Lake	10:42	12.2	6.97	ND (0.1)	ND (0.004)
Little Campbell Lake - Duplicate	10:45	12.4	6.85	ND (0.1	ND (0.004)
Lake Otis	15:08	13.0	6.86	ND (0.1)	ND (0.004)
Hideaway Lake	18:04	12.2	7.97	ND (0.1)	ND (0.004)

5.0 Discussion

The results of pesticide screening during the 2018 sampling season continue to support the previous results for Carbaryl. In 2013, 2,4-D was detected in Lake Otis and Hideaway Lake. While the concentrations were low and below the maximum contaminant level established by the EPA for drinking water (70 µg/L), the detection of 2,4-D had not occurred during any previous sampling. However, in 2016 and 2018, 2,4-D was not detected in any of the lakes, results that are in line with historical results.

It is likely that the non-detection results from 2016 and 2018 are the product of education programs established for property owners around the lakes on the use of pesticides and their effects within waterbodies, on wildlife, and humans. Therefore, it is recommended the pesticide screening program continues to monitor the three lakes and the education programs to remind property owners of the impacts of pesticide use on the waterbodies on which they live.

5.0 References

ADEC (Alaska Department of Environmental Conservation). 2007. Alaska Pesticide Management Plan to Protect and Restore Water Quality. Alaska Department of Environmental Conservation. October 31, 2007.

MOA (Municipality of Anchorage). 1999. Pesticide Screening at Anchorage Alaska, Conceptual Design. Prepared by CH2M Hill, Inc. Prepared for Watershed Management Section, Municipality of Anchorage. December 1999. Publication No. W MP App 99003

———. 2000. Pesticide Screening at Anchorage Alaska, Data Report. Prepared by CH2M Hill, Inc. Prepared for Watershed Management Section, Municipality of Anchorage. December 2000. Publication No. WMP APR 00006

———. 2013. 2013 Pesticide Screening Report. Prepared by HDR Alaska, Inc. Prepared for Watershed Management Section, Municipality of Anchorage. October 2013. Publication No. WMP APR 00006

———. 2016. Monitoring, Evaluation, and Quality Assurance Plan, APDES Permit NO. AKS-052558. Prepared for Alaska Department of Environmental Conservation, Division of Water. Prepared by HDR Alaska, Inc. and Municipality of Anchorage. January 2016.

———. 2017. 2016 Pesticide Screening Report. Prepared by HDR Alaska, Inc. Prepared for Watershed Management Section, Municipality of Anchorage. January 2017. Publication No. WMP APR 00006

NOAA (National Oceanic and Atmospheric Administration). 2018. National Weather Service Forecast Office, Anchorage. Available online at http://www.nws.noaa.gov/climate/index.php?wfo=pafc

U.S. Geological Survey (USGS). 1999. Circular 1225. Available online at http://pubs.usgs.gov/circ/circ1225/index.html

Appendix A
Photographs

Photograph 1. Hideway Lake, Looking SW

Photograph 2. Hideaway Lake, Looking West

Photograph 3. Lake Otis, Looking Southwest

Photograph 4. Lake Otis, Looking West

Photograph 5. Little Campbell Lake, Looking SSW

Photograph 6. Little Campbell Lake, Looking SSW

Appendix B
Completed Chain of Custody

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636- 1068
www.alsglobal.com

SGS

REVIEWED AA

SGS North America Inc.
CHAIN OF CUSTODY RECORD

1185476

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Page ___ of ___

Section 1

CLIENT: MOA / HDR

CONTACT: Lynn Spencer — PHONE NO: 907 440 4224

PROJECT NAME: Lake Pesticide — PROJECT/ PWSID/ PERMIT#:

REPORTS TO: Lynn Spencer, Kristi Bischofberger — E-MAIL: mspencer@hdrinc.com

INVOICE TO: " " — QUOTE #:

P.O. #:

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	Section 3 # CONTAINERS	Type C = COMP G = GRAB MI = Multi Incre-mental Soils	Preservative: CHAC	Preservative: 2,4-D	Preservative: Carbarg I	REMARKS/ LOC ID
(1) A-D (2) A-B (3) A-B	MOA LCL 001	9/25/18	1045	SW	8	G	4	4		
(4) A-D	MOA LCL 002	9/25/18	1045	SW	4	G	2	2		
(5) A-D	MOA LCL EB	9/25/18	1045	SW	4	G	2	2		

Section 5

	Date	Time	
Relinquished By: (1) R Spencer	9/25/18	1229	Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	9/25/18	12:29	Received For Laboratory By: Mi Com

Section 4

DOD Project? Yes No

Cooler ID: _____

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 7.7 D36

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle) HD

INTACT BROKEN (ABSENT)

(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

e-Sample Receipt Form

SGS Workorder #: **1185476**

1 1 8 5 4 7 6

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		YES Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	ABSENT
COC accompanied samples?	YES	
YES **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	NO	Cooler ID: 1 @ 7.7 °C Therm. ID: D36
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	YES	
If <0°C, were sample containers ice free?	N/A	
If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	YES	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)? **Note: If times differ <1hr, record details & login per COC.	YES	
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	YES	
	N/A	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	YES	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	N/A	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Client: SGS Environmental Services, Inc. **Service Request:**K1809348
Project: 1185476

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K1809348-001	MOA LCL 001	9/25/2018	1045
K1809348-002	MOA LCL 002	9/25/2018	1045
K1809348-003	MOA LCL EB	9/25/2018	1045

K1809348

SGS North America Inc.

CHAIN OF CUSTODY RECORD

1185476

Locations Nationwide

Alaska Florida
New Jersey Colorado
Texas North Carolina
Virginia Louisiana

www.us.sgs.com

CLIENT:	SGS North America Inc. - Alaska Division	**SGS Reference:**	**ALS Kelso, Washington**
CONTACT:	Julie Shumway	**PHONE NO:**	(907) 562-2343
PROJECT NAME:	1185476	**PWSID#:**	
		NPDL#:	
REPORTS TO:		**E-MAIL:**	Julie.Shumway@sgs.com
INVOICE TO:	SGS - Alaska	**QUOTE #:**	
		P.O. #:	1185476

Additional Comments: All soils report out in dry weight unless otherwise requested.

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HHMM	MATRIX/ MATRIX	# CONTAINERS	Preservative Used:	MCAA	NONE			MS	MSD	SGS lab #	Location ID
						TYPE C = COMP G = GRAB Multi Incremental Soils	SW8321 - Carbaryl	SW8151 - 2, 4-D						
	MOA LCL 001	9/25/2018	10:45	SW	4	GRAB	X	X					1185476001	
	MOA LCL 001 MS	9/25/2018	10:45	SW	2	GRAB	X	X			X		1185476002	
	MOA LCL 001 MSD	9/25/2018	10:45	SW	2	GRAB	X	X				X	1185476003	
	MOA LCL 002	9/25/2018	10:45	SW	4	GRAB	X	X					1185476004	
	MOA LCL EB	9/25/2018	10:45	SW	4	GRAB	X	X					1185476005	

Relinquished By: (1)	**Date** 9/26/18	**Time** 1010	**Received By:**	DOD Project? YES Report to DL (J Flags)? YES Cooler ID:
Relinquished By: (2)	**Date**	**Time**	**Received By:**	**Data Deliverable Requirements:** Level 2 Report
Relinquished By: (3)	**Date**	**Time**	**Received By:**	**Requested Turnaround Time and-or Special Instructions:** Standard. Report all analyses for Soils/Waters in mg/L or mg/Kg, where possible
Relinquished By: (4)	**Date**	**Time**	**Received For Laboratory By:**	Temp Blank °C: _____ or Ambient [ ] Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

[X] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

PC 42

Cooler Receipt and Preservation Form

Client SGS Service Request K18 09348

Received: 9/27/18 Opened: 9/27/18 By: Unloaded: 9/27/18 By:

1. Samples were received via? *USPS* *Fed Ex* (*UPS*) *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) (*Box*) *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2, sides
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID (NA)	Tracking Number (NA)	Filed
1.4	1.1	3.3	3.0	-0.3	370		1Z A86 19W 01 6803 5023	

4. Packing material: *Inserts* *Baggies* (*Bubble Wrap*) (*Gel Packs*) *Wet Ice* *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA Y (N)
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* (NA) Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time
MOA LCL 002	1L			X						
MOA LCL EB	1L			X						

Notes, Discrepancies, & Resolutions: _____

SGS

SGS North America Inc.
CHAIN OF CUSTODY RECORD

1185516

Locations Nationwide

aska	Maryland
w Jersey	New York
rth Carolina	Indiana
est Virgina	Kentucky

www.us.sgs.com

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Page ____ of ____

Section 1

CLIENT: MOA/HDR

CONTACT: Lynn Spencer PHONE NO: 907.440.4274

PROJECT NAME: Lake Pesticides PROJECT/ PWSID/ PERMIT#:

REPORTS TO: Lynn Spencer, Kristi Bischoffberger E-MAIL: mspencer@hdrinc.com

INVOICE TO: Watershed MOA- Management QUOTE #: P.O. #:

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	Section 3 # CONTAINERS	Section 3 Type C = COMP G = GRAB MI = Multi Incre-mental Soils	Preservative									REMARKS/ LOC ID
							2,4-D	Carbonyl								
①A-D	MOA LO 001	9/25/18	15:08	SW	2	G	2	2								
②A-D	MOA HAL 001	9/25/18	18:04	SW	2	G	2	2								

Section 5

	Date	Time	Received By:
Relinquished By: (1) Spencer	9/26/18	1342	
Relinquished By: (2)			
Relinquished By: (3)			
Relinquished By: (4)	9/26/18	13:42	Received For Laboratory By: KET

Section 4

DOD Project? Yes No

Cooler ID: _____

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 1.3 D44

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle) HD

INTACT BROKEN ABSENT

(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

http://www.sgs.com/terms-and-conditions

e-Sample Receipt Form

SGS Workorder #: **1185516**

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		yes Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	n/a	
COC accompanied samples?	yes	
n/a **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	yes	Cooler ID: 1 @ 1.3 °C Therm. ID: D44
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
If >6°C, were samples collected <8 hours ago?	n/a	
If <0°C, were sample containers ice free?	n/a	
If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)? **Note: If times differ <1hr, record details & login per COC.	yes	
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	yes	
	n/a	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	n/a	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	n/a	
Were all soil VOAs field extracted with MeOH+BFB?	n/a	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1185516001-A	No Preservative Required	OK			
1185516001-B	No Preservative Required	OK			
1185516001-C	No Preservative Required	OK			
1185516001-D	No Preservative Required	OK			
1185516002-A	No Preservative Required	OK			
1185516002-B	No Preservative Required	OK			
1185516002-C	No Preservative Required	OK			
1185516002-D	No Preservative Required	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

Appendix C
Data Package

Laboratory Report of Analysis

To: HDR Alaska, Inc.
2525 C St. Ste 500
Anchorage, AK 99503
644-2034

Report Number: **1185476**

Client Project: **Lake Pesticide**

Dear Joe Miller,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Justin Nelson Date
Project Manager
Justin.Nelson@sgs.com

Case Narrative

SGS Client: **HDR Alaska, Inc.**
SGS Project: **1185476**
Project Name/Site: **Lake Pesticide**
Project Contact: **Joe Miller**

Refer to sample receipt form for information on sample condition.

MOA LCL 001 (1185476001) PS

SW8321- Carbaryl and SW8151 - 2,4-D were analyzed by ALS of Kelso, WA.

MOA LCL 002 (1185476004) PS

SW8321- Carbaryl and SW8151 - 2,4-D were analyzed by ALS of Kelso, WA.

MOA LCL 001 MS (1185476002) BMS

SW8321- Carbaryl and SW8151 - 2,4-D and MS were analyzed by ALS of Kelso, WA.

MOA LCL 001 MSD (1185476003) BMSD

SW8321- Carbaryl and SW8151 - 2,4-D and MSD were analyzed by ALS of Kelso, WA.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Sample Receipt Information

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
MOA LCL 001	1185476001	09/25/2018	09/25/2018	Water (Surface, Eff., Ground)
MOA LCL 001 MS	1185476002	09/25/2018	09/25/2018	Water (Surface, Eff., Ground)
MOA LCL 001 MSD	1185476003	09/25/2018	09/25/2018	Water (Surface, Eff., Ground)
MOA LCL 002	1185476004	09/25/2018	09/25/2018	Water (Surface, Eff., Ground)
MOA LCL EB	1185476005	09/25/2018	09/25/2018	Water (Surface, Eff., Ground)

Method	Method Description

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

SGS

REVIEWED AA

SGS North America Inc.
CHAIN OF CUSTODY RECORD

1185476

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Page ___ of ___

Section 1

CLIENT: MOA / HDR

CONTACT: Lynn Spencer — PHONE NO: 907 440 4224

PROJECT NAME: Lake Pesticide — PROJECT/ PWSID/ PERMIT#:

REPORTS TO: Lynn Spencer, Kristi Bischofberger — E-MAIL: mspencer@hdrinc.com

INVOICE TO: " " — QUOTE #:

P.O. #:

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	Section 3 # CONTAINERS	Type C = COMP G = GRAB MI = Multi Incre-mental Soils	Preservative: CHAC	Preservative: 2,4-D	Preservative: Carbarg I	REMARKS/ LOC ID
(1) A-D (2) A-B (3) A-B	MOA LCL 001	9/25/18	1045	SW	8	G	4	4		
(4) A-D	MOA LCL 002	9/25/18	1045	SW	4	G	2	2		
(5) A-D	MOA LCL EB	9/25/18	1045	SW	4	G	2	2		

Section 5

	Date	Time	
Relinquished By: (1) R Spencer	9/25/18	1229	Received By:
Relinquished By: (2)			Received By:
Relinquished By: (3)			Received By:
Relinquished By: (4)	9/25/18	12:29	Received For Laboratory By: Mi Com

Section 4

DOD Project? Yes No

Cooler ID: _____

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 7.7 D36

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle) HD

INTACT BROKEN (ABSENT)

(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

e-Sample Receipt Form

SGS Workorder #: **1185476**

1 1 8 5 4 7 6

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		YES Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	N/A	ABSENT
COC accompanied samples?	YES	
YES **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	NO	Cooler ID: 1 @ 7.7 °C Therm. ID: D36
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
	N/A	Cooler ID: @ °C Therm. ID:
*If >6°C, were samples collected <8 hours ago?	YES	
If <0°C, were sample containers ice free?	N/A	
If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	YES	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)? **Note: If times differ <1hr, record details & login per COC.	YES	
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	YES	
	N/A	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	YES	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	N/A	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	N/A	
Were all soil VOAs field extracted with MeOH+BFB?	N/A	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1185476001-A	No Preservative Required	OK			
1185476001-B	No Preservative Required	OK			
1185476001-C	No Preservative Required	OK			
1185476001-D	No Preservative Required	OK			
1185476002-A	No Preservative Required	OK			
1185476002-B	No Preservative Required	OK			
1185476003-A	No Preservative Required	OK			
1185476003-B	No Preservative Required	OK			
1185476004-A	No Preservative Required	OK			
1185476004-B	No Preservative Required	OK			
1185476004-C	No Preservative Required	OK			
1185476004-D	No Preservative Required	OK			
1185476005-A	No Preservative Required	OK			
1185476005-B	No Preservative Required	OK			
1185476005-C	No Preservative Required	OK			
1185476005-D	No Preservative Required	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

October 31, 2018 Service Request No:K1809348

Julie Shumway
SGS Environmental Services, Inc.
200 West Potter Drive
Anchorage, AK 99518

Laboratory Results for: 1185476

Dear Julie,

Enclosed are the results of the sample(s) submitted to our laboratory September 27, 2018
For your reference, these analyses have been assigned our service request number **K1809348.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3364. You may also contact me via email at howard.holmes@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Howard Holmes
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental

Narrative Documents

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

ALS Environmental

Client: SGS Environmental Services, Inc.
Project: 1185476
Sample Matrix: Water

Service Request: K1809348
Date Received: 09/27/2018

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

Sample Receipt:

Three water samples were received for analysis at ALS Environmental on 09/27/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

Semivoa GC:

No significant anomalies were noted with this analysis.

Organic LC:

Method 8321B, 10/19/2018:Manual integration of one or more chromatographic peaks was required to correct the integration performed by the automated data processing program. The manual integration was performed in accordance with ALS policy, which is consistent with the National Environmental Laboratory Accreditation Program (NELAP), Department of Defense (DOD), and other certifying agencies. The analytes that required manual integrations are identified on each sample report contained in this data package.

Method 8321B, 10/19/2018:The laboratory is not accredited by the Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP) for the analysis of Carbaryl by EPA 8321B.

Approved by _____ Date 10/31/2018

Client: SGS Environmental Services, Inc. **Service Request:**K1809348
Project: 1185476

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K1809348-001	MOA LCL 001	9/25/2018	1045
K1809348-002	MOA LCL 002	9/25/2018	1045
K1809348-003	MOA LCL EB	9/25/2018	1045

K1809348

SGS North America Inc.

CHAIN OF CUSTODY RECORD

1185476

Locations Nationwide

Alaska Florida
New Jersey Colorado
Texas North Carolina
Virginia Louisiana

www.us.sgs.com

CLIENT:	SGS North America Inc. - Alaska Division	**SGS Reference:**	**ALS Kelso, Washington**
CONTACT:	Julie Shumway	**PHONE NO:**	(907) 562-2343
PROJECT NAME:	1185476	**PWSID#:**	
		NPDL#:	
REPORTS TO:		**E-MAIL:**	Julie.Shumway@sgs.com
INVOICE TO:	SGS - Alaska	**QUOTE #:**	
		P.O. #:	1185476

Additional Comments: All soils report out in dry weight unless otherwise requested.

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HHMM	MATRIX/ MATRIX	# CONTAINERS	Preservative Used:	MCAA	NONE			MS	MSD	SGS lab #	Location ID
						TYPE C = COMP G = GRAB Multi Incremental Soils	SW8321 - Carbaryl	SW8151 - 2, 4-D						
	MOA LCL 001	9/25/2018	10:45	SW	4	GRAB	X	X					1185476001	
	MOA LCL 001 MS	9/25/2018	10:45	SW	2	GRAB	X	X			X		1185476002	
	MOA LCL 001 MSD	9/25/2018	10:45	SW	2	GRAB	X	X				X	1185476003	
	MOA LCL 002	9/25/2018	10:45	SW	4	GRAB	X	X					1185476004	
	MOA LCL EB	9/25/2018	10:45	SW	4	GRAB	X	X					1185476005	

Relinquished By: (1)	**Date** 9/26/18	**Time** 1010	**Received By:**	DOD Project? YES Report to DL (J Flags)? YES Cooler ID:
Relinquished By: (2)	**Date**	**Time**	**Received By:**	**Data Deliverable Requirements:** Level 2 Report
Relinquished By: (3)	**Date**	**Time**	**Received By:**	**Requested Turnaround Time and-or Special Instructions:** Standard. Report all analyses for Soils/Waters in mg/L or mg/Kg, where possible
Relinquished By: (4)	**Date**	**Time**	**Received For Laboratory By:**	Temp Blank °C: _____ or Ambient [ ] Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

[X] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

PC 42

Cooler Receipt and Preservation Form

Client SGS Service Request K18 09348

Received: 9/27/18 Opened: 9/27/18 By: Unloaded: 9/27/18 By:

1. Samples were received via? *USPS* *Fed Ex* (*UPS*) *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) (*Box*) *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2, sides
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID (NA)	Tracking Number (NA)	Filed
1.4	1.1	3.3	3.0	-0.3	370		1Z A86 19W 01 6803 5023	

4. Packing material: *Inserts* *Baggies* (*Bubble Wrap*) (*Gel Packs*) *Wet Ice* *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA Y (N)
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* (NA) Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time
MOA LCL 002	1L			X						
MOA LCL EB	1L			X						

Notes, Discrepancies, & Resolutions: _____

Miscellaneous Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

Acronyms

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

Client: SGS Environmental Services, Inc. **Service Request:** K1809348
Project: 1185476

Sample Name: MOA LCL 001 **Date Collected:** 09/25/18
Lab Code: K1809348-001 **Date Received:** 09/27/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
8151A	TANDREWS	MRICHARDS
8321B	BDAVIS	LDOMREIS

Sample Name: MOA LCL 002 **Date Collected:** 09/25/18
Lab Code: K1809348-002 **Date Received:** 09/27/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
8151A	TANDREWS	MRICHARDS
8321B	BDAVIS	LDOMREIS

Sample Name: MOA LCL EB **Date Collected:** 09/25/18
Lab Code: K1809348-003 **Date Received:** 09/27/18
Sample Matrix: Water

Analysis Method	Extracted/Digested By	Analyzed By
8151A	TANDREWS	MRICHARDS
8321B	BDAVIS	LDOMREIS

Sample Results

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Semivolatile Organic Compounds by GC

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809348
Project:	1185476	**Date Collected:**	09/25/18 10:45
Sample Matrix:	Water	**Date Received:**	09/27/18 11:57
Sample Name:	MOA LCL 001	**Units:**	ug/L
Lab Code:	K1809348-001	**Basis:**	NA

Chlorinated Herbicides by GC

Analysis Method: 8151A
Prep Method: Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4-D	ND U	0.40	0.10	0.036	1	10/10/18 16:37	10/1/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4-Dichlorophenylacetic Acid	45	17 - 113	10/10/18 16:37	

Analytical Report

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809348
Project:	1185476	**Date Collected:**	09/25/18 10:45
Sample Matrix:	Water	**Date Received:**	09/27/18 11:57
Sample Name:	MOA LCL 002	**Units:**	ug/L
Lab Code:	K1809348-002	**Basis:**	NA

Chlorinated Herbicides by GC

Analysis Method: 8151A
Prep Method: Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4-D	ND U	0.40	0.10	0.037	1	10/10/18 17:50	10/1/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4-Dichlorophenylacetic Acid	50	17 - 113	10/10/18 17:50	

Analytical Report

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809348
Project:	1185476	**Date Collected:**	09/25/18 10:45
Sample Matrix:	Water	**Date Received:**	09/27/18 11:57
Sample Name:	MOA LCL EB	**Units:**	ug/L
Lab Code:	K1809348-003	**Basis:**	NA

Chlorinated Herbicides by GC

Analysis Method: 8151A
Prep Method: Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4-D	ND U	0.40	0.10	0.036	1	10/10/18 18:15	10/1/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4-Dichlorophenylacetic Acid	51	17 - 113	10/10/18 18:15	

High Performance Liquid Chromatography

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809348
Project:	1185476	**Date Collected:**	09/25/18 10:45
Sample Matrix:	Water	**Date Received:**	09/27/18 11:57
Sample Name:	MOA LCL 001	**Units:**	ug/L
Lab Code:	K1809348-001	**Basis:**	NA

Solvent Extractable Nonvolatile Compounds by HPLC-MS/MS

Analysis Method: 8321B
Prep Method: Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Carbaryl	ND U	0.020	0.0040	0.0040	1	10/19/18 15:27	9/28/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-3,5-dimethylphenyl N-Methylcarbamate	99	70 - 130	10/19/18 15:27	

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809348
Project:	1185476	**Date Collected:**	09/25/18 10:45
Sample Matrix:	Water	**Date Received:**	09/27/18 11:57
Sample Name:	MOA LCL 002	**Units:**	ug/L
Lab Code:	K1809348-002	**Basis:**	NA

Solvent Extractable Nonvolatile Compounds by HPLC-MS/MS

Analysis Method: 8321B
Prep Method: Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Carbaryl	ND U	0.020	0.0040	0.0040	1	10/19/18 15:37	9/28/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-3,5-dimethylphenyl N-Methylcarbamate	106	70 - 130	10/19/18 15:37	

Analytical Report

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809348
Project:	1185476	**Date Collected:**	09/25/18 10:45
Sample Matrix:	Water	**Date Received:**	09/27/18 11:57
Sample Name:	MOA LCL EB	**Units:**	ug/L
Lab Code:	K1809348-003	**Basis:**	NA

Solvent Extractable Nonvolatile Compounds by HPLC-MS/MS

Analysis Method: 8321B
Prep Method: Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Carbaryl	ND U	0.020	0.0040	0.0040	1	10/19/18 15:46	9/28/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-3,5-dimethylphenyl N-Methylcarbamate	104	70 - 130	10/19/18 15:46	

QC Summary Forms

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
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Semivolatile Organic Compounds by GC

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: SGS Environmental Services, Inc. **Service Request:** K1809348
Project: 1185476
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Chlorinated Herbicides by GC

Analysis Method: 8151A
Extraction Method: Method

Sample Name	Lab Code	2,4-Dichlorophenylacetic Acid 17-113
MOA LCL 001	K1809348-001	45
MOA LCL 002	K1809348-002	50
MOA LCL EB	K1809348-003	51
Method Blank	KQ1814259-04	50
Lab Control Sample	KQ1814259-03	61
MOA LCL 001	KQ1814259-01	54
MOA LCL 001	KQ1814259-02	52

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809348
Project:	1185476	**Date Collected:**	09/25/18
Sample Matrix:	Water	**Date Received:**	09/27/18
		Date Analyzed:	10/10/18
		Date Extracted:	10/1/18

Duplicate Matrix Spike Summary
Chlorinated Herbicides by GC

Sample Name:	MOA LCL 001	**Units:**	ug/L
Lab Code:	K1809348-001	**Basis:**	NA
Analysis Method:	8151A		
Prep Method:	Method		

		Matrix Spike KQ1814259-01			**Duplicate Matrix Spike** KQ1814259-02					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
2,4-D	ND U	1.58	2.53	63	1.65	2.69	61	41-108	4	30

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

Analytical Report

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809348
Project:	1185476	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ1814259-04	**Basis:**	NA

Chlorinated Herbicides by GC

Analysis Method: 8151A
Prep Method: Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4-D	ND U	0.38	0.10	0.036	1	10/12/18 12:09	10/1/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4-Dichlorophenylacetic Acid	50	17 - 113	10/12/18 12:09	

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809348
Project:	1185476	**Date Analyzed:**	10/12/18
Sample Matrix:	Water	**Date Extracted:**	10/01/18

Lab Control Sample Summary
Chlorinated Herbicides by GC

Analysis Method:	8151A	**Units:**	ug/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	611021

Lab Control Sample
KQ1814259-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
2,4-D	1.69	2.50	68	35-110

Confirmation Results

Client: SGS Environmental Services, Inc.
Project: 1185476
SRM Matrix: Water

Service Request: K1809348
Date Collected: 09/25/18 10:45
Date Received: 9/27/18

Sample Name: MOA LCL 001
Lab Code: KQ1814259-01

Units: ug/L
Basis: NA

Chlorinated Herbicides by GC

Analytical Method: 8151A
Prep Method: Method

	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
2,4-D	0.037	1.58	1.61	2		1	10/10/18 17:01

Confirmation Results

Client: SGS Environmental Services, Inc.
Project: 1185476
SRM Matrix: Water

Service Request: K1809348
Date Collected: 09/25/18 10:45
Date Received: 9/27/18

Sample Name: MOA LCL 001
Lab Code: KQ1814259-02

Units: ug/L
Basis: NA

Chlorinated Herbicides by GC

Analytical Method: 8151A
Prep Method: Method

	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
2,4-D	0.039	1.65	1.70	3		1	10/10/18 17:26

Confirmation Results

Client: SGS Environmental Services, Inc.
Project: 1185476
SRM Matrix: Water

Service Request: K1809348
Date Collected: NA
Date Received:

Sample Name: Lab Control Sample
Lab Code: KQ1814259-03

Units: ug/L
Basis: NA

Chlorinated Herbicides by GC

Analytical Method: 8151A
Prep Method: Method

	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
2,4-D	0.036	1.69	1.77	5		1	10/12/18 11:45

High Performance Liquid Chromatography

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: SGS Environmental Services, Inc. **Service Request:** K1809348

Project: 1185476

Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Solvent Extractable Nonvolatile Compounds by HPLC-MS/MS

Analysis Method: 8321B

Extraction Method: Method

Sample Name	Lab Code	4-Bromo-3,5-dimethylphenyl N-Methylcarbamate 70-130
MOA LCL 001	K1809348-001	99
MOA LCL 002	K1809348-002	106
MOA LCL EB	K1809348-003	104
Method Blank	KQ1813813-03	88
Lab Control Sample	KQ1813813-01	89
Duplicate Lab Control Sample	KQ1813813-02	88

Analytical Report

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809348
Project:	1185476	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ1813813-03	**Basis:**	NA

Solvent Extractable Nonvolatile Compounds by HPLC-MS/MS

Analysis Method: 8321B
Prep Method: Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Carbaryl	ND U	0.020	0.0040	0.0040	1	10/19/18 14:58	9/28/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-3,5-dimethylphenyl N-Methylcarbamate	88	70 - 130	10/19/18 14:58	

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809348
Project:	1185476	**Date Analyzed:**	10/19/18
Sample Matrix:	Water	**Date Extracted:**	09/28/18

Duplicate Lab Control Sample Summary
Solvent Extractable Nonvolatile Compounds by HPLC-MS/MS

Analysis Method:	8321B	**Units:**	ug/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	611597

	Lab Control Sample KQ1813813-01			Duplicate Lab Control Sample KQ1813813-02					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Carbaryl	0.482	0.500	96	0.494	0.500	99	70-130	2	30

Laboratory Report of Analysis

To: HDR Alaska, Inc.
2525 C St. Ste 500
Anchorage, AK 99503
644-2034

Report Number: **1185516**

Client Project: **Lake Pesticides**

Dear Joe Miller,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely,
SGS North America Inc.

Justin Nelson Date
Project Manager
Justin.Nelson@sgs.com

Case Narrative

SGS Client: **HDR Alaska, Inc.**
SGS Project: **1185516**
Project Name/Site: **Lake Pesticides**
Project Contact: **Joe Miller**

Refer to sample receipt form for information on sample condition.

MOA LO 001 (1185516001) PS

SW8321- Carbaryl and SW8151- 2,4-D were analyzed by ALS of Kelso, WA.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 **f** 907.561.5301 www.us.sgs.com

Sample Summary

Client Sample ID	Lab Sample ID	Collected	Received	Matrix
MOA LO 001	1185516001	09/25/2018	09/26/2018	Water (Surface, Eff., Ground)
MOA HAL 001	1185516002	09/25/2018	09/26/2018	Water (Surface, Eff., Ground)

Method	Method Description

SGS North America Inc.
200 West Potter Drive, Anchorage, AK 99518
t 907.562.2343 f 907.561.5301 www.us.sgs.com

SGS

SGS North America Inc.
CHAIN OF CUSTODY RECORD

1185516

Locations Nationwide

aska	Maryland
w Jersey	New York
rth Carolina	Indiana
est Virgina	Kentucky

www.us.sgs.com

Instructions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.

Page ____ of ____

Section 1

CLIENT: MOA/HDR

CONTACT: Lynn Spencer PHONE NO: 907.440.4274

PROJECT NAME: Lake Pesticides PROJECT/ PWSID/ PERMIT#:

REPORTS TO: Lynn Spencer, Kristi Bischoffberger E-MAIL: mspencer@hdrinc.com

INVOICE TO: Watershed MOA- Management QUOTE #: P.O. #:

Section 2

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HH:MM	MATRIX/ MATRIX CODE	Section 3 # CONTAINERS	Section 3 Type C = COMP G = GRAB MI = Multi Incre-mental Soils	Preservative									REMARKS/ LOC ID
							2,4-D	Carbonyl								
①A-D	MOA LO 001	9/25/18	15:08	SW	2	G	2	2								
②A-D	MOA HAL 001	9/25/18	18:04	SW	2	G	2	2								

Section 5

	Date	Time	Received By:
Relinquished By: (1) Spencer	9/26/18	1342	
Relinquished By: (2)			
Relinquished By: (3)			
Relinquished By: (4)	9/26/18	13:42	Received For Laboratory By: KET

Section 4

DOD Project? Yes No

Cooler ID: _____

Data Deliverable Requirements:

Requested Turnaround Time and/or Special Instructions:

Temp Blank °C: 1.3 D44

or Ambient [ ]

(See attached Sample Receipt Form)

Chain of Custody Seal: (Circle) HD

INTACT BROKEN ABSENT

(See attached Sample Receipt Form)

[ ] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

http://www.sgs.com/terms-and-conditions

e-Sample Receipt Form

SGS Workorder #: **1185516**

Review Criteria	Condition (Yes, No, N/A)	Exceptions Noted below
Chain of Custody / Temperature Requirements		yes Exemption permitted if sampler hand carries/delivers.
Were Custody Seals intact? Note # & location	n/a	
COC accompanied samples?	yes	
n/a **Exemption permitted if chilled & collected <8 hours ago, or for samples where chilling is not required		
Temperature blank compliant* (i.e., 0-6 °C after CF)?	yes	Cooler ID: 1 @ 1.3 °C Therm. ID: D44
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
	n/a	Cooler ID: @ °C Therm. ID:
If >6°C, were samples collected <8 hours ago?	n/a	
If <0°C, were sample containers ice free?	n/a	
If samples received without a temperature blank, the "cooler temperature" will be documented in lieu of the temperature blank & "**COOLER TEMP**" will be noted to the right. In cases where neither a temp blank nor cooler temp can be obtained, note "ambient" or "chilled".		
Note: Identify containers received at non-compliant temperature . Use form FS-0029 if more space is needed.		
Holding Time / Documentation / Sample Condition Requirements		Note: Refer to form F-083 "Sample Guide" for specific holding times.
Were samples received within holding time?	yes	
Do samples **match COC**** (i.e.,sample IDs,dates/times collected)? **Note: If times differ <1hr, record details & login per COC.	yes	
Were analyses requested unambiguous? (i.e., method is specified for analyses with >1 option for analysis)	yes	
	n/a	***Exemption permitted for metals (e.g,200.8/6020A).
Were proper containers (type/mass/volume/preservative***)used?	yes	
Volatile / LL-Hg Requirements		
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samples?	n/a	
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6mm)?	n/a	
Were all soil VOAs field extracted with MeOH+BFB?	n/a	

Note to Client: Any "No", answer above indicates non-compliance with standard procedures and may impact data quality.

Additional notes (if applicable):

Sample Containers and Preservatives

Container Id	Preservative	Container Condition	Container Id	Preservative	Container Condition
1185516001-A	No Preservative Required	OK			
1185516001-B	No Preservative Required	OK			
1185516001-C	No Preservative Required	OK			
1185516001-D	No Preservative Required	OK			
1185516002-A	No Preservative Required	OK			
1185516002-B	No Preservative Required	OK			
1185516002-C	No Preservative Required	OK			
1185516002-D	No Preservative Required	OK			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.
BU - The container was received with headspace greater than 6mm.
DM - The container was received damaged.
FR - The container was received frozen and not usable for Bacteria or BOD analyses.
IC - The container provided for microbiology analysis was not a laboratory-supplied, pre-sterilized container and therefore was not suitable for analysis.
PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.
PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

October 31, 2018 Service Request No:K1809392

Julie Shumway
SGS Environmental Services, Inc.
200 West Potter Drive
Anchorage, AK 99518

Laboratory Results for: 1185516

Dear Julie,

Enclosed are the results of the sample(s) submitted to our laboratory September 28, 2018
For your reference, these analyses have been assigned our service request number **K1809392.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3364. You may also contact me via email at howard.holmes@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Howard Holmes
Project Manager

ADDRESS 1317 S. 13th Avenue, Kelso, WA 98626
PHONE +1 360 577 7222 | FAX +1 360 636 1068
ALS Group USA, Corp.
dba ALS Environmental

Narrative Documents

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

ALS Environmental

Client: SGS Environmental Services, Inc. **Service Request:** K1809392
Project: 1185516 **Date Received:** 09/28/2018
Sample Matrix: Water

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples designated for Tier II data deliverables. When appropriate to the method, method blank results have been reported with each analytical test. Surrogate recoveries have been reported for all applicable organic analyses. Additional quality control analyses reported herein include: Laboratory Duplicate (DUP), Matrix Spike (MS), Matrix/Duplicate Matrix Spike (MS/DMS), Laboratory Control Sample (LCS), and Laboratory/Duplicate Laboratory Control Sample (LCS/DLCS).

Sample Receipt:

Two water samples were received for analysis at ALS Environmental on 09/28/2018. The samples were received in good condition and consistent with the accompanying chain of custody form. The samples were stored in a refrigerator at 4ºC upon receipt at the laboratory.

Semivoa GC:

No significant anomalies were noted with this analysis.

Organic LC:

Method 8321B, 10/19/2018:The lower control criterion was exceeded for Benomyl-d4 in sample MOA LO 001. The error associated with reduced internal standard response equated to a high bias to the results quantitated using this internal standard. The target analyte was not detected above the Limit of Quantitation (LOQ) in this sample. Since the apparent problem equated to a high bias, the data quality was not significantly affected. No further corrective action was appropriate.

Method 8321B, 10/19/2018:The upper control criterion was exceeded for 4-Bromo-3,5-dimethylphenyl N-Methylcarbamate in sample MOA LO 001. The target analyte was not detected above the Limit of Quantitation (LOQ) in this sample. The error associated with an elevated recovery equated to a high bias. The quality of the sample data was not significantly affected. No further corrective action was appropriate.

Method 8321B, 10/19/2018:Manual integration of one or more chromatographic peaks was required to correct the integration performed by the automated data processing program. The manual integration was performed in accordance with ALS policy, which is consistent with the National Environmental Laboratory Accreditation Program (NELAP), Department of Defense (DOD), and other certifying agencies. The analytes that required manual integrations are identified on each sample report contained in this data package.

Method 8321B, 10/19/2018:The laboratory is not accredited by the Department of Defense Environmental Laboratory Accreditation Program (DoD-ELAP) for the analysis of Carbaryl by EPA 8321B.

Approved by _____ Date 10/31/2018

Sample Receipt Information

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
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Client: SGS Environmental Services, Inc. **Service Request:**K1809392
Project: 1185516

SAMPLE CROSS-REFERENCE

SAMPLE #	CLIENT SAMPLE ID	DATE	TIME
K1809392-001	MOA LO 001	9/25/2018	1508
K1809392-002	MOA HAL 001	9/25/2018	1804

K1809392

SGS

SGS North America Inc.

CHAIN OF CUSTODY RECORD

1185516

Locations Nationwide

Alaska	Florida
New Jersey	Colorado
Texas	North Carolina
Virginia	Louisiana

www.us.sgs.com

CLIENT:	SGS North America Inc. - Alaska Division	**SGS Reference:**	**ALS Kelso, Washington**
CONTACT:	Julie Shumway	**PHONE NO:**	(907) 562-2343
PROJECT NAME:	1185516	**PWSID#:**	
		NPDL#:	
REPORTS TO:		**E-MAIL:**	Julie.Shumway@sgs.com
INVOICE TO:	SGS - Alaska	**QUOTE #:**	
		P.O. #:	1185516

Additional Comments: All soils report out in dry weight unless otherwise requested.

RESERVED for lab use	SAMPLE IDENTIFICATION	DATE mm/dd/yy	TIME HHMM	MATRIX/ MATRIX	# CONTAINERS	Preservative Used:	MCAA	NONE			MS	MSD	SGS lab #	Location ID
						TYPE C = COMP G = GRAB Multi Incremental Soils	SW8321 - Carbaryl	SW8151 - 2, 4-D						
	MOA LO 001	9/25/2018	15:08	W	2	GRAB	X	X					1185516001	
	MOA HAL 001	9/25/2018	18:04	W	2	GRAB	X	X					1185516002	

Relinquished By: (1)	**Date**	**Time**	**Received By:**	DOD Project? YES Report to DL (J Flags)? YES Cooler ID:	**Data Deliverable Requirements:** Level 2 Report
Shumway	9/27/18	0909			
Relinquished By: (2)	**Date**	**Time**	**Received By:**	**Requested Turnaround Time and-or Special Instructions:**	
	9/28/18	1010			
Relinquished By: (3)	**Date**	**Time**	**Received By:**	**Standard.** Report all analyses for Soils/Waters in mg/L or mg/Kg, where possible	
Relinquished By: (4)	**Date**	**Time**	**Received For Laboratory By:**	**Temp Blank °C:** _____ **or Ambient [ ]**	**Chain of Custody Seal: (Circle)** **INTACT BROKEN ABSENT**

[X] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
[ ] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

PC H2

Cooler Receipt and Preservation Form

Client SGS Service Request K18 09392

Received: 9/28/18 Opened: 9/28/18 By: [signature] Unloaded: 9/28/18 By: [signature]

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2 sides
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID (NA)	Tracking Number (NA)	Filed
1.6	1.3	1.1	0.8	-0.3	370		1Z A861 9W0 1684 1 3148	

4. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* cardboard
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* (NA) Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

Miscellaneous Forms

ALS Environmental—Kelso Laboratory
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Phone (360) 577-7222 Fax (360) 425-9096
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Inorganic Data Qualifiers

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

Metals Data Qualifiers

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

Organic Data Qualifiers

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

Additional Petroleum Hydrocarbon Specific Qualifiers

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

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

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

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

Acronyms

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

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809392
Project:	1185516		

Sample Name:	MOA LO 001	**Date Collected:**	09/25/18
Lab Code:	K1809392-001	**Date Received:**	09/28/18
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
8151A	TANDREWS	MRICHARDS
8321B	BDAVIS	LDOMREIS

Sample Name:	MOA HAL 001	**Date Collected:**	09/25/18
Lab Code:	K1809392-002	**Date Received:**	09/28/18
Sample Matrix:	Water		

Analysis Method	Extracted/Digested By	Analyzed By
8151A	TANDREWS	MRICHARDS
8321B	BDAVIS	LDOMREIS

Sample Results

ALS Environmental—Kelso Laboratory
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Semivolatile Organic Compounds by GC

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Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Analytical Report

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809392
Project:	1185516	**Date Collected:**	09/25/18 15:08
Sample Matrix:	Water	**Date Received:**	09/28/18 10:10
Sample Name:	MOA LO 001	**Units:**	ug/L
Lab Code:	K1809392-001	**Basis:**	NA

Chlorinated Herbicides by GC

Analysis Method: 8151A
Prep Method: Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4-D	ND U	0.43	0.11	0.039	1	10/10/18 18:39	10/1/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4-Dichlorophenylacetic Acid	50	17 - 113	10/10/18 18:39	

Analytical Report

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809392
Project:	1185516	**Date Collected:**	09/25/18 18:04
Sample Matrix:	Water	**Date Received:**	09/28/18 10:10
Sample Name:	MOA HAL 001	**Units:**	ug/L
Lab Code:	K1809392-002	**Basis:**	NA

Chlorinated Herbicides by GC

Analysis Method: 8151A
Prep Method: Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4-D	ND U	0.40	0.10	0.036	1	10/10/18 19:53	10/1/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4-Dichlorophenylacetic Acid	43	17 - 113	10/10/18 19:53	

High Performance Liquid Chromatography

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www.alsglobal.com

Analytical Report

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809392
Project:	1185516	**Date Collected:**	09/25/18 15:08
Sample Matrix:	Water	**Date Received:**	09/28/18 10:10
Sample Name:	MOA LO 001	**Units:**	ug/L
Lab Code:	K1809392-001	**Basis:**	NA

Solvent Extractable Nonvolatile Compounds by HPLC-MS/MS

Analysis Method: 8321B
Prep Method: Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Carbaryl	ND U	0.020	0.0040	0.0040	1	10/19/18 15:56	9/28/18	*

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-3,5-dimethylphenyl N-Methylcarbamate	155	70 - 130	10/19/18 15:56	*

Analytical Report

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809392
Project:	1185516	**Date Collected:**	09/25/18 18:04
Sample Matrix:	Water	**Date Received:**	09/28/18 10:10
Sample Name:	MOA HAL 001	**Units:**	ug/L
Lab Code:	K1809392-002	**Basis:**	NA

Solvent Extractable Nonvolatile Compounds by HPLC-MS/MS

Analysis Method: 8321B
Prep Method: Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Carbaryl	ND U	0.020	0.0040	0.0040	1	10/19/18 16:05	9/28/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-3,5-dimethylphenyl N-Methylcarbamate	115	70 - 130	10/19/18 16:05	

QC Summary Forms

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Semivolatile Organic Compounds by GC

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www.alsglobal.com

Client: SGS Environmental Services, Inc. **Service Request:** K1809392
Project: 1185516
Sample Matrix: Water

SURROGATE RECOVERY SUMMARY
Chlorinated Herbicides by GC

Analysis Method: 8151A
Extraction Method: Method

Sample Name	Lab Code	2,4-Dichlorophenylacetic Acid 17-113
MOA LO 001	K1809392-001	50
MOA HAL 001	K1809392-002	43
Method Blank	KQ1814259-04	50
Lab Control Sample	KQ1814259-03	61

Analytical Report

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809392
Project:	1185516	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ1814259-04	**Basis:**	NA

Chlorinated Herbicides by GC

Analysis Method: 8151A
Prep Method: Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
2,4-D	ND U	0.38	0.10	0.036	1	10/12/18 12:09	10/1/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
2,4-Dichlorophenylacetic Acid	50	17 - 113	10/12/18 12:09	

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809392
Project:	1185516	**Date Analyzed:**	10/12/18
Sample Matrix:	Water	**Date Extracted:**	10/01/18

Lab Control Sample Summary
Chlorinated Herbicides by GC

Analysis Method:	8151A	**Units:**	ug/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	611021

Lab Control Sample
KQ1814259-03

Analyte Name	Result	Spike Amount	% Rec	% Rec Limits
2,4-D	1.69	2.50	68	35-110

Confirmation Results

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809392
Project:	1185516	**Date Collected:**	NA
SRM Matrix:	Water	**Date Received:**	
Sample Name:	Lab Control Sample		
Lab Code:	KQ1814259-03	**Units:**	ug/L
		Basis:	NA

Chlorinated Herbicides by GC

Analytical Method: 8151A
Prep Method: Method

	MDL	Primary Result	Confirmation Result	RPD	Q	Dilution Factor	Date Analyzed
2,4-D	0.036	1.69	1.77	5		1	10/12/18 11:45

High Performance Liquid Chromatography

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360) 577-7222 Fax (360) 425-9096
www.alsglobal.com

Client: SGS Environmental Services, Inc. **Service Request:** K1809392

Project: 1185516

Sample Matrix: Water

SURROGATE RECOVERY SUMMARY

Solvent Extractable Nonvolatile Compounds by HPLC-MS/MS

Analysis Method: 8321B

Extraction Method: Method

Sample Name	Lab Code	4-Bromo-3,5-dimethylphenyl N-Methylcarbamate 70-130
MOA LO 001	K1809392-001	155*
MOA HAL 001	K1809392-002	115
Method Blank	KQ1813813-03	88
Lab Control Sample	KQ1813813-01	89
Duplicate Lab Control Sample	KQ1813813-02	88

Analytical Report

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809392
Project:	1185516	**Date Collected:**	NA
Sample Matrix:	Water	**Date Received:**	NA
Sample Name:	Method Blank	**Units:**	ug/L
Lab Code:	KQ1813813-03	**Basis:**	NA

Solvent Extractable Nonvolatile Compounds by HPLC-MS/MS

Analysis Method: 8321B
Prep Method: Method

Analyte Name	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Date Extracted	Q
Carbaryl	ND U	0.020	0.0040	0.0040	1	10/19/18 14:58	9/28/18	

Surrogate Name	% Rec	Control Limits	Date Analyzed	Q
4-Bromo-3,5-dimethylphenyl N-Methylcarbamate	88	70 - 130	10/19/18 14:58	

Client:	SGS Environmental Services, Inc.	**Service Request:**	K1809392
Project:	1185516	**Date Analyzed:**	10/19/18
Sample Matrix:	Water	**Date Extracted:**	09/28/18

Duplicate Lab Control Sample Summary
Solvent Extractable Nonvolatile Compounds by HPLC-MS/MS

Analysis Method:	8321B	**Units:**	ug/L
Prep Method:	Method	**Basis:**	NA
		Analysis Lot:	611597

	Lab Control Sample KQ1813813-01			Duplicate Lab Control Sample KQ1813813-02					
Analyte Name	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Carbaryl	0.482	0.500	96	0.494	0.500	99	70-130	2	30