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www.alsglobal.com

LABORATORY REPORT

July 22, 2013

John Cleary
Washington State Department of Ecology
Eastern regional Office
4601 N Monroe St
Spokane, WA 99205

RE: Site L

Dear John:

Enclosed are the results of the samples submitted to our laboratory on June 28, 2013. For your reference, these analyses have been assigned our service request number P1302786.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

Samantha Henningsen
By Samantha Henningsen at 12:35 pm, Jul 22, 2013
Samantha Henningsen
Project Manager

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Client: Washington State Department of Ecology
Project: Site L

Service Request No: P1302786

CASE NARRATIVE

The samples were received intact under chain of custody on June 28, 2013 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Aldehyde Analysis

The DNPH silica gel tube samples were analyzed for aldehydes according to EPA Method TO-11A using high performance liquid chromatography (HPLC). This method is not included on the laboratory's NELAP, DoD-ELAP, or AIHA-LAP scope of accreditation.

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ALS Environmental – Simi Valley

Certifications, Accreditations, and Registrations

Agency	Web Site	Number
AIHA	http://www.aihaaccreditedlabs.org	101661
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0694
DoD ELAP	http://www.pjlabs.com/search-accredited-labs	L11-203
Florida DOH (NELAP)	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E871020
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/water/dwp-services/labcert/labcert.htm	2012039
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	494864
New Jersey DEP (NELAP)	http://www.nj.gov/dep/oqa/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	CA200007
Pennsylvania DEP	http://www.depweb.state.pa.us/labs	68-03307 (Registration)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704413-12-3
Utah DOH (NELAP)	http://www.health.utah.gov/lab/labimp/certification/index.html	CA015272012-2
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Washington State Department of Ecology Service Request: P1302786
Project ID: Site L

Date Received: 6/28/2013
Time Received: 07:20

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	TO-11A - Carbonyls
Mass Bed NE Corner	P1302786-001	Air	6/27/2013	08:05	X
Mass Bed NW Corner	P1302786-002	Air	6/27/2013	09:15	X
Mass Bed Middle W	P1302786-003	Air	6/27/2013	10:25	X
Mass Bed Middle S	P1302786-004	Air	6/27/2013	11:45	X
Mass Bed Middle E	P1302786-005	Air	6/27/2013	13:00	X
Equipment Blank	P1302786-006	Air	6/27/2013	14:15	X

Air - Chain of Custody Record & Analytical Service Request

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10-Day-Standard

ALS Project No. P1302786

Company Name & Address (Reporting Information)
Washington Department of Ecology
4601 North Monroe Street
Spokane, WA

Project Name: Site L

Project Number:

ALS Contact:

Project Manager: John Cleary

P.O. # / Billing Information: PIC # 9NWRR

Phone: (509)329-3531

Fax:

Email Address for Result Reporting: jcle461@ecy.wa.gov

Sampler (Print & Sign): John Cleary John P Cleary

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume	Analysis Method: TO-11A/Carbonyl Aldehyde Analysis		Comments e.g. Actual Preservative or specific instructions
Mass Bed NE Corner	1	6/27/13	8:05						X		DNPH Sorbent
Mass Bed NW Corner	2		9:15						X		tubes
Mass Bed Middle W	3		10:25						X		
Mass Bed Middle ES	4		11:45						X		
Mass Bed Midde E	5		1:00						X		
Equipment Blank	6		2:15						X		

Report Tier Levels - please select
Tier I - Results (Default in not specified) _____ Tier III (Results + QC & Calibration Summaries) _____
Tier II (Results + QC Summaries _____ Tier IV (Date Validation Package) 10% Surcharge _____

EDD required YES / No
Type: _____ Units: _____

Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
John P Cleary	6/27/13	3:00 PM		6/28/13	0720
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:

Cooler / Blank
Temperature 4 °C

ALS Environmental
Sample Acceptance Check Form

Client: Washington State Department of Ecology Work order: P1302786

Project: Site L

Sample(s) received on: 6/28/13 Date opened: 6/28/13 by: MZAMORA

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Container(s) **supplied by ALS**?	☒	☐	☐
3	Did **sample containers** arrive in good condition?	☒	☐	☐
4	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
5	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
6	Was **sample volume** received adequate for analysis?	☒	☐	☐
7	Are samples within specified holding times?	☒	☐	☐
8	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☒	☐	☐
	Cooler Temperature: 4° C Blank Temperature: ° C **Gel Packs**			
9	Was a **trip blank** received?	☐	☒	☐
10	Were **custody seals** on outside of cooler/Box?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
	Were custody seals on outside of sample container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
11	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
12	**Tubes:** Are the tubes capped and intact?	☒	☐	☐
	Do they contain moisture?	☒	☐	☐
13	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1302786-001.01	Silica Gel DNPH Tube					
P1302786-002.01	Silica Gel DNPH Tube					
P1302786-003.01	Silica Gel DNPH Tube					
P1302786-004.01	Silica Gel DNPH Tube					
P1302786-005.01	Silica Gel DNPH Tube					
P1302786-006.01	Silica Gel DNPH Tube					

Explain any discrepancies: (include lab sample ID numbers): _____

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Washington State Department of Ecology**
Client Sample ID: **Mass Bed NE Corner** ALS Project ID: P1302786
Client Project ID: **Site L** ALS Sample ID: P1302786-001

Test Code:	EPA Method TO-11A	Date Collected:	6/27/13
Instrument ID:	Agilent Infinity LC 1220/LC3	Date Received:	6/28/13
Analyst:	Lusine Hakobyan	Date Analyzed:	7/16/13
Sample Type:	Silica Gel DNPH Tube	Desorption Volume:	1.0 ml
Test Notes:	**BC**	Volume Sampled:	36.294 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	350	**9.6**	2.8	**7.8**	2.2	
75-07-0	Acetaldehyde	220	**6.1**	2.8	**3.4**	1.5	
123-38-6	Propionaldehyde	< 100	ND	2.8	ND	1.2	
4170-30-3	Crotonaldehyde, Total	< 100	ND	2.8	ND	0.96	
123-72-8	Butyraldehyde	< 100	ND	2.8	ND	0.93	
100-52-7	Benzaldehyde	180	**4.8**	2.8	**1.1**	0.64	
590-86-3	Isovaleraldehyde	< 100	ND	2.8	ND	0.78	
110-62-3	Valeraldehyde	< 100	ND	2.8	ND	0.78	
529-20-4	o-Tolualdehyde	< 100	ND	2.8	ND	0.56	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	5.5	ND	1.1	
66-25-1	n-Hexaldehyde	< 100	ND	2.8	ND	0.67	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	2.8	ND	0.50	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
BC = Results reported are not blank corrected.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Washington State Department of Ecology**
Client Sample ID: **Mass Bed NW Corner** ALS Project ID: P1302786
Client Project ID: **Site L** ALS Sample ID: P1302786-002

Test Code:	EPA Method TO-11A	Date Collected:	6/27/13
Instrument ID:	Agilent Infinity LC 1220/LC3	Date Received:	6/28/13
Analyst:	Lusine Hakobyan	Date Analyzed:	7/16/13
Sample Type:	Silica Gel DNPH Tube	Desorption Volume:	1.0 ml
Test Notes:	**BC**	Volume Sampled:	36.405 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	< 100	ND	2.7	ND	2.2	
75-07-0	Acetaldehyde	< 100	ND	2.7	ND	1.5	
123-38-6	Propionaldehyde	< 100	ND	2.7	ND	1.2	
4170-30-3	Crotonaldehyde, Total	< 100	ND	2.7	ND	0.96	
123-72-8	Butyraldehyde	< 100	ND	2.7	ND	0.93	
100-52-7	Benzaldehyde	< 100	ND	2.7	ND	0.63	
590-86-3	Isovaleraldehyde	< 100	ND	2.7	ND	0.78	
110-62-3	Valeraldehyde	< 100	ND	2.7	ND	0.78	
529-20-4	o-Tolualdehyde	< 100	ND	2.7	ND	0.56	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	5.5	ND	1.1	
66-25-1	n-Hexaldehyde	< 100	ND	2.7	ND	0.67	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	2.7	ND	0.50	

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ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Washington State Department of Ecology**
Client Sample ID: **Mass Bed Middle W** ALS Project ID: P1302786
Client Project ID: **Site L** ALS Sample ID: P1302786-003

Test Code:	EPA Method TO-11A	Date Collected:	6/27/13
Instrument ID:	Agilent Infinity LC 1220/LC3	Date Received:	6/28/13
Analyst:	Lusine Hakobyan	Date Analyzed:	7/16/13
Sample Type:	Silica Gel DNPH Tube	Desorption Volume:	1.0 ml
Test Notes:	**BC**	Volume Sampled:	36.504 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	< 100	ND	2.7	ND	2.2	
75-07-0	Acetaldehyde	140	**3.8**	2.7	**2.1**	1.5	
123-38-6	Propionaldehyde	< 100	ND	2.7	ND	1.2	
4170-30-3	Crotonaldehyde, Total	< 100	ND	2.7	ND	0.96	
123-72-8	Butyraldehyde	< 100	ND	2.7	ND	0.93	
100-52-7	Benzaldehyde	< 100	ND	2.7	ND	0.63	
590-86-3	Isovaleraldehyde	< 100	ND	2.7	ND	0.78	
110-62-3	Valeraldehyde	< 100	ND	2.7	ND	0.78	
529-20-4	o-Tolualdehyde	< 100	ND	2.7	ND	0.56	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	5.5	ND	1.1	
66-25-1	n-Hexaldehyde	< 100	ND	2.7	ND	0.67	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	2.7	ND	0.50	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
BC = Results reported are not blank corrected.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Washington State Department of Ecology**
Client Sample ID: **Mass Bed Middle S** ALS Project ID: P1302786
Client Project ID: **Site L** ALS Sample ID: P1302786-004

Test Code:	EPA Method TO-11A	Date Collected:	6/27/13
Instrument ID:	Agilent Infinity LC 1220/LC3	Date Received:	6/28/13
Analyst:	Lusine Hakobyan	Date Analyzed:	7/16/13
Sample Type:	Silica Gel DNPH Tube	Desorption Volume:	1.0 ml
Test Notes:	**BC**	Volume Sampled:	36.615 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	< 100	ND	2.7	ND	2.2	
75-07-0	Acetaldehyde	170	**4.6**	2.7	**2.6**	1.5	
123-38-6	Propionaldehyde	< 100	ND	2.7	ND	1.2	
4170-30-3	Crotonaldehyde, Total	< 100	ND	2.7	ND	0.95	
123-72-8	Butyraldehyde	< 100	ND	2.7	ND	0.93	
100-52-7	Benzaldehyde	< 100	ND	2.7	ND	0.63	
590-86-3	Isovaleraldehyde	< 100	ND	2.7	ND	0.78	
110-62-3	Valeraldehyde	< 100	ND	2.7	ND	0.78	
529-20-4	o-Tolualdehyde	< 100	ND	2.7	ND	0.56	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	5.5	ND	1.1	
66-25-1	n-Hexaldehyde	< 100	ND	2.7	ND	0.67	
5779-94-2	2,5-Dimethylbenzaldehyde	140	**3.8**	2.7	**0.69**	0.50	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
BC = Results reported are not blank corrected.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Washington State Department of Ecology**
Client Sample ID: **Mass Bed Middle E** ALS Project ID: P1302786
Client Project ID: **Site L** ALS Sample ID: P1302786-005

Test Code: EPA Method TO-11A Date Collected: 6/27/13
Instrument ID: Agilent Infinity LC 1220/LC3 Date Received: 6/28/13
Analyst: Lusine Hakobyan Date Analyzed: 7/16/13
Sample Type: Silica Gel DNPH Tube Desorption Volume: 1.0 ml
Test Notes: **BC** Volume Sampled: 36.759 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	2,400	**66**	2.7	**54**	2.2	
75-07-0	Acetaldehyde	40,000	**1,100**	2.7	**600**	1.5	**BT**
123-38-6	Propionaldehyde	8,600	**230**	2.7	**98**	1.1	**BT**
4170-30-3	Crotonaldehyde, Total	< 100	ND	2.7	ND	0.95	
123-72-8	Butyraldehyde	8,000	**220**	2.7	**74**	0.92	**BT**
100-52-7	Benzaldehyde	9,000	**250**	2.7	**57**	0.63	**BT**
590-86-3	Isovaleraldehyde	9,500	**260**	2.7	**73**	0.77	**BT**
110-62-3	Valeraldehyde	240	**6.6**	2.7	**1.9**	0.77	
529-20-4	o-Tolualdehyde	480	**13**	2.7	**2.7**	0.55	**BT, M**
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	5.4	ND	1.1	
66-25-1	n-Hexaldehyde	840	**23**	2.7	**5.6**	0.66	**BT**
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	2.7	ND	0.50	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
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BC = Results reported are not blank corrected.
BT = Results indicated possible breakthrough; back section > 10% front section.
M = Matrix interference; results may be biased high.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Washington State Department of Ecology**
Client Sample ID: **Equipment Blank** ALS Project ID: P1302786
Client Project ID: **Site L** ALS Sample ID: P1302786-006

Test Code:	EPA Method TO-11A	Date Collected:	6/27/13
Instrument ID:	Agilent Infinity LC 1220/LC3	Date Received:	6/28/13
Analyst:	Lusine Hakobyan	Date Analyzed:	7/16/13
Sample Type:	Silica Gel DNPH Tube	Desorption Volume:	1.0 ml
Test Notes:	**BC**	Volume Sampled:	36.840 Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	150	**4.0**	2.7	**3.3**	2.2	
75-07-0	Acetaldehyde	300	**8.0**	2.7	**4.5**	1.5	
123-38-6	Propionaldehyde	< 100	ND	2.7	ND	1.1	
4170-30-3	Crotonaldehyde, Total	< 100	ND	2.7	ND	0.95	
123-72-8	Butyraldehyde	< 100	ND	2.7	ND	0.92	
100-52-7	Benzaldehyde	< 100	ND	2.7	ND	0.63	
590-86-3	Isovaleraldehyde	< 100	ND	2.7	ND	0.77	
110-62-3	Valeraldehyde	< 100	ND	2.7	ND	0.77	
529-20-4	o-Tolualdehyde	< 100	ND	2.7	ND	0.55	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	ND	5.4	ND	1.1	
66-25-1	n-Hexaldehyde	< 100	ND	2.7	ND	0.66	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	ND	2.7	ND	0.49	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
BC = Results reported are not blank corrected.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Washington State Department of Ecology**
Client Sample ID: **Method Blank (05:54)**
Client Project ID: **Site L**

ALS Project ID: P1302786
ALS Sample ID: P130716-MB

Test Code:	EPA Method TO-11A	Date Collected:	NA
Instrument ID:	Agilent Infinity LC 1220/LC3	Date Received:	NA
Analyst:	Lusine Hakobyan	Date Analyzed:	07/16/13
Sample Type:	Silica Gel DNPH Tube	Desorption Volume:	1.0 ml
Test Notes:	**BC**	Volume Sampled:	NA Liter(s)

CAS #	Compound	Result ng/Sample	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
50-00-0	Formaldehyde	< 100	NA	NA	NA	NA	
75-07-0	Acetaldehyde	< 100	NA	NA	NA	NA	
123-38-6	Propionaldehyde	< 100	NA	NA	NA	NA	
4170-30-3	Crotonaldehyde, Total	< 100	NA	NA	NA	NA	
123-72-8	Butyraldehyde	< 100	NA	NA	NA	NA	
100-52-7	Benzaldehyde	< 100	NA	NA	NA	NA	
590-86-3	Isovaleraldehyde	< 100	NA	NA	NA	NA	
110-62-3	Valeraldehyde	< 100	NA	NA	NA	NA	
529-20-4	o-Tolualdehyde	< 100	NA	NA	NA	NA	
620-23-5							
104-87-0	m,p-Tolualdehyde	< 200	NA	NA	NA	NA	
66-25-1	n-Hexaldehyde	< 100	NA	NA	NA	NA	
5779-94-2	2,5-Dimethylbenzaldehyde	< 100	NA	NA	NA	NA	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
BC = Results reported are not blank corrected.
NA = Not applicable.