Technical Memorandum

TO:	Matthew Morris, PE, Washington State Department of Ecology
CC:	John Felder, PE, Washington State Department of Natural Resources
FROM:	Sierra Mott and Eric Weber, LHG, CWRE
DATE:	February 21, 2019
RE:	**First Quarter Groundwater Monitoring Results** **Webster Nursery Site, Site ID 3380** **Tumwater, Washington** **LAI Project No. 0774006.040.045**

Introduction

On behalf of the Washington State Department of Natural Resources (DNR), Landau Associates, Inc. (LAI) is providing the August 2018 groundwater monitoring results for DNR's Webster Nursery former pesticide storage warehouse (site). The site is associated with past releases of organochlorine pesticides to soil and groundwater. The constituents of concern at the site include the organochlorine pesticides heptachlor epoxide (HE; breakdown product of heptachlor) and technical chlordane. Groundwater at the site was most recently sampled in September 2017 (LAI 2017b). The site location is shown on Figure 1.

Remedial action excavation and disposal of soil contaminated with HE was completed August 2018. Results of the excavation are provided in a draft Cleanup Action Completion Report (CACR; LAI 2018).

Groundwater Monitoring Summary

Groundwater monitoring was completed by LAI on August 29, 2018. The six groundwater monitoring wells sampled were SW-9R, SW-10R, SW-11R, SW-14, SW-15, and SW-16. The groundwater monitoring framework was established under an Agreed Order (No. DE 00TCP-SR295) dated January 8, 2001) with the Washington State Department of Ecology (Ecology) and in accordance with the Remedial Action Work Plan (RAWP; LAI 2017a) and CACR (LAI 2018). The scope of groundwater monitoring is described below.

- Groundwater samples were collected for analysis at three new replacement wells (SW-9R, SW-10R, and SW-11R) and three existing wells (SW-14, SW-15, and SW-16). All groundwater samples were analyzed for organochlorine pesticides using US Environmental Protection Agency Method 8081A low-level at Analytical Resources, Inc. (ARI) located in Tukwila, Washington.
- Depth to groundwater measurements were also collected at three additional wells (SW-1, SW-12, and SW-13) to support analysis of groundwater level contours and flow direction.
- Per the RAWP and CACR, four consecutive quarters of groundwater sampling will be conducted as described above. Second quarter (2Q), 3Q, and 4Q sampling will be conducted in November 2018, and February and May 2019, respectively.

All groundwater samples were collected with a peristaltic pump and dedicated tubing using low-flow groundwater sampling techniques. Low-flow groundwater monitoring consists of measuring the depth to water with an electronic groundwater level indicator, monitoring field parameters using a YSI 554 multi-parameter probe, and measuring turbidity with a handheld meter. One duplicate sample (SW-99 at SW-11R) and one matrix spike/matrix spike duplicate (at SW-15) were collected for quality control purposes.

As mentioned above, an additional three wells (SW-1, SW-12, and SW-13) were measured for depth to water. Groundwater elevation data were used to determine groundwater flow direction; further discussion is provided in the next section. The groundwater monitoring network is shown on Figure 2.

Groundwater Monitoring Results

No organochlorine pesticides were detected at concentrations greater than the laboratory-reporting limits at five (SW-9R, SW-10R, SW-14, SW-15, and SW-16) of the six wells. However, the reporting limit was elevated at SW-10R above the cleanup level (CUL).[1] HE was detected at a concentration exceeding the applicable cleanup level at SW-11R. August 2018 organochlorine pesticide data are provided in Table 1 and the laboratory data package is provided in Attachment 1.

HE was detected at SW-11R at a concentration of 0.005 micrograms per liter (µg/L). This concentration narrowly exceeds the Model Toxics Control Act (MTCA) Method B cleanup level of 0.00481 µg/L. Time series data of recent HE concentrations in groundwater (dating back to January 2010) are presented on Figure 3. No constituents other than HE were detected at any well.

Groundwater elevations in August 2018 were similar to previous elevations measured in September 2017. The depth to groundwater ranged from 10.42 to 12.86 feet below the top of the PVC well casing. Regionally, groundwater flow is likely to the south toward Salmon Creek.[2] Locally, groundwater flow elevation is more variable and is likely influenced by factors including runoff, infiltration, and possibly buried utilities. Depth to water and groundwater elevations data are provided in Table 2. Groundwater elevation contours are shown on Figure 2.

1Q monitoring data cannot conclusively prove the effectiveness of the remedial excavations. However, additional quarterly data may effectively determine that the remedial action eliminated the potential pathway from soil to groundwater, which would result in groundwater compliance. LAI and DNR will be working with ARI in the meantime to maintain data quality objectives for future sampling events.

[1] HE, trans-chlordane and cis-chlordane have an elevated reporting limit due to matrix effects in the sample.
[2] The location of Salmon Creek is shown on Figure 1.

Environmental Information Management Submittal

An Environmental Information Management (EIM) submittal is required. This submittal will be completed in fall 2018, after submission of this technical memorandum to Ecology.

LANDAU ASSOCIATES, INC.

Sierra Mott
Senior Project Scientist

Eric Weber, LHG, CWRE
Principal

SMM/EFW/ccy
Y:\774\006\R\Quarterly GW Monitoring Reports\1Q_Aug 18\LAI_ 1Q GW Monitoring_tm_02212019.docx

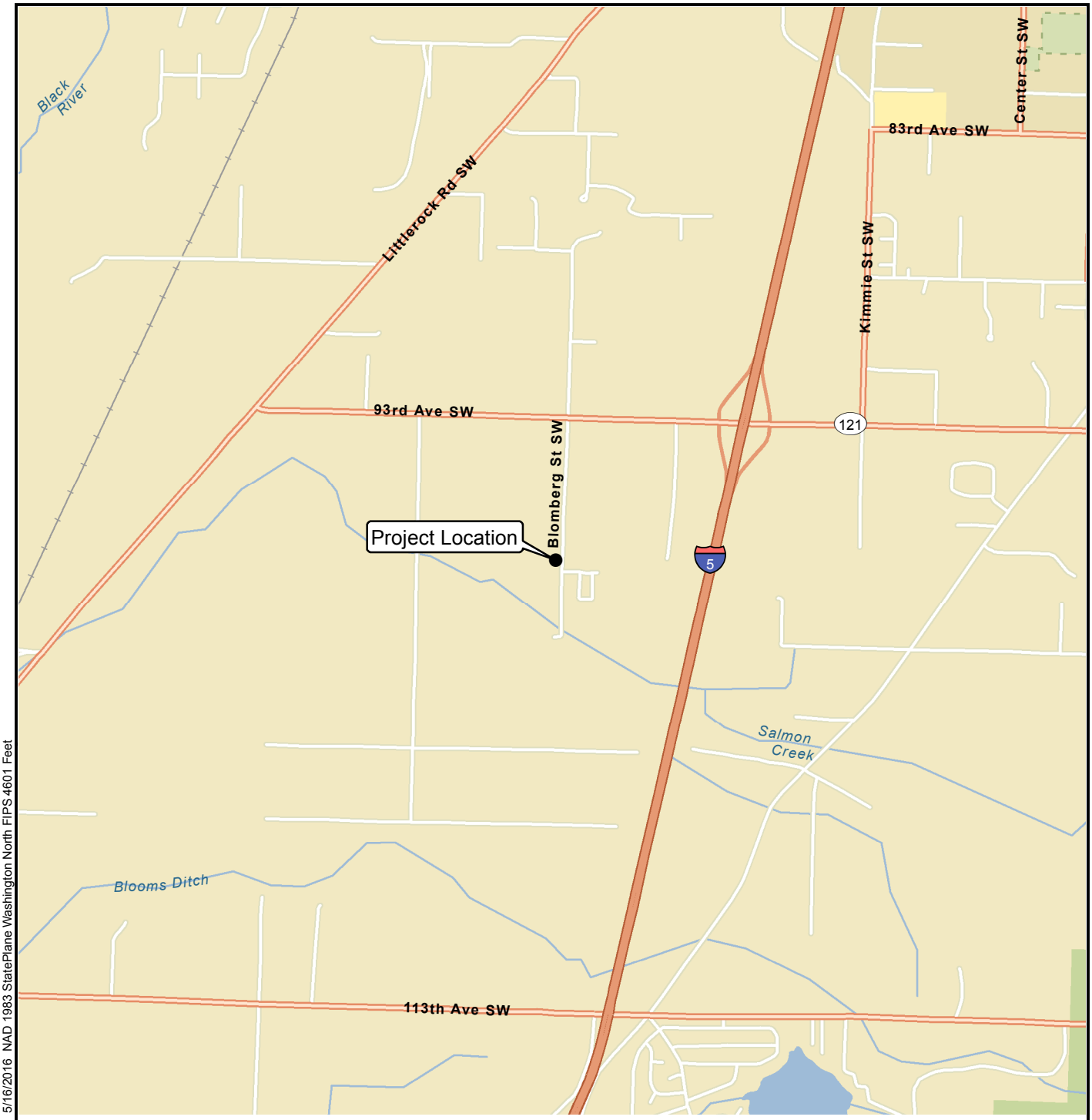
References

LAI. 2017a. Remedial Action Work Plan, Webster Nursery, 9805 Blomberg Street SW, Tumwater, Washington. Landau Associates, Inc. October 31.

LAI. 2017b. Technical Memorandum: September 2017 Groundwater Monitoring Results, Webster Nursery Site, Site ID 3380, Tumwater, Washington. Landau Associates, Inc. November 9.

LAI. 2018. Draft: Cleanup Action Completion Report, Washington State Department of Natural Resources Webster Nursery, Tumwater, Washington. Landau Associates, Inc. October 12.

Attachments:
Figure 1: Vicinity Map
Figure 2: Monitoring Well Network and August 2018 Groundwater Elevation Contours
Figure 3: Heptachlor Epoxide Time Series Concentrations for SW-10 and SW-11
Table 1: Groundwater Analytical Results
Table 2: Groundwater Level Measurements
Attachment 1: August 2018 Laboratory Data Package



N

0 0.5 1

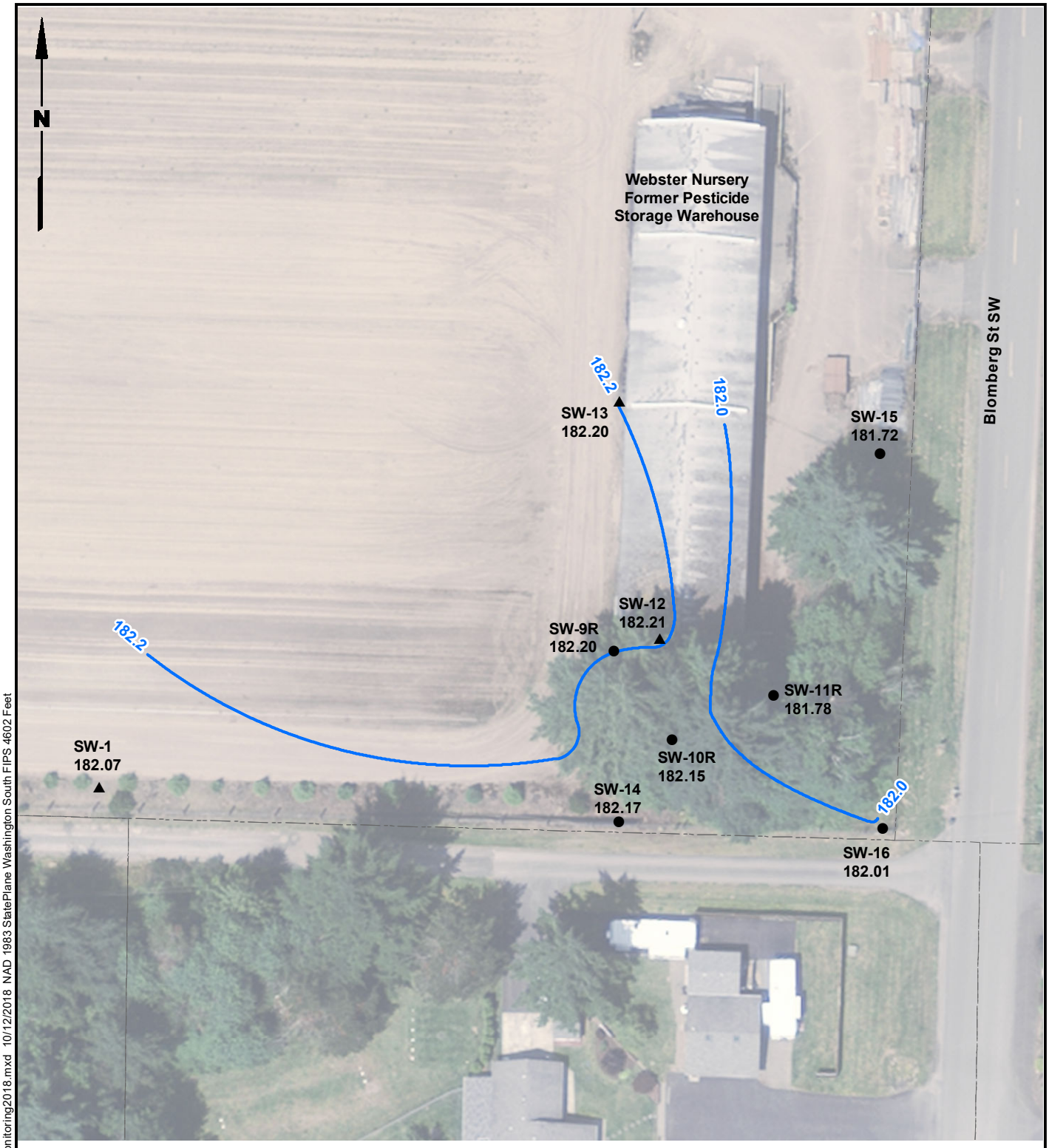
Miles

Data Source: Esri 2012

G:\Projects\774\006\020\026\FSIF01 VicinityMap.mxd 5/16/2016 NAD 1983 StatePlane Washington North FIPS 4601 Feet

LANDAU ASSOCIATES

Webster Nursery Site Tumwater, Washington	**Vicinity Map**	Figure 1



Legend

- Pesticide Monitoring Well
- Other Monitoring Well
- Tax Parcels
- Groundwater Contour

0 50 100

Scale in Feet

Notes

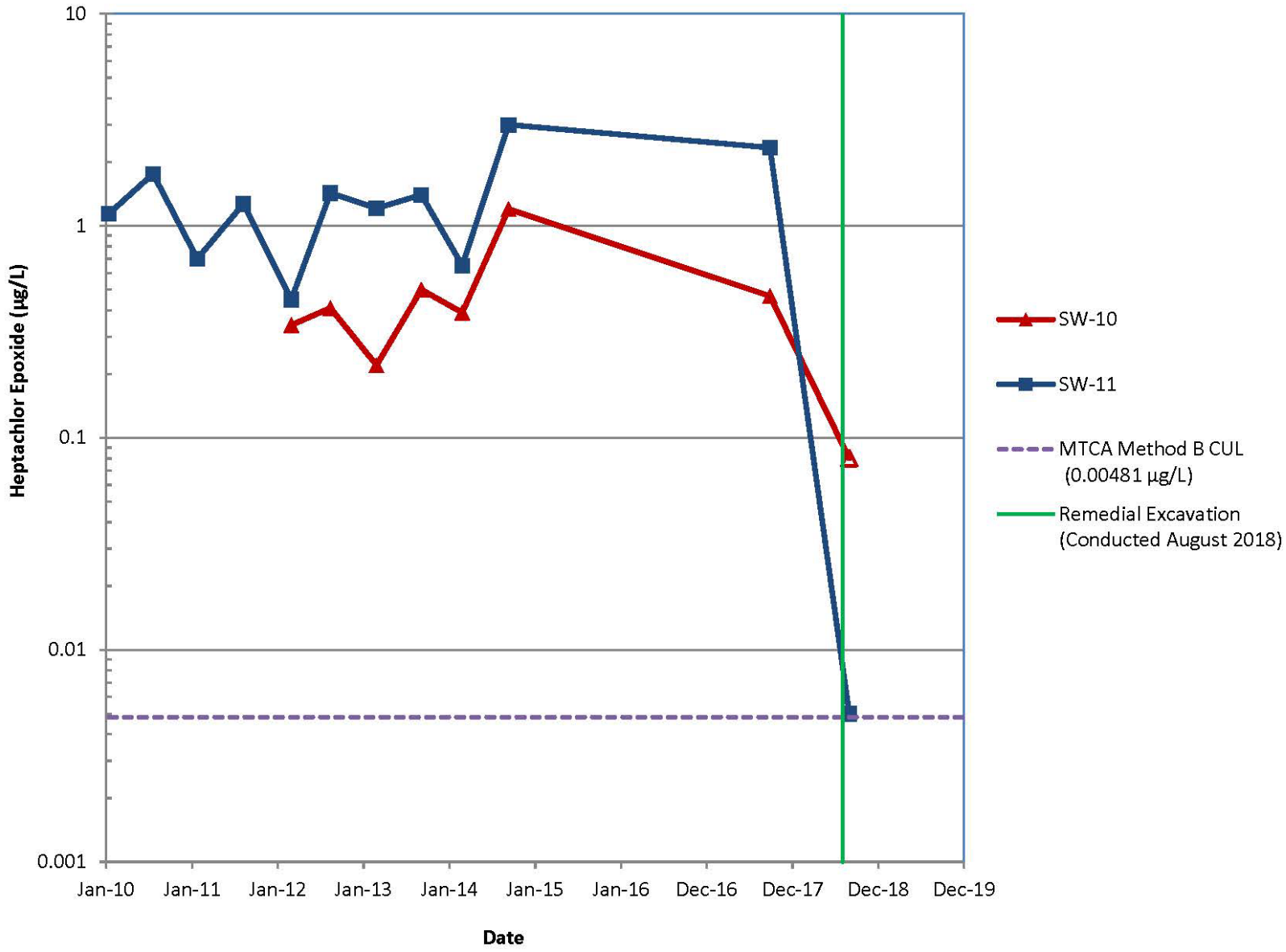
1. SW-9R, SW-10R, and SW-11R are new (replacement) wells.
2. Black and white reproduction of this color original may reduce its effectiveness and lead to incorrect interpretation.

Data Sources: Thurston County GIS; WA DNR Survey, 2018.

G:\Projects\774\006\040\042\F02GWMonitoring2018.mxd 10/12/2018 NAD 1983 StatePlane Washington South FIPS 4602 Feet

LANDAU ASSOCIATES

Webster Nursery Site Tumwater, Washington	**Monitoring Well Network and August 2018 Groundwater Elevation Contours**	Figure 2



1. Open markers on graph denote non-detect values. Values shown represent the analytical reporting limit.
2. Data after the remedial action excavation in 2018 are from replacement wells.

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Webster Nursery Site Tumwater, Washington	**Heptachlor Epoxide Time Series Concentrations for SW-10 and SW-11**	Figure 3

Table 1
Groundwater Analytical Results
Webster Nursery
Tumwater, Washington

Analyte	MTCA Method B Cleanup Levels		Sample Location, Sample ID, Laboratory SDG, Sample Date, and Sample Type						
			SW-9R SW-9R-20180829 18H0408 8/29/2018	SW-10R SW-10R-20180829 18H0408 8/29/2018	SW-11R SW-11R-20180829 18H0408 8/29/2018	SW-11R SW-99-20180829 18H0408 8/29/2018	SW-14 SW-14-20180829 18H0408 8/29/2018	SW-15 SW-15-20180829 18H0408 8/29/2018	SW-16 SW-16-20180829 18H0408 8/29/2018
	Non-cancerous	Cancerous	N	N	N	FD	N	N	N
Pesticides (µg/L; SW-846 8081B)									
4,4'-DDD	--	--	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
4,4'-DDE	--	--	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
4,4'-DDT	--	--	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Aldrin	--	--	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
alpha-BHC	--	--	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
beta-BHC	--	--	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
Chlordane	8.0	0.25	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U	0.005 U
cis-Chlordane	--	--	0.0006 U	0.015 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
delta-BHC	--	--	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
Dieldrin	--	--	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Endosulfan I	--	--	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
Endosulfan II	--	--	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Endosulfan Sulfate	--	--	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Endrin	--	--	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Endrin Aldehyde	--	--	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
Endrin Ketone	--	--	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U	0.001 U
gamma-BHC	--	--	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
Heptachlor	8.0	0.0194	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U
Heptachlor Epoxide	0.104	0.00481	0.0006 U	0.080 U	**0.005**	**0.005**	0.0006 U	0.0006 U	0.0006 U
Methoxychlor	--	--	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U	0.006 U
Toxaphene	--	--	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U	0.063 U
trans-Chlordane	--	--	0.0006 U	0.035 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U	0.0006 U

Notes:

-- = cleanup level not applicable

Bold text indicates detected analyte.

Green Box = detected concentration is greater than at least one of the cleanup levels.

U = The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.

Abbreviations:

FD = field duplicate

ID = identification

µg/L = micrograms per liter

MTCA = Model Toxics Control Act

N = primary sample

SDG = sample delivery group

Table 2
Groundwater Level Measurements
Webster Nursery
Tumwater, Washington

Well ID	Top of Casing Elevation (ft)	Depth to Water (ft bgs)	Groundwater Elevation (ft)
SW-1	193.22	11.15	182.07
SW-9R	192.62	10.42	182.20
SW-10R	193.41	11.26	182.15
SW-11R	192.50	10.72	181.78
SW-12	192.68	10.47	182.21
SW-13	192.95	10.75	182.20
SW-14	192.87	10.70	182.17
SW-15	194.58	12.86	181.72
SW-16	194.57	12.56	182.01

Abbreviations:

bgs = below ground surface

ft = feet

ATTACHMENT 1

August 2018 Laboratory Data Package

Analytical Resources, Incorporated
Analytical Chemists and Consultants

18 September 2018

Sierra Mott
Landau Associates, Inc. - Tacoma
2107 South C Street
Tacoma, WA 98402

RE: Webster Nursery

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

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

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

Associated Work Order(s)	Associated SDG ID(s)
18H0408	N/A

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

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

Analytical Resources, Inc.

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

Cert# 100006

PJLA Testing
Accreditation # 66169

Chain of Custody Record & Laboratory Analysis Request

ARI Assigned Number: 18H0408	Turn-around Requested: Standard	Page: 1 of 1	
ARI Client Company: Landau Associates	Phone: 253-926-2493	Date: 8/29/18	Ice Present?
Client Contact: Eric Weber, Siena Mott		No. of Coolers: 2	Cooler Temps: 5.1 2.9
Client Project Name: Webster Nursery: quarterly groundwater monitoring			
Client Project #: 774006.040.045	Samplers: Katie Gaugiltz		

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

Sample ID	Date	Time	Matrix	No. Containers	Analysis Requested: Pesticides EPA 8081B LL Organochlorine	Notes/Comments
SW15-20180829	8/29/18	1008	Aq	2	X	Please allow all samples to settle and collect aliquot from clear portion
SW16-20180829	"	1148	"	2	X	
SW14-20180829	"	1256	"	2	X	
SW9R-20180829	"	1348	"	2	X	
SW10R-20180829	"	1449	"	2	X	
SW11R-20180829	"	1547	"	2	X	
SW99-20180829	"	1550	"	2	X	

Comments/Special Instructions	Relinquished by: (Signature)	Printed Name:	Company:	Date & Time:	Received by: (Signature)	Printed Name:	Company:	Date & Time:	Relinquished by: (Signature)	Printed Name:	Company:	Date & Time:	Received by: (Signature)	Printed Name:	Company:	Date & Time:
	Katie Gaugiltz	Katie Gaugiltz	Landau Associates	8/29/2018 17:45	Stephanie Fisher	Stephanie Fisher	ARI	8-29-18 1748								

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

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

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	18-Sep-2018 13:31

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SW-15-20180829	18H0408-01	Water	29-Aug-2018 10:08	29-Aug-2018 17:45
SW-16-20180829	18H0408-02	Water	29-Aug-2018 11:48	29-Aug-2018 17:45
SW-14-20180829	18H0408-03	Water	29-Aug-2018 12:56	29-Aug-2018 17:45
SW-9R-20180829	18H0408-04	Water	29-Aug-2018 13:48	29-Aug-2018 17:45
SW-10R-20180829	18H0408-05	Water	29-Aug-2018 14:49	29-Aug-2018 17:45
SW-11R-20180829	18H0408-06	Water	29-Aug-2018 15:47	29-Aug-2018 17:45
SW-99-20180829	18H0408-07	Water	29-Aug-2018 15:50	29-Aug-2018 17:45

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	18-Sep-2018 13:31

Case Narrative

Pesticides - EPA Method SW8081A

The sample(s) were extracted and analyzed within the recommended holding times.

Initial and continuing calibrations were within method requirements.

Internal standard areas were within limits.

The surrogate percent recoveries were within control limits.

The method blank(s) were clean at the reporting limits.

The LCS/LCSD percent recoveries and RPDs were within control limits.

Heptachlor Epoxide, Trans-chlordane and Cis-chlordane have an elevated reporting limit due to matrix effects in sample 18H0408-05.

4611 S. 134th Place, Suite 100 • Tukwila, WA 98168 • Ph: (206) 695-6200 • Fax: (206) 695-6202

WORK ORDER

18H0408

Client: Landau Associates, Inc. - Tacoma
Project: Webster Nursery
Project Manager: Kelly Bottem
Project Number: Webster Nursery

Report To:
Landau Associates, Inc. - Tacoma
Sara Fees
2107 South C Street
Tacoma, WA 98402
Phone: (253) 926-2493
Fax: (253) 926-2531

Invoice To:
Landau Associates, Inc. - Tacoma
Sara Fees
2107 South C Street
Tacoma, WA 98402
Phone :(253) 926-2493
Fax: (253) 926-2531

Date Due:	13-Sep-2018 18:00 (10 day TAT)		
Received By:	Stephanie Fishel	Date Received:	29-Aug-2018 17:45
Logged In By:	Jacob Walter	Date Logged In:	30-Aug-2018 09:38

Samples Received at: **5.1°C**

Intact, properly signed and dated custody seals attached to outside of cooler(s)	No	Custody papers included with the cooler	Yes
Custody papers properly filled out (in, signed, analyses requested, etc)	Yes	Was a temperature blank included in the cooler	No
Was sufficient ice used (if appropriate)	Yes	All bottles sealed in individual plastic bags	No
All bottles arrived in good condition (unbroken)	Yes	All bottle labels complete and legible	Yes
Number of containers listed on COC match number received	Yes	Bottle labels and tags agree with COC	Yes
Correct bottles used for the requested analyses	Yes	All VOC vials free of air bubbles	No
Analyses/bottles require preservation (attach preservation sheet excluding VOC)	No	Sufficient amount of sample sent in each bottle	Yes
Sample split at ARI	No		

Analysis	Due	TAT	Expires	Comments

WORK ORDER

18H0408

Client: Landau Associates, Inc. - Tacoma **Project Manager:** Kelly Bottem

Project: Webster Nursery **Project Number:** Webster Nursery

Analysis	Due	TAT	Expires	Comments
18H0408-01 SW15-20180829 [Water] Sampled 29-Aug-2018 10:08 (GMT-08:00) Pacific Time (US & Canada)				
A = Glass NM, Amber, 1000 mL *B = Glass NM, Amber, 1000 mL*				
8081B Pest (Low Level H2O)	13-Sep-2018 15:00	10	05-Sep-2018 10:08	Must meet MTCA method B. Must not over dilute. LC
18H0408-02 SW16-20180829 [Water] Sampled 29-Aug-2018 11:48 (GMT-08:00) Pacific Time (US & Canada)				
A = Glass NM, Amber, 1000 mL *B = Glass NM, Amber, 1000 mL*				
8081B Pest (Low Level H2O)	13-Sep-2018 15:00	10	05-Sep-2018 11:48	Must meet MTCA method B. Must not over dilute. LC
18H0408-03 SW14-20180829 [Water] Sampled 29-Aug-2018 12:56 (GMT-08:00) Pacific Time (US & Canada)				
A = Glass NM, Amber, 1000 mL *B = Glass NM, Amber, 1000 mL*				
8081B Pest (Low Level H2O)	13-Sep-2018 15:00	10	05-Sep-2018 12:56	Must meet MTCA method B. Must not over dilute. LC
18H0408-04 SW9R-20180829 [Water] Sampled 29-Aug-2018 13:48 (GMT-08:00) Pacific Time (US & Canada)				
A = Glass NM, Amber, 1000 mL *B = Glass NM, Amber, 1000 mL*				
8081B Pest (Low Level H2O)	13-Sep-2018 15:00	10	05-Sep-2018 13:48	Must meet MTCA method B. Must not over dilute. LC
18H0408-05 SW10R-20180829 [Water] Sampled 29-Aug-2018 14:49 (GMT-08:00) Pacific Time (US & Canada)				
A = Glass NM, Amber, 1000 mL *B = Glass NM, Amber, 1000 mL*				
8081B Pest (Low Level H2O)	13-Sep-2018 15:00	10	05-Sep-2018 14:49	Must meet MTCA method B. Must not over dilute. LC
18H0408-06 SW11R-20180829 [Water] Sampled 29-Aug-2018 15:47 (GMT-08:00) Pacific Time (US & Canada)				
A = Glass NM, Amber, 1000 mL *B = Glass NM, Amber, 1000 mL*				
8081B Pest (Low Level H2O)	13-Sep-2018 15:00	10	05-Sep-2018 15:47	Must meet MTCA method B. Must not over dilute. LC
18H0408-07 SW99-20180829 [Water] Sampled 29-Aug-2018 15:50 (GMT-08:00) Pacific Time (US & Canada)				
A = Glass NM, Amber, 1000 mL *B = Glass NM, Amber, 1000 mL*				
8081B Pest (Low Level H2O)	13-Sep-2018 15:00	10	05-Sep-2018 15:50	Must meet MTCA method B. Must not over dilute. LC

Reviewed By

Date

Analytical Resources, Incorporated
Analytical Chemists and Consultants

Cooler Receipt Form

ARI Client: Andw Project Name: Webster nursery

COC No(s): _____ NA Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: 18H0408 Tracking No: _____ NA

Preliminary Examination Phase:

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

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry) 5.1 2.9

Time: 1746

If cooler temperature is out of compliance fill out form 00070F Temp Gun ID#: D00250

Cooler Accepted by: Jef Date: 8-29-18 Time: 1746

Complete custody forms and attach all shipping documents

Log-In Phase:

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

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

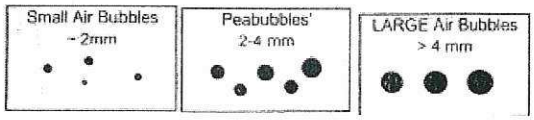
Samples Logged by: JBw Date: 08/30/18 Time: 0931

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

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

Additional Notes, Discrepancies, & Resolutions:

By: Date:



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

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	18-Sep-2018 13:31

SW-15-20180829

18H0408-01 (Water)

Chlorinated Pesticides

Method: EPA 8081B — Sampled: 08/29/2018 10:08

Instrument: ECD6 Analyst: YZ — Analyzed: 14-Sep-2018 16:41

Sample Preparation:	Preparation Method: EPA 3510C SepF	
	Preparation Batch: BGI0040	Sample Size: 1000 mL
	Prepared: 04-Sep-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Silica Gel	
	Cleanup Batch: CGI0097	Initial Volume: 0.5 mL
	Cleaned: 13-Sep-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	
	Cleanup Batch: CGI0096	Initial Volume: 0.5 mL
	Cleaned: 13-Sep-2018	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	1	0.0006	ND	ug/L	U
beta-BHC	319-85-7	1	0.0006	ND	ug/L	U
gamma-BHC (Lindane)	58-89-9	1	0.0006	ND	ug/L	U
delta-BHC	319-86-8	1	0.0006	ND	ug/L	U
Heptachlor	76-44-8	1	0.0006	ND	ug/L	U
Aldrin	309-00-2	1	0.0006	ND	ug/L	U
Heptachlor Epoxide	1024-57-3	1	0.0006	ND	ug/L	U
trans-Chlordane (beta-Chlordane)	5103-74-2	1	0.0006	ND	ug/L	U
cis-Chlordane (alpha-chlordane)	5103-71-9	1	0.0006	ND	ug/L	U
Endosulfan I	959-98-8	1	0.0006	ND	ug/L	U
4,4'-DDE	72-55-9	1	0.001	ND	ug/L	U
Dieldrin	60-57-1	1	0.001	ND	ug/L	U
Endrin	72-20-8	1	0.001	ND	ug/L	U
Endosulfan II	33213-65-9	1	0.001	ND	ug/L	U
4,4'-DDD	72-54-8	1	0.001	ND	ug/L	U
Endrin Aldehyde	7421-93-4	1	0.001	ND	ug/L	U
4,4'-DDT	50-29-3	1	0.001	ND	ug/L	U
Endosulfan Sulfate	1031-07-8	1	0.001	ND	ug/L	U
Endrin Ketone	53494-70-5	1	0.001	ND	ug/L	U
Methoxychlor	72-43-5	1	0.006	ND	ug/L	U
Toxaphene	8001-35-2	1	0.063	ND	ug/L	U
Chlordane (NOS)	57-74-9	1	0.005	ND	ug/L	U
Surrogate: Decachlorobiphenyl			*30-160 %*	*49.1*	*%*	
Surrogate: Decachlorobiphenyl [2C]			*30-160 %*	*60.3*	*%*	
Surrogate: Tetrachlorometaxylene			*30-160 %*	*42.4*	*%*	
Surrogate: Tetrachlorometaxylene [2C]			*30-160 %*	*37.4*	*%*	

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Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	18-Sep-2018 13:31

SW-16-20180829

18H0408-02 (Water)

Chlorinated Pesticides

Method: EPA 8081B — Sampled: 08/29/2018 11:48

Instrument: ECD6 Analyst: YZ — Analyzed: 14-Sep-2018 16:59

Sample Preparation:	Preparation Method: EPA 3510C SepF	
	Preparation Batch: BGI0040	Sample Size: 1000 mL
	Prepared: 04-Sep-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Silica Gel	
	Cleanup Batch: CGI0097	Initial Volume: 0.5 mL
	Cleaned: 13-Sep-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	
	Cleanup Batch: CGI0096	Initial Volume: 0.5 mL
	Cleaned: 13-Sep-2018	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	1	0.0006	ND	ug/L	U
beta-BHC	319-85-7	1	0.0006	ND	ug/L	U
gamma-BHC (Lindane)	58-89-9	1	0.0006	ND	ug/L	U
delta-BHC	319-86-8	1	0.0006	ND	ug/L	U
Heptachlor	76-44-8	1	0.0006	ND	ug/L	U
Aldrin	309-00-2	1	0.0006	ND	ug/L	U
Heptachlor Epoxide	1024-57-3	1	0.0006	ND	ug/L	U
trans-Chlordane (beta-Chlordane)	5103-74-2	1	0.0006	ND	ug/L	U
cis-Chlordane (alpha-chlordane)	5103-71-9	1	0.0006	ND	ug/L	U
Endosulfan I	959-98-8	1	0.0006	ND	ug/L	U
4,4'-DDE	72-55-9	1	0.001	ND	ug/L	U
Dieldrin	60-57-1	1	0.001	ND	ug/L	U
Endrin	72-20-8	1	0.001	ND	ug/L	U
Endosulfan II	33213-65-9	1	0.001	ND	ug/L	U
4,4'-DDD	72-54-8	1	0.001	ND	ug/L	U
Endrin Aldehyde	7421-93-4	1	0.001	ND	ug/L	U
4,4'-DDT	50-29-3	1	0.001	ND	ug/L	U
Endosulfan Sulfate	1031-07-8	1	0.001	ND	ug/L	U
Endrin Ketone	53494-70-5	1	0.001	ND	ug/L	U
Methoxychlor	72-43-5	1	0.006	ND	ug/L	U
Toxaphene	8001-35-2	1	0.063	ND	ug/L	U
Chlordane (NOS)	57-74-9	1	0.005	ND	ug/L	U
Surrogate: Decachlorobiphenyl			*30-160 %*	*52.1*	*%*	
Surrogate: Decachlorobiphenyl [2C]			*30-160 %*	*58.6*	*%*	
Surrogate: Tetrachlorometaxylene			*30-160 %*	*79.8*	*%*	P1
Surrogate: Tetrachlorometaxylene [2C]			*30-160 %*	*44.0*	*%*	P1

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Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	18-Sep-2018 13:31

SW-14-20180829

18H0408-03 (Water)

Chlorinated Pesticides

Method: EPA 8081B — Sampled: 08/29/2018 12:56

Instrument: ECD6 Analyst: YZ — Analyzed: 14-Sep-2018 17:17

Sample Preparation:	Preparation Method: EPA 3510C SepF	
	Preparation Batch: BGI0040	Sample Size: 1000 mL
	Prepared: 04-Sep-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Silica Gel	
	Cleanup Batch: CGI0097	Initial Volume: 0.5 mL
	Cleaned: 13-Sep-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	
	Cleanup Batch: CGI0096	Initial Volume: 0.5 mL
	Cleaned: 13-Sep-2018	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	1	0.0006	ND	ug/L	U
beta-BHC	319-85-7	1	0.0006	ND	ug/L	U
gamma-BHC (Lindane)	58-89-9	1	0.0006	ND	ug/L	U
delta-BHC	319-86-8	1	0.0006	ND	ug/L	U
Heptachlor	76-44-8	1	0.0006	ND	ug/L	U
Aldrin	309-00-2	1	0.0006	ND	ug/L	U
Heptachlor Epoxide	1024-57-3	1	0.0006	ND	ug/L	U
trans-Chlordane (beta-Chlordane)	5103-74-2	1	0.0006	ND	ug/L	U
cis-Chlordane (alpha-chlordane)	5103-71-9	1	0.0006	ND	ug/L	U
Endosulfan I	959-98-8	1	0.0006	ND	ug/L	U
4,4'-DDE	72-55-9	1	0.001	ND	ug/L	U
Dieldrin	60-57-1	1	0.001	ND	ug/L	U
Endrin	72-20-8	1	0.001	ND	ug/L	U
Endosulfan II	33213-65-9	1	0.001	ND	ug/L	U
4,4'-DDD	72-54-8	1	0.001	ND	ug/L	U
Endrin Aldehyde	7421-93-4	1	0.001	ND	ug/L	U
4,4'-DDT	50-29-3	1	0.001	ND	ug/L	U
Endosulfan Sulfate	1031-07-8	1	0.001	ND	ug/L	U
Endrin Ketone	53494-70-5	1	0.001	ND	ug/L	U
Methoxychlor	72-43-5	1	0.006	ND	ug/L	U
Toxaphene	8001-35-2	1	0.063	ND	ug/L	U
Chlordane (NOS)	57-74-9	1	0.005	ND	ug/L	U
Surrogate: Decachlorobiphenyl			*30-160 %*	*56.8*	*%*	
Surrogate: Decachlorobiphenyl [2C]			*30-160 %*	*64.0*	*%*	
Surrogate: Tetrachlorometaxylene			*30-160 %*	*60.1*	*%*	
Surrogate: Tetrachlorometaxylene [2C]			*30-160 %*	*43.1*	*%*	

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	18-Sep-2018 13:31

SW-9R-20180829

18H0408-04 (Water)

Chlorinated Pesticides

Method: EPA 8081B — Sampled: 08/29/2018 13:48

Instrument: ECD6 Analyst: YZ — Analyzed: 14-Sep-2018 17:35

Sample Preparation:	Preparation Method: EPA 3510C SepF	
	Preparation Batch: BGI0040	Sample Size: 1000 mL
	Prepared: 04-Sep-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Silica Gel	
	Cleanup Batch: CGI0097	Initial Volume: 0.5 mL
	Cleaned: 13-Sep-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	
	Cleanup Batch: CGI0096	Initial Volume: 0.5 mL
	Cleaned: 13-Sep-2018	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	1	0.0006	ND	ug/L	U
beta-BHC	319-85-7	1	0.0006	ND	ug/L	U
gamma-BHC (Lindane)	58-89-9	1	0.0006	ND	ug/L	U
delta-BHC	319-86-8	1	0.0006	ND	ug/L	U
Heptachlor	76-44-8	1	0.0006	ND	ug/L	U
Aldrin	309-00-2	1	0.0006	ND	ug/L	U
Heptachlor Epoxide	1024-57-3	1	0.0006	ND	ug/L	U
trans-Chlordane (beta-Chlordane)	5103-74-2	1	0.0006	ND	ug/L	U
cis-Chlordane (alpha-chlordane)	5103-71-9	1	0.0006	ND	ug/L	U
Endosulfan I	959-98-8	1	0.0006	ND	ug/L	U
4,4'-DDE	72-55-9	1	0.001	ND	ug/L	U
Dieldrin	60-57-1	1	0.001	ND	ug/L	U
Endrin	72-20-8	1	0.001	ND	ug/L	U
Endosulfan II	33213-65-9	1	0.001	ND	ug/L	U
4,4'-DDD	72-54-8	1	0.001	ND	ug/L	U
Endrin Aldehyde	7421-93-4	1	0.001	ND	ug/L	U
4,4'-DDT	50-29-3	1	0.001	ND	ug/L	U
Endosulfan Sulfate	1031-07-8	1	0.001	ND	ug/L	U
Endrin Ketone	53494-70-5	1	0.001	ND	ug/L	U
Methoxychlor	72-43-5	1	0.006	ND	ug/L	U
Toxaphene	8001-35-2	1	0.063	ND	ug/L	U
Chlordane (NOS)	57-74-9	1	0.005	ND	ug/L	U
Surrogate: Decachlorobiphenyl			*30-160 %*	*68.3*	*%*	
Surrogate: Decachlorobiphenyl [2C]			*30-160 %*	*75.1*	*%*	
Surrogate: Tetrachlorometaxylene			*30-160 %*	*60.4*	*%*	
Surrogate: Tetrachlorometaxylene [2C]			*30-160 %*	*53.4*	*%*	

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	18-Sep-2018 13:31

SW-10R-20180829

18H0408-05 (Water)

Chlorinated Pesticides

Method: EPA 8081B — Sampled: 08/29/2018 14:49

Instrument: ECD6 Analyst: YZ — Analyzed: 14-Sep-2018 17:54

Sample Preparation:	Preparation Method: EPA 3510C SepF	
	Preparation Batch: BGI0040	Sample Size: 1000 mL
	Prepared: 04-Sep-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Silica Gel	
	Cleanup Batch: CGI0097	Initial Volume: 0.5 mL
	Cleaned: 13-Sep-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	
	Cleanup Batch: CGI0096	Initial Volume: 0.5 mL
	Cleaned: 13-Sep-2018	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	1	0.0006	ND	ug/L	U
beta-BHC	319-85-7	1	0.0006	ND	ug/L	U
gamma-BHC (Lindane)	58-89-9	1	0.0006	ND	ug/L	U
delta-BHC	319-86-8	1	0.0006	ND	ug/L	U
Heptachlor	76-44-8	1	0.0006	ND	ug/L	U
Aldrin	309-00-2	1	0.0006	ND	ug/L	U
Heptachlor Epoxide	1024-57-3	1	0.080	ND	ug/L	P1, Y1, U
trans-Chlordane (beta-Chlordane)	5103-74-2	1	0.035	ND	ug/L	Y1, U
cis-Chlordane (alpha-chlordane)	5103-71-9	1	0.015	ND	ug/L	P1, Y1, U
Endosulfan I	959-98-8	1	0.0006	ND	ug/L	U
4,4'-DDE	72-55-9	1	0.001	ND	ug/L	U
Dieldrin	60-57-1	1	0.001	ND	ug/L	U
Endrin	72-20-8	1	0.001	ND	ug/L	U
Endosulfan II	33213-65-9	1	0.001	ND	ug/L	U
4,4'-DDD	72-54-8	1	0.001	ND	ug/L	U
Endrin Aldehyde	7421-93-4	1	0.001	ND	ug/L	U
4,4'-DDT	50-29-3	1	0.001	ND	ug/L	U
Endosulfan Sulfate	1031-07-8	1	0.001	ND	ug/L	U
Endrin Ketone	53494-70-5	1	0.001	ND	ug/L	U
Methoxychlor	72-43-5	1	0.006	ND	ug/L	U
Toxaphene	8001-35-2	1	0.063	ND	ug/L	U
Chlordane (NOS)	57-74-9	1	0.005	ND	ug/L	U
Surrogate: Decachlorobiphenyl			*30-160 %*	*56.9*	*%*	
Surrogate: Decachlorobiphenyl [2C]			*30-160 %*	*61.9*	*%*	
Surrogate: Tetrachlorometaxylene			*30-160 %*	*47.6*	*%*	
Surrogate: Tetrachlorometaxylene [2C]			*30-160 %*	*40.2*	*%*	

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	18-Sep-2018 13:31

SW-11R-20180829

18H0408-06 (Water)

Chlorinated Pesticides

Method: EPA 8081B — Sampled: 08/29/2018 15:47

Instrument: ECD6 Analyst: YZ — Analyzed: 14-Sep-2018 18:12

Sample Preparation:	Preparation Method: EPA 3510C SepF	
	Preparation Batch: BGI0040	Sample Size: 1000 mL
	Prepared: 04-Sep-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Silica Gel	
	Cleanup Batch: CGI0097	Initial Volume: 0.5 mL
	Cleaned: 13-Sep-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	
	Cleanup Batch: CGI0096	Initial Volume: 0.5 mL
	Cleaned: 13-Sep-2018	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	1	0.0006	ND	ug/L	U
beta-BHC	319-85-7	1	0.0006	ND	ug/L	U
gamma-BHC (Lindane)	58-89-9	1	0.0006	ND	ug/L	U
delta-BHC	319-86-8	1	0.0006	ND	ug/L	U
Heptachlor	76-44-8	1	0.0006	ND	ug/L	U
Aldrin	309-00-2	1	0.0006	ND	ug/L	U
Heptachlor Epoxide	1024-57-3	1	0.0006	**0.005**	ug/L	
trans-Chlordane (beta-Chlordane)	5103-74-2	1	0.0006	ND	ug/L	U
cis-Chlordane (alpha-chlordane)	5103-71-9	1	0.0006	ND	ug/L	U
Endosulfan I	959-98-8	1	0.0006	ND	ug/L	U
4,4'-DDE	72-55-9	1	0.001	ND	ug/L	U
Dieldrin	60-57-1	1	0.001	ND	ug/L	U
Endrin	72-20-8	1	0.001	ND	ug/L	U
Endosulfan II	33213-65-9	1	0.001	ND	ug/L	U
4,4'-DDD	72-54-8	1	0.001	ND	ug/L	U
Endrin Aldehyde	7421-93-4	1	0.001	ND	ug/L	U
4,4'-DDT	50-29-3	1	0.001	ND	ug/L	U
Endosulfan Sulfate	1031-07-8	1	0.001	ND	ug/L	U
Endrin Ketone	53494-70-5	1	0.001	ND	ug/L	U
Methoxychlor	72-43-5	1	0.006	ND	ug/L	U
Toxaphene	8001-35-2	1	0.063	ND	ug/L	U
Chlordane (NOS)	57-74-9	1	0.005	ND	ug/L	U
Surrogate: Decachlorobiphenyl			*30-160 %*	*59.0*	*%*	
Surrogate: Decachlorobiphenyl [2C]			*30-160 %*	*61.2*	*%*	
Surrogate: Tetrachlorometaxylene			*30-160 %*	*47.2*	*%*	
Surrogate: Tetrachlorometaxylene [2C]			*30-160 %*	*40.1*	*%*	

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	18-Sep-2018 13:31

SW-99-20180829

18H0408-07 (Water)

Chlorinated Pesticides

Method: EPA 8081B — Sampled: 08/29/2018 15:50

Instrument: ECD6 Analyst: YZ — Analyzed: 17-Sep-2018 13:35

Sample Preparation:	Preparation Method: EPA 3510C SepF	
	Preparation Batch: BGI0040	Sample Size: 1000 mL
	Prepared: 04-Sep-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Silica Gel	
	Cleanup Batch: CGI0097	Initial Volume: 0.5 mL
	Cleaned: 13-Sep-2018	Final Volume: 0.5 mL
Sample Cleanup:	Cleanup Method: Sulfur	
	Cleanup Batch: CGI0096	Initial Volume: 0.5 mL
	Cleaned: 13-Sep-2018	Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	1	0.0006	ND	ug/L	U
beta-BHC	319-85-7	1	0.0006	ND	ug/L	U
gamma-BHC (Lindane)	58-89-9	1	0.0006	ND	ug/L	U
delta-BHC	319-86-8	1	0.0006	ND	ug/L	U
Heptachlor	76-44-8	1	0.0006	ND	ug/L	U
Aldrin	309-00-2	1	0.0006	ND	ug/L	U
Heptachlor Epoxide	1024-57-3	1	0.0006	**0.005**	ug/L	
trans-Chlordane (beta-Chlordane)	5103-74-2	1	0.0006	ND	ug/L	U
cis-Chlordane (alpha-chlordane)	5103-71-9	1	0.0006	ND	ug/L	U
Endosulfan I	959-98-8	1	0.0006	ND	ug/L	U
4,4'-DDE	72-55-9	1	0.001	ND	ug/L	U
Dieldrin	60-57-1	1	0.001	ND	ug/L	U
Endrin	72-20-8	1	0.001	ND	ug/L	U
Endosulfan II	33213-65-9	1	0.001	ND	ug/L	U
4,4'-DDD	72-54-8	1	0.001	ND	ug/L	U
Endrin Aldehyde	7421-93-4	1	0.001	ND	ug/L	U
4,4'-DDT	50-29-3	1	0.001	ND	ug/L	U
Endosulfan Sulfate	1031-07-8	1	0.001	ND	ug/L	U
Endrin Ketone	53494-70-5	1	0.001	ND	ug/L	U
Methoxychlor	72-43-5	1	0.006	ND	ug/L	U
Toxaphene	8001-35-2	1	0.063	ND	ug/L	U
Chlordane (NOS)	57-74-9	1	0.005	ND	ug/L	U
Surrogate: Decachlorobiphenyl			*30-160 %*	*60.3*	*%*	
Surrogate: Decachlorobiphenyl [2C]			*30-160 %*	*61.2*	*%*	
Surrogate: Tetrachlorometaxylene			*30-160 %*	*49.3*	*%*	
Surrogate: Tetrachlorometaxylene [2C]			*30-160 %*	*39.7*	*%*	

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Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	18-Sep-2018 13:31

Chlorinated Pesticides - Quality Control

Batch BGI0040 - EPA 3510C SepF

Instrument: ECD6 Analyst: YZ

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Blank (BGI0040-BLK1)			Prepared: 04-Sep-2018 Analyzed: 14-Sep-2018 15:47							
alpha-BHC	ND	0.0006	ug/L							U
beta-BHC	ND	0.0006	ug/L							U
gamma-BHC (Lindane)	ND	0.0006	ug/L							U
delta-BHC	ND	0.0006	ug/L							U
Heptachlor	ND	0.0006	ug/L							U
Aldrin	ND	0.0006	ug/L							U
Heptachlor Epoxide	ND	0.0006	ug/L							U
trans-Chlordane (beta-Chlordane)	ND	0.0006	ug/L							U
cis-Chlordane (alpha-chlordane)	ND	0.0006	ug/L							U
Endosulfan I	ND	0.0006	ug/L							U
4,4'-DDE	ND	0.001	ug/L							U
Dieldrin	ND	0.001	ug/L							U
Endrin	ND	0.001	ug/L							U
Endosulfan II	ND	0.001	ug/L							U
4,4'-DDD	ND	0.001	ug/L							U
Endrin Aldehyde	ND	0.001	ug/L							U
4,4'-DDT	ND	0.001	ug/L							U
Endosulfan Sulfate	ND	0.001	ug/L							U
Endrin Ketone	ND	0.001	ug/L							U
Methoxychlor	ND	0.006	ug/L							U
Toxaphene	ND	0.063	ug/L							U
Chlordane (NOS)	ND	0.005	ug/L							U
Surrogate: Decachlorobiphenyl	0.0115		ug/L	*0.0200*		*57.3*	*30-160*			
Surrogate: Decachlorobiphenyl [2C]	0.0122		ug/L	*0.0200*		*60.8*	*30-160*			
Surrogate: Tetrachlorometaxylene	0.00651		ug/L	*0.0200*		*32.6*	*30-160*			
Surrogate: Tetrachlorometaxylene [2C]	0.00625		ug/L	*0.0200*		*31.2*	*30-160*			
LCS (BGI0040-BS1)			Prepared: 04-Sep-2018 Analyzed: 14-Sep-2018 16:05							
alpha-BHC	0.005	0.0006	ug/L	0.0100		50.1	30-160			
beta-BHC	0.005	0.0006	ug/L	0.0100		52.3	30-160			
gamma-BHC (Lindane)	0.005	0.0006	ug/L	0.0100		54.5	30-160			
delta-BHC	0.005	0.0006	ug/L	0.0100		51.5	30-160			
Heptachlor	0.005	0.0006	ug/L	0.0100		47.8	30-160			
Aldrin	0.004	0.0006	ug/L	0.0100		37.1	30-160			
Heptachlor Epoxide	0.006	0.0006	ug/L	0.0100		55.8	30-160			

Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	18-Sep-2018 13:31

Chlorinated Pesticides - Quality Control

Batch BGI0040 - EPA 3510C SepF

Instrument: ECD6 Analyst: YZ

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS (BGI0040-BS1)				Prepared: 04-Sep-2018 Analyzed: 14-Sep-2018 16:05						
trans-Chlordane (beta-Chlordane)	0.005	0.0006	ug/L	0.0100		54.4	30-160			
cis-Chlordane (alpha-chlordane)	0.005	0.0006	ug/L	0.0100		54.5	30-160			
Endosulfan I	0.005	0.0006	ug/L	0.0100		54.9	30-160			
4,4'-DDE	0.012	0.001	ug/L	0.0200		60.1	30-160			
Dieldrin	0.012	0.001	ug/L	0.0200		57.9	30-160			
Endrin	0.011	0.001	ug/L	0.0200		56.0	30-160			
Endosulfan II	0.012	0.001	ug/L	0.0200		58.8	30-160			
4,4'-DDD	0.011	0.001	ug/L	0.0200		53.0	30-160			
Endrin Aldehyde	0.010	0.001	ug/L	0.0200		51.0	30-160			
4,4'-DDT	0.011	0.001	ug/L	0.0200		56.5	30-160			
Endosulfan Sulfate	0.011	0.001	ug/L	0.0200		53.4	30-160			
Endrin Ketone	0.011	0.001	ug/L	0.0200		54.6	30-160			
Methoxychlor	0.058	0.006	ug/L	0.100		58.4	30-160			
Surrogate: Decachlorobiphenyl	0.0120		ug/L	*0.0200*		*59.8*	*30-160*			
Surrogate: Decachlorobiphenyl [2C]	0.0127		ug/L	*0.0200*		*63.6*	*30-160*			
Surrogate: Tetrachlorometaxylene	0.00821		ug/L	*0.0200*		*41.0*	*30-160*			
Surrogate: Tetrachlorometaxylene [2C]	0.00763		ug/L	*0.0200*		*38.1*	*30-160*			
LCS Dup (BGI0040-BSD1)				Prepared: 04-Sep-2018 Analyzed: 14-Sep-2018 16:23						
alpha-BHC	0.005	0.0006	ug/L	0.0100		50.4	30-160	0.60	30	
beta-BHC	0.005	0.0006	ug/L	0.0100		50.4	30-160	3.47	30	
gamma-BHC (Lindane)	0.005	0.0006	ug/L	0.0100		51.8	30-160	5.12	30	
delta-BHC	0.005	0.0006	ug/L	0.0100		48.9	30-160	5.18	30	
Heptachlor	0.005	0.0006	ug/L	0.0100		48.7	30-160	1.93	30	
Aldrin	0.004	0.0006	ug/L	0.0100		38.3	30-160	7.55	30	
Heptachlor Epoxide	0.005	0.0006	ug/L	0.0100		52.0	30-160	6.94	30	
trans-Chlordane (beta-Chlordane)	0.005	0.0006	ug/L	0.0100		52.2	30-160	4.09	30	
cis-Chlordane (alpha-chlordane)	0.005	0.0006	ug/L	0.0100		52.8	30-160	3.25	30	
Endosulfan I	0.005	0.0006	ug/L	0.0100		51.9	30-160	5.67	30	
4,4'-DDE	0.012	0.001	ug/L	0.0200		58.2	30-160	3.25	30	
Dieldrin	0.011	0.001	ug/L	0.0200		55.7	30-160	3.75	30	
Endrin	0.011	0.001	ug/L	0.0200		53.5	30-160	4.44	30	
Endosulfan II	0.011	0.001	ug/L	0.0200		53.0	30-160	10.30	30	
4,4'-DDD	0.010	0.001	ug/L	0.0200		50.4	30-160	4.94	30	
Endrin Aldehyde	0.008	0.001	ug/L	0.0200		38.4	30-160	5.58	30	

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Landau Associates, Inc. - Tacoma	Project: Webster Nursery	
2107 South C Street	Project Number: Webster Nursery	**Reported:**
Tacoma WA, 98402	Project Manager: Sierra Mott	18-Sep-2018 13:31

Chlorinated Pesticides - Quality Control

Batch BGI0040 - EPA 3510C SepF

Instrument: ECD6 Analyst: YZ

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
LCS Dup (BGI0040-BSD1)				Prepared: 04-Sep-2018 Analyzed: 14-Sep-2018 16:23						
4,4'-DDT	0.011	0.001	ug/L	0.0200		54.9	30-160	2.86	30	
Endosulfan Sulfate	0.011	0.001	ug/L	0.0200		53.0	30-160	0.72	30	
Endrin Ketone	0.011	0.001	ug/L	0.0200		54.7	30-160	0.26	30	
Methoxychlor	0.056	0.006	ug/L	0.100		55.7	30-160	4.72	30	
Surrogate: Decachlorobiphenyl	0.0113		ug/L	*0.0200*		*56.7*	*30-160*			
Surrogate: Decachlorobiphenyl [2C]	0.0121		ug/L	*0.0200*		*60.3*	*30-160*			
Surrogate: Tetrachlorometaxylene	0.00818		ug/L	*0.0200*		*40.9*	*30-160*			
Surrogate: Tetrachlorometaxylene [2C]	0.00729		ug/L	*0.0200*		*36.4*	*30-160*			

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Certified Analyses included in this Report

Analyte	Certifications
EPA 8081B in Water	
alpha-BHC	WADOE,DoD-ELAP,NELAP,CALAP
alpha-BHC [2C]	WADOE,DoD-ELAP,NELAP,CALAP
beta-BHC	WADOE,DoD-ELAP,NELAP,CALAP
beta-BHC [2C]	WADOE,DoD-ELAP,NELAP,CALAP
gamma-BHC (Lindane)	WADOE,DoD-ELAP,NELAP,CALAP
gamma-BHC (Lindane) [2C]	WADOE,DoD-ELAP,NELAP,CALAP
delta-BHC	WADOE,DoD-ELAP,NELAP,CALAP
delta-BHC [2C]	WADOE,DoD-ELAP,NELAP,CALAP
Heptachlor	WADOE,DoD-ELAP,NELAP,CALAP
Heptachlor [2C]	WADOE,DoD-ELAP,NELAP,CALAP
Aldrin	WADOE,DoD-ELAP,NELAP,CALAP
Aldrin [2C]	WADOE,DoD-ELAP,NELAP,CALAP
Heptachlor Epoxide	WADOE,DoD-ELAP,NELAP,CALAP
Heptachlor Epoxide [2C]	WADOE,DoD-ELAP,NELAP,CALAP
trans-Chlordane (beta-Chlordane)	WADOE,DoD-ELAP,NELAP,CALAP
trans-Chlordane (beta-Chlordane) [2C]	WADOE,DoD-ELAP,NELAP,CALAP
cis-Chlordane (alpha-chlordane)	WADOE,DoD-ELAP,NELAP,CALAP
cis-Chlordane (alpha-chlordane) [2C]	WADOE,DoD-ELAP,NELAP,CALAP
Endosulfan I	WADOE,DoD-ELAP,NELAP,CALAP
Endosulfan I [2C]	WADOE,DoD-ELAP,NELAP,CALAP
4,4'-DDE	WADOE,DoD-ELAP,NELAP,CALAP
4,4'-DDE [2C]	WADOE,DoD-ELAP,NELAP,CALAP
Dieldrin	WADOE,DoD-ELAP,NELAP,CALAP
Dieldrin [2C]	WADOE,DoD-ELAP,NELAP,CALAP
Endrin	WADOE,DoD-ELAP,NELAP,CALAP
Endrin [2C]	WADOE,DoD-ELAP,NELAP,CALAP
Endosulfan II	WADOE,DoD-ELAP,NELAP,CALAP
Endosulfan II [2C]	WADOE,DoD-ELAP,NELAP,CALAP
4,4'-DDD	WADOE,DoD-ELAP,NELAP,CALAP
4,4'-DDD [2C]	WADOE,DoD-ELAP,NELAP,CALAP
Endrin Aldehyde	WADOE,DoD-ELAP,NELAP,CALAP
Endrin Aldehyde [2C]	WADOE,DoD-ELAP,NELAP,CALAP
4,4'-DDT	WADOE,DoD-ELAP,NELAP,CALAP
4,4'-DDT [2C]	WADOE,DoD-ELAP,NELAP,CALAP
Endosulfan Sulfate	WADOE,DoD-ELAP,NELAP,CALAP

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Endosulfan Sulfate [2C]	WADOE,DoD-ELAP,NELAP,CALAP
Endrin Ketone	WADOE,DoD-ELAP,NELAP,CALAP
Endrin Ketone [2C]	WADOE,DoD-ELAP,NELAP,CALAP
Methoxychlor	WADOE,DoD-ELAP,NELAP,CALAP
Methoxychlor [2C]	WADOE,DoD-ELAP,NELAP,CALAP
Hexachlorobutadiene	WADOE,DoD-ELAP,NELAP,CALAP
Hexachlorobutadiene [2C]	WADOE,DoD-ELAP,NELAP,CALAP
Hexachlorobenzene	WADOE,DoD-ELAP,NELAP,CALAP
Hexachlorobenzene [2C]	WADOE,DoD-ELAP,NELAP,CALAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	02/07/2019
CALAP	California Department of Public Health CAELAP	2748	06/30/2019
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	02/07/2019
NELAP	ORELAP - Oregon Laboratory Accreditation Program	WA100006-011	05/12/2019
WADOE	WA Dept of Ecology	C558	06/30/2019
WA-DW	Ecology - Drinking Water	C558	06/30/2019

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Notes and Definitions

*	Flagged value is not within established control limits.
E	The analyte concentration exceeds the upper limit of the calibration range of the instrument established by the initial calibration (ICAL)
P1	The reported value is greater than 40% difference between the concentrations determined on two GC columns where applicable.
U	This analyte is not detected above the applicable reporting or detection limit.
Y1	Raised reporting limit due to interference
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
[2C]	Indicates this result was quantified on the second column on a dual column analysis.