

# Technical Memorandum

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**TO:** Matthew Morris, PE, Washington State Department of Ecology  
**CC:** Amy Sikora, Washington State Department of Natural Resources  
**FROM:** Sierra Mott and Eric Weber, LHG, CWRE  
**DATE:** July 1, 2020  
**RE:** **Second Quarter 2020 Groundwater Monitoring Results  
Webster Nursery Site, Site ID 3380  
Tumwater, Washington  
Project No. 0774006.040.046**

## Introduction

This technical memorandum summarizes the results of quarterly groundwater monitoring completed by Landau Associates, Inc. (LAI) at the Washington State Department of Natural Resources Webster Nursery site, a former pesticide-storage warehouse in Tumwater, Washington (site; Figure 1). The site is associated with past releases of organochlorine pesticides to soil and groundwater. Constituents of concern include the organochlorine pesticides heptachlor epoxide (HE; breakdown product of heptachlor) and technical chlordane.

Remedial action excavation and disposal of HE-contaminated soil were completed in August 2018. A summary of the remedial action is provided in a draft Cleanup Action Completion Report (LAI 2018).

## Groundwater Monitoring Summary

Second quarter 2020 (2Q20) groundwater monitoring was completed on May 13, 2020. Groundwater monitoring was completed in accordance with the framework established by Washington State Department of Ecology (Ecology) Agreed Order No. DE 00TCP-SR295, the Remedial Action Work Plan (LAI 2017), and the Compliance Monitoring Plan (LAI 2019). Groundwater samples were collected from two wells (SW-10R and SW-11R). Analytical Resources, Inc. of Tukwila, Washington analyzed the groundwater samples for organochlorine pesticides using U.S. Environmental Protection Agency Method 8081A low-level.

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

## Groundwater Monitoring Results

Groundwater monitoring results are summarized below:

- HE was detected in SW-10R at a concentration of 0.0602 micrograms per liter ( $\mu\text{g/L}$ ), above the cleanup level (CUL; 0.00481  $\mu\text{g/L}$ ).
- HE was detected in SW-11R at a concentration of 0.0066  $\mu\text{g/L}$ , above the CUL. HE was detected in the SW-11R duplicate sample at a concentration of 0.0059  $\mu\text{g/L}$ , also above the CUL.
- Trans-chlordane was detected at SW-10R and SW-11R at concentrations of 0.0016  $\mu\text{g/L}$  and 0.0021  $\mu\text{g/L}$ , respectively; there is no CUL for this analyte. No analytes other than HE and trans-chlordane were detected in either well during 2Q20 groundwater monitoring.

May 2020 organochlorine pesticide data are provided in Table 1, and the laboratory data package is provided in Attachment 1. Time series data of recent HE concentrations in groundwater at SW-10R and SW-11R (dating back to January 2010) are presented on Figure 3.

Groundwater elevations at SW-10R and SW-11R were 185.60 and 185.28 feet mean sea level, respectively. This represents an approximate 3 foot variation from the previous monitoring event, completed in February 2020. Depth-to-water and groundwater elevation data are provided in Table 2 and SW-10R groundwater elevation data collected since the remedial action is shown on Figure 3.

## Environmental Information Management Submittal

An Environmental Information Management submittal is required. The submittal will be completed in summer 2020, after this technical memorandum has been submitted to Ecology.

LANDAU ASSOCIATES, INC.



Sierra Mott  
Senior Project Scientist



Eric Weber, LHG, CWRE  
Principal

SMM/EFW/kjg

[\\TACOMA3\PROJECT\774\006\R\QUARTERLY GW MONITORING REPORTS\2020\_05\_2Q20\LAI\_WEBSTER NURSERY 2Q20 GW MONITORING\_Tech MEMO\_07-01-20.DOCX]

## References

- LAI. 2019. Compliance Monitoring Plan, Washington State Department of Natural Resources Webster Nursery, Tumwater, Washington. Landau Associates, Inc. July 24.
- LAI. 2018. Draft Cleanup Action Completion Report, Washington State Department of Natural Resources Webster Nursery, Tumwater, Washington. Landau Associates, Inc. October 12.
- LAI. 2017. Remedial Action Work Plan, Webster Nursery, 9805 Blomberg Street SW, Tumwater, Washington. Landau Associates, Inc. October 31.

## Attachments

Figure 1. Vicinity Map

Figure 2. Monitoring Well Network

Figure 3. Heptachlor Epoxide and Groundwater Elevation Time Series, SW-10(R) and SW-11(R)

Table 1. Groundwater Analytical Results

Table 2. Groundwater Level Measurements

Attachment 1. May 2020 Laboratory Data Package

G:\Projects\774\006\020\026\FIS\F01\_VicinityMap.mxd 5/16/2016 NAD 1983 StatePlane Washington North FIPS 4601 Feet



Data Source: Esri 2012

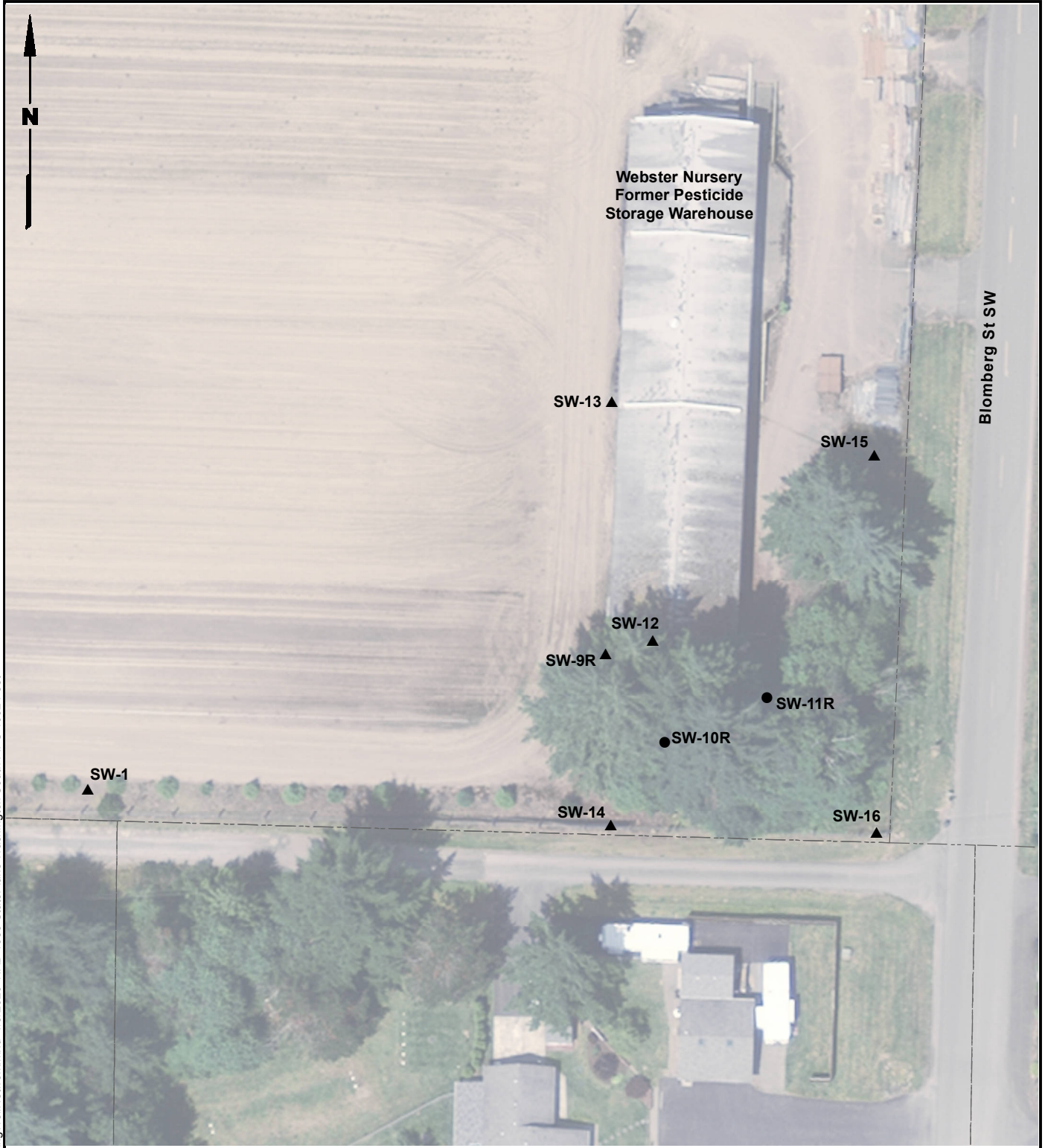


Webster Nursery Site  
Tumwater, Washington

Vicinity Map

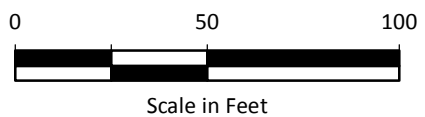
Figure  
**1**

G:\Projects\7741006\0401045\F02MonitoringWellNetwork.mxd 1/9/2020 NAD 1983 StatePlane Washington South FIPS 4602 Feet



**Legend**

- Pesticide Monitoring Well
- ▲ Other Monitoring Well
- Tax Parcels



**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.

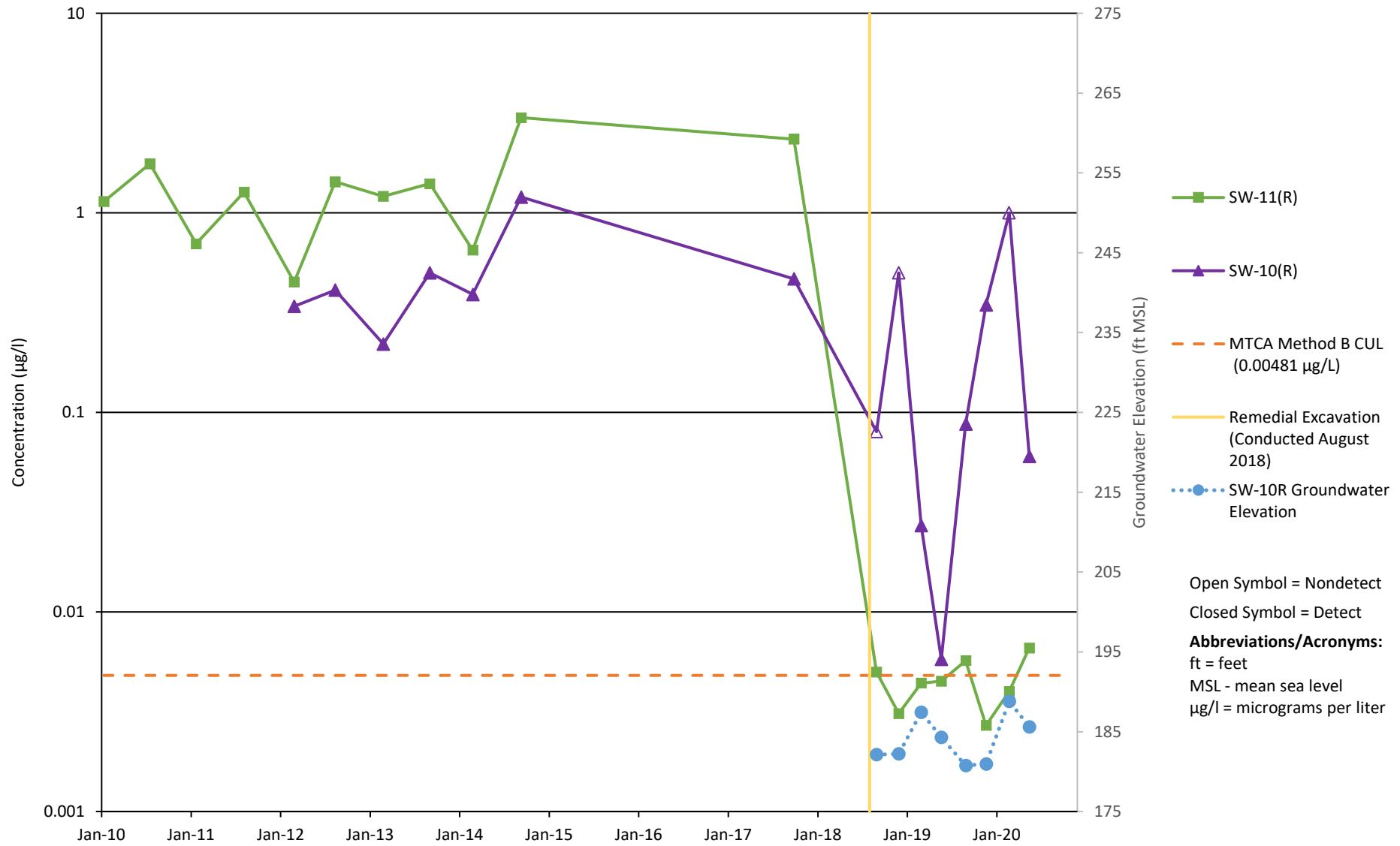
Data Sources: Thurston County GIS; WA DNR Survey, 2018.



Webster Nursery Site  
Tumwater, Washington

**Monitoring Well Network**

Figure  
**2**



Webster Nursery Site  
Tumwater, Washington

**Heptachlor Epoxide and Groundwater  
Elevation Time Series  
SW-10(R) and SW-11(R)**

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-10R SW-10R-20200513 20E0132 5/13/2020 N	SW-11R SW-11R-20200513 20E0132 5/13/2020 N	SW-11R SW-99-20200513 20E0132 5/13/2020 FD
<b>Pesticides (µg/L; SW-846 8081B)</b>				
4,4'-DDD	--	0.0025 U	0.0025 U	0.0025 U
4,4'-DDE	--	0.0025 U	0.0025 U	0.0025 U
4,4'-DDT	--	0.0025 U	0.0025 U	0.0025 U
Aldrin	--	0.0013 U	0.0013 U	0.0013 U
alpha-BHC	--	0.0013 U	0.0013 U	0.0013 U
beta-BHC	--	0.0013 U	0.0013 U	0.0013 U
Chlordane	0.25	0.0100 U	0.0100 U	0.0100 U
cis-Chlordane	--	0.0013 U	0.0013 U	0.0013 U
delta-BHC	--	0.0013 U	0.0013 U	0.0013 U
Dieldrin	--	0.0025 U	0.0025 U	0.0025 U
Endosulfan I	--	0.0013 U	0.0013 U	0.0013 U
Endosulfan II	--	0.0025 U	0.0025 U	0.0025 U
Endosulfan Sulfate	--	0.0025 U	0.0025 U	0.0025 U
Endrin	--	0.0025 U	0.0025 U	0.0025 U
Endrin Aldehyde	--	0.0025 U	0.0025 U	0.0025 U
Endrin Ketone	--	0.0025 U	0.0025 U	0.0025 U
gamma-BHC	--	0.0013 U	0.0013 U	0.0013 U
Heptachlor	0.0194	0.0013 U	0.0013 U	0.0013 U
Heptachlor Epoxide	0.00481	<b>0.0602 J</b>	<b>0.0066</b>	<b>0.0059</b>
Methoxychlor	--	0.0125 U	0.0125 U	0.0125 U
Toxaphene	--	0.125 U	0.125 U	0.125 U
trans-Chlordane	--	<b>0.0016</b>	<b>0.0021</b>	<b>0.0018</b>

**Notes:**

-- = cleanup level not applicable

**Bold text** = Indicates detected analyte.

Green Box = Detected concentration is greater than the cleanup level

J = The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

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

**Abbreviations and Acronyms:**

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**

<b>Well ID</b>	<b>Top of Casing Elevation (ft)</b>	<b>Depth to Water (ft bgs)</b>	<b>Groundwater Elevation (ft)</b>
SW-10R	193.41	7.81	185.60
SW-11R	192.50	7.22	185.28

**Notes:**

Groundwater elevation data was collected May 13, 2020.

**Abbreviations:**

- bgs = below ground surface
- ft = feet
- ID = identification



# May 2020 Laboratory Data Package



08 June 2020

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.

<u>Associated Work Order(s)</u>	<u>Associated SDG ID(s)</u>
20E0132	N/A

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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 enclosed 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.*







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

Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
08-Jun-2020 14:14

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
SW-10R-20200513	20E0132-01	Water	13-May-2020 10:40	13-May-2020 13:05
SW-11R-20200513	20E0132-02	Water	13-May-2020 11:28	13-May-2020 13:05
SW-99-20200513	20E0132-03	Water	13-May-2020 11:30	13-May-2020 13:05



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

Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
08-Jun-2020 14:14

## Work Order Case Narrative

### Pesticides - EPA Method SW8081B

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

Initial and continuing calibrations were within method requirements with the exception of Dieldrin and 4,4-DDE which were out of control high in the 5/26/2020 analysis on both columns.

Dieldrin is out of control high on one column for the 6/1/2020 analysis in the CCAL. The data was reported from the column in control.

Internal standard areas were within limits with the exception of the 5/26/2020 analysis. The internal standards are out of control high in all of the associated samples for the 5/26/2020 analysis. The samples were re-analyzed with internal standard recoveries in control.

The surrogate percent recoveries were within control limits with the exception of surrogates flagged on the associated forms. The samples were re-analyzed at a 5x and 2x dilution and both runs have been reported for your review.

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

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



# Cooler Receipt Form

ARI Client: Landa Assoc. Inc

Project Name: Webster Nursey

COC No(s): \_\_\_\_\_ (NA)

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: \_\_\_\_\_

Assigned ARI Job No: 20 E0132

Tracking No: \_\_\_\_\_ (NA)

**Preliminary Examination Phase:**

Were intact, properly signed and dated custody seals attached to the outside of the 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)

Time 1305 Temp Gun ID#: DOO 5206

Cooler Accepted by: JSW Date: 05/13/2020 Time: 1305

**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

How were bottles sealed in plastic bags? ..... Individually  Grouped  Not

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

Were the sample(s) split by ARI?  YES Date/Time: \_\_\_\_\_ Equipment: \_\_\_\_\_ Split by: \_\_\_\_\_

Samples Logged by: JSW Date: 05/13/2020 Time: 1621 Labels checked by: JSW

**\*\* 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: \_\_\_\_\_



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

Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
08-Jun-2020 14:14

**SW-10R-20200513**  
**20E0132-01 (Water)**

**Chlorinated Pesticides**

Method: EPA 8081B Sampled: 05/13/2020 10:40  
Instrument: ECD6 Analyst: YZ Analyzed: 05/26/2020 23:46

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 20E0132-01 A 01  
Preparation Batch: BIE0337 Sample Size: 1000 mL  
Prepared: 05/20/2020 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Silica Gel Extract ID: 20E0132-01 A 01  
Cleanup Batch: CIE0133 Initial Volume: 0.5 mL  
Cleaned: 21-May-2020 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Sulfur Extract ID: 20E0132-01 A 01  
Cleanup Batch: CIE0132 Initial Volume: 0.5 mL  
Cleaned: 21-May-2020 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	0.0760	ug/L	E
trans-Chlordane (beta-Chlordane)	5103-74-2	1	0.0006	0.0033	ug/L	P1
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	0.0013	ND	ug/L	U
Dieldrin	60-57-1	1	0.0013	ND	ug/L	U
Endrin	72-20-8	1	0.0013	ND	ug/L	U
Endosulfan II	33213-65-9	1	0.0013	ND	ug/L	U
4,4'-DDD	72-54-8	1	0.0013	ND	ug/L	U
Endrin Aldehyde	7421-93-4	1	0.0013	ND	ug/L	U
4,4'-DDT	50-29-3	1	0.0013	ND	ug/L	U
Endosulfan Sulfate	1031-07-8	1	0.0013	ND	ug/L	U
Endrin Ketone	53494-70-5	1	0.0013	ND	ug/L	U
Methoxychlor	72-43-5	1	0.0063	ND	ug/L	U
Toxaphene	8001-35-2	1	0.0625	ND	ug/L	U
Chlordane (NOS)	57-74-9	1	0.0500	ND	ug/L	Y1, U
<i>Surrogate: Decachlorobiphenyl</i>			30-160 %	136	%	P1
<i>Surrogate: Decachlorobiphenyl [2C]</i>			30-160 %	601	%	*, P1
<i>Surrogate: Tetrachlorometaxylene</i>			30-160 %	55.2	%	P1
<i>Surrogate: Tetrachlorometaxylene [2C]</i>			30-160 %	117	%	P1



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

Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
08-Jun-2020 14:14

**SW-10R-20200513**  
**20E0132-01RE2 (Water)**

**Chlorinated Pesticides**

Method: EPA 8081B Sampled: 05/13/2020 10:40  
Instrument: ECD6 Analyst: JGR Analyzed: 06/01/2020 11:13

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 20E0132-01RE2 A 01  
Preparation Batch: BIE0337 Sample Size: 1000 mL  
Prepared: 05/20/2020 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Silica Gel Extract ID: 20E0132-01RE2 A 01  
Cleanup Batch: CIE0133 Initial Volume: 0.5 mL  
Cleaned: 21-May-2020 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Sulfur Extract ID: 20E0132-01RE2 A 01  
Cleanup Batch: CIE0132 Initial Volume: 0.5 mL  
Cleaned: 21-May-2020 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	5	0.0031	ND	ug/L	U
beta-BHC	319-85-7	5	0.0031	ND	ug/L	U
gamma-BHC (Lindane)	58-89-9	5	0.0031	ND	ug/L	U
delta-BHC	319-86-8	5	0.0031	ND	ug/L	U
Heptachlor	76-44-8	5	0.0031	ND	ug/L	U
Aldrin	309-00-2	5	0.0031	ND	ug/L	U
Heptachlor Epoxide	1024-57-3	5	0.0031	0.0578	ug/L	P1, D
trans-Chlordane (beta-Chlordane)	5103-74-2	5	0.0031	ND	ug/L	U
cis-Chlordane (alpha-chlordane)	5103-71-9	5	0.0031	ND	ug/L	U
Endosulfan I	959-98-8	5	0.0031	ND	ug/L	U
4,4'-DDE	72-55-9	5	0.0063	ND	ug/L	U
Dieldrin	60-57-1	5	0.0063	ND	ug/L	U
Endrin	72-20-8	5	0.0063	ND	ug/L	U
Endosulfan II	33213-65-9	5	0.0063	ND	ug/L	U
4,4'-DDD	72-54-8	5	0.0063	ND	ug/L	U
Endrin Aldehyde	7421-93-4	5	0.0063	ND	ug/L	U
4,4'-DDT	50-29-3	5	0.0063	ND	ug/L	U
Endosulfan Sulfate	1031-07-8	5	0.0063	ND	ug/L	U
Endrin Ketone	53494-70-5	5	0.0063	ND	ug/L	U
Methoxychlor	72-43-5	5	0.0313	ND	ug/L	U
Toxaphene	8001-35-2	5	0.313	ND	ug/L	U
Chlordane (NOS)	57-74-9	5	0.0250	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>			30-160 %	89.1	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>			30-160 %	113	%	
<i>Surrogate: Tetrachlorometaxylene</i>			30-160 %	66.2	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>			30-160 %	73.1	%	





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

Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
08-Jun-2020 14:14

**SW-10R-20200513**  
**20E0132-01RE3 (Water)**

**Chlorinated Pesticides**

Method: EPA 8081B Sampled: 05/13/2020 10:40  
Instrument: ECD6 Analyst: JGR Analyzed: 06/01/2020 15:59

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 20E0132-01RE3 A 01  
Preparation Batch: BIE0337 Sample Size: 1000 mL  
Prepared: 05/20/2020 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Silica Gel Extract ID: 20E0132-01RE3 A 01  
Cleanup Batch: CIE0133 Initial Volume: 0.5 mL  
Cleaned: 21-May-2020 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Sulfur Extract ID: 20E0132-01RE3 A 01  
Cleanup Batch: CIE0132 Initial Volume: 0.5 mL  
Cleaned: 21-May-2020 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	2	0.0013	ND	ug/L	U
beta-BHC	319-85-7	2	0.0013	ND	ug/L	U
gamma-BHC (Lindane)	58-89-9	2	0.0013	ND	ug/L	U
delta-BHC	319-86-8	2	0.0013	ND	ug/L	U
Heptachlor	76-44-8	2	0.0013	ND	ug/L	U
Aldrin	309-00-2	2	0.0013	ND	ug/L	U
Heptachlor Epoxide	1024-57-3	2	0.0013	0.0602	ug/L	P1, D
trans-Chlordane (beta-Chlordane)	5103-74-2	2	0.0013	0.0016	ug/L	D
cis-Chlordane (alpha-chlordane)	5103-71-9	2	0.0013	ND	ug/L	U
Endosulfan I	959-98-8	2	0.0013	ND	ug/L	U
4,4'-DDE	72-55-9	2	0.0025	ND	ug/L	U
Dieldrin	60-57-1	2	0.0025	ND	ug/L	U
Endrin	72-20-8	2	0.0025	ND	ug/L	U
Endosulfan II	33213-65-9	2	0.0025	ND	ug/L	U
4,4'-DDD	72-54-8	2	0.0025	ND	ug/L	U
Endrin Aldehyde	7421-93-4	2	0.0025	ND	ug/L	U
4,4'-DDT	50-29-3	2	0.0025	ND	ug/L	U
Endosulfan Sulfate	1031-07-8	2	0.0025	ND	ug/L	U
Endrin Ketone	53494-70-5	2	0.0025	ND	ug/L	U
Methoxychlor	72-43-5	2	0.0125	ND	ug/L	U
Toxaphene	8001-35-2	2	0.125	ND	ug/L	U
Chlordane (NOS)	57-74-9	2	0.0100	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>			30-160 %	112	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>			30-160 %	117	%	
<i>Surrogate: Tetrachlorometaxylene</i>			30-160 %	74.6	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>			30-160 %	76.7	%	



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

Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
08-Jun-2020 14:14

**SW-11R-20200513**  
**20E0132-02 (Water)**

**Chlorinated Pesticides**

Method: EPA 8081B Sampled: 05/13/2020 11:28  
Instrument: ECD6 Analyst: YZ Analyzed: 05/27/2020 00:08

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 20E0132-02 A 01  
Preparation Batch: BIE0337 Sample Size: 1000 mL  
Prepared: 05/20/2020 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Silica Gel Extract ID: 20E0132-02 A 01  
Cleanup Batch: CIE0133 Initial Volume: 0.5 mL  
Cleaned: 21-May-2020 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Sulfur Extract ID: 20E0132-02 A 01  
Cleanup Batch: CIE0132 Initial Volume: 0.5 mL  
Cleaned: 21-May-2020 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	0.0052	ug/L	P1
trans-Chlordane (beta-Chlordane)	5103-74-2	1	0.0006	0.0029	ug/L	
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	0.0013	ND	ug/L	U
Dieldrin	60-57-1	1	0.0013	ND	ug/L	U
Endrin	72-20-8	1	0.0013	ND	ug/L	U
Endosulfan II	33213-65-9	1	0.0013	ND	ug/L	U
4,4'-DDD	72-54-8	1	0.0013	ND	ug/L	U
Endrin Aldehyde	7421-93-4	1	0.0013	ND	ug/L	U
4,4'-DDT	50-29-3	1	0.0013	ND	ug/L	U
Endosulfan Sulfate	1031-07-8	1	0.0013	ND	ug/L	U
Endrin Ketone	53494-70-5	1	0.0013	ND	ug/L	U
Methoxychlor	72-43-5	1	0.0063	ND	ug/L	U
Toxaphene	8001-35-2	1	0.0625	ND	ug/L	U
Chlordane (NOS)	57-74-9	1	0.0050	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>			30-160 %	137	%	P1
<i>Surrogate: Decachlorobiphenyl [2C]</i>			30-160 %	650	%	*, P1
<i>Surrogate: Tetrachlorometaxylene</i>			30-160 %	50.8	%	P1
<i>Surrogate: Tetrachlorometaxylene [2C]</i>			30-160 %	153	%	P1



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

Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
08-Jun-2020 14:14

**SW-11R-20200513**  
**20E0132-02RE2 (Water)**

**Chlorinated Pesticides**

Method: EPA 8081B Sampled: 05/13/2020 11:28  
Instrument: ECD6 Analyst: JGR Analyzed: 06/01/2020 11:31

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 20E0132-02RE2 A 01  
Preparation Batch: BIE0337 Sample Size: 1000 mL  
Prepared: 05/20/2020 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Silica Gel Extract ID: 20E0132-02RE2 A 01  
Cleanup Batch: CIE0133 Initial Volume: 0.5 mL  
Cleaned: 21-May-2020 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Sulfur Extract ID: 20E0132-02RE2 A 01  
Cleanup Batch: CIE0132 Initial Volume: 0.5 mL  
Cleaned: 21-May-2020 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	5	0.0031	ND	ug/L	U
beta-BHC	319-85-7	5	0.0031	ND	ug/L	U
gamma-BHC (Lindane)	58-89-9	5	0.0031	ND	ug/L	U
delta-BHC	319-86-8	5	0.0031	ND	ug/L	U
Heptachlor	76-44-8	5	0.0031	ND	ug/L	U
Aldrin	309-00-2	5	0.0031	ND	ug/L	U
Heptachlor Epoxide	1024-57-3	5	0.0031	0.0045	ug/L	D
trans-Chlordane (beta-Chlordane)	5103-74-2	5	0.0031	ND	ug/L	U
cis-Chlordane (alpha-chlordane)	5103-71-9	5	0.0031	ND	ug/L	U
Endosulfan I	959-98-8	5	0.0031	ND	ug/L	U
4,4'-DDE	72-55-9	5	0.0063	ND	ug/L	U
Dieldrin	60-57-1	5	0.0063	ND	ug/L	U
Endrin	72-20-8	5	0.0063	ND	ug/L	U
Endosulfan II	33213-65-9	5	0.0063	ND	ug/L	U
4,4'-DDD	72-54-8	5	0.0063	ND	ug/L	U
Endrin Aldehyde	7421-93-4	5	0.0063	ND	ug/L	U
4,4'-DDT	50-29-3	5	0.0063	ND	ug/L	U
Endosulfan Sulfate	1031-07-8	5	0.0063	ND	ug/L	U
Endrin Ketone	53494-70-5	5	0.0063	ND	ug/L	U
Methoxychlor	72-43-5	5	0.0313	ND	ug/L	U
Toxaphene	8001-35-2	5	0.313	ND	ug/L	U
Chlordane (NOS)	57-74-9	5	0.0250	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>			30-160 %	87.0	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>			30-160 %	115	%	
<i>Surrogate: Tetrachlorometaxylene</i>			30-160 %	66.2	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>			30-160 %	76.6	%	



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Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
08-Jun-2020 14:14

**SW-11R-20200513**  
**20E0132-02RE3 (Water)**

**Chlorinated Pesticides**

Method: EPA 8081B Sampled: 05/13/2020 11:28  
Instrument: ECD6 Analyst: JGR Analyzed: 06/01/2020 16:17

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 20E0132-02RE3 A 01  
Preparation Batch: BIE0337 Sample Size: 1000 mL  
Prepared: 05/20/2020 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Silica Gel Extract ID: 20E0132-02RE3 A 01  
Cleanup Batch: CIE0133 Initial Volume: 0.5 mL  
Cleaned: 21-May-2020 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Sulfur Extract ID: 20E0132-02RE3 A 01  
Cleanup Batch: CIE0132 Initial Volume: 0.5 mL  
Cleaned: 21-May-2020 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	2	0.0013	ND	ug/L	U
beta-BHC	319-85-7	2	0.0013	ND	ug/L	U
gamma-BHC (Lindane)	58-89-9	2	0.0013	ND	ug/L	U
delta-BHC	319-86-8	2	0.0013	ND	ug/L	U
Heptachlor	76-44-8	2	0.0013	ND	ug/L	U
Aldrin	309-00-2	2	0.0013	ND	ug/L	U
Heptachlor Epoxide	1024-57-3	2	0.0013	0.0066	ug/L	D
trans-Chlordane (beta-Chlordane)	5103-74-2	2	0.0013	0.0021	ug/L	D
cis-Chlordane (alpha-chlordane)	5103-71-9	2	0.0013	ND	ug/L	U
Endosulfan I	959-98-8	2	0.0013	ND	ug/L	U
4,4'-DDE	72-55-9	2	0.0025	ND	ug/L	U
Dieldrin	60-57-1	2	0.0025	ND	ug/L	U
Endrin	72-20-8	2	0.0025	ND	ug/L	U
Endosulfan II	33213-65-9	2	0.0025	ND	ug/L	U
4,4'-DDD	72-54-8	2	0.0025	ND	ug/L	U
Endrin Aldehyde	7421-93-4	2	0.0025	ND	ug/L	U
4,4'-DDT	50-29-3	2	0.0025	ND	ug/L	U
Endosulfan Sulfate	1031-07-8	2	0.0025	ND	ug/L	U
Endrin Ketone	53494-70-5	2	0.0025	ND	ug/L	U
Methoxychlor	72-43-5	2	0.0125	ND	ug/L	U
Toxaphene	8001-35-2	2	0.125	ND	ug/L	U
Chlordane (NOS)	57-74-9	2	0.0100	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>			30-160 %	102	%	
<i>Surrogate: Decachlorobiphenyl [2C]</i>			30-160 %	129	%	
<i>Surrogate: Tetrachlorometaxylene</i>			30-160 %	74.1	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>			30-160 %	91.4	%	



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Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
08-Jun-2020 14:14

**SW-99-20200513**  
**20E0132-03 (Water)**

**Chlorinated Pesticides**

Method: EPA 8081B Sampled: 05/13/2020 11:30  
Instrument: ECD6 Analyst: YZ Analyzed: 05/27/2020 00:30

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 20E0132-03 A 01  
Preparation Batch: BIE0337 Sample Size: 1000 mL  
Prepared: 05/20/2020 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Silica Gel Extract ID: 20E0132-03 A 01  
Cleanup Batch: CIE0133 Initial Volume: 0.5 mL  
Cleaned: 21-May-2020 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Sulfur Extract ID: 20E0132-03 A 01  
Cleanup Batch: CIE0132 Initial Volume: 0.5 mL  
Cleaned: 21-May-2020 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	0.0105	ug/L	
trans-Chlordane (beta-Chlordane)	5103-74-2	1	0.0006	0.0041	ug/L	
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	0.0013	ND	ug/L	U
Dieldrin	60-57-1	1	0.0013	ND	ug/L	U
Endrin	72-20-8	1	0.0013	ND	ug/L	U
Endosulfan II	33213-65-9	1	0.0013	ND	ug/L	U
4,4'-DDD	72-54-8	1	0.0013	ND	ug/L	U
Endrin Aldehyde	7421-93-4	1	0.0013	ND	ug/L	U
4,4'-DDT	50-29-3	1	0.0013	ND	ug/L	U
Endosulfan Sulfate	1031-07-8	1	0.0013	ND	ug/L	U
Endrin Ketone	53494-70-5	1	0.0013	ND	ug/L	U
Methoxychlor	72-43-5	1	0.0063	ND	ug/L	U
Toxaphene	8001-35-2	1	0.0625	ND	ug/L	U
Chlordane (NOS)	57-74-9	1	0.0050	ND	ug/L	U
Surrogate: Decachlorobiphenyl			30-160 %	147	%	P1
Surrogate: Decachlorobiphenyl [2C]			30-160 %	512	%	*, P1
Surrogate: Tetrachlorometaxylene			30-160 %	58.2	%	P1
Surrogate: Tetrachlorometaxylene [2C]			30-160 %	181	%	*, P1



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2107 South C Street  
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Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
08-Jun-2020 14:14

**SW-99-20200513**  
**20E0132-03RE2 (Water)**

**Chlorinated Pesticides**

Method: EPA 8081B Sampled: 05/13/2020 11:30  
Instrument: ECD6 Analyst: JGR Analyzed: 06/01/2020 11:49

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 20E0132-03RE2 A 01  
Preparation Batch: BIE0337 Sample Size: 1000 mL  
Prepared: 05/20/2020 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Silica Gel Extract ID: 20E0132-03RE2 A 01  
Cleanup Batch: CIE0133 Initial Volume: 0.5 mL  
Cleaned: 21-May-2020 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Sulfur Extract ID: 20E0132-03RE2 A 01  
Cleanup Batch: CIE0132 Initial Volume: 0.5 mL  
Cleaned: 21-May-2020 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	5	0.0031	ND	ug/L	U
beta-BHC	319-85-7	5	0.0031	ND	ug/L	U
gamma-BHC (Lindane)	58-89-9	5	0.0031	ND	ug/L	U
delta-BHC	319-86-8	5	0.0031	ND	ug/L	U
Heptachlor	76-44-8	5	0.0031	ND	ug/L	U
Aldrin	309-00-2	5	0.0031	ND	ug/L	U
Heptachlor Epoxide	1024-57-3	5	0.0031	0.0059	ug/L	D
trans-Chlordane (beta-Chlordane)	5103-74-2	5	0.0031	ND	ug/L	U
cis-Chlordane (alpha-chlordane)	5103-71-9	5	0.0031	ND	ug/L	U
Endosulfan I	959-98-8	5	0.0031	ND	ug/L	U
4,4'-DDE	72-55-9	5	0.0063	ND	ug/L	U
Dieldrin	60-57-1	5	0.0063	ND	ug/L	U
Endrin	72-20-8	5	0.0063	ND	ug/L	U
Endosulfan II	33213-65-9	5	0.0063	ND	ug/L	U
4,4'-DDD	72-54-8	5	0.0063	ND	ug/L	U
Endrin Aldehyde	7421-93-4	5	0.0063	ND	ug/L	U
4,4'-DDT	50-29-3	5	0.0063	ND	ug/L	U
Endosulfan Sulfate	1031-07-8	5	0.0063	ND	ug/L	U
Endrin Ketone	53494-70-5	5	0.0063	ND	ug/L	U
Methoxychlor	72-43-5	5	0.0313	ND	ug/L	U
Toxaphene	8001-35-2	5	0.313	ND	ug/L	U
Chlordane (NOS)	57-74-9	5	0.0250	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>			<i>30-160 %</i>	<i>83.4</i>	<i>%</i>	
<i>Surrogate: Decachlorobiphenyl [2C]</i>			<i>30-160 %</i>	<i>108</i>	<i>%</i>	
<i>Surrogate: Tetrachlorometaxylene</i>			<i>30-160 %</i>	<i>68.3</i>	<i>%</i>	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>			<i>30-160 %</i>	<i>77.7</i>	<i>%</i>	



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Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
08-Jun-2020 14:14

**SW-99-20200513**  
**20E0132-03RE3 (Water)**

**Chlorinated Pesticides**

Method: EPA 8081B Sampled: 05/13/2020 11:30  
Instrument: ECD6 Analyst: JGR Analyzed: 06/01/2020 16:35

Sample Preparation: Preparation Method: EPA 3510C SepF Extract ID: 20E0132-03RE3 A 01  
Preparation Batch: BIE0337 Sample Size: 1000 mL  
Prepared: 05/20/2020 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Silica Gel Extract ID: 20E0132-03RE3 A 01  
Cleanup Batch: CIE0133 Initial Volume: 0.5 mL  
Cleaned: 21-May-2020 Final Volume: 0.5 mL

Sample Cleanup: Cleanup Method: Sulfur Extract ID: 20E0132-03RE3 A 01  
Cleanup Batch: CIE0132 Initial Volume: 0.5 mL  
Cleaned: 21-May-2020 Final Volume: 0.5 mL

Analyte	CAS Number	Dilution	Reporting Limit	Result	Units	Notes
alpha-BHC	319-84-6	2	0.0013	ND	ug/L	U
beta-BHC	319-85-7	2	0.0013	ND	ug/L	U
gamma-BHC (Lindane)	58-89-9	2	0.0013	ND	ug/L	U
delta-BHC	319-86-8	2	0.0013	ND	ug/L	U
Heptachlor	76-44-8	2	0.0013	ND	ug/L	U
Aldrin	309-00-2	2	0.0013	ND	ug/L	U
Heptachlor Epoxide	1024-57-3	2	0.0013	0.0051	ug/L	P1, D
trans-Chlordane (beta-Chlordane)	5103-74-2	2	0.0013	0.0018	ug/L	D
cis-Chlordane (alpha-chlordane)	5103-71-9	2	0.0013	ND	ug/L	U
Endosulfan I	959-98-8	2	0.0013	ND	ug/L	U
4,4'-DDE	72-55-9	2	0.0025	ND	ug/L	U
Dieldrin	60-57-1	2	0.0025	ND	ug/L	U
Endrin	72-20-8	2	0.0025	ND	ug/L	U
Endosulfan II	33213-65-9	2	0.0025	ND	ug/L	U
4,4'-DDD	72-54-8	2	0.0025	ND	ug/L	U
Endrin Aldehyde	7421-93-4	2	0.0025	ND	ug/L	U
4,4'-DDT	50-29-3	2	0.0025	ND	ug/L	U
Endosulfan Sulfate	1031-07-8	2	0.0025	ND	ug/L	U
Endrin Ketone	53494-70-5	2	0.0025	ND	ug/L	U
Methoxychlor	72-43-5	2	0.0125	ND	ug/L	U
Toxaphene	8001-35-2	2	0.125	ND	ug/L	U
Chlordane (NOS)	57-74-9	2	0.0100	ND	ug/L	U
<i>Surrogate: Decachlorobiphenyl</i>			30-160 %	94.2	%	P1
<i>Surrogate: Decachlorobiphenyl [2C]</i>			30-160 %	146	%	P1
<i>Surrogate: Tetrachlorometaxylene</i>			30-160 %	65.8	%	
<i>Surrogate: Tetrachlorometaxylene [2C]</i>			30-160 %	89.9	%	



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Project: Webster Nursery  
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Reported:  
08-Jun-2020 14:14

### Chlorinated Pesticides - Quality Control

#### Batch BIE0337 - EPA 3510C SepF

Instrument: ECD6 Analyst: JGR

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Blank (BIE0337-BLK1)</b>										
Prepared: 20-May-2020 Analyzed: 01-Jun-2020 12:07										
alpha-BHC	ND	0.0031	ug/L							U
beta-BHC	ND	0.0031	ug/L							U
gamma-BHC (Lindane)	ND	0.0031	ug/L							U
delta-BHC	ND	0.0031	ug/L							U
Heptachlor	ND	0.0031	ug/L							U
Aldrin	ND	0.0031	ug/L							U
Heptachlor Epoxide	ND	0.0031	ug/L							U
trans-Chlordane (beta-Chlordane)	ND	0.0031	ug/L							U
cis-Chlordane (alpha-chlordane)	ND	0.0031	ug/L							U
Endosulfan I	ND	0.0031	ug/L							U
4,4'-DDE	ND	0.0063	ug/L							U
Dieldrin	ND	0.0063	ug/L							U
Endrin	ND	0.0063	ug/L							U
Endosulfan II	ND	0.0063	ug/L							U
4,4'-DDD	ND	0.0063	ug/L							U
Endrin Aldehyde	ND	0.0063	ug/L							U
4,4'-DDT	ND	0.0063	ug/L							U
Endosulfan Sulfate	ND	0.0063	ug/L							U
Endrin Ketone	ND	0.0063	ug/L							U
Methoxychlor	ND	0.0313	ug/L							U
Toxaphene	ND	0.313	ug/L							U
Chlordane (NOS)	ND	0.0250	ug/L							U
Surrogate: Decachlorobiphenyl	0.0132		ug/L	0.0200	66.0		30-160			
Surrogate: Decachlorobiphenyl [2C]	0.0185		ug/L	0.0200	92.4		30-160			
Surrogate: Tetrachlorometaxylene	0.0101		ug/L	0.0200	50.6		30-160			
Surrogate: Tetrachlorometaxylene [2C]	0.0139		ug/L	0.0200	69.7		30-160			

<b>LCS (BIE0337-BS1)</b>										
Prepared: 20-May-2020 Analyzed: 01-Jun-2020 14:12										
alpha-BHC	0.0063	0.0031	ug/L	0.0100	62.7		30-160			D
beta-BHC	0.0077	0.0031	ug/L	0.0100	76.8		30-160			D
gamma-BHC (Lindane)	0.0070	0.0031	ug/L	0.0100	69.7		30-160			D
delta-BHC	0.0069	0.0031	ug/L	0.0100	69.3		30-160			D
Heptachlor	0.0066	0.0031	ug/L	0.0100	66.5		30-160			D
Aldrin	0.0063	0.0031	ug/L	0.0100	63.3		30-160			D
Heptachlor Epoxide	0.0082	0.0031	ug/L	0.0100	82.4		30-160			D





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Project: Webster Nursery  
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Project Manager: Sierra Mott

Reported:  
08-Jun-2020 14:14

### Chlorinated Pesticides - Quality Control

#### Batch BIE0337 - EPA 3510C SepF

Instrument: ECD6 Analyst: JGR

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS (BIE0337-BS1)</b>										
					Prepared: 20-May-2020 Analyzed: 01-Jun-2020 14:12					
trans-Chlordane (beta-Chlordane)	0.0078	0.0031	ug/L	0.0100		77.8	30-160			D
cis-Chlordane (alpha-chlordane)	0.0083	0.0031	ug/L	0.0100		82.7	30-160			D
Endosulfan I	0.0080	0.0031	ug/L	0.0100		79.6	30-160			D
4,4'-DDE	0.0155	0.0063	ug/L	0.0200		77.3	30-160			D
Dieldrin	0.0179	0.0063	ug/L	0.0200		89.7	30-160			D
Endrin	0.0198	0.0063	ug/L	0.0200		98.9	30-160			P1, D
Endosulfan II	0.0223	0.0063	ug/L	0.0200		111	30-160			P1, D
4,4'-DDD	0.0203	0.0063	ug/L	0.0200		102	30-160			P1, D
Endrin Aldehyde	0.0148	0.0063	ug/L	0.0200		73.8	30-160			P1, D
4,4'-DDT	0.0195	0.0063	ug/L	0.0200		97.6	30-160			P1, D
Endosulfan Sulfate	0.0198	0.0063	ug/L	0.0200		99.1	30-160			P1, D
Endrin Ketone	0.0187	0.0063	ug/L	0.0200		93.3	30-160			D
Methoxychlor	0.103	0.0313	ug/L	0.100		103	30-160			P1, D
Surrogate: Decachlorobiphenyl	0.0360		ug/L	0.0200	180		30-160			*, P1
Surrogate: Decachlorobiphenyl [2C]	0.0240		ug/L	0.0200	120		30-160			P1
Surrogate: Tetrachlorometaxylene	0.0110		ug/L	0.0200	54.9		30-160			
Surrogate: Tetrachlorometaxylene [2C]	0.0132		ug/L	0.0200	65.9		30-160			
<b>LCS Dup (BIE0337-BSD1)</b>										
					Prepared: 20-May-2020 Analyzed: 01-Jun-2020 14:30					
alpha-BHC	0.0067	0.0031	ug/L	0.0100		67.1	30-160	6.77	30	D
beta-BHC	0.0085	0.0031	ug/L	0.0100		85.5	30-160	10.70	30	D
gamma-BHC (Lindane)	0.0072	0.0031	ug/L	0.0100		72.3	30-160	3.73	30	D
delta-BHC	0.0073	0.0031	ug/L	0.0100		73.4	30-160	5.65	30	D
Heptachlor	0.0067	0.0031	ug/L	0.0100		66.9	30-160	0.71	30	D
Aldrin	0.0058	0.0031	ug/L	0.0100		57.9	30-160	8.91	30	D
Heptachlor Epoxide	0.0086	0.0031	ug/L	0.0100		86.4	30-160	4.68	30	D
trans-Chlordane (beta-Chlordane)	0.0080	0.0031	ug/L	0.0100		79.5	30-160	2.24	30	D
cis-Chlordane (alpha-chlordane)	0.0084	0.0031	ug/L	0.0100		84.5	30-160	2.07	30	D
Endosulfan I	0.0083	0.0031	ug/L	0.0100		82.7	30-160	3.76	30	D
4,4'-DDE	0.0159	0.0063	ug/L	0.0200		79.5	30-160	2.73	30	D
Dieldrin	0.0184	0.0063	ug/L	0.0200		92.0	30-160	2.52	30	D
Endrin	0.0173	0.0063	ug/L	0.0200		86.5	30-160	13.40	30	D
Endosulfan II	0.0194	0.0063	ug/L	0.0200		97.0	30-160	13.70	30	D
4,4'-DDD	0.0169	0.0063	ug/L	0.0200		84.7	30-160	18.20	30	D
Endrin Aldehyde	0.0128	0.0063	ug/L	0.0200		64.2	30-160	13.90	30	D



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

Project: Webster Nursery  
Project Number: Webster Nursery  
Project Manager: Sierra Mott

Reported:  
08-Jun-2020 14:14

**Chlorinated Pesticides - Quality Control**

**Batch BIE0337 - EPA 3510C SepF**

Instrument: ECD6 Analyst: JGR

QC Sample/Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>LCS Dup (BIE0337-BSD1)</b>				Prepared: 20-May-2020 Analyzed: 01-Jun-2020 14:30						
4,4'-DDT	0.0169	0.0063	ug/L	0.0200		84.7	30-160	14.10	30	D
Endosulfan Sulfate	0.0178	0.0063	ug/L	0.0200		89.0	30-160	10.80	30	D
Endrin Ketone	0.0205	0.0063	ug/L	0.0200		103	30-160	14.40	30	D
Methoxychlor	0.0936	0.0313	ug/L	0.100		93.6	30-160	9.94	30	D
Surrogate: Decachlorobiphenyl	0.0193		ug/L	0.0200		96.7	30-160			
Surrogate: Decachlorobiphenyl [2C]	0.0228		ug/L	0.0200		114	30-160			
Surrogate: Tetrachlorometaxylene	0.00967		ug/L	0.0200		48.4	30-160			
Surrogate: Tetrachlorometaxylene [2C]	0.0113		ug/L	0.0200		56.3	30-160			



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2107 South C Street  
Tacoma WA, 98402

Project: Webster Nursery  
Project Number: Webster Nursery  
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Reported:  
08-Jun-2020 14:14

**Certified Analyses included in this Report**

Analyte	Certifications
<b>EPA 8081B in Water</b>	
alpha-BHC	DoD-ELAP,WADOE,NELAP
alpha-BHC	DoD-ELAP,WADOE,CALAP
alpha-BHC [2C]	DoD-ELAP,WADOE,CALAP
alpha-BHC [2C]	DoD-ELAP,WADOE,NELAP
beta-BHC	DoD-ELAP,WADOE,CALAP
beta-BHC	DoD-ELAP,WADOE,NELAP
beta-BHC [2C]	DoD-ELAP,WADOE,CALAP
beta-BHC [2C]	DoD-ELAP,WADOE,NELAP
gamma-BHC (Lindane)	DoD-ELAP,WADOE,NELAP
gamma-BHC (Lindane)	DoD-ELAP,WADOE,CALAP
gamma-BHC (Lindane) [2C]	DoD-ELAP,WADOE,NELAP
gamma-BHC (Lindane) [2C]	DoD-ELAP,WADOE,CALAP
delta-BHC	DoD-ELAP,WADOE,CALAP
delta-BHC	DoD-ELAP,WADOE,NELAP
delta-BHC [2C]	DoD-ELAP,WADOE,NELAP
delta-BHC [2C]	DoD-ELAP,WADOE,CALAP
Heptachlor	DoD-ELAP,WADOE,NELAP
Heptachlor	DoD-ELAP,WADOE,CALAP
Heptachlor [2C]	DoD-ELAP,WADOE,NELAP
Heptachlor [2C]	DoD-ELAP,WADOE,CALAP
Aldrin	DoD-ELAP,WADOE,CALAP
Aldrin	DoD-ELAP,WADOE,NELAP
Aldrin [2C]	DoD-ELAP,WADOE,NELAP
Aldrin [2C]	DoD-ELAP,WADOE,CALAP
Heptachlor Epoxide	DoD-ELAP,WADOE,CALAP
Heptachlor Epoxide	DoD-ELAP,WADOE,NELAP
Heptachlor Epoxide [2C]	DoD-ELAP,WADOE,NELAP
Heptachlor Epoxide [2C]	DoD-ELAP,WADOE,CALAP
trans-Chlordane (beta-Chlordane)	DoD-ELAP,WADOE,CALAP
trans-Chlordane (beta-Chlordane)	DoD-ELAP,WADOE,NELAP
trans-Chlordane (beta-Chlordane) [2C]	DoD-ELAP,WADOE,NELAP
trans-Chlordane (beta-Chlordane) [2C]	DoD-ELAP,WADOE,CALAP
cis-Chlordane (alpha-chlordane)	DoD-ELAP,WADOE,NELAP
cis-Chlordane (alpha-chlordane)	DoD-ELAP,WADOE,CALAP
cis-Chlordane (alpha-chlordane) [2C]	DoD-ELAP,WADOE,CALAP



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2107 South C Street  
Tacoma WA, 98402

Project: Webster Nursery  
Project Number: Webster Nursery  
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Reported:  
08-Jun-2020 14:14

cis-Chlordane (alpha-chlordane) [2C]	DoD-ELAP,WADOE,NELAP
Endosulfan I	DoD-ELAP,WADOE,NELAP
Endosulfan I	DoD-ELAP,WADOE,CALAP
Endosulfan I [2C]	DoD-ELAP,WADOE,NELAP
Endosulfan I [2C]	DoD-ELAP,WADOE,CALAP
4,4'-DDE	DoD-ELAP,WADOE,NELAP
4,4'-DDE	DoD-ELAP,WADOE,CALAP
4,4'-DDE [2C]	DoD-ELAP,WADOE,CALAP
4,4'-DDE [2C]	DoD-ELAP,WADOE,NELAP
Dieldrin	DoD-ELAP,WADOE,CALAP
Dieldrin	DoD-ELAP,WADOE,NELAP
Dieldrin [2C]	DoD-ELAP,WADOE,CALAP
Dieldrin [2C]	DoD-ELAP,WADOE,NELAP
Endrin	DoD-ELAP,WADOE,NELAP
Endrin	DoD-ELAP,WADOE,CALAP
Endrin [2C]	DoD-ELAP,WADOE,NELAP
Endrin [2C]	DoD-ELAP,WADOE,CALAP
Endosulfan II	DoD-ELAP,WADOE,CALAP
Endosulfan II	DoD-ELAP,WADOE,NELAP
Endosulfan II [2C]	DoD-ELAP,WADOE,NELAP
Endosulfan II [2C]	DoD-ELAP,WADOE,CALAP
4,4'-DDD	DoD-ELAP,WADOE,NELAP
4,4'-DDD	DoD-ELAP,WADOE,CALAP
4,4'-DDD [2C]	DoD-ELAP,WADOE,NELAP
4,4'-DDD [2C]	DoD-ELAP,WADOE,CALAP
Endrin Aldehyde	DoD-ELAP,WADOE,CALAP
Endrin Aldehyde	DoD-ELAP,WADOE,NELAP
Endrin Aldehyde [2C]	DoD-ELAP,WADOE,CALAP
Endrin Aldehyde [2C]	DoD-ELAP,WADOE,NELAP
4,4'-DDT	DoD-ELAP,WADOE,NELAP
4,4'-DDT	DoD-ELAP,WADOE,CALAP
4,4'-DDT [2C]	DoD-ELAP,WADOE,CALAP
4,4'-DDT [2C]	DoD-ELAP,WADOE,NELAP
Endosulfan Sulfate	DoD-ELAP,WADOE,NELAP
Endosulfan Sulfate	DoD-ELAP,WADOE,CALAP
Endosulfan Sulfate [2C]	DoD-ELAP,WADOE,NELAP
Endosulfan Sulfate [2C]	DoD-ELAP,WADOE,CALAP
Endrin Ketone	DoD-ELAP,WADOE,CALAP
Endrin Ketone	DoD-ELAP,WADOE,NELAP



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2107 South C Street  
Tacoma WA, 98402

Project: Webster Nursery  
Project Number: Webster Nursery  
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Reported:  
08-Jun-2020 14:14

Endrin Ketone [2C]	DoD-ELAP,WADOE,NELAP
Endrin Ketone [2C]	DoD-ELAP,WADOE,CALAP
Methoxychlor	DoD-ELAP,WADOE,NELAP
Methoxychlor	DoD-ELAP,WADOE,CALAP
Methoxychlor [2C]	DoD-ELAP,WADOE,NELAP
Methoxychlor [2C]	DoD-ELAP,WADOE,CALAP
Hexachlorobutadiene	DoD-ELAP,WADOE,CALAP
Hexachlorobutadiene	DoD-ELAP,WADOE,NELAP
Hexachlorobutadiene [2C]	DoD-ELAP,WADOE,CALAP
Hexachlorobutadiene [2C]	DoD-ELAP,WADOE,NELAP
Hexachlorobenzene	DoD-ELAP,WADOE,NELAP
Hexachlorobenzene	DoD-ELAP,WADOE,CALAP
Hexachlorobenzene [2C]	DoD-ELAP,WADOE,NELAP
Hexachlorobenzene [2C]	DoD-ELAP,WADOE,CALAP
2,4'-DDE	DoD-ELAP
2,4'-DDE	DoD-ELAP
2,4'-DDE [2C]	DoD-ELAP
2,4'-DDE [2C]	DoD-ELAP
2,4'-DDD	DoD-ELAP
2,4'-DDD	DoD-ELAP
2,4'-DDD [2C]	DoD-ELAP
2,4'-DDD [2C]	DoD-ELAP
2,4'-DDT	DoD-ELAP
2,4'-DDT	DoD-ELAP
2,4'-DDT [2C]	DoD-ELAP
2,4'-DDT [2C]	DoD-ELAP
Oxychlorane	DoD-ELAP
Oxychlorane	DoD-ELAP
Oxychlorane [2C]	DoD-ELAP
Oxychlorane [2C]	DoD-ELAP
cis-Nonachlor	DoD-ELAP
cis-Nonachlor	DoD-ELAP
cis-Nonachlor [2C]	DoD-ELAP
cis-Nonachlor [2C]	DoD-ELAP
trans-Nonachlor	DoD-ELAP
trans-Nonachlor	DoD-ELAP
trans-Nonachlor [2C]	DoD-ELAP
trans-Nonachlor [2C]	DoD-ELAP
Mirex	DoD-ELAP



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

Project: Webster Nursery  
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**Reported:**  
08-Jun-2020 14:14

Mirex	DoD-ELAP
Mirex [2C]	DoD-ELAP
Mirex [2C]	DoD-ELAP
Toxaphene	DoD-ELAP
Toxaphene	DoD-ELAP
Toxaphene [2C]	DoD-ELAP
Toxaphene [2C]	DoD-ELAP
Chlordane, technical	DoD-ELAP
Chlordane, technical	DoD-ELAP
Chlordane, technical [2C]	DoD-ELAP
Chlordane, technical [2C]	DoD-ELAP

Code	Description	Number	Expires
ADEC	Alaska Dept of Environmental Conservation	17-015	01/31/2021
DoD-ELAP	DoD-Environmental Laboratory Accreditation Program	66169	01/01/2021
WADOE	WA Dept of Ecology	C558	06/30/2020
WA-DW	Ecology - Drinking Water	C558	06/30/2020



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08-Jun-2020 14:14

### Notes and Definitions

- \* Flagged value is not within established control limits.
- D The reported value is from a dilution
- 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 reporting limit (RL) or if noted, not detected above the limit of detection (LOD).
- 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.